Cultural flows: managing Aboriginal water as a Commons in the Murray Darling Basin, Australia

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Introduction

The Murray Darling Basin (the Basin) is the catchment for Australia's largest river system. Since the 1960s, over-extraction of water for irrigation has led to severe environmental degradation. In response, the Australian Government embarked on a water reform program to improve the efficiency of water use and return water from irrigators to the environment as environmental flows. This is being achieved through the creation of individual property rights to water – entitlements – and the development of a water market, and represents a major shift in river management from a focus on supplying water for irrigation, to multiple use management.

Historically, the river systems were also integral to Aboriginal customary economic, cultural and social activities. However, Aboriginal people have been largely excluded from the contemporary market-based institutional arrangements being established for water. This paper presents a preliminary exploration of the creation of cultural flows, water rights that can be managed collectively as an Aboriginal commons within a market-based institutional framework. While a property rights framework in many ways sits uncomfortably with an Aboriginal cultural ontology, water policy in the Basin over the last 20 years has been based on the premise that individual property rights to water are essential for achieving both economic and environmental objectives. From a policy view point, the consideration of cultural flows is likely to gain greater traction if they can be understood through a property rights lens.

This paper explores some of the issues in using a property rights approach for the creation of cultural flows. The first part of the paper provides background to the Basin and institutional arrangements for water management in Australia, and a brief overview of the methodology. The rest of the paper provides a broad overview of customary practices and considers whether a property rights framework is a valid conceptual framework - whether customary practices can be interpreted as operational and collective choice rights as a way of operationalising the cultural flows concept. We end with some observations about the implications for cultural flows and outline the next research steps.

Background

The Basin covers 14 per cent of Australia's land area and extends 3500km from Queensland to South Australia (Map 1). Ninety-six per cent of water extraction in the Basin is for irrigated agriculture. The rivers in the Basin supply water for 3 million people and support the production of 30 per cent of Australia's food. The Basin is also the ancestral home to around 50 Aboriginal nations or language groups. The rivers and floodplains traditionally provided food and resources to Aboriginal people, and are still an integral element of Aboriginal cultural life. Some 70,000 people in the Basin – 3.5 per cent of the Basin's population - are of Aboriginal descent.[1] There are also significant environmental values, with over 20,000 km of rivers, creeks and watercourses flowing through 30,000

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[1] https://www.mdba.gov.au/discover-basin/people/basin-people-21st-century

wetlands of which 16 are protected under the Ramsar Convention.[2] The Basin thus has deep economic, social, environmental and cultural value to Australia.

Water flows in the Basin are highly variable, ranging from 6,700 gigalitres (GL) to 117,900 GL a year (MDBA, 2012). This natural flow pattern provides a variety of floodplain and channel habitat types and many species and ecosystems inhabit ecological niches that depend critically on this flow variability (Poff, 1997).

Map 1: The Murray Darling Basin, Australia

Extraction of water for irrigation has reduced average flows through the Murray Mouth by 60 per cent since the 1950s. The construction of large dams and storages in parts of the Basin to enable the delivery of irrigation water in summer has led to significant reductions in flow variability. The intervals between floods have increased, small and medium floods have been eliminated, and the seasonality of flows has in places been reversed from winter to summer (Connell 2007; Grafton 2010; Connell & Grafton, 2011; Bunn et al, 2014; Grafton et al, 2014). In conjunction with over-extraction and clearance of trees and native vegetation, these flow changes have led to significant damage to wetlands and other riverine ecosystems, reduced floodplain connectivity, rising salinity, and losses in birdlife, native fish and other biodiversity (Arthington & Pusey, 2003; Hone, 2016; Pittock & Finlayson, 2011).

Water reform program

A water reform program to address these issues began in the 1970s and is still underway. Water rights in Australia are statutory rights, with ownership of water vesting in the Crown (state governments). Historically, water users were licensed to extract water as a usufructuary right. Prior to the 1970s there were no volumetric limits to water extraction (NWC, 2011b). The period between the 1960s and 1980s saw the introduction of volumetric licenses, and in 1995 a Cap on extraction was introduced to limit total water extractions. The Cap was not designed to reduce water extractions, but was intended to stop them rising further (Papas, 2007). The 1980s and 90s were a period of significant economic reform in Australia. Water policy reforms to address over-extraction of water and environmental degradation reflected the economic focus of the day, and a market approach to environmentalism with the creation of individual property rights and water markets, became the predominant institutional framework for managing water resources.

The creation of individual property rights in water, which could be traded separately to land, was seen as necessary to facilitate the development of water markets.[3] Water markets were regarded as the most cost effective way of reallocating water from irrigation to the environment. This process began in 1994 with the separation of land titles and water rights (COAG 1994) and continued in 2004 with the creation of tradeable water entitlements under the National Water Initiative (NWI) (COAG 2004). Unlike a water license, a water entitlement is a property right to a share of the consumptive pool of water. The NWI also recognised social and environmental objectives in water management for the first time, representing a shift toward multiple use management of the Basin's water resources (Connell & Grafton, 2008).

[2] https://www.environment.gov.au/water/wetlands/ramsar
[3] https://www.environment.gov.au/resource/council-australian-governments-water-reform-framework

By 2007 however, 20 out of 23 catchments in the Basin were in poor or very poor condition (Davies, 2008). The Murray Darling Basin Authority (MDBA) was set up to establish environmentally sustainable limits on water extraction under the Murray Darling Basin Plan (Basin Plan).[4] A Commonwealth Environmental Water Holder (CEWH) was also established to hold a portfolio of water entitlements for management as an environmental flow. The Basin Plan was the first attempt to reduce levels of extraction in the Basin to sustainable levels, and a Sustainable Diversion Limit (SDL) replaced the 1995 Cap. By 2019 the Basin Plan will have reallocated 2750 GL (out of an average annual 13,623 GL) back to the environment.[5] While other estimates put the required level of environmental water recovery at between 4000 GL (MDBA, 2010) and 7000 GL (Wentworth Group of Concerned Scientists, 2010), 2750 GL is nevertheless a sizeable reallocation of water from irrigation to environmental uses.

Aboriginal water rights

The Australian colonies were unique amongst former British colonies in not recognising indigenous land or water rights at the time of colonisation.[6] In the United States, Canada and New Zealand, treaty rights created – in principle if not always in practice – indigenous rights to land and other resources. In the United States, treaty rights have provided the basis for high security water rights for tribal reservations; in Canada, water rights for First Nations people are based on both historic and modern treaty rights, modern settlements, and constitutional protection of native title; while in New Zealand customary title to water was recognised through the 1840 Treaty of Waitangi and, more recently, through settlements that have transferred some rights to water, lands and fisheries to Maori (Durette, 2008).

The strength and content of these rights vary, but are in contrast to the situation in Australia where the absence of treaty rights with Aboriginal people has meant that, until recently, there was no recognition of any Aboriginal rights to either land or water. The first such recognition was the *Aboriginal Land Rights Act* of 1976, which granted statutory land rights to Aboriginal people in the Northern Territory.[7] Statutory land rights are freehold but inalienable, and do not include water rights. The first recognition under common law of an underlying 'native title' on the basis of Aboriginal occupation that pre-dated European colonisation, was the 'Mabo' High Court decision in 1992[8] followed by the *Native Title Act 1993 (Cth)* which gave legislative effect to the Mabo decision. While the legal recognition of native title was highly significant, it is also highly constrained, limited to customary activities such as hunting, fishing, and ceremony.[9,10] Native title has been described as a '*feudal' right, limited to customary uses and contingent on the continued observance of a traditional life style* (Grattan and McNamara, 1999).

In 2000, the nature of native title was clarified by the court as a 'bundle of rights' in which each stick in the bundle was separable and distinct:

> *[i]n our opinion the rights and interests of indigenous people which together make up native title are aptly described as a 'bundle of rights'. It is possible for some ... of those rights to be extinguished…. (Western Australia v Ward 2000, s109)*

Under the NWI (2004) the recognition of environmental and other 'public benefit outcomes' included a new policy requirement to take account of Aboriginal interests and objectives in the development of Water Resource Plans

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[4] The Basin Plan is a plan made under the *Water Act 2007 (Cth)*

[5] Under the Basin Plan, the SDL of 2750 GL can be reduced to 2100 GL through so called supply measures - infrastructure projects such as regulators that enable small floodplain inundations to occur without overbank flooding, or the reconfiguration of storages to reduce evaporation. It is estimated that supply measures might provide up to 650 GL, thereby allowing the SDL to be reduced to 2100 GL and achieving the same environmental outcome with less water. The SDL may also be increased through efficiency measures such as improvements in the efficiency of on-farm irrigation networks. It is estimated that efficiency measures might allow the SDL to be increased to 3200 GL by allowing more water to be recovered for environmental flows with 'no socioeconomic impact'.

[6] Australia itself was not a colony. The colonies of NSW, Victoria, Western Australia, South Australia, Queensland and Tasmania were federated in 1901 to become the independent Commonwealth of Australia.

[7] *Aboriginal Land Rights (NT) Act 1976 (Cth)*

[8] High Court of Australia '*Mabo v Queensland (No. 2)*' 1992

[9] *Western Australia v Ward 2000*

[10] Another of the challenges with claiming native title is the need to demonstrate continued (physical) connection to country and customary practice. This can be difficult given historical actions to remove Aboriginal people from their traditional lands.

(WRP).[11] Aboriginal access to water resources was to be achieved through representation in water planning *wherever possible*, and the incorporation of indigenous social, spiritual and customary objectives and strategies for achieving these objectives *wherever they can be developed* (COAG, 2004, emphasis added). This was an important recognition of the rights of Aboriginal people to water resources, but their inclusion in the allocation of water through WRP was still highly discretionary (Jackson & Altman, 2009). The NWI provides no guidelines as to how Aboriginal objectives for water resource management should be taken into account in practice, and there are no agreed principles for resolving competing Aboriginal, environmental or irrigator interests. The SDL under the Basin Plan now makes it harder for Aboriginal people to secure water allocations through the water planning process because of opposition from irrigators to further reallocation of water away from agriculture. The reallocation of water for cultural flows is thus likely to be highly contentious (Bark et al, 2012).

Currently, NSW is the only state that has made formal provision for Aboriginal participation in water planning (NWC, 2014). Cultural water access licences provide water for Aboriginal domestic, cultural and spiritual purposes, but are for defined purposes – to fill a specific wetland for example – and can be retracted once the purpose has been achieved. So far only one cultural access license has been granted in NSW (Duff, Delfau, & Durette, 2010; Jackson and Langton, 2012). Aboriginal community development licenses are for commercial purposes but are not available in the Basin where the SDL applies under the Basin Plan. Neither license is equivalent to irrigator entitlements in terms of providing a legally enforceable property right to water.

The NWI (2004) also required that, where native title to land has been found to exist, that must be taken into account in the allocation of water through WRP. Again, NSW is the only state to have provided water allocations for native title, but only under two WRP and the amount allocated has been determined on the basis of a domestic household water requirement rather than the amount that might appropriately be required to satisfy a native title or cultural requirement (Tan and Jackson, 2013).

The *Water Act 2007* is also largely silent on the issue of Aboriginal water rights other than to say that native title rights should not be impeded, and that Aboriginal people should be included in the water planning process. Under the *Water Amendment Bill 2015 (Cth)* the MDBA is required to engage with indigenous communities to integrate Aboriginal values and uses into planning for environmental watering and the development of Environmental Watering Priorities under the Basin Plan (MDBA 2016a). This engagement provides a consultative rather than decision making role (NWC, 2014).

Research objectives and methodology

The background to the market-based framework for water management in the Basin was the need to reallocate water from irrigators to the environment, and an economic policy objective of improving the efficiency of water use by allowing it to be reallocated between users (primarily irrigators) through a water market. The current design of water entitlements and markets has been geared toward the needs of irrigators to be able to trade water, and the political objective of building up an environmental water portfolio through the voluntary purchase of water from irrigators.

The desire of Aboriginal people to also have access to water resources is just beginning to be acknowledged. The purpose of this research is to consider how water for Aboriginal people can be included within a multiple-use water resource management framework. We will undertake the analysis in three stages. The first stage is to develop a suitable definition of cultural flows that is acceptable to Aboriginal people and is workable within a contemporary institutional setting of water markets and entitlements. For this we need to have an understanding of Aboriginal cultural law and customary practices, and evaluate whether it is legitimate to translate an Aboriginal conceptual framework into an economic property rights framework by interpreting customary practices through a property rights lens.

We start by developing a general understanding of cultural values and customary practices using a rich historical literature on customary practices, written by early convicts, settlers, explorers, missionaries and pastoralists who lived in and amongst Aboriginal people in the 19th and early 20th centuries, as well as a significant body of

[11] Water Resource Plans (known as Water Sharing Plans in NSW) are plans required under state legislation to balance the allocation of water between irrigation, the environment and other uses such as town water supplies. Under the Basin Plan all Water Resource Plans must be consistent with the Basin Plan by 2019, and are currently being renewed to ensure this consistency.

anthropological research from the early - mid 20th century. The historical literature records direct observations of cultural practices by people who lived with Aboriginal groups for extended periods of time. While it is possible that such observations may be biased either because of a blurring of boundaries between the observed and observer (Sofaer, 1999) or for reasons of cultural bias, these records are nevertheless the most detailed we have of traditional customary practice. Contemporary Aboriginal writers, while noting that these historic texts were written through a western lens and value system, agree that they nevertheless provide useful insights into Aboriginal beliefs and traditional practices (Marshall, 2014).

Different parts of the Basin have different eco-hydrologic characteristics and different Aboriginal groups have different cultural practices, making Aboriginal customary resource management practices and conceptual frameworks location-and culture-specific. The second stage of the research will be to use a number of detailed case studies of specific Aboriginal groups to test and deepen our understanding of customary practices. We will undertake two original case studies (of the Euhlaroi people in the Narran Lakes area of NSW, and the Wayilwan people of the Macquarie Marshes, NSW). A third case study will make use of extensive original information gathered during a three-year study as part of the 1998 unsuccessful native title claim for the Yorta Yorta people of Victoria (Lyons, 1988). It is hoped that a comparison of the findings across different case studies might enable key insights to be identified which can be generalised to develop a more widely applicable conceptual framework of customary practices (Turner, 2010; Yin, 2013). The case studies will also be used in the final stage of the research, the development of economic-eco/hydrology models for particular river systems as input to empirical economic analysis of options for creating cultural flows, and to assess impacts of the creation of cultural flows on other water users.

The rest of this paper presents a broad overview of Aboriginal customary practices, considers a number of conceptual issues, provides a preliminary analysis of customary practices through a property rights lens, and outlines what we think are some important features of cultural flows.

Cultural flows – a definition

There is an implicit assumption in many WRP that Aboriginal water requirements can be met through environmental flows (Jackson et al, 2012). However, there can be significant differences between cultural and environmental watering objectives in terms of species or other environmental outcomes that may be prioritised in determining where to allocate an environmental flow (Finn and Jackson, 2011).

Where the provision of cultural flows has been considered as a separate allocation of water under water plans, researchers and policy makers have largely adopted the same approach used to define environmental flows. The environmental flows approach treats the environment as a water consumer, and ranks environmental assets in terms of their priority for watering each year to determine an environmental flow regime (Swirepik et al, 2015). Applied to cultural flows the approach requires the identification of cultural values followed by the determination of a flow regime to maintain key cultural assets or sites associated with cultural values (MDBA 2016a; see also the National Cultural Flows Research Project).[12]

Traditional or customary Aboriginal uses of water relied on natural flows, with cultural obligations and activities triggered by particular flow events or other environmental cues. The Murray Lower Darling Rivers – Indigenous Nations (MLDRIN) is an umbrella group for a number of Aboriginal nations in the Basin. Some of the key objectives for cultural flows have been identified by MLDRIN as:

> *The rivers and creeks get a proper amount of water at the right times…[and] If our Country is healthy enough [then] we can look after and use our Country according to our culture (MLDRIN 2007, p2)*

Other than to say a cultural flow is a natural flow, there is still little understanding of water requirements for specific cultural outcomes in terms of flows and volumes (Tan and Jackson, 2013) and even greater difficulties in valuing cultural (and indeed many environmental) outcomes (Ven & Quiggin, 2007; Kosoy & Corbera, 2010; Norgaard, 2010; Spash, 2013, 2015; Bark et al, 2015). But it is almost certain that a cultural flow as identified by Aboriginal

[12] www.culturalflows.com.au

people would entail quite different objectives and watering priorities than those currently pursued by environmental agencies.

There is however a deeper issue, and that is a lack of precision about what we mean by cultural flows (Jackson and Langston, 2012). Currently cultural flows are taken to mean a flow of water to meet cultural needs, where cultural needs are defined as specific sites of cultural value – for example, ceremonial sites or sacred sites. Implicit in this 'cultural heritage' approach is the assumption that a cultural flow is simply about water (Jackson, 2006). However, Aboriginal people have identified cultural governance as an important distinction between a cultural flow and an environmental flow (MDBA 2016a). Cultural governance, defined as the rules and norms by which a society makes decisions (Richardson, 2009) is about the maintenance of cultural decision making structures and relationships. MLDRIN has defined cultural flows as:

> *… 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. …Cultural Flows are water rights that we hold in our own name. (MLDRIN 2007, p2)*

Beneficial ownership means water that is owned by Aboriginal groups and can be managed in accordance with cultural law to achieve objectives for water as determined by Aboriginal people. Environmental watering priorities for Commonwealth-held water are determined by the MDBA (MDBA 2016b) while decision-making for the management of environmental water remains with the CEWH. Although both agencies have established mechanisms for Aboriginal involvement in planning and priority setting (NWC 2014) this involvement is discretionary and consultative. Aboriginal people do not have agency – decision-making or management responsibility - in the allocation of environmental flows, or of any other water. It is this agency that is required for the practice of cultural governance:

> *Indigenous people often identify Indigenous governance as a key distinction between environmental and cultural water. With cultural flows, it is the Indigenous people themselves who decide where and when water should be delivered… this direct governance role ensures that Indigenous peoples are empowered to fulfil responsibilities to care for country… it also reduces the costs of translating their values. (Weir et al 2013, p 16)*

There is a fundamental difference between providing water for Aboriginal cultural purposes through environmental flows managed by environmental agencies for whom Aboriginal cultural objectives are at best incidental; and cultural flows or water allocations managed by Aboriginal people. But what would cultural flows defined as beneficially owned entitlements look like, and how could cultural flows as beneficially owned entitlements be operationalised? In order to understand the implications of cultural governance for the definition and implementation of cultural flows, we need a conceptual framework for interpreting customary practices.

Customary practices: a review of the literature

To understand Aboriginal customary practices – how the landscape and water resources were managed and used – it is essential to have some understanding of Aboriginal cultural beliefs and kinship relationships. Kinship structures people's relationships with each other and their obligations to country, where country includes not only land and water, but also culture, the law and ecological knowledge (Weir, 2012). The next two sections give a brief introduction to Dreaming and kinship before discussing territories and boundaries.

Dreaming

> *The creation ancestors travelled across the earth making the landscapes, all living things, and laws and institutions. When the Ancestors had created the earth they returned to the Warrambul, the sky world. (www.ancient-origins.net/history-ancient-origins-traditions/songlines-mapping-journeys-creation-ancestors-australis)*

The Dreamtime or Dreaming was the time when creation ancestors travelled the earth creating the landscape, the law, rights and obligations, and customs and social rules (Williams 1986; Jones et al 2001; Skulthorpe and Svelby 2006; Norris and Harney 2014). Creation ancestors are not considered Gods, they are ancestors of people living today (Skulthorpe and Svelby, 2006).

The creation ancestors bequeathed land or territory to different language groups through their travels. The paths taken by the creation ancestors in their travels are known as Dreaming Tracks, or songlines. These provide the link between the creation ancestors and the territory of each Aboriginal language group or nation. The ownership

of country bequeathed from the creation ancestors through songlines and sacred ceremony has been described as 'radical title' analogous to crown title in the western legal system (Williams,1986).

Songlines describe landscape features and landmarks and knowledge of where water or other resources can be found, and this knowledge enabled people to navigate their way across country on trips for trade or ceremony (Jones et al, 2001):

> *[songlines] describe … the location of mountains, waterholes, landmarks, and boundaries. The song therefore constitutes an oral map, enabling the traveller to navigate across the land while finding food and water. (Norris and Harney, 2014 p6)*
>
> *Provided you knew the song, you could always find your way across the country. (Jones et al, 2001 p14)*
>
> *All across Australia there's pathways that people could use to move about the country. As long as you knew the protocol and the proper ceremonies associated with each place you could use those pathways. (Shaun Hooper, 'Songlines across the Wollemi', Sydney Morning Herald, 27 September 2003)*

When the creation ancestors had finished on earth, they returned to the sky, and other songlines describe their routes across the sky. Knowledge of the sky – astronomy – also provides a way of navigating, and is an important source of ecological knowledge as changes in the constellations signal seasonal changes that were used as cues for hunting or other food gathering as well as ceremonies and travel (Fuller et al, 2014). This knowledge is told in dreaming stories and passed on through song, dance, stories and ceremony.

Places where songlines cross or where the creation ancestors 'did something' are sacred, and hunting and other activities may be forbidden (Rose et al, 2003). Where sacred sites coincide with water or other resources that are important during drought or breeding seasons, sacred sites create sanctuaries or refugia that protect animals and other resources. The same songlines can be known by a number of Aboriginal groups and provide links between different nations who have the same (or share parts of the same) Dreaming stories. Different nations thus share connections to particular places through their songlines. This connection of multiple language groups to place through songlines is important to understanding the nature of boundaries and territories, and will be returned to in the discussion below.

Kinship

Language groups are divided into Moieties or 'halves' (although some groups have four moieties), and each moiety is further divided into a number of subdivisions or sections - clans and family groups based on kinship (Fraser, 1892). Moieties and sections are all divided into totem groups. Totems are descended from the creation ancestors, and include people, animals, plants, rocks and mountains, rivers, the sky and the stars – thus people and all other things are all descended from totemic (creation) ancestors (Rose et al, 2003). In this way, the totemic system *'extends the boundaries of kinship across tribes and into the natural world*' (Rose et al, 2003 p24).

Figure 1: Kinship structure

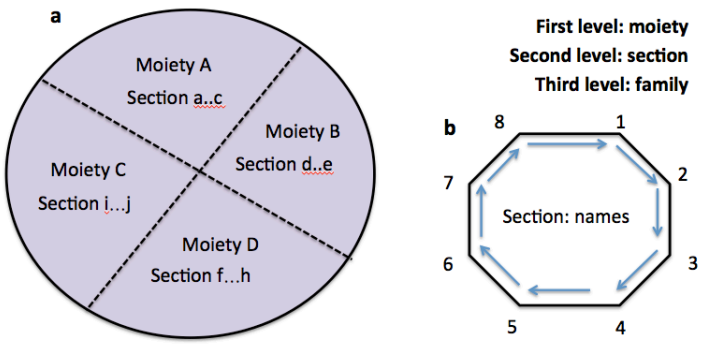


Figure 1 shows the kinship structure for an Aboriginal group with four moieties. Each moiety has a number of totems. If a person's moiety is A, which might be kangaroo, they have an obligation to look after it – to ensure it is not overhunted, and to manage the availability of grass and water. Moieties are divided into a number of sections or totem groups (Figure 1a), and each of these also have a specific totem and number of sub-totems. As with moiety totems, if a person's section is 'd', which might be emu, they have an obligation to protect the emu by managing country to ensure the availability of food and water (Ridley 1873; Fraser 1892; Langloh Parker 1905; Mathews 1906). Section totems are passed down in a predetermined pattern (Figure 1b).

Aboriginal people not only have their language group totem, their moiety totem, and their section totem, but also a personal totem given to them at birth, perhaps the totem from a rock or tree or other landmark where the mother

first knew she was pregnant, or where the child was born. A personal totem is kept for life. Each individual has a responsibility for their personal totem. You cannot hunt or eat your personal totem, but have an obligation to look after it and make sure it is not over-hunted or exploited by others.

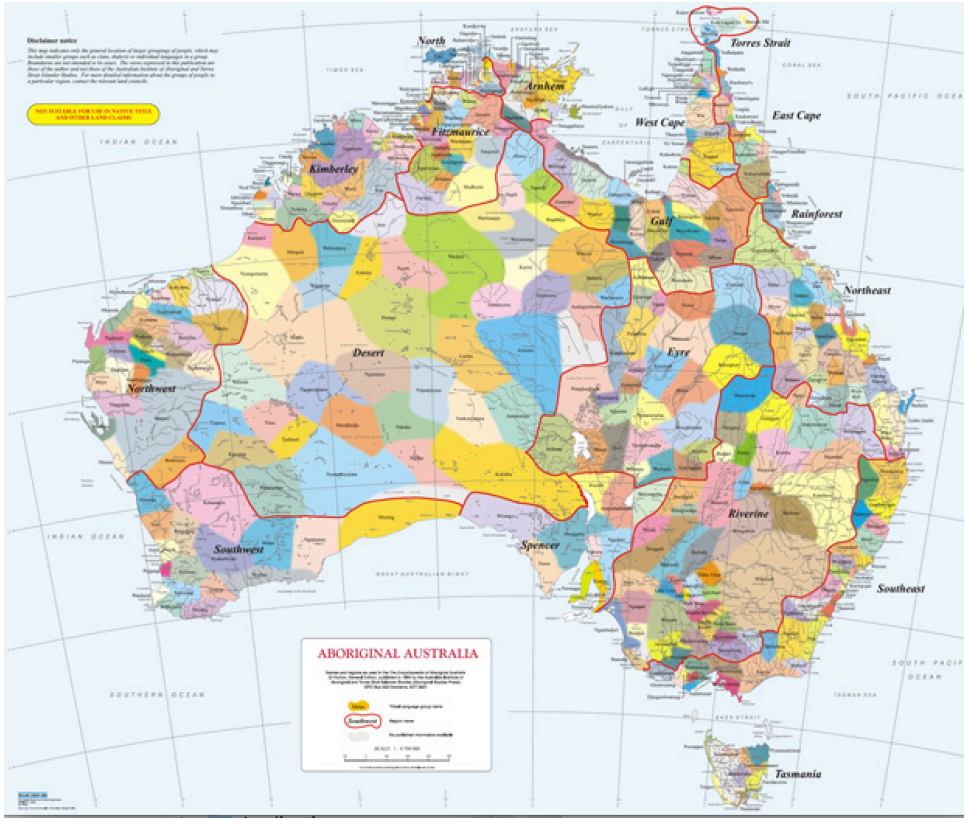
Marriage within the same moiety and totem is strictly forbidden – known as 'wrong marriage'. There are strict and complex rules about which sections can inter-marry. At one level the marriage rules of kinship are a way of maintaining genetic diversity, but the kinship relationships of moiety, section and totem are much more than marriage rules. Moiety, section and personal totems create a complex set of overlapping rights to resources, and obligations to manage or care for country.

Clans and estates

Early writers – convicts, missionaries, explorers, surveyors, and settlers – from the 1820s through to the 1920s observed that Aboriginal groups had well defined territories with boundaries defined by natural features, and this was reaffirmed by a number of anthropological studies in the 19th and 20th centuries (see Stanner 1965; Williams 1986; Sutton 1995). These boundaries are well known amongst all surrounding Aboriginal groups. Although boundaries are delineated by natural features, they are based on language:

> *Language marks the relationship between different groups … [W]here language changes ...[it] marks the boundary of the land of a related but separate land owning group (Williams, 1986 p 40)*

Map 2: Map of Aboriginal language groups[13]



The major Aboriginal language groups or nations are shown in map 2. Each of these language groups is divided into clans (sections). Each clan has its own songlines bequeathed by creation ancestors that define the group, the land they live on, their laws, and their obligations to country.

Clans are extended family groups of around 50 people descended from a creation ancestor (Rose et al, 2003). They have custodial responsibilities for particular territories (Jones et al, 2001):

> *"Custodial rights" to a piece of land were passed down by the use of songlines ... these "songlines" described and defined the shape and size of the land in each region. Everyone inherited … a stretch of the ancestors songlines… which were linked to [a] particular stretch of country. The custodianship of this piece of land was passed down... They were title to his territory, of which he was the temporary custodian... until the songs were passed onto the next generation. (Jones et al, 2001 p 14)*

The landscape is thus divided into territories defined by language group, and within each language group further divided into clan areas and family estates, parcels of land that are the custodial responsibility of clans and family groups. In addition to responsibilities to their own clan area, people also have rights and obligations to other clan areas through kinship – for example to the clan areas of your mother or wife or grandmother. Hence clan areas

[13] Source: http://nationalunitygovernment.org/pdf/aboriginal-australia-map.pdf.

are areas of overlapping rights and obligations. The networks of kinship relationships create a patchwork of rights and obligations - rights to use particular places for food and resources, for ceremony, for trade, or simply visiting family or friends - and obligations to look after things. Maintaining kinship connections through visits to other clan areas maintains reciprocal access to resources (Myers, 1982).

The boundaries between clan areas are not hard barriers, but are areas where a number of clan groups have overlapping rights and obligations (Stanner, 1965). They are determined on the basis of connection to country through totems, a direct connection to creation ancestors. Stanner (1965) described these as estates and ranges. Estates are the home territory of clans based on primary totemic connection. The range is the larger territory where members of different clans with kinship connections have use rights, and custodial obligations to fulfil. Clan and family members frequently crossed into other estates and territories to maintain connection and fulfil custodial obligations, but there are strict rules about entering. There had to be a kinship connection, and permission had to be sought from the clan whose estate is being entered (Thomas, 2007):

> *When someone 'carrying a message stick entered another groups' country, they announced themselves with smoke signals and were then accompanied safely with the message stick to the elders so that they may speak their verbal message. The messenger would then be accompanied back to the border with a reply to pass back to their tribe. (www.ancient-origins.net/ancient--places-australia-oceania/aboriginal-message-sticks-and-ancient-system-communication)*

Borders between clan estates and language group territories (ranges) overlapped and intersected but were nevertheless monitored and enforced. Entry to another clan or language groups territory without the right permission could lead to punishment or reprisals. Estates and territories were exclusive in the sense that there were clearly defined rules of access and use of resources, but exclusion took the form of asking permission to enter another clan or groups country. The purpose of enforcement wasn't to enforce exclusive access, but rather to ensure that the right permissions or protocols had been sought. They have been characterised as the 'right to be asked' to come onto country to fulfil custodial obligations or access food and other resources, rather than a boundary that provides exclusive (restricted) access to resources or places (Myers, 1982). Boundaries between estates were defined in terms of categories of rights and created obligations to share according to clearly understood rules - a complex mix of negotiated rights (Pink, 1936).

Resources were actively managed within this territorial system to both enhance the productivity of food resources and to ensure that they were not overharvested. The fishtraps of Brewarrina and elsewhere in the Basin – stone structures built in-stream to manage the movement and aggregation of fish – were used to enhance the productivity of fishing activity. Likewise, country was regularly burned to stimulate new growth and encourage kangaroo and other game (Jackson et al, 2010).

Defining a cultural flow: can we use a property rights framework?

How do we go from an understanding of customary practices – seen as an overlapping complex of rights and obligations - to a definition of cultural flows that is acceptable to Aboriginal people, but is also consistent with a property rights framework and compatible with a market-based approach to water resource management? Is it legitimate to interpret customary practices through a property rights lens?

Customary practices as an Aboriginal Commons

The Schlager-Ostrom (1992) property rights framework is a useful framework for thinking about customary practices in property rights terms. Schlager-Ostrom define property rights as operational and collective choice level rights. Operational rights are the rights to use and access resources, and the holders of these rights are authorised users. Operational level rules specify who may hold authorised user rights. Collective choice rights are the rights to manage resources, to exclude others from resource areas, and to alienate or transfer collective choice rights to other rights holders. The holders of collective choice rights have decision making rights to determine who can be an authorised user.

Significantly more evidence will be gathered through the case studies yet to be completed, but preliminary insights from the literature review suggest that the customary practices described in this paper can be interpreted through this framework as operational and collective choice rights. A tentative mapping of customary rights described earlier in this paper, into a property rights framework, is shown in Table 1.

Table 1: Preliminary mapping of customary rights onto a property rights framework

	Right	Holder of right	Customary right	Holder of customary right
Operational rights	Access and withdrawal right	Authorised user	Access and withdrawal right (e.g. to hunt, fish, hold ceremony, camp)	Individual members and family groups within clans and nations (language groups) based on kinship
Collective choice rights	Management right	Proprietor	Management – right to determine when hunting or other activity can occur or has to stop, or when burning or other activity should occur	Individuals, family members and clan members based on totemic obligations
	Exclusion rights	Claimant	Right to be asked for permission to enter clan or nation territory	Senior members of clans or language groups
	Alienation rights	Owners	Uncertain	Uncertain

Source: based on Schlager and Ostrom (1992)

Operational level use and access rights to resources are held both by individuals and families within their own clan territory but also to other clan territories based on kinship relations and totemic connection to country. Collective choice rights to manage resources are held by individuals, family and clan members based on totemic obligations. The right to be asked is exercised by senior members of clans and language groups. It is unclear yet whether there are customary practices that could be interpreted as alienation rights, although Williams (1986) describes the practice amongst the Yolngu people of Arnhem Land of 'lending' and 'giving' the rights to parts of estates to other clan members to 'look after' (p 78).

Bundle of rights, web of rights, or web of interests?

Interpreting customary practices through a property rights lens can help us think about the nature of rights associated with different Aboriginal water endowments and what bundles of rights are required for cultural flows. Even though customary uses of water *appear* to non-Aboriginal people to be limited to some use and access rights, the literature presented in this paper would suggest that operational and collective choice rights were exercised within customary Aboriginal systems. The experience to date with Aboriginal water rights is that they only recognise limited authorised user rights (Jackson and Morrison, 2007). The dispossession of Aboriginal people and the formalisation of Aboriginal rights under native title and WRP, has stripped away many of the operational level rights, and all of the collective choice (and constitutional) level rights formerly held by Aboriginal clans and nations. Without the full suite of rights, Aboriginal people cannot fulfil custodial obligations and maintain cultural governance. This is consistent with the observation that it is often the formalisation or legal codification of customary rights that leads to the loss of some rights (Glaskin 2003; Meinzen-Dick and Mwangi, 2008). Aboriginal people themselves have recognised this:

> *We have ongoing cultural responsibilities to care for Country which are difficult to fulfil with limited use and access rights to water and low participation in water resource governance. We are often viewed as just another stakeholder rather than as a partner in water management. (Federation of Victorian Traditional Owners Corporations 2014, p13)*

Despite the usefulness of using property rights as an interpretive framework for customary practices, the risk that translation of an Aboriginal ontology into a property rights ontology can change the meaning of customary relationships has to be acknowledged – '*when putting a concept into another language we inevitably transform it*' (Thomas 2007, p4). Indeed, many writers have challenged the bundle of rights framework as applied to Aboriginal customary rights. While Marshall (2014) acknowledges that Aboriginal customary rights do recognise relationships that can be interpreted as property rights - the rights to exclude or the rights to manage resources - and that use rights are regulated by (cultural) law, she also argues that the bundle of rights construct

'*compartmentalizes cultural or legal rights as unconnected separate rights'* and is not useful for explaining Aboriginal rights and interests because '*Aboriginal laws are not bundles of separate values'* (p 122). Arnold (2002) argues that the bundle of rights fails to recognise the interconnectedness between people and things and ignores the 'thingness' of things.

The western ontology of property based on the separation of people and the natural world has underpinned the development of western legal principle from the 16th century onward.[14] The property rights ontology contrasts with the Aboriginal concept of rights as reciprocal rights and duties in which both people *and things* have rights and obligations. That is, an Aboriginal conceptual framework is one in which things themselves – plants, animals, the landscape - also have agency, or their own interests and obligations.

The legal interpretation of property as a bundle of rights is that each stick in the bundle is separable and can be extinguished without affecting the bundle as a whole, although a number of legal scholars have criticised this interpretation. Barnett (2000) argued that the bundle of rights theory was an inappropriate legal framework for native title '*as it describes the incidents of property from only one cultural perspective... [and] does not square at all well with indigenous perspectives on their relationship with the land'* (Barnett, 2000 pp 474-475). Smith (2011) uses the analogy of a diamond to argue that property is more than just a bundle of separable rights, just as a diamond is more than a collection of carbon atoms, and that the bundle of rights construct is equivalent to 'counting atoms' to describe a diamond. He notes that a bundle of sticks framework *could* take the interaction between different rights into account, but doesn't:

> *...adding or subtracting a stick to the bundle affects the rest of the sticks. In principle the bundle theory could take this into account, but it typically does not. Instead, the metaphor of the bundle of sticks is used to imply precisely the opposite. In a bundle of sticks the sticks do not interact; you can add or subtract them at will, and still you will have a bundle with roughly the same properties. (Smith 2011, p286)*

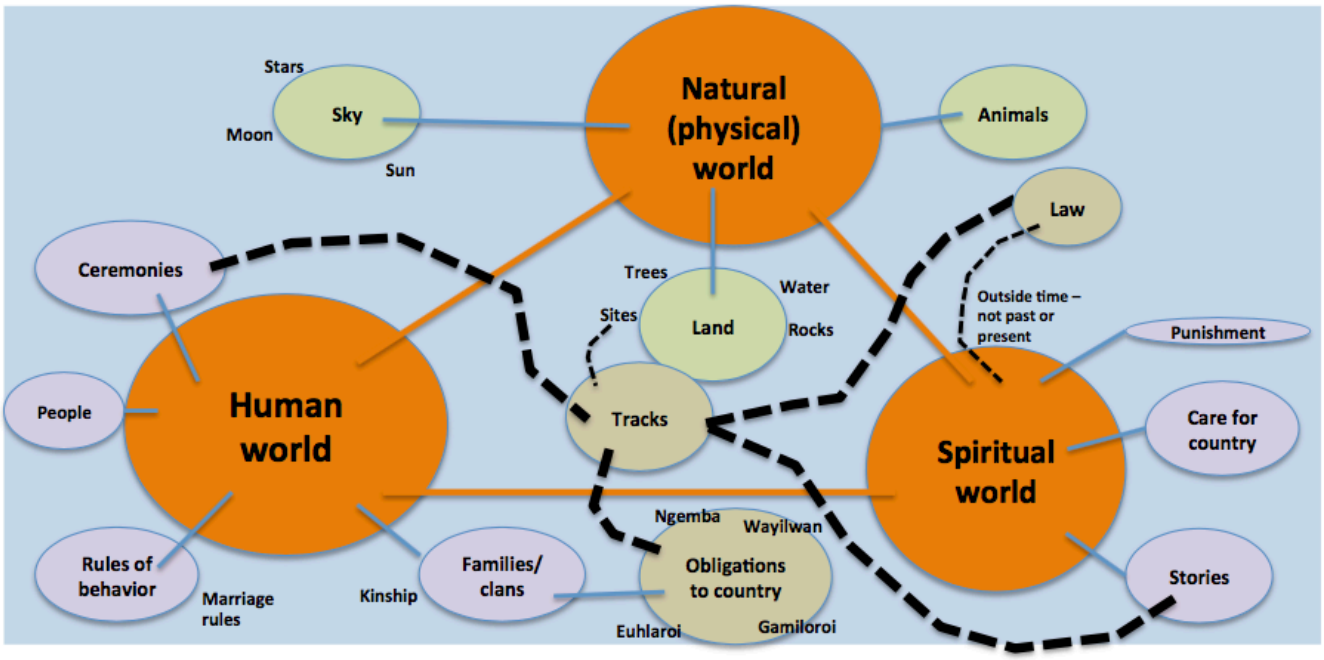
The legal definition of property rights also regards alienability as an important determinant of proprietary interest (Gray, 2002). Indeed, much of the mainstream economics literature regards alienability as an essential feature of property rights. The works of Elinor Ostrom and others on the rich diversity of social and cultural – customary – rights structures show, however, that alienability is not necessary for the creation of property interests or rules for the management of resources, and that, while the sticks in the bundle of rights are separable to the extent they can be held by different people, they are not separable to the extent that individual rights can be extinguished without affecting the bundle as a whole. This literature shows that property rights are not unconnected separate rights, but a nested set of rights that together enable the creation of rules for the management of resources (see for example, Ostrom, 1990; Anderies et al, 2004; Kallis and Norgaard, 2010; Poteete et al, 2010).

Arnold (2002, 2010) proposes a web of interests as a new way to conceptualise property relations that would accommodate the integration of human-human, human-thing, and thing-thing relationships in an Aboriginal ontology. These connections and relationships between the human world, the spiritual world and the natural world are illustrated in Figure 2. Even recognising property rights as social relations or a 'set of practices' (Bryan 2000, p4) that include both formal legal relationships and informal social and cultural rules and norms, it is hard to see how a web of interests could be operationalized since property relations can, by definition, only govern the behaviour of humans. Social relations – whether formal or informal – govern 'obligations to country' in the human domain, but cannot regulate the natural or spiritual worlds.

Another approach that can take account of the interconnectedness between human, physical and spiritual domains might instead be to have highly granular bundles of rights that make a complex web of rights creating multiple overlapping and complementary interests (Meinzen-Dick and Mwangi, 2008). This conceptualisation of a web of property rights as a complex system of overlapping bundles of rights is not the same as Arnold's (2002) web of interests because it does not conceptualise property relations as extending to non-humans. But there would seem to be nothing intrinsically inconsistent between a property rights framework as a *nested set of rights*, and a web of interests framework, as long as the nesting includes the full suite of rights and allows people to continue to fulfil custodial obligations under cultural law.

[14] For example, see the writings of Hugo Grotius (1583-1645), Thomas Hobbs (1588-1679), Samuel von Pufendorf (1632-1694), John Locke (1632-1704), Emer de Vattel (1714-1767), Adam Smith (1723-1790) and William Blackstone (1723-1780).

Figure 2: Dreamtime: the Aboriginal view of connectedness[15]



The language used in the property rights literature – proprietor, claimant, owner – strongly reflects a western construct of ownership, and this is perhaps one of the barriers to acceptability of the property rights framework in an Aboriginal context. Nevertheless, having separate bundles of rights as nested rights to govern human behaviour does not imply that human, spiritual and environmental values are themselves separate. What seems to be required is for a property rights framework to be able to account for the interrelationships between these dimensions rather than be able to regulate the natural and spiritual worlds. The conceptualisation of rights as *nested* rather than *separable bundles* is, we think, a fundamental distinction.

Cultural flows

Current water entitlements are defined in terms of volume of water. For cultural flows an essential characteristic is the 'naturalness' of the flow, and so timing of the flow and the flow profile are important (see for example, Settre and Wheeler, 2015). Different types of entitlements or water products can change the costs of water recovery for cultural flows, and the costs of managing water collectively as a cultural flow (see for example, Scoccimarro and Collins, 2006; Leroux and Crase, 2007). One important question for this research is, are there different types of entitlements and water products that could reduce the costs of water recovery for cultural flows, and that would enable water held by Aboriginal groups to be managed collectively as a 'more natural' flow?

The other significant challenge is the issue of institutional arrangements and governance to operationalise cultural flows as more than simply water. Water belongs to each nation while it's on their country, each nation acting as custodian of the water before it flows downstream to the next nation:

> *While it's on our territory it's [our nations] water, we only benefit from that water while it's here on our lands… (Ted Fields Jr, personal communication 6 April 2017)*

The creation of cultural flows as beneficially owned water can be seen as a 'nation-based' model of Aboriginal water ownership (Hemming et al, 2017). Ownership of water collectively by different Aboriginal groups would create genuine agency in the management of water, but would also require the coordinated management of water as it moves from one Aboriginal group to another, as well as between Aboriginal groups, the CEWH and river management authorities. This is not only a matter of legal or corporate governance, but also cultural governance. Cultural governance – the management of water rights within each Aboriginal group - provides the conversion from a bundle or nesting of property rights, to an interconnected set of relationships between the human, natural and spiritual domains by enabling the ongoing fulfilment of custodial obligations. So, another key question for this research is, what sort of organisational and governance arrangements would be suitable for holding entitlements

[15] Source: adapted from Institute for Aboriginal Development 'Dreamtime Chart', www.aboriginalart.com.au

to be managed as cultural flows (Tan and Jackson, 2013; Marshall, 2017). The challenge is to develop a mixed property rights framework or semi commons to enable common property management of water for cultural flows within a system of water entitlements (individual property rights) and markets (Fennell 2009).

Conclusions

The creation of cultural flows is significantly more complex than simply the reallocation of water to Aboriginal people or the provision of a flow of water for cultural purposes.

This paper has provided a preliminary overview of traditional customary practices through a property rights lens in order to focus attention on the nature of the rights that need to be attached to Aboriginal water rights if they are to be managed as cultural flows. A key question is whether the property rights framework is a valid conceptual framework. We would argue that, if property rights are seen as a nested set of rights rather than a bundle of rights, and if cultural flows embody both operational and collective choice rights, then a property rights framework can be an appropriate and useful framework for the creation of cultural flows. But there is still significant research to be undertaken into the nature of entitlements and governance arrangements for the operationalisation of cultural flows as beneficially owned water that could be managed collectively by Aboriginal groups.

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