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Implementing the Aboriginal Waterways Assessment tool: collaborations to engage and empower First Nations in waterway management

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ABSTRACT

Aboriginal representative organisations collaborated with the Murray Darling Basin Authority to develop the Aboriginal Waterways Assessment (AWA) tool. We consider the AWA as part of an evolving toolkit of methodologies designed to elevate First Nations' objectives in water planning, in the context of national water reform and implementation of the Murray Darling Basin Plan. We describe the adaptation of the AWA from an approach developed in Aotearoa/New Zealand, the Maori Cultural Health Index for Streams and Waterways. We review the delivery and outcomes of seven AWA projects undertaken in Victoria between 2017 and 2018, demonstrating that the AWA is an effective and culturally safe mechanism for First Nations to document water-related values and influence waterway management. The article identifies improvements in water management resulting from the use of data generated through AWA projects, as well as project outcomes at the individual and broader political scale, including the social benefits of First Nations' data collection and the importance of data sovereignty. We highlight the value of waterway assessments undertaken by First Nations as a tool to address their widespread exclusion from water planning and management.

KEYWORDS

Cultural flows; Murray Darling Basin; water reform; Aboriginal water management; Indigenous data sovereignty

Introduction

First Nations' activists and advocates confront a colonial legacy of land and water theft across the continent of Australia. Indigenous efforts to achieve restorative justice have been evident in the legal recognition of native title and a growing 'Indigenous estate' (Altman and Markham 2015). Yet, restoring First Nations rights to fresh water has posed unique and enduring challenges (McAvoy 2008; Tan and Jackson 2013; Jackson and Langton 2012; Taylor, Moggridge, and Poelina 2017; Weir 2009). The Murray Lower Darling Rivers Indigenous Nations (MLDRIN) was established in 1998 to consolidate and amplify First Nations' claims to an inherent right to water in the river systems of the Southern Murray-Darling Basin. Starting as a confederation of ten member Nations

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(Morgan 2011), MLDRIN has grown to an alliance of twenty-five independent, sovereign First Nations, united in their efforts to secure rights to own and manage water resources and restore the health of ancestral waterways.

Since the early 2000s, Australian governments have mandated improved recognition and delivery of First Nations' outcomes in water planning (Tan and Jackson 2013). National water reform, enacted through the inter-governmental agreement referred to as the National Water Initiative (Council of Australian Governments 2004), and passage of the *Water Act 2007* (Cth) included measures to re-balance the distribution of water between consumptive uses and the environment (Grafton and Connell 2011). These reforms also directed Australian jurisdictions to improve Indigenous access to water, to include recognition of First Nations objectives in water planning, and to account for water allocated for native title purposes (Tan and Jackson 2013).

MLDRIN has argued that, beyond considerations of efficient water use and the water requirements of the environment, First Nations' inherent rights, and objectives regarding use and management of water, need to be elevated. Furthermore, MLDRIN asserts that Indigenous-led research should be given greater weight in governance and decision-making processes. The first author (Will Mooney) has taken an active role in water rights research and advocacy, through roles with Friends of the Earth (2012–2015) and MLDRIN where he has, since 2015, been the Executive Officer. This article draws on the first author's experience in collaborating with MLDRIN's 26 member Nations to develop policy and research tools, which seek to create a platform for achieving restorative justice in water. The second author (Alexander Cullen) has drawn on his research into Indigenous mapping and customary land tenure to contextualise the AWA as a tool that can help to build 'information bridges' and strengthen the recognition of First Nations' knowledge and rights claims.

In the context of ongoing national water reform, First Nations and water planners based in state agencies are grappling with the question: How can 'mainstream' water planning respond to First Nations' objectives and achieve shared benefits? In particular, the 2012 Murray Darling Basin Plan requires that state governments identify First Nations' water-related objectives and outcomes in the Water Resource Plans (WRPs) that are to be prepared for the 36 water resource areas of the Basin. As stipulated in the *Water Act 2007*, water managers must consult with Indigenous communities when they prepare WRPs, they must identify Indigenous water objectives, and have regard to Indigenous values and uses of water.

Under the current arrangements relating to the MDB, First Nations can influence water resource planning in a number of ways: (1) by articulating water-related priorities and objectives; (2) by guiding state agencies in the preparation of plans and related instruments, including consultation processes; and (3) in providing advice to the MDBA on the adequacy of a WRP prior to approval by the minister. Here we focus on the use of the Aboriginal Waterway Assessment (AWA) tool in seven projects across the State of Victoria in 2016–2018. The AWA is but one part of an evolving toolkit of approaches aimed at responding to these requirements and opportunities.

The AWA is a community-driven tool developed in response to a major, multistate water planning process and national and international commitments to Indigenous participation in waterway management (Taylor, Moggridge, and Poelina 2017; Jackson 2018). The development of the AWA was initially supported by the Australian

Government agency responsible for managing the Murray Darling Basin, the Murray Darling Basin Authority (MDBA), but it has since received funding and support from three basin states and is being applied and adapted under the leadership of Aboriginal organisations and Traditional Owner corporations. Drawing on international precedents in Indigenous participatory assessment and monitoring (Tipa and Nelson 2012; Tipa and Teirney 2006; Sieber 2006), the AWA addresses significant gaps in Australian water management.

We argue that the introduction of the AWA has provided an effective and culturally appropriate pathway for Traditional Owners to document water-related values and inform water planning. Drawing on the Maori Cultural Health Index for Streams and Waterways developed by Tipa and Teirney (2006), the AWA tool incorporates a worksheet comprising a standardised sequence of questions and scoring options relating to cultural values, uses and waterway health. Traditional Owners address worksheet questions at a range of sites on-Country to generate quantitative and qualitative data about cultural and environmental health. First Nations have used the AWA to prompt improved management of state-held environmental water, as well as to build the case for First Nations' entitlements, or what MLDRIN and many Aboriginal groups now call 'cultural flows'. We argue that the value of the tool far exceeds its function as a technical method of gathering data and assessing waterways. We reflect on the application of the AWA tool as a process of social engagement and empowerment and a catalyst for improved resourcing and recognition for Indigenous participation in environmental management.

Application of the AWA can be integrated with other research and assessment methodologies, such as a new framework developed through the National Cultural Flows Research Project (2019). Users have continued to develop and adapt the tool, through processes that reflect the diversity of Nation priorities and perspectives. Use of the tool supports Indigenous data sovereignty while providing for ongoing additions to local First Nations' databases. Finally, involvement by Aboriginal individuals and organisations in the process of undertaking an AWA project acts as a catalyst for extending advocacy and water policy reform.

We start by contextualising cultural flows, Aboriginal environmental outcomes (or 'shared benefits'), and the need for First Nations' water assessment methodologies. We then discuss the development of the AWA and its application on Country, before describing the results, partnerships and other diverse outcomes arising from the implementation of the tool by MLDRIN at seven sites in Victoria. Finally, we outline how the application of the tool can progress First Nations' water management agendas and strengthen the recognition of First Nations water rights, thereby contributing to restorative justice.

Cultural flows

The Murray Darling Basin (MDB) covers a million square kilometres, encompassing Australia's three longest rivers and the territories of more than forty Aboriginal Nations. From the 1840s, Traditional Owners endured the accelerated invasion and occupation of ancestral land and waters by European colonists, with displacement of communities and the progressive alienation and degradation of water and other natural resources (Weir 2009, 2011). This complex of impacts meant First Nations people were largely excluded from the beneficial use of waterways and the successive development of land and water

resources (Langford 2004). Throughout the last 100 years, river basin management has reflected settler-colonial priorities and largely focused on regulating hydrological variability to ensure support and connectivity for irrigated agriculture (Kingsford 2000) which, today, is responsible for 70 per cent of the water consumed in the MDB. The resulting patterns of water use continue to have substantial impact on the Basin's riparian ecosystems (Pittock and Finlayson 2011).

Since the late twentieth century, political negotiations about water allocation and scientific debates about the erosion of basin health have driven increased investment and planning focussed on the ecological dimensions of riverine management. However, mainstream water management discourse has been dominated by conflicts between agricultural and environmental needs. Incorporation of First Nations' perspectives on riparian health, access to water and equity in decision making has been marginal to these debates. Moreover, governments and non-Indigenous water scientists have assumed that environmental flow assessments (EFAs) can serve as an acceptable surrogate for the protection of Aboriginal values and interests (Finn and Jackson 2011). Yet these approaches have not effectively incorporated First Nations' values, or addressed their rights and interests, as expressed in the concept of cultural flows (Weir 2009; Jackson 2017).

First Nations have responded to these deficiencies by developing strategies to challenge assumptions and drive innovation in mainstream water planning and policy. In 1998, community leaders, Elders and activists established the Murray Lower Darling Rivers Indigenous Nations (MLDRIN), as a confederation of First Nations' representatives from the Southern Murray Darling Basin, to forge a united voice and advocate for First Nations water rights. In 2010, the Northern Basin Aboriginal Nations (NBAN) was established, representing First Nations in the headwaters and upper catchment of the Murray-Darling system. Collectively, the two organisations now represent over forty First Nations. For the past decade, NBAN and MLDRIN have led research and advocacy to advance the concept of cultural flows.

Cultural flows denote water rights (or entitlements) that sustain First Nations' social, cultural and economic needs, including self-determination and cultural sustainability. The concept emphasises water as intrinsically linked to the cultural and spiritual identity of First-Nations people while recognising its inherent agency and life force (Rose 2004; Toussaint, Sullivan, and Yu 2005; Weir 2009). First Nations advocates point out that an adequate allocation of cultural flow will support the continuation of cultural activities, including fishing, hunting, ceremony and the maintenance of songlines (Morgan 2011), as well as support wellbeing and contemporary economic opportunities. It will also honour the inherent rights of First Nations to own and manage natural resources, as per the United Nations Declaration of the Rights of Indigenous Peoples (United Nations 2008).

In 2007 MLDRIN articulated these attributes in the Echuca Declaration. The Declaration defined cultural flows as 'water entitlements that are legally and beneficially owned by Indigenous Nations of a sufficient and adequate quantity and quality, to improve the spiritual, cultural, environmental, social and economic conditions of those Indigenous Nations. That is our inherent right' (MLDRIN 2008).

This definition highlighted issues within the Australian environmental management sector that reflect a continued impulse towards reductionism in the management of water, and little understanding of its cultural dimensions. In many cases, water planners

and ecologists have a poor understanding of First Nations ontologies and epistemologies, which are, therefore, often excluded from the environmental assessments they make (Jackson 2017). This omission has exacerbated the conceptual gap between the principles, values, needs and norms of contemporary First Nations governance and current mainstream Australian water management.

Many Indigenous representatives and scholars have highlighted the associated tendency of participants in Australian water management to essentialise Indigenous interests in water (see McAvoy 2006; Weir 2009; Jackson 2017). First Nations interests continue to be relegated to a 'traditional' or pre-colonial paradigm within existing planning approaches, whereas ways of knowing and relating to water continue to evolve (Maclean and Bana Yaralji Bubu Inc 2011). Beyond simplistic constructions of 'culture', First Nations water knowledges, values and governance interests espouse distinct and specialised knowledge of place, localised species histories and contemporary management practices (Maclean 2015; Jackson et al. 2012).

Jackson and Langton (2012) saw an essentialist premise to the cultural flow idea. While acknowledging that advocates of the concept seek to leverage water allocations for Indigenous purposes off the success of the 'environmental flow' concept, Jackson and Langton (2012) argued that the concept was risky. These authors considered that the notion of a separate water allocation category capable of capturing cultural identity may lack the requisite definitional clarity and precision to be accommodated within existing frameworks. They further warned that the strategy of arguing for 'water for culture' may relegate Indigenous uses and needs to a

> … category of 'cultural' activities poorly understood by the water policy and management sector and, according to current approaches, one that tends to require negligible amounts of water. The concept has gained attention in policy circles because it appears to accord with a preconception that indigenous groups have no significant demand for water resources. (Jackson and Langton 2012, 122)

In recognition of these potential risks, Aboriginal organisations have stressed the need for more research and funding to explore implementation pathways for cultural flows, and for improved economic outcomes from water reform, beyond what might be realised from changes to environmental water management. One of the major limitations to water reform from an Indigenous perspective is the failure of state water laws to provide First Nations with opportunities to gain from participation in the water economy. This limitation is compounded by the narrow definition of native title (Tan and Jackson 2013), whereby a native title right to water tends to include the taking and use of water for only domestic, social and cultural purposes. The *Native Title Act 1994* protects activities such as ceremonies, the preparation of food and bush medicines, the manufacture of artefacts, and the teaching of traditional laws, customs and practices such as fishing. So far, native title determinations that include a right to take and use water do not allow commercial water use, nor confer exclusive ownership of water (O'Donnell 2013). As O'Donnell (2013), Jackson and Langton (2012) argue, it is imperative that First Nations employ strategies that will alter the distribution of commercially valuable resource rights such as water entitlements, and this agenda is being pursued by both MLDRIN and NBAN as part of their advocacy for cultural flows.

In order to advance the implementation of the cultural flow strategy, MLDRIN, NBAN and the National Native Title Council (NNTC) led a major inter-disciplinary research project, the National Cultural Flows Research Project, that ran from 2011 to 2018. The intention of the project was to challenge mainstream assumptions about Indigenous water needs and to develop methodologies that can document water-related cultural values and quantify necessary flow requirements. In 2018, MLDRIN and NBAN released the findings and outcomes of the Cultural Flows project, including a 10-step water-planning tool for First Nations and water managers to develop Cultural Flows Management Plans and quantify flows required to achieve First Nations objectives. The outcomes of the Cultural Flows research project are an important corollary to the application of the AWA and MLDRIN and NBAN are exploring ways to integrate these methodologies.

First Nations water research

Processes that strengthen and validate Indigenous water knowledges, while improving involvement in decision-making, are a way to address weaknesses in past practices. Personal and institutional prejudices within government water management agencies have limited the understanding and meaningful inclusion of First Nations water objectives (Jackson et al. 2012). We argue that new approaches are needed to build the capacity of both Indigenous and non-Indigenous participants (e.g. two-way capacity building) and overturn the tendency to privilege western science and worldviews as the sole sources of knowledge. Therefore, developing tools and supporting practices for Indigenous-driven cultural assessment that may inform current decision making is one very important way to achieve progress towards the objectives of First Nations.

With growing recognition of the significance of cultural values and objectives in water management, four key factors point to First Nations' waterway assessments as a key component for better water governance and decision-making. Firstly, First Nations' waterway assessments contribute to improved holistic understanding of water, filling knowledge gaps generated by the exclusive focus on the collection of economic and ecological flow data by researchers (Gratani, Royee, and Butler 2016; Jackson et al. 2014). In the global context, it has been shown that traditional regulatory tools of the state are not able to address the world water problems on their own (UNWWAP 2003). Indigenous communities have hydrological knowledge that can inform water management processes and enable linkages with other environmental flow assessments (Weir 2009; Jackson et al. 2014). While recognition of possible divergences between Indigenous and ecological values may pose a challenge to scientifically driven decision-making, such information builds more complex and holistic understandings of water management imperatives. Work undertaken by Harmsworth et al. (2011) in New Zealand shows strong linkages between cultural and scientific indicators of river and stream health. Correlation between results of scientific and cultural monitoring approaches indicates the potential for cultural indicators to set benchmarks in a similar manner to scientific ones. Used alongside each other in a complementary manner they simultaneously reflect different epistemological systems and perspectives, providing a wealth of knowledge that better interrogates meanings of a 'river', for example (Harmsworth et al. 2011).

Indigenous management objectives for meeting social and cultural needs are unique, often informed by place and community-specific information, stories and ancestral

connections. A cultural assessment tool can generate such data while facilitating dialogue across different social worlds (Maclean 2015), thereby also allowing claims across institutional divides (Cullen 2015).

Secondly, First Nations peoples can collect, manage and control water-related traditional ecological knowledge through Indigenous-led cultural assessment. When directed and controlled by Indigenous communities, cultural assessment satisfies aspirations for recording local knowledge while retaining control over its use and distribution. This approach avoids problems of simplistic or positivistic data capture, often presented in disembodied technical outputs (Dunn 2007), or the release of culturally sensitive and confidential knowledge. Such outcomes can be anticipated if assessment processes rely upon western information frameworks that fail to accommodate alternative ontologies (Palmer 2007) or privilege facts over contextualised understandings derived through experience (Sieber 2006). By holding authority over what information to share with formalised decision makers or elite institutions, First Nations can challenge the embedded power and colonial vantage vested in data expression.

Thirdly, First Nations' waterway assessments can help advance recognition for Aboriginal resource management techniques, support claims to Country and normalise Indigenous water values and knowledge. Key to this outcome is the role of assessments in helping to emphasise the qualitative dimensions of people-place relationships (Finn and Jackson 2011). Obstacles to Indigenous participation in decision making regarding environmental governance include managerial legitimacy, colonial dislocation and historical efforts of assimilation (Carter 2008). Participation in water governance, through waterway assessment, works as an expression of customary law while representing diverse, but culturally significant, water interests (Morgan 2011). Davies and Young (1996) suggest Aboriginal groups with success in claiming land recognition and rights were those best at meaningfully conversing with the state. First Nations waterway assessments support these conversations and negotiations with respect to water resources.

Lastly, and following on from the previous point, First Nations' waterway assessments can assist in building relationships, within communities and between communities and the State. First Nations are empowered through decision-making and site attendant cultural assessment, which nourishes connection to place while reconfiguring new intra-community responsibilities. Collaborative processes and the relationships that structure them are key to addressing current and emerging water governance challenges. However, their ability to do so is dependent in part on reconciling mainstream and Indigenous assumptions. First Nations waterway assessment achieves this when utilised as a component in a mix of adaptive governance mechanisms so that accountability is better coordinated and uncertainty dealt with (Bark et al. 2012). Cooperative methods of research have enabled better Indigenous water governance engagement in Northern Australia (Maclean 2015; Hoverman and Ayre 2012; Ayre and Mackenzie 2013; Jackson et al. 2014), improving trust in formal institutions (Von der Porten and de Loe 2013). Such projects have also worked to better legitimise Indigenous water knowledge to mainstream stakeholders. In south-eastern Australia, First Nations-led waterway assessments, supported by collaborations with waterway management agencies and research institutions, are a growing but relatively recent endeavour.

Toolkit development and adaptation in the Murray Darling Basin

MLDRIN, NBAN and the MDBA drew on participatory processes first designed and trialled in Aotearoa/New Zealand to support the development of the AWA in Australia. Tipa and Nelson (2012) have described the development of the Maori Cultural Health Index for Streams and Waterways (MCHISW), recognising these understandings, while seeking increased Indigenous management, decision-making and knowledge inputs in water governance. The MCHISW was first implemented in 2005, as a process for a Maori-responsive assessment that articulated cultural preferences for water quality. Maori practitioners ensured that development and application of the index was sensitive to the complexity and multiple dimensional nature of Maori relationships to freshwater systems. By establishing a framework for Maori participation and input in setting environmental flows, the MCHISW provided important cultural opportunities while re-establishing customary and treaty rights (Tipa and Nelson 2012).

According to Tipa and Teirney (2006), the MCHISW is comprised of several key components. These include, first, rigorous engagement and community designation of member roles with regard to participation. Second, defining the cultural association with the river system. Third, mapping of values and use, the hydrological character needed to protect sites, comparing current and historical hydrological patterns, and the site effects of current characteristics. Fourth, identifying flow-related specifics for measurement, including key values already sufficiently collected in existing environmental flow assessments. Finally, multiple assessments are conducted on key flow attributes through a rating system over a year at the sites deemed significant.

The success of the MCHISW assessment process spurred the incorporation of its design as a template for development of the AWA tool. In 2013, a delegation of representatives from MLDRIN, NBAN, the National Cultural Flows Project Planning and Research Committee, Aboriginal water professionals and the MDBA travelled to Aotearoa/New Zealand to study the development and application of the MCHISW. With the endorsement of Maori initiators, members of the delegation agreed that further development of an assessment tool based on the MCHISW would support a rigorous and culturally sensitive approach to participation in water planning in the Murray-Darling Basin. MDBA, MLDRIN and NBAN developed a pilot version of the updated Cultural Health Index, drawing on the structure and logic of the MCHISW and input from Maori practitioners. The tool developers amended indicators for components of the assessment to reflect the unique characteristics of Basin Aboriginal cultures and environments (MDBA 2015). While the MCHISW involves a detailed survey of plant, bird and fish species at each site, the AWA uses a rapid assessment of key cultural resources and values. Similarly, the two methodologies adopt some unique measurements for waterway health. The AWA, for example, asks users to rate fish health and abundance, while the MCHISW asks users to rate water clarity in addition to water quality.

MDBA, MLDRIN and NBAN developed and refined the AWA tool through a pilot project conducted between 2013 and 2016, in conjunction with three Traditional Owner groups in the Murray Darling Basin. The MDBA provided funding and technical advice to undertake initial research and development, meaning the agency had significant investment in and influence over the collaborative project. MDBA's interests in the project reflected its statutory role in the implementation of the Basin Plan, including assisting

Basin states to meet requirements for the development of WRPs. The project partners developed a participatory action research strategy to trial and test the assessment tool with each Nation, incorporating results and feedback into a final iteration of the methodology (MDBA 2015). In 2016, Ngunnawal Traditional Owners in the Canberra region and First People of the River Murray and Mallee in South Australia applied the finalised tool, working alongside MDBA and state government water agencies.

The final AWA tool incorporates three components of measurement, which combine to produce a quantitative 'score' reflecting the health of sites associated with waterways and wetlands on Country as perceived by participants. The first component asks participants to rate the overall cultural significance of a site and to define whether they would return to that site for cultural purposes. The second component asks participants to rate the site's ability to support a range of cultural values and uses. They then produce a 'score' for cultural values and uses for each site visited. The final component asks participants to respond to nine questions regarding waterway health, reflecting conventional ecological river and wetland health assessments. An assessment team of between ten and 14 Traditional Owners undertakes assessments while visiting different sites on Country over the course of a week. Traditional Owners determine the size and make-up on the assessment team, to facilitate practical travel through Country and to ensure inclusion of different ages and genders, as well as to account for different levels of familiarity with the assessment locations. Individual users' responses for each of the three components are aggregated to produce a single set of quantitatives score for cultural values and uses and waterway or wetland health. These scores can then be used to inform discussion about the comparative health of areas of Country and to prioritise and advocate for management responses, including planning and delivery of environmental water.

In addition to the quantitative 'scores', participants respond to a range of open-ended questions that elicit qualitative data about each site. MLDRIN researchers analyse this information to identify key values, threats and objectives. This data can be further analysed to define interventions and actions needed to support Traditional Owners' preferred outcomes.

Cognisant of First Nation's vexed experience of engagement in non-Indigenous research agendas, MLDRIN highlighted the importance of community control over the assessment process and data management in the implementation of the AWA tool, through negotiations with the MDBA. A core principle of Indigenous-led research is to support the authority and autonomy of First Nations, as agents rather than objects of research (Hemming, Berg, and Rigney 2010). First Nations 'must control their knowledge and, most importantly, possess the resources required for full engagement at the local and regional level for the issue of control to be addressed' (Hemming, Berg, and Rigney 2010, 93). Led by these experiences and principles, MLDRIN prosecuted an argument for divestment of AWA funding held by governments to Aboriginal organisations, to support training, resourcing for capabilities in data management and analysis and First-Nation led planning and delivery of assessment methodologies.

In 2016, MLDRIN negotiated funding with the Victorian Government to conduct six AWA projects with Traditional Owners in the Victorian portion of the MDB. The Victorian Government had undertaken a broad policy shift towards recognition of First Nations' rights and interests in water planning in the State's water strategy (State of Victoria 2016) and the implementation of the MDB Plan. In addition to funding received to support the Victorian Government's response to Basin Plan requirements, MLDRIN was also engaged

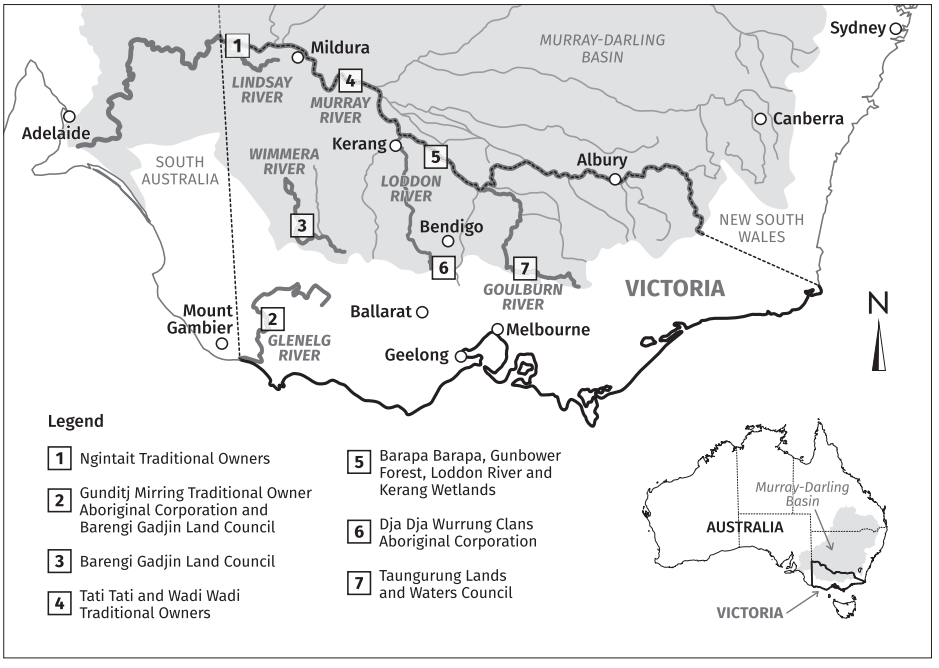

Figure 1. Locations of aboriginal waterway assessment projects facilitated by MLDRIN, in the State of Victoria between 2016–2017.

as part of a research project led by Gunitj Mirring Traditional Owners Aboriginal Corporation, Barengi Gadjin Land Council and Glenelg Hopkins Catchment Management Authority, to run an AWA on the Glenelg River in South Western Victoria. MLDRIN was also able to leverage the Victorian Government's commitment to secure additional funding held by the MDBA. Broad investment and support across jurisdictions, has helped to reinforce the value of the AWA as a tool that addresses gaps in water planning.

The first author drew on a review of First Nations-led water planning and input from Aboriginal water practitioners to determine principles to underpin MLDRIN's application of the AWA tool. These include:

- Traditional Owner agency (assessment teams, study area and cultural protocols for assessment are determined by First Nations in collaboration with partners)
- consistency (the AWA tool is used consistently across different regions and with different First Nation)
- collaboration (partnerships that empower First Nations, and build capability and networks of influence are critical to successful projects)
- inclusivity (diverse forms of knowledge and practices of evaluation are valued. 'Western' technical and scientific knowledge is not necessary to complete assessments).

Between November 2017 and April 2018, MLDRIN coordinated seven Aboriginal Waterway Assessments, in close collaboration with Traditional Owner organisations and with support from Catchment Management Authorities (CMAs) and other water sector partners. The AWA projects (see Figure 1), organised by date of assessment, were:

- Gunditj Mirring Traditional Owner Aboriginal Corporation and Barengi Gadjin Land Council, Glenelg River, October 2016
- Barapa Barapa, Gunbower Forest, Loddon River and Kerang Wetlands. November 2016
- Barenegi Gadjin Land Council, Wimmera River and terminal lakes, March 2017
- Dja Dja Wurrung Clans Aboriginal Corporation, Upper Coliban River, May 2017
- Tati Tati and Wadi Wadi Traditional Owners, Mid Murray River and wetlands, July 2017
- Taungurung Lands and Waters Council, Mid-Goulburn River, October 2017
- Ngintait Traditional Owners, Lindsay River and connected wetlands, April 2018.

At the time of writing, the Northern Basin Aboriginal Nations (NBAN) had initiated a program of six AWAs in the Queensland portion of the MDB, with funding provided by the Queensland Government and the MDBA. In NSW, planning was underway for an AWA in the Murray Valley National Park, Millewa Forest icon site.

Results

The seven Victorian AWA projects produced a range of outcomes and benefits for First Nations. While results continue to emerge through water planning processes, partnerships and new projects, the key outcomes to date include: production of First Nations' waterway data, improved water management and individual, social and community benefits. MLDRIN believes that by providing a focus for research efforts, community mobilisation, capacity building, institutional partnerships and government funding, the application of the AWA has been a pathway for improved recognition of First Nations values and objectives in water planning.

First Nations' waterway data

Traditional Owner participation in MLDRIN's seven AWA projects generated data in the form of site locations, quantitative scores for cultural values and waterway health, as well as qualitative data detailing values, threats and objectives. The data was compiled by MLDRIN staff and returned to Traditional Owner partner organisations as a 'Community Report'. Traditional Owner participants determined the appropriate organisation or entity to hold and manage use of the data and community report, through an intellectual property protocol. All raw data (hard copy worksheets and excel spreadsheets) were delivered back to appropriate First Nations organisations. First Nations waterway data can complement mainstream data about stream and wetland health, adding an additional layer of information to inform management responses and prioritisation. It can also problematise mainstream western science-based data, as First Nations' observations and ratings of stream health, site significance and priority species reflect unique place-based knowledge and cultural affiliations. The reports and raw user responses constitute a detailed record of culturally-informed, site-specific data that empowers Traditional Owners to engage in and inform decision-making.

The commitment to return all data to First Nations participants and their chosen representative organisations is a critical safeguard for communities and the success of the tool. This practice helps to address asymmetries in relations and negotiations between First

Nations and the State, which has historically reinforced its authority through the collection and use of data about Aboriginal people (Pool 2016). First Nations' experience of misuse and manipulation of data pose barriers to the sharing and compilation of Indigenous knowledge about waterway health. Data sovereignty ensures that the community retains ownership and intellectual property rights (Nursey-Bray 2015), creating a safe zone to share information and restoring agency to First Nations as the creators and holders of data.

Improved waterway planning and management

Traditional Owner organisations have been able to apply the data generated through the seven Victorian AWA projects to enhance planning and decision-making about the management of water resources in a number of rivers and wetland systems. While the full gamut of benefits and impacts requires long term analysis, some tangible results of improved management have been quick to emerge. An AWA conducted on the Glenelg River, in South West Victoria, informed the delivery of environmental flow releases from Rocklands Reservoir, to coincide with an important community event at the John Mullagh Memorial Park, a culturally significant location highlighted through the assessment (Victorian Environmental Water Holder 2018). Results of the Barapa Barapa AWA in Gunbower forest and the Kerang Wetlands contributed to Seasonal Watering Proposals developed by North Central Catchment Management Authority (CMA) and have informed environmental water planning and delivery for Reedy Lagoon and Black Swamp, two wetlands of significance to Barapa Barapa Traditional Owners. An AWA conducted on the Wimmera River led to the inclusion of 'The Ranch' billabong, a wetland of contemporary cultural significance, in the 2018–2019 Wimmera CMA Seasonal Watering Plan and informed a Country Plan developed by Barengi Gadjin Land Council. Two environmental watering events were held in 2019 to inundate the Billabong, in conjunction with community gatherings.

All six Traditional Owner groups who undertook assessments within the Victorian portion of the MDB have drawn on the data generated by the use of the AWA to develop detailed content, including information about water-dependent values, objectives and risks, for inclusion in WRPs for the Wimmera-Mallee and Northern Victorian areas. WRPs are the key instruments for implementing the MDB Plan and MLDRIN and NBAN have a role in providing advice to the MDBA on accreditation of those plans. The inclusion of detailed Traditional Owner objectives in these plans, emerging from Indigenous-led research, provides a valuable point of leverage for progressing First Nations rights and interests.

Encouragingly, a number of groups have utilised the AWA tool to undertake further on-Country investigations, ensuring that planning processes are responsive to First Nations' priorities. For example, Taungurung Lands and Waters Council has built on the data and community involvement arising from an AWA conducted in 2017 to develop focussed projects for two key sites: Reedy Lake and Horseshoe Lagoon. Ongoing use of the AWA tool is incorporated into these projects. Barapa Barapa Nation have utilised the tool as part of the application of a Decision Support tool for wetland restoration. Dja Dja Wurrung Clans Aboriginal Corporation have continued to employ the tool in their collaboration with North Central CMA on the development of seasonal

watering proposals for Lake Boort and other high-value wetlands. Tati Tati Traditional Owners have reviewed data from their 2017 assessment, and conducted further AWAs, as part of a cultural and biodiversity values assessment project at Margooya Lagoon, in North West Victoria.

Individual, social and community benefits

In an internal evaluation of the seven Victorian AWA projects conducted by MLDRIN in 2018, participants noted important personal, social and community outcomes arising from First Nations' application of the tool. These included improved understandings of waterways and strengthened relationships with water management stakeholders. Furthermore, participants felt the AWAs improved the connection to Country and information sharing within communities and family, while encouraging the identification of new project priorities and opportunities. Importantly the tool worked to meet objectives for Country (Jenkins 2018).

Individual participant responses to questions posed by MLDRIN in the evaluation highlight some of the community, cultural and social benefits of applying the tool. One respondent highlighted the cultural strengthening aspect of First-Nation led assessment:

> We were able to behave and express ourselves in our natural world. There weren't any restrictions on our country in terms of interacting with country and animals. And how we were moving through country was up to us and at our discretion. We led the program, which is very empowering for groups in terms of self-determination. That was a big plus. Usually when we are in these types of environments, its departments driving the project. (Jenkins 2018)

The seven Victorian AWA projects have provided a framework for First Nations to influence decisions about water delivery and natural resource management and challenge the legacy of exclusion from water management. The direct contribution of information about water-dependent cultural values and objectives to improve water planning is reinforced by the development of skills, capacity and networks to support longer-term outcomes.

Discussion

MLDRIN and NBAN have led or contributed to seventeen AWA projects across the Murray Darling Basin between 2015 and 2019. This activity represents a significant, First-Nation led research initiative, and the largest scale application of a cultural waterway assessment methodology by First Nations in Australia. The AWA projects generate diverse benefits and outcomes for participating groups, across biophysical, cultural, social and personal domains. These outcomes could be realised because application of the AWA acted as a catalyst for investment of much needed and long-sought resources, allowing Indigenous nations to undertake research and define objectives on their own terms.

MLDRIN's role in the development and application of the AWA reflects and responds to a trajectory of aspirations for Indigenous leadership and agency in water-related research. Early First Nations responses to Basin water reforms included recognition of

the need for 'new indicators' to ensure cultural outcomes could be accounted for and given equal consideration alongside economic and environmental factors (Murray Darling Basin Commission 2003) First Nation communities and organisations, including MLDRIN and the now-disbanded First Peoples Water Engagement Council (see Taylor, Moggridge, and Poelina 2017), have consistently advanced the need for research, support and capacity building to allow Aboriginal people to participate fully and effectively in water planning and management (First Peoples Water Engagement Council 2012). The AWA tool responds to this need by providing a unique research methodology that generates valuable data, while attracting support to build capabilities and technical proficiency in water management.

Successful application of the AWA also highlights the potential for First Nations-led research to overcome some of the institutional and technical barriers to the inclusion of Aboriginal objectives in water planning. Traditional Owners are exploring and capitalising on pathways for AWA data to be utilised to improve decisions about water delivery and natural resource management. The process of assessment and data collection is also offering new strategies for cultural strengthening and empowerment. The literature on Indigenous participatory mapping and data collection projects points to the important social outcomes of this work. Reconceptualising data collection activities as social engagements, shows how participatory mapping and cultural assessment can 'strengthen social bonds and a sense of community, to reproduce cultures and identities in the face of social change, and to rebuild connections to a common heritage' (Sletto 2012, 14). By strengthening group cohesion and equipping First Nations with meaningful data, the process and the results of AWA projects can help to redefine the terms of partnerships and engagement between First Nations and the state.

First Nations' use of the AWA tool also highlights a tension between the need for consistency, and the benefits of adaptability and flexibility, in response to localised protocols and priorities. Three of the First Nations groups who have utilised the tool to date have amended the worksheet in response to Traditional Owners' preferred approaches to collecting quantitative and qualitative data. Questions and expectations relating to the consistency, replicability and adaptability of the tool need to be addressed through an ongoing dialogue between First Nations practitioners and government agencies interested in the application of the AWA. Growing interest from government agencies in the modification of the AWA to support First Nations' assessment of groundwater resources, as well as terrestrial and marine biodiversity, point to the demand for methodologies that allow for Indigenous values and objectives to be documented via standardised procedures. This imperative needs to be balanced against the benefits of adaptation to respond to diverse community and environmental contexts. MLDRIN is exploring options for the establishment of a more formal community of practice around the AWA, identifying standards for accreditation and principles to guide ongoing use, changes and adaptation, to ensure methodological rigour, while allowing for the tool's evolution.

The application of the AWA tool, across diverse geographical and social contexts, surfaced questions and issues which have contributed to ongoing discussions about the refinement of the methodology and approaches to its implementation. MLDRIN's observation of the application of the AWA tool, and evaluations conducted with Traditional Owners, has identified key conceptual and ethical questions relating to:

- the efficacy of applying a reductive, quantitative framework to 'score' sites on Country. Some participants have questioned how well the AWA's scoring framework fits with holistic and nuanced understandings of site-significance and cultural value.
- the risks associated with assessing and prioritising discrete sites when all Country is significant. Participants have identified the scoring of discreet sites, and associated prioritisation, as a process that could undermine First Nations representations of Country as interconnected and universally significant, if used inappropriately.
- the personal impact of being asked to assess parts of Country where First Nations have experienced displacement or where cultural and familial connections may have been disrupted. Use of the AWA can foreground the traumatic realities of colonisation and create pressures to present knowledge which may have been impacted by loss of continuity within families and communities.

MLDRIN has continued to reflect on these emergent issues in partnership with NBAN and other AWA users. In addressing these issues, MLDRIN has also had to contend with the priorities of funding bodies, including the MDBA, who have sought to curtail adaptation of the AWA tool in order to maintain scientific rigour. MLDRIN has welcomed dialogue amongst all stakeholders about the methodological challenges arising throughout the application of the seven AWAs in Victoria and any limitations to the approach. These challenges reflect place and community-specific concerns and priorities and, more broadly, the incongruity of rigid, quantitative assessment frameworks and more dynamic and narrative modes of understanding and documenting waterway health favoured by some First Nations peoples.

Finally, consideration of how AWA projects perform political 'work' helps to understand the efficacy of the tool. First Nations' waterway assessments are projects enacted within the highly contested domain of water politics, where access to data and mobilisation of cultural and political capital intersect to shape outcomes in terms of control of a vital natural resource. The AWA is contributing to an evolving toolkit of strategies available to assess Country, gather data, mobilise community engagement in water planning and influence political considerations that determine resource allocation. The AWA interfaces with other methodologies, such as those utilised in the National Cultural Flows Research Project, to produce powerful claims for access to water resources, substantiated through a rigorous and defensible methodology.

Use of the AWA tool can foster First Nations advocacy, through mobilisation of data that gives voice to Indigenous claims and priorities, as well as through social mobilisations that build momentum and galvanise political action. As a tool (in its application and its outcomes), the AWA demonstrates the success of First Nations-led assessment and objective setting, contributing to consolidate progress towards legislative and policy reform that recognises Aboriginal water rights and interests. The AWA can be seen, in its praxis and outputs, as part of the contribution of First People's vision and innovation to Australian water policy with potential to shape ongoing evolution of policy (Taylor, Moggridge, and Poelina 2017; Jackson et al. 2012). Evidence of the tool's effectiveness and impetus can be noted in its recent incorporation in a key Victorian Government Water Plan (State of Victoria 2016) and in an agreement between the federal Coalition government and the Australian Labor Party to implement amendments to the Basin Plan (Australian Government 2019).

First Nations confront significant political, financial and technical barriers in the ongoing effort to achieve recognition of inherent rights to water and restorative justice. A May 2018 federal government commitment of $40 million to support acquisition of water entitlements by First Nations for cultural and economic purposes represents a significant shift towards acknowledgement of the inequities inherent in Australia's water allocation regime. The application of the AWA, and resourcing for First Nations'-led assessment and research, help to substantiate rights claims and document Indigenous water needs, bringing momentum to a slow policy shift towards achievement of cultural flows.

Conclusion

We have highlighted the value of the AWA tool as a method for marshalling data about First Nations water-related values, priorities and objectives while foregrounding self-determination and capacity building. The AWA process facilitates the inclusion of key cultural data alongside mainstream ecological and economic indicators to compel and enable improved water governance and decision making. While still nascent in design and application, the development and implementation of the AWA tool with seven Murray-Darling Basin Traditional Owner groups demonstrates great potential for speaking across institutional divides (Cullen 2015) while emphasising First Nations' identification, collection and control of water assessment data in culturally meaningful ways. Furthermore, the practice of undertaking AWAs facilitates community mobilisation, assists relationship and partnership building and strengthens the connection to Country for Aboriginal people. The AWA projects provide a framework for First Nations to challenge the legacy of exclusion from water management. The direct contribution of data to inform culturally-responsive water planning is reinforced by the development of skills, capacity and networks to support longer term outcomes.

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