

# CULTURAL FLOWS

## LITERATURE REVIEW



NATIONAL  
CULTURAL FLOWS  
RESEARCH PROJECT

For First Nations People, water is a sacred source of life. The natural flow of water sustains aquatic ecosystems that are central to our spirituality, our social and cultural economy and wellbeing. The rivers are the veins of Country, carrying water to sustain all parts of our sacred landscape. The wetlands are the kidneys, filtering the water as it passes through the land.

First Nations Peoples have rights and a moral obligation to care for water under their law and customs. These obligations connect across communities and language groups, extending to downstream communities, throughout catchments and over connected aquifer and groundwater systems.

The project partners acknowledge all of the Traditional Owners across Australia who care for the waterways that sustain our Country. We pay deepest respects to their Ancestors and Elders who have protected and maintained water resources for thousands of years, and passed on the knowledge, stories and lessons through the generations.

We acknowledge the nations of Murray Lower Darling Rivers Indigenous Nations and Northern Basin Aboriginal Nations who continue to fight for their inherent right to water, and who had a pivotal role in creating and directing the National Cultural Flows Research Project.

We thank the Murrawarri and Nari Nari Nations who worked tirelessly as part of the research team to develop the cultural flows assessment approaches for this project.

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Spatial data captured by Australian Cultural Heritage Management Pty Ltd in this report for any newly recorded sites has been obtained by using hand held or differential GPS units using the GDA94 co-ordinate system.

## Abbreviations

Term	Meaning
ACHM	Australian Cultural Heritage Management Pty Ltd
AHRC	Australian Human Rights Commission
AIATSIS	Australian Institute of Aboriginal and Torres Strait Islander Studies
CHI	Cultural Health Index
CMFP	Canadian Model Forestry Program
COAG	Council of Australian Governments
CRG	Daly River Community Reference Group
CSIRO	Commonwealth Scientific and Industrial Research Organisation
EFA	Environmental Flow Assessments
ELOHA	Ecological Limits of Hydrological Alteration
FPWEC	First Peoples' Water Engagement Council
GIS	Geographic Information Systems
IBFA	Integrated Basin Flow Assessments
IWRM	Integrated Water Resources Management
LWA	Land and water Australia
MDBC	Murray Darling Basin Commission
MDRIN	Murray Darling Rivers Indigenous Nations
NAILSMA	North Australian Indigenous Land and Sea Management Alliance
NNTC	National Native Title Council
NWC	National Water Commission
NWI	National Water Initiative
NWT	North West Territories
TRaCK	Tropical Rivers and Coastal Knowledge

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Darren Griffin, RAP Manager at Barengi Gadjin Land Council Aboriginal Corporation

Maitland Parker, Banjima Elder and Heritage Coordinator, Eastern Pilbara, WA

Dr Naomi Rea



## Executive Summary

The National Native Title Council (NNTC) has engaged Australian Cultural Heritage Management Pty Ltd (ACHM) to undertake Component One of the National Cultural Flows Research Project. This baseline component is required to describe the Indigenous cultural water values and needs across Australia. Specifically, this involves:

1. A comprehensive reference (literature review) of known Indigenous uses and values of water in Australia and internationally.
2. A comprehensive review of projects and methodologies that have described cultural values of water.
3. Recommended needs and gaps of cultural flows research in the context of this research program.
4. Recommended and justified terminology for this Research Program. (National Native Title Council 2012)

The need for the study arose because, over many decades of ongoing issues in Australian water management and the reiteration of the necessity of including Indigenous values in water management, there has been a singular failure to adequately define the cultural values of water. This lack of definition is compounded by a general lack of knowledge about patterns of Indigenous water use – ranging from past water practices and dependencies of pre-contact Aboriginal people through to community water practices and needs in the present day (Jackson, Moggridge & Robinson 2010).

Literature and documentary sources containing relevant information about Indigenous water use in Australia, past and present, have been summarised, and the distribution of the water bodies concerned has been mapped. This report is accompanied by a Microsoft Access database containing all of the examples summarised in the report. The database can be searched for specific information and patterns of data. The report summarises these sources for each State and Territory in turn.

There are several recurring themes through this material. There is the strong cultural association of water sources with Aboriginal creation mythology, and their special association with the primary Creation Ancestor, the Rainbow Serpent and the basic creative duality of fresh and salt water. Many aspects of cultural knowledge relating to these matters are confidential and restricted to adults of one gender or the other. There is the fundamental, traditional economic focus of food sources and potable water, each with its accompanying cultural significance. There is accompanying technology in some places – fish traps, eel farms, and the like, as well as the permanent markers of extensive shell middens along coasts and river banks to show where people have traditionally camped together, collected and consumed food from the water. Throughout the country, special places near water have provided seasonal or occasional abundance which allowed large groups of people traditionally to gather together for ceremonial, social and economic purposes. There is the importance of rivers, streams and lakes as boundaries between tribes and nations, marking traditional country. The larger river systems like the Murray-Darling were also transportation highways along which people have always travelled, with special cultural relationships defining travel and trading partnerships.

The majority of the Australian reports reviewed note the importance of recognising the Indigenous values attached to water and of consultation with Aboriginal people. In particular it was noted that resources and species of high economic value to Western stakeholders do not always coincide with those of significance to Indigenous communities. Many of the reports, while stressing the importance of consultation, stress the shortcomings and failures of this process when not followed up with opportunities for Aboriginal people to be actively involved in the planning, monitoring and management of waterways. This is a reflection of the growing appreciation for the role Indigenous knowledge of the environment can inform management plans.

The focus of Indigenous consultation is moving beyond simply avoiding negative impacts on Aboriginal communities to ensure environmental management works in cooperation with, rather than alongside, traditional and cultural land use. This is a radical shift from a culture of excluding Aboriginal knowledge as non-expert in even quite recent research projects. Many Indigenous groups contacted through these projects demonstrated a willingness to engage and protect the waterways, but this was often prevented by a lack of opportunity for direct involvement.

Indigenous involvement in the planning and monitoring of management plans may also serve as the solution to another major problem: volumetric water allocations for culturally significant waters. Although economic resources valued by Indigenous people can often be managed in much the same way as other economically important aspects of the environment, there is far greater ambiguity when it comes to determining how much water needs to be set aside for culturally significant places. Often the presence of water effectively ‘creates’ the site in that it may represent a spiritual entity or mark a place of social significance. Exactly how much water is needed to maintain this kind of site’s presence cannot be measured in the same way that economic resource demands can be. In reality there is unlikely to be a clear distinction between sufficient and insufficient water

volumes; it is more probable that a continuous spectrum, ranging from fully sufficient to insufficient exist. The direct involvement of Aboriginal people in decision making processes may provide some means of determining whether or not water allocations are sufficient.

A third reason to actively involve Aboriginal people in environmental management is to avoid concepts of value being artificially constrained by Western distinctions between economic and cultural, between social and spiritual and numerous other potential false dichotomies. By giving Indigenous people more responsibility and input into defining and protecting places of significance, management plans would be tapping into a wealth of knowledge regarding the nuances of that significance and how best to maintain it.

The international level offers instructive perspectives on issues raised by the Australian literature and projects. Steenstra's (2010) account of the formulation of the Cultural Health Index for the Waikato River in New Zealand, for instance, goes at least some way towards quantifying cultural information without reducing it to a commodity. The example of the Canadian Model Forestry Program provides a relatively long term model for linking environmental, economic and cultural aspects of a natural resource with what appears to be a good level of success. The Integrated Water Resources Management approach (IWRM), as described by Johnston (2012), may provide a useful model of practice for the Australian context.

While projects dealing with Aboriginal relationships to water have a relatively impressive geographical spread, this report has identified a variety of geographical locations that would be suitable for further, illuminating project work. It is acknowledged that some project specifics, such as methodology or limitations, were not able to be elucidated to the extent that had been originally expected at the outset of Component One of the National Cultural Flows Research Project. Budgetary and time constraints played a part, as did the lack of relevant information provided in many of the project reports. Further, it is acknowledged that due to timing and budgetary constraints, the report overall was not as comprehensive as had been expected.

The analysis of terminology used in projects dealing with Aboriginal relationships to water reveals considerable complexity in meaning and usage, and this includes the term 'cultural flows' itself. This report asserts that terms such as 'cultural flows' and 'cultural values' are important and useful descriptive tools which allow for the tangible aspects of cultural water values to be easily defined and therefore understood.

The terminology used, such as 'culture' and 'values', but also 'economics' and 'sustainability', evince a variety of meanings even within the same report. The contention of this report is that the current terminological use is sound, so long as terms used are carefully defined at the outset of a project, are carefully documented within the project report, and that these definitions are strictly consistent throughout both the project life cycle and the subsequent report. Where the research findings challenge conceptual assumptions or terminological use, this must also be carefully documented.

This terminological consistency will prove vitally important to the outcomes of Component 2 of the National Cultural Flows Research Project, which requires the development and utilisation of methodologies that allow for the measurement of Aboriginal cultural water uses and values. However, internal consistency within one report or with regard to one Aboriginal group's values of water is only the first step. To really produce meaningful results, this terminological consistency must be carried over from group to group, region to region. The literature and project reviews provided in the above report have formed a baseline of information which will hopefully inform the research questions asked in Component 2, especially with regard to examining both the historical and contemporary cultural uses and values of water for the Aboriginal group or groups within the specified case study areas.

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# 1 Introduction

## 1.1 General Introduction

The National Native Title Council (NNTC) has engaged Australian Cultural Heritage Management Pty Ltd (ACHM) to undertake Component One of the National Cultural Flows Research Project. This baseline component is required to describe the Indigenous cultural water values and needs across Australia. Specifically, this involves:

1. *A comprehensive reference (literature review) of known Indigenous uses and values of water in Australia and internationally.*
2. *A comprehensive review of projects and methodologies that have described cultural values of water.*
3. *Recommended needs and gaps of cultural flows research in the context of this research program.*
4. *Recommended and justified terminology for this Research Program.* (National Native Title Council 2012)

The need for the study arose because, over many decades of ongoing issues in Australian water management and the reiteration of the necessity of including Indigenous values in water management, there has been a singular failure to adequately define the cultural values of water (Jackson, Moggridge & Robinson 2010: 2).

Compounding this problem has been the fact that for many water systems, like the Murray-Darling, little is known about patterns of Indigenous water use (Jackson, Moggridge & Robinson 2010: 3). Jackson, Moggridge and Robinson point to a lack of baseline information and a lack of consistent definitions as barriers to incorporating Indigenous interests (2010: 4). A critical part of this study is to develop an understanding of past water practices and dependencies of pre-contact Aboriginal people with contemporary groups and their needs. For this reason taking time depth into consideration offers a perspective that has rarely been offered in previous water studies. Critically, understanding how Aboriginal people adapted to climate change over the Pleistocene and Holocene provides a window into understanding how the likely future changes in Australian water regimes may impact on the cultural value of water.

It should also be noted that this study occurs at a time in which the control and allocation of water is enmeshed in a lengthy and to date unresolved debate between Federal and State governments, as well as local interests over national water reform (Sections 10.2 & 10.3). The Murray-Darling Basin reform process is the most obvious example of a challenge to prevailing paradigms with a view to both environmental and economic sustainability. This has resulted in States positioning themselves against each other over water access and allocation issues. Against such a background it is important that Indigenous interests and voices are not drowned out by Federal, State and Non-Indigenous local stakeholders.

The first stage of the project literature review researched a case study of the Lower Murray and Lakes in South Australia, which demonstrated how information about water uses and values could be represented using Geographic Information Systems (GIS) (Gorman 2013a). Then, an interim report was undertaken which described updates to the literature review incorporating data from New South Wales and the Northern Territory (Gorman 2013b). This report also outlined a database created to review the methods and areas studied in projects investigating Indigenous water values. The aim of the project review was to identify gaps in research and the methods used to investigate contemporary Aboriginal water values. Expectations were that some geographic areas may have received more coverage than others, and that some methods may have been used more frequently, leaving areas that would be valuable to target for future research. Subsequently a literature review of the remaining states and territories was completed, taking into account these reflections.

The literature review identified a comprehensive body of historical and contemporary sources about Aboriginal cultural practices and spiritual beliefs, from which any references to the use of or the association with water was identified and analysed within the parameters of this project. The guidelines used to construct the accompanying literature database are provided in Appendix 3. Inevitably historical accounts of Aboriginal life ways and beliefs were filtered to us through the eyes of non-Indigenous observers and coloured by their cultural preconceptions of race. Consequently Aboriginal voices are most prominent in the contemporary works available, allowing for some cross referencing of the accuracy of historical observations. The methods used to record and analyse the literature review have been described in the earlier reports and are repeated below. A large number of sources that did not contain any relevant literature entries were also read as part of the literature review. These documents are listed in Appendix 1.

The project review looks at pre-existing or current projects that have considered the cultural values of water in both Australia and internationally. At an international level, there is a trend towards recognition of the synergism and analytical potential of coupling biological and social systems when analysing the complex needs of a changing environment (Johnston 2012). In particular, there is a growing appreciation and understanding of the roles that

traditional knowledge, stewardship and management systems and technologies can play in the development of sustainability science.

From this research a comprehensive GIS database has been developed to indicate the geographical locations and spatial patterns of these water bodies and their social and spiritual associations. This visual map combined with the associated examples of economic, social and spiritual water use within a wider landscape context and cosmology, demonstrates a series of trends stretching across the continent and reveals a complex understanding of the use and maintenance of water sources to sustain survival and cultural and spiritual health that is fundamental to both understanding and integrating Indigenous cultural values in the use and management of water in this country.

Categorisations of water association used for the literature review saw an overwhelming number of entries assigned a spiritual association with water, whilst a much lower number of entries assigned the use of water as social (primarily territorial boundary markers), or economic (fishing, gathering and water collection). The dominance of a spiritual theme is hardly surprising as the traditional Indigenous world view generally sees the landscape as a unified whole combining resources for use and survival, in this case water or resources arising from water, with the origins of the water and/or water feature connecting to the continuing responsibilities of the Traditional Owners to maintain this resource and world order. Water viewed in this more holistic sense, as opposed to a purely economic resource, represents survival (both physical and spiritual), cultural continuity, and cosmic stability. The landscape is literally alive with meaning through the eyes of Traditional Owners and their experience of being in that world, and the information provided in this report clearly illustrates this interconnection of cultural, social and economic factors and their influence on the maintenance of traditional life ways.

Common themes arise across the states and territories, which after all are simply imposed western boundary constructs atop traditional country, in the ways in which water bodies form cultural and social boundaries to delineate territory and then how the presence of water provides a physical/spiritual map across the landscape for physical movement, action (such as initiations and ceremonies), food procurement, song lines and the maintenance of water sources.

Serpents or snakes (and crocodiles in northern regions) form a common motif in both the creation of water features and as a continuing presence in the landscape. They are the guardians of a precious resource in a harsh land, and represent serious to deadly punishment for those who may transgress their cultural obligations and allow these critical resources to decline or end. These are most often variants of the prime creator Rainbow Serpent, who is intimately associated with all water sources (see Buchler and Maddock 1978 for a general overview).

Archaeological remains of fish traps and 'weirs' in coastal regions demonstrate a technological aspect of resource procurement for food, with archaeological evidence found of the food eaten. Other examples of human action demonstrate the development of fresh water storage as a survival strategy, as demonstrated by the manufacture of rock holes (gnammas) to catch and collect fresh water.

Ultimately, water is a precious resource essential to survival. Issues of access, ownership and maintenance have generated over deep time, upon an economic resource base, a rich cultural, social and spiritual structure. The information presented below only scrapes the surface of this multi-storied landscape of meaning, but it does clearly demonstrate that across the continent, Traditional Owners constructed a physical and spiritual map of water bodies in their various forms and availabilities and determined a system to maintain them for both their physical and spiritual wellbeing. In the contemporary discussion and management of water resources it is this traditional complexity of water usage and maintenance that must be recognised as part of the process of ensuring a sustainable resource that promotes not just survival, but spiritual wellbeing through cultural connection and practised responsibility.

## 1.2 A Note on the Use of Names

The spelling of names for places and for Aboriginal groups has changed over the years in many cases. There has been no attempt in this report to update or to standardise these names in references to different documentary sources, as this would only complicate following the links back to the original sources. It may be worthwhile at a future stage of the project to compile a list of variant spelling and pronunciations of specific Aboriginal group names and place names used by the project. In the meantime, many variations of these names are listed by Horton (1994) and by Tindale (1974a).

## 1.3 A Note on Maps Used in the Report

Maps have been generated for the literature review component of this report (sections 2 - 9) in order to provide approximate geographical locations for places described in the literature. Since these locations are only derived

from information provided in the literature, they do not identify all locations of significant water bodies in Australia. We confidently assume that there are many water bodies that are significant and that have not been covered by the literature review provided in this report.

## 1.4 The Research Team

The research for this report was conducted by a large team of ACHM anthropologists and archaeologists, including: Nick Butler, Stephen Damhuis, Aylza Donald, Neale Draper, Alice Gorman, Justine Hobbs, Claire Keating, Jon Marshallsay, Andrew Morley, Stephen Muller, Damon Parker, Leda Sivak, Daniel Thomas, Martin Wimmer, Alex van wessem and Amy Ziesing. Report coordination and editing was provided by David Mott and Fiona Sutherland. Valuable research material was contributed by Lynette Crocker, Ngangki Burka, Senior Kurna Woman. We also acknowledge the kind permission of Maitland Parker and the Martidja Banyjima people to refer to field records and consultancy reports relating to the Fortescue River and Weeli Wolli Creek in the Eastern Pilbara, as well as additional consultancy reporting on this area kindly provided by anthropologists Brad Goode and Dr Eddie McDonald.

## 2 Cultural Values of Water - A State by State Summary of Documentary Sources

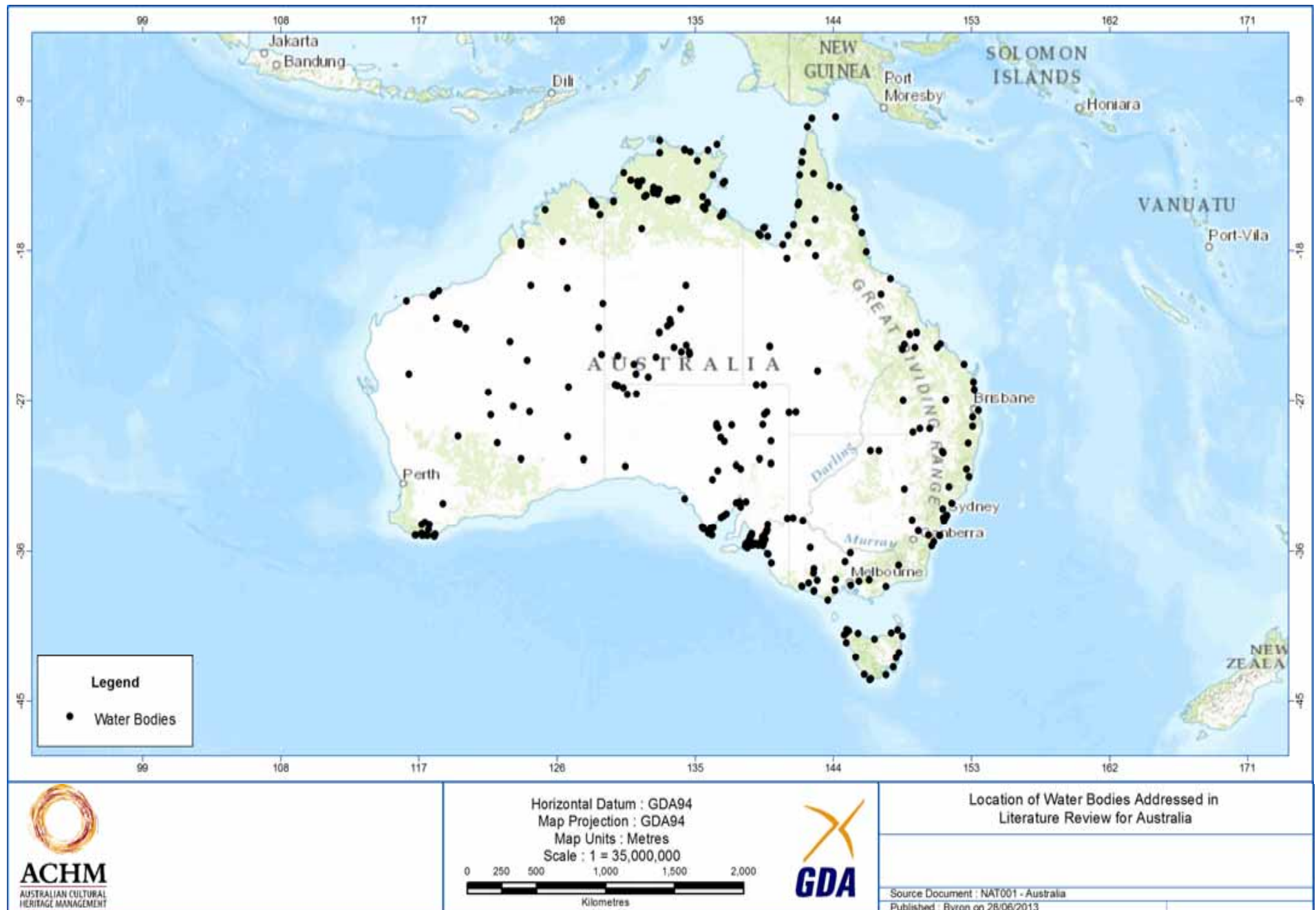
### 2.1 Introduction

This section of the report deals with each State and Territory in turn, and summarises all of the useful documents – both published literature and unpublished reports that the research team was able to identify and access during the allotted time for this project. The material is summarised by the name of the Aboriginal Group or by the region to which it refers. Note that the spellings for Aboriginal group names are those used in the sources being summarised – no attempt has been made to update or standardise these names.

The distribution of water bodies referred to in the documentary sources we have identified is shown in Map 2.1. The coverage of published literature, while not exhaustive, is certainly indicative of the range of material and subject matter in this format. The coverage of unpublished reports – the 'grey literature' is not nearly as comprehensive, because heritage and community development consultancy reports, native title connection reports, and internal Government reports are not so well referenced nor available as published sources. The acquisition of this kind of material will involve a long term process, and will rely largely upon the cooperation and goodwill of both Authors and commissioning agents for the reports to identify and supply copies. To provide some examples to illustrate the potentially high value of this material, we have included references from ACHM reports and from other reports we know about in regions where we have worked.

We have the advantage of previous experience with some archival material, such as the Tindale Archive in the SA Museum, but there are many potentially valuable archival sources in Australian Libraries and other institutions which do not have such well developed on-line catalogues, so that we feel certain that there is a great deal more relevant documentary material in such places – it is just very expensive and time consuming to access.

There are several recurring themes through this material. There is the strong cultural association of water sources with Aboriginal creation mythology, and their special association with the primary Creation Ancestor, the Rainbow Serpent and the basic creative duality of fresh and salt water. Many aspects of cultural knowledge relating to these matters are confidential and restricted to adults of one gender or the other. There is the fundamental, traditional economic focus of food sources and potable water, each with its accompanying cultural significance. There is accompanying technology in some places – fish traps, eel farms, and the like, as well as the permanent markers of extensive shell middens along coasts and river banks to show where people have traditionally camped together, collected and consumed food from the water. Throughout the country, special places near water have provided seasonal or occasional abundance which allowed large groups of people traditionally to gather together for ceremonial, social and economic purposes. There is the importance of rivers, streams and lakes as boundaries between tribes and nations, marking traditional country. The larger river systems like the Murray-Darling were also transportation highways along which people have always travelled, with special cultural relationships defining travel and trading partnerships.



Map 2-1: Geographical distribution of literature review location points - Australia



## 3 New South Wales

### 3.1 Introduction

The majority of the entries in the New South Wales database relate to the social value of rivers and lakes. In almost every instance these water bodies were used by Aboriginal groups as a natural limit to their territory. The River Murray, as the largest river in the country, features often in this regard.

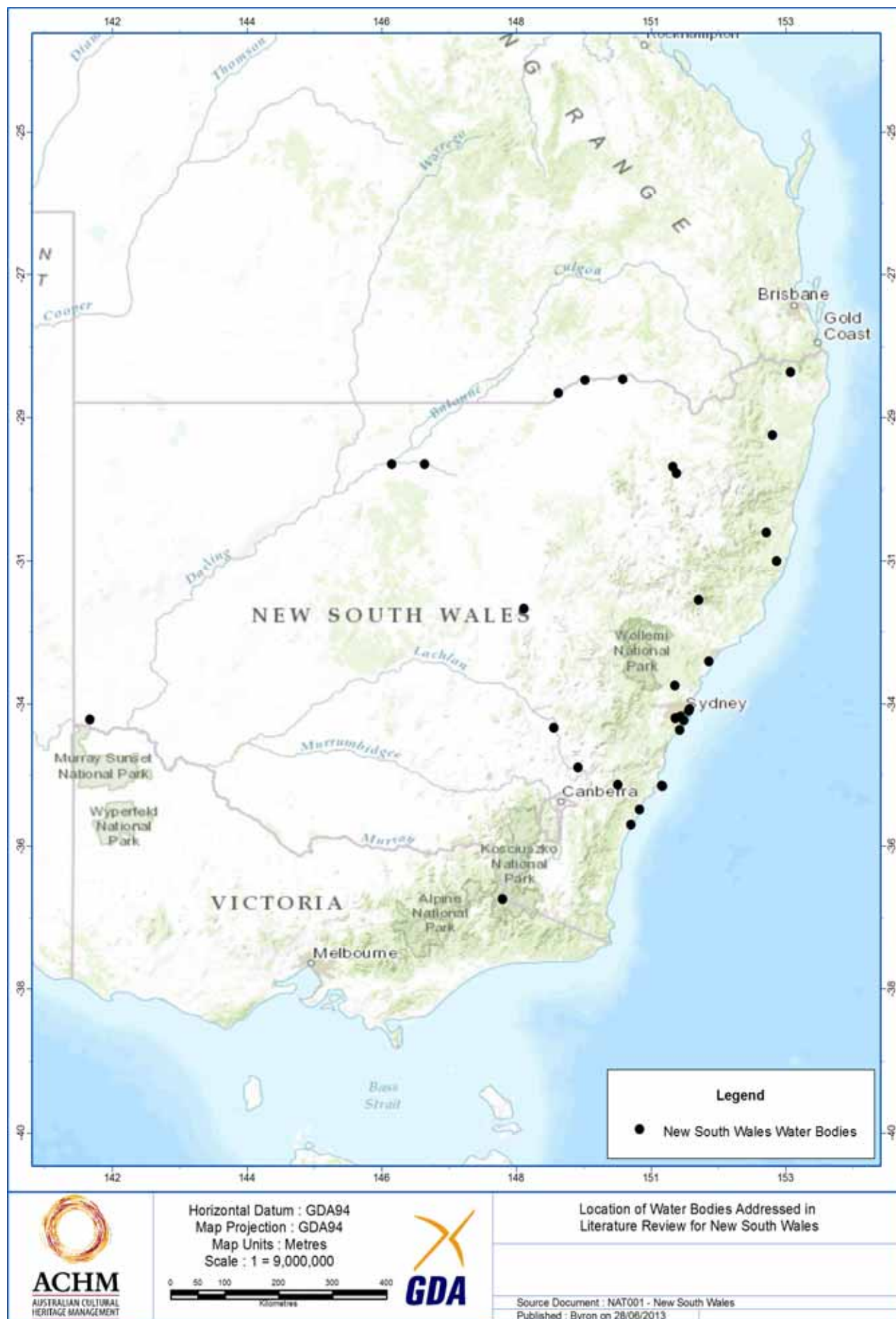
The use of water bodies for this purpose is unsurprising given that water bodies, especially rivers, are easily distinguished in the landscape. The use of cultural boundaries ensured that the natural resources of the landscape were shared equitably by a number of groups over a large area. While intergroup cooperation and the sharing of food resources most probably did occur in New South Wales, there were no references to these practises found in the literature.

References to rivers and coastal areas were found most commonly throughout the literature, with references to creeks and waterholes occurring less frequently.

Within the literature, gender roles were identified for a single Aboriginal group in New South Wales: the Bugundji. In this instance, Allen (1974: 312) notes that Bugundji women gathered reptiles, shellfish and crayfish while Bugundji men speared fish. It is likely that this type of gender based division of various economic activities was common throughout Aboriginal groups in New South Wales, and more generally throughout the continent, reflecting gender divisions in economic and spiritual terms.

A number of references to initiation ceremonies associated with water bodies were identified in the literature. Ceremonial grounds and their associated camps were often positioned near creeks, rivers or waterholes to ensure easy access to fresh water for those involved.

Map 3-1 shows locations identified by the literature.



Map 3-1: Literature review location points - New South Wales

## 3.2 NSW Review Results

### Arakwal

The Richmond River is socially significant to the Arakwal people as it forms a natural border between their territory and that of the neighbouring Badjalang people. This boundary extends from Ballina to Casino (Tindale 1974a: 191; 1974b).

### Badjalang

The Richmond River is socially important to the Bandjalang people as it forms a natural border between their territory and that of the neighbouring Arakwal people. This boundary extends from Ballina to Casino (Tindale 1974a: 191; 1974b).

### Bahree

The Bahree were known to participate in the Keeparra, an initiation ceremony, along the banks of Stony Creek. The creek provided a source of fresh water for the people involved in the initiation ceremonies (Mathews 1897b: 321). A camp was also established along a nearby tributary of the Allyn River to house those who participated in the ceremonies (Mathews 1897b: 323).

### Barada

The Isaac River is socially significant as the division between the Barada traditional lands and those of the Kabalbara. This border follows the Isaac River from the town of Bombandi until it meets the Connors River (Tindale 1974a: 191; 1974b).

### Baranbinja

The Darling River of northern New South Wales is socially important to the Baranbinja people as it forms a natural boundary from Brewarrina to west of Bourke between Baranbinja territory and that of the neighbouring Ngemba people (Tindale 1974a: 191,198; 1974b).

### Birrabee

The Birrabee were known to participate in the Keeparra, an initiation ceremony, along the banks of Stony Creek. The creek provided a source of fresh water for the people involved in the initiation ceremonies (Mathews 1897b: 321). A camp was established along a nearby tributary of the Allyn River to house those who participated in the ceremonies (Mathews 1897b: 323).

### Bugundji

The Murray-Darling Basin is economically significant to the Bugundji people who, during spring and summer, would congregate along the river banks and lagoons to engage in large scale food gathering activities which frequently involved everyone, men and women, young and old. The actual body of the river itself was the focus for aquatic and aerial nets, aimed at catching fish and birds.

The fishing nets could be up to 90 m long and 1 m wide, with a 75 mm mesh. With floats and weights attached, they could be used as seine nets or dragnets. The net would be dragged through the water, remaining as a vertical barrier with the floats keeping the upper surface level with the water and the weights holding it on the bottom. The net was dragged into a circle to enclose the fish. Many people might be required to drag such a net, as its weight could be considerable. The nets were also sometimes fixed to stakes on the river banks so that the fish swam into them (Mathews 1903: 152; Sturt 1883a: 92).

Fish traps made of stone pens and wickerwork weirs also observed in use along the Darling River by Major Thomas Mitchell (Mitchell 1839: 100-101).

Above the waterline, similarly large nets were used to catch the numerous herons, ducks, pelicans and cormorants that came to the river. The nets, 45 to 90 m long and 18 m deep, were strung across watercourses attached to trees or poles placed there for that purpose. Women drove the birds downstream while the men placed the net and threw sticks and boomerangs at the approaching birds to drive them into it (Krefft 1866: 368-369; Sturt 1883b: 140).

In the spring and summer when the water level is high, the river teems with fish, water birds, shellfish, crustaceans and edible plants such as typha or bulrush. Summer rains and floods promote the growth of seed bearing grasses. At these times, Aboriginal people of the Bugundji or Barkindji language group would gather on the banks of the Darling River (Allen 1974: 312). Allen's ethnographic review discusses the use of the river to sustain these large groups during the peak season, and also how the lack of water in the low season was overcome. Allen (1974: 312) also provides comment on the gender roles of the Bugundji: "[w]omen generally collected the shellfish, crayfish and reptiles and the men speared fish, but some other activities, like duck hunting involved the entire community".

### **Carapath**

The Carapath were known to participate in the Keeparra, an initiation ceremony, along the banks of Stony Creek. The creek provided a source of fresh water for the people involved in the initiation ceremonies (Mathews 1897b: 321). A camp was established along a nearby tributary of the Allyn River to house those who participated in the ceremonies (Mathews 1897b: 323).

### **Dharawal**

The Dharawal believe that the Gurungaty, an aquatic monster, lived in the deep waterholes south of Sydney. Although he did not harm his own people, he would catch, drown and eat strangers as soon as they stopped to drink at the waterhole. Gurungaty usually climbed a tree near the waterhole from which he kept a lookout (Attenbrow 2002: 130).

### **Duduroa**

The Murray River serves as a natural boundary between the territory of the Wiradjuri and that of the Duduroa from Albury to just west of Greg Greg (Tindale 1974a: 201, 204; 1974b).

### **Euhlayi**

The Euhlayi people of eastern New South Wales believe that the Narran River is home to the kurea (large serpents) and the gowaray (featherless emu). The Narran River, as a result, is valued by the Euhlayi as a story place (Mountford 1978: 60-61). Furthermore, when travelling down the Darling in July 1835 Major Thomas Mitchell observed grass harvesting and storage on tributaries of the Darling including the Narran River (Mitchell 1839: 238-9, 290-291). K.L. Parker also observed the Euhlayi group collecting grass seeds (Parker 1905: 30).

### **Goreenggai**

The Goreenggai were known to participate in the Keeparra, an initiation ceremony, along the banks of Stony Creek. The creek provided a source of fresh water for the people involved in the initiation ceremonies (Mathews 1897b: 321). A camp was established along a nearby tributary of the Allyn River to house those who participated in the ceremonies (Mathews 1897b: 323).

### **Gundungarra**

The Gundungarra believe that the Gurungaty, an aquatic monster, lived in the deep waterholes south of Sydney. Although he did not harm his own people, he would catch, drown and eat strangers as soon as they stopped to drink at the waterhole. Gurungaty usually climbed a tree near the waterhole from which he kept a lookout (Attenbrow 2002: 130).

### **Jarjari**

The stretch of the Murray River between Ouyen and Redcliffs separated Kureinji territory from that of the Jarjari people (Tindale 1974a: 196, 205; 1974b).

### **Jeithi**

The Murray River forms a natural boundary between the territory of the Jeithi and that of the Kwatkwat people. The boundary between these two groups follows the river from Tocumwal to Howlong (Tindale 1974a: 193, 206; 1974b).

### **Jiegara**

The Clarence River is of social importance to the Jiegara people as it forms a natural boundary between their territory and that of the Badjalang people. The boundary follows the Clarence River from Gafton and terminates at the coast (Tindale 1974a: 191, 194; 1974b).

### **Jitajita**

The Lachlan River forms a natural boundary between the traditional territories of the Jitajita and Narinari groups. This boundary follows the Lachlan River from Booligal to Balranald (Tindale 1974a: 194, 197; 1974b).

### **Jotijota**

The Murray River forms a natural boundary between the traditional territories of the Jotijota and the Pangerang groups. This boundary follows the River Murray from Cohuna to Echuca (Tindale 1974a: 194, 207; 1974b).

### **Kamilroi**

The Kamilroi were recorded as performing the Bora (initiation ceremony) at a waterhole along the Gnoura Gnoura Creek in northern New South Wales (Mathews 1895: 411).

In terms of social value, the Gwydir River forms a natural boundary between territories of the Weraera and Kamilaroi people from Moree to Bingara (Tindale 1974a: 194, 200; 1974b).

### **Kula**

The stretch of the Darling River between Brewarina and Bourke separates Ngemba territory from that of the Kula (Tindale 1974a: 195, 198; 1974b).

### **Kutthack**

The Kutthack were known to participate in the Keeparra, an initiation ceremony, along the banks of Stony Creek. The creek provided a source of fresh water for the people involved in the initiation ceremonies (Mathews 1897b: 321). A camp was established along a nearby tributary of the Allyn River to house those who participated in the ceremonies (Mathews 1897b: 323).

### **Kureinji**

The Murray River served as a natural boundary between the Kureinji and a number of other neighbouring groups. The stretch of river between Ouyen to Redcliffs separated Kureinji and Jarjari territory, the stretch between Redcliffs to Wentworth separated Kureinji and Latjilatji territory and the stretch of river from Robinvale to Ouyen separated the Kureinji from the Tatitai (Tindale 1974a: 196, 205-207; 1974b).

### **Kwatkwat**

The Murray River forms a natural boundary between the territory of the Jeithi and that of the Kwatkwat people. The boundary between these two groups follows the river from Tocumwal to Howlong (Tindale 1974a: 193, 206; 1974b).

### **Latjilatji**

The stretch of the Murray River between Redcliffs to Wentworth separated Kureinji and Latjilatji territories (Tindale 1974a: 196, 206; 1974b). Similarly, the stretch of the river extending 30 km west from Wentworth was used as a boundary between the Latjilatji and the Maraura people (Tindale 1974a: 196, 206; 1974b).

### **Maraura**

The Murray River serves as a natural boundary between Maraura territory and that of the neighbouring Latjilatji people. The stretch of the river continuing 30 km west of Wentworth was used in this capacity (Tindale 1974a: 196, 206; 1974b). Similarly, the stretch of river between Wentworth and Chowilla served as a boundary between the Maraura and Ngintait groups (Tindale 1974a: 196, 216; 1974b).

### **Miinyowa**

The Miinyowa were known to participate in the Keeparra, an initiation ceremony, along the banks of Stony Creek. The creek provided a source of fresh water for the people involved in the initiation ceremonies (Mathews 1897b: 321). A camp was established along a nearby tributary of the Allyn River to house those who participated in the ceremonies (Mathews 1897b: 323).

### **Molo**

The Molo were known to participate in the Keeparra, an initiation ceremony, along the banks of Stony Creek. The creek provided a source of fresh water for the people involved in the initiation ceremonies (Mathews 1897b: 321). A camp was established along a nearby tributary of the Allyn River to house those who participated in the ceremonies (Mathews 1897b: 323).

### **Murri**

The Murri of New South Wales value the spiritual significance of the Page and Isis Rivers. According to the associated Creation story, the two rivers were created by a number of thirsty Creation Ancestors who were looking for water. They found a possum hole in a tree, which they proceeded to enlarge with their axe. As this occurred, the rivers flowed forth from the possum hole (Greenway et al. 1878: 257).

### **Narinari**

The Lachlan River forms a natural boundary between the traditional territories of the Jitajita and Narinari groups. This boundary follows the Lachlan River from Booligal to Balranald (Tindale 1974a: 194, 197; 1974b).

### **Ngemba**

The Darling River serves as a natural boundary between the territory of the Ngemba and that of the neighbouring Kula and Baranbinja groups. The stretch of river between Brewarina and Bourke separates the Ngemba from the Kula while the stretch between Bourke and Dunlop separates the Ngemba and the Baranbinja (Tindale 1974a: 191, 195, 198; 1974b).

**Ngintait**

The Murray River serves as a natural boundary between the Ngintait and Maraaura people. Specifically, this boundary comprised the stretch of river between Wentworth and Chowilla (Tindale 1974a: 196, 216; 1974b).

**Pangerang**

The Murray River forms a natural boundary between the traditional territories of the Jotijota and the Pangerang groups. This boundary follows the River Murray from Cohuna to Echuca (Tindale 1974a: 194, 207; 1974b).

**Tatitati**

The stretch of the Murray River from Robinvale to Ouyen separated Kureinji territory from that of the Tatitati (Tindale 1974a: 196, 207; 1974b).

**Ta-ta-thi**

The Ta-ta-thi value the Murray River for its spiritual significance. Cameron (1885: 368-369) recounts a Ta-ta-thi Creation story associated with the river:

Ngwoorangbin (water rat), who lived in the Murray River, had a large hut in which he kept the fire for the purpose of cooking the mussels which he brought out of the river. This fire he very jealously guarded, but one day whilst he was down in the river gathering mussels, a spark flew out of the hut and was caught by Kiridka (a small hawk), who, having some inflammable materials ready, kindled a fire, by means of which he burned down the house of Ngwoorangbin, and also at the same time a large tract of forest, so that it is now open plains.

Lake Victoria is also valued by the Ta-ta-thi as it is believed this water body is home to Rakur (the Bat) and his two wives (Cameron 1885: 370).

**Ualarai**

The Barwon River serves as a natural boundary between the territories of the Ualarai and Weilwan groups. This boundary follows the Barwon River from Brewarrina to Walgett (Tindale 1974a: 199, 200; 1974b).

**Watthungk**

The Watthungk were known to participate in the Keeparra, an initiation ceremony, along the banks of Stony Creek. The creek provided a source of fresh water for the people involved in the initiation ceremonies (Mathews 1897b: 321). A camp was established along a nearby tributary of the Allyn River to house those who participated in the ceremonies (Mathews 1897b: 323).

**Wathi-wathi**

The Wathi-wathi also tell Creation stories about the Bookoomuri (a race of ancient animal-people). The following story relates to the River Murray:

Two Bookoomuri, Koorambin (a water rat) and Pandawinda (codfish), were the sole possessors of fire, which they jealously guarded in an open space among the reed-beds of the Murray River.

Many efforts were made by other Bookoomuri, and by the present race, to obtain a spark of it, but without success, till one day Karigari (a hawk), who of course had originally been a Bookoomuri, discovered Koorambin and Pandawinda in the act of cooking mussels, which they had obtained from the river. He flew up to such a height that they could not see him, and then caused a strong wind to blow the fire among the dry reeds. This was, however, extinguished. He then sent a wind from the opposite direction, and eventually a whirlwind, which scattered the fire in every direction, causing a conflagration which set the whole of the reed-beds on fire, and extending to the forests, laid waste vast tracts of country, upon which trees have never since grown, so that where there were once forests we find now immense bare plains (Cameron 1885: 368).

**Weilwan**

The Barwon River serves as a natural boundary between the territories of the Ualarai and Weilwan groups. This boundary follows the Barwon River from Brewarrina to Walgett (Tindale 1974a: 199, 200; 1974b).

**Weraerai**

The Gwydir River forms a natural boundary between territories of the Weraerai and Kamilaroi people from Moree to Bingara (Tindale 1974a: 194, 200; 1974b).

**Wiradjuri**

The Murray River serves as a natural boundary between the territory of the Wiradjuri and that of the Duduroa (Tindale 1974a: 201, 204; 1974b).



The Wiradjuri were also known to conduct the Burbung, an initiation ceremony, along Bulgerage Creek (Mathews 1897a: 296-296, 298).

### **Wodiwodi**

The Shoalhaven River, from Marulan to the coast, forms a natural boundary between the territory of the Wodiwodi and that of the Wandandian people (Tindale 1974a: 199, 201; 1974b).

### **Wandanian**

The Shoalhaven River, from Marulan to the coast, forms a natural boundary between the territory of the Wodiwodi and that of the Wandandian people (Tindale 1974a: 199, 201; 1974b).

### **Unspecified**

A large number entries that do not relate to a specific Aboriginal group were identified during the New South Wales literature review. The majority of these relate to the economic value of water bodies to Aboriginal people. These water bodies are spread throughout the state and include rivers, creeks, stretches of coast and a lake. Economic activities carried out at these water bodies include catching fish and eels; and the gathering of mussels, prawns, oysters and reeds. (Massola 1971: 137, 145; Goodall and Cadzow 2009: 28, 61, 63, 163; Flood 2004: 246, 247). According to Attenbrow (2002: 62-63, 67, 69), the Aboriginal people of Port Jackson and Botany Bay were known to opportunistically utilise whale meat from dead whales which would wash up on the ocean-side of Manly Cove.

Other entries relating to unspecified Aboriginal groups include a reference to a burial ground along the Darling River (Massola 1971: 113) and a Creation story relating to Lake Victoria. The story is recounted by Massola (1971):

The Crow went to get a drink of water at Were-wulka (Big Lake--Lake Victoria). As he bent down, he saw something in the water and scooped it up with his hand. It was a little baby girl. He said to the baby: 'Grow up, quick.' After two days he told her to walk about, and before long she grew into a woman. This is how the Crow got his wife.

A number of other entries relate to the Bookoomuri - a race of ancient animal-people associated with water bodies in the Riverina region of New South Wales. Cameron (1885: 369) recounts a story in which the Bookoomuri create the Willandra Creek:

Two Bookoomuri had a wonderful chase after a gigantic kangaroo which lived near Hilston on the Lachlan River. He was followed by the two Bookoomuri for hundreds of miles, but they eventually lost sight of him. Following the track, however, for some days, they at last came to where another Bookoomuri, who having met the kangaroo in an exhausted state, had, with the assistance of his dog, killed it and already had partly cooked it. The visitors were invited to partake but they refused, and waiting for a few minutes till the attention of the other was engaged on something else, they restored the kangaroo to life, to the great indignation of its captor, who immediately sent his dog after it. The two hunters, however, placed a magic spell on the dog which prevented its running. They then followed the kangaroo, and eventually killed it near the junction of the Darling and Murray Rivers. The Willandra Creek, which has a course of more than three hundred miles, is supposed to be the track of the Kangaroo when flying from its pursuers. The few hills which occur in the district are the camps of the Bookoomuri when following it.

Similarly, Merowie Creek is said to have been created by the tracks of a mystic animal who was pursued by two Bookoomoori hunters (Cameron 1885: 369).

Near Lake Macquarie, an unspecified Aboriginal group believe that a monster fish name Wauwai occasionally killed people. It was said Wauwai inhabited fresh waterhole between Lake Macquarie and the Sugar Loaf Mountains. The water hole was said by the local Aboriginal group to be bottomless (Attenbrow 2002: 130).

The Aboriginal people of the Barwon River area believed that a kurrea (large serpent) dwelt at Boobera Lagoon (Mountford 1978: 59-60).

## **3.3 Discussion**

The documentary references summarised above cover a wide range of associations between Aboriginal people in NSW traditionally and water sources. These water sources are recorded as a primary source of sustenance (food and water) and as geographic boundaries between the traditional lands of different group of people. These water bodies also features as the homes of Creation Ancestors (particularly variants of the Rainbow Serpent), and as important creative elements in creation mythology – the source of new life, or the Dreaming tracks made by those Ancestors.

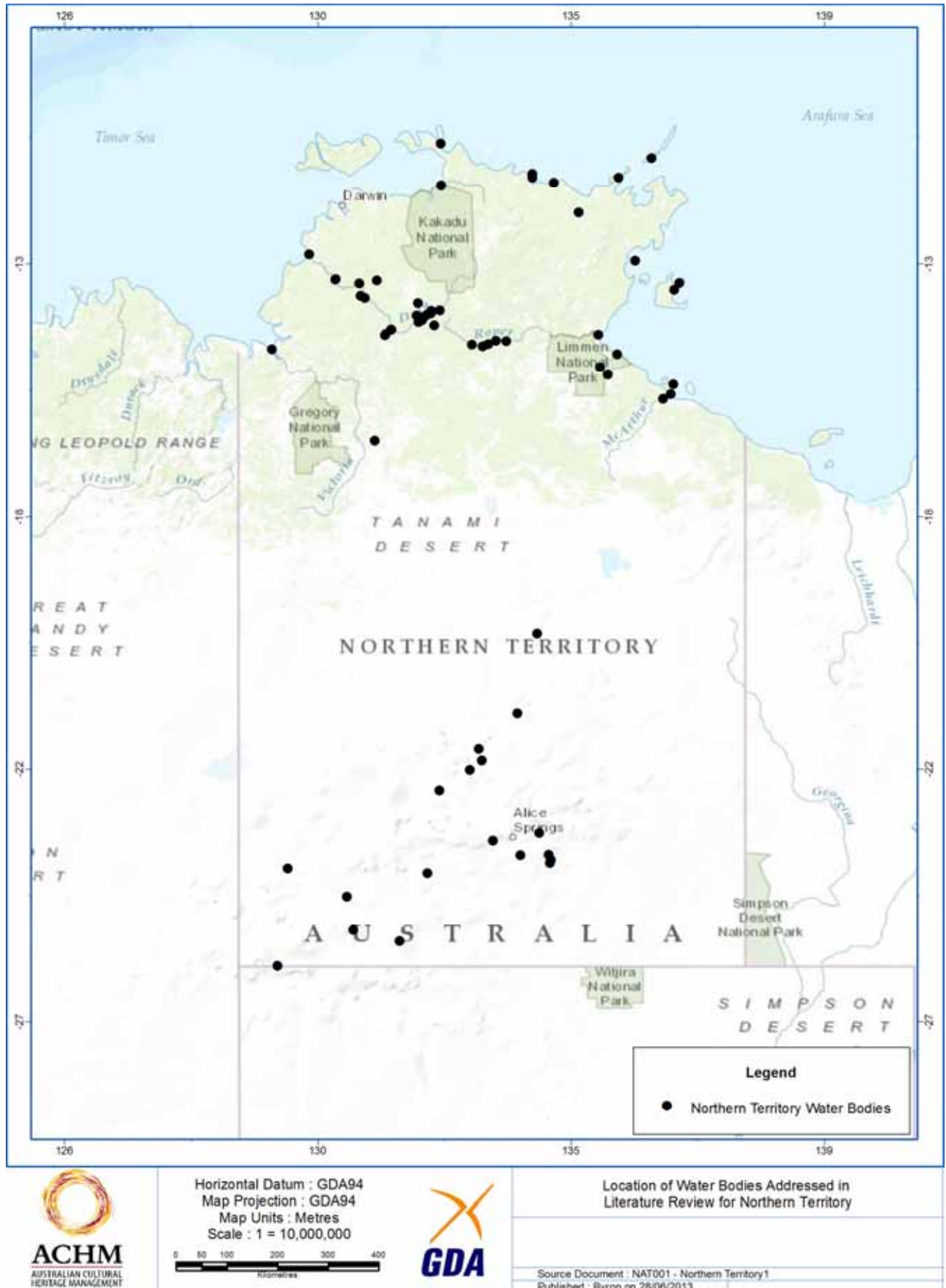
## 4 Northern Territory

### 4.1 Introduction

The Northern Territory literature review yielded a large number of entries relating to the spiritual value of water to Aboriginal people. Of the 172 entries for the Northern Territory, 117 relate to the spiritual significance, 18 relate to social significance, three relate to educational/informational significance, five relate to historic significance, 21 relate to economic significance and eight relate to ceremonial significance. Rivers are the most commonly referenced water body type with a total of 46 entries.

It should be noted, however, that some rivers have multiple entries (such as the Roper and Flora Rivers). Waterholes, springs and creeks also feature commonly throughout the entries, while rockholes, open oceans, billabongs, aquifers, lakes, wells and wetlands are present in lesser numbers.

Map 4-1 shows locations in the Northern Territory identified by the literature.



Map 4-1: Literature review location points - Northern Territory

## 4.2 Northern Territory Review Results

### Amurag

The Amurag People of Arnhem Land in the Northern Territory value a number of water bodies for their association with a pair of Creation Ancestor siblings. Alad, a natural spring located in Amurag territory, is said to have been made by two Creation Ancestors who proceeded to drink from the spring before moving on to Arura Springs where they also drank the fresh water located therein (Berndt and Berndt 1989: 30). Likewise, at Wululbi, the siblings dug a hole which subsequently became a well (Berndt and Berndt 1989: 30).

At a place called Ngalgara - where Cooper's Creek and East Alligator River intersect - the Amurag people believe that the aforementioned Creation Ancestors were forced to jump the Alligator River. The first sibling made the crossing in a single jump but the second sibling fell into the middle of the river. He swam back to the shore quickly to avoid the crocodiles. On his second attempt, the second sibling made it across the river (Berndt and Berndt 1989: 30).

### Anmatyerr

Kwalpa Kuna, a rockhole located just east of the Aileron Roadhouse, has deep historical value for the local Anmatyerr people. In historical times, Anmatyerr people living at nearby Ryan's Well would travel to Kwalpa Kuna by donkey to renew their water supplies. The rockhole also lies along the Rain Dreaming track. The water located within the rockhole was so precious to the Anmatyerr people that, during historic times, they used to overlay the opening with a grid of cut timbers to protect the water from contamination (Rea 2008: 34). Mer Anningie, a waterhole, also has social and historical value to the Anmatyerr people. In historic times, the Anmatyerr 'Old People' would not allow the waterhole to be accessed by children as they could potentially scare off the emu that would often come to the place for water. The 'Old People' would construct a rough humpy and wait for the emus to approach before spearing them (Rea 2008: 47). Mer Ywerternt, a permanent swamp, also has unspecified historical value to the Anmatyerr people (Rea 2008: 33).

More recently, places such as Pwerrey Ilpay soak have been used by Anmatyerr elders to teach the younger generation how to find and access fresh water (Rea 2008: 29).

The Anmatyerr people also value water bodies within their territory for their spiritual associations. One Creation Ancestor story, for example, describes the journey of a small snake which came from Harpers Spring and moved towards Woolla Downs, where he grew bigger. From there, he made his way to Wallaby Springs where he fell on the families camping there, causing havoc and chaos. The snake ate many people here (Rea 2008: 21).

The waterholes around Napperby Creek also relate to a Creation Ancestor story - the 'Fish Dreaming'. It is against Anmatyerr law to remove fish from the creek or its associated waterholes (Rea 2008: 22).

### Anula

A number of water bodies valued by the Anula people were identified during the literature review. The creation of Batten Creek, for example, is attributed to the Creation Ancestor Murrumbura, a crocodile, who arose in a place called Yalko and returned underground at Wankilli (Spencer and Gillen 1899 [2003]: 313). A rock in the middle of Kulampbirri Creek is said to represent a dugong, while the trees on either side of the bank represent its hunters. Sticks thrown at the rock are meant to bring forth dugongs (Spencer and Gillen 1899 [2003]: 313). At Upintjara, a waterhole along an unspecified creek, a dollar bird Creation Ancestor made the first rain ceremony. Interestingly, only men from the Awukaria moiety are given access to this story (Spencer and Gillen 1899 [2003]: 314).

### Arunta

The Arunta people believe that an important Unchichera (frog totem) centre is located at Imanda on the Hugh River (Spencer and Gillen 1899 [2003]: 341). The Arunta believe that Oruncha (spirits) dwell at Kulparra (Deep Well), 50 miles south of Alice Springs, (Spencer and Gillen 1899 [2003]: 329). The literature review also yielded a large number of entries relating to the Alcheringa - a period of time in which the Arunta believe that the world was moulded into its current form. A range of water bodies are associated with the Alcheringa including creeks, waterholes and rivers (Spencer and Gillen 1899 [2003]: 299-444).

### Dirilirlin

The Dirilirlin people value Gulun (Longreach Point) and Mungugg (a natural spring near the Strangways River) for their spiritual association with the Nagarran (devildevil) Creation Ancestor story (Barber and Jackson 2011b: 16).

### Aboriginal People of Elcho Island

The people referred to as the 'Elcho Island Men' by R.M. Berndt in the mid-1970s have a number of Ancestral Creation stories which relate to a range of water bodies in and around Elcho Island. Chief of these are the Djanggawul and Carpet Snake stories. The former story relates to the travels of the three Djangguwal siblings, who

are said to have created a number of water bodies including Bungbungwalman Well, the Djurangalbi springs and the Nguruwurunana springs. Additionally, they are believed to have attempted to catch a fish in the ocean off the coast of the island (Berndt 1976: 152-154). The Carpet Snake Ancestral Story similarly follows the travels of a Creation Ancestor. Gaburaibin spring, for example, represents a place where the Ancestral Carpet Snake dug a hole, while the Duraidla rockhole represents the snake's tail (Berndt 1976: 153). It is believed that the snake lives at Mundda Swamp (Berndt 1976: 153). The Elcho Island People also believe that the southeast wind originally arrived down the Gulgawalba Creek while the Grulmangura Spring was created by the Eaglehawk Creation Ancestor (Berndt 1976: 151, 154)

### **Gagadju (Kakadu)**

The Aboriginal people of Kakadu, in Western Arnhem Land, believe that the Creation Ancestor, Grudbibi, was speared and died at the mouth of the East Alligator River. A reef at this place, which can be seen at low tide, is believed to be Grudbibi's body (Berndt and Berndt 1989: 21-23).

### **Guyanggan**

The Guyanggan people value Gandirrgiyan (Wagon Wheel Lagoon) for its association with an Ancestor Creation story which relates to the Wanggij (child or piccaninni). It was at Gandirrgiyan that the Wanggij started its journey (Barber & Jackson 2011b:16).

### **Jawoyn**

The Jawoyn people have gender and behavioural restrictions related to Katherine Gorge. Women and girls are not allowed inside the gorge, while fishing is only allowed downstream. People are not allowed to swim in the area. Further, unless there has been significant water flow, people are not allowed to drink from the gorge (Cooper and Jackson 2008: 30). The Katherine Gorge National Park, known at Nitmuluk to the Jawoyn, is believed to be the house a rainbow serpent (Cooper and Jackson 2008: 31).

### **Jilkmingan**

The Jilkmingan value McMinns Bar as a place where the Picaninny Creation Ancestors 'blew water like a spray to make a rainbow, then the water bubbled in a big hole' (Barber and Jackson 2011b: 18).

### **Jiritja**

The Jiritja of North East Arnhem Land value Blue Mud Bay for its associated mythological site (Berndt and Berndt 1954: 32).

### **Kaitish**

The Kaitish believe that the Barrow Creek was made by the spilling of blood during an initiation ceremony during the creation period (Spencer and Gillen 1899 [2003]: 344).

### **Kukatja**

Lake Amadeus forms part of the boundary between Kukatja and Pitjandjara territory in the southwest of the state (Tindale 1974a: 217, 229).

### **Kunibidji**

Haul Island (Ngarraku) is valued by the Kunibidji of Northern Arnhem Land as a place where the 'lurra' - an age grading ceremony where initiated men are introduced to a Muya (Dreaming Spirit) - takes place. Part of this ceremony involves fishing using plant based poisons and nets (Cooke and Armstrong 1998: 188-191). Haul Island is also valued for its other economic resources which are gathered by initiated men only - namely bird eggs. The 'lurra' ceremony is also carried out at nearby Entrance Island (Kabalko) (Cooke and Armstrong 1998: 184-191). The 'lurra' ceremony takes places only in the wet season (Cooke and Armstrong 1998: 184-188).

### **Lurdurdminyi**

Crescent Lagoon is valued by the Lurdurdminyi as the principal site of the Rain Dreaming (Barber and Jackson 2011b: 18).

### **Mariu**

The Victoria River forms the boundary between Mariu and Alura territory in the northwest of the state from the river mouth to Baines River (Tindale 1974a: 220, 231; 1974c).

### **Maung**

The Maung believe that Number Two Sandy Creek was created by Ambidj, the Rainbow Snake (Berndt and Berndt 1977).

### **Murwangi**

The Arafura Swamp and its surrounds are valued for its economic significance. Women in particular are known to hunt for long-necked turtle in the swamp (Jackson and O'Leary 2006: 44).

### **Ngaliwuru**

The Ngaliwuru share a number of territorial boundaries with other nearby groups. The Victoria River serves as a natural boundary between Ngaliwuru territory and that of the Alura, from Baines river almost as far as Bradshaw, and Djamindjung people from that point until Tiber Creek (Tindale 1974a: 220, 223, 233; 1974c).

### **Nganawirdbird**

The Nganawirdbird people of northwest Northern Territory value a number of water bodies for their spiritual associations. The chief Ancestral Creation story of the Nganawirdbird is the Garawi (plains kangaroo) story. Creeks, rivers and lagoons all feature as part of this story which enters Nganawirdbird territory at Mataranka (Barber and Jackson 2011b: 17). Places visited by the Garawi include Elsey Falls (Na-Burl), Gorowan Creek, the Roper River crossing at Garawi Yirrij wa-gardjag and a number of named places associated with Little Red Lily Lagoon (Barber and Jackson 2011b: 17).

### **Ngewin**

The Cox River forms a natural boundary between Ngewin territory and that of the Wilingura from 25 km west of Limmen Bight River to near Janumbirin (Tindale 1974a: 234, 238; 1974d).

### **Tagoman**

The Daly River forms a natural boundary between Tagoman territory and that of the Wagiman from the main bend near Tipperary to the Fergusson River (Tindale 1974a: 235, 236; 1974c).

Jackson (2006) provides an academic account of project work undertaken in the Daly River catchment. In particular, Jackson identifies a material-spiritual dichotomy in environmental planning approaches that marginalises Aboriginal interests in the Daly River region (2006: 29).

### **Uuluru People**

An Uuluru Creation story tells of two women, Lantjingalli and Tjuangalli, who rose from Tjuldu, a waterhole located west of Alice Springs (Spencer and Gillen 1899 [2003]: 284)

### **Wadere**

The Limmen Bight and Cox Rivers form a natural boundary between Wadere territory and that of the Mara people from Limmen Bight River for a distance of roughly 25 km west. (Tindale 1974a: 230, 236; 1974c).

### **Wagiman**

The Wagiman people value a range of water bodies. Of the Wagiman entries identified as part of the literature study, the majority relate to economic or social values. A number of these water bodies are valued for multiples reasons. Reedy Hole, a waterhole on Jool Chung Creek, is valued as a place to fish and hunt animals such as goannas, fish, kangaroos and short-necked turtles. It is also valued as a place for "remembering birth places, significant life cycle events and the death of previous generations" (Jackson and O'Leary 2006: 26). The same can be said for Douglas Hot Springs, Banyan Waterhole and the Flora River (Jackson and O'Leary 2006: 26). Flora River is also valued for its spiritual connection to a Wagiman Creation story (Jackson and O'Leary 2006: 29).

### **Wanindiljaugwa**

According to Rose (1987: 44,182), the 'Wanindiljaugwa/Hubert Lake Foraging Group' were known to hunt dugong at Angurugubira Lake and spear fish in Little Lagoon.

### **Wardaman**

The Wardaman people of Northern Central Australia value water bodies for spiritual and educational reasons. A Wardaman Creation story recounts the travels of a rainbow serpent who travels underground and emerges at a number of sinkholes and caves. Two of these sinkholes are located on the Katherine Golf Course and at the intersection of the Stuart and Victoria Highways. One cave featured as part of this Creation story is the Cutta Cutta Cave (Cooper and Jackson 2008: 28, 33).



The Flora River Springs are also significant to the spiritual life of the Wardaman people. The Wardaman people believe that the Flora River Springs are produced by a grasshopper which lies underground and pumps the water through the springs and into the nearby Daly River (Jackson and O'Leary 2006: 139). It is also thought that the rainbow serpent was created by the spring water here (Cooper and Jackson 2008: 32).

### **Warramunga**

A number of water bodies in Warramunga territory relate to the Creation story of the Wollunqua - a large beast which is the totem of the Warramunga people. The waterhole at Kadjinara, for example, was the original home of the Wollunqua before it moved into its current residence at the Thapauerlu waterhole (Spencer and Gillen 1899 [2003]: 227-228). As it travelled across Warramunga territory, the Wollunqua stopped and rested at the Antipateringa waterhole (Spencer and Gillen 1899 [2003]: 229).

The Tjinquokora River is also valued for its connection with the black snake, known as Thalaualla, who arose during the Creation time at this place (Spencer and Gillen 1899 [2003]: 298). Water bodies are also valued by the Warramunga for their ceremonial associations. The waterholes at Wiarminni, for example, are closely associated with the Warramunga fish totem (Spencer and Gillen 1899 [2003]: 250).

### **Wenamba**

Lake Neale forms a natural boundary marker between Wenamba territory and that of the Pitjandjara people (Tindale 1974a: 217, 259).

#### **Wildman and Mary River People**

The Aboriginal group referred to as the 'Wildman and Mary River People' by Berndt and Berndt (1989:25) have a Creation story that relates to an ancestral brother and sister who travel from the sister's camp to the Wildman River. Along the way, they stopped at Gobolbu-namareidju - a swamp which contains an 'island' of rocks relating to the Sun Dreaming (Berndt and Berndt 1989: 25).

### **Yanyuwa**

To the Yanyuwa of the Gulf of Carpentaria coast, water bodies are valued for both economic and spiritual reasons. At the mouth of the McArthur River, for example, honey is still harvested from the mangrove sugar bags that line the mouth of the river (Jackson and O'Leary 2006: 43). The Yanyuwa recount the mythic journey of the Creation Ancestor Dugong Hunters for a distance of 110km through the Sir Edward Pellew Island Group (McNiven 2003: 333). For contemporary Yanyuwa people, the act of dugong hunting across the sea is a recreation of the Creation Ancestor Dugong Hunters and a reaffirmation of Yanyuwa identity as dugong hunters and 'Saltwater People' (McNiven 2003: 336).

### **Yolgnu**

The Yolgnu utilise the marine environment of the Wessell Archipelago for its economic resources which include shellfish, fish, mangrove crabs, turtle, dugong and turtle eggs (Meyers et al. 1996: 14).

Schwartz recounts how water is used ritually to remove a 'killing weapon', to source of power of a sorcerer (Schwartz 2010: 76). Schwartz goes on to describe the ritual activity:

*If people refused to wash, that meant they were the ones with 'blood on their hands' (mangumirr). One by one, the men came to the centre of the township...to wash themselves with hoses...The washing lasted a few hours and could be witnessed by all (Schwartz 2010: 76)*

Magowan (2001: 280) notes that 'cool water' is used by Yolgnu healers (*marrngiti*) 'to restore the tissues, blood and health' of an ill person, 'without cutting the body'.

### **Unspecified or Multiple Groups**

A large number of less specific entries relating to Aboriginal values of water were also collected during the literature review. These entries can relate to either multiple or unspecified Aboriginal groups. While the vast majority of these entries relate to spiritual value, other values including ceremonial and historic, were also identified.

A number of entries attributed to unspecified Aboriginal groups relate to the rainbow serpent. It is believed, for example that explosives used by non-Indigenous people have killed the Rainbow Serpents that lived at Edith Falls and the Katherine River in Central Australia. (Cooper and Jackson 2008: 28). Katherine Hot Springs (Jamanbukjang) is thought to be the place of origin of the rainbow serpent (Cooper and Jackson 2008: 32). Rockholes are often associated with the wanambi, or rainbow serpent, in Central Australia and into the Mann and Musgrave Ranges. For example, the Piltadi rockhole in the Mann Ranges is said to be home to two wanambi and their wives (Mountford 1978: 56-58). At Mandaruka Rockhole, a story recounts the attack on two wanambi by two women. The wanambi fled their home, never to return (Mountford 1978: 53-54).

At Gum Hole (Dimanji) on Manbulloo Station, it is believed that the fringing vegetation surrounding the waterhole was left by the rainbow serpent. The vegetation includes freshwater mangrove (Wularin) which is used as a poison to catch fish. It is believed Creation Ancestors, including the rainbow serpent, left the Wularin there for use by subsequent generations (Cooper and Jackson 2008: 33). Other water bodies, such as Kathleen Falls, are associated with the rainbow serpent more generally (Cooper and Jackson 2008: 34).

A reference to a lightning serpent was also identified. From Nandjajuba, a large freshwater pool on the Liverpool River, it is said that the Wala-undajua (lightning serpent) brings forth thunderstorms (Mountford 1978: 68).

The ceremonial significance of water bodies is also a common theme. Knotts Crossing (Delerrmilluk) and Donkey Camp (Dulukurrulula), for example, are both associated with ceremonial activities. Their proximity to fresh water makes them prime locations to conduct large scale ceremonial activities (Cooper and Jackson 2008: 34). The same is true for a significant lawground, positioned at the junction of the Flora and Katherine Rivers (Cooper and Jackson 2008: 34).

Unsurprisingly, some water bodies are valued on multiple levels. The Maude River, for example, has been used in recent times as a weekend camping and fishing destination (Cooper and Jackson 2008: 35). This dual social/economic significance is not uncommon. Leech Lagoon (Wubilawun), for example, is valued by the local Aboriginal people as both a Turtle dreaming site as well as a place at which long-necked turtles can be caught (Cooper and Jackson 2008: 39). Likewise, Salt Springs (Irikerteye) and its surrounds are used both for hunting and for ceremonial activities (Dobson 2009: 34-35).

The historical value of water bodies in the Northern Territory is also evident. Bandicoot Bar, known to the local Aboriginal group as Tharram, is valued for its association with a number of historic events including births and deaths of people who camped, hunted and travelled through the area (Barber and Rumley 2003: 17).

A large number of water bodies were also identified as having economic significance. The Aboriginal groups along the Fitzroy, Prince Regent, Victoria, Daly, Alligator, Roper and Liechhardt Rivers were recorded by Basedow in the 1920s as utilising the waterholes that accompany the aforementioned rivers. He described their method of obtaining fish:

*Men and boys enter a waterhole at one end and scare fish into shallow water and onto the mud banks, where they are tossed onto land and killed by awaiting persons who crush the fishes' heads in their teeth (Basedow 1925: 127-128).*

### 4.3 Discussion

Literature reviewed for the Northern Territory illustrates that water bodies (often rivers but sometimes lakes) were used by Aboriginal people to serve as natural boundaries between territories.

The rainbow serpent (known also as Wanambi, Rankiniti or Ngajjod) is an Ancestral Creation figure which features heavily in the Northern Territory literature (Mountford 1978: 53-54, 64-65, 71-74). Rockholes are often viewed as places where the rainbow serpent emerged from, or submerged into, the ground as well as the home of the serpent.

There are two distinct geographic regions in the Northern territory when considering water sources. The Northern coast, islands, and adjacent rivers and lagoons lies within the tropical monsoon region, and feature a seasonal abundance of water – an annual cycle which is culturally and economically fundamental to Aboriginal people. In this zone, the Rainbow Serpent is often manifested as a crocodile as well as a snake. In the arid interior and central deserts, water sources are scarce, unpredictable and precious. Permanent and semi-permanent water sources (deep pools and rock holes) are always afforded great respect, both for their precious water supplies and as dwelling places for the Rainbow Serpent.

It is interesting to note that there are apparent gender restrictions relating to different economic activities. For example, the hunting of fish in the waterholes that line the major rivers of the Northern Territory is a task performed by men and boys (Basedow 1925: 127-128).

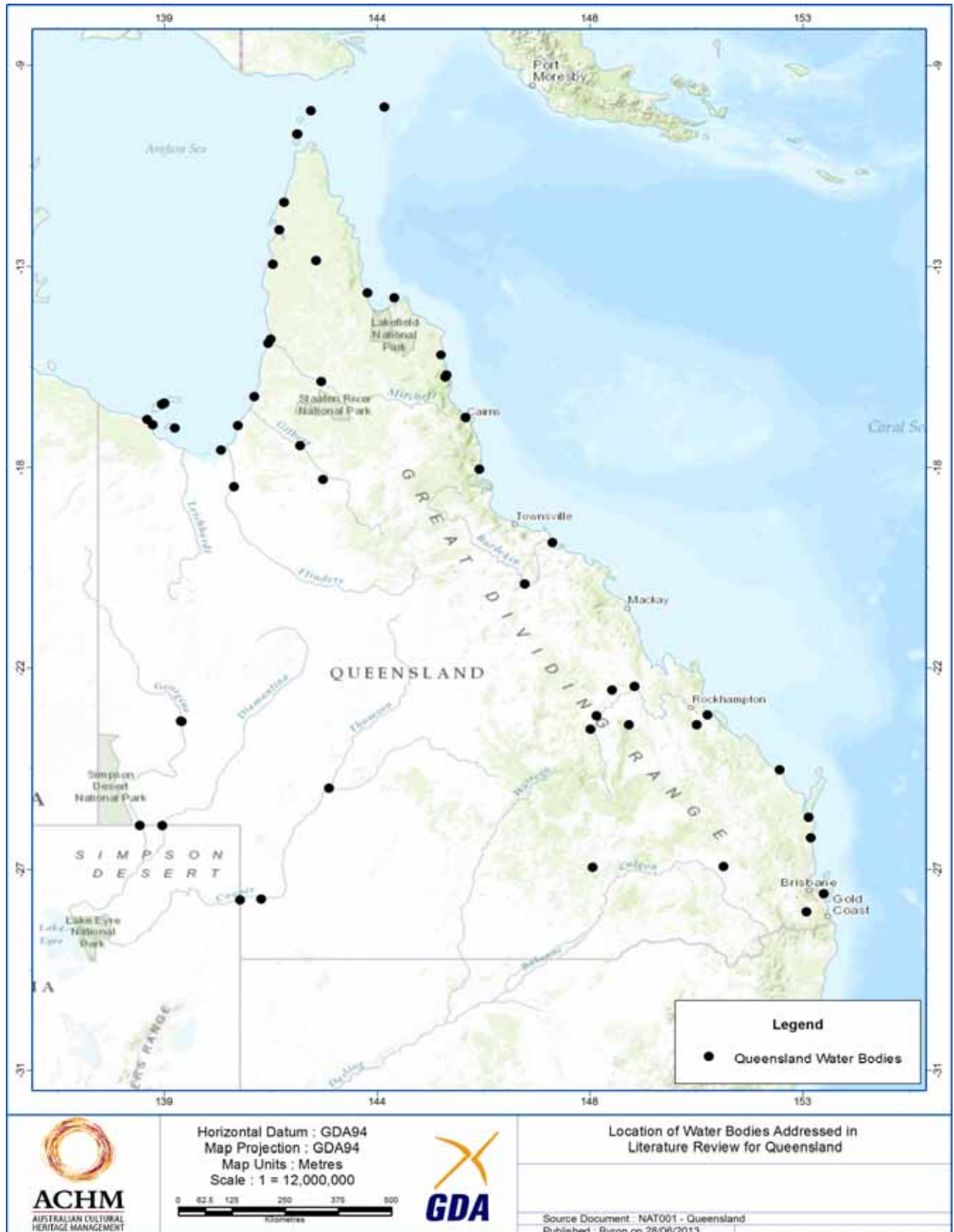
## 5 Queensland

### 5.1 Introduction

A large proportion of the water bodies identified as having significance in the review of literature relating to Queensland were rivers or other bodies of water denoting boundaries between neighbouring Indigenous groups (e.g. Elkin 1977; Langton 2006: 153; Tindale 1974a, 1974b, 1974d). These places are necessarily of significant social importance since they determine the areas in which the individual can or cannot not collect food and other resources as well as determining the nature of social interactions between groups.

A second common use of water in Queensland, and indeed across Australia, is for the procurement of food resources. Fishing is supplemented by hunting of aquatic animals including turtles, dugongs, crocodiles and sharks and gathering of crustaceans and shellfish. These animals may be procured by nets, spears, line-fishing, being grabbed by hand and several more inventive means. Roth (1884a: 20) describes the use of parasitic sucker fish which were released by the 'Mallapara blacks' to indicate the location of large prey, while others (Petrie 1975: 65-75; Tindale & Lindsay 1963: 70) report that dolphins and porpoises were encouraged to herd fish towards the shore - a technique also recorded in South Australia (Martin 1988: 37, 41).

Map 5-1 shows locations identified in the literature.



Map 5-1: Literature review location points - Queensland

## 5.2 Queensland Review Results

### Ajabakan

One water body with significance to the Ajabakan people was identified. This was the Coleman River, which forms a boundary with the Olkolo. This boundary runs for about 100 km, extending west from a point roughly 10 km east of the town of Strathmay (Tindale 1974a: 164, 184; 1974d).

### Araba

One water course found to have significance to the Araba was discovered, although by Western geographic tradition this has been determined to be three separate rivers flowing into each other – the Smithburne, the Gilbert and the Einasleigh Rivers. This water course marks the Araba's border with the Walangama. The boundary starts near Stirling and follows the Smithburne River until it empties into the Gilbert River; from here the border follows the Gilbert river until it becomes the Einasleigh River, and then continues eastward with the Einasleigh for another 50 km (Tindale 1974a: 164, 187; 1974d).

### Baiali

The Fitzroy River was found to have social significance to the Baiali. It forms the boundary with the Darambal, which stretches from Rockhampton to the coast (Tindale 1974a: 164, 167; 1974d).

### Barada

The Isaac River is socially significant as the division between the Barada traditional lands and those of the Kabalbara. This border follows the Isaac River from the town of Bombandi until it meets the Connors River (Tindale 1974a: 165, 172; 1974d).

### Bidia

The Thomson River was identified as having social significance to the Bidia. This river forms the boundary with the Kulumali between the towns of Jundah and Galway Downs (Tindale 1974a: 166, 178; 1974d).

### Bindal

One waterway was found which has a known significance to the Bindal. This is the Burdekin River, which for roughly 40 km forms the border between the traditional lands of the Bindal and the Juru, terminating at the coast. (Tindale 1974a: 166, 172; 1974d).

### Biria

The Burdekin River is also of significance to the Biria, as it forms their boundary with the Warungu. This limit follows the Burdekin River from the crest of the Leichhardt Range to Bogie River (Tindale 1974a: 166, 188; 1974d).

### The Aboriginal People of Bloomfield River

Recreational activities recorded on the Bloomfield River suggest a social significance. Roth (1884b: 10) records that competition was held among "The Bloomfield aboriginals [sic]" to determine who could hold their breath for the longest period of time, and who could dive feet-first from the greatest height.

### The Aboriginal People of Brisbane River

Petrie (1975) discusses the economic significance of Fisherman's Island to the local Indigenous groups. Fishing was a regular practice on the island, with established practices relating to seasonal and tidal variations and the gender specific tasks involved (Petrie 1975: 65-75). In addition to fish and eel, oysters and mussels were also collected in the area and dugongs were prized for ingredients in medicine (Petrie 1975: 65-75). Porpoises were also used to help herd the fish (Petrie 1975: 65-75).

### The Aboriginal People of Cairns

Economic significance is evident for the Barron, Mulgrave and Russel Rivers from the records of Roth (1884a: 23) regarding the construction of stone in order to drive fish into nets.

Both spiritual and economic significance is also attached to a waterhole on the Barron River by an unspecified Indigenous group. Mountford (1978: 63-64) reports a story that that the kurra – a spirit dingo – inhabits the waterhole, and fish will be plentifully provided to those who ask the kurra for permission to take them. Swimming in the water, however, will result in drowning (Mountford 1978: 63-64).

### Darambal

The Fitzroy River was found to have social significance to the Darambal people. It forms the boundary with the Baiali from Rockhampton to the coast (Tindale 1974a: 164, 167; 1974d).

### **The Aboriginal People of Endeavour River**

Gordon and Haviland (1980) record two stories that demonstrate the spiritual significance of the Endeavour River, although they do not specify the group to which these stories belong. The first relates to the creation of the Endeavour River, which was the track left by Mungurru the scrub python as he retreated to the ocean after having a boulder dropped on his head by Dyirimadhi (Gordon & Haviland 1980: 1-3).

The second story tells of Ganhaar, a crocodile that lived on the river and captured a woman to be his wife and her child. The woman eventually escaped, laying crocodile eggs along the path as she fled. The fate of the crocodile and the child are not recorded (Gordon & Haviland 1980: 9-11).

### **Ganggalida**

Three significant places – all involving the economic use of water – were identified in relation to the Ganggalida. Bayley Point and Point Parker were both identified as places where fishing was performed, particularly through the use of fish traps (Memmott & Trigger 1998: 114). These two places also have relation to the Dugong dreaming story, and thus a cultural dimension as well (Memmott & Trigger 1998: 114).

Not far off shore from Bayley Point and Point Parker are the Wellesley Islands, which were used for turtle and dugong hunting and the gathering of crustaceans and shellfish as well as fishing (Memmott & Trigger 1998: 112, 114). Fishing was again performed with the assistance of fishtraps, with at least 334 fishtraps between 108 sites on the islands (Memmott & Trigger 1998: 112, 114). The Wellesley Islands were also utilised by the Lardil, Yangkall and Kaiadilt.

### **Ghungalu**

The only waters identified to have significance to the Ghungalu are part of a tradition relating to the munda gara, or rainbow serpent. The munda gara, according to this tradition, lives at the head of Mimosa Creek, at Planet Creek and at Niagara Falls, located near Woorabinda (Weiner, Godwin & L'Oste-Brown 2002: 13.).

### **Goa and Maitakudi**

The Diamantina has social and spiritual significance to the Goa and Maitakudi as a meeting place and a point along their territorial boundaries. Elkin (1977: 117) reports that the Goa teach magic to the next generation of Maitakudi medicine men at this site.

### **Ilba**

The Suttor River was determined to have social significance to the Ilba. This river formed their boundary with the Jangga, stretching from the Burdekin River to Mount Douglas (Tindale 1974a: 168, 170; 1974d).

### **Jangga**

As described above, the Jangga share the Suttor River from the Burdekin River to Mount Douglas as a border with the Ilba (Tindale 1974a: 168, 170; 1974d). In addition to this, a second waterway – also a boundary – was identified as significant to the Jangga. The Burdekin River, from the previously described border with the Ilba to the crest of the Leichhardt Range forms the Jangga's frontier with the Warungu (Tindale 1974a: 170, 188; 1974d).

### **Jetimarala**

Two water bodies were found to have relevance to the Jetimarala. Both served as borders with neighbouring groups. The first is the Mackenzie River, which forms the boundary of the Jetimarala's traditional lands with the Kanolu from Mount Morgan to Isaac River (Tindale 1974a: 170, 174; 1974d).

The second is the Isaac River, which forms the limit between the traditional lands of the Jetimarala and the Kabalbara. It stretches from the termination of the previous boundary line until the Isaac River reaches the Connors River (Tindale 1974a: 170, 172; 1974d).

### **Juru**

The Burdekin River is socially significant to the Juru. For a length of around 40 km, ending at the coast, the Burdekin River marks the limit of Juru Country and the border with the Bindal (Tindale 1974a: 166, 172; 1974d). For the remaining distance to Bogie creek, the Burdekin then acts as the border between the Juru and the Warungu (Tindale 1974a: 172, 188; 1974d).

### **Kaanju**

The Archer River was found to be socially significant to the Kaanju. This river acts as the boundary between their traditional land and that of the Lamalama (Langton 2006: 153).



### **Kabalbara**

Two water courses have been identified to have significance to the Kabalbara; both act as boundaries with neighbouring groups. The first is the Isaac River which divides their traditional lands from those of the Barada and the Jetimarala. The Barada border follows the Isaac River from the town of Bombandi until it meets the Connors River (Tindale 1974a: 165, 172; 1974d). From this point until it meets the Mackenzie River, the Isaac River continues as the boundary with the Jetimarala. (Tindale 1974a: 170, 172; 1974d)

Southwest of this point the Mackenzie River forms another boundary with the Kanolu as it flows from the Nogoa River to meet the Issac River and previously described Jetimarala border (Tindale 1974a: 172, 174; 1974d).

### **Kaiadilt and Yangkall**

Only one waterbody of significance to the Kaiadilt and Yangkall was discovered. This is the seas around the Wellesley Islands Region, used for various economic practices including the hunting, gathering and fishing of marine food sources (Memmott & Trigger 1998: 112, 114). This area was also used by the Ganggalida, as mentioned above, and by the Lardil, discussed in detail below.

In this area turtles and dugongs were hunted, crabs and shellfish – particularly oysters – were gathered and fish were caught with fishtraps (Memmott & Trigger 1998: 112, 114). Memmott and Trigger (1998: 112, 114) claim that at least 334 individual fishtraps were constructed on the islands, forming 108 known fishtrap sites, and that on some islands, such as Bentinck Island, this reached a density of two and a half fishtraps per km.

Roth (1884a: 23) also notes the presence of fishtraps on Bentinck, Mornington and Sweers Islands, which were described as semicircular dams up to 300 yards from the shore.

### **Kairi**

The Comet River was found to be socially significant to the Kairi. This river formed the boundary between the Kairi and the Kanolu, from Rolleston and the Nogoa River (Tindale 1974a: 173, 174; 1974d).

### **Kanolu**

As described above, the Kanolu share a border with the Kairi along the Comet River from Rolleston and the Nogoa River (Tindale 1974a: 173, 174, 1974d). In addition to this another waterway was found to have significance to the Kanolu, again as a boundary.

The Mackenzie River forms the limit of the Kanolu's traditional lands and their frontier with two neighbouring groups as described previously. The Kanolu – Kabalbara border follows the Mackenzie River from the Nogoa River to the Isaac River (Tindale 1974a: 172, 174; 1974d). From the Isaac River to Mount Morgan, the Mackenzie River continues as the Kanolu's border with the Jetimarala (Tindale 1974a: 170, 174; 1974d).

### **Karanja**

One waterway with significance to the Karanja was identified. This is the Georgina River, which forms a boundary with two neighbouring groups. From Lake Machattie to near the township of Bedourie the river serves as a marker of the border between the traditional lands of the Karanja and the Lanima (Tindale 1974a: 174, 179; 1974d). From this last point until the river approaches the Moorabulla Waterhole, it forms a boundary with the Kungkalenja (Tindale 1974a: 174, 178; 1974d).

### **Kareldi**

Two waterways were found to be of significance to the Kareldi: the Smithburne and Flinders Rivers. Both serve as boundaries with neighbouring groups. The Smithburne River forms the border between the Kareldi and Kunggara, which runs from Stirling to the coast (Tindale 1974a: 174, 178; 1974d). The Flinders River forms a second boundary between the Kareldi and the Kukatja, winding from the junction with Bynoe River to the coast (Tindale 1974a: 174, 177; 1974d).

### **Karrandee**

The estuary at the mouth of the Norman River was found to have economic significance for the Karrandee. Curr (1886: 307) reports that the river mouth in particular was a place where various foods including turtles, sharks and dugongs were hunted.

### **Kaurareg**

The Prince of Wales Channel was identified as having spiritual significance to the Kaurareg, as a result of its connections to the story of the warrior Waubin. It is said the Waubin created the strong current running through Prince of Wales Channel to ward off intruders (McNiven 2003: 333). Particularly significant places within this area include Hammond Rock, which according to the story is the petrified body of Waubin (Southon & Kaurareg Tribal Elders 1998: 221), and the rock formation known as Ipili, his wives (Southon & Kaurareg Tribal Elders 1998: 224).

The current Waubin created was contrived in such a way that anyone visiting his closely guarded wives would first have to venture past Waubin (Southon & Kaurareg Tribal Elders 1998: 224).

### **Kawadji**

Many places of spiritual significance to the Kawadji exist in or near the Coral Sea, relating to the travels of I'wai. I'wai is associated with male initiates, and sometimes described as a crocodile carrying initiates on his back. I'wai is also associated with many coastal landforms in this area, in particular headlands and islands. Thomson (1933) argues that I'wai provides the basis for tribal solidarity, and therefore sites associated with the story are also socially significant.

Some of these significant places include Tolnonoma – the original home of I'wai – and various places he visited, including Mutarra (Forbes Island), Ontiba (Hicks Island), Kononon (Margaret Bay), Neyinda (near Cape Grenville), Poi'pa'mul (a small island near Thrush Reef) and Mitirinji (Quoin Island). On one side of Mitirinji there is a beach where I'wai slept after swimming to the island (Thomson 1933: 466). On the other is a site restricted to initiated men, which includes a cave where two girls carried to the island by I'wai have been turned to stone after being punished for using the panmadda (bull-roarer) which today can only be seen and touched by men (Thomson 1933: 466).

In addition to these spiritually and socially significant places, two waterbodies were economically significant to the Yintjingga division of the Kawadji. The first of these is the mouth of the Stewart River, which is an area used in the hunting for Dugong and Turtle (Thomson 1933: 457). The Yintjingga also used to cross the waters around the Great Barrier Reef on canoes to collect turtle and bird eggs (Thomson 1933: 457).

### **Kokomini**

Two of the waterways with significance to the Kokomini were identified. These were the Palmer River and the Mitchell River, both used as boundaries with neighbouring groups. The Palmer River forms the northern border between the Kokomini and the Laia, which winds from Palmerville to the junction with the Mitchell River (Tindale 1974a: 176, 179; 1974d).

The Mitchell River serves as the southern border with the Ngudjan, extending from the east of the Lynd River to the junction with the Palmer River (Tindale 1974a: 176, 183; 1974d).

### **Kowanyama**

The Mitchell River and surrounding wetlands and tributaries hold spiritual and economic significance for the Kowanyama Indigenous community. Strang (2005: 369) explains the meaning of water as the outcome of creative activities of ancestral beings. Jackson and O'Leary (2006: 132) record that the wetlands contain a number of sacred sites directly related to the water which are central to the livelihood of the contemporary Indigenous community, including increase sites, conception centres, poison places and burial sites. Strang (2005: 367; 2006: 72) identifies the language groups of this area as Yir, Yoront, Kokohera, and Kunjen.

The area also contains a variety of food resources which the Indigenous community hunts and fishes (Jackson & O'Leary 2006: 132). Through the lens of 'environmental productivity', Strang (2005: 366) examines divergences and overlaps of interests in the Mitchell river catchment between Aboriginal people, pastoralists, and environmentalists.

### **Kukatja**

One waterway significant to the Kukatja is the Flinders River, which serves as a boundary with a neighbouring group. The Flinders River divides the Kareldi and the Kukatja and runs from the junction with the Bynoe River to the coast (Tindale 1974a: 174, 177; Tindale 1974d).

### **Kulumali**

The Thomson River was identified to have social significance to the Kulumai. This river forms the boundary with the Bidja as it flows from the town of Jundah to Galway Downs. (Tindale 1974a: 166, 178; 1974d).

### **Kunggara**

Two waterways were found to be of significance to the Kunggara: the Smithburne and Staaten Rivers. Both serve as boundaries with neighbouring groups. The Smithburne River forms the Kunggara's southern border with the Kareldi, which runs from Stirling to the coast (Tindale 1974a: 174, 178; Tindale 1974b). The Staaten River forms the northern border with the Kwantari from Wyaaba Creek to the coast (Tindale 1974a: 178, 179, Tindale 1974d).

### **Kungkalenja**

One waterway with significance to the Kungkalenja was discovered: the Georgina River, which forms a boundary with two neighbouring groups. From the Hamilton River to near the Moorabulla Waterhole the river serves as a marker of the border between the traditional lands of the Kungkalenja and the Rakkaia (Tindale 1974a: 178, 185;

1974d). From this point until the river approaches the township of Bedourie it forms a boundary with the Karanja (Tindale 1974a: 174, 178; Tindale 1974d).

### **Kuungkari**

The Thomson River is of social significance to the Kuungkari, as it forms the limit of their traditional lands and their border with the Malintji. This boundary follows the Thomson River from Tocal to Jundah (Tindale 1974a: 179, 180; 1974d).

### **Kwantari**

One waterway of significance to the Kwantari is the Staaten River. This river has social significance as a boundary with the Kungara, which stretches from Wyaaba Creek to the coast (Tindale 1974a: 178, 179; 1974d).

### **Laia**

The Palmer River was discovered to have social significance to the Kokomini. The Palmer River forms the border of the Laia's and Kokomini's traditional lands. This boundary winds from Palmerville to the junction with the Mitchel River (Tindale 1974a: 176, 179; 1974d).

### **Lamalama**

Three of the waterways with significance to the Kokomini were identified. The first is the Archer River, which is socially significant since it serves as the boundary between the Lamalama and the Kaanju (Langton 2006: 153).

The second is the Stewart River, which is economically significant as a fishing place (Langton 2006: 153-154). There may also be a social or spiritual aspect to this significance, hinted at by the cultural restrictions placed on dugong, turtle and bullock and non-traditional baits (Langton 2006: 154).

The third significant waterways are the Brakeman Rivers. These have an indirect economic value as a result of their use as a firebreak, which is part of traditional "firestick farming" practices to manage and increase vegetation. Because of this tangible link to traditional practices, the Brakeman Rivers also have associative significance (Langton 2006: 157).

### **Lanima**

Two waterways with significance to the Lanima were discovered. Both serve as borders with neighbouring groups. The first is the Georgina River, which forms a boundary with the Karanja. This border follows the Georgina River from Lake Machattie towards the township of Bedourie (Tindale 1974a: 174, 179; 1974d).

The second waterway is Eyre Creek which forms the division between the Lanima and the Mitaka. This boundary line follows the creek from Glengyle to Kalidawarry Waterhole (Tindale 1974a: 174, 179; 1974d).

### **Lardil**

Two of the water bodies with significance to the Lardil are the waters around Mornington Island and the waters around the Wellesley Islands.

The waters around Mornington Island have a spiritual significance to the Lardil people through connection to their ancestors. Of particular significance is a site at the eastern end of Mornington Island where Lardil people identify three rocks protruding from the seas as the bodies of their ancestors, the first humans who came into their country (McNiven 2003: 334).

The Wellesley Islands are of economic significance to the Lardil. The seas around the Wellesley Islands support various economic practices including the hunting, gathering and fishing of marine food sources (Memmott & Trigger 1998: 112, 114). This area was also used by the Ganggalida, Kaiadilt and Yangkall as mentioned previously.

In this area turtles and dugongs were hunted, crabs and shellfish – particularly oysters – were gathered and fish were caught with fishtraps (Memmott & Trigger 1998: 112, 114). At least 334 individual fish traps were constructed on the islands, forming 108 known fishtrap sites, and on some islands, such as Bentinck Island, this reached a density of two and a half fishtraps per kilometre (Memmott & Trigger 1998: 112, 114).

### **Malintji**

The Thomson River is of social significance to the Malintji, as it forms the limit of their traditional lands and their border with the Kuungkari. This boundary follows the Thomson River from Tocal to Jundah (Tindale 1974a: 179, 180; Tindale 1974d).

### **Mallapara**

Roth (1884a) indicates that the coastline near Tully River area is of economic significance to a group referred to as the 'Mallapara blacks'. The hunting of dugongs and turtles, as well as large fish, were recorded along the coast and at the Tully River mouth. According to Roth (1884a: 20), sucker fish were captured alive and had string attached

to their tails so that they could be released and latch onto the hunter's target to allow a more accurate gauge of the distance and angle to throw the spear.

It was also noted that women used to uproot water grasses that grew in the Tully River around the time of mid-tide to find crustaceans (Roth 1884a: 17), that eels would be caught with a rod and line using worms for bait (Roth 1884a: 20), that fish were caught in nets in the narrow channels (Roth 1884a: 22) and speared in the open river (Roth 1884a: 24) and that ducks and geese were caught here and on the Embley River during the night and the daytime (Roth 1884a: 27). Photographs taken by Roth (Khan 1993: 97) also indicate that canoes were used along the river.

### **Mitaka**

Only one of the waterways with significance to the Mitaka was identified. This waterway is Eyre Creek which forms the boundary between the Mitaka and the Lanima. This border follows the creek from Glengyle to Kalidawarry Waterhole (Tindale 1974a: 174, 179; 1974d).

### **The Aboriginal People of Moreton Bay**

Tindale and Lindsay (1963) provide a record of the economic significance attached to the waters of Moreton Bay. Fish were caught here with the aid of dolphins (Tindale & Lindsay 1963: 70).

### **Muragan**

The Mitchell River was found to have social significance to the Muragan as it formed their boundary with the Ngudjan. This border follows the Mitchell River from Dunbar to the Palmer River (Tindale 1974a: 182, 183; 1974d).

### **The Mer People of Murray Island**

The significance of the water around Murray Island is recorded by Meyers et al. (1996) in relation to marine tenure and fishing. Fish were caught within zones designated by poles embedded into the reefs (Meyers et al. 1996: 12). The ownership of fishing areas, and thus the association of a specific person with that place, demonstrates the associative as well as economic significance of the area.

### **Mycoolon**

The Saxby River has economic significance to the Mycoolon people. This river contained small crocodiles called Chilcha-boona and Kulcha which the Mycoolon caught with their bare hands (Palmer 1884: 285). The eggs of the crocodile also provided a source of food (Palmer 1884: 285).

### **Ngundjan**

Only one of the waterways significant to the Ngundjan was identified. This is the Mitchell River, which is socially significant as the frontier of the Ngundjan people's traditional lands and the border with the neighbouring Muragan and Kokomini. The Ngundjan – Muragan boundary follows the Mitchell River from Dunbar to the Palmer River (Tindale 1974a: 182, 183; 1974d). From its junction with the Palmer River, the Mitchell River serves as the Ngundjan border with the Kokomini, extending east of the Lynd River (Tindale 1974a: 176, 183; 1974d).

### **Olkolo**

One water body with significance to the Olkolo people was identified. This was the Coleman River, which forms a boundary with the Ajabakan. This boundary runs for about 100 km, extending west from a point roughly 10 km east of the town of Strathmay (Tindale 1974a: 164, 184; 1974d).

### **The Aboriginal People of the Pennefeather and Wenlock Rivers**

The economic significance of the Pennefeather is documented by Roth (1884a). Waterfowl, including ducks, cranes and diver-birds were struck with rods (Roth 1884a: 27). Turtles were hunted here and on the Wenlock River with harpoons, and were reported to struggle against the hunters for many hours (Khan 2003: 46).

### **The Aboriginal People of Princess Charlotte Bay**

The area around Princess Charlotte Bay was discovered to have economic significance. Roth (1884a: 21) reports that crayfish, eel and rock cod were caught in the hinterland and surrounds of Princess Charlotte Bay by an unnamed Indigenous group. This was performed by putting hollow logs into waterholes and waiting for the creatures to inhabit it – a process said to take no more than a day (Roth 1884a: 21). The logs were then retrieved, being held at an angle and drained through the collector's hands in order to prevent the prey escaping (Roth 1884a: 21).

### **Rakkaia**

Two waterways with significance to the Rakkaia were identified: the Georgina River, which forms a boundary with the Kungkalenja people, and the Hamilton River, which forms a border with the Ringaringa. This first frontier with

the Kungkalenja follows the Georgina River from near the Moorabulla Waterhole to the Hamilton River (Tindale 1974a: 178, 185; Tindale 1974d).

From this junction of the Hamilton and the Georgina rivers, for over 50 km northeast, the Rakkaia-Ringaringa boundary follows the Hamilton River (Tindale 1974a: 185; 1974d).

### **Ringaringa**

As described above, the Ringaringa share a border with the Rakkaia along the socially significant Hamilton River. This boundary follows Hamilton River for over 50 km northeast from its junction with the Georgina River (Tindale 1974a: 185; 1974d).

### **The Aboriginal People of Roaring Meg Creek**

Mountford (1978: 23-97) notes that Roaring Meg Creek was believed by an unspecified Indigenous group to be the home of the yero or rainbow serpent. As such, this creek has spiritual significance.

### **The Aboriginal People of Tin Can Bay**

The evidence for economic significance along Teewah Beach and throughout Tin Can Bay was noted by McNiven (1992). Numerous middens of oceanic and estuarine shellfish shells were mentioned, and are suggested to be middens of the remains of locally collected and consumed “snacks” (McNiven 1992: 498-502).

### **Thereila**

The Wilson River is of social significance to the Thereila, and serves as a border between their traditional lands and those of the Wongkumara. This boundary follows the Wilson River from Nockatunga to the main bend near Orientos (Tindale 1974a: 185, 190; 1974b).

### **Walangama**

One water course found to have significance to the Walangama was discovered, although by Western geographic tradition this has been determined to be three distinct rivers flowing into each other – the Smithburne, the Gilbert and the Einasleigh Rivers. This water course marks the boundary between the traditional lands of the Walangama and Araba. The border starts near Stirling and follows the Smithburne River until it empties into the Gilbert River; from here the border follows the Gilbert river until it becomes the Einasleigh River, and then continues eastward with the Einasleigh for another 50 km (Tindale 1974a: 164, 187; 1974d).

### **Warungu**

One waterway significant to the Warungu was identified. This is the Burdekin River, which forms the frontier of the Warungu’s traditional land and their border with the traditional lands of the Biria, Jangga and Juru. The Burdekin River, from the Suttor River to the crest of the Leichhardt Range, forms the Jangga’s frontier with the Warungu (Tindale 1974a: 170, 188; 1974d). The Biria-Warungu border follows the Burdekin River from the crest of the Leichhardt Range to the Bogie River (Tindale 1974a: 166, 188; 1974d). For approximately 12 km further, the Burdekin acts as a division between the Warungu and the Juru (Tindale 1974a: 172, 188; 1974d).

### **Wik**

The Archer River is of social significance to the Wik as the frontier between their lands and those of the Wikmunkan and Winduwinda. From the south of Merluna to Nookanon Creek, the border between Wik and the Wikmunkan follows the Archer River (Tindale 1974a: 188, 189; 1974d). From Nookanon Creek to the coast, the Archer River traces the course of the Wik’s boundary with the Winduwinda (Tindale 1974a: 188, 189; 1974d).

### **Wikmunkan**

As described above, the Archer River forms the boundary between the Wikmunkan and the Wik, and is therefore socially significant. This border follows the Archer River from the south of Merluna to Nookanon Creek (Tindale 1974a: 188, 189; 1974d).

### **Winduwinda**

The Archer River is also socially significant to the Winduwinda as the boundary between their own traditional land and that of the Wik. This border follows the Archer River from Nookanon Creek to the coast (Tindale 1974a: 188, 189; 1974d).

### **Wongkumara**

The Wilson River is of social significance to the Wongkumara and serves as a border between their traditional lands and those of the Thereila. This boundary follows the Wilson River from Nockatunga to the main bend near Orientos (Tindale 1974a: 185, 190; 1974b).

## Yolngu

The waters around the Wessel Archipelago are economically significant to the Yolngu. A wide variety of foods were collected from here, as recorded by Meyers et al. (1996: 14). Food collecting around the Wessel Archipelago included the hunting of dugong and turtle and the gathering of shellfish, crabs and turtle eggs as well as fishing practices.

## 5.3 Discussion

The Queensland literature review included a broad spread of entries relating to the economic, social and spiritual value of water. Of the 63 water bodies with known significance in Queensland, 25 had economic significance, 19 had social significance and 21 had spiritual significance. There were also two places of associative significance. Some of these places were significant in more than one of these categories – for example the Mitchell River, which in addition to providing food resources through hunting and fishing (Jackson & O’Leary 2006: 132), was also a socially significant boundary between the Muragan and Kokomini to the north and the Ngundjan to the south (Tindale 1974a: 176, 182, 186; 1976d) and directly related to several spiritual sites (Jackson & O’Leary 2006: 132).

Of the 25 economically significant water bodies, the vast majority were related to harvesting animals as a food resource. Little mention was made of the other uses the animal remains – including fat, bones and skins – may have been used for, although mention was made of dugongs used for curative and medicinal purposes on Fishermans Island in the Brisbane River (Petrie 1975: 65-75). There was also no mention of the economic use of the water itself for drinking, mixing pigments, grinding or any other purposes, nor was there discussion regarding the uses of any water plants. One site with economic significance, by contrast, was used as a firebreak to manage burning to renew and control vegetation (Langton 2006: 157).

Of the 19 socially significant waterways identified, 17 were waterways that formed boundaries between Indigenous groups, and one more was a meeting place on another border. All of these, with the exception of Eyre Creek, were rivers. This was probably one of the major contributing reasons that more than half of the entries were rivers. Of the 63 distinct water bodies with known significance, 33 were rivers, along with four creeks and two estuaries. The second most common source of significant water was the ocean, making up 22 of the entries. There were only two waterholes and no wells with significance discovered in the literature review of Queensland – a far lower proportion of the entries than in arid areas, such as Western Australia, South Australia and the Northern Territory.

Most of the significant waterways had no known cultural restrictions on access. The exceptions to this were a river and two islands associated with the story of I’wai (Thomson 1933: 453-537).

## 6 South Australia

### 6.1 Introduction

There is a high correlation between Aboriginal archaeological sites and major water courses in South Australia (Thorley 2001). Modelling studies have demonstrated that the availability of fresh water correlates directly with important traditional living places in Australia (ACHM 2001, McDonald 1997).

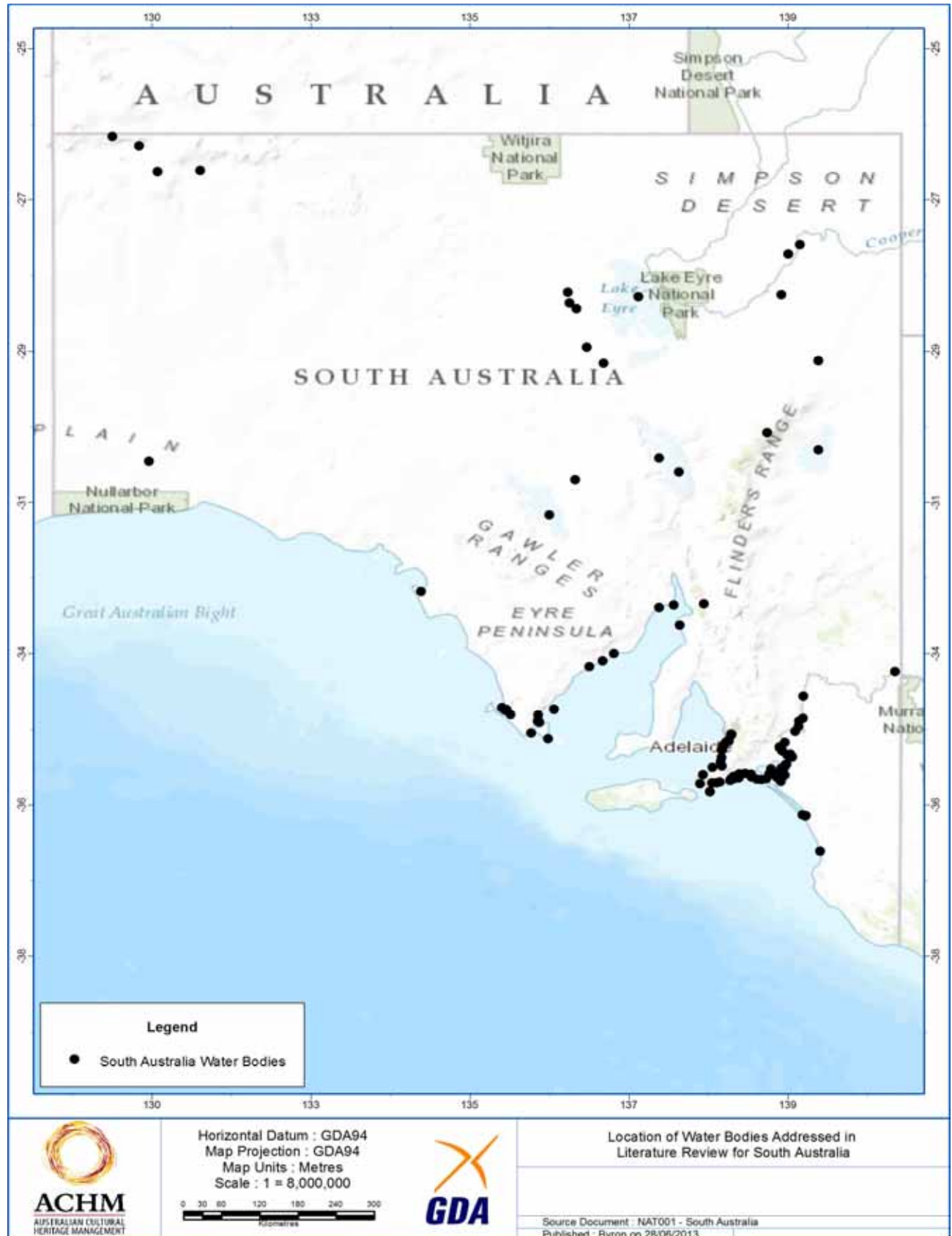
Areas with a plentiful water supply and resources available (such as bark for implements, animals etc.) were prime locations for camping grounds and as such are often associated with extensive archaeological resources. Hearths, food remains and stone tools are representative of many of the archaeological resources most commonly found in these locations. Additionally; creek overflow areas were also targeted for burial grounds for their soft sandy and easy to excavate soils.

Ethnographically, water sources are significant, as they feature in various creation and ancestor mythologies (Tindale 1987). Additionally some water sources have imposed social restrictions such as gender or age placed upon their access or use (ACHM 2001). AARD guidelines and various scholarly articles indicate that areas in the vicinity of major water course have an elevated risk of containing buried archaeological material; including human remains.

Researchers have known of archaeological sites along the floodplain of the Onkaparinga River for around 80 years (Howchin 1934). Tindale recorded the slopes west, east and north of River Road as containing stone artefacts, including a pebble chopper and hammer stone. Lambert also excavated an outcrop in this general area into which stone artefacts, hearthstones and associated charcoal had become encrusted and radiocarbon dates from this indicate it to be the oldest site recorded for occupation at the Onkaparinga River (Campbell 1988).

Other floodplain campsites have provided evidence of Aboriginal stone, glass and ceramic tool use between the late 1800's to the 1900's demarking them as important contact sites (Draper 1991, Czerwinski 1997). In the late 19th century the estuary was wetter with warmer conditions and larger lagoonal swamps, and the use of mounded areas would have proved increasingly important as protected areas for camping.

Map 6-1 shows locations identified in the literature.



Map 6-1: Literature review location points - South Australia



## 6.2 South Australia Review Results

### Adnyamathanha

Three water bodies with spiritual value to the Adnyamathanha (of the Flinders Ranges) were identified during the literature review. The places, Akurula Creek, Lake Fromm and a water body within the Gammon Ranges, are all associated with the *Akaru* (rainbow serpent) Dreaming. The former, Akurula Creek, was created by the Akaru as it flew from its place of origin at Lake Fromm to the Gammon Ranges. The latter, an unspecified water body within the Gammon Ranges, is said to be the current home of the *Akaru*. He is unhappy in his home and as he rolls over to get more comfortable, he causes rumblings throughout the northern Flinders Ranges (Mountford 1978: 29).

In terms of economic value, Eudlia Wagloona waterhole on the southeastern edge of Lake Frome was of high importance to the Adnyamathanha people of the Flinders Ranges as a source of fresh water (Walsh 2005: 25).

### Barngarla

The Barngarla people of the Eyre Peninsula value a number of water bodies for their spiritual associations. A number of these places were identified during the literature review. At Cape Catastrophe, for example, the Creation Ancestor Pulyallana found and killed his missing wives. They were subsequently turned to stone at that place (Howitt & Siebert 1904: 238-239).

At Coffin and Sleaford Bays the Creation Ancestors, Marnpi and Tatta, are said to have put out a fire and, in doing so, created a line of sand hills in the area (Howitt & Siebert 1904: 240-241).

At Port Lincoln, a Creation Ancestor Story tells of two women who are chased away from a Creation Ancestor's hut by a fire elemental (Howitt & Siebert 1904: 235).

Other places, such as Franklin Harbour and Point Gibbon, are also valued for their spiritual connection to water (Martin 1988: 37).

Fishing at North Shields and Point Gibbon on the Eyre Peninsula, however, had a spiritual element in that Barngarla Elders would 'sing' the sharks and dolphins to drive fish into the shallows where they could simply be picked up (Martin 1988: 37, 41).

### Dieri

One reference to the spiritual significance of water to the Dieri Aboriginal group of South Australia was found during the literature review. This reference relates to an island in the middle of Lake Buchanan (known as Perigundi Lake to the Dieri people). According to a Dieri Creation Ancestor story, this island was the birthplace of the Dieri 'totem animals' (Howitt and Siebert 1904: 102).

Basedow (1925: 121) recounts the collection of molluscs from Cooper Creek by the Yantowannta, Wongkanguru and Dieri Aboriginal groups. Basedow describes a similar activity at Strzelecki Creek by the same three Aboriginal groups (1925: 121).

### Gnaji

The Gnaji, of Central Australia, likewise used important water sources, such as the Whanularu water hole, as places to meet as well as hunt (Spencer and Gillen 1899 [2003]:9).

### Kurna

The Aboriginal people of the Adelaide Plains and western Mount Lofty Ranges region are today recognised as the Kurna people (Edwards 1972b; Groome and Irvine 1981; Hemming 1990) and their traditional lands stretch from Crystal Brook and the Clare Valley in the north to Cape Jervis at the southern end of the Fleurieu Peninsula. In pre-colonial times, Kurna families and clans generally moved inland to more sheltered locations in the Mount Lofty Ranges foot hills in winter, and spent much of the summer fishing and hunting along the coastline of St Vincent Gulf (Tindale 1987:10).

Before European colonisation, the Kurna people of the Adelaide Plains were a very populous society, with more than twenty clans living in tracts of home country that stretched from the foothills of the Mount Lofty Ranges and across the plains to the coastal beaches, estuaries and wetlands. The coastal streams provided watered access routes across these lands. Some Kurna places are known, including the sites and springs along the Tjilbruke Dreaming track, and the archaeological campsites and burial sites along the coastal cliffs and dunes of the Adelaide coastline, and throughout the Fleurieu Peninsula.

Because of the resources available in areas with a plentiful water supply (such as bark for implements, animals, etc.), these were prime locations for camping grounds, and as such are often associated with extensive archaeological resources. Hearths, food remains and stone tools are representative but not exclusive of the

archaeological resources most commonly found in these locations. Additionally, creek overflow areas were used for burial grounds for their soft sandy and easy to excavate soils.

Anthropologically, water sources are significant, as they feature in various creation and ancestor mythologies (Tindale 1987). Additionally, some water sources have social restrictions relating to gender or age placed upon their access or use. Scholarly research (Tindale 1987; Thorley 2001) indicates that areas in the vicinity of major water courses have an elevated risk of containing buried archaeological material, including human remains.

The majority of the Kurna literature reviewed relates to a specific Creation Ancestor story: known commonly as the Tjilbruke Trail. Tjilbruke (Tjirbruki) was and still is the most important Dreaming ancestor to Kurna people. Tjilbruke (Tjirbruki) moved through Marion to Brighton beach and then down the southern coast as far as Cape Jervis, forming freshwater springs at various locations along the coast (Tindale 1987). This Dreaming track remains sacred to the Kurna people today.

Although complex and multifaceted, some aspects of the Tjilbruke (Tjirbruki) Dreaming Story have been made available to the public, despite its deeper significance to Aboriginal people, particularly in terms of cultural beliefs regarding creation, the law and human relationships both with one another and with the land. One version of the Story, which has been made public by Kurna people at Warraparinga, was recorded by Hemming, Wood & Harris (2003) as follows:

*Tjilbruke (Tjirbruki) was an ancestral being of the Kurna people of the Adelaide plains, whose lands extended from Parewarangk (Cape Jervis) in the south to Crystal Brook in the north. He was keeper of the fire and a peace maker. His spirit lives on in the lands and waters, in the Kurna people and in Tjilbruke (Tjirbruki) the glossy ibis.*

*Tjilbruke (Tjirbruki)'s much loved nangari (nephew) Kulultuwi, his sister's son, killed a kari (emu) which was rightfully Tjilbruke (Tjirbruki)'s but he forgave him for this mistake. However, Kulultuwi was subsequently killed by his two part brothers, Jurawi and Tetjawi, supposedly for breaking the law.*

*Tjilbruke (Tjirbruki), being a man of the law, had to decide if Kulultuwi had been lawfully killed. He determined Kulultuwi had been murdered. Tjilbruke (Tjirbruki) avenged the crime by spearing and burning the two nephews, killing them. This happened in the vicinity of what is now called Warraparinga.*

*Tjilbruke (Tjirbruki) then carried Kulultuwi's partly smoked dried body to Tululkudangk (a fresh water spring at Kingston Park) to complete the smoking and then to Patparno (Rapid Bay) for burial in a perki (cave). Along his journey he stopped to rest and overwhelmed by sadness, he wept and his luki (tears) formed the freshwater springs along the coast at Ka'reildun (Hallett Cove), Tainba'rang (Port Noarlunga), Potartang (Red Ochre Cove), Ruwarung (Port Willunga), Witawali (Sellicks Beach), and Kongaratinga (near Wirrina Cove).*

*Saddened by these events Tjilbruke (Tjirbruki) decided he no longer wished to live as a man. His spirit became a bird, the Tjilbruke (Tjirbruki) Glossy Ibis, and his body became a martowalan (memorial) in the form of the baruke (iron pyrites) outcrop at Barrukungga, the place of hidden fire (Brukunga – north of Nairne in the Adelaide Hills). Tjilbruke (Tjirbruki) was a master at fire-making. (Hemming, Wood & Harris, 2003: 1)*

A monument was built in 1972 at Kingston Park to honour the Tjilbruke (Tjirbruki) legend and to recognise the significance of the Kurna attachment to land along the Adelaide beaches.

According to the Adelaide and Mount Lofty Ranges Natural Resource Management Board (2007: 41):

*[t]he connection of the springs and the Tjilbruke story served traditional Aboriginal people as a cogent reminder of the importance of the rare water sources along this section of the coast and the inter-relationship between the dreamtime and the present*

The coastline itself was also of economic value to the Kurna people. Cleland (1966: 127-133) recounts the hunting of large marine mammals by the Kurna clans of the Adelaide coastline.

The Onkaparinga River is also highly valued by the Kurna people for economic, social and spiritual reasons. In economic terms, the Onkaparinga River - the second largest permanent river in South Australia - provides feeding, breeding and nursery resources to many species of animals. Ethnographic records of Aboriginal life along the Onkaparinga River and Estuary, on the other hand, include references to "Aboriginal mythology, corroborees, initiation and burial ceremonies, cemeteries, trade routes, visitor's camps, competitive skin 'ball' games, basketry, spear and hook, line and sinker fishing, cooking fish, catching crayfish, and trade in ochre, possum skin rugs and blankets (Cawthorne 1844: 12; Jessop 1862; Ramsay-Smith 1966; Colwell 1972: 65; Ross 1984: 21; Cawthorne, in Foster 1991: 9, 58, 67; Clarke 1991: 68; O'Brien and Williams 1992: 69; Berndt and Berndt 1993: 330; Gara 1986: 122; Tindale n.d.b; Czerwinski 2002: 33-34). Furthermore, the river has many archaeological sites of different ages

and type, including “old campsites, a 5,600-year-old shell midden, canoe trees, ochre mines, and gender restricted traditional knowledge” (ACHM 2005: 13), and it has become evident through archaeological surveying that all environmental zones – right from the gorge to the river mouth – were used for resource collection or camping.

The Onkaparinga River is a culturally sensitive and highly significant mythological area for Kurna women. The name Onkaparinga still retains the original Kurna meaning for the river and was derived from the Kurna words *ungke* and *perringa*; literally meaning ‘woman’s locality near the river’ (Meyer 1846: 18, 21). Kurna people believe the river is a female entity and the mouth and estuary are representative of the female reproductive organs (O’Brien and Williams 1992: 69). The naming of the river itself is derived from a women’s legend. An Aboriginal Site record (ACHM 2010) for the *Ngankiparri* ( Women’s River - Onkaparinga River) mythological and archaeological site complex has been documented submitted to the SA Government pursuant to the *Aboriginal Heritage Act 1988* at the request of the Kurna Traditional Owners and Native Title claimants, although the State has declined to register the site.

The River Torrens, which flows through the city of Adelaide, was also valued by the Kurna people for social and ceremonial reasons. An example of intergroup cooperation along the Torrens is supplied by Ladd (2012: 89), who describes a summer burial underneath the Morphett Street bridge which crosses the Torrens. The burial, which occurred in the early years of the South Australian colony, was significant in that it was not of a local Kurna person, but a member of the neighbouring Peramangk group. Howitt similarly describes inhumation of Kurna people along the River Torrens, whose graves were marked with burial fires (Howitt & Siebert 1904: xxix). An Aboriginal Site record (ACHM 2009) for the *Karrawirra Parri* (River of the redgum forest – River Torrens) mythological and archaeological site complex has been documented submitted to the SA Government pursuant to the *Aboriginal Heritage Act 1988* at the request of the Kurna Traditional Owners and Native Title claimants, although the State has declined to register the site.

### **Kokatha**

At Point Lowly in Weroona Bay, Kokatha people believe that sharks can be sung into being. Point Lowly is known to the Kokatha people as ‘the place of the sharks’ (Martin 1988: 26, 36). Kokatha people also revere Lake Torrens, Lake Hart, Lake Garidner, Pernatty Lagoon and other inland salt lakes and lagoons as the creations of and dwelling places of powerful Creation Ancestors, including Wati Njiru and the Seven Sisters. However, detailed information regarding the mythological associations of these places is restricted to initiated Kokatha men and/or women, depending on the aspects concerned (Draper, Morley & Damhuis 2007, ACHM). ACHM (2008) submitted an Aboriginal Heritage site Record for Lake Torrens to the SA Government at the request of the Kokatha Traditional Owners, but the site has not been registered. Lake Gairdner was previously registered in 2004.

### **Nganguruku**

At Ngaut Ngaut (Devon Downs) on the River Murray, the local Nganguruku people would give permission for the neighbouring Ngarkat people to access the river and its resources (Tindale 1976: 15). Rock engravings along the river at sites like Nagaut Nagaut include the depiction of a finned aquatic creature – either a shark or dolphin, and it has been reported that before the construction of the Murray Mouth Barrages in the 1930s that in some dry seasons seawater penetrated up the Murray River as far as Mannum, only to be flushed fresh in the next good wet season (Tindale n.d.a).

### **Ngarrindjeri**

The literature review yielded a large number of references to Ngarrindjeri spiritual connection to water. A good deal of these references relate to the Creation Ancestor story of Ngurunderi. The River Murray itself, according to Ngarrindjeri tradition, was created by Ngurunderi as he chased the large Murray cod (Pondi) south from an existing water body. To escape Ngurunderi, Pondi was forced to forge a new waterway through the land which became the Murray River (Howitt & Siebert 1904; Berndt and Berndt 1977; Hemming, Jones & Clarke 1989: 4; Weir 2008: 160). Near the mouth of the river at Lake Alexandrina another Creation Ancestor, Nepeli, speared Pondi. Ngunderi then proceeded to throw the pieces of the cod into the water - thus giving rise to the array of different fish species present in the river and lower lakes today (Howitt & Siebert 1904; Berndt and Berndt 1993).

According to Berndt and Berndt (1993: 13):

*[t]he River Murray was like a lifeline, an immense artery of living 'body' consisting of the Lakes and the bush hinterland that stretched across towards the Adelaide Hills and over the southern plains and undulating land. ... Its 'legs' spread south-eastwards along the Coorong and south-westwards along Encounter Bay and beyond. The 'body', symbolic of Ngurunderi himself, embraced five different environments which merged into one another: salt-water country, riverine, Lakes, bush (scrub) and desert plains (on the east) – a combination that had particular relevance to the socio-economic life of the people.*

The Ngurunderi Creation story touches on a number of smaller water bodies in addition to Lake Alexandrina and the Murray River. Places such as Freemans Nob or Granite Island, where Ngurunderi cast nets or a spear respectively to create those landmarks, show the close association Ngarrindjeri people had between water bodies, landforms and their Ancestral Creation stories (Howitt & Siebert 1904: 205). Other water bodies are said to have been created by Ngurunderi including both a fishing place and a sealing place at Middleton (Bell 1998: 92).

A number of spiritual or mythological associations to water bodies not directly connected to the Ngurunderi story were also identified. Oral tradition speaks of the Mulgewanke, a mythical creature that inhabits Lake Alexandrina. It is said that the Mulgewanke makes booming sounds that can be heard coming from the lake (Jenkin 1985: 205; Howitt & Siebert 1904: 62-63).

The seasonal flushing of the lower Murray River (occasionally as far upstream as Mannum – Tindale n.d.a), the lakes and the Coorong between salt and fresh water which occurred before the construction of the Barrages near the mouth in the 1930s has great cultural significance for Aboriginal people of the lower Murray region. The area in the vicinity of the Murray Mouth, Coorong and Lake Alexandrina is known as “the Meeting of the Waters” (e.g., see Draper 1996; Bell 1998). Different elements of this mythology are confidential to senior Ngarrindjeri men or women only. These cultural traditions were the subject of the Hindmarsh Island Bridge (Kumarangk) SA Royal Commission and the subsequent Federal Court case (Chapman vs. Tickner and others) in the mid to late 1990s. A great deal of information of relevance to the subject of cultural flows is contained in the transcripts and evidence submitted in both these proceedings, though again, most of this material is confidential.

The Murray also served as a source of fresh water and supported plants and animals – including fish, yabbies and waterbirds – utilised by the Ngarrindjeri (Weir 2008: 160).

### **Lake Alexandrina**

In neighbouring Lake Alexandrina, water is also valued as a means of subsistence. Both Taplin (1879) and Angas (1847) refer to Aboriginal camps along Lake Alexandrina from which a wide range of activities were carried out, including fishing, hunting molluscs water fowl and turtles, digging for mussels and gathering turtle eggs (Taplin 1879: 105, 113, Angas 1847: 57-58, 90-92; Kartinyeri & Anderson 2008: 9-10). Rushes were also gathered from the banks of the lake for use in weaving (Kartinyeri & Anderson 2008: 101).

More recent studies support the notion that Lake Alexandrina was utilised extensively by Ngarrindjeri people prior to, and even after, European settlement in the region (Jenkin 1985: 13,103; Tindale 1974a: 61; Edwards 1972a: 22; Berndt & Berndt 1993: 29). The economic value of the lower lakes and Coorong region to the local Aboriginal population cannot be understated.

### **The Coorong**

The act of spearing or catching fish from riverine, lacustrine and coastal water bodies was commonly referenced in the literature. It was often the case that multiple fishing techniques or approaches were utilised at the same water body. Along the Coorong, which sits at the mouth of the River Murray, a wide range of different fishing techniques were employed. In the lagoons of the Coorong, for example, Tindale and Lindsay write of Ngarrindjeri people both fishing as well as constructing fish traps:

*All around the coasts, as well as along the bigger rivers, fish traps were constructed, either by building walls of loose stones or by driving in stakes to make fences. In the Coorong lagoons of South Australia, basket-ware cages served to hold the mullet and other fish trapped behind such . . . (Tindale & Lindsay 1963: 62)*

Tindale provides further insight into the economic value of the Coorong to the local Ngarrindjeri people, describing the use of fish traps as well as fishing nets on the landward shores of the Coorong (Tindale 1974a: 61-62). While the seaward side of the Coorong also provided good fishing spots, it also provided the opportunity to partake in whale meat and share it with neighbouring groups (Tindale 1974a: 18). Other subsistence activities, including the gathering of cockles from the shores of the Coorong, were also noted by Tindale (1974a: 62). This activity was carried out mainly in the winter months.

While the Coorong was used as a food source, a number of references were found which relate to nearby sources of fresh water. Kartinyeri and Anderson (2008: 8) refer to Ngarrindjeri traditional knowledge of fresh water wells in the Coorong region.

The Coorong was also valued for its other natural resources which provided a wide range of materials used in Ngarrindjeri daily life. Seaweed, for example, was gathered by Ngarrindjeri people for use in bedding and also as a cooking ingredient (Kartinyeri and Anderson 2008: 8). Further, men would soak local tree branches in the numerous small creeks running off the Coorong, in order to make them pliable, before using them in the construction of wurlies (shelters) (Kartinyeri and Anderson 2008: 7).

The waters of the Coorong, and the nearby lakes district, were often used as a means of transportation (National Parks and Wildlife Service 1984: 54). Ngarrindjeri women, for example, were noted as used large and bulky rafts made from reeds in their search of mussels and freshwater crayfish (Angas 1847).

The Ngarrindjeri also used water bodies in their territory as focal points for social interaction. Howitt & Siebert (1904) lists a number of places at which Ngarrindjeri people met with other groups to trade and participate in ceremonies. These include Kangerung (Swanport), Linteleti (Long Island), Naberuwa (Wood's Point) Tagalang (Tailem Bend) and Pomeruk.

### **Pitjantjatjara**

Itjarango Rockhole, Podalja Rockhole and Trew Gap Waterhole, for example, located in the traditional lands of the Pitjantjatjara people of northwest South Australia, were of vital importance to the local inhabitants (Tindale and Lindsay 1963: 64-65). Accessing these waterholes was not only essential for the survival of the Pitjantjatjara people, but the knowledge associated with their location represents a deep understanding of the landscape in which they lived. In terms of spiritual values attributed to water bodies, the Pitjantjatjara believe that Owelinna Spring, located in Central Australia, contains a wanambi (Rainbow Snake) that was stolen from Atila Spring by a Pitjantjara medicine man when the spring dried up (Mountford 1978: 45-50).

### **Ramindjeri**

Ramindjeri people believe that that Inman River (Muwerang) and the Hindmarsh River were made by a Creation Ancestor, Palpangye (Howitt & Siebert 1904: 202). A waterhole along the coast, Mootabarringar, is also thought to have been produced by the dancing of the Ramindjeri Creation Ancestors (Howitt & Siebert 1904: 202-203).

### **Wangkangurru**

The Wangkangurru people believe that Lake Eyre was made by an unspecified Creation Ancestor (Shaw 1995: 35). Basedow (1925: 121) recounts the collection of molluscs from Cooper Creek by the Yantowannta, Wongkanguru and Dieri Aboriginal groups. Basedow describes a similar activity at Strzelecki Creek by the same three Aboriginal groups (1925: 121).

### **Urubanna**

The Urubanna Aboriginal groups of Central Australia believe that Brinkley, Loddon, Strangways and Fountain Springs were all made by the Kunmaras, two Creative Ancestor snakes during the Alcheringa (time of the Creation Ancestors) (Spencer and Gillen 1899 [2003]: 147).

### **Wirangu**

The Wirangu of the far west coast of South Australia similarly attribute the creation of water bodies to snake creatures. Lakes Gairdner and Torrens are both believed to be part of the tracks of the Djidara, a large Ancestral snake (Tindale 1974a: 213, 219).

### **Yantowannta**

Basedow (1925: 121) recounts the collection of molluscs from Cooper Creek by the Yantowannta, Wongkanguru and Dieri Aboriginal groups. Basedow describes a similar activity at Strzelecki Creek by the same three Aboriginal groups (1925: 121).

### **Unspecified/Multiple Groups**

A large number of South Australian database entries do not relate to a specific group or, conversely, relate to multiple unspecified groups. The information below relates to these entries.

### **Fishing**

For the purposes of this study, fishing can include any means of capturing fish (both saltwater and freshwater) without the aid of established pre-constructed mechanisms (i.e. traps or weirs). This can include a range of activities including spearing fish with barbed spears, hooking fish using a rod and bait, capturing fish with nets or simply with one's hands. At Lake Albert, for example, Aboriginal people would paddle out and spear fish that were in abundance in the shallow waters of the lake (Edwards 1972a: 22). Similarly, at Salt Creek, the local Aboriginal people were known to catch fish at the mouth of the creek (Tindale 1974a).

Martin (1988: 42), citing Mountford, describes a technique used by the Aboriginal people of Streaky Bay whereby:

*the natives ... caught their fish by building a large fire on the edge of the water. The fish, attracted by the light, would swim towards it only to be killed by the waiting Aborigines with boomerangs, and in more recent times with pieces of hoop iron.*

This technique was also recorded by ACHM anthropologists working with Western Mirning elder Arthur Dimer in the late 1990s for the Nullarbor Coast region from Israelite Bay (WA) across to Fowlers Bay (SA). In Arthur Dimer's account, his family and forebears accessed shallow coastal waters at beaches or via steep "paths" down the Nullarbor cliffs. They waded out at night, using flaming torches of resinous native pine (*Callitris* sp.), and later hurricane lanterns, and stabbed the fish (often mullet) attracted by the light with "swords" made from hardwood or metal barrel staves (from barrels washed up on shore from passing ships). A fire on the beach was essential for orientation so they could find their way back to shore (ACHM 2000).

### **Fish Traps**

Fish traps feature very heavily in the South Australian literature. Studies carried out by scholars such as Martin (1988) have aimed to build an inventory of the remaining extant fish traps which dot various stretches of the South Australian coastline.

At Horse Peninsula on the southern tip of the Eyre Peninsula, for example, an unspecified Aboriginal group were known, in the winter months, to catch fish in a stone walled, semicircular, fish trap located in a shallow bay (Martin 1988: 31-32). At nearby Point Longnose, according to ethnographic sources, a stone fish trap consisted of a bent line of rocks across the opening of a samphire drainage flat (Martin 1988: 44). The extent of these fish traps range from smaller singular traps and weirs up to large fish trap 'complexes, such as the one that has been recorded at Point Bolingbroke (Martin 1988: 39).

Fish traps in South Australia were made not only from stone but also from wood. A large wooden fish trap positioned at the entrance to Salt Creek, at Porter Bay, was described by Martin (1988: 41). Another reference to Salt Creek describes an interesting amalgamation of different fishing techniques whereby Aboriginal men, women and children herded snapper into fish traps using tree branches, where they were subsequently speared (Martin 1988: 42). At Drivers Bay, Eyre Peninsula, Aboriginal people were known to use a wooden 'rack' which could be closed at the entrance of a nearby creek, thereby trapping the fish upstream as the water level dropped (Martin 1988: 44).

### **Hunting**

While the majority of the literature refers to fishing, hunting also features in some instances. For the purposes of this report, hunting can include the capturing of waterfowl as well as the hunting of aquatic mammals such as seals or whales. At Encounter Bay, on the Fleurieu Peninsula, the local Aboriginal people were known to hunt seals and whales along a coastline rich with marine food resources (Cleland 1966: 127-133).

### **Food Gathering**

In the context of this study, food gathering relates to any activity in which water based food sources are gathered (as opposed to hunted or caught). Activities such as the gathering of edible plant material, in addition to the collecting of molluscs or crustaceans, fall into this category.

### **Accessing Fresh Water**

Arguably, the locating and retrieval of fresh water is of higher importance than the acquisition of food sources. As such, there are a number of references to fresh water sources in the literature. Rockholes and waterholes, for example, are quite common especially in South Australia's arid interior where waterways are often ephemeral if present at all.

## **6.3 Discussion**

The South Australian literature review yielded a large number of entries relating to the economic value of water to Aboriginal people. Water sources throughout the state were highly valued for their often bountiful provision of lacustrine and riverine food sources. Additionally, these same water sources were often used as primary water sources. Fishing was found to be the most common activity carried out at water bodies throughout South Australia. In addition to this, however, a range of other water based subsistence activities were also identified in the literature. These include the construction of fish traps, the gathering of shellfish and molluscs, as well as the hunting and trapping of water based mammals or fowl.

Other economic uses of water bodies not directly associated with subsistence include transportation and the gathering of sea weeds and rushes.

A large number of water bodies within South Australia are imbued with spiritual significance. The rainbow serpent, an Ancestral Creation figure, features heavily throughout South Australia and is often associated with rockholes and waterholes, as well as the large salt lakes.

The coastline is also strongly imbued with spiritual value. The Kaurna Ancestral Creation story of Tjilbruke is a prime example of this as are the numerous spiritual associations the Barngala people have to the coastline of Eyre Peninsula.

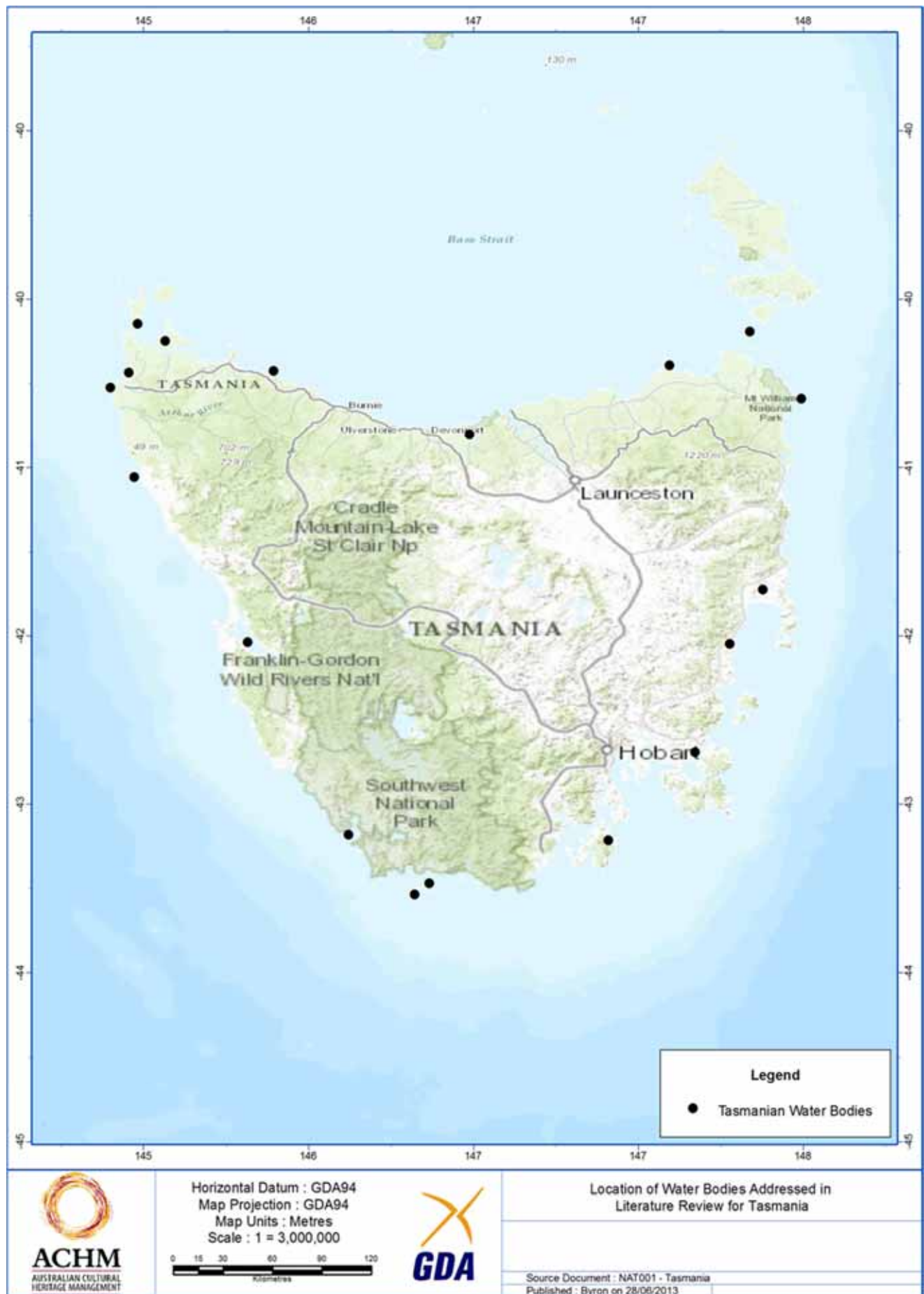
## 7 Tasmania

### 7.1 Introduction

When compared to other states, the range of available resources pertaining to Indigenous water values in Tasmania has been considerably less; despite this however, a total of 21 references to water values were found amongst available resources for Tasmania. Of these references, 20 are concerned with economic uses of water, and three with social uses (habitation and necklace production). These references are entirely tied to coastal regions and largely refer to hunting and gathering activities such as sealing, egg gathering, abalone fishing, oyster processing and cockleshell harvesting; however references are also made to water transport (Roth 1899: 155), and semipermanent coastal habitation practices (Jones 1974; Australian Government Department of Sustainability, Environment, Water, Population and Communities 2013). The value of water in these references is therefore entirely economic.

Map 7-1 shows locations identified in the literature.





Map 7-1: Literature review location points - Tasmania

## 7.2 Tasmania Review Results

### North Tribe

References to water values amongst the North Tribe on the one hand concern economic practices such as egg gathering at Port Sorell (Jones 1974); however at Robbins Island, Jones (1974: 345) also refers to the collection of shells for necklaces thus highlighting the social value of this coastal environment. There are no status, gender or kinship restrictions mentioned for these activities.

### North Midlands Tribe

Waterhouse Point, on Tasmania's northeastern coast, is referred to by Jones (1974) as a locus for shellfishing thus indicating the important economic value of this marine environment. There are no status, gender or kinship restrictions mentioned for these activities.

### Northeast Tribe

Anthropologist H.L. Roth (1899) highlights the importance of marine environments for the provision of food resources, specifically seals, in Banks Strait. There are no status or kinship restrictions mentioned for these activities, however Roth highlights that this activity was specific to women amongst the Northeastern Tribe.

### Oyster Bay Tribe

Three references to water bodies of importance to the Oyster Bay Tribe were identified in the course of this literature review. Two of these concerned the shell mounds at Little Swanport and East Bay Neck. According to Roth (1899) these shell mounds are indicative of the economic value of coastal resources such as oyster processing and shell fishing. Furthermore, Roth's observations indicate that these shell fishing and processing activities were carried out by women, however there are no other status or kinship restrictions mentioned. The third reference concerns Moulting Lagoon where swan and duck eggs were gathered by the Oyster Bay people (Jones 1974). There are no status, gender or kinship restrictions mentioned for this particular activity.

### Southeast Tribe

Evidence that seal rookeries were favoured hunting grounds at Maatsuyker Island, De Witt Island and Eddystone Rock highlight the economic value of these marine environments (Jones 1974: 336-337). There are no references to gender, status or kinship restrictions for this activity; however Jones (1974: 336-337) does state that seal hunting was carried out during the summer months. Roth also highlights the use of watercraft by Aboriginal people at Adventure Bay for the purpose of sealing expeditions (Roth 1899: 155).

### Southwest Tribe

As with the Southeast Tribe, Maatsuyker Island, De Witt Island and Eddystone Rock were important seal hunting areas for the South West Tribe (Jones 1974). While there are no references to gender, status or kinship specifics for this activity, Jones (1974: 336-337) does state that seal hunting was carried out during the summer months. Port Davey and Macquarie Harbour are also highlighted as marine environments of economic value for the Southwest Tribe who gathered swan and duck eggs from the shores of these water bodies (Jones 1974: 336). No gender, status or kinship restrictions are mentioned for these activities.

### Northwest Tribe

Hunter Passage, Sandy Cape, and Mount Cameron West are identified within the sources as a marine environment valued by the Northwest Tribe for its economic resources, primarily seal and mutton bird hunting. These activities were preferentially carried out during the summer. While no specific location is highlighted for Sandy Cape and Mount Cameron West, the shell middens at Hunter Passage on the southern coast of Hunter Island, are referred to as the locus of seal hunting activities (Jones 1974: 333). There are no status, gender or kinship restrictions mentioned for these activities.

According to Meyers et.al. (1996) archaeological evidence at Rocky Cape suggest that the Aboriginal people living in these harsh coastal environments were "intrepid sea people" (Meyers et al. 1996: 4). Furthermore, Hunter Passage and West Point are identified in sources (Jones 1974; Australian Government Department of Sustainability, Environment, Water, Population and Communities 2013) as semipermanent habitation places due to their proximity to coastal resources.

### 7.3 Discussion

A review of literature pertaining to Indigenous water values in Tasmania has found a clear orientation toward economic values, however we should not assume that social or cultural values were of lesser importance. It must be reiterated that this literature review is limited by comparably fewer resources dealing with Indigenous water values in Tasmania. Of further note is the coastal focus of these resources leaving Tasmania's many inland waterways, as yet, unassessed.

The economic values highlighted in these resources primarily concern food procurement with seal hunting constituting 11 of the 20 entries. Shellfish and oyster processing is the second most common theme with six entries. Egg gathering has four entries, while transport and mutton bird hunting have one entry each.

A single reference to the collection of shell fish for the production of shell necklaces (Jones 1974: 345) while on the one hand falling into the economic values category may also indicate social or cultural value. Furthermore the existence of semipermanent habitation in close proximity to places valued for their economic resources indicates that social or cultural value was also ascribed to these locations.

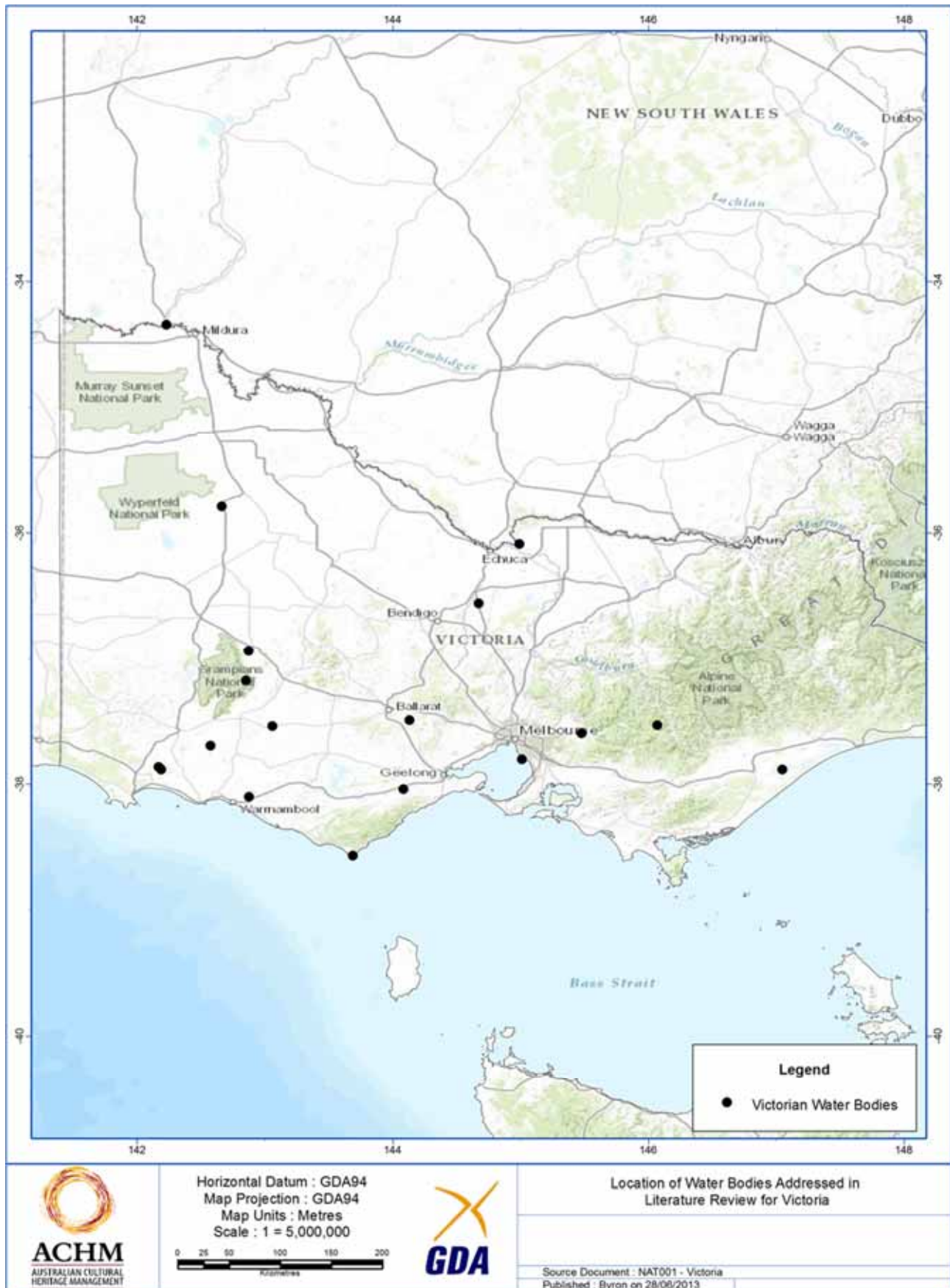
There are no known cultural restrictions on access to the locations mentioned in this literature review.

## 8 Victoria

### 8.1 Introduction

Rivers and lakes relating to fishing or other economic activities made up a large proportion of the water bodies identified as having significance in the review of literature relating to Victoria. Fish and eel were the most commonly mentioned food sources, with no mention of turtle or other large aquatic animals which were frequently utilised in other states. Fish traps were common ways of obtaining food at these locations and often left archaeological remains that give sites informational significance as well. Several social and spiritual sites were also identified, although fewer boundaries were noted here than in most other states.

Map 7-1 shows locations identified in the literature.



Map 8-1: Literature review location points - Victoria

## 8.2 Victoria Review Results

### **Bangerang**

Only one of the water bodies significant to the Bangerang was identified. This is the Murray River, or more specifically the creeks that run into the Murray in the Murray Goulburn area, which are of economic significance as fishing places. Curr (1886: 65) records that two or three Bangerang men owned specific creeks in the area and every year would erect fishing weirs. The tenure of these waterways reported by Curr also suggests the possibility of associative significance, as each creek was associated with its owner.

### **The Aboriginal People of Barwon River and Moorabool River**

The economic significance of the Barwon and Moorabool Rivers was noted by the Department of Sustainability and Environment (2009: 25). These rivers are economically significant to more than one Aboriginal group, and provide a source of fish, eels and – in the case of the Moorabool River – platypus (Department of Sustainability and Environment 2009: 25, 45).

### **The Aboriginal People of Bridgewater Cave**

Lourandos (1980: 251) indicates that the seashore near Bridgewater Cave is economically significant as a hunting ground. Use of this area was limited to the winter months, and hunting activities were focussed mostly on the acquisition of food (Lourandos 1980: 251).

### **Bunganditj and Jaadwa**

Two water sources were identified as significant to the Bunganditj and Jaadwa people: the Toolondo Reservoir and the Lagoon below Mount William. Both are primarily of economic significance to these two groups as places where food and water are available. Archaeological evidence indicates that eel were trapped along ephemeral wetlands of the Toolondo Reservoir (Lourandos 1980: 251-254). The archaeological evidence also suggests that there was an elaborate system of swamp management during both drought and flood (Lourandos 1980: 251-254). As an archaeological site, the Toolondo Reservoir also has informational significance.

Lourandos (1980: 251-254) also refers to early records of fishing and water management at the Lagoon below Mount William in the Grampians National Park. Both of these places are also mentioned to be significant to the Tjapwurong (Lourandos 1980: 251-254), as discussed below.

### **Bunurong**

Four places of economic significance to the Bunurong were identified in the literature review, in addition to the spiritually significant Sawtells Creek. The mouth of Sawtells creek is believed to be the home of the Tooroodun, a bunyip responsible for supernatural events and illnesses (Eidelson 1997).

Three of the economically significant water bodies are freshwater wells in the Melbourne area, which were used as reliable water supplies by the Bunurong (Eidelson 1997: 46, 50). These are Rickets Point Well, fed from a nearby spring (Eidelson 1997: 50), and Black Rock and Long Bob's Wells, which are supplied by the gullies between the long sand ridges and, historically, the Carrum and Dandenong swamps (Eidelson 1997: 46).

The fourth economically significant place is Solomons Ford on the Maribyrnong River, near Avondale Heights. There is historical and archaeological evidence that fish and eels were caught here using traps. Although the archaeological evidence here is disturbed, this place may still have informational significance as well (Eidelson 1997: 60).

### **Gunditjmara**

Lake Condah was one of two water bodies found to be significant to the Gunditjmara. The area was traditionally used for its heavily water dependent vegetation used in food and medicine as well as supporting hunting practices. Birds – particularly ducks – were commonly hunted on the lake, as well as kangaroos and other fauna dependent on the water supply (Department of Sustainability and Environment 2009: 31). The trapping of eels was another common source of food along the lake edge (Tibby et al. 2006: 266). The Kerupmar clan of the Gunditjmara, in particular, are recorded as using the abundant fish traps along the lake's edge (Aboriginal Affairs Victoria & The Kerrup Jmara Elders Aboriginal Corporation 1993), which also give the area informational significance as an archaeological site. These fish traps are geographically associated with stone circles (Aboriginal Affairs Victoria & The Kerrup Jmara Elders Aboriginal Corporation 1993: 140). At least six of these stone circles are known (Aboriginal Affairs Victoria & The Kerrup Jmara Elders Aboriginal Corporation 1993: 239) and may have social or spiritual significance.

In addition to Lake Condah, the Hopkins River was found to be socially significant, as it served as a boundary between their traditional lands and those of the Kirrae. This border followed the Hopkins River from the major bend at Mortlake to the coast (Tindale 1974a: 205; 1974b), and was important not only in terms of the Gunditjmara's relationship with the Kirrae but as a demarcation of where resources could or could not be collected by individuals of both groups.

## **Kirrae**

As mentioned above, the Hopkins River served as a socially significant waterway that divides the lands of the Gunditjmara and the Kirrae from the coast to the major bend near Mortlake (Tindale 1974a: 205; 1974b). From this point on to Lake Bolac, the Hopkins River served as the Kirrae's boundary with the Tjapwurong (Tindale 1974a: 205, 207; 1974b).

## **Kurnai**

Two water bodies of significance to the Kurnai were identified: the Thomson River and Lake Wellington. Both are socially significant as locations of the jeraeil ceremony (Howitt 1885: 301; 1887: 36). This ceremony involves the initiation of young men and is generally performed in the summer (Howitt 1885: 302).

## **The Aboriginal People of Lake Bolac**

Lake Bolac is a place of economic and spiritual importance to many groups (Department of Sustainability and Environment 2009: 45). It is economically important as a source of fish and eel (Department of Sustainability and Environment 2009: 45; Mountford 1978: 31-32), and was also the location of ceremonial activities (Mountford 1978: 31-32). A nearby arrangement of stones, described by the Department of Sustainability and Environment (2009: 45) as symbolically resembling an eel and overlooking Lake Bolac may add to the spiritual significance of the lake.

## **The Aboriginal People of Lake Coorong**

Lake Coorong was socially and economically important to more than one Aboriginal group. The lake was an agreed place for the express purpose of trading goods with hostile groups, without meeting face-to-face (Massola 1971: 63). One group would arrange their goods and retreat so that the other could inspect them and arrange the items they wished to exchange; after the second group had retired the first group could accept the trade by taking the offered goods or retire again as a sign that the second group should increase their offer (Massola 1971: 63).

## **The Aboriginal People of Lake Lonsdale**

The Department of Sustainability and Environment (2009) identified the presence of burials exposed by the receding waters of Lake Lonsdale. As a burial place, Lake Lonsdale is both socially and spiritually significant and also has informational significance. The Aboriginal group connected to these burials was not named by the Department of Sustainability and Environment.

## **The Aboriginal People of Mustons Creek**

Mustons Creek is of spiritual significance to an undetermined Indigenous group as a result of its association with a much-feared bunyip and the creation of black swans. Dunlop and Holmes (1899: 24-25) relate the origin of Black Swans as the victims of a flood brought on by the Bunyip and note that the place was avoided by the local Aboriginal people.

## **The Aboriginal People of Penshurst**

The Department of Sustainability and Environment (2009: 45) report that there is a natural spring near Penshurst that is of significance to more than one Indigenous group. The spring is economically significant as a source of fresh, drinkable water (Department of Sustainability and Environment 2009: 45).

## **The Aboriginal People of Seal Point**

The seashore near Seal Point is of economic significance to one or more undisclosed Aboriginal groups. Lourandos (1980: 250) reports that Indigenous people camping at Seal Point would collect shellfish along the shore; this was most commonly performed during the warmer summer months.

## **Tjapwurong**

Three places of significance to the Tjapwurong were discovered during the literature review of Victorian water sources. These were one socially significant river – the Hopkins River – and two water bodies of economic significance.

As discussed previously, the Hopkins River served as a socially significant waterway that divides the lands of the Tjapwurong and the Kirrae. This division runs from the main bend of the Hopkins River near Mortlake to Lake Bolac along the course of the river (Tindale 1974a: 205, 207; 1974b).

The two economically water sources were the Toolondo Reservoir and the Lagoon below Mount William. Archaeological evidence indicates that eel were trapped along ephemeral wetlands of the Toolondo Reservoir (Lourandos 1980: 251-254). The archaeological evidence also suggests that there was an elaborate system of swamp management during both drought and flood (Lourandos 1980: 251-254). As an archaeological site, the Toolondo Reservoir also has informational significance.

Lourandos (1980: 251-254) also refers to early records of fishing and water management at the Lagoon below Mount William in the Grampians National Park.

Both of these places are also significant to the Bunganditj and Jaadwa (Lourandos 1980: 251-254), as discussed above.

### **The Aboriginal People of Victoria**

Mountford (1978: 31-32) describes the Noelounum or Bukara-bunnal Creek as a place of importance to all tribes in Victoria. According to Aboriginal tradition, this creek is the drinking place of the Myndie, a rainbow serpent whose powers are so great as to affect all Aboriginal people in the state Mountford (1978: 31-32). This creek, therefore, has widespread spiritual significance.

### **Woiworung**

The Yarra River was the only water source identified as having significance to the Woiworung. The Yarra River is spiritually significant as the route followed by Loän, an Aboriginal giant who discovered Corner Inlet in Gippsland and founded the cultural practices associated with the admission of outsiders to the Woiworung traditional lands (Howitt 1886: 416-417).

### **Wurundjeri**

The only place found to have significance to the Wurundjeri in the review of literature pertaining to water sources in Victoria was the Bolin Bolin Billabong. This billabong is economically significant for its regular and reliable supply of eels for up to five weeks of the year (Eidelson 1997: 20).

### **Yorta Yorta**

Weir (2007: 104) relays a story told to her by a Yorta Yorta woman, Monica Morgan. When Monica was a child in the 1960s, her Elders taught her that when duck weed grew along the Murray, swan eggs would be available for collection in the Barmah-Millewa lakes. This story not only relates to the economic utilisation of the Barmah-Millewa lakes by the Yorta Yorta, but also hints at the intimate ecological knowledge that Aboriginal people possessed with regard to the water bodies in their territories.

## **8.3 Discussion**

The Victorian literature review was dominated by places of economic significance. Of the 23 separate water bodies reviewed, 15 had economic significance and nine of those related to fishing. Three of the economic sites related to hunting – two of these in conjunction with fishing activities– and three places were significant for access to the fresh water itself. There was also one site where shellfish were gathered and one involved with trade.

There were also six places with confirmed spiritual significance and five with known social significance. There was also the distinct possibility of social and spiritual significance relating to six stone circles at Lake Condah.

The socially significant water bodies included a wide range of associated practices, including a territorial boundary, a burial place, two initiation sites and the trading place. The spiritually significant water bodies were predominantly associated with important stories. Four places of archaeological, and therefore informational, significance were also identified. With the exception of one burial site, all of these included fish traps. Some of these places had more than one type of significance.

The vast majority of significant water bodies discovered were rivers, lakes or creeks. Of the 23 distinct water bodies with known significance, six were rivers, along with four creeks. Five lakes were recorded, and these were the places most likely to have more than one level of significance. The remaining significant sources of water were two coastal environments, two wells, two wetlands, a lagoon and a spring. Most of the significant waterways had no known cultural restrictions on access. The exceptions to this were the initiation sites, although it was not specified whether this restriction applied at all times or just during the ceremonies.



## 9 Western Australia

### 9.1 Introduction

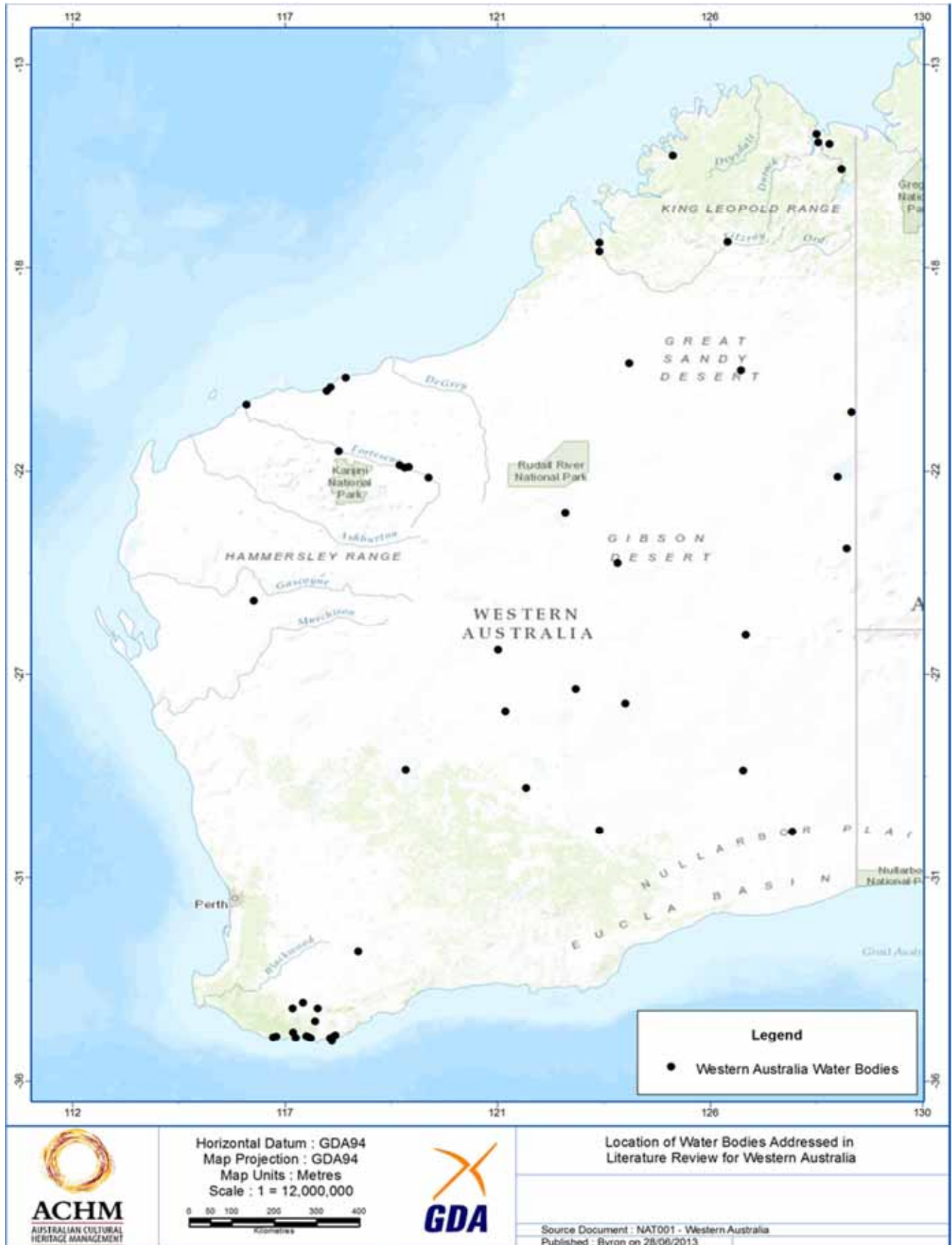
Common themes arise across the literature related to Western Australia, in the ways in which water bodies form cultural and social boundaries to delineate territory and then how the presence of water provides a physical/spiritual map across the landscape for physical movement, actions, such as initiations and ceremonies, song lines and their maintenance of the water sources.

Serpents or snakes form a common Creation motif in both the creation of water features and a continuing presence in the landscape. They are guardians of a precious resource in a harsh land, with serious to deadly punishment on offer for those who may transgress their cultural obligations and allow these critical resources to decline or end. Male and female versions of the Rainbow Serpent – the Wargyl in the SW and the Warlu in the Pilbara, are represented as the salt and the fresh water at their interface at coastal river estuaries.

Archaeological remains of fish traps and ‘weirs’ in coastal regions demonstrate a technological aspect of resource procurement for food, with archaeological evidence found of the food eaten. Other examples of human action demonstrate the development of fresh water storage as a survival strategy, as demonstrated by the manufacture of rock holes (gnammas) to catch and collect fresh water.

The information presented below clearly demonstrates that across what is now the state of Western Australia, Traditional Owners constructed a physical and spiritual map of water bodies in their various forms and determined to maintain them for both their physical and spiritual wellbeing.

Map 9-1 shows locations identified in the literature.



Map 9-1: Literature review location points - Western Australia

## 9.2 Western Australia Review Results

### Balgo

The Balgo of the Kimberleys link water bodies as story places along their Songline between Lake White and Lake Mackay. The story line cites several soaks, springs, rockholes, lagoons and creeks (Berndt 1976: 138). The songline relates to a group of men (Dingari) who are pursued by women (Ganabuda) as they open up the land. The pursuit leads to the creation of features in the landscape. For example, at Magudjari the two Gabulula sisters by crawling along make this creek, and camp here. The water features are also sites for the travel and/or emergence of other dreaming beings such as the Lingga snake men and the Ngadari (Bandicoot) and the creation of landscape features visible today, such as at Labandja soak where the Balgo believe the Maiaun (wind) men killed a kangaroo, creating this soak (Berndt 1976: 138).

### Duulnagari

The Cambridge Gulf (Kimberley Coast) forms a social boundary between the Duulnagari and the Jeidji (Tindale 1974a: 241, 243; 1974c). The Gulf is associated with a large saltwater snake (Lumiri) with the Gulf's tidal movements seen as the result of Lumiri's activity (McNiven 2003: 333).

### Indjibandi

The Yule River forms a social boundary between the Indjibandi and the Kariara (Tindale 1974a: 22; 1974c).

### Inggarda

The Gascoyne River forms a social boundary between the Inggarda, Maia and Malgaru. The boundary with the Maia follows the river from Doorawarra to the Lyons River junction, and the boundary with the Malgaru follows the Gascoyne River from the Lyons River to the main bend a little over 25 km to the west (Tindale 1974a: 242, 246-247; 1974c).

### Jeidji

The Cambridge Gulf forms a social boundary between the Jeidji and the Duulnagari (Tindale 1974a: 241, 243; 1974c).

### Kalamaia

Lake Barlee marks a point that marks part of the social boundary between Kalamaia and Koara (Tindale 1974a: 243, 245; 1974e).

### Karadjari

Anna Springs is a spiritual site that forms part of the story of the Bulain (Rainbow Serpent). The springs are seen as its home (Mountford 1978: 34).

### Kariara

The Yule River forms a social boundary between the Indjibandi and the Kariara (Tindale 1974a: 22), whilst the Balla Balla River is understood by the Kariara to form their social boundary with the Ngaluma. The Peawah River is understood by the Ngaluma to form their social boundary with the Kariara (Tindale 1974a: 22, 66).

### Kartudjara

Lake Disappointment (Midwest) is a point that marks part of the social boundary between Kartudjara and Wanman (Tindale 1974a: 244, 258; 1974c).

### Koara

Lake Barlee marks a point that marks part of the social boundary between Kalamaia and Koara (Tindale 1974a: 243, 245; 1974e).

### Jadira

In the Pilbara, the Fortescue River forms the social boundary between the Mardudunera and the Jadira. The boundary follows the river from the main bend south of Cape Preston to the western scarp of the higher plateau of the Hamersley Range (Tindale 1974a: 242, 248; 1974c).

### Maia

The Gascoyne River forms a social boundary between the Inggarda and the Maia. The boundary follows the river from Doorawarra to the Lyons River junction (Tindale 1974a: 242, 246; 1974c).

### Malgaru

The Gascoyne River forms a social boundary between the Malgaru and the Inggarda. The boundary follows the Gascoyne River from the Lyons River to the main bend a little over 25 km to the west (Tindale 1974a: 242, 247; 1974c).

## Mandjindja

Waterholes in the Warburton Ranges (Kolornga and Kadada) are spiritual water bodies and the home of the Wonambi snake. At Kolornga the Wonambi is described as 36 m long and 1 m thick, and may act as a guardian who both provides and reserves the water, whereas the Wonambi at Kadada is described as being “as tall as the sky”, capable of flight and also acts as a guardian over the use and availability of the water source (Elkin 1977: 105).

## Mangala

Joanna Spring (Werewelke and Pikura’u) located in the Pilbara is the starting point for two trade routes (Tindale 1974a: 65, 82). The Nyikina and Mangala tell a story of how a man named Wunyumbu used a poisonous tree to kill the fish in a billabong at Mijrayikan. A serpent rose up to attack him and Wunyumbu speared it, jumped on its back and rode on it to Fitzroy Crossing, thereby creating the Fitzroy River and its plants and animals (Jackson & O’Leary 2006: 111).

## Mardudunera

In the Pilbara, the Fortescue River forms the social boundary between the Mardudunera and the Jadira. The boundary follows the river from the main bend south of Cape Preston to the western scarp of the higher plateau of the Hamersley Range (Tindale 1974a: 242, 248; 1974c).

## Martidja Banyjima

For the Martidja Banyjima people of the eastern Pilbara, water holds great social, cultural and ecological significance beyond its obvious importance in sustaining life. According to Martidja Banyjima culture and tradition, all permanent and ephemeral water courses and water sources are associated with the warlu, a Creation Ancestor whose activities formed the hydrological systems within Martidja Banyjima country, and who maintains and is imbued in them.

Martidja Banyjima Traditional Owners consider themselves ‘environmental caretakers’, particularly with regards to maintaining water supplies and water quality on their traditional lands. This cultural tradition is not just for the benefit of their own survival, it is an obligation they uphold for the benefit of neighbouring groups too (Aboriginal and non-Aboriginal). If a water source in MIB country becomes tainted and thus causes others to suffer, MIB people believe they are responsible even if a third party is at fault. These rules apply to subterranean water sources and flows as well as those on the surface.

Of particular cultural significance to Martidja Banyjima people is the extensive Fortescue River system which bisects their traditional lands from east to west. The Fortescue Marsh and floodplain are both called Mungurrdu in the Banyjima language, although the Mungurrdu to Martidja Banyjima people also refers to the ‘floods’, when annual rains dramatically change the country and provide life to a landscape that has become dry and barren throughout the winter months. Several aspects of the Mungurrdu are celebrated in the Wardilba, the Martidja Banyjima system of Law and Culture, from these mythological aspects to the more fundamental of social elements that teach participants survival skills and ceremonial rites.

For Martidja Banyjima people, water serves to carry their culture back and forth across country:

*When I was growing up, they always used to tell us that all our law and culture come from Millstream and come east up the Fortescue. It all comes back with the water (Maitland Parker interview in ACHM 2006-8).*

Beyond the identification of natural flows of water across country as a carrier of culture, Martidja Banyjima people identify different types of water within these flows, each with a specific traditional story, ceremony and songs associated with it:

*My old people used to tell me that from up the top end, up the Fortescue there's a marsh, and on mulga downs station and ... along the Fortescue valley there's claypans and billabongs; that's got dirty red water, and then it's just the plain fresh water as well. Those three types of water all run down the Fortescue and come out at a certain place at Millstream. We can go there now and show people this is the salt water coming from the marsh, red dirty water is from the claypan country on the Fortescue valley, and then there's the fresh water itself which also runs down the Fortescue valley. That's a story in itself in regards to water that flows down the Fortescue and comes out at Millstream (Maitland Parker interview in ACHM 2006-8).*

Flowing to the Fortescue Marsh in the north, Weeli Wolli Creek is both culturally and environmentally important to Martidja Banyjima and to neighbouring Niyaparli people forming a joint use zone along their mutual boundary. It is a source of fresh water and abundant plant and animal life for food and other traditional food and medicinal needs. There are several specific ethnographic sites of very high cultural significance along Weeli Wolli Creek including waterholes and sink holes, particular hill features, and rock art (petroglyphs). Several of these features and other culturally connected features on the landscape on either side are highly significant and potentially dangerous “men only” sites associated with the Warlu and with the Wardilba and Mingka song cycles which are widely known and respected throughout the Pilbara region and beyond (relevant heritage research includes ACHM 2006-8; Day 2004a & 2004b; McDonald 2004; McDonald & Grove 2003; Murphy et al. 1992; O’Connor & Veth 1984; Quartermaine 1991).

*This is our country, along with the Nyiyaparli people, Banyjima people. We've been working together for years along the Weeli Wolli, and learning it from our elders in terms of the significance of the Weeli Wolli and what it means to us. And this whole area here is what makes us who we are in terms of our identity... as Banyjima people. (Slim Parker, interview in ACHM 2006-8)*

The seasonally varying flow rates, water quality and colouration flowing down the Weeli Wolli to its junction with the Fortescue Marsh have important cultural significance in these ceremonial song cycles and the associated cultural beliefs about the creation and seasonal renewal of life and country. These cultural beliefs and values are held both by Martidja Banyjima and Nyiyarpali people with respect to the Weeli Wolli in particular, and by Aboriginal groups throughout the Pilbara and along the length of the Fortescue River in terms of its broader cultural meaning.

In recent years, the waters of the Weeli Wolli and other locations within Martidja Banyjima country have been increasingly impacted upon by the steady incursion of mining activities, in particular the process of 'dewatering' whereby excess water is pumped out of the expanding mine pit to be redistributed elsewhere, in this case directly into the existing Weeli Wolli creek drainage system and subsequently into the Fortescue river system. The excessive influx of water removes the seasonal variations in the creek, causing the creek to be in constant flood. This has the effect of negating the seasonal cycle that Martidja Banyjima people regard as a spiritually, culturally and environmentally significant aspect of their traditional law and custom. It also has direct physical effects on significant cultural heritage sites downstream of the discharge point. Barber & Jackson (2011a: 39) make this same point.

Not only are these effects manifested downstream of the discharge point into the Weeli Wolli drainage system, but also upstream and further afield. Of particular concern to Martidja Banyjima people is the 'drying out' of country and the increased formation of sinkholes in the landscape. The cultural explanation provided by Martidja Banyjima people for this increase in sinkhole formation is attributed to the drying up through water extraction of the places below the surface within which the warlu lives and moves through. As explained by one Martidja Banyjima Traditional Owner:

*When the water holes and springs dry up, the warlu gets upset and has to move. He starts to create new pathways and places such as sinkholes. The sinkholes show where the warlu is moving and coming up looking for places to go (Margaret Parker, Morley field notes 2010:26).*

Barber & Jackson (2011a: 39) elicited from Slim Parker the following meta-statement concerning Martidja Banyjima ritual life and water:

*Places that are of importance are connected with water, and the water provides for us when we conduct our ceremonies. Important places are known as thalu [increase] sites. Inda is the word for the waterholes made by the snake, where the snake is. These are the most important places for us (Slim Parker, quoted in Barber & Jackson 2011a: 39)*

## **Nana**

Warupuju is a reliable waterhole in the Warburton Range accessed by the Ngadadjara and occasionally by other groups (e.g. the Nana) (Tindale 1974a: 65, 70). Lake Wells and Lake Carnegie (Central Western Australia) form points marking the social boundary between Pini and Nana country. These lakes also denote boundary points with Tjalkadjara country and Lake Carnegie with Wardal (Tindale 1974a: 249, 256-257; 1974c).

## **Nangatadjara**

Jubilee Lake (southeast Western Australia) forms a point marking the social boundary between Pindini and Nangatadjara country. Lake Throstle forms a point marking the social boundary between Tjalkadjara and Nangatadjara country (Tindale 1974a: 249-250, 255, 257; 1974e).

## **Ngadadjara**

Lake Hopkins (Midwest) forms a point marking the social boundary of the Ngadadjara and Wenamba (Tindale 1974a: 250, 259; 1974c). Warupuju is a reliable waterhole in the Warburton Range accessed by the Ngadadjara and occasionally by other groups (e.g. the Nana) (Tindale 1974a: 65, 70).

## **Ngaluma**

The Balla Balla River (Pilbara) is understood by the Kariara to form their social boundary with the Ngaluma. The Peawah River is understood by the Ngaluma to form their social boundary with the Kariara (Tindale 1974a: 22, 66).

## **Ngarinyin**

The Ngarinyin see the Hann River (Kimberley) and a source of the Fitzroy River as the creation of snakes (ungudd/wungurr/unggurr). These metaphysical snakes both create water (rain) and reside in water (water bodies), particularly deep pools. They can leave the water and lay eggs on the land (Jackson & O'Leary 2006: 153-154).

## Ngurlu

Lake Raeside (south central Western Australia) is a point that marks part of the social boundary between Waljen and Ngurlu (Tindale 1974a: 252, 258; 1974e).

## Njakinjaki

Lake Grace (southwest) is a point that marks part of the social boundary between Wiilman and Njakinjaki country (Tindale 1974a: 253, 260, 1974e).

## Noongar

On the Western Australian south coast Traditional Owners value the economic resources provided by the coastal, riverine and lake systems. The Frankland, Denmark and Gordon Rivers and surrounds are valued for their natural state, fishing, camping and as a travel route. There is archaeological evidence of stone fish traps, in a weir formation, located in the Walpole and Parry inlets amongst other locations and wooden stakes, on the eastern side of the Gordon River at Slab Hut Gully 40 km south of Kojonup, used into the 1920's by Traditional Owners (Good et al. 2008: 55). This region also contains several natural wells or gnamma holes (depressions in rock or soft sands) that fill with water following rain and were used by Traditional Owners who camped nearby (Good et al. 2008: 60-62). These features could also be created by Traditional Owners for water storage as exemplified at the Styx River waterfall where five gnamma holes have been 'dug' into the surface of a rock ledge above the falls, using fire to break the rock surface and filling the intrusions with rocks. Natural flows would roll the rocks about to grind out the holes further. Regular cleaning of the widening holes allowed for supplies of fresh water to be retained during dryer periods (Good et al. 2008: 64).

McDonald, Coldrick & Christensen (2008) undertook what they term 'ethnographic consultation' with several Nyungar (spelling variant to Noongar above) groups to identify 'indigenous social and cultural values of in situ groundwater-dependent features on the Gngangara Mound' (2008: 64), located in the Perth Basin, and the most important source of water for Perth. The authors recorded several 'water-related Dreamings' within the consultation area (2008: 67). These are:

- the story of the *Waugal* (also *Doogarch*), the creator of the full variety of water places, including Ellen Brook, Bennett Brook, Mussel Pool, and Moore River (McDonald, Coldrick & Christensen 2008: 67)
- the story of the Sea Waugal and the Emu, creating islands and coastal topographies (McDonald, Coldrick & Christensen 2008: 67)
- the story of *Doorda/Dwert*, the dog, associated with freh and salt water sources in Yanchep, and linked with locations in Fremantle (McDonald, Coldrick & Christensen 2008: 68)
- the story of the flood and three women who floated down the Helena River, and are associated with Lake Gngangara (McDonald, Coldrick & Christensen 2008: 68)

## Nyikina

The Nyikina and Mangala tell a story of how a man named Wunyumbu used a poisonous tree to kill the fish in a billabong at Mijrayikan. A serpent rose up to attack him and Wunyumbu speared it, jumped on its back and rode on it to Fitzroy Crossing, thereby creating the Fitzroy River and its plants and animals (Jackson & O'Leary 2006: 111).

## Nyiyaparli

The Nyiyaparli view the custodianship of the Fortescue River and Marsh as their cultural responsibility and that any damage to the quality of the water supply will see them held accountable by downstream Traditional Owners. In addition the marsh forms a spiritual and cultural foundation landscape that is central to the survival of Nyiyaparli traditional beliefs and community wellbeing. In their Creation story a snake (yurtupa) encounters a dingo singing out at the side of the river. As a result the snake turns to stone and all the seas retreat, leaving the salt and marsh of today. Another Nyiyaparli Creation story tells of a sand dune in the Fortescue Marsh (Mirlimpirrinha) in the East Pilbara, at a point where the Fortescue River goes underground. The dune resembles a snake's head and represents the Warlu – a mythical water serpent – who lives in the marsh and goes underground at Mirlimpirrinha and emerges at Millstream (Goode 2009: iv, 18, 20-21).

Certain waterholes (yenta) in this area have ceremonial and spiritual significance and are associated with song lines and stories. Ngawarnkuranha is visited to sing traditional songs with the intention of maintaining the health of the river system and wet season to ensure rain occurs. Failure to maintain these traditions risks the countryside remaining dry with the associated hardships this would bring for Traditional Owners and their very survival on the land (Goode 2009: 22-23). These waterholes also provide stopping places for young men during initiation rites.

## Pini

Lake Wells and Lake Carnegie (Central Western Australia) form points marking the social boundary between Pini and Nana country. Lake Wells also forms a boundary point with Tjalkadjara country and Lake Carnegie with Wardal country (Tindale 1974a: 249, 256-257, 259; 1974c).

## Pindini

Jubilee Lake (southeast Western Australia) forms a point marking the social boundary between Pindini and Nangatadjara country (Tindale 1974a: 250, 255; 1974e).

## Potidjara

Lake Disappointment (Midwest) is a point that marks part of the social boundary between Wanman and Potidjara (Tindale 1974a: 249, 259; 1974c).

## Tjalkadjara

Lake Carnegie and Lake Wells (Central Western Australia) form points marking the social boundary between Tjalkadjara and Nana country. Lake Wells also forms a boundary point with Pini country. Lake Throstle forms a point marking the social boundary between Tjalkadjara and Nangatadjara country (Tindale 1974a: 249-250, 256-257; 1974c; 1974e).

## Tjeraridjal

Springs on the Nullarbor Plain such as the Queen Victoria Spring (Munuruna Tindale's pronunciation) and Kaluru provided fresh water and form knowledge of economic resources that allow for travel through country (Tindale 1974a: 143).

## Waljen

Lake Raeside (south central Western Australia) is a point that marks part of the social boundary between Waljen and Ngurlu (Tindale 1974a: 252, 258, 1974e).

## Walmadjari

Godfrey Tank (Konin' nara) provided seasonal water supply for Traditional Owners (Tindale 1974a: 63). Toussaint (2008) explores theories of attachment to place, using the Fitzroy River as the ethnographic context. In explaining how different Aboriginal groups taught each other about water, its uses and meanings, she quotes a Walmajarri woman informant saying:

*We had to learn about the martuwarra [river], how to fish with string and burnt needles shaped like a little hook, we didn't have throw nets. Nothing! The Gooniyandi and Bunuba [meaning river groups] taught us how to fish - how to hunt, cook and eat fish (Toussaint 2008: 52)*

Toussaint (2008: 52-53) also quotes La Fontaine who recorded a Walmajarri man explaining the relationships between humans and the landscape:

*Everything we know comes from the Dreamtime. People even in town still know how to sing story for their country. Every Jila [water hole] has its own songs, story and skin groups. Without the snake underneath the water will go away. We have been looking after our waterholes and rivers for thousands of years. We have respect because we know that if you don't treat it right many things can happen. This is the reason that we need to make othewr people learn (La Fontaine 2006: 217)*

## Wanman

Lake Disappointment (Midwest) is a point that marks part of the social boundary between Wanman, Kartudjara and Potidjara (Tindale 1974a: 244, 256, 258; 1974c).

## Wardal

Lake Carnegie is a point that marks part of the social boundary between Wardal and Nana country and Wardal and Pini country (Tindale 1974a: 249, 256, 259; 1974c).

## Wenamba

Lake Hopkins (Midwest) that marks part of the social boundary of the Ngadadjara and Wenamba (Tindale 1974a: 250, 259; 1974c).

## Wiilman

Lake Grace (southwest) that marks part of the social boundary between Wiilman and Njakinjaki country (Tindale 1974a: 253, 260; 1974e).

## Yindjibarndi

Deep Reach Pool (Nunganunna), Millstream (Jindawurru) in the East Pilbara is associated with the Creation story of the Warlu Narrimindi (see also Nyiyaparli). The Warlu (snake) travelled from Onslow on the coast and followed the flow of the Fortescue River chasing two boys who had broken the law. At Nunganunna he caught them and sent them up into the air in a willy willy before swallowing them in his anus (thumbu). The boy's tribe was then drowned in a flood. The Warlu is said to live at the bottom of this pool (Mark, Turk & Stea 2007: 14).

## Unspecified or multiple groups:

### Gibson Desert

The soakage well at Pulykara (Gibson Desert near to Mt Madley) was utilised as an economic resource with evidence that the Traditional Owners had dug down to a depth of about 4.5 m to reach the water table lying beneath the dry lake bed (Bayly 1999: 21).

A waterhole (Kapi Pilbit) in the Warburton Range and its associated creek is seen by Traditional Owners has having been created by a kangaroo (Malu) (Mountford 1976: 109).

### Great Victoria Desert

Lake Darlot is one of two places cited in the text where Aboriginal doctors (gingin) are made (Berndt & Berndt 1977).

### Kimberley

Jackson & O'Leary (2006: 106) note that in the Kimberley,

*... people would move from camp to camp utilizing the river's resources according to the season. Contemporary Aboriginal people often spent most of each weekend with their families hunting and fishing in, and along the banks of, the Fitzroy River. The river and its surrounds provided turtle, goanna, cherabun, crocodile, mussels and fish.*

Waterholes (Gunanurang) and billabongs were formed along the Ord River in the dry season as the rivers flow declined and the waters pooled. This process provided economic opportunities for hunting and fishing, with camping along the river favoured for the soft sandy banks. The permanent pools contained barramundi, salt and fresh water crocodiles and other riverine species. Hunting techniques were also adapted to these pools, with plants such as freshwater mangrove (malawarn) and rolls of spinifex to entangle and trap the fish in the pools or divert them to the surface for spearing or trapping. Senior women continue to camp and fish at the Ord's junction with the Dunham River, which is a place that also provides drinking water and a locale for cultural activities (Barber & Rumley 2003: 19, 23). At Kununurra's diversion dam, hunting and fishing occurs along the banks.

### Pilbara

Karntama is a ceremonial/spiritual waterhole (yinta) found at the confluence of Christmas Creek and the Fortescue Marsh. Whilst often dry on the surface it is possible to dig down to the water. Karntama is associated with an increase song. This ritual seeks to ensure the renewal of water resources in the area (Goode 2009: 33).

### Southwest

The economic utilisation of aquatic food resources was widespread in the southwest, with fishing occurring in the ocean as well as marine lagoons, rivers (such as the Swan), lakes and utilising curved stone weirs or fish traps. Vancouver (cited in Martin 1988: 24) was one of the first Europeans to describe fish traps (or 'weirs') found lying on the shores of Oyster Harbour near the Kalgan River in the Albany area. They were constructed of loose stones or sticks/stumps of wood measuring 8-9 inches high.

Archaeological evidence of such stone constructs has also been investigated at Oyster Harbour, Broke Inlet, the Murray and Serpentine Rivers, Lake Richmond and Boundary Lake. These fish traps/'weirs', and submerged artefact assemblages have archaeological dates ranging from c5000 to the modern era across these locations. Fishing patterns were also related to cultural and social factors such as gatherings and rituals. There are photos of wooden weirs c1900 (Dortch 1997: 15-35).

On the Nullarbor Plain in southwestern Western Australia there is archaeological evidence of abalone harvesting on the coast (Cane 1998: 71). Coastal fishing using beach fires and pine-pitch firesticks or hurricane lanterns and wooden of barrel-stave "swords" was been recorded for the Nullarbor Coast as well (ACHM 2000 – see also the South Asutralian section of this report).

## 9.3 Discussion

The Western Australian sources cover a very wide range of geographic diversity, though with a lot of common cultural themes relating to the cultural, social, and economic significance of water sources to Aboriginal people. These themes



are consistent with the other States and Territory reviewed – tribal boundaries, food and water sources which are highly seasonal in the monsoonal north, and highly unpredictable and precious in the desert interior. The Rainbow Serpent is integral to all of the major water sources, particularly the rivers – but also relates to underground water flows – such as the Fortescue from the Marsh down to Millstream, and to the formation of sinkholes which are the dwelling place and point of entry/exit – sometimes referred to as the 'eye' of the Warlu. Coastal groups such as the Ngarluma and Kariara in the Pilbara also emphasise the duality of the male and female Warlu as the salt and fresh water – their mingling is the source of life, just as the river estuaries are teeming sources of life. All of the State's coastal Rivers appear to have similar significance to local Aboriginal people, and some, such as the Swan River which flows through Perth, have been registered with the State as significant Aboriginal sites.

## 10 Summary of the State and Territory Water Bodies from the Literature Review

The most prominently featured water bodies in the literature are rivers. Of rivers, the Murray River has the most coverage and is the most well described. Each state and territory evinces a slightly different emphasis in regard to the water bodies described, ranging, for example, from the Western Australian literature having a broad geographical spread of information, to the Tasmanian literature focussed on coastal areas.

The literature on New South Wales shows a concentration on rivers and lakes, with Allyn River being identified several times. The main concentration of information relates to the Murray-Darling Basin and particularly the Darling River and Murray River.

The Northern Territory literature identifies a good range of information on a wide variety of types of water bodies (as described in 4-1 above), but not over a particularly extensive geographical area, limited as it is to the tropical north and the centre of the territory. For rivers, the Roper River and Flora River are most prominent, but the literature also describes a variety of springs, wells, and coastal environments.

The Queensland literature also provides a reasonable range of water body types. This literature also contains the greatest number of rivers. The most frequently described rivers are the Palmer River, Thompson River, Suttor River, Mitchell River, Smithburne River, Burdekin River and Fitzroy River.

The South Australian literature is more limited, focussing mainly on the Onkaparinga River and Murray River. More than one description is however provided concerning Lake Alexandrina and the Coorong.

Tasmanian entries tended to be limited to the coast or adjacent the coast and waters surrounding islands adjacent the main island. Interior water bodies remain undescribed.

Like the South Australian literature, the Victorian literature focusses on rivers (again, the Murray River in particular), with mentions of lakes. The Hopkins River and the Yarra River have some prominence.

Like the Northern Territory, Western Australia has extensive spread of studied water bodies, but with a more pronounced river focus. However, the Western Australian literature shows an impressive geographical spread. The most cited rivers are the Gascoyne River, Fortescue River, and Ord River. Among the lakes mentioned, Lake Carnegie and Lake Disappointment have the most description.

# 11 Projects Examining Indigenous Cultural Values of Water

## 11.1 Introduction

This section provides a review and analysis of projects that have identified or described the relationship between Indigenous cultural values and water. Other projects, tangentially related, are also referred to where necessary for context or elucidation. Additionally, this section provides a brief description of the political and economic context for the projects described and analysed. As part of the project and methodology review, a number of reports were reviewed that did not provide specific information relating to projects relating to Aboriginal values of water. These reports are listed in Appendix 2.

This section begins with a brief account of the political context in which these reports have been generated. It goes on to examine types of report according to conceptual approach and methodology employed to produce results. Analysis of methodologies used was hampered by the lack of detail describing methodologies in detail within much of the literature. This section also accounts for projects undertaken federally and by state and territory.

## 11.2 Political and Economic Context

Current project funding on water and water use across Australian society cannot be divorced from ongoing interplay between federal and state power and interests, and prevailing economic interests. While water focussed projects have examined a variety of water bodies, the political and economic importance of the Murray-Darling Basin is the provocation for local, state and federal change and reform, and therefore for federal and state funding of research projects through government research priorities handed down to a variety of statutory agencies such as the Australian Institute of Aboriginal and Torres Strait Islander Studies (AIATSIS) and the Commonwealth Scientific and Industrial Research Organisation (CSIRO). The subset of projects dealing with Indigenous uses and understandings of water, therefore, is positioned within a complex of federal, state, and local political and economic struggles over the control and allocation of water.

The *Native Title Act 1993* (Cwth) recognised that Indigenous laws and customs establish Indigenous connections to water in cases that meet the relevant criteria of the Act. The following year saw the Keating Government's Water Reform Framework Agreement (Council of Australian Governments 1994). This is the landmark federal-state document for the current era of water politics, not least because the Agreement was brought within the National Competition Policy created by the Keating Government. This strategic framework dealt with pricing, appraisal of investment and trading of water entitlements. The next major federal-state development came with the Howard Government's establishment of the National Water Initiative (NWI) in 2004, an initiative overseen by the National Resource Management Ministerial Council, and implemented by the Council of Australian Governments (COAG), acting on advice from the National Water Commission. The *Water Act 2007* (Cwth) subsequently became law. Under the Rudd Government, 2008 saw the introduction of the Intergovernmental Agreement on Murray-Darling Basin Reform. This abolished the Murray-Darling Basin Commission (est. 1988) and replaced it with the Murray-Darling Basin Authority, a commonwealth authority.

These statutory formulations and intergovernmental agreements have advanced the commodification of water in Australia. As the following review will show, this provides an important context for understanding why many projects define research terms and identify and describe the relationship between Indigenous cultural understandings and water in ways suitable for the broader political demands and context in which the project is undertaken.

## 11.3 National Water Reform

Australia's climate ensures that water supply, access and reform remain an ongoing issue of national importance. Any consideration of Indigenous interests in water needs to consider this broader national context, and the water interests of States/Territories and local communities and how such at times competing demands may effect and continue the impact upon Indigenous water interests, an effect that has been ongoing since European colonisation.

### 11.3.1 National Water Initiative: Recognition of Indigenous Interests in Water

The Intergovernmental Agreement on a NWI is COAG's current principal water policy agreement. As Australia's 'blueprint for water reform', it is a policy of national significance, requiring cooperative action by Australian governments. The NWI was signed at the COAG meeting on 25 June 2004. In June 2005 the Tasmanian Government joined the Agreement, followed by the Western Australian Government in April 2006 (National Water Commission 2012a). The impetus for the creation of the NWI can be attributed to a number of factors. Two of these have been identified as the "over-allocation" of water in the Murray-Darling Basin (Haisman 2005: 148), and national concern about water scarcity and water quality issues (Altman, Buchanan & Larsen 2007: 32). There is also growing interest in the possible utilisation of water supplies from drainage basins and in opportunities for agricultural development in tropical

northern Australia because of the region's relatively intact catchments and rivers (Altman, Buchanan & Larsen 2007: 32).

The NWI is a continuation of and builds upon the national water reforms of 1994, and emphasises 'a national approach to water property rights and the improvement of water market mechanisms' (Haisman 2005: 148). The 1994 national water reforms, also agreed upon by COAG, involved a 'comprehensive statement of principles and processes' and sought to align the water sector with the National Competition Policy (Haisman 2005: 126). This included separating water utilities from resource management agencies while acknowledging the need for environmental flows. Recognition of environmental flows sat within the review of water allocation policies, including the establishment of 'a national framework for the implementation of property rights in water to facilitate the growing trade in water rights' (Haisman 2005: 126).

Prior to the advent of the NWI, specific Indigenous interests in water and contributions to water policy and planning were not prioritised at a national level (Jackson & Morrison 2007). Of the fifty submissions received in 2002 during the public consultation process for the COAG Chief Executive Officer's Group on Water draft paper on water property rights, few concerned Indigenous matters (Altman 2004: 33). One submission dealing with Indigenous rights and interests argued that:

*Indigenous stakeholders should be considered from the outset in any proposal for the creation of new property rights in water—their diverse rights, interests, values and activities should be recognised and incorporated into water management planning.* (Altman & Cochrane 2003: 5)

Altman & Cochrane (2003: 2) added that for 'future water resource markets to function efficiently and equitably' it would be necessary to recognise Indigenous property rights in water and accommodate 'particularities ... created by western laws, [and] ... the articulation between western and customary laws'. Although few submissions to the draft paper on water property rights dealt with Indigenous water matters, recognition of Indigenous interests in water was increasing. Articles and reports dealing with Indigenous access to water, cultural values of water and involvement in water planning from the early to mid-2000s included: Douglas 2004; Jackson 2004; Lane 2000; Toussaint et al. 2001; Lingiari Foundation 2002; Morgan, Strelein & Weir 2004; Rumley & Barber 2004; Toussaint et al. 2001.

Despite the small number of submissions focusing on Indigenous water interests, the NWI includes a number of clauses specifically addressing Indigenous matters (National Water Commission 2004). These are as follows:

*25 (ix) The Parties agree that, once initiated, their water access entitlements and planning frameworks will ... recognise indigenous needs in relation to water access and management ...*

*(Council of Australian Governments 2004: 5)*

*52. The Parties will provide for indigenous access to water resources, in accordance with relevant Commonwealth, State and Territory legislation, through planning processes that ensure:*

*i) inclusion of indigenous representation in water planning wherever possible; and*

*ii) water plans will incorporate indigenous social, spiritual and customary objectives and strategies for achieving these objectives wherever they can be developed.*

*53. Water planning processes will take account of the possible existence of native title rights to water in the catchment or aquifer area.*

*The Parties note that plans may need to allocate water to native title holders following the recognition of native title rights in water under the Commonwealth Native Title Act 1993.*

*54. Water allocated to native title holders for traditional cultural purposes will be accounted for. (Council of Australian Governments 2004: 9)*

*SCHEDULE B(ii) ... environmental and other public benefit outcomes are agreed as part of the water planning process, are specified in water plans and may include a number of aspects, including: ... indigenous and cultural values.*

*(Council of Australian Governments 2004: 32)*

*SCHEDULE E 1(vi) The following characteristics and components will guide States and Territories in preparing water plans: Descriptions to include: ... the uses and users of the water including consideration of indigenous water use.*

*(Council of Australian Governments 2004: 35)*

*Schedule G 3(v) The Parties agree that water trading rules will be established consistent with the principles below ... Restrictions on extraction, diversion or use of water resulting from a trade can only be used to manage ... features of major indigenous, cultural heritage or spiritual significance.*

*(Council of Australian Governments 2004: 38)*

Clause 52 (ii), and Schedules B(ii) and G(v) appear particularly relevant to the scope of this project as they include reference to Indigenous social, spiritual and cultural uses of water, and/or refer to Indigenous cultural values, and features of Indigenous cultural heritage and spiritual significance. The broader issues relating to water access, planning and management, as well as strategies and processes for consultation are beyond the scope of this report's focus but clearly connect to Indigenous use of water.

### **11.3.2 The Role of the National Water Commission**

Under the NWI, the National Water Commission (NWC) has the responsibility of driving water reform at the national level. The NWC is an independent statutory body with three primary continuing roles: monitoring, audit, and assessment (National Water Commission 2012a [strategic plan]). The NWC aims to provide:

- *reliable, credible, transparent and trusted monitoring and assessment of progress toward improved water management outcomes by all governments*
- *high quality, independent advice to all governments and the community*
- *leadership by raising the profile of water management and by communicating a clear position and direction on reform issues*
- *a national forum for brokering knowledge and facilitating leading practice water management across governments and non-government stakeholders.*

*(National Water Commission 2012a: 1 [strategic plan])*

Since the NWI was set up, monitoring, reporting and assessment has taken place according to the National Water Commission Act 2004. Progress towards all NWI objectives and outcomes have been gauged through the NWC's biennial assessment reports to COAG in 2007, 2009 and 2011 (National Water Commission n.d.). In 2012 the assessment period was changed to a triennial basis and the next report is due in 2014. (National Water Commission n.d.). From 2007 to 2011 the NWC biennial assessment process has paid increased attention to Indigenous water interests (National Water Commission 2007, 2009 & 2011a). The two most recent NWC biennial assessment reports reflect these developments.

Although progress was noted in some areas, others were identified as still needing more work and attention. One area which was identified in both the 2009 and 2011 assessment as needing further work is water for social, spiritual and customary objectives:

*Water to meet Indigenous social, spiritual and customary objectives is rarely clearly specified in water plans. It appears often to be implicitly assumed that these objectives, where considered at all, can be met by rules-based environmental water provisions ... The Commission recommends further exploration of Indigenous needs in relation to water access and management, and mechanisms to meet those needs. The Commission proposes to initiate a national study on this matter.*

(National Water Commission 2009: 121)

The 2011 assessment report noted that although improvements had been made in terms of Indigenous consultations, progress in incorporating cultural objectives remained problematic:

*Most jurisdictions have improved consultations with Indigenous communities in water planning and management, but have generally failed to incorporate effective strategies for achieving Indigenous social, spiritual and customary objectives in water plans, as envisaged under the NWI.*

(National Water Commission 2011a: 46)

In contrast to the 2009 assessment report (National Water Commission 2009), the 2011 assessment report was able to describe a number of Indigenous water projects implemented and funded under the NWC's Raising National Water Standards Program (National Water Commission 2011a). This illustrates some of the progress made in terms of improving 'Indigenous engagement and consultation in water planning and management' through investment in these projects (National Water Commission 2011a: 45).

### **11.33 The National Water Commission and Northern Australia water resources**

In contrast to southern states, where both inland and coastal waters have undergone major modification and disturbance, northern Australia contains 'ecological intact riparian zones' and marine environments which are in 'relatively pristine condition' (Altman, Buchanan & Larsen 2007: 32-33). Much of the 'three main drainage areas in northern Australia: the Timor, Gulf of Carpentaria, and North-Eastern drainage basins' are owned by Indigenous peoples (Altman, Buchanan & Larsen 2007: 32). As a consequence Indigenous people have been identified as 'significant stakeholders in future water policy and emerging property rights and water markets' (Altman, Buchanan & Larsen 2007: 33; see also Altman 2004; Altman & Cochrane 2003; Jackson & Morrison 2007).

The 2011 biennial assessment report states that to improve understanding, knowledge and management of water resources in northern Australia, the NWC funded or co-funded particular projects in the area (National Water Commission 2011a: 96). Two of these projects included a specific Indigenous focus:

- The Tropical Rivers and Coastal Knowledge (TRaCK) consortium of social, cultural, environmental and economic researchers
- The Northern Australia Water Futures Assessment (NAWFA) jointly funded by the Commission and the Department of Sustainability, Environment, Water, Population and Communities

The TRaCK project consults with Northern Australian Indigenous communities, agricultural and industrial users of water to 'inform decision makers working towards the sustainable management of northern Australian water systems' (National Water Commission 2011a: 96). The NAWFA project has four sub-categories; Water Resources, Ecological, Cultural and Social, and Knowledge Base. The Cultural and Social program identifies 'tools and processes to articulate water-related Indigenous social and economic aspirations and recommend directions and priorities for future research' (National Water Commission 2011a: 96). The program works with jurisdictions, Indigenous groups and organisations to:

- identify sociocultural values, beliefs and practices as they relate to water
- conduct location-specific case studies to understand sociocultural values, beliefs and practices as they relate to water, including patterns of usage, religious implications, economic activities, and social and political issues.

(National Water Commission 2011a: 96)

### **11.34 The National Water Commission and Indigenous Access to Water Resources**

Following on from the 2011 assessment report the NWC published a Position Statement on Indigenous access to water resources in 2012 (National Water Commission 2012b [position statement]). This document states the importance the NWI places on recognising Indigenous people as legitimate stakeholders in water planning and management, and

acknowledges the need to identify Indigenous water values and water requirements in water plans (National Water Commission 2012b: 1 [position statement]).

The Position Statement reiterates the failure identified in the 2011 assessment report: the lack of development 'of effective strategies to incorporate Indigenous social, spiritual and customary objectives in water plans' (National Water Commission 2012b: 1 [position statement]). However it also notes that the NWC has invested in 16 projects with the aim of improving knowledge and understanding of Indigenous Australian's social and economic aspirations related to water (National Water Commission 2012b: 1 [position statement]). These 16 projects are summarised in Table 10.1 and Table 10.2 below, and relevant national level documents are dealt with in more detail/reviewed below. The reports/projects dealing specifically with Northern Australia through the Northern Australia Water Futures Assessment, as outlined above, are dealt with separately in Table 10.2.

One of these projects included the NWC's funding of the First Peoples' Water Engagement Council (FPWEC) in 2010. The FPWEC produced a submission to the 2011 Biennial report (Collings 2011) followed by more comprehensive advice to the NWC in 2012 (First Peoples' Water Engagement Council 2012), both of which are reviewed below. The NWC's position on Indigenous Access to water resources in Australia was refined by these two statements (National Water Commission 2012b: 1 position statement).

Details in the following tables have been extracted from the archived NWC Raising National Water Standards Program (RNWS) Indigenous Projects webpage (National Water Commission 2013). Through this Program more than \$10 million was invested in projects to 'improve knowledge and understanding of Indigenous Australians' water-related social and economic aspirations' between 2006 and 2012 (National Water Commission 2013).

The RNWS offered support for projects that would 'improve Australia's national capacity to measure, monitor and manage our water resources' and closed on 30 June 2012. Funds from the RNWS Program were directed at activities across three strategic investment areas:

1. advancing the implementation of the National Water Initiative
2. improving integrated water management across Australia
3. improving knowledge and understanding of our water resources

(National Water Commission 2013)

Indigenous Projects funded or co-funded by the NWC under the Raising National Water Standards Program						
No.	Project Name	Objective	Funding	Jurisdiction, Start & Finish	Further project details/Project Outputs	Reference
1	Indigenous Community Water Facilitators Network	'To establish a community-based network to advance Indigenous engagement in the research and management of tropical rivers, water use and conservation across northern Australia'.	'Up to \$4 787 000 plus applicable GST from the Australian Government towards cost associated with supporting the work program. Total value of the project is \$7 187 000 with \$2 400 000 being contributed by the North Australian Indigenous Land and Sea Management Alliance'.	Multi State November 2007 to November 2011	<p>'It is envisaged that this network will work closely with the Tropical Rivers and Coastal Knowledge (TRaCK) consortium, the The North Australian Indigenous Land and Sea Management Alliance (NAILSMA) Indigenous Water Policy Group, the National Water Commission and state and territory jurisdictions'.</p> <p>An evaluation report has been produced: North Australia Indigenous Land and Sea Management Alliance 2011. Performance Story Report on the Indigenous Community Water Facilitator Network Project. NAILSMA July 2011</p> <p>This proposal will address key challenges encountered in implementing the National Water Initiative in Australia's north. It will complement existing coordinated action and increase regional knowledge and capacity to underpin water planning for both surface water and groundwater systems, including the capacity of communities to participate in water planning and management processes.</p>	National Water Commission 2011b
2	TRaCK synthesis year	The project targeted the 'adoption by water planners and managers of the results of TRaCK and other water research'.	'Commission funding of \$1.77m plus applicable GST and \$1,565,544 of in-kind contributions from the TRaCK consortium'.	Multi-jurisdictional across northern Australia February 2011 to March 2012	<p>'The project will result in the following tools:</p> <ul style="list-style-type: none"> <li>- an interactive web-based classification tool for the TRaCK Digital Atlas</li> <li>- decision support tools for tropical river catchments</li> <li>- environmental flows tools for the wet dry tropics</li> </ul> <p>It will promote Indigenous enterprises and water planning and Indigenous engagement in water research and assist to monitor river health in the wet dry tropics</p> <p>TRaCK (Tropical Rivers and Coastal Knowledge) is a research hub under the Commonwealth Environmental Research Facilities scheme, managed by the Department of Sustainability, Environment, Water, Population, the Arts and Communities.</p> <p>TRaCK draws together more than 70 of Australia's leading social, cultural, environmental and economic researchers. Its research focuses on the tropical north of Australia from Cape York to Broome'.</p>	National Water Commission 2012c



Indigenous Projects funded or co-funded by the NWC under the Raising National Water Standards Program						
No.	Project Name	Objective	Funding	Jurisdiction, Start & Finish	Further project details/Project Outputs	Reference
3	Indigenous water policy group	'To provide funds to continue the work of the Indigenous Water Policy Group that was established one year ago with funding from Land and Water Australia'.	'Up to \$1.983 million plus applicable GST from the Australian Government towards the costs associated with supporting the work program'.	Multi State November 2007 to July 2012	'The Indigenous Water Policy Group has been operating since 2006, and has been funded by the Commission since 2007. It provides research-based policy advice on water reform initiatives as they affect Indigenous communities and their land holdings. It also provides advice and representation on all matters concerning water resources - including social, economic, environmental and cultural interests - and assists with the appropriate engagement of Indigenous interests in regional water planning in north Australia. Membership comprises independent Indigenous water experts and regional land council representatives. It is supported by an Advisory Group made up of researchers from a number of institutions and the Policy Engagement Group which is made up of state, territory and federal water agency representatives. The objectives of the Indigenous Water Policy Group are to: improve Indigenous awareness of water reform to inform decisions on water planning and management conduct research relating to Indigenous rights, responsibilities and interests in water resources in northern Australia work with governments to implement policy so that Indigenous rights, responsibilities and interests in water resources are recognized ensure that the policy approach is consistent across northern Australia'.	National Water Commission 2011c
4	Aboriginal community engagement and consultation in water sharing planning in NSW	'To improve Aboriginal involvement and representation in water management and planning processes in NSW'.	'Up to \$307,834 plus applicable GST plus \$130,000 of in-kind contribution from the NSW Office of Water'.	NSW April 2011 Finalised	'The Water Management Act 2000 and the NSW Implementation Plan for the National Water Initiative require Aboriginal representation in water planning, the inclusion of social, spiritual and customary objectives in water planning and strategies to achieve the objectives. The purpose of the project is to provide additional resources to the NSW Office of Water to: 1. educate Aboriginal communities on water licensing and encourage their active involvement in water planning activities 2. identify cultural values for all water sharing plans 3. capture baseline information to inform Aboriginal performance indicators in water sharing plans'.	National Water Commission 2012d

Indigenous Projects funded or co-funded by the NWC under the Raising National Water Standards Program						
No.	Project Name	Objective	Funding	Jurisdiction, Start & Finish	Further project details/Project Outputs	Reference
5	Indigenous Water Planning Forum	'To bring together Indigenous people and jurisdictional water planners to identify and document good examples of Indigenous engagement in water planning processes'.	'\$200,000 from the Australian Government Raising National Water Standards program'.	National 1 July 2008 30 December 2008	<p>.The explicit inclusion of Indigenous interests in water plans is rare. To help address this concern, Indigenous people and jurisdictional water planners will be brought together to identify and document good examples of Indigenous engagement in water planning processes. To ensure the aims of the Forum are met, it will be informed by: a compilation of the various jurisdictional legislative requirements for Indigenous participation in water planning an assessment of those water plans that have previously included Indigenous interests, and a summary of where Indigenous needs have been met previously through an allocation from the consumptive pool'.</p> <p>'Project benefits - the Forum will: summarise the existing Australian water plans that have had Indigenous engagement bring together the Indigenous people and jurisdictional water planners who have previously participated in water planning processes document the best examples of Indigenous engagement in water planning processes refine a statement of principles for Indigenous engagement in water planning processes'.</p> <p>'The project will support the implementation of National Water Initiative by enhancing the recognition of Indigenous needs in relation to water access and management'</p> <p>Related reports:</p> <p>Altman &amp; Arthur 2009 Water Licences &amp; Allocations to Indigenous People for Commercial Purposes CAEPR, Canberra, ACT. Jackson 2009 National Indigenous Water Planning Forum Background Paper CSIRO, Canberra, ACT.</p> <p>Jackson, S., Tan, P. &amp; Altman, J. 2009. Indigenous Fresh Water Planning Forum: Proceedings, Outcomes and Recommendations. Unpublished Report Prepared for the National Water Commission, March 2009. CSIRO Sustainable Ecosystems.</p>	National Water Commission 2011d

Indigenous Projects funded or co-funded by the NWC under the Raising National Water Standards Program						
No.	Project Name	Objective	Funding	Jurisdiction, Start & Finish	Further project details/Project Outputs	Reference
6	Tiwi Islands water allocation plan	'To enable the Northern Territory Government to employ an Indigenous water planner. The water planner will develop a water allocation plan for the Tiwi Islands over the next two years'.	'\$300 000 plus applicable GST'.	Northern Territory January 2009 January 2011	<p>'The Tiwi Islands water plan will be the first developed for a water system entirely within Aboriginal land. The methodology and processes developed will provide lessons for other plans in Indigenous lands and also for areas where there is a mixture of land tenure and ownership'.</p> <p>'The Australian Government is contributing funds to the Northern Territory Government to employ an Indigenous water planner for two years. The water planner will develop a water allocation plan for the Tiwi Islands where there are forestry and groundwater extraction pressures on the resource'.</p> <p>'The Tiwi Islands water allocation plan will also be a case study for the development of tools and guidelines for water planning that will be developed in the separately funded Water Planning Processes: Lessons, gaps and adoption project'.</p> <p>'Project benefits It provides an opportunity to develop tools and guidelines that support other Indigenous water allocation plans and other water sharing plans that recognise Indigenous access to water resources. This project will be one of the first steps into the water planning profession for Indigenous people in Australia'. (see review in 10.7.3)</p> <p>Related report:  Hoverman, S., Ayre, M., Tan, P. &amp; Jackson, S. 2010. Planning for Tiwi Water Resources Future. Waterlines, 37: 283-382.</p>	National Water Commission 2011e

Indigenous Projects funded or co-funded by the NWC under the Raising National Water Standards Program						
No.	Project Name	Objective	Funding	Jurisdiction, Start & Finish	Further project details/Project Outputs	Reference
7	Australian Indigenous Water Roundtable	'To establish and support a National Indigenous Reference Group for water issues'.	'\$450,000 (excluding GST) from the Australian Government Raising National Water Standards Program'	National 19 February 2009 Completed	<ul style="list-style-type: none"> <li>- Indigenous Water Forum 2009</li> <li>- First People' Water Engagement Council (FPWEC)</li> <li>- First Peoples' National Water Summit 2012</li> <li>- FPWEC Policy framework</li> <li>- FPWEC Advice to the National Water Commission</li> </ul> <p>'The Australian Indigenous Water Roundtable project convened an Indigenous Water Planning Forum in Adelaide, in February 2009. The Forum was attended by approximately 50 Indigenous leaders from across Australia, who discussed Indigenous water access issues and selected an interim National Indigenous Reference Group to provide guidance to the Commission. The Reference Group held their first meeting being held in Canberra, in March 2009 and established their Terms of Reference and a process for transitioning their role to an ongoing reference group, the First Peoples' Water Engagement Council'.</p> <p>'The First Peoples' Water Engagement Council (FPWEC) who was established to provide advice to the Commission on national Indigenous water issues held their first meeting in June 2010...The FPWEC consulted widely with Aboriginal groups from across Australia to develop a number of key documents designed to inform Australian Governments on how to improve the engagement of Indigenous Australians in water planning and management and to delivery water for cultural values and economic development'.</p> <p>'The work program of the FPWEC culminated in them hosting the First Peoples' National Water Summit in Adelaide, March 2012, where they achieve endorsement of their policy positions on water for cultural and economic purposes, from over 70 Aboriginal delegates from across Australia. Using feedback from this Summit and drawing on the good work of other groups the FPWEC delivered their policy Advice to the National Water Commission on 30 May 2012'.</p> <p>'This project has made a significant contribution to advancing policy discussion on Indigenous water issues in Australia. The FPWEC have been instrumental in raising the profile of these issues through conferences, workshops, meetings and through their Submission to the Commissions 2011 Biennial Assessment and their Advice to the Commission. The FPWEC advice to the Commission informed the development of the National Water Commissions policy position on Indigenous access to water'.</p>	National Water Commission 2013a

Indigenous Projects funded or co-funded by the NWC under the Raising National Water Standards Program						
No.	Project Name	Objective	Funding	Jurisdiction, Start & Finish	Further project details/Project Outputs	Reference
8	Assessing water sharing plan Aboriginal performance indicators	'To collate Aboriginal information to inform the development and review of water sharing plans in NSW'.	'\$230,000 plus applicable GST allied with \$268,906 of in-kind contribution from the NSW Office of Water'.	New South Wales January 2011 December 2012	<p>'The primary aim of the project is to collate Aboriginal information in a central database to inform the development of water sharing plans, and their review, in NSW. Baseline metrics will be developed to evaluate the effectiveness of water sharing plans in providing for Aboriginal cultural and commercial water'.</p> <p>'The project will:  provide an overall state-wide (statistical and spatial) picture of Aboriginal environmental issues within water sharing plan areas using standard Aboriginal organisational and environmental profiles  identify the existing water licences held by Aboriginal land owners and other Aboriginal entities  establish the existence of Aboriginal landowners adjacent to water courses who may wish to secure cultural or commercial water entitlement  identify other environmental and cultural landscapes of importance to Aboriginal people that could provide opportunities for accessing cultural flows'</p>	National Water Commission 2011f

Indigenous Projects funded or co-funded by the NWC under the Raising National Water Standards Program						
No.	Project Name	Objective	Funding	Jurisdiction, Start & Finish	Further project details/Project Outputs	Reference
9	Indigenous water characteristics	'Undertake a series of think pieces and options papers on national issues affecting Indigenous water access and management'.	'\$300,000 plus applicable GST'	National February 2011 December 2011	<p>'The recently established First Peoples' Water Engagement Council, the Commission's Indigenous advisory council, will oversight the development of a series of discussion papers and position statements on a number of national issues affecting Indigenous water access and management'.</p> <p>'The think pieces and options papers will identify Indigenous needs on water access and management, considering both cultural requirements and commercial interests. It will also examine the relationship between environmental flows and Indigenous social, spiritual and customary objectives'.</p> <p>'The Commission's 2009 Biennial Assessment noted that water to meet Indigenous social, spiritual and customary objectives is rarely clearly specified in water plans. It recommended the further exploration of Indigenous needs in relation to water access and management and of the mechanisms to meet those needs'.</p> <p>'Recognition of Indigenous access to water is gaining traction within many jurisdictions. However, water allocations are ad hoc and jurisdictions are seeking guidance on better ways to appropriately recognise Indigenous interests'.</p> <p>'Where position statements are produced, this project will also identify appropriate mechanisms to meet the needs identified and make recommendations at national and jurisdictional levels on how to provide for those needs'.</p> <p>Related Reports:</p> <p>Collings, N. 2011 Indigenous water planning and management issues. Advice by the First Peoples' Water Engagement Council to the National Water Commission for the 2011. Biennial Assessment of progress in implementation of the National Water Initiative</p> <p>Duff, N. Delfau, K &amp; Durette, M. 2010. A review of Indigenous involvement in water planning. Submission to the 2011 biennial assessment of the National Water Initiative (NWI). Prepared for the First Peoples' Water Engagement Council, September 2010.</p>	National Water Commission 2011g

Indigenous Projects funded or co-funded by the NWC under the Raising National Water Standards Program						
No.	Project Name	Objective	Funding	Jurisdiction, Start & Finish	Further project details/Project Outputs	Reference
10	National risk assessment - water services in remote Indigenous communities	'To undertake a national risk assessment to identify key opportunities for improving drinking water management in remote Indigenous communities'.	'Up to \$600 000 plus applicable GST from the Australian Government under the Raising National Water Standards program towards the costs associated with supporting the work program. In-kind contributions are expected from a number of state and territory governments, utilities, and other organisations'.	National September 2007 August 2010	The project delivered a web-based tool. The tool is a companion to the NHMRC Community Water Planner covering chemical, physical and radiological risks to drinking water supplies.	National Water Commission 2012e
11	Guidelines, best practice examples - remote Indigenous communities	'To revise key documents, including aspects of the Australian Drinking Water Guidelines, and develop an information package, including materials such as diagrams, maps, and tables, that assists with preparing usable and understandable drinking water management plans'.	'Up to \$250 000 plus applicable GST from the Australian Government under the Raising National Water Standards program towards the costs associated with supporting the work program. In-kind contributions are expected from a number of state and territory governments, utilities, and other organisations'.	National April 2008 Finalised	The project delivered a Field Guide.  'The materials comprise the Community Water Planner field guide, which was developed by the Centre for Appropriate Technology on behalf of Water Quality Research Australia. The guide is an easy-to-understand resource to assist service providers and remote Indigenous communities to identify the most applicable water supply systems for their communities'.	National Water Commission 2013b

Table 11-1: Raising National Water Standards Projects

NAILSMA projects delivered under the NAWFA Cultural and Social Program guided and advised by the NAILSMA Indigenous Water Policy Group (IWPG)						
No.	Project	Objective	Funding	Jurisdiction Start & Finish	Further project details/Project outputs	Reference
	Indigenous aspirations on northern water	'To develop knowledge and understanding on Indigenous social, cultural and economic aspirations with respect to land and water management and development in northern Australia'.	Up to \$800,000 plus applicable GST	Multi jurisdictional across northern Australia February 2011 Finalised	'Increased knowledge and understanding of Indigenous social, cultural and economic aspirations with respect to water management and development in Northern Australia'	National Water Commission 2012f
12	Indigenous Livelihoods – Background Paper	This paper 'explored and evaluated Indigenous livelihood options and opportunities, identified their barriers and presents recommendations for overcoming them and enabling a greater exploration and utilisation of livelihood options and opportunities on country' (North Australian Indigenous Land and Sea Management Alliance 2012a).	See above	See above	<p>Highlights key barriers to the creation of Indigenous businesses drawing on natural resources in northern Australia.</p> <p>One key barrier concerns the sheer difficulty of establishing private businesses or obtaining employment in regions that have limited local economies. Challenges of operating in remote, infrastructure-poor regions (Whitehead 2012: 2).</p> <p>Other barriers include the 'failure of land rights laws to link rights in renewable resources to rights in land,' and 'limited experience of remote and regional Indigenous people in business and paid employment' (Whitehead 2012:2).</p> <p>Regional development plans must include and provide for employment and workforce development programs; market-based environmental services and purchases by government; offset policies; regional conservation initiatives; and water allocation processes (Whitehead 2012: 4). Regional development programs should involve all levels of government while enabling Land Councils and other relevant Indigenous organisations to participate fully in regional development planning and Indigenous livelihoods development. Programs and project designs must be influenced by Indigenous views of favourable livelihoods and program viability (Whitehead 2012: 3-4).</p> <p>Related report:</p> <p>Whitehead, P. 2012. Indigenous Livelihoods - Background Paper, NAILSMA Knowledge Series NKS011/2012 , Darwin, North Australian Indigenous Land and Sea Management Alliance Ltd.</p>	North Australian Indigenous Land and Sea Management Alliance 2012a



NAILSMA projects delivered under the NAWFA Cultural and Social Program guided and advised by the NAILSMA Indigenous Water Policy Group (IWPG)						
No.	Project	Objective	Funding	Jurisdiction Start & Finish	Further project details/Project outputs	Reference
13	Sustainable Indigenous Livelihoods from north Australian land and water resources - Towards a Research and Development Agenda and Implementation Strategy	This strategy identified 'Indigenous aspirations and priorities in regard to sustainable Indigenous livelihoods, and presents a research and development agenda and implementation strategy to address these aspiration and priority areas' (North Australian Indigenous Land and Sea Management Alliance 2012b).	See above	See above	<p>The aims of this reports are to '(i) articulate Indigenous social and economic aspirations with respect to water in northern Australia; and (ii) develop a 'sustainable Indigenous livelihoods' research and development agenda and implementation strategy' (Greiner, Stanley &amp; Austin 2012: 1).</p> <p>The methodology of the project consisted of a literature review and consultation. The research was governed by a version of 'sustainable livelihoods', a conceptual approach formulated in the 1970s. The report recommends that for research involving Indigenous approaches to water, consultation must be ongoing, and that the research should be seeking practical, tangible outcomes for Indigenous people (Greiner, Stanley &amp; Austin 2012:6).</p> <p>Related report:</p> <p>Greiner, R., Stanley, O., and Austin, B. 2012. Sustainable Indigenous livelihoods from north Australian land and water resources - towards a research and development agenda and implementation strategy, NAILSMA Knowledge Series 8/2012, Darwin, North Australian Indigenous Land and Sea Management Alliance Ltd.</p>	North Australian Indigenous Land and Sea Management Alliance 2012b

NAILSMA projects delivered under the NAWFA Cultural and Social Program guided and advised by the NAILSMA Indigenous Water Policy Group (IWPG)						
No.	Project	Objective	Funding	Jurisdiction Start & Finish	Further project details/Project outputs	Reference
14	Supporting Indigenous Livelihoods – Appropriate Scales of Governance	The author explored 'the relationship and support between Indigenous representative groups in three case study catchments and government agencies, identified barriers and suggests ways for improving processes and governance support' (North Australian Indigenous Land and Sea Management Alliance 2012c).	See above	See above	<p>This report is mainly literature based, with strong weighting toward government material. Focus on the Mitchell River (QLD), Daly River (NT), and Fitzroy River (WA). The project involved “visits” to these areas rather than anthropological fieldwork (Sullivan &amp; Stacy 2012: 5). There were also telephone interviews.</p> <p>The recommendations focus on how 'jurisdictional fragmentation' (Sullivan &amp; Stacey 2012: 35) is the norm and that whole-of-government coordination, while a problem, is unlikely to improve. It recommends that Aboriginal environment managers should be given appropriate support for reporting in the framework required by government.</p> <p>Related report:</p> <p>Sullivan, P. &amp; Stacey, C. 2012 Supporting Indigenous Livelihoods - Appropriate Scales of Governance, NAILSMA Knowledge Series NKS 009/2012, Darwin, North Australian Indigenous Land and Sea Management Alliance Ltd.</p>	North Australian Indigenous Land and Sea Management Alliance 2012c
15	Indigenous Knowledge in Water Planning, Management and Policy - Cape York Peninsula, Qld Case Studies	'...sought to obtain Indigenous perspectives of incorporating Indigenous knowledge in water planning, management and policy' (North Australian Indigenous Land and Sea Management Alliance 2012d).	See above	See above	<p>This report consists of two location studies, Aurukun and Coen, both in Cape York. It consists of an account of how to conduct research projects with Aboriginal people, specifically in regard to water management. The methodology used is 'qualitative interviews' (Roberts 2012:10), involving phone calls initially, and then face to face conversations. These conversations were then analysed, with concluding recommendations focussed on the idea that Aboriginal people have much to contribute to water management, but their contributions are often overlooked due to the way research projects are framed and executed.</p> <p>Related report:</p> <p>Roberts, C. 2012. Indigenous knowledge in water planning, management and policy – Cape York Peninsula, Qld. Case Studies. NAILSMA Knowledge Series 10/2012. North Australian Indigenous Land and Sea Management Alliance Ltd. Darwin.</p>	North Australian Indigenous Land and Sea Management Alliance 2012d

NAILSMA projects delivered under the NAWFA Cultural and Social Program guided and advised by the NAILSMA Indigenous Water Policy Group (IWPG)						
No.	Project	Objective	Funding	Jurisdiction Start & Finish	Further project details/Project outputs	Reference
16	Capturing Indigenous Knowledge in Water Management Processes - Wudjulu Lagoon Case Study, Ngukurr NT	This case study 'records the incorporation of Indigenous knowledge with western planning in regard to a larger enterprise development project, and presents key barriers to that integration' (North Australian Indigenous Land and Sea Management Alliance 2012e).	See above	See above	(reviewed in 10.7.3 below)  Related report:  Watts, L. 2012. Capturing Indigenous Knowledge in Water Management Processes - Wudjulu Lagoon Case Study, Ngukurr, NT. Report Prepared for Northern Land Council. Centrefarm Aboriginal Horticulture Ltd., NT.	North Australian Indigenous Land and Sea Management Alliance 2012e

Table 11-2: NAILSMA Projects Delivered Under the NAWFA Cultural and Social Program

## 11.4 Discussion of National Projects

Much of the national project work undertaken can be seen as preliminary. The information produced tends to be general, and does not tend to address in any detail the cultural underpinnings of the relationship between Indigenous people and water. The preliminary nature of the projects is unsurprising since the majority of them have been undertaken in the past two years. Among the Raising National Water Standards projects are an evaluation (Indigenous Community Water Facilitators Network), the development of an education package (NSW Office of Water 2012), preparatory work for tools and guidelines (Hoverman et al. 2010), and policy discussion (2012). Included among the NAILSMA projects are constraints to Indigenous business development (Whitehead 2012), and identifying social and economic aspirations (Greiner, Stanley & Austin 2012). Among the methodological approaches are literature reviews (Greiner, Stanley & Austin 2012; Sullivan & Stacey 2012), interviews (Roberts 2012), and site visits (Sullivan & Stacey 2012). All of the reports that address the issue recommend greater direct involvement of Indigenous people in the planning and execution of any research seeking to identify Indigenous interests in water (see particularly Roberts 2012). Finer grained field research, of the kind Sullivan & Stacey (2012) suggest they did not have time to undertake, would be required to push the current level of knowledge into specifics that can capture the cultural value of water to particular Indigenous groups in particular locations. This further work may be planned and is required, not least since it cannot be assumed that the more heavily targeted areas of policy, such as Indigenous economic development, can be isolated from the broader cultural setting of Indigenous communities with any successful outcome.

## 11.5 Projects by State and Territory

### 11.5.1 Australia Capital Territory

Think Water, Act Water (Environment ACT 2004a and 2004b) is the prime water management strategy in the ACT. By means of six key objectives, it provides guidance for the management of the ACT's water resources (excluding those federally controlled) until 2050. In essence, the main foci of Think Water, Act Water are to increase sustainability and improve the quality of water with the ACT. Think Water, Act Water does not overtly contain any Indigenous views or knowledge with regard to water, its spiritual significance, (traditional) use values or general management principles other than suggestions for future engagement and an opportunity for increased Indigenous input into the development of National Park management plans.

Think Water, Act Water was drafted at the same time as the National Water Initiative (NWI). Consequently, it is claimed that many of the objectives of the NWI are met in Think Water, Act Water (ACT 2006: 4). The ACT National Water Initiative Implementation Plan (ACT 2006) recognises the need for Indigenous communities to have access to water and to be involved in the development of water management policies and practices, however, it also states that 'no [Indigenous] access or entitlement issues [were] identified during [the consultation] process' (ACT 2006: 18) and that plans to address Indigenous water issues were 'ongoing' at the time of writing (ACT 2006: 18). The Department of Territory and Municipal Services of the ACT Government was given responsibility for developing and implementing these plans, and it is anticipated there may be outcomes to this effect in the future.

### 11.5.2 New South Wales

The projects listed below in Table 10-3 relating to New South Wales recognise the importance of consulting with Aboriginal groups when managing water sources. All of these reports noted that this extends beyond avoiding any infringement on the needs of local Indigenous communities, and recognised that traditional knowledge can be essential in formulating the best course of action to protect and control water flows.

The Department of Environment and Water Resources (2007) in particular has focussed on results that offer a sustainable future for the environment and Indigenous communities in tacit acknowledgement that the two are fundamentally interdependent. Another important theme, and one especially highlighted by the NSW Office of Water (2012), is the importance of recognising the cultural significance of water bodies to Indigenous stakeholders and the access to those water bodies that this requires.

Most of this information has come from the Murray-Darling Basin, the Murray-Darling River and Murrumbidgee.

Project name	Study Area	Relevant Aboriginal Stakeholders	Aim of Project	Types of Water Assessed	Methodology	Cultural domain of water identified	Outcomes of Project	Limitations	Comments
<b>Jackson, S. 2006b. Recognising and Protecting Indigenous Values in Water Resource Management. A Report from a Workshop held at CSIRO in Darwin, NT. CSIRO Sustainable Ecosystems, April 2006.</b>	Murray and Darling Rivers	Murray Lower Darling Indigenous Nations	<ul style="list-style-type: none"> <li>• To have a good discussion about water issues</li> <li>• For northern Australian Aboriginal groups, especially from the Daly River, to hear about the experiences of other groups, e.g. from the Murray Darling, and vice versa</li> <li>• To think about environmental policy, especially water management, and how it can work for Indigenous people</li> <li>• To talk about the words 'cultural values', how they are being used and whether they reflect Indigenous values</li> <li>• To talk about rivers and water reforms: what worries people about the changes and are there opportunities, or good parts, to the changes</li> <li>• To talk about ways Indigenous people can document their values, promote them and be involved with governments and other groups e.g. catchment management groups.'</li> </ul> (Jackson 2006b: 7)	Riverine, estuarine, wetlands, floodplains, coastal zone, subsurface	Focus group, consultation	Economic, social, spiritual	'This workshop represented the first step in a dialogue that Indigenous groups in northern Australia need to have with each other, and with other sectors of Australian society, in order to overcome the neglect of their interests from the national water reform agenda. For the first time in the context of national changes to the use, regulation and management of water, a number of Indigenous people came together to discuss common issues and progress regional priorities. A firm recommendation arising from the workshop was for more such meetings and discussions, preferably in the bush...' (Jackson 2006b: 23).	Authors satisfied 'with the reasonable balance of people from various backgrounds. Aboriginal people were in the majority, making a difference to the degree of attention given to issues of interest to the Indigenous participants' (Jackson 2006b: 6). Majority of people were from the Daly River Aboriginal Reference Group as well as visitors from the Murray Lower Darling Indigenous Nations and the Miriwung Gajerrong people of the east Kimberley.	

Project name	Study Area	Relevant Aboriginal Stakeholders	Aim of Project	Types of Water Assessed	Methodology	Cultural domain of water identified	Outcomes of Project	Limitations	Comments
<b>Morgan, M., Strelein, L., and Weir, J. 2004. Indigenous Rights to Water in the Murray Darling Basin: In Support of the Indigenous Final Report to the Living Murray Initiative. Research Discussion Paper No. 14, Native Title Research Unit, Australian Institute of Aboriginal and Torres Strait Islander Studies, Canberra.</b>	Murray-Darling Basin	Murray Darling Rivers Indigenous Nations (MDRIN)	This discussion paper stems from an expert round table dialogue between the Murray Darling Rivers Indigenous Nations (MDRIN) and the Murray Darling Basin Commission (MDBC) regarding the <i>Living Murray Initiative</i> . Upholding the vision of a 'healthy, living river with natural flows and cycles, sustaining communities and preserving unique values' (Morgan, Strelein & Weir 2004: 3). The <i>Living Murray Initiative</i> seeks to improve the health of the Murray River through managing its scarce water resources and recognising community ties to and economic reliance on this resource. Recognising the integral role Indigenous peoples play in the social, cultural and economic communities of the Murray Darling Basin, this discussion addresses the 'inherent rights of the Indigenous Nations to these water resources and the surrounding ecosystem' (Morgan, Strelein & Weir 2004: 3).	Basin, rivers, tributaries	Workshop (roundtable)	Economic, social, spiritual	<p>This paper highlights 'the barriers and constraints to engaging with Indigenous peoples in natural resource management decision making as well as the integration of Indigenous cultural heritage considerations into relevant Murray Darling Basin Commission Programs' (Morgan, Strelein &amp; Weir 2004: 21).</p> <p>As part of these discussions MDRIN submitted a number of recommendations and proposals for the co-management of water resources and the natural and cultural heritage of the Murray River. Framing consultations within the broader context of human rights, these management proposals call for an approach that allows meaningful Indigenous involvement in decisions and outcomes that effect the social, economic and environmental well-being of the Murray Darling River system.</p> <p>The right to a cultural flow is addressed, along with the 'need to preserve the cultural economy through the identification of cultural flows' (Morgan, Strelein &amp; Weir 2004: 40). Morgan, Strelein &amp; Weir (2004: 51) also note that 'Further work could be done to determine a baseline requirement for cultural flows of each [Indigenous] Nation'.</p> <p>In particular this discussion paper highlights a lack of legislative recognition of Indigenous interest in water as well as the need for equal access and rights to water. In light of this it is, it is recommended that a government approach to water allocation in the Murray should recognise Indigenous rights and responsibilities to manage not only the cultural benefits of this landscape but also its economic benefits. In the course of this discussion paper, the following key recommendations were proposed by MDRIN:</p> <p>That the MDBC 'recognise the distinct rights and interests of Indigenous Nations in the Murray Darling Basin'; and that appropriate 'principles and processes' be established for engaging with Indigenous Nations. (Morgan, Strelein &amp; Weir 2004: 59)</p>		

Project name	Study Area	Relevant Aboriginal Stakeholders	Aim of Project	Types of Water Assessed	Methodology	Cultural domain of water identified	Outcomes of Project	Limitations	Comments
<b>Department of Environment and Water Resources 2007. Toogimbie, The Riverina, New South Wales. Fact Sheet.</b>	Hay Plain/ Murrumbidgee River	Nari Nari Tribal Council	'Our vision is to protect and enhance our culture and history, while encouraging and protecting the natural environment and conserving biodiversity.' (Department of Environment and Water Resources: 2007: 1)	riverine, floodplain	Report review	Economic, social, spiritual	Holistic approach to the river and floodplains management. Lignum floodplains have been set aside for conservation purposes. 'IPA funded activities include improving wetland inundation, replanting vegetation, and controlling weeds and feral animals.' (Department of Environment and Water Resources: 2007: 2) Sustainable timber harvesting practised. Cultural sites recorded and fenced off. Revegetation works undertaken. Bush tucker garden constructed. 'Toogimbie IPA is part of Australia's National Reserve System, a nation-wide network of reserves especially set up to protect examples of Australia's unique landscapes, flora and fauna for current and future generations.' (Department of Environment and Water Resources: 2007:2)		'The local ecosystem and wildlife habitats have been affected by former farming practices, and by timber cutting along waterways. As a result, the Toogimbie wetlands are environmentally degraded and fragile, and are the main focus of land management activities. Managed intervention by the Tribal Council supports the recovery of the land, and is helping to ensure a sustainable future for both the Nari Nari and their environment.' (Department of Environment and Water Resources: 2007: 2)

<p><b>Jackson, S., Moggridge, B. &amp; Robinson. R. 2010. Summary of the scoping study: Effects of change in water availability on Indigenous people of the Murray-Darling Basin. Report prepared by CSIRO for the Murray Darling Basin Authority.</b></p>	<p>Murray Darling Basin</p>	<p>Nari Nari (Hay), Ngemba (Brewarrina), Yorta Yorta (Barmah-Millewa)</p>	<p>To scope out 'the impacts of changes in water availability on Indigenous communities of the Murray Darling Basin' (Jackson, Moggridge &amp; Robinson 2010: 1); to assist with exploring opportunities for addressing Indigenous interests in the Basin Plan.</p>	<p>23 River basins, the Murray, Darling and Murrumbidgee rivers</p>	<p>Scoping study, case study</p>	<p>Highlighted a neglect of Indigenous interests in water resource planning. The potential for restoring environmental systems and the relationships that Indigenous people have with their country is a motivating factor behind Indigenous participation. Indigenous people have diverse and interrelated interests in water and are responding in varied ways to address water management issues within their lands. 'There needs to be a more rigorous and consistent approach to Indigenous water management with a holistic approach to economic, social and cultural water uses, aspirations and values.' (Jackson, Moggridge &amp; Robinson 2010: 7) The report makes three recommendations: '1. Increase benefits to Indigenous people through improved environmental water management.' – 'improved mechanisms and frameworks to identify and incorporate Indigenous values and to facilitate increased Indigenous involvement in water resource management.' – 'broaden and strengthen the application and use of Indigenous Protected Areas (IPAs) in water resources management.' '2. MDBA to set benchmarks for accreditation of State Basin Plans that reflect Indigenous water needs.' – 'needs to be systematic and transparent assessments of Indigenous water use requirements at the catchment scale.' – 'could be done through Indigenous Water Management Plans for each catchment to achieve the objectives of the NWI.' – 'Indigenous groups ... need support to have a great role and responsibility in Indigenous Water management Plans and increase collaboration between these groups across the Basin.' – 'Finance needs to be provided to purchase environmental water by Indigenous groups and the cost of delivery to areas/features/purposes.' – 'Investigation is needed of the governance issues associated with a range of entitlement holding and management models. Assistance is needed to develop governance arrangements to support Indigenous management of water allocations.' '3. Regional economic development and planning - Indigenous livelihood opportunities from SDLs. – Government and Basin agencies could achieve region-wide benefits through facilitating Indigenous employment opportunities in environmental services. (Jackson, Moggridge &amp; Robinson 2010: 8) Six priority areas for reseach were identified to improve the following: '1. baseline information, e.g. on Indigenous commercial water use, socio economic regional profiles etc which will also facilitate monitoring 2. understanding of the barriers to Indigenous participation in the water market 3. understanding of the 'cultural flows' concept and how it aligns with environmental flows including under differing management models 4. techniques to quantify Indigenous environmental and cultural water use and the specification of Indigenous water requirements 5. water policy instruments to better accommodate Indigenous people's cultural, environmental and economic needs 6. deeper understandings of the context for Indigenous water resources through case study research to describe and</p>	<p>No obvious limitations</p>	
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Project name	Study Area	Relevant Aboriginal Stakeholders	Aim of Project	Types of Water Assessed	Methodology	Cultural domain of water identified	Outcomes of Project	Limitations	Comments
							test multiple cultural and environmental benefits from environmental water allocations. Any research needs to further the conceptual and empirical understanding of Indigenous water requirements and, in doing so, fully involve Indigenous people in subsequent policy development and decision-making' (Jackson, Moggridge & Robinson 2010: 8)		

NSW Office of Water 2012. <b>Our Water Our Country: An information manual for Aboriginal people and communities about the water reform process. Edition 2.0.</b> NSW Department of Primary Industries, Office of Water, Sydney, NSW.	NSW	All Aboriginal peoples living in NSW	<p>The way water is managed in NSW has changed over time. Each region has, or will soon have, its own water sharing plan, which will include the protection of customary and economic values. Active involvement by Aboriginal communities in the water sharing planning process will confirm identity, respect and acknowledgement of Aboriginal rights to water. This information manual, along with the DVD, aims to build knowledge, skills and confidence, and encourage Aboriginal people to make the most of these new opportunities. (NSW Office of Water 2012: 1-1). More specifically, this manual aims to:</p> <ul style="list-style-type: none"> <li>• encourage Aboriginal people to not only know the law of how water is managed by government, but to exercise their rights within this law</li> <li>• assist Aboriginal people to gain fair and equitable access to water along with other interests including the environment, domestic and commercial</li> <li>• provide practical ways for Aboriginal individuals and communities to achieve cultural, social and enterprise goals</li> <li>• encourage and assist government agencies and</li> </ul> <p>Aboriginal people to work together. (NSW Office of Water 2012: 1-2)</p> <p>This report defines Aboriginal cultural water access licences as allowing 'communities to access water for important cultural purposes, such as manufacturing traditional artefacts, hunting, fishing, gathering, recreation, cultural and ceremonial purposes. An Aboriginal cultural water access licence can also be used for drinking, food preparation, washing, and watering domestic gardens. These licences will be considered in both inland and coastal surface water and groundwater systems but can not be used for commercial activities' (NSW Office of Water 2012: 7-8).</p>	'Fresh water that comes from rivers, streams, lakes, billabongs, floodwater, wetlands, springs, and groundwater. Water from a brackish estuary or a salty lake is also included, but not the ocean.' (NSW Office of Water 2012: 2)	Consultation	Economic, social, spiritual	<p>Key themes emerged across three case study communities: 'There is concern about the previous lack of consultation with the Aboriginal community regarding the water sharing process ... Many people were unaware of the status of their water sharing plan, unsure what government agency was responsible, or who to contact within the agency. Terminology and jargon used in association with the water sharing process caused confusion and misunderstanding amongst the participants. The Aboriginal cultural water access licence is a new concept and therefore little was known about it. Participants showed much interest in the allocation of cultural water licences and were very keen to learn more about them ... The idea for Aboriginal communities to purchase their own property to potentially generate income and provide employment within their community was welcomed and explored at all workshops with enthusiasm. The issue of resourcing and funding for the water sharing process is of particular interest. There is a need to have regionally specific Aboriginal bodies formed to be involved with the local water sharing plan process. Aboriginal community Elders and other local Aboriginal people need to be involved in any consultation design and implementation about the water sharing process. There was also discussion about state level representation relating to water sharing processes. The Aboriginal Water Trust was identified as an important body for representing the interests of Aboriginal communities in terms of economic policy and commercial developments which progress the achievement of Aboriginal community objectives (the Aboriginal Water Trust ceased operating in 2009). Information resources about the water sharing process need to be user-friendly, clear, concise and non-complicated ... The importance of consistency in approach to the process of developing water sharing plans and administration of the water licensing system was stated. This process should be mapped out to ensure transparency and to identify key points for engagement and consultation with Aboriginal communities to encourage timely, active and equitable participation. There is significant enthusiasm for the use of case studies to exemplify key messages regarding Aboriginal water use and participation in the water sharing process. The Aboriginal cultural significance of water was highlighted. There is a need to explore how Aboriginal cultural activities and the water sharing process are linked and to ensure these cultural activities are catered for in the water sharing plans. The importance of economic development and opportunity within Aboriginal communities was raised at all workshops. Aboriginal communities are unaware of the resources and funding available to encourage their participation in the water sharing process and enhance their communities. The resource package should set out how and for what Aboriginal communities can seek funding for water use activities. The appropriate government agencies and contacts that can assist these communities need to be highlighted. Aboriginal cultural values associated with rivers and aquifers are poorly understood by water resource managers, and some values may be difficult to relate to particular flow regimes, to quantify or to describe in allocation decisions. However, Aboriginal people are critical of water agencies for the exclusive focus given to the satisfaction of ecological criteria in environmental flow assessments. Environmental flows tends to be highly technical and strongly focused on meeting purely ecological objectives, resulting in alienation of traditional Aboriginal knowledge and values. There is a need for research to specify</p>	<p>Many workshop participants were sceptical at first about the relevance of the project to them (a typical comment was 'the irrigators always get it all anyway'). However, once people understood how water reforms could make a difference to them and their community, they became very interested, and wanted to know how to get involved. This confirmed that a resource such as Our Water Our Country was needed. (NSW Office of Water 2012: 1-6)</p>	
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Project name	Study Area	Relevant Aboriginal Stakeholders	Aim of Project	Types of Water Assessed	Methodology	Cultural domain of water identified	Outcomes of Project	Limitations	Comments
							the water required to sustain cultural values'. (NSW Office of Water 2012: 1-7)		

Table 11-3: Projects examining Indigenous cultural values of water: New South Wales

### 11.53 Northern Territory

Most of the projects conducted in the Northern Territory (see Table 10-4 below) noted the inadequacy of consultation as it has been hitherto conducted in regards to the planning and conduct of water management. Jackson (2006: 7), for example, investigates how to make environmental policy work for, rather than merely alongside, Indigenous people. Barber and Jackson (2011) seek to emphasize the importance of Indigenous perspectives in any environmental plan. Three of the four aims in their report refer to the importance of Indigenous knowledge and understanding (Barber and Jackson 2011b: 2-3); the fourth and last aim is to then make recommendations based upon the information provided by the Aboriginal groups consulted (Barber and Jackson 2011b: 3). Wirf et al. (2008) investigate the current status of gendered cultural information with regard to water allocation planning and explore the role that Aboriginal women can play in future water planning processes.

Rea and the Anmatyerr Water Project Team (2008: x) recognise the fundamental relationship between Indigenous communities and the environment, and accordingly give equal importance to outcomes for the Anmatyerr people and outcomes for land and water resources. This project also aims to give recognisable authority to Anmatyerr water knowledge Rea and the Anmatyerr Water Project Team (2008: x), having noted that Aboriginal knowledge and value in the past has been regularly sidelined (Rea and the Anmatyerr Water Project Team 2008: 4). Jackson and Altman (2009: 43) make a similar observation that Indigenous groups must be given 'an equitable, or even principal, interest in water'.

Watts (2012: 11) also recognised the necessity of integrating Indigenous knowledge with western science to ensure that any outcomes were better placed to succeed. This resulted in the recommendation that co-management of land and water resources with Indigenous groups be implemented and that Aboriginal people are encouraged to further participation in decision making processes (Watts 2012: 8).

Many of the projects similarly recognised that Indigenous input needed to expand beyond consultation to active participation in all aspects of water management (e.g. Jackson 2006b: 7; Jackson and O'Leary 2006: 10; Woodward, Jackson & Straton 2008: 112). Jackson and O'Leary (2006: 10) point out that Aboriginal participation in research, for example, is absolutely essential.

As pointed out by Jackson and Altman (2009: 41-42), the problem is larger than a simple failure of consultation; there is a culture in natural resource management programs that excludes Indigenous people and groups as non-experts. Although many groups, such as the Anmatyerr people, have expressed a wish to be actively involved in the management of culturally water bodies (Craig et al. 2009: 27), Jackson, Storrs and Morrison (2005) demonstrate that there are numerous ways that the capacity for Indigenous involvement can be improved.

Hoverman et al. (2010) have provided a practical example of how advances can be made in this direction by assisting Tiwi people to initiate the planning of a water sharing plan.

Project name	Study Area	Relevant Aboriginal Stakeholders	Aim of Project	Types of Water Assessed	Methodology	Cultural domain of water identified	Outcomes of Project	Methodological Limitations	Comments
<b>Jackson, S. 2004. Preliminary Report on Aboriginal Perspectives on Land-use and Water Management in the Daly River region, Northern Territory. Report Prepared for the Northern Land Council, May 2004. CSIRO Sustainable Ecosystems.</b>	Daly River region	Wadjigan/Kiyuk, Malak Malak and Kamu, Nanggiwumerri, Maramanindji, Marranunggu, Wagiman, Wardaman, Dagoman, Jawoyn (Jackson 2004: 8).	The aim is to 'conduct a study of the indigenous cultural values of the Daly River and associated environments. The intention of the study was twofold: firstly, to provide a foundational document to assist the deliberations of the CRG [Daly River Community Reference Group], and secondly, to assist the Aboriginal members of the CRG.' (Jackson 2004: 4)		Literature review, consultation, interviews	Economic, spiritual, social	Nine recommendations: '1. Investigate models for a region wide negotiated settlement of management arrangements. 2. Review the adequacy of current arrangements for Aboriginal participation in catchment management processes and examine structures established in other regions. 3. Investigate options for declaring a river park along the Daly River under joint management arrangements. 4. Examine water resource management institutions to ensure water efficiency. 5. Facilitate further consultation and negotiations around the current principles underpinning water allocation planning and environmental flows research. 6. Notify the Aboriginal Areas Protection Authority of the Foster family's interest in further protecting the registered gravesite near Woollanna. 7. Establish a process to elicit a more comprehensive qualitative, and where possible, quantitative understanding of Aboriginal social values. 8. Ensure that social and cultural impacts are monitored. 9. Address the concerns related above regarding sedimentation of the Daly and Katherine Rivers and the environmental impacts of recreational boating' (Jackson 2004: 41-44).	'Preparation of this report has been severely constrained by insufficient time in which to properly engage the large and widely dispersed Aboriginal population. As a result this report should be considered as a preliminary document that is not comprehensive in its reach across all affected Aboriginal groups, and contains recommendations that have not yet been endorsed by the Aboriginal community.' (Jackson 2004: 1)	
<b>Jackson, S., Storrs, M., and Morrison, J. 2005. Recognition of Aboriginal rights, interests and values in river research and management: Perspectives from northern Australia. Ecological Management and Restoration, 6(2): 105-110.</b>	The Tropical Savanna region of Australia's north (Broome to Cairns)	Australia wide - Northern Australian Aboriginal peoples focus	'This paper documents Aboriginal perspectives from certain areas in northern Australia, defined as the region of tropical savannas stretching from Townsville to Broome, and offers a number of suggestions for improving current knowledge of Aboriginal values and Aboriginal participation rates in water and catchment management. The paper highlights the cultural significance of rivers and water in selected northern regions, and provides a preliminary outline of research and management priorities as determined by key northern Australian Aboriginal land management organizations.' (Jackson, Storrs and Morrison 2005: 105)	River, riparian habitats	Literature review	Economic, spiritual, social	'Priorities include developing the capacity for collaborative aquatic resource management, conservation of traditional ecological knowledge, riparian resource inventories and threat assessment, as well as improved Aboriginal participation in catchment management and water policy.' (Jackson, Storrs and Morrison 2005: 105)  'Three suggestions are made to improve the level of understanding of Aboriginal ecological knowledge and the effectiveness of Aboriginal participation in land and water resource management: (i) support for community-based initiatives; (ii) 'twoways' research methodologies; and (iii) innovative regional management structures. (Jackson, Storrs and Morrison 2005: 107)		

Project name	Study Area	Relevant Aboriginal Stakeholders	Aim of Project	Types of Water Assessed	Methodology	Cultural domain of water identified	Outcomes of Project	Methodological Limitations	Comments
<b>Jackson, S. 2006. Recognising and Protecting Indigenous Values in Water Resource Management. A Report from a Workshop held at CSIRO in Darwin, NT. CSIRO Sustainable Ecosystems, April 2006.</b>	Daly River region	The majority of people were from the Daly River Aboriginal Reference Group as well as interstate visitors from the Murray Lower Darling Indigenous Nations and the Miriwiung Gajerrong people of the east Kimberley.	<ul style="list-style-type: none"> <li>• To have a good discussion about water issues</li> <li>• For northern Australian Aboriginal groups, especially from the Daly River, to hear about the experiences of other groups, e.g. from the Murray Darling, and vice versa</li> <li>• To think about environmental policy, especially water management, and how it can work for Indigenous people</li> <li>• To talk about the words 'cultural values', how they are being used and whether they reflect Indigenous values</li> <li>• To talk about rivers and water reforms: what worries people about the changes and are there opportunities, or good parts, to the changes</li> <li>• To talk about ways Indigenous people can document their values, promote them and be involved with governments and other groups e.g. catchment management groups' (Jackson 2006b: 7)</li> </ul>	Riverine, estuarine, wetlands, floodplains, coastal zone, subsurface	Focus group, consultation	Economic, spiritual, social	'This workshop represented the first step in a dialogue that Indigenous groups in northern Australia need to have with each other, and with other sectors of Australian society, in order to overcome the neglect of their interests from the national water reform agenda. For the first time in the context of national changes to the use, regulation and management of water, a number of Indigenous people came together to discuss common issues and progress regional priorities. A firm recommendation arising from the workshop was for more such meetings and discussions, preferably in the bush...' (Jackson 2006b: 23).	'We were satisfied with the reasonable balance of people from various backgrounds. Aboriginal people were in the majority which, in our view, made a difference to the conduct and course of the meeting and the degree of attention given to issues of interest to the Indigenous participants' (Jackson 2006b: 6). The majority of people were from the Daly River Aboriginal Reference Group as well as interstate visitors from the Murray Lower Darling Indigenous Nations and the Miriwiung Gajerrong people of the east Kimberley. This ensured a good mix of perspectives at the workshop.	Water management and care of waterways is important to all involved

Project name	Study Area	Relevant Aboriginal Stakeholders	Aim of Project	Types of Water Assessed	Methodology	Cultural domain of water identified	Outcomes of Project	Methodological Limitations	Comments
Jackson, S. and O'Leary, P. 2006. Indigenous Interests in tropical Rivers: Research and management Issues. A Scoping Study for Land & Water Australia's Tropical Rivers Program. Unpublished Report Prepared for the North Australian Indigenous Land and Sea Management Alliance, March 2006. CSIRO Sustainable Ecosystems, Darwin, NT.	Top end of the NT, Roper River and McArthur River regions (Gulf of Carpentaria). Daly River	Ngukurr and Borroloola	<p>The goal of the Tropical River's Program is: 'To undertake research and knowledge exchange to support the sustainable use, protection and management of Australia's tropical rivers' (Jackson &amp; O'Leary 2006: 13).</p> <p>The Tropical Rivers Program has four research themes: '• Assess river assets and threats; • Support regional planning frameworks; • Assess social, cultural and economic values, and • Understand river ecosystems' (Jackson &amp; O'Leary 2006: 13)</p>	Rivers, wetlands, floodplains and estuaries	Literature review, interviews, consultation	Economic, spiritual, social	<p>This study was also seen by NAILSMA as a means of helping it to better understand the issues across the north and to shape its activities in the years to come, as well as those of Land &amp; Water Australia (LWA). 'We hope this report will serve to assist LWA, NAILSMA and other river research organisations to significantly advance the rates and effectiveness of Indigenous participation in river research, planning and management in the tropics' (Jackson &amp; O'Leary 2006: 7).</p> <p>'This report outlines a number of priority areas of research interest arising from the literature reviewed and the interviews of representatives or nominees from Indigenous organisations. They fall under two major themes:</p> <ul style="list-style-type: none"> <li>• The need for a sound understanding of the current condition of river and wetland environments and their contemporary role in meeting the subsistence and spiritual needs of Indigenous communities. Increased pressure on resources, places, and sites is felt by many groups who wish to better understand the drivers of change and the consequences for their communities.</li> <li>• The need for more effective resource governance arrangements, management models and engagement methodologies. In particular research with an action research orientation that seeks to work directly with communities in identifying problems and addressing information and knowledge needs.</li> </ul> <p>The report makes three specific recommendations to LWA to improve the rates and quality of research conducted in partnership with Indigenous communities:</p> <ol style="list-style-type: none"> <li>'1. That the LWA Board considers ways of ensuring high ethical standards in the research it sponsors where Indigenous people are involved, including research conducted by Indigenous organisations. It is suggested that the guidelines developed by AIATSIS should be adopted as a basis for satisfying LWA's human ethics requirements.</li> <li>2. In recognition of the importance of early engagement with Indigenous communities and the under-resourced nature of Indigenous organisations, that LWA consider mechanisms for bringing researchers and Indigenous organisations together to discuss and negotiate research project ideas.</li> <li>3. Given that the opportunity for Indigenous participation in research is a key ingredient in successful arrangements and relationships nominated by people consulted during this study, LWA should consider tailoring its investments to encourage LWA sponsored researchers to work collaboratively with Indigenous organisations in the tropical rivers region. Training and employment of Indigenous people and effective consultation processes are expensive and time consuming. For example, some funds could be dedicated to projects that demonstrate a very high degree of participation by Indigenous communities.' (Jackson &amp; O'Leary 2006: 10)</li> </ol>	<p>'We believe that the organisations covered in the report are a suitably representative subset of Aboriginal organisations involved with these issues across the study region. It is important to note however that the report did not set out to capture the views of every Aboriginal person or organisation in the region, nor would it have been practical to do so, given the project's constraints' (Jackson &amp; O'Leary 2006: 7). 'A general scepticism towards research is evident in some sectors of the Indigenous community' (Jackson &amp; O'Leary 2006: 9).</p>	<p>'The field of Indigenous land and water management is rapidly growing and in regions such as the Kimberley, the pace of change is marked. The funding base is inadequate and insecure and this limitation is a source of consternation to many Indigenous organisations surveyed. Short time-frames, piecemeal approaches, constantly shifting eligibility criteria, burdensome reporting requirements and the lack of recurrent core funding constrain the Indigenous sector in its efforts to respond to environmental problems and meet the social and cultural responsibilities of Indigenous community members.</p> <p>'This constraint should also be a cause for concern for research organisations for whom a representative Indigenous organisation is often a prerequisite for negotiating a research agreement or relationship with an Indigenous community' (Jackson &amp; O'Leary 2006: 9).</p>

Project name	Study Area	Relevant Aboriginal Stakeholders	Aim of Project	Types of Water Assessed	Methodology	Cultural domain of water identified	Outcomes of Project	Methodological Limitations	Comments
							A standard of paying Indigenous people for their expertise and participation in research activities could then become embedded in research practice.' (Jackson & O'Leary 2006: 10).		



Project name	Study Area	Relevant Aboriginal Stakeholders	Aim of Project	Types of Water Assessed	Methodology	Cultural domain of water identified	Outcomes of Project	Methodological Limitations	Comments
<b>Cooper, D. and Jackson, S. 2008. Preliminary Study on Indigenous Water Values and Interests in the Katherine Region of the Northern Territory. Report Prepared for NAILSMA's Indigenous Water Policy Group, March 2008. CSIRO Sustainable Ecosystems, Darwin, NT.</b>	Catchment area of the Katherine River	Jawoyn and Wardaman Associations support the reports conclusions.	'The study aims to describe the social arrangements and cultural practices relating to water and to document the Indigenous knowledge of groundwater and surface water sources held by cultural groups in the vicinity of the regional centre of Katherine.'(Cooper & Jackson 2008: 3)	groundwater and surface water	Literature review, physical survey, consultation	Economic, spiritual, social	'The report finds that Aboriginal rights and interests in water in the study area are in part a product of the history of Aboriginal occupation and use of land, which has been influenced by a number of environmental, cultural and historical factors.' (Cooper & Jackson 2008: 3) The study also makes ten recommendations relating to future water research in Katherine: 1. Rehabilitation and remediation of damage 2. Facilitate traditional knowledge recording and transmission 3. Assistance for under-resourced Aboriginal communities 4. Damage to cultural water sites on pastoral lands [should be identified and remedied] 5. Caring for country activities on non-Indigenous lands 6. Assistance for Aboriginal bodies to engage with water planning processes 7. Heritage legislation and native title [require further research and consideration in relation to the project area] 8. Including Aboriginal access to cultural water sites as an objective of Water Allocation Plans: 9. Aboriginal commercial water needs [must be considered] 10. Establish an Aboriginal Values Implementation Group to oversee monitoring and revise interim monitoring measure for impact on Aboriginal values (Cooper & Jackson 2008: 64-65)	'From the outset it was acknowledged that, due to its limited scale and scope, the project could not provide a comprehensive picture of culturally significant water resources in the study area and the customary relationships relating to such resources. Instead, the study could most usefully provide an outline of the range and nature of such resources and relationships through interviews with key individuals and selected case studies and field visits. The resulting cultural data was augmented with material from published and unpublished studies, reports and transcripts relating to the area, including the Jawoyn (Katherine Area) Land Claim.' (Cooper & Jackson 2008: 11).	'Report does not purport to represent the the views of other Aboriginal groups in the... regions...for example, the Daly Aboriginal Reference Group, and the Northern Land Council' (Cooper & Jackson 2008: 2). 'The country in between Jawoyn and Wardaman lands comprises the traditional lands of the Dagoman' (Cooper & Jackson 2008: 10). Many Traditional Owners outside of Jawoyn and Wardaman were interviewed as part of the process.

Project name	Study Area	Relevant Aboriginal Stakeholders	Aim of Project	Types of Water Assessed	Methodology	Cultural domain of water identified	Outcomes of Project	Methodological Limitations	Comments
<b>Rea, N. and the Anmatyerr Water Project Team. 2008. Provision for Cultural Values in Water Management: The Anmatyerr Story. Land and Water Australia Final Report, February 2008.</b>	Ti Tree region	This project involved Anmatyerr tyerrty (people)	"The aim is to maximise the outcomes for Anmatyerr people, land and water in the near future. The aim was to give authority but not visibility to the extensive, rich and active Anmatyerr Law and knowledge about water in the same way other sectors command rights while maintaining privacy.' (Rea & the Anmattyer Water Project Team 2008: x)	Surface and subsurface	Consultation, physical survey	Economic, spiritual, social	The Project describes the context of water governance in Australia, the NT and Central Australia. A comprehensive methodology for conveying cultural values and cultural provisions of water includes steps: ie research process; engagement; culturally based livelihoods; intercultural capacity; and research embedded in practice. Cultural water values were placed into 5 categories: Law; Responsibilities and Protocols; Economies, Environment and Education; Recreation and Well being; and History of People and Place. Recommendations for cultural water provisions were a) volumetric through an allocation for consumptive us and non-consumptive use of surface water and groundwater; and importantly b) non-volumetric through a wide range and number of mechanisms that were also placed into 5 categories: 1. Anmatyerr Names (eg Importance of language, place names); 2. Anmatyerr Protocols (a new Anmatyerr organisation); 3. Access, Land Management and Coexistence (eg Access, Grazing, Dialogue, Legislation; Respect); 4. Livelihoods and Skills Exchange (Cultural Framework, Cultural and Natural Resource Management; Young people; Success indicators; Partnership projects; Anmatyerr enterprises); 5. Governance and Participation (Equity between two systems of Law; Collaborative arrangements; guiding principles; Membership and representation; Anmatyerr Kwaty Agreement). A model for livelihoods in water management and protection of cultural values was further developed in Rea and Messner (2008).		'The five key elements of cultural water values were: Law; Responsibilities and Protocols; Economies, Environment and Education; Recreation and Well Being; and History of People and Place. The five overarching ways to provide for these values were: Water Allocation; use of Anmatyerr Names and Protocols; Access, Land Management and Coexistence; Livelihoods and Skills Exchange; and Governance and Participation.' (Rea & the Anmattyer Water Project Team 2008: x-xi) 'Decisions are being made about water on a regular basis in desert Australia, yet Aboriginal people are not always participating effectively, or having their rights to water and cultural values recognised in governance arrangements and decisions. This has been the situation in the Ti Tree or Anmatyerr region to date' (Rea & the Anmattyer Water Project Team 2008: 4).

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<b>Altman, J.C and Branchut, V. 2008. Fresh Water in the Maningrida Region's Hybrid Economy: Intercultural Contestation Over Values and Property Rights. CAEPR Working Paper 46/2008. Prepared by Centre for Aboriginal Economic Policy Research. Canberra.</b>	Maningrida region, Arnhem Land	Kuninjku/Bininj Kunwok and the Yolngu	'This working paper focuses on fresh water in the Maningrida, north-central Arnhem Land regional economy, and describes the results of one of the case studies undertaken during 2007 and completed in 2008. Each case study has a different emphasis. This one focuses on the issue of fresh water and the hybrid economy.' (Altman & Branchut 2008: v)	surface and subsurface	Literature review, interviews	Economic, social, historical	<p>Makes five recommendations 'to ameliorate potential water conflict in the Maningrida region' (Altman &amp; Branchut 2008: 32).</p> <ol style="list-style-type: none"> <li>1. 'need to resolve the legal status of water ownership in the Maningrida region.'</li> <li>2. 'need to start a dialogue with local traditional owners and their mediating organisations about future possible water governance in this region.'</li> <li>3. 'might be helpful to take a longer term view on the contributions to the maintenance of water quality and associated biodiversity that the activities of Aboriginal people living on country fulfil.'</li> <li>4. need to ensure consistency in frameworks between Maningrida township and outstations, especially as people move on an almost constant basis between them.</li> <li>5. 'lack of consistency between township and outstations could prove extremely problematic if any attempt was made to introduce a user pays system in Maningrida ... Consideration should be given to enabling traditional owners to establish their own water corporation as an economic or social enterprise.' (Altman &amp; Branchut 2008: 32-34).</li> </ol> <p>'The analysis has highlighted that much of the complexity of water issues in this region can be attributed to a range of inter-linkages that take us beyond any simplistic and false binaries: in this region it is not simply pre- or post-colonial; western or Aboriginal; customary or market; township or outstation; commercial or cultural; consumptive or non-consumptive water pools. Rather it is proposed that there are a range of economic and institutional inter-linkages that are captured by the term 'intercultural'' (Altman &amp; Branchut 2008: 34).</p>	<p>'This methodology has a number of shortcomings that should be noted:</p> <ul style="list-style-type: none"> <li>• The published and available unpublished literature on the Maningrida region is so voluminous that it cannot be comprehensively covered here, so an attempt has been made to be both strategic and selective in choice. For example, in discussing the customary economy the focus is principally on two sites, Kopanga (Meehan 1982) and Mumeka (Altman 1987, 2003a)—one coastal, one riverine. Similarly, in discussions of the cultural significance of water in ceremony and art, only a few cases have been selected.</li> <li>• While the study was conducted under the auspices of an outstations resource agency (BAC), research has sought to focus broadly on all regional interests. While historically I have worked primarily with the Kuninjku language community whose lands lie to the south-west of Maningrida, field research reported here is broadly representative of the members of numerous language groups who were interviewed.</li> <li>• While an attempt is made to place this research in an important regional historical context, this history is by necessity extremely simplified, focusing only on key events in the colonial and post- colonial periods.' (Altman &amp; Branchut 2008: 4)</li> </ul>	

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<b>Armstrong, R. 2008. An overview of Indigenous Rights in Water Resource Management. Published by the North Australian Indigenous Land and Sea Management Alliance on behalf of the Indigenous Water Policy Group.</b>	Onshore waters (on and under the land) and offshore waters across Australia.	Australia wide, no specific Aboriginal group, although document produced with guidance from the Lingiari Foundation Inc.	Provide an overview of the current status of Indigenous involvement in the way that water is managed and governed	Onshore and offshore	Literature review	Economic	This overview highlights that Aboriginal groups are increasingly being involved in the management of water in Australia	Appears to be a literature review only. Consultation with Aboriginal groups for their perspective may have painted a different picture.	Although this isn't a project as such that Aboriginal people have been involved in - it does provide a relevant overview or their involvement in discussions about water management in general across Australia.

Project name	Study Area	Relevant Aboriginal Stakeholders	Aim of Project	Types of Water Assessed	Methodology	Cultural domain of water identified	Outcomes of Project	Methodological Limitations	Comments
<b>Woodward, E., Jackson, S. and Straton, A. 2008. Water Resources of the Howard River Region, Northern Territory: A Report on the Social and Cultural Values and a Stakeholder assessment of Water Use Scenarios. CSIRO Sustainable Ecosystems: Darwin.</b>	Howard River	Larrakia Nation	<p>'This report describes the results of social research designed to inform the plan, with two primary aims:</p> <ol style="list-style-type: none"> <li>1. To document the social use and importance of Howard River water resources and aquatic environments to Indigenous and non-Indigenous groups (e.g. hunters, plant enthusiasts, Landcare groups, recreational fishers), including: The use of surface water and groundwater resources by Indigenous traditional owners and by others with an interest in the cultural values, as defined by the beneficial use concept of the <i>Water Act 1992</i> (NT); Community perceptions of change in environmental condition and use, and perceived threats to valued resources, places and traditions or beliefs, and</li> <li>2. To identify and assess the relative significance of resource impacts possible under different water resource use scenarios, including stakeholder perspectives on the means of protecting or enhancing social and cultural values through water resource management.</li> </ol> <p>An allied aim was to increase community capacity and enthusiasm to participate in water resource management research and planning by facilitating stakeholder input into the research underpinning the identification of the water and flow requirements of user groups' (Woodward, Jackson &amp; Straton 2008: 8).</p> <p>'The overarching objective of this project required that we gain an understanding of the way in which potential changes to water use in the greater Darwin area might affect the social and cultural values of the Howard River catchment' (Woodward, Jackson &amp; Straton 2008: 112).</p>	'The study area is characterised by extensive wetland systems, including the Howard River and its tributaries, springs, swamps, floodplain areas and lagoons. Surface water features include lakes, lagoons, wetlands and streams' (Woodward, Jackson & Straton 2008: 8).	Literature review, consultation	Economic, spiritual, social	<p>'During this stage of the project the researchers witnessed an emerging awareness among stakeholders that the interests of all water users are inextricably linked in managing the quantity and quality of this limited and shared resource. This realisation focused attention on the relationship between land use planning and water planning. Discussions about water use and management revealed a clear need to improve our knowledge base, to know precisely how much water is available, and how the hydrological system works, particularly rates of re-charge. There are many unregulated bores and improvements to be made to the monitoring of water use in the region.</p> <p>Given the importance of groundwater resources to the local economy, there is a particular need for further scientific effort to better understand the connectivity between surface and groundwater resources and for connected systems to be managed as a single resource.</p> <p>The research found that there are multiple and diverse social and cultural values of water being realised and practiced in the Howard River region. These include nature appreciation, education, indigenous hunting and gathering and non-indigenous hunting, fishing, motorsports, swimming, picnicking, the teaching and transfer of knowledge, exploring, boating, kayaking and canoeing, historical and archaeological appreciation, as an inspiration for art, craft and photography and research. Members of the community are actively managing wetlands and waterways within the region, demonstrating strong ownership and custodianship over public and private lands that contain these water places.</p> <p>However demands on groundwater are already compromising the realisation of some social and cultural values, including the perceived threat of bores and groundwater pumping to wetlands for hunting, and the reduced flow of the spring at Howard Springs, a popular picnic area, leading to reduced water quality and its subsequent closure to swimming.</p> <p>The workshops held for the deliberative multi-criteria evaluation determined that while there was a range of opinions about the importance of certain criteria to a preferred outcome for the region, there was overwhelming agreement among participants in wanting to see the catchment's environmental condition maintained and improved in order to sustain the diverse social and cultural values appreciated by many. Participants acknowledged that this scenario was unlikely if current trends for water use, land sub-division and uncoordinated planning were to continue' (Woodward, Jackson &amp; Straton 2008:10-11).</p>		There are many stakeholders represented in this report - not just Traditional Owners.

<p><b>The North Australian Indigenous Land and Sea Management Alliance 2009b. 'Standing Together for Water Rights'. North Australian Indigenous Experts Water Forum Report. Darwin, Charles Darwin University.</b></p>	<p>Top end of the NT</p>	<p>The Northern Land Council</p>	<p>'NAILSMA supports Aboriginal and Torres Strait Islander land and sea management using strategic approaches to care for country with an emphasis on practical management by Traditional Owners across north Australia.' (North Australian Indigenous Land and Sea Management Alliance 2009b: ii) 'This forum provided an opportunity to raise ideas and concerns about economic development and opportunities; potential impacts of development in north Australia; governance and institutional arrangements as they affect Indigenous community interests, aspirations and issues.' (North Australian Indigenous Land and Sea Management Alliance 2009b: 4)</p>	<p>Rivers, floodplains, lakes, sea, wetlands</p>	<p>Focus group, consultation</p>	<p>Economic, spiritual, social</p>	<p>'The four outcomes of the Forum were:</p> <ul style="list-style-type: none"> <li>• the Mary River Statement of intent, that is consistent with other declarations of Indigenous land, sea and water managers, such as Garma International Indigenous Peoples Water Declaration</li> <li>• Principles to guide water policy and management</li> <li>• Recommendations for water reform and management; and</li> <li>• the election of an Interim Working Group to engage other interest groups to develop partnerships that promote understanding, recognition and common goals'. (North Australian Indigenous Land and Sea Management Alliance 2009b: 17)</li> </ul> <p>Recommendations</p> <p>'1. That new ways to deal with government need to be created, such as a new authoritative, statutory governance arrangement between governments and north Australian Traditional Owners to be established and supported. This could include the establishment of Regional Basin authorities in north Australia, or an Indigenous Water Commission.</p> <p>2. That the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) be used as the benchmark for establishing and building a new legal and cultural framework for doing business between governments, enterprises and north Australian Indigenous people.</p> <p>3. That membership and governance of NAILSMA be expanded to include Prescribed Body Corporates with the intent of returning authority back to Traditional Owners living and working on country as part of building sustainable livelihoods.</p> <p>4. That NAILSMA, the Northern Australia Land and Water Taskforce and land councils facilitate a broader forum across north Australia, that would, among its tasks, establish a set of guiding principles for governments to support the Interim Working Group elected at this Forum, and their efforts to advocate for Indigenous people's rights to water.</p> <p>5. That the uses of water as a northern Indigenous economic development opportunity through sustainable practices, be vigorously investigated; and that clearly defined culturally relevant geographical boundaries of north Australia be developed.</p> <p>6. That all water policy and legislation is enacted in accordance with relevant Indigenous national and international laws and policies.</p> <p>7. That a communication strategy be developed to ensure that Indigenous communities are able to actually participate and are fully informed on water policy issues and opportunities; and that the strategy includes requirements for institutional feedback to community for a two-way approach.</p> <p>8. That the Native Title Act be amended to include water as a commercial use right to negotiate (other than just a customary use right), and this be included in other local, state, federal and international laws, codes and protocols.</p> <p>9. That other interest groups be engaged to develop partnerships that promote understanding, recognition and a common goal in water use and management.</p> <p>10. That the diversity, different needs and aspirations of urban, remote and all regional areas be considered in any consultations and decisions.'(North Australian</p>	<p>Productive meeting in which the interim working group was elected with two members each from WA, NT and QLD</p>
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							Indigenous Land and Sea Management Alliance 2009b: 21).		

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<b>Craig, D., Hancock, D., Rea, N., Gipey, C., Penangk, E. Nabangardi, J. and Scrutton, T. 2009. An Agreement Approach that Recognises Customary Law in Water Management. Land &amp; Water Australia Final Report.</b>	Anna's Reservoir Conservation Reserve/Mer Ngwurla	Anmatyerr	'The explicit emphasis was on recognition of customary law in natural resource management and customary law institutions through a negotiated agreement. The objective of this project was to develop a bi-cultural approach for governance of water through the use of an agreement that reflects both western and customary laws and protocols for managing natural resources, especially water.' (Craig et al. 2009: 3)	reservoir	Literature review, consultation, interviews	Economic, spiritual, social	'Anmatyerr people raised the need for greater protection of, and access to the rock hole Mer Ngwurla and surrounding country during research activities of the wider Anmatyerr Water Project. The lack of management in terms of cultural and ecological heritage and the missed opportunities at this place were repeatedly raised in discussions about regional water management. Anmatyerr people explicitly stated their wish to be actively involved in management decisions that concerned this site of significant cultural and heritage value and to take a lead role in the absence of other authorities and activities. Some of the concerns of the Anmatyerr traditional managers included the degradation of this large rock hole from algal blooms, and stock and wildlife during dry periods, and difficulties with access to undertake caring for country responsibilities. The opportunity for a good outcome was clear given the interest and activity of the local parties. 'Land and Water Australia provided the funding for the research team to develop a governance of water agreement that connects western and customary management approaches. This would be an agreement model additional to alternative options such as Indigenous land use agreements and joint management frameworks being progressed by representative and government bodies. The intention was to develop an approach that local parties could adopt quickly and effectively. Overarching issues of tenure, ownership and processes of regulatory and legal responsibilities are essential in contested situations but are better circumvented where local parties can reach agreement.' (Craig et al. 2009: 27) 'This project highlights the importance of negotiated approaches, even in the most difficult and frustrating circumstances. It allows capacity building, development of a knowledge base and the establishment of protocols, best practice and working arrangements. These may not need to be formalised in a legally-binding agreement or aspects may become part of a later agreement, such as an Indigenous land use agreement. The most important lesson is that communities and stakeholders can take the lead and not have to wait for government to begin the process of agreement making and livelihood creation. It is hoped that some of these initiatives will be expanded when the plan of management for Anna's Reservoir is reviewed.' (Craig et al. 2009: 36)	'The process proved to be difficult and time consuming because of the exceptional demands being placed on a small and poorly resourced region. This included resource-poor management agencies with other priorities and a sense of ownership of all negotiations with Indigenous people. Anmatyerr people are also extremely poorly resourced, in part due to the lack of an Anmatyerr organisation. Anmatyerr people face major issues daily, such as the failure of their drinking water supplies, ill-health, poor transport and a lack of food options. During the project the rare earth and uranium mine proposal for this local area also diverted attention and catalysed questionable responses by agencies who appeared to feel threatened by the empowerment of Anmatyerr people. Inadequate understanding by the main host institution (Charles Darwin University) about the project and implementation of remote Indigenous research projects contributed to destabilising progress with the research.' (Craig et al. 2009: 35)	



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<b>Jackson, S. and Altman, J. 2009. Indigenous Rights and Water Policy: Perspectives from Tropical Northern Australia, Australian Indigenous Law Review, 13(1): 27-48.</b>	Arnhem Land to Katherine region	Australia wide - Northern Australia focus via case studies from the Maningrida (Bawinanga Aboriginal Corporation) and Katherine (Jawoyn Association and Wardaman Association) regions in the Northern Territory.	‘[T]o articulate [through case studies] issues relating to water rights, use and management by Indigenous people.’ (Jackson and Altman 2009: 32) To raise awareness of the implications of broad state goals of Aboriginal socioeconomic improvement (or 'closing the gap') and the recent shift to a market-based approach in relation to water. 'The focus of the project is on learning more about the circumstances of tropical Indigenous Australia, and is targeted at research into local socioeconomic and institutional contexts to provide evidence-based research of value to broader policy processes.' (Jackson and Altman 2009: 32)	surface and subsurface; Katherine river system; springs; Tindale aquifer;	Literature review, consultation	Economic, spiritual, social	Highlights that 'Indigenous cultural and spiritual understandings about water are still misunderstood or simply ignored by dominant societies' and that 'Indigenous communities are not being engaged meaningfully in water policy and planning processes' (Jackson & Altman 2009: 41).  'This problem is not merely one of failed engagement; it is rather that the orthodox natural resource management approaches are premised on the wrong paradigm and need to shift from consultation to negotiation and collaborative management.' (Jackson & Altman 2009: 41-42). '[T]he two case studies highlighted in this study reveal two general issues that warrant closer attention and further consideration in water policy-making and planning: ... imposing a Western water management frame onto Indigenous stakeholders will not result in either efficient or effective outcomes in water management and planning ... Management processes need to create the space for exchange of ideas and dialogue around differing cultural perspectives on water, its broader social meaning and value, as well as how to equitably share in its direct use and economic benefits.' Secondly, water management policies should 'be shaped to address social justice concerns, particularly Indigenous disadvantage, and to ensure more inclusive and equitable remote area development ... In the implementation of Australian water reforms, attention needs to be given to affording Indigenous stakeholders an equitable, or even principal, interest in water vis-à-vis other stakeholders with historical, as well as future, entitlements. The distinct Indigenous intercultural interests in water, which often encompass non-market values, need to be included in any new system that seeks to either facilitate or establish market-based approaches. Provision needs to be made by the Australian state for relatively impoverished Aboriginal land owners to have adequate access to water for their interrelated consumptive and non-consumptive, or commercial and enviro-cultural, purposes.' (Jackson & Altman 2009: 43)		

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<b>Department of Land Resource Management 2009. Water Allocation Plan – Tindall Limestone Aquifer, Katherine. DLRM, Northern Territory.</b>	Tindall Limestone Aquifer	Jawoyn, Wardaman and Dagoman	'The purpose of this Plan is to initiate strategies for sustainably allocating and managing water from this water source. These strategies, as detailed in Clause 18 were created by assessing: (i) water availability in the context of climatic variability and community, environmental and Indigenous cultural needs; (ii) community response to the economic opportunities associated with the use of this water source, including consumptive uses such as agriculture, industry and public water supply and non-consumptive uses such as tourism and recreation; (iii) opportunities and needs arising from growth in existing and emerging activities, including economic development opportunities for Indigenous landowners.' (Department of Land Resource Management 2009: 13)	aquifer	Consultation	Economic, Spiritual, social	Part of a much larger plan that recognises Aboriginal rights to water. This document sets out how the water will be allocated from the Tindall aquifer. Section C deals with Protection of Environmental and Indigenous Cultural Values '(i) This Plan assumes that the provision of discharge from this water source to maintain flows in the Katherine and Daly Rivers will maintain aquatic ecosystems and groundwater dependant riparian and terrestrial vegetation; (ii) Despite subclause (i), it is recognised that specific environmental water requirements may be required in addition to the maintenance of river base flows and any research that becomes available in this regard will be considered as part of the review process specified in Part 8; (iii) This Plan assumes that provision of discharge for environmental protection will also maintain the condition of places that are valued by Indigenous people for cultural purposes; (iv) Despite subclause (iii), it is recognised that cultural flow requirements may not align entirely with environmental requirements and any research that becomes available in this regard will be considered as part of the review process specified in Part 8.' (Department of Land Resource Management 2009:18). Performance Indicators include: Identification of methodology to quantify water requirements for Indigenous cultural purposes ' (Department of Land Resource Management 2009:19). Outcomes include: '5. Water dependent sites with identified Indigenous cultural importance, ... are preserved'(Department of Land Resource Management 2009:21). Strategies include: 'Through engagement and research identify sites of Indigenous cultural importance which are dependent on water from the Tindall Aquifer, and assess essential water requirements. To be detailed in an Implementation strategy to this Plan ... Through engagement increase understanding of the importance of the Tindall Aquifer to Indigenous people. To be detailed in an Implementation strategy to this Plan' (Department of Land Resource Management 2009:21).		Government plan recognises Traditional Owners' rights to have a say on the water strategy of the area. Community groups are encouraged to assist in the development and develop and improvement of future management of the Tindall Limestone Aquifer, through the Tindall Limestone Aquifer (Katherine) Water Implementation Strategy (Department of Land Resource Management 2009: 12).

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<b>Hoverman, S., Ayre, M., Tan, P. &amp; Jackson, S. 2010. Planning for Tiwi Water Resources Future, Waterlines, 37:283-382.</b>	Northern Australia	Tiwi People, Tiwi Islands, NT.	The development of a 'water resource strategy'. A holistic approach to managing the water would be applied, in which water management is seen in a broader context of land management issues. 'This holistic approach also reflects the Indigenous worldview of interconnectedness between the natural, cultural and social environment' (Hoverman et al. 2010: 290).	Soaks, springs, streams, rivers, billabongs, swamps, waterholes	Consultation	Economic	The project succeeded in 'developing and trialling tools to facilitate the initial steps in the development of a water sharing plan' (Hoverman et al. 2010: 347). Of the seven stages of water sharing plan development, this project succeeded in assisting the Tiwi people undertake steps 1 and 2. These are planning initiation (organising the planning itself) and situational analysis (looking at current status of resources as well as potential risks, opportunities and benefits).	As this was a pre-emptive study (there is currently no pressure on the water resources of the Tiwi Islands), the participants often found it difficult to conceive the purpose of the project. Women were underrepresented in the engagement activities. 'Throughout most of the pilot, this was interpreted as a failure to make contact with and provide sufficient incentives to women to encourage their attendance' (Hoverman et al. 2010: 359). Poor communication and transport infrastructure meant that engagement with the Tiwi customary owners was restricted.	
<b>Barber, M. &amp; Jackson, S. 2011b. Indigenous Water Values and Water Planning in the Upper Roper River, Northern Territory. Unpublished Report Prepared for the National Water Commission, November 2011. CSIRO.</b>	Upper Roper River	The majority of these people were from or strongly related to the Mangarrayi, Yangman, and Wubulawun language groups as well as people with connections to the Beswick Land Trust area, and a significant number were members of the Mataranka Traditional Owner Water Allocation Reference Group (Barber & Jackson 2011b: 3)	1 - 'document Indigenous people's water values and seasonal and hydrological knowledge in the upper Roper area' 2 - 'document Indigenous people's views about and understanding of water planning processes and their objectives'. 3 - 'suggest implications for water planning processes of those values and knowledge' 4 - 'make recommendations for future water plans in the general northern Australia context (Barber & Jackson 2011b: 2-3)	Rivers, creeks and pools	Interviews	Economic, spiritual, social	The study found that the 'values and interests expressed by Indigenous people in the upper Roper are consistent with the values and interests expressed by Indigenous people reported elsewhere in the literature' (Barber & Jackson 2011b: v). 'evidence of a range of practices, protocols and prohibitions with respect to water, ... [and] clear statements about the ongoing value of hunting and fishing to contemporary life.' (Barber & Jackson 2011b: 50) two features of the archival and ethnographic record for the area are: – 'significance of riparian vegetation, particularly large trees growing at major water sites, and their association with past and present individual people ....implies an additional layer of meaning and significance for riparian vegetation, in a contemporary water planning context it suggests that some additional management effort with respect to that vegetation may need to be considered.' (Barber & Jackson 2011b: 50) – 'traditional practice of the construction of weirs in the upper Roper' (Barber & Jackson 2011b: 50) these features 'represent different aspects of Indigenous relations with water, incorporating spiritual, cultural, historical, economic and physical dimensions.' (Barber & Jackson 2011b: 50) There is a 'multifaceted role for Indigenous water governance with respect to contemporary water planning [including] ... some form of co-management model which takes a more holistic account of Indigenous involvement is required to meet the challenges of water planning and governance in the upper Roper. Successfully enacting such a model will require capacity building in both Indigenous and non-Indigenous communities (Barber & Jackson 2011b: 51)	35 - 40 people were interviewed, with only 15 of these being Aboriginal people.	Water bodies are used for territorial boundaries, as well as hunting. Aboriginal people have strong cultural connections to water bodies, including the Roper River.
<b>Finn, M. &amp; Jackson, S. 2011. 'Protecting Indigenous Values in Water Management: A Challenge to</b>	Northern Australia	Australia wide; Northern Australia focus	There is a need to adapt flow assessments to account for linkages and dependencies between people and rivers (i.e. socio-ecological linkages), as opposed to the current	Rivers, floodplains, swamps, streams	Literature review	Economic, spiritual, social	This paper uses the Ecological Limits of Hydrological Alteration (ELOHA) framework as an example of how Environmental Flow Assessments (EFA) methods can 'more adequately incorporate indigenous values into flow management' (Finn and Jackson 2011: 1233). It	There is a risk that Indigenous values may be adopted or incorporated as a relatively fixed set of propositions, whereas in In	'Qualitative research could be undertaken as a scoping exercise to identify key

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<b>Conventional Environmental Flow Assessments', Ecosystems 14: 1232-1248.</b>			<p>focus on meeting ecological needs of river systems. Finn and Jackson (2011) propose three challenges to improve the ability of water resource planning to address indigenous interests:</p> <ul style="list-style-type: none"> <li>• [T]o recognize that in an indigenous context, a different suite of species may be considered important when compared to those of other stakeholders – for example, customary use is often dependent upon common and widespread species vs those species of importance in terms of conservation and rarity</li> <li>• [T]o accommodate a different set of management objectives in environmental flow allocation – ie. to meet hunting and fishing activities at rates that are socially and economically sustainable</li> <li>• [T]o take into account indigenous worldviews and the quality of people-place relationships that are significant in indigenous cultures' (Finn and Jackson 2011: 1232)</li> </ul>				<p>cites Altman and Branchut (2008: 2) which refers to the Aboriginal view that water is a resource with inseparable cultural and economic values, often with high religious and livelihood values vs. western notions of water as a resource with competing commercial and environmental /recreational values. Points to the need for multi-disciplinary efforts to examine differences in world view between human groups, which in turn effects the interrelationships that create systems of value. (Altman &amp; Branchut 2008)</p> <p>If EFAs are to be more inclusive of indigenous values and thereby provide greater protection of indigenous interests, concerted research, experimentation and cross-cultural engagement will be required. Our early research shows that indigenous values and uses of aquatic systems can be quite distinct from the benefits derived by non-indigenous people. (Finn and Jackson 2011: 1246)</p>	reality such values will always be dynamic in nature.	<p>indigenous issues. In many cases, even values conventionally perceived to fall outside the scope of environmental flows, such as creation stories about a site and custodial responsibilities like calling to ancestors upon approaching a site can be linked back to flow regimes. A qualitative understanding of people–place relationships during environmental flow assessments may provide opportunities to formally support indigenous customary management practices in subsequent water plan implementation and to mitigate any adverse effects arising from flow alteration.'</p> <p>(Finn and Jackson 2011: 1241)</p> <p>'Environmental water management practices, including scientific assessments, should allow for the actualization of complex and distinct values; requiring of course the appropriate resourcing of long-term processes that maintain, affirm, and, in some cases, restore and enhance, indigenous relationships with water and water bodies (Barber and Jackson 2010). Indigenous participation in long-term monitoring of environmental flow outcomes could</p>

Project name	Study Area	Relevant Aboriginal Stakeholders	Aim of Project	Types of Water Assessed	Methodology	Cultural domain of water identified	Outcomes of Project	Methodological Limitations	Comments
									provide such opportunities.' (Finn and Jackson 2011: 1242)
<b>Watts, L. 2012. Capturing Indigenous Knowledge in Water Management Processes - Wudjulu Lagoon Case Study, Ngukurr, NT. Report Prepared for Northern Land Council. Centrefarm Aboriginal Horticulture Ltd, NT.</b>	Wudjulu Lagoon, Ngukurr, NT	Ngalakan people	In relation to the area in question, the case study aims to: '(1) utilise knowledge of traditional practices; (2) integrate Indigenous knowledge with western science; and (3) develop a context analysis that informs policy and water management processes' (Watts 2012: 11)	lagoon	Consultation, physical survey, interviews	Economic	Key Recommendations from the report are: '1. Reinstate the health of Wudjulu Lagoon through (i) implementing abatement programs that control feral plant and animal species and (ii) increasing land management practices and recreational activity. 2. Develop a set of management objectives and strategies that meet social and recreational requirements to sustain Indigenous livelihoods of Wudjulu Lagoon. 3. Undertake an environmental assessment of the impact of the sewerage treatment plant on the biodiversity of Wudjulu Lagoon. 4. Organise a full meeting of landowners, including both Traditional Owners and guardians of Wudjulu Lagoon, to uphold traditional decision making processes on the future use and management of the resource. 5. Implement the second stage of the Ngukurr Economic Development Study, which tests identified economic opportunities for feasibility based on the identification of suitable soils and sustainable surface water resources. 6. Dependent on the outcomes of actions under recommendations 4 and 5, ensure that full business planning for a horticultural enterprise be conducted utilising the results of this Case Study and the Ngukurr Economic Development feasibility reports. 7. Develop co-management structures that integrate the social organisation of the landholding group, including its decision-making processes, as a means to communicate traditional knowledge in planning and policy processes for land and water resources (for instance, via ongoing research consultation)' (Watts 2012: 8). The report 'makes a significant contribution to improving land and water management practices as it demonstrates the importance of landowners reaching consensual agreement in determining the viability of developing a horticultural enterprise at Wudjulu Lagoon, including assessing its opportunities and risks' (Watts 2012: 11).	Difficulty with genealogies	'In the dramatic transition of land and water management regimes over a very short time frame Indigenous knowledge has received little recognition, and Indigenous histories and biogeography are rarely valued as significant data to the sustainable contemporary management of water resources. This study attempts to reverse this phenomenon by bringing attention to the narratives of the landowners of Wudjulu Lagoon, entitling the interests, knowledge, practices and values passed down through generations' (Watts 2012: 5).

Project name	Study Area	Relevant Aboriginal Stakeholders	Aim of Project	Types of Water Assessed	Methodology	Cultural domain of water identified	Outcomes of Project	Methodological Limitations	Comments
Wirf, L., Campbell, A. & Rea, N. 2008. Implications of gendered environmental knowledge in water allocation processes in central Australia. Gender, Place and Culture, 15(5): 505-518.	Area surrounding Ti Tree township	Anmatyerr people	This project aimed to fill a 'gap in existing research' with regard to how 'Indigenous women's knowledge and laws can be provided for in resource management context' (Wirf et al. 2008:505, 515). Further, the authors aim to 'highlight Anmatyerr women's own perspectives of their roles, in contemporary contexts, with particular reference to cultural change and continuity in relation to rights and responsibilities around water' (Wirf et al. 2008:506).	Water sources associated with the Ti Tree Ground Water Basin including "rock holes, natural clay pans, water holes in rivers, mound springs, underground soakages, tree hollows, tree roots, dew and burrowing frogs"	'...informal discussions, storytelling, visits to a number of water sites with the women and discussing ideas in workshops' (Wirf et al. 2008:507).	Economic and social	The research found:  1. That 'there is an important gender divide within Anmatyerr knowledge systems and relationships to the country, with women 'seeing' country differently to men'  2. That 'gendered knowledges, in an Anmatyerr context, are not necessarily separate knowledges but different parts of a whole system that need to work together to ensure that the integrity of Anmatyerr cultural values is maintained.  3. That ' Anmatyerr women's voices, perspectives and knowledges need to be specifically included in any future water allocation processes in their region' (Wirf et al. 2008:514-515).		

Table 11-4: Projects examining Indigenous cultural values of water: Northern Territory

#### 11.54 Queensland

Relevant reports are summarised in Table 10-5.

The complexities inherent in defining significance was an important theme addressed by Barber et al. (2012). Not only does effective consultation need to deal with such limitations as cultural and gender restrictions on knowledge and contrasting world views (Barber et al. 2012: 197), but it also needs to appreciate the diversity of forms that value can take, and require equally diverse management solutions (Barber et al. 2012: 204). Jackson and O'Leary (2006: 10) also recognise the need to identify the contemporary role a waterway plays in meeting the various needs of Aboriginal communities. This project suggested that some common limitations to consultation include short, place-by-place and site-by-site projects, regular changes to reporting and funding eligibility requirements and the absence of reliable and recurrent funding for Indigenous groups attempting to manage environmental systems (Jackson and O'Leary 2006: 9). A lack of suitable funding can hinder efficiency and impact on the outcomes of consultation as well as place pressure on individuals involved in the work (Tran et al. 2013: 56). Another limitation to consultation is the desire for rapid outcomes from researchers newly introduced to the community; Tran et al. (2013: 23) report that it takes weeks to 'build trust and elicit the necessary information for the research'.

Even after successful consultation has identified the value of water bodies, managing and protecting them provide additional challenges. Although many significant economic resources can be managed in much the same way as other environmental aspects of the landscape, it is much more difficult to calculate the necessary water allocation for social and spiritual sites (DNRM 2013: 7).

This is one of the key reasons that the involvement of Indigenous groups must extend beyond consultation to playing an active role in the management of culturally significant water bodies – a recommendation that formed a common theme across the projects conducted in Queensland (Cranny and Poh-Ling 2011; Jackson and O'Leary 2006: 10; Lockie, Rockloff & Muir 2003: 31-32). This is most practically implemented 'at the outset of the planning process and not at the end' to avoid 'the displacement of previous decision-making processes, causing inconsistencies, tension, and confusion over roles and responsibilities' (Tran et al. 2013: 4).

Project name	Study Area	Relevant Aboriginal Stakeholders	Aim of Project	Types of Water Assessed	Methodology	Cultural domain of water identified	Outcomes of Project	Limitations	Comments
<b>Lockie, S., Rockloff, S. &amp; Muir, B. 2003. Indigenous Coastal and Waterways Resource management: Current Reflections and Future Directions. Cooperative Research Centre for Coastal Zone, Estuary and Waterway Management, Brisbane.</b>	Fitzroy and Port Curtis Catchments of Central Queensland	Darumbal Noolar Murree Aboriginal Corporation for Land and Culture; Fitzroy Basin Elders Committee; Springsure area cultural heritage interpretation and protection; Woorabinda Council; Woppa Burra and Sea Forum; Gooreng Gladstone	<p>'Discussions were focused around: Indigenous coastal resource issues; current Indigenous resource management initiatives; future research projects and questions; Indigenous capacity building needs and training; and processes /protocols to advance collaboration between Indigenous communities and researchers.' (Lockie, Rockloff and Muir 2003: 4).</p> <p>'[To] assist in the integration of Indigenous knowledge into all future projects in the Cooperative Research Centre' for Coastal Zone, Estuary and Waterway Management (Lockie, Rockloff and Muir 2003: 7).</p>	Fitzroy drainage basin; Port Curtis drainage basin and harbour	Consultation	Economic, social	<p>'The main issues identified from discussions covered five areas:</p> <ol style="list-style-type: none"> <li>1. Deficiencies in representation and participation by Indigenous people in decision-making;</li> <li>2. Certainty in government processes and recognition of cultural laws and protocols;</li> <li>3. Determination of ownership of culture, rights to land and interest in research, planning and management of Country;</li> <li>4. Protection and management of Indigenous cultural heritage; and</li> <li>5. Lack of resources for Indigenous communities to be proactive and insufficient expertise in European decision-making structures.'</li> </ol> <p>(Lockie, Rockloff and Muir 2003: 4).</p> <p>The following future research projects and questions were identified:</p> <ul style="list-style-type: none"> <li>- 'determination of the most appropriate Indigenous natural resource management frameworks and governance arrangements for the representation of Indigenous interests and rights.'</li> <li>- 'impacts of human activities ... on traditional hunting, marine foods and protection of natural and cultural heritage.'</li> <li>- 'how Indigenous rights to water and associated resources, and their cultural values are recognised and incorporated into decisions, specifically in environmental impact assessment and strategic planning processes.'</li> <li>- 'Investigation of Aboriginal cultural heritage; specifically, the need to identify areas of cultural significance at regional and local scale to inform and guide planning and negotiation. Identify methods to determine the acceptability of impacts against the scale of development, and the spatial scale of impact from cumulative effects, along with reforms to environmental impact assessment processes.' (Lockie, Rockloff and Muir 2003: 5).</li> </ul> <p>The report also identifies current Indigenous resource management initiatives, Indigenous capacity building needs and training and processes/protocols to advance collaboration between Indigenous communities and researchers. The three recommendations are: strengthening Indigenous peoples' involvement in planning and management; adopting appropriate processes and protocols; capacity building; and 'supporting the development of a frame work for Indigenous governance ...' (Lockie, Rockloff and Muir 2003: 7).</p>	The issues raised through consultation process outlined in this report require practical and specific steps to resolve.	An additional methodology employed in this study is described as stakeholder analysis.



Project name	Study Area	Relevant Aboriginal Stakeholders	Aim of Project	Types of Water Assessed	Methodology	Cultural domain of water identified	Outcomes of Project	Limitations	Comments
Jackson S. and O'Leary, P. 2006. Indigenous Interests in tropical Rivers: Research and management Issues. A Scoping Study for Land & Water Australia's Tropical Rivers Program. Unpublished Report Prepared for the North Australian Indigenous Land and Sea Management Alliance, March 2006. CSIRO Sustainable Ecosystems, Darwin, NT.	Southern Gulf of Carpentaria		<p>The goal of the Tropical River's Program is:</p> <p>'To undertake research and knowledge exchange to support the sustainable use, protection and management of Australia's tropical rivers' (Jackson &amp; O'Leary 2006: 13).</p> <p>'The Tropical Rivers Program has four research themes:</p> <ul style="list-style-type: none"> <li>• Assess river assets and threats;</li> <li>• Support regional planning frameworks;</li> <li>• Assess social, cultural and economic values, and</li> <li>• Understand river ecosystems'</li> </ul> <p>(Jackson &amp; O'Leary 2006: 13)</p>	Rivers, wetlands, floodplains and estuaries	Literature review, interviews, consultation	Economic, social, spiritual	<p>'This study was also seen by NAILSMA as a means of helping it to better understand issues across the north and to shape its activities in the years to come, as well as those of LWA.' It is hoped the report might 'significantly advance the rates and effectiveness of Indigenous participation in river research, planning and management in the tropics' (Jackson &amp; O'Leary 2006: 7).</p> <p>'This report outlines a number of priority areas of research interest arising from the literature reviewed and the interviews of representatives or nominees from Indigenous organisations. They fall under two major themes:</p> <ul style="list-style-type: none"> <li>• The need for a sound understanding of the current condition of river and wetland environments and their contemporary role in meeting the subsistence and spiritual needs of Indigenous communities. Increased pressure on resources, places, and sites is felt by many groups who wish to better understand the drivers of change and the consequences for their communities.</li> <li>• The need for more effective resource governance arrangements, management models and engagement methodologies. In particular research with an action research orientation that seeks to work directly with communities in identifying problems and addressing information and knowledge needs.'</li> </ul> <p>(Jackson and O'Leary 2006: 10)</p> <p>There are three recommendations to LWA to improve research conducted in partnership with Indigenous communities:</p> <ol style="list-style-type: none"> <li>1. That the LWA Board considers ways of ensuring high ethical standards in the research it sponsors where Indigenous people are involved, including research conducted by Indigenous organisations. Guidelines developed by the Australian Institute of Aboriginal and Torres Strait Islander Studies should be adopted as a basis for satisfying LWA's human ethics requirements.</li> <li>2. In view of the importance of early engagement with Indigenous communities and the under-resourced nature of Indigenous organisations, that LWA consider mechanisms for bringing researchers and Indigenous organisations together to discuss and negotiate research project ideas.</li> <li>3. The opportunity for Indigenous participation in research is key in successful arrangements and relationships nominated by people consulted during this study. LWA should consider investing to encourage LWA sponsored researchers to work collaboratively with Indigenous organisations in the tropical rivers region. Training and employment of Indigenous people and effective consultation processes are expensive and time consuming. Funds could be dedicated to projects with a high degree of participation by Indigenous communities. Paying Indigenous people for their expertise and participation in research activities could then become embedded in research practice. (Jackson &amp; O'Leary 2006: 10).</li> </ol>	<p>'We believe that the organisations covered in the report are a suitably representative subset of Aboriginal organisations involved with these issues across the study region. It is important to note however that the report did not set out to capture the views of every Aboriginal person or organisation in the region, nor would it have been practical to do so, given the project's constraints' (Jackson &amp; O'Leary 2006: 7). 'A general scepticism towards research is evident in some sectors of the Indigenous community' (Jackson &amp; O'Leary 2006: 9).</p>	<p>'The field of Indigenous land and water management is rapidly growing and in regions such as the Kimberley, the pace of change is marked. The funding base is inadequate and insecure and this limitation is a source of consternation to many Indigenous organisations surveyed. Short time-frames, piecemeal approaches, constantly shifting eligibility criteria, burdensome reporting requirements and the lack of recurrent core funding constrain the Indigenous sector in its efforts to respond to environmental problems and meet the social and cultural responsibilities of Indigenous community members.</p> <p>'This constraint should also be a cause for concern for research organisations for whom a representative Indigenous organisation is often a prerequisite for negotiating a research agreement or relationship with an Indigenous community' (Jackson &amp; O'Leary 2006: 9).</p>

Project name	Study Area	Relevant Aboriginal Stakeholders	Aim of Project	Types of Water Assessed	Methodology	Cultural domain of water identified	Outcomes of Project	Limitations	Comments
<b>The North Australian Indigenous Land and Sea Management Alliance 2009b. Standing Together for Water Rights. North Australian Indigenous Experts Water Forum Report, Darwin, Charles Darwin University.</b>	Cape York	Carpentaria Land Council Aboriginal Corporation and Balkanu Cape York Development	'NAILSMA supports Aboriginal and Torres Strait Islander land and sea management using strategic approaches to care for country with an emphasis on practical management by Traditional Owners across north Australia.' (North Australian Indigenous Land and Sea Management Alliance 2009b: ii) 'This forum provided an opportunity to raise ideas and concerns about economic development and opportunities, potential impacts of development in north Australia, governance and institutional arrangements as they affect Indigenous community interests, aspirations and issues.' (North Australian Indigenous Land and Sea Management Alliance 2009b: 4)	Rivers, floodplains, lakes, sea, wetlands	Focus group, consultation	Economic, spiritual, social	'The four outcomes of the Forum were: • the Mary River Statement of intent, that is consistent with other declarations of Indigenous land, sea and water managers, such as Garma International Indigenous Peoples Water Declaration • Principles to guide water policy and management • Recommendations for water reform and management; and • the election of an Interim Working Group to engage other interest groups to develop partnerships that promote understanding, recognition and common goals. Four main outcomes: ' (North Australian Indigenous Land and Sea Management Alliance 2009b:17)		Productive meeting in which the interim working group was elected with two members from WA, NT and QLD
<b>Cranney, K. &amp; Poh-Ling, Tan. 2011. Old knowledge in freshwater: why traditional ecological knowledge is essential for determining environment flows in water plans. The Australasian Journal of Natural Resources Law and Policy, 14(2): 71-113.</b>	Mitchell River catchment, Far North Queensland	Muluridigi, kuku, Yalanji, Kuku Djungan, Kuku Minnie, Wakkaman, Barbaram, Kowanyama, and various councils and boards including the Mitchell River Watershed Management Group	'Over the past decade in Australia water policy has seen fundamental reforms. This article addresses two areas of reform: the unprecedented recognition in water policy of Indigenous interests- in water/ and, catalysed by widespread environmental degradation/ the acceptance that the environment is a bona fide 'user' of water. Both developments are reflected in the 2004 Intergovernmental Agreement on a National Water Initiative ('the NWI')' (Cranney & Tan 2011:72-73)	Catchment	Policy analysis and statement	Social, spiritual	'Requirement for not only granting water as a resource, but also recognising broader concerns regarding Indigenous water rights and involvement in water management; call for a systematic method to include Indigenous cultural values in water in water plans.' (Cranney & Tan 2011:112)  The article identifies interconnected themes relating to 'developments of law, policy and culture. There are international norms and national policies, ... which require governments to engage with Indigenous people in water planning ... a growing body of research attempting to bridge the 'pervasive dichotomy' between Indigenous and scientific worldviews ... an increasing recognition that Indigenous knowledge is valuable in water planning and management ...[and] precedents that demonstrate that collaborative water planning is pragmatic and possible ... the Queensland government is well positioned to move beyond consultation, technical analysis and rhetoric towards genuine collaborative water planning and management with Indigenous groups, working together for shared environmental outcomes. (Cranney & Tan 2011:112-113)	Traditional Ecological Knowledge should be incorporated into the Queensland Department of Environment and Resoiurce Management activities.	Traditional Ecological Knowledge should be incorporated into the Queensland Department of Environment and Resource Management activities. Authors argue 'that Indigenous participation in environmental flow determinations is essential given that the Queensland government considers that "Traditional indigenous uses are generally provided for by ensuring there are sufficient environmental flows". Currently, environmental flow provisions cannot encompass Indigenous values in water. (Cranney & Tan 2011:74)

Project name	Study Area	Relevant Aboriginal Stakeholders	Aim of Project	Types of Water Assessed	Methodology	Cultural domain of water identified	Outcomes of Project	Limitations	Comments
<b>Barber, M., Shellberg, J., Jackson, S. and Sinnamon, V. 2012. Working Knowledge: local ecological and hydrological knowledge about the flooded forest country of Oriners Station, Cape York. CSIRO, Darwin.</b>	Oriners Station, south-central Cape York (and Sefton station and Indigenous lands north of the Alice River)	Kowanyama people	Local ecological and hydrological knowledge recovery, documentation and modelling. Key community objective - a step in the process of building, and maintaining a socially, economically and environmentally sustainable presence at Oriners. (Barber et al. 2012: xiii)	River, river catchment, seasonal flooding	Literature review, interviews, physical survey	Economic, historic	<p>The research provides 'a provisional information source to aid further planning' (Barber et al. 2012: 204).</p> <p>The study also demonstrates that 'conditions on the Cape continue to evolve, and that the conceptual frameworks used to meet those conditions will need to be similarly adaptable. Oriners was a valuable property when it was purchased in the early 1990s, and it is considerably more valuable now. Maintaining and enhancing that value in all its forms will require similarly diverse forms of work, the resources to support that work, and appropriate alignments between that activity and those occurring elsewhere in the region' (Barber et al. 2012: 204).</p> <p>'[The study] demonstrates the need for sustained funding sources and for government agencies to support the long term vision of local Indigenous managers' (Barber et al. 2012: 198).</p> <p>'The primary recommendations made from this project relate to potential areas of further research and/or management planning and action. One important issue to address in a subsequent work is the matter of women's knowledge of Oriners, and in particular the documentation of the knowledge held by senior Indigenous women familiar with the area. Womens' knowledge and labour was integral to pastoral life and pastoral work patterns, and Indigenous women carry a range of gender-specific and general knowledge about country, as well as being heavily involved in ongoing land management decisions at Oriners. An appropriately structured study of women's knowledge would be a necessary and important addition to this current study.' (Barber et al. 2012: 202).</p> <p>'Also evident from this research is the value of Oriners Mob residence in the area and the need to address resourcing and logistical constraints to enable this to occur more often. However further recommendations of this nature are beyond the boundaries of a knowledge recovery project such as this one.'(Barber et al. 2012: 202-203).</p>	<p>'An important next step emerges from a limitation of the current study, which in response to initial fieldwork circumstances, focused on knowledge held by men (both Indigenous and non-Indigenous). This orientation deliberately left considerable space for a complementary study emphasising the (working) knowledge of women about the Oriners area.' (Barber et al. 2012: xiv-xv).</p> <p>'This project was also focused on Oriners Station itself, rather than on research and other developments occurring on adjacent relevant stations. This limits the degree to which regional scale recommendations can be considered'. (Barber et al. 2012: 202).</p> <p>Geographic limitation of the study limits any regional scale recommendations. 'The research perspective is functional and ecological, focussing on empirical observations of natural phenomena, and in this way it is constrained from an Indigenous perspective' (Barber et al. 2012: 204).</p>	'The consequences of cultural differences and intertwined but very different histories impedes communication and understanding in a range of ways, not least in the sphere of wider catchment management in the Mitchell' (Barber et al. 2012: 197).

Project name	Study Area	Relevant Aboriginal Stakeholders	Aim of Project	Types of Water Assessed	Methodology	Cultural domain of water identified	Outcomes of Project	Limitations	Comments
<b>Department of Natural Resources and Mines (DNRM) 2013. Draft Water Resource (Wet Tropics) Plan 2013 - Indigenous Cultural Values Report. Queensland Government, Qld.</b>	Wet tropics	Bandjin, Djabugay, Djiru, Girramay, Gugu-Badhun, Gulnay, Gunggandji, Jirrbal, Koko Muluridji, Eastern Kuku, Yalanji, Mamu, Ngadjon, Nywaigi, Warramay, Warungnu, Wulgurukaba, Yidinji, Yirrganydji and Bar Barrum.	'This report presents a compilation of information about specific water related Indigenous cultural values/assets in the Wet Tropics through documented literature reviews and discussions with Indigenous stakeholders. Where information was available, particular flow requirements of significant sites have been listed and the water resource planning process considers how these cultural values may be recognised. The report also summarises the legislative context of cultural values within the water resource planning process. It discusses issues raised by Indigenous stakeholders during the development of the Wet Tropics water resource plan and how these issues have been addressed.' (DNRM 2013: 4)	Rivers, waterfalls, swimming holes	Literature review, consultation 'a number of broader issues for Traditional Owners were raised through the submission and consultation processes, the department sought to gather detailed information about specific water-related cultural values/assets through documented literature and discussions with individual Indigenous stakeholders' (DNRM 2013: 9).	Economic, spiritual, social	<p>Indigenous issues raised during development of the draft Water Resource (Wet Tropics) Plan area included</p> <ul style="list-style-type: none"> <li>– 'Cultural heritage and values related to flow: Stakeholders expressed a need to recognise flow of water as culturally significant. Water bodies should have sufficient flow to enable Traditional Owners to engage in cultural activities as stipulated by their traditional custom. The need to recognise the cumulative impact of water extraction upon cultural responsibilities and native title was expressed. Also identified was the need to protect particular areas or processes that are considered culturally important. Traditional Owner groups strongly believe that cultural flow provisions are needed to protect Indigenous cultural values.</li> <li>– Indigenous water reserves ...</li> <li>– Domestic and community water supplies ...</li> <li>– Issues outside the scope of the water resource planning process' (DNRM 2013: 8-9)</li> </ul> <p>'Of 11 ecological assets identified for the environmental risk assessment, three were recognised as having Indigenous cultural value and were located within watercourses, lakes or springs in the plan area. These include Australian freshwater crocodile (<i>Crocodylus johnstoni</i>), eel-tailed catfish (<i>Tandanus tandanus</i>), and barramundi (<i>Lates calcarifer</i>).' (DNRM 2013: 11)</p> <p>'All WRPs [Water Resource Plans] have, as a general outcome, the need to recognise and support the water-related cultural values of Aboriginal and Torres Strait Islander communities in a plan area. The Wet Tropics WRP will include the same outcome. This ensures that future decisions recognise water-related cultural values.' (DNRM 2013: 11)</p> <p>'The department is committed to continuing strong engagement and consultation with Traditional Owner representative groups and individuals following release of the draft WRP.' (DNRM 2013: 12)</p> <p>There are also identified sites of Indigenous cultural significance in the Wet Tropics listed in the Appendices (DNRM 2013: 15-20), as well as water related species identified as having Indigenous cultural significance.</p>	'The recognition of cultural values may be achieved through plan outcomes, flow asset modelling, identification of culturally significant sites and locations requiring specific flow provisions or a combination of environmental management strategies to meet the requirements of cultural values and assets. However, while environmental flow requirements for particular assets [...] can be quantified, there is often major difficulty in quantifying flow requirements for cultural values and assets, making it very difficult to provide for 'cultural flows'.' (DNRM 2011: 11)	'Water related sites of cultural significance are numerous in the Wet Tropics region. Site specific values may also be linked to other locations by storylines and oral traditions.' (DNRM 2013: 10)

<p><b>Tran, T., Strelein, L., Weir, J., Stacey, C., Dwyer, A. 2013 Native Title and Climate Change. Changes to Country and Culture: Strengthening Institutions for Indigenous Resilience and Adaptation. Australian Institute of Aboriginal and Torres Strait Islanders Studies. (MULTI STATE)</b></p>	Kowanyama, QLD	Abm Elgoring Ambung Aboriginal Corporation RNTBC	Recognising a gap in climate change adaptation literature with regards to how Indigenous groups interact with the socio-institutional structures to assert their knowledge and participate in climate change adaptation activities, this project seeks to bring understanding to these socio-institutional structures for the potential contribution Indigenous knowledge can make in climate change monitoring, observation, and adaptation.	Rivers, coastal waters, swamps and waterholes recharged via flood waters	Active community engagement and involvement in the project was a core component of its research process and outcomes. Interviews with community members organised and conducted via a community liaison officer from within the community. Investigators also conducted “extended field work” spending weeks within the communities in order to “build trust and elicit the necessary information for the research, as well as provide something back to the community in recognition of their contribution to the project. (Tran et al. 2013: 23).” Data was collected from large scale meetings of RNTBCs at a regional and national level – focus group method. Literature review; legal and policy analysis.	Connected with ecological renewal; the proximity of the community to a coastal area prone to flooding has imbued the community with a greater appreciation of and resilience to natural disaster events; “The people of Kowanyam have their own explanations for these events and link them with their own cultural knowledge” (Tran et al. 2013: 87); “The Kowanyam people bring their own unique knowledge system to bear on the challenges created by climate change” (Tran et al. 2013: 87)	<p>The project met its first aim, to understand the aspiration and capacity of RNTBCs to be effective agents in climate change adaptation; Consultations with key government and shire stakeholders throughout the project has resulted in a greater awareness of RNTBCs roles in relation to land use, water and community planning.</p> <p>“These research activities contributed to the following findings within the context of our two case studies:</p> <ul style="list-style-type: none"> <li>• There are synergies between RNTBC caring for country priorities, governance and community development that are consistent with climate change adaptation priorities, yet the lack of development of and RNTBC priorities, such as through land use planning, is a significant barrier to Indigenous participation in adaptation activities.</li> </ul> <p>The retrospective recognition of native title has supported traditional owner authority in land use and natural resource management and decision making, whilst simultaneously creating the institutional marginalisation of RNTBCs as a ‘new’ governance sector.</p> <ul style="list-style-type: none"> <li>• There is a critical need to renegotiate governance arrangements within Indigenous communities, especially where RNTBCs have been created alongside existing governance institutions, resulting in the displacement of previous decision-making processes, causing inconsistencies, tension, and confusion over roles and responsibilities.</li> <li>• The complex interaction between native title and planning can be addressed in a very practical way through the inclusion of RNTBCs at the outset of the planning process and not at the end.</li> <li>• The imperative for a long term approach is driven by the communal and binding nature of decision making over native title lands as well as the intergenerational consequences of climate change.</li> <li>• There has been a lack of respect for the plans and priorities developed by RNTBCs and local communities, coupled with ad hoc and at times divergent development proposals, undermining agreed upon decisions and decision making processes, and affecting sustainable land use planning outcomes that are central to climate adaptation.</li> <li>• The former community/Aboriginal councils system, historically used as a means of enabling self-government, has been slowly replaced by mainstream structures that impose new forms of accountability or remove accountability to a broader regional constituency. The regionalisation of planning and local government risks the under-representation of the unique needs and priorities of remote Aboriginal communities. The involvement of RNTBCs in planning and decision-making processes can play a part in mitigating this risk.</li> <li>• Funding preferences created by different regimes to support different Indigenous forms of governance can place Indigenous community/shire councils in competition with RNTBCs, often with an outcome that draws resources away from RNTBCs.</li> </ul>	<p>Project highlights that while there is “synergy” between RNTBC caring for country priorities, governance and community development consistent with climate change adaptation priorities, there are a number of factors which create a barrier to Indigenous participation in adaptation activities. These include: a lack of development of RNTBC priorities; the need to renegotiate governance arrangements within Indigenous communities that currently displace previous decision-making processes thus creating tension, inconsistencies and confusion over roles and responsibilities; retrospective recognition of native title that creates the institutional marginalisation of RNTBCs as a “new” governance sector; lack of respect for the plans and priorities developed by RNTBCs and local communities; underrepresentation of remote Aboriginal communities in the face of regionalisation of planning and local government; the need for integrated planning that is consistent with native title holder’s holistic and intergenerational perspective on country.</p>
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Project name	Study Area	Relevant Aboriginal Stakeholders	Aim of Project	Types of Water Assessed	Methodology	Cultural domain of water identified	Outcomes of Project	Limitations	Comments
							<ul style="list-style-type: none"><li>• The unrealistic expectation that RNTBCs will be able to effectively engage in equitable and meaningful negotiations over land and water use without funding support creates a spiral of incapacity that distracts from the planning needs of remote communities.</li><li>• The design of decision-making structures needs to reflect the cultural legitimacy and representative role of RNTBCs and, at the same time, have this reflected in the distribution of resources.</li><li>• The principle of ‘getting the whole system in the room’ to look at long-term planning for native title lands is consistent with the successful approach to agreement-making with native title groups in the Dampier Peninsula Planning Process, and is of relevance to RNTBCs facing comprehensive planning challenges.</li><li>• Integrated planning that is consistent with native title holders’ holistic and intergenerational perspective on country holds the greatest potential for RNTBCs to play an effective enabling role in climate change adaptation.’ (Tran et al. 2013: 3-4)</li></ul>		

Table 11-5: Projects examining Indigenous cultural values of water: Queensland

### 11.55 South Australia

The South Australian reports considered below (Table 10-6) demonstrate the need for greater consultation with, and involvement of, Aboriginal groups during the planning of water management projects. Birckhead et al. notes that the concerns of Indigenous groups in regards to water extend beyond economic or social/spiritual significance; these waterways are fundamentally and inextricably tied to the wellbeing of the Aboriginal communities that interact with them (Birckhead et al. 2011: 6-10).

Despite this, Godden and Gunter (2010: 250-251) report that many Indigenous groups feel that their position as stakeholders is often little more than an empty gesture, that participation in water management is 'piecemeal' and that consultation on many of the reforms to the Murray-Darling Basin has been limited and ineffective. It has also been demonstrated that continuation of traditional activities, including the education of younger generations within Aboriginal communities, has been limited by the inability of government and private programs to follow consultation with active community engagement (Australian Institute of Aboriginal and Torres Strait Islander Studies 2006: 191; Jackson 2006b: 7).

Project name	Study Area	Relevant Aboriginal Stakeholders	Aim of Project	Types of Water Assessed	Methodology	Cultural domain of water identified	Outcomes of Project	Methodological limitations	Comments
<b>Australian Institute of Aboriginal and Torres Strait Islander Studies 2006. Sea Countries of the South: Indigenous Interests and Connections within the South-west Marine Region of Australia. AIATIS, Canberra, ACT.</b>	South-west Marine Region (this also in WA database)	Mirning, Wirangu, Nawu, Banggarla, Nukunu, Narungga, Kurna and Ramindjeri. Also included Yamatji and Noongar people in WA	<p>'This report is a review providing historical and contemporary information concerning Indigenous connections to the 'Sea countries of the South-west Marine Region''( Australian Institute of Aboriginal and Torres Strait Islander Studies 2006: 12)</p> <p>'The main purpose of this report is to provide key information about Indigenous connections within the SWMR. Ongoing consultations with the many diverse Indigenous groups and individuals with interests in the SWMR will occur during future implementation of the SWMR Plan. This report serves as a scoping document to aid DEH and interested Indigenous and non-Indigenous parties to engage in the SWMR planning process. The report was commissioned by DEH for the purpose of assisting in:</p> <p>understanding the diversity of interests/connections to Sea Country in the Region and their relative importance. The information will also provide a basis for understanding pragmatic and effective Indigenous consultation and decision making mechanisms with regard to Sea Country in the Region' (Australian Institute of Aboriginal and Torres Strait Islander Studies 2006: 22)</p>	sea and ocean mainly but also rivers and creeks and their relationship to the sea	Literature review, consultation	Economic, spiritual, social	<p>'This literature review documents a range of consultative processes that are attempting to deal with Indigenous interests in sea country within the SWMR. From recognition of native title claims and negotiated agreements over cultural heritage, to MoUs regarding regional governance and representation, the picture that emerges is one of active engagement by Indigenous peoples in industry, government and conservation forums.</p> <p>'Indigenous aspirations to adhere to principles of obligatory responsibility to sea country are expressed through this constant engagement. It is an immutable right of Traditional Owners to utilise and enjoy sea country. It is a responsibility to ensure that it is properly managed in accordance with culturally specific practices located within Indigenous Law.</p> <p>'It is an obligation to ensure that the protection of this country occurs for future generations through the transmission of Indigenous ecological knowledge. However, the ability of Indigenous groups to meaningfully engage with this process has been hindered by past policies of exclusion and the inability of government and industry to move beyond consultation into effective management regimes.' (Australian Institute of Aboriginal and Torres Strait Islander Studies 2006: 191)</p> <p>'Due to the low level of effective engagement with Indigenous peoples in conservations programmes and initiatives within the SWMR, DEH should not rely on these models in developing benchmarks for sea country plans in the SWMR.' (AITSIS 2006: 15)</p> <p>'DEH, in developing collaborative, sustainable management approaches to the SWMR, should ensure that it both supports and works with the Western Australian and South Australian state level Indigenous NRM committees.' (AITSIS 2006: 15)</p> <p>DEH should support and adopt 'The Principles Communiqué on Indigenous Fishing', agreed to in August 2004 by the Australian Government' including the aims 'to integrate and protect customary fishing within fisheries management frameworks in a manner that protects customary fishing; to provide assistance strategies to engage Indigenous people in fisheries-related business; and to expedite processes to increase Indigenous involvement in fisheries management and vocational training'. (AITSIS 2006: 15)</p> <p>'[T]he provision of Indigenous cultural fishing plans and zones proposed within the Fisheries Management Bill 2005 (SA) will necessitate DEH's engagement with the ALRM as the representative body in the negotiation of ILUA agreements that form the basis of these plans.' (AITSIS 2006: 16)</p> <p>'DEH must consult native title groups with claims covering sea country in the SWMR under future act provisions of the Commonwealth Native Title Act 1993</p>	<p>'This report focuses specifically on the Indigenous coastal groups found within Indigenous 'territories' in the SWMR.</p> <p>The report does not deal explicitly with each Indigenous group found within the region. The intent of this report is to provide an overview of Indigenous peoples' sense of place, space and belonging to sea country. This overview places emphasis on the demonstrable ability of Indigenous peoples to adapt to changing socio-political environments and to continue their cultural traditions and obligations to country within a contemporary setting.' (Australian Institute of Aboriginal and Torres Strait Islander Studies 2006: 19)</p>	Notes that the link between Indigenous cultural values and biodiversity is well established in Australia in, for example, the EPBC Act. ( Australian Institute of Aboriginal and Torres Strait Islander Studies 2006: 21)



							<p>particularly in regard to management and licensing regimes.</p> <p>'DEH should consult with coastal communities whose claim area is adjacent to the SWMR in regard to management and licensing regimes.</p> <p>'DEH should negotiate with native title claimants and holders with a view to reaching agreements over joint management, representation, protection of interests and compensation for impairment of use in the development of management and licensing regimes.'</p> <p>(AITSIS 2006: 16)</p>		
<p><b>Jackson, S. 2006b. Recognising and Protecting Indigenous Values in Water Resource Management. A Report from a Workshop held at CSIRO in Darwin, NT. CSIRO Sustainable Ecosystems, April 2006.</b></p>	Lower Murray River	Murray Lower Darling Indigenous Nations	<ul style="list-style-type: none"> <li>• To have a good discussion about water issues</li> <li>• For northern Australian Aboriginal groups, especially from the Daly River, to hear about the experiences of other groups, e.g. from the Murray Darling, and vice versa</li> <li>• To think about environmental policy, especially water management, and how it can work for Indigenous people</li> <li>• To talk about the words 'cultural values', how they are being used and whether they reflect Indigenous values</li> <li>• To talk about rivers and water reforms: what worries people about the changes and are there opportunities, or good parts, to the changes</li> <li>• To talk about ways Indigenous people can document their values, promote them and be involved with governments and other groups e.g. catchment management groups' (Jackson 2006b: 7).</li> </ul>	Riverine, estuarine, wetlands, floodplains, coastal zone, aquifers	Consultation, focus group	Economic, spiritual, social	<p>'This workshop represented the first step in a dialogue that Indigenous groups in northern Australia need to have with each other, and with other sectors of Australian society, in order to overcome the neglect of their interests from the national water reform agenda. For the first time in the context of national changes to the use, regulation and management of water, a number of Indigenous people came together to discuss common issues and progress regional priorities. A firm recommendation arising from the workshop was for more such meetings and discussions, preferably in the bush...' (Jackson 2006b: 23).</p>	<p>'We were satisfied with the reasonable balance of people from various backgrounds. Aboriginal people were in the majority which, in our view, made a difference to the conduct and course of the meeting and the degree of attention given to issues of interest to the Indigenous participants' (Jackson 2006b: 6).</p> <p>'The majority of people were from the Daly River Aboriginal Reference Group as well as interstate visitors from the Murray Lower Darling Indigenous Nations and the Miriwung Gajerrong people of the east Kimberley. This ensured a good mix of perspectives at the workshop.'</p> <p>(Jackson 2006b: 6)</p>	Water management and care of waterways is important to all involved
<p><b>Pemberton, F., Baird, I., Draper, N. 2009. Community Consultation for the Alinytjara Wilurara NRM Region Future Water Management and Allocation Planning - Groundwater and Surface Water Investigations. ACHM, Adelaide.</b></p>	Maralinga Tjarutja Lands, Yalata Lands and the Anangu Pitjantjatjara Yankunytjatjara Lands	Maralinga Tjarutja, Yalata, Anangu Pitjantjatjara Yankunytjatjara	<p>Water resource management 'to undertake Indigenous community consultation with communities on the Maralinga Tjarutja (MT), Yalata and Anangu Pitjantjatjara Yankunytjatjara (APY) Lands within the Alinytjara Wilurara Natural Resource Management (AWNRM) area, in South Australia.' P. 9</p> <p>'It was not the intention of the consultants to visit particular sites and collect GPS data to plot sites on maps, but to talk to people about water management and allocation issues.' P. 28</p>	Groundwater and surface water	Consultation, physical survey	Historic	<p>Recommendations, such as further consultation, water education for local communities, rainwater tank monitoring.</p> <p>Revisit additional water asset sites identified by community representatives with Traditional Owners and record accurate locational data for mapping purposes</p> <p>...</p> <p>Conduct further background research and consultation with regard to the cultural significance of surface and groundwater sources and regional biodiversity</p> <p>Liaise with SA Water and DWLBC regarding developing further water monitoring options and possibilities, in consultation with communities</p> <p>Examine the issue of protecting sacred rock holes (Tjurinya, Piranya and Wantu) in consultation with Oak Valley community</p>	Consultation in the APY Lands was difficult and restricted.	

							<p>Look at implementing community education on water usage as part of the Future Water Management and Allocation Planning process</p> <p>Explore the issue of rainwater tank monitoring and management to ensure supplies are of a potable quality</p> <p>AWNRM to expand their rock hole management program with Oak Valley and Yalata communities</p> <p>...</p> <p>That AWNRM and APY complete the MOU process already in progress. This may need to include agreement on a workable model for the provision of resources to APYLM for a Project Officer position to coordinate AWNRM projects on the APY Lands' (Pemberton, Baird &amp; Draper 2009: 3)</p>		
<p><b>Godden, L. &amp; Gunter, M. 2010. 'Realising Capacity: Indigenous Involvement in Water Law and Policy Reform in South-Eastern Australia'. The Journal of Water Law, Vol. 20, No. 5, pp. 243-253.</b></p>	Lower Murray-Darling Basin	Murray Lower Darling Rivers Indigenous Nations (MLDRIN)	<p>'This article examines policy and legal changes in Australian water reform within the context of the Murray-Darling Basin, focusing on the ramifications of legislative change and the introduction of water planning for Indigenous communities.'</p> <p>(Godden and Gunter 2010: 243)</p> <p>'The article draws in part on a case study of an Indigenous representative group, the Murray Lower Darling Rivers Indigenous Nations (MLDRIN), that is, active in policy and legal issues across the river Basin. It presents the main findings of a research project which included interviews with MLDRIN members about their experiences with water law and policy reform processes, with a view to examining how Indigenous people's interests and values are reflected in emerging legal and policy measures and the regulatory development of water law in Australia.'</p> <p>(Godden and Gunter 2010: 243)</p>	Riverine	Interviews, review of literature and legislation	Economic, spiritual, social	<p>'MLDRIN representatives have commented on the increased opportunities for public participation in many areas of water management. However, many interviewees reflect that such participation is often 'piecemeal'. Representatives are concerned by the level of tokenism in their role as 'stakeholders' on many government water and natural resource committees. This leads to scepticism among Indigenous communities about the meaningful involvement of their values and role in national reforms and even within locally based water management projects' (Godden &amp; Gunter 2010: 250-251).</p> <p>'Apart from the increase in stakeholder consultation mechanisms, traditional owners indicated a shared frustration with the proliferation of water-related reforms that have swept through the Murray-Darling Basin in recent years.' (Godden &amp; Gunter 2010: 251)</p> <p>'Many of the communities have experienced only a limited degree of consultation and effective adoption of cultural perspectives in past water law and policy reform.' (Godden &amp; Gunter 2010: 251)</p> <p>Notes the lack of 'substantive recognition and implementation of Indigenous interests in water in the Basin.' (Godden &amp; Gunter 2010: 252)</p> <p>'MLDRIN representatives continue to advocate an entitlement to water for cultural purposes in the form of a 'cultural flow' allocation so that a supply of water to strengthen inter-generational knowledge transfer is guaranteed, and to provide Indigenous people with the resources to engage effectively in all facets of water management.' (Godden &amp; Gunter 2010: 252)</p> <p>'Indigenous groups need to be proactive in seeking effective representation and substantive recognition of cultural values in water, as well as in the sustainable management of water in a more holistic sense.' (Godden &amp; Gunter 2010: 253)</p>	<p>All interviewees were contacted through MLDRIN, which 'represents the interests of, and is accountable to, 10 traditional owner groups' (p. 250). There is no mention of how many interviewees were contacted, or of who these people were. This implies a homogeneity of opinion which may not reflect the reality.</p>	<p>'It is clear from this overview of Water Act provisions that there are established procedural forms to allow Indigenous participation. However, procedural guarantees of participation, while welcome, are no substitute for more substantive recognition and implementation of Indigenous interests in water in the Basin.'</p> <p>(Godden &amp; Gunter 2010: 252)</p> <p>'Aboriginal groups have asserted that legal recognition of 'cultural flows' is an important part of increasing the involvement of Indigenous peoples in water law implementation within the Murray-Darling Basin' 244</p> <p>'This failure to provide substantial cultural flows/allocations to Indigenous peoples under existing legislative arrangements highlights the critical importance of effective and inclusive participation, through groups such as MLDRIN, by Aboriginal nations in water planning as it unfolds under the Water Act process.' (p.249)</p>

									'cultural flows represent an increasingly effective means through which Indigenous communities can engage with water law and policy reform in the Murray-Darling Basin.' P. 253
<b>Birckhead, J., Greiner, R., Hemming, S., Rigney, K., Trevorrow, G. and Trevorrow, T. 2011. Economic and Cultural Values of Water to the Ngarrindjeri People of the Lower Lakes, Corrong and Murray Mouth. River Consulting. Townsville.</b>	Lower lakes and Coorong of South Australia	Ngarrindjeri (Murray Lower Darling Rivers Indigenous Nations)	'The original aim of the discussions was to fully engage with CSIRO to recognise Indigenous knowledge systems and Indigenous values of water throughout the whole river system for all Indigenous Nations.' (Birckhead et al. 2011: ii)  'Its objectives were to:  1. quantify and evaluate in welfare economics terms the uses of water, wetlands and floodplains by the Ngarrindjeri people and 2. document their cultural values to the Ngarrindjeri people.' P. 1	Groundwater, wetlands and floodplains	Consultation, focus group	Economic, spiritual, social	,1. That the research agreement developed be a benchmark for projects with Indigenous Nations. 2. That funds be provided so that Indigenous people can obtain proper legal advice when engaging in research programs to enable development of research agreements that protect the interests of Indigenous people. 3. That research projects should include funding to enable Indigenous nations to properly engage with the research program. Research projects should also minimise stress on Indigenous leadership. 4. That collaborative research projects on Indigenous community outcomes should begin with discussions involving potential Indigenous nation partners. 5. That the collaborative, multidisciplinary research model developed as part of this project is used as a template for future research projects with Indigenous communities. Long-term, community-based researchers should be incorporated into project teams. 6. That funding be better coordinated and directed towards Indigenous capacity building to achieve long-term positive measurable outcomes for the significant investments being made in NRM and associated Indigenous engagement. 7. That allocations of cultural water to Indigenous Nations in the Murray-Darling Basin be supported and understood as critical in the rehabilitation of the lands and waters that provide the foundation for Indigenous wellbeing. Indigenous Nations need to make their own decisions about how Indigenous allocations are used. 8. That investments in building the capacity of Indigenous Nations to be actively engaged in the long-term sustainable management of their lands and waters including Indigenous Caring for Country programs incorporating, research, planning, training and jobs. 9. That development of regional Indigenous Caring for Country programs in the Murray-Darling Basin as recommended in the workshops be supported. This could mean the development of partnerships with Indigenous nations and a range of other non-Indigenous programs and agencies such as NRM Boards and universities. The Ngarrindjeri could be a pilot project. 10. That the principles identified in the recently ratified UN Declaration on Indigenous peoples provide the basis for collaborative projects that aim for best practice in Indigenous research, NRM and water policy development. Best practice should also be informed by Indigenous research and policy directions being taken in other Pacific Rim countries.' (Birckhead et al. 2011: vii-ix)	'This project was constrained by the available time and funding and by the dynamic complexity of the issues under consideration.'  Values chiefly measured in terms of wellbeing and, less directly, economic value (p. 12-21). While this included the possibility to consider past (ancestral) and future generations, and thus cultural and educational activities (p. 21) any attempt to rigidly define uses of water for protection, allocation etc. must as a result exclude certain activities.	'[B]ecause Ngarrindjeri water, wetlands and floodplains are so intimately tied to Ngarrindjeri wellbeing there must be a holistic, long-term program for Ngarrindjeri to address the impacts of extensive environmental degradation of Ngarrindjeri lands and waters.' (Birckhead et al. 2011: 44)

Table 11-6: Projects examining Indigenous cultural values of water: South Australia

### 11.5.6 Tasmania

Tasmania is a signatory to the NWI and, as such, is required to implement actions, strategies and policies to meet its objectives. As with other jurisdictions, the Tasmanian Government acknowledges the need to 'recognise indigenous needs in relation to water access and management' (Department of Primary Industries, Parks and Water 2006: 29) and outlines steps to achieve this outcome, which (at the time of writing) included liaison with the Tasmanian Office of Aboriginal Affairs and the Tasmanian Aboriginal Land and Sea Council (as required), and the possible amendment of local Water Plans as well as the Generic Principles for Water Management Planning. It is not clear whether amendments have been made to these documents at present, but outcomes to this effect are still anticipated.

The key piece of State legislation that controls water management in Tasmania is the Water Management Act 1999. The Water Management Act 1999 does not make any direct reference to Indigenous water rights and interests 'as this issue was not raised during the consultation phase prior to the proclamation of [that Act] nor during the 2005 review of the Act. Nevertheless indigenous rights are covered through provisions in Part 5 of the [Water Management Act 1999] relating to water rights for persons in their causal use of land ' (Department of Primary Industries, Parks and Water 2006: 28).

### 11.5.7 Victoria

Projects conducted in Victoria (Table 10-7) highlight the importance of dialogue in order to ensure progress in accommodating the needs of Indigenous communities. In drafting the Western Region Sustainable Water Strategy, EMS Consultants were tasked with developing a consultation plan with Aboriginal groups. This was considered important not only to ascertain the economic importance of food and water sources, but to ensure water allocations to culturally significant waterways and other places in order to maintain traditional cultural activities (EMS Consultants 2009: 5). The report recognises the importance of protecting the rights of Aboriginal people in sustaining traditional life, culture and knowledge, and further notes that many members of the Aboriginal community felt that their knowledge and expertise had been underutilised or neglected in attempts to address threats to natural resources (EMS Consultants 2009: 5).

Jackson (2006b) advocates a broader system of engagement and communication beyond case-specific consultation. This includes dialogue between Indigenous groups (Jackson 2006b: 23) and providing Aboriginal communities and individuals opportunities for greater participation in planning and management practices (Jackson 2006b: 7). Jackson (2006b: 7) also suggests attention needs to be paid to ensuring water management policy works for, rather than coexisting with, Aboriginal people and that terms such as 'cultural value' are re-evaluated with input from Indigenous groups.

Project name	Study Area	Relevant Aboriginal Stakeholders	Aim of Project	Types of Water Assessed	Methodology	Cultural domain of water identified	Outcomes of project	Methodological limitations	Comments
Jackson, S. 2006b. Recognising and Protecting Indigenous Values in Water Resource Management. A Report from a Workshop held at CSIRO in Darwin, NT. CSIRO Sustainable Ecosystems, April 2006.	Murray River	Murray Lower Darling Indigenous Nations	<ul style="list-style-type: none"> <li>• To have a good discussion about water issues</li> <li>• For northern Australian Aboriginal groups, especially from the Daly River, to hear about the experiences of other groups, e.g. from the Murray Darling, and vice versa</li> <li>• To think about environmental policy, especially water management, and how it can work for Indigenous people</li> <li>• To talk about the words 'cultural values', how they are being used and whether they reflect Indigenous values</li> <li>• To talk about rivers and water reforms: what worries people about the changes and are there opportunities, or good parts, to the changes</li> <li>• To talk about ways Indigenous people can document their values, promote them and be involved with governments and other groups e.g. catchment management groups' (Jackson 2006b: 7).</li> </ul>	Riverine, estuarine, wetlands, floodplains, coastal zone, subsurface	Consultation	Water generally	<p>'This workshop represented the first step in a dialogue that Indigenous groups in northern Australia need to have with each other, and with other sectors of Australian society, in order to overcome the neglect of their interests from the national water reform agenda. For the first time in the context of national changes to the use, regulation and management of water, a number of Indigenous people came together to discuss common issues and progress regional priorities. A firm recommendation arising from the workshop was for more such meetings and discussions, preferably in the bush...' (Jackson 2006b: 23).</p>	<p>'We were satisfied with the reasonable balance of people from various backgrounds. Aboriginal people were in the majority which, in our view, made a difference to the conduct and course of the meeting and the degree of attention given to issues of interest to the Indigenous participants' (Jackson 2006b: 6).</p> <p>'The majority of people were from the Daly River Aboriginal Reference Group as well as interstate visitors from the Murray Lower Darling Indigenous Nations and the Miriwung Gajerrong people of the east Kimberley. This ensured a good mix of perspectives at the workshop.' (Jackson 2006b: 6)</p>	Water management and care of waterways is important to all involved

Project name	Study Area	Relevant Aboriginal Stakeholders	Aim of Project	Types of Water Assessed	Methodology	Cultural domain of water identified	Outcomes of project	Methodological limitations	Comments
<b>Goulding, M. Schell, P. and Albrecht, M. 2008. Cultural Heritage Values Assessment Gaps Analysis: Northern Region Sustainable Water Strategy. Report Prepared for Department of Sustainability &amp; Environment, February 2008. Goulding Heritage Consulting Pty Ltd, North Carlton, Victoria.</b>	'The study area [is] in northern Victoria. Bordered to the south by the Great Dividing Range, the study area extends along the Murray River as far as the border with South Australia.' (Goulding, Schell & Albrecht 2008: 7)		'This report is designed to provide DSE Office of Water with an analysis of the level of previous engagement with Indigenous people relating to water values in the Northern Region and to identify any gaps in this engagement. The main tasks are to: <ul style="list-style-type: none"> <li>• Undertake a gaps analysis of existing documentation for the northern region regarding Indigenous values associated with water and issues of specific relevance to the development of the NRSWS;</li> <li>• Provide advice on the documentation and expression of Indigenous values associated with water in the Northern Region Sustainable Water Strategy' (Goulding, Schell &amp; Albrecht 2008: 5).</li> </ul>		Gaps analysis		<p>Recommendations:</p> <ol style="list-style-type: none"> <li>1. There needs to be more, and appropriate, consultation.</li> <li>2. More in-depth research, including field research and studying the overlap between Indigenous and non-Indigenous interests.</li> <li>3. Identify best practise case studies.</li> </ol> <ol style="list-style-type: none"> <li>1. Address Gaps in Consultation to Date ...</li> <li>2. Documenting Spatial Interests - Where appropriate, map the areas of Indigenous group interests across the Northern Region.</li> <li>3. Mapping Values/Interests - Where appropriate, work with Indigenous groups across the Northern Region to map specific places/areas of particular concern or interest that relate to water values and water management.</li> <li>4. Overview of Water in Indigenous Culture - Consider drawing together a narrative or comprehensive overview of the place of water in traditional and contemporary Indigenous cultural practice.</li> <li>5. Explore Common Ground: Indigenous and Non-Indigenous Values &amp; Interests - Consider documenting the shared values, concerns and aspirations of Indigenous and non-Indigenous communities in relation to water and water management in the Northern Region.</li> <li>6. Develop Case Studies where Indigenous People have Been Successfully Involved in Water Management Issues - Pull together case studies where there have been positive models of engagement between land managers and Indigenous communities over water management.</li> <li>7. Models for a Way Forward - Start working on realistic models for improved engagement with Indigenous stakeholders and implementation of strategies to better manage water values. (Goulding et al. 2008)</li> </ol>	This is a background gap analysis only.	Those groups who appear not to have been consulted directly to date are the: <ul style="list-style-type: none"> <li>• Ngintait</li> <li>• Nyera Nyera</li> <li>• Latji Latji</li> <li>• Tati Tati</li> <li>• Dja Dja Wurrung</li> <li>• Bangerang</li> <li>• Dhudoroa</li> <li>• Way Wuro peoples (Goulding, Schell &amp; Albrecht 2008: 21).</li> </ul>

<p><b>EMS Consultants 2009. Consultations with Indigenous Groups for the Development of the draft Western Region Sustainable Water Strategy. Report Prepared for the The Department of Sustainability and Environment, July 28, 2009. Effective Management Solutions.</b></p>	<p>Warrnambool in the south to Ouyen in the north west</p>	<p>'• Gunditj Mirring – Traditional Owner Group and RAP • Barengi Gadjin Land Council – Traditional Owner Group and RAP • Martang – RAP • Dja Dja Wurrung – RAP • Framlingham Aboriginal Trust – RAP applicant • Ballarat and District Aboriginal Co-operative – RAP applicant • Brambuk Incorporated - RAP applicant • Wadda Wurrung Aboriginal Corporation– RAP applicant • Worn Gundidj Aboriginal Co-operative • Windamara Aboriginal Co-operative • Victorian Indigenous Seafood Committee' (EMS Consultants 2009: 10)</p>	<p>'This project was initiated to develop and implement a consultation plan to ensure western Victorian Traditional Owner groups and other Indigenous communities were provided with appropriate opportunities to have an input.' (EMS Consultants 2009: 4) 'The objective of this project has been to develop and implement a Consultation Plan to ensure western Victorian Traditional Owner groups and other Indigenous communities are provided with appropriate opportunities to have an input into the Western Region SWS. This involved: • planning and implementing a program for the appropriate consultation of Western Region Indigenous communities about the Western Region SWS; and • undertaking consultations with all key Indigenous stakeholders to ensure their concerns can be considered in the development of the Western Region SWS' (EMS Consultants 2009: 8)</p>	<p>Rivers and other waterways</p>	<p>Focus group, consultation</p>	<p>Economic, social, symbolic</p>	<p>'Aboriginal people have a range of aspirations about water. These include cultural allocations of water to particularly significant waterways, access to rivers and other waterways for traditional cultural activities, access to water for economic development and greater involvement of Aboriginal people in water / natural resource management and decision making. Critical to all of these is a general aspiration for healthy waterways with an abundance of clean drinking water.' (EMS Consultants 2009: 30) 'The consultations indicated high levels of anger and frustration about policies and practices related to water that are having detrimental effects to the environment and which continue to erode the rights of Aboriginal people to sustain, protect and preserve traditional life, culture and knowledge. Aboriginal people feel their knowledge and expertise which could be used to address threats to natural resources. They have not been recognised or valued.' (EMS Consultants 2009: 5) 'Participants in this consultation process felt it was critically important for the Western Region Sustainable Water Strategy to acknowledge and respect Aboriginal knowledge and the values Aboriginal people associate with water and land.' (EMS Consultants 2009: 5). '[P]eople in this region want to take their place in the management of water in the west. However, government needs to provide an opportunity for these groups to determine how this can best be achieved. All groups consulted indicated they would be willing to come together to work through the issues and reach agreement about how they want to work with government. A starting point will be a follow-up meeting with all groups as part of the public consultation phase of the Draft Western Region Sustainable Water Strategy. Bambruk Cultural Centre has offered its' conference/ meeting facilities as a venue and given the DSE's commitment to work in partnership with Indigenous communities, we would urge the Department to take this suggestion on board.' (EMS Consultants 2009: 44)  '• Stop future plantations and wind them down. • If plantations continue there needs to be a process to ensure cultural assessments are completed before approval is given. ... • The broader community needs to know about culturally important areas on Aboriginal land and alternative ways of farming so that everyone can look after the land and the water systems. For example, it is really important to keep sheep and cattle away from rivers and dams.</p>	<p>'We were unable to organise a consultation time with Wathaurong Aboriginal Corporation (which was subsequently approved as a RAP in May 2009) and Kikkabush (RAP Applicant). We did not specifically consult with Goolum Goolum or Gunditjmara Co-ops following discussions with those groups and being advised they did not want to be involved in commenting on natural resource management issues.' (EMS Consultants 2009: 10)</p>	<p>'Aboriginal land management practice and philosophy is holistic and is about balancing needs and not using more than is needed.' (EMS Consultants 2009: 5) 'These consultations have clearly shown that Aboriginal people in the region are willing and enthusiastic to take their place in the management of water in the west. In the first instance, however, government needs to provide an opportunity for these groups to determine how this can best be achieved going forward.' (EMS Consultants 2009: 6)</p>
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Project name	Study Area	Relevant Aboriginal Stakeholders	Aim of Project	Types of Water Assessed	Methodology	Cultural domain of water identified	Outcomes of project	Methodological limitations	Comments
							<ul style="list-style-type: none"><li>• Environmental allocation percentage needs to increase and be protected and part of this needs to be allowed for cultural use. Environmental and cultural use can't continue to be the lowest priority in decision making.</li><li>• Cultural allocations should be made for the purpose of reviving lakes, wetlands etc.</li></ul> ... <ul style="list-style-type: none"><li>• Parks Victoria, the Department of Primary Industries, and CMAs often have grant programs for landowners. These organisations should allocate extra money to the grants to make sure they can pay for a cultural heritage assessment and advice on their projects. This won't cost the landowners any extra, will give Aboriginal people employment, cultural heritage will be preserved and protected and the strategies put in place for land management will be better. At the moment cultural heritage is not seen as a positive asset for landowners.' (EMS Consultants 2009: 34-37)</li></ul>		

Table 11-7: Projects examining Indigenous cultural values of water: Victoria



### 11.5.8 Western Australia

Project work done in Western Australia deals almost exclusively with the Kimberley and Pilbara regions (Table 10-8). The exception is the AIATSIS (2006) study dealing with the South-West Marine Region - the coastal area from north of Shark Bay around and across the Great Australian Bight. This area is broadly defined by the Leeuwin Current.

Most of the reports discussed below are based on consultation with Indigenous groups as a preliminary stage to other projects. Barber and Rumley (2003: 37) note that previous involvement of Aboriginal people in the management of the Ord River had been limited and ineffective. Rumley and Barber (2004: 54-56) also noted that consultation over the use of water throughout the Pilbara had been lacking in the government and private sectors for a significant period of time. Often where consultation has been conducted in the past it has been brief and disjointed, even being described as 'piecemeal' (Jackson & O'Leary 2006: 9); It was noted by Tran et al. (2013: 23) that extended time had to be spent with the community in order to 'build trust and elicit the necessary information for the research, as well as provide something back to the community in recognition of their contribution to the project.'

The South-West Marine Region study noted that the immutable rights of Aboriginal people regarding culturally significant land and water had been inhibited by government policy and restriction on access in other parts of the state (Australian Institute of Aboriginal and Torres Strait Islander Studies 2006: 191). It is important, therefore, to recognise that in addition to current economic, cultural and environmental limitations to effective consultation (e.g. Jackson and O'Leary 2006: 9; Pursche 2004: 138), there are also historical factors that may obstruct communication of cultural information, including hesitancy and scepticism among Indigenous communities and inaccuracies or omissions in older works. This is an artefact of historical attitudes regarding Western scientific approaches as sufficient to manage environmental systems. One way to avoid perpetuation of these errors is to encourage and enable greater active participation by Aboriginal people in the management of culturally significant water bodies, as proposed by several of the Western Australian projects (Jackson and O'Leary 2006: 10).

In situations where Indigenous organisations — specifically RNTBCs — have been retroactively involved, Indigenous co-management has been hindered by 'the displacement of previous decision-making processes, causing inconsistencies, tension, and confusion over roles and responsibilities' (Tran et al. 2013: 4). This can be avoided 'through the inclusion of RNTBCs at the outset of the planning process and not at the end' (Tran et al. 2013: 4).

Project name	Study Area	Relevant Aboriginal Stakeholders	Aim of Project	Types of Water Assessed	Methodology	Cultural domain of water identified	Outcomes of Project	Methodological Limitations	Comments
<b>Yu, S. 1999. Ngapa Kunangkul: Living Water. Report on the Aboriginal Cultural Values of Groundwater in the La Grange Sub-Basin. Report Prepared by The Centre for Anthropological Research, University of Western Australia, for The Water and Rivers Commission of Western Australia. December 1999.</b>	La Grange sub-basin and Fitzroy valley, Kimberley region	Yawuru Nyikina Karajarri Mangala Nyangumarta	<p>'The goals of this study into the Aboriginal cultural values of groundwater were outlined in the initial research brief as follows:</p> <ul style="list-style-type: none"> <li>To identify and document the Aboriginal cultural values of groundwater dependent ecological and hydrologic features within the study area.</li> <li>To provide an assessment of the significance of these environmental values with respect to the cultural values they possess.</li> <li>To identify any registered Aboriginal heritage sites in the study area that are linked to groundwater dependent ecological or hydrological features.</li> <li>To involve the Karajarri and other Aboriginal groups with traditional lands in the study area in the research process. To make specific recommendations regarding the avoidance of negative impacts on the groundwater dependent cultural values within the study area.</li> <li>To ensure that the resultant study report is approved by the Aboriginal community and groups involved.' (Yu 1999: 2)</li> </ul>	subsurface and surface water	Physical survey, Consultaion with men and women by male and female anthropologists, conducted with several Indigenous groups.	Spiritual, historic, social	<p>'The brief for this research project requires recommendations regarding the avoidance of negative impacts on the cultural values associated with groundwater from an Aboriginal perspective. They are:</p> <p>RECOMMENDATION 1. Funding should be provided to enable the relevant Aboriginal people to participate collaboratively in further research on groundwater in the La Grange sub-basin. Appropriate hydrogeological studies should involve substantial participation such that Aboriginal models concerning the groundwater can be addressed (See sections 6.1/6.2)</p> <p>RECOMMENDATION 2. Waters and Rivers Commission should continue to adopt a bi-cultural approach to the management of groundwater in the La Grange aquifer.</p> <p>RECOMMENDATION 3. A local groundwater management committee should be established for the La Grange aquifer and the relevant Aboriginal people should have representation on the committee.<sup>41</sup></p> <p>RECOMMENDATION 4. Funding for further investigation of the ecosystems of wetlands in the sub-basin through a holistic approach incorporating cultural, ecological and economic values.</p> <p>RECOMMENDATION 5. Establish a register of traditional wetlands in the La Grange aquifer, and adopt culturally appropriate processes to maintain the register.</p> <p>RECOMMENDATION 6. Register the wetlands of the sub-basin and its surrounds on the Register of the National Estate, and provide adequate funding to document the ecological and cultural significance of each site.</p> <p>RECOMMENDATION 7. Establish a multi-agency approach for the provision of funding and resources to enable communities to undertake planning processes for resources and develop appropriate cultural and environmental techniques for water and land management. Investigate options for the future uses of land and water that incorporate traditional values.' (Yu 1999: 40-41)</p>	<p>'Due to the enormous size of the study area and the remoteness of many identified Aboriginal water sites only a small percentage of water sources could be visited in the course of the research. Most permanent and ephemeral water sources located in the inland desert areas could not be accessed due to the difficulty, expense and time required to locate them and to the frailty of some of the principal TOs. To compensate, I have incorporated data from previous research and created a 'mud-map' from interviews with the TOs.' (Yu 1999: 4).</p>	

<p>Toussaint, S. Sullivan, P., Yu, S., and Mularty, M, Jnr 2001. <b>Fitzroy Valley Indigenous Cultural Values Study (a preliminary assessment). Report for the Water and Rivers Commission, 3 Plain Street, Perth, WA, 6000. Centre for Anthropological Research, The University of Western Australia, Nedlands, WA, 6009. February 2001.</b></p>	Fitzroy Valley	<p>Bayulu, Djugerari, Jarlmadangah, Kupungarri, Looma, Mimbi and Yakanarra communities</p>	<p>'In CAR's tender document (p.3), it was stated that the researchers would address the following interdependent lines of inquiry at a level of detail appropriate to 'preliminary assessment':</p> <ul style="list-style-type: none"> <li>• interpretations of the ecosystems within the Fitzroy Valley with particular reference to Aboriginal use of certain species of bush food and medicine) and seasonal activity (e.g. influence of the wet season, consequences when the river becomes high, problems when the water level drops);</li> <li>• cultural significance of water with respect to familial, social, ceremonial, totemic, work, educative and recreational activities;</li> <li>• the relationship between local groupings distinguished as 'the river people' and 'the desert people' (e.g. cultural and economic resource exchange, including knowledge and information about the river and its history);</li> <li>• relationship between water, plants, birds, animals, insects and humans;</li> <li>• measures required to 'look after' or protect water resources;</li> <li>• consequences of negative impact of water loss or abundance (and Aboriginal explanations for these).</li> </ul> <p>In addition to the presentation of indicative ethnographic data, these lines of inquiry have been addressed in Section 5.0., 'Study Findings'. Note that not only were Indigenous attachments to the rivers of interest, but all sources of water in the study area.' (Toussaint et al. 2001: 6-7)</p>	<p>Fresh and saltwater rivers, their tributaries, springs, creeks, soaks, billabongs</p>	<p>Literature review, interviews, physical survey</p>	<p>Spiritual, economic, social</p>	<p>'On the basis of this Report, it is recommended that:</p> <ol style="list-style-type: none"> <li>1. WRC undertake to negotiate fully and widely with Indigenous communities in the Fitzroy Valley before initiating plans which may impact on sources of water;</li> <li>2. WRC ensure that cultural material in this report is acknowledged as belonging to the Fitzroy Valley communities from whom the material was collected (as foreshadowed in CAR's tender document);</li> <li>3. there should be no more dams built on the Fitzroy River or its tributaries;</li> <li>4. the river country of the Fitzroy Valley River Basin must have environmental and cultural heritage protection. Rivers and waters should be considered as intrinsic to the entire cultural landscape, vital to the Indigenous people who live near and are culturally responsible for the area;</li> <li>5. the Camballin Barrage to be cleared of waste material left in the 1960s as a result of the State's interest in establishing an agricultural irrigation plant there. The WRC to organise a clearance program as a matter of urgency with the aim of ensuring the site is restored;</li> <li>6. advice on WRC work programs to be channelled through local Indigenous organisations, including local radio, health and art centres, in addition to regional representative, land councils, focus communities and government agencies;</li> <li>7. any future study to have inbuilt lead and research time to ensure wide and substantial consultation with relevant communities which may be affected by the WRC's work;</li> <li>8. cultural distinctions between river, saltwater and desert using groups to be recognised in consultations by WRC employees to ensure that the Fitzroy Valley is not assumed to be an homogenous cultural bloc;</li> <li>9. the names of all water sources (rivers, billabongs, creeks, and so on) in the Fitzroy Valley to be recorded in Indigenous languages. Where several languages exist, efforts should be made to ensure the language with which the place is most affiliated is recorded first, e.g. a Bunuba name in Bunuba country. Linguists with the Kimberley</li> </ol>	<p>Field work was limited to three weeks (Toussaint et al. 2001: 11). A further concern was that, while one of the criteria in WRC's tender document stipulated that some collaborative work between the anthropological and environmental consultants should occur, the three member environmental science team and the WRC employee who accompanied Sarah Yu and Mervyn Mularty and Sandy Toussaint during parts of their fieldwork (five and a half days out of eleven with SY and MM, and two and a half days out of seven with ST) occasionally hampered the fieldwork potential and confused the independent nature of the research. For example, MM and the anthropologists were often required to facilitate introductions to relevant persons in the focus communities, negotiate community liaison and visits, and conduct two-</p>	
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Project name	Study Area	Relevant Aboriginal Stakeholders	Aim of Project	Types of Water Assessed	Methodology	Cultural domain of water identified	Outcomes of Project	Methodological Limitations	Comments
							<p>Language Resource Centres in Fitzroy Crossing and Halls Creek may be able to assist with this recommendation;</p> <p>10. WRC to commit to a more substantial 'second stage' of cultural research on water among Indigenous communities in the Fitzroy Valley;</p> <p>11. WRC employees to undertake cultural awareness training before commencing work in the region as outlined in the WA government's booklet titled 'Working with Aboriginal Communities' (n.d. Department of Resources Development). Kimberley Aboriginal Law and Culture and Karrayili Education in Fitzroy Crossing may be able to assist with advice on the provision of this training;</p> <p>12. a process of culturally-observant consultation to become a necessary part of water-related WRC work practices in the Kimberley and other places where there is an Indigenous population;</p> <p>13. a Memorandum of Understanding (MOU) between the WRC and local Fitzroy Valley Indigenous organisations and communities on cultural relationships to water use to be formally discussed among relevant parties (such as Kimberley Aboriginal Law and Culture and the Kimberley Land Council);</p> <p>14. local communities and organisations, such as Kimberley Aboriginal Law and Culture, Karrayili Adult Education and Cultural Health in Fitzroy Crossing, to discuss development of a campaign to ensure that the river and other water sources are cleaned up, where necessary (e.g. sections of Bullock Crossing), and education provided to protect against the river becoming a dump for waste (e.g. disused boxes, food containers, drink cans);</p> <p>15. conservation measures for rivers and other water sources to be identified and made available to local communities;</p> <p>16. a cross-cultural research project involving local communities, paying particular attention to young adults, in water conservation and management to be initiated;</p> <p>17. an audit of pastoral station water</p>	<p>way cultural interpretation. 'That some Indigenous Informants were uncomfortable about contributing certain cultural insights, and the environmental team did not always seem interested in the information Informants wanted to provide (perhaps when the information was water-related but not river-based), also generated concern about the level of field data.' (Toussaint et al. 2001: 11)</p> <p>'In our assessment, the potential of cross-disciplinary work was sometimes disadvantaged by inconsistent attention to cultural etiquette and divergent work practices (Toussaint et al. 2001: 12).</p>	

Project name	Study Area	Relevant Aboriginal Stakeholders	Aim of Project	Types of Water Assessed	Methodology	Cultural domain of water identified	Outcomes of Project	Methodological Limitations	Comments
							sources to be undertaken with communities to ensure inclusion of local knowledge. The following recommendation was also made at a meeting in Looma during the course of fieldwork for this report: 18. The BandaraIngarri Committee should be funded to continue to act as a negotiating body between Indigenous groups of the Fitzroy River Basin and government and potential developers. Ngarinyin people should also be represented on this Committee' (Toussaint et al. 2001: 72-74).		
<b>Barber, K. and Rumley, H. 2003, 'Gunanurang: (Kununurra) Big River Aboriginal Cultural Values of the Ord River and Wetlands. A Study And Report Prepared For The Water And Rivers Commission.</b>	East Kimberley	Miriuwung, Kuluwaring, Gajerrabeng	'[T]o record and articulate the cultural, environmental, social and economic values which TOs and Aboriginal communities attach to the Ord River and associated flood plains and wetlands...to acknowledge past effects on Aboriginal people of the damming of the Ord River.' (Barber and Rumley 2003: 7)  '1. develop protocols for the provision of information by TOs 2. develop measures to protect the intellectual property rights of informants and the cultural sensitivities of the information itself 3. provide a brief, relevant literature review 4. describe an Aboriginal-derived framework for understanding water as a cultural and natural resource 5. identify and document environmental features and ecological processes dependent on surface water regarded as of cultural, social and economic significance to TOs in the study region 6. identify and map riparian areas and adjacent land integral to the identified water features 7. describe the cultural, social and economic context and	River, flood-plains, wetlands	Literature review, focus group, consultation	Spiritual, economic, historic	Recommendations include: establishment of a heritage agreement with Traditional Owners for clearance procedures; the establishment of an Aboriginal Native Title Reference Group of Traditional Owners to consider heritage agreement, water quality, access, and commercial and recreational use; require all employees of the WRC to attend cross-cultural awareness induction/training courses; coordinate and liaise between agencies with the view of forming an all-of-government approach to issues within the Ord - to create a body/committee, complete with Traditional Owner representatives, to oversee the activities of the state government in the region. (Barber and Rumley 2003: 50-52)	Limited time period and resources available for research and consultation, especially considering the complexity of the land tenure systems and cultural values of these riverine groups, as well as rugged terrain in the study area.	'The seasonality of the wet/dry are integral components of cultural design, which have been impacted on with the construction of dams (Diversion and Argyle).' (Barber and Rumley 2003: 18) There is 'little meaningful involvement of Aboriginal people in the management of the Ord River or an accommodation of their rights and interests in any substantive fashion.' (Barber and Rumley 2003: 46)

Project name	Study Area	Relevant Aboriginal Stakeholders	Aim of Project	Types of Water Assessed	Methodology	Cultural domain of water identified	Outcomes of Project	Methodological Limitations	Comments
			significance of different water sources and the inter-relationship between these  8. assess and evaluate the cultural significance of any ecological features  9. identify and document impacts of current dam structures, water use and flow regimes on Aboriginal values and ecological features of importance to TOs  10. investigate any distinction between Aboriginal values relating to environmental features of pre-dam and post-dam river systems  11. make recommendations regarding the minimisation or avoidance of negative impacts (or the enhancement of positive impacts) on water-dependent values of  TOs in the study area 12. produce a report integrating the research findings,' p. 8-9						

Goode, B. 2003. South West Yarragadee Blackwood Groundwater Area Aboriginal Cultural Values Survey. Report Prepared for Department of Environmental Protection Water and Rivers Commission. Brad Goode & Associates Consulting Anthropologists & Archaeologists, Dunsborough, WA.	The Blackwood, Donnelly and Scott rivers and their tributaries.	Nyungar language group	<p>To produce a 'study of the Aboriginal cultural values associated with this groundwater resource, including the South West Yarragadee aquifer' as part of 'the development of a comprehensive Environmental management Plan for the Blackwood Groundwater Area' (Goode 2003: 1)</p> <p>'To provide advice on all known and/or registered Aboriginal Heritage sites in the study area.</p> <p>To record and to provide advice on all known and/or registered Aboriginal Heritage sites relevant to the significance of water.</p> <p>To identify and document the Aboriginal cultural values associated with the water resources of the primary study area and how these values may be effected by human use of water both in situ and if withdrawn.' (Goode 2003: 6)</p> <p>'To establish contact with Aboriginal people who retain traditional or current knowledge of the study area.</p> <p>To record and to provide advice on all known Aboriginal Heritage sites relevant to the significance of water.</p> <p>To identify and document the Aboriginal cultural values associated with the water resources of the primary study area and how these values may be effected by human use of water both in situ and if withdrawn.' (Goode 2003: 42)</p>	Rivers and tributaries	Archival research, community consultation.	Social, Spiritual, Economic	<p>The Blackwood, Donnelly and Scott rivers, and their tributaries and pools be entered on an interim basis on the Aboriginal Sites Register. The Waters and Rivers Commission investigate ownership rights under the Future Acts clause of the <i>Native title Act 1993</i>. The Waters and Rivers Commission consult relevant groups, and procure employment for members of relevant groups, including creating positions for the same. Any clearing of "large habitat trees" should be accompanied by relevant group monitoring.</p>	<p>This report does not self-identify any limitations</p> <p>Consulation in conference-style setting not conductive to discussion of secret/sacred aspects of Indigenous knowledge At least one TO 'had reservations about the information from the meeting being taken out of context and used against the Nyungar people.' (Goode 2003: 45) It was also suggested that 'the consultation period should be extended, as there was not enough time for the community to be properly consulted.' (Goode 2003: 45) There was general agreement that there was not enough Aboriginal representation on the project. (Goode 2003: 45) Fieldwork conducted by a single (male) anthropologist.</p>	<p>It is recommended that the Blackwood River, its tributaries, ... associated pools ... and the waters from the Yarragadee aquifer be entered upon the interim Aboriginal Sites Register as a site of mythological significance in association with Waugal beliefs. It should also be recorded that the above places have both traditional and contemporary significance as places that represent a cultural boundary, a path of migration between camps, and around the summer pools where traditional and contemporary resources procurement activities continue. Marroning and fishing are central to these activities. It is recommended that the Donnelly River, the Scott River, and their associated tributaries should be considered in the same manner. Prior to issuing a license for the Water Corporation to harvest 45 giga litres of ground water from the Yarragadee aquifer it is recommended that the Waters and Rivers Commission make application under Section 18 of the Aboriginal Heritage Act (1972) so that the ACMC can consider the status of these places as sites under the Act. Following this determination it is recommended that prior to any further decisions being made or works taking place that are likely to impact upon the Aboriginal communities sentiments, beliefs and cultural practices that the Waters and Rivers Commission enter into discussions with members of the South West Aboriginal community in order to determine a role for the Aboriginal community in the management and monitoring of water resources within the region. It is also recommended that prior to any further decisions being made on the issuing of any further licenses for water harvesting, that the Waters and Rivers Commission investigate the question of ownership rights in regards to water resources with regards to any rights the Aboriginal community may have under the Future Acts clause of the 1993 Native Title Act.</p>
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								<p>It is also recommended that Waters and Rivers Commission continue to consult and inform the Aboriginal community as to the progress of the project and as to the findings of all other studies. This could be achieved by regular contact, consultation and briefings with the South West Aboriginal Land and Sea Council (SWALSC) at working party meetings and the provision of the findings of studies to the SWALSC.</p> <p>It is also recommended that the Waters and Rivers Commission make provision for a suitably qualified Aboriginal person or persons to be involved with the Whicher Ranges Water Resources Management Committee. Advertisement, selection and appointment for such positions should be entered into in a culturally appropriate manner. Written applications and submissions of CV's are a significant cultural barrier to Aboriginal participation. In order to make this process effective the Waters and Rivers Commission should consult local Aboriginal organizations and the SWALSC. It is also recommended that the Waters and Rivers Commission make provision for the employment of Aboriginal people within their department in scientific, policy development and water monitoring roles. This would greatly enhance the understanding and diffusion of Aboriginal cultural values with regards to the development of management plans for the regions water resources. It is suggested that this recommendation could be achieved by the creation of identified cadetships in sciences, identified positions in graduate development programs and traineeships for para-professional areas to do with the ongoing water monitoring program.</p> <p>It is also recommended that the Waters and Rivers Commission request that the Water Corporation create identified positions, both within their department and with contractors engaged in construction works,that may result from approval to develop the</p>
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Project name	Study Area	Relevant Aboriginal Stakeholders	Aim of Project	Types of Water Assessed	Methodology	Cultural domain of water identified	Outcomes of Project	Methodological Limitations	Comments
									<p>Yarragadee aquifer. If local Aborigines are employed in all aspects of the project adequate monitoring of the Aboriginal peoples cultural interests can be achieved without having specific people just employed as ‘Cultural Monitors’.</p> <p>It is finally recommended that the Waters and Rivers Commission advise the Water Corporation that any clearing of large habitat trees for bore locations and access roads be avoided and that Aboriginal community members are employed to monitor any necessary clearing for bore locations, pipelines etc. (Goode 2003: 2-3)</p>

<p><b>Rumley, H. and Barber, K. 2004. "We Used to Get our Water Free...", Identification and Protection of Aboriginal Cultural Values of the Pilbara Region. A Study and Report prepared for the Water and Rivers Commission of Western Australia. April 2004.</b></p>	<p>Pilbara</p>	<p>Thalandji, Gurama, Innawongga, Bandjima, Indjibarndi, Ngaluma, Kariara and Nyiabali (Rumley &amp; Barber 2004: 16).</p>	<p>'One aim of this research project is to describe in general terms the importance and significance of these water sources to Aboriginal people in the Pilbara region. An additional aim of the study is provide advice and guidance to the WRC on ways in which the water supplies of Aboriginal communities may be protected and managed .' (Rumley &amp; Barber 2004: 10)</p> <p>'This research project has the following specific objectives:</p> <ol style="list-style-type: none"> <li>1. To provide an overview of water dependent environmental features and ecological processes regarded as culturally and socially important to Aboriginal communities within the region, including case studies to further expand on the above in key areas and/ or where future development is proposed. The overview includes a map showing registered Aboriginal heritage sites.</li> <li>2. To identify whether existing mechanisms have been introduced by other government agencies to protect water dependent Aboriginal cultural values.</li> <li>3. To develop a set of management guidelines in collaboration with key Aboriginal groups and relevant others that aims to assist both proponents applying for a water allocation licence and WRC officers responsible for approving licences to minimise or avoid negative impacts on water dependent Aboriginal cultural values within the study area.</li> <li>4. To review options and develop guidelines for possible approaches which the WRC may take to manage/protect indigenous communities' water supplies. The approaches should recognise the need for sensitivity and flexibility on the part of the WRC in meeting its requirements while being acceptable to Aboriginal communities.</li> <li>5. To identify appropriate and practical mechanisms for Aboriginal involvement in managing and protecting water</li> </ol>	<p>Rivers, creeks, waterholes, soaks, aquifers, dams</p>	<p>Literature review, consultation with men and women of several language groups, physical survey</p>	<p>Economic, historic, social</p>	<p>'As a result of the research findings in this report and bearing in mind specific objectives 3, 4, 5 and 6 noted in Section 1.2 (see aims) above, the following recommendations are made:-</p> <ol style="list-style-type: none"> <li>1. The WRC on behalf of the State Government acknowledge past insensitivities to Aboriginal cultural values relating to water in the Pilbara region.</li> <li>2. The WRC acknowledge the lack of past consultation with Aboriginal people of the Pilbara region over the use of water in their country.</li> <li>3. The WRC on behalf of the State Government apologise to Aboriginal people of the Pilbara region for damage inflicted to water-related sites and places of significance to them.</li> <li>4. The WRC appoint Aboriginal liaison officer/heritage officer positions within the WRC who, among other activities, can liaise with Aboriginal communities and equivalent others in government and non-government agencies/organizations re issues relating to water.</li> <li>5. The WRC establish Indigenous Land Use Agreements (ILUAs) with Pilbara Regional Organisations and Agencies (eg local government authorities, industry groups, Aboriginal organisations/Representative Bodies) for heritage clearance procedures.</li> <li>6. With the assistance of the local ATSIC Regional Council (or its replacement), DIA and the NNTT, the WRC support the establishment of an Aboriginal Native Title Reference Group which can consider all relevant issues such as heritage agreements, water quality, access, commercial and recreational use.</li> <li>7. The WRC establish committees within the WRC which would include at least 2 people from the Aboriginal Native Title Reference Group. These committees would consider and make decisions on matters of common interest to the WRC and other stakeholders.</li> <li>8. The WRC rename water allocation 'licences' to 'Water Agreements'.</li> <li>9. The WRC explain more fully and carefully to Aboriginal individuals and communities the reasons for and the benefits of entering a Water Agreement.</li> </ol>	<p>Initial discussions were held with WRC project staff in Perth in order to clarify and, where necessary, modify the aims and objectives of the study in order to achieve what were considered to be more appropriate and realistic outcomes within the time frame and budget of the research. (Rumley and Barber 2004: 18)</p> <p>It was not possible to program specific meetings before the fieldwork commenced. The availability and location of TOs and developing research concerns determined the timing and location of discussions. (Rumley and Barber 2004: 20)</p> <p>The locations where people were consulted depended on their current commitments, movements and their availability at the time of the study. (Rumley and Barber 2004: 21)</p>	<p>'The results of this research can then be used both to provide the WRC with guidance on how best to ensure the protection of Aboriginal cultural values linked to water in the Pilbara region and to offer informed advice and recommendations to the WRC on the measures which could be taken to sensitively protect these cultural values.' (Barber and Rumley 2003: 10)</p>
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Project name	Study Area	Relevant Aboriginal Stakeholders	Aim of Project	Types of Water Assessed	Methodology	Cultural domain of water identified	Outcomes of Project	Methodological Limitations	Comments
			<p>dependent Aboriginal cultural values.</p> <p>6. To develop protocols for the provision of information and measures to protect the intellectual property rights of Aboriginal people providing the information. Cultural sensitivities of such information are also developed and included.</p> <p>7. To integrate the findings in this report, having ensured that the outcomes of this study are understood and endorsed by the Aboriginal people involved.' (Rumley &amp; Barber 2004: 11-12)</p>				<p>10. The WRC and the WC work together to explain and clarify to Aboriginal organisations and communities in the Pilbara the differences between their respective responsibilities regarding water supply issues.</p> <p>11. The WRC require all of its employees working in the Pilbara region to attend cross cultural awareness induction/training courses.</p> <p>12. The WRC work with CALM and Aboriginal TOs to resolve water access and other issues.</p> <p>13. The WRC work more closely with CALM and appropriate Aboriginal organisations to implement measures to protect riparian areas from erosion and damage by animals.</p> <p>14. In consultation, the WRC commence a process of collating/documenting the indigenous names of all water sources in the Pilbara region with a view to re- naming these water sources.</p> <p>16. The WRC ensure that the intellectual property rights of Aboriginal people are protected through recognition that cultural material and information belongs to those who provided it.</p> <p>17. The WRC, in association with local Aboriginal associations/communities (eg Juluwara), and the Natural Heritage Trust, produce a publication(s) which describes the cultural significance of river systems in the whole environment of the Pilbara region via oral histories and other sources (similar to the existing publications "Stories of the Oldfield River" and "Stories of the Bremer").</p> <p>18. The WRC examine the generic guidelines and protocol documents discussed in this report with a view to adopting culturally appropriate procedures.' (Rumley &amp; Barber 2004: 56-58)</p>		

<p><b>Pursche, K. 2004. 'Aboriginal Management and Planning for Country: respecting and sharing traditional knowledge. Full report on Subprogram 5 of the Ord-Bonaparte program'. Kimberley Land Council. Land and Water Australia.</b></p>	<p>East Kimberley, Ord River catchment</p>	<p>Kija, Jaru, Miriwoong-Gadjirrawoong, Balangarra</p>	<p>'The work was part of the broader integrated NRM Ord–Bonaparte Program (OBP). OBP was designed as an innovative five-year research and development program focused on the Ord River catchment in the East Kimberley, Western Australia.' (Pursche 2004: 13) The OBP had its origins in a scoping study undertaken in 1999 by CSIRO (Johnson et al. 1999). 'The R&amp;D Plan states that the '...aims of the OBP are underpinned by the environmental, economic, social and cultural principles of Ecologically Sustainable Development (as defined by the National Strategy for ESD, 1992)' [Department of Sustainability, Environment, Water, Population and Communities 1992: 6, 23]. 'The R&amp;D priorities for the OBP region include: • social, cultural and political data/understanding • participation – research into best practice for participatory planning • institutions – reviewing and evaluating alternative institutional mechanisms • capacity – lack of human and financial capacity.' (Pursche 2004: 24)</p>	<p>River, river catchment</p>	<p>Literature review, participatory action research</p>	<p>Economic, historic, social</p>	<p>'Key outcomes of the program are: • building relationships with traditional owners from the Ord River catchment • a better understanding of the cultural diversity and make-up of the catchment area • a better understanding of the challenges to implementing field research activities in the East Kimberley • identification of institutional factors and resource limitations that can impede research and Aboriginal involvement in NRM • establishment of an organisational framework in relation to NRM in the East Kimberley • identification of key land use issues and concerns from Kija, Jaru, Miriwoong and Gadjirrawoong people • formation of a strong Aboriginal Steering Committee for the Ord Catchment, including people from Halls Creek, Warmun, Kununurra and Wyndham area, which is building a foundation for the future.' (Pursche 2004: 14)</p>	<p>'The fieldwork period was short, with a one-year time frame originally provided to complete the three research projects. There were also seasonal factors, including the wet season when rain and flooding make travel impossible. The wet is also when cultural responsibilities are carried out, and from December to February it is not appropriate to conduct meetings.' (Pursche 2004: 22) Additional challenges were: '• the large geographical area • cultural complexity and diversity • gender issues and cultural implications • lack of support and integration with other research • the locations of researchers – Perth, Hobart, Canberra, Townsville, Brisbane, Darwin. • time frame of OBP was initially 5 years • competing demands • uncertainty about future of OBP • whitefella ways of doing things</p>	<p>'Certain events and issues curtailed the comprehensive scope of the work originally proposed... A key issue was that all the anticipated funding for the OBP did not eventuate and, early in the program implementation, all the subprograms had to dramatically reduce the scope of their intended research.' (Pursche 2004: 38) 'Aboriginal peoples' understanding of management comes from another world perspective to that of traditional western style of thought. This must be acknowledged, recognised and considered when developing, producing and presenting information about R&amp;D and NRM.' (Pursche 2004: 40)</p>
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Project name	Study Area	Relevant Aboriginal Stakeholders	Aim of Project	Types of Water Assessed	Methodology	Cultural domain of water identified	Outcomes of Project	Methodological Limitations	Comments
								<ul style="list-style-type: none"><li>• lack of resources to implement employment and training initiatives</li><li>• remote location, easily ignored by southern-based government agencies.'</li></ul> (Pursche 2004: 138)	

Project name	Study Area	Relevant Aboriginal Stakeholders	Aim of Project	Types of Water Assessed	Methodology	Cultural domain of water identified	Outcomes of Project	Methodological Limitations	Comments
<b>Australian Institute of Aboriginal and Torres Strait Islander Studies 2006. Sea Countries of the South: Indigenous Interests and Connections within the South-west Marine Region of Australia. AIATIS, Canberra, ACT.</b>	'The South-west Marine Region (SWMR) begins from the mid-Western Australian coastline near Shark Bay (which is commonly referred to as the Gascoyne/Midwest region) at Cape Inscription and continues south-east to Kangaroo Island, located directly off the coast of South Australia. The SWMR extends 200 nautical miles out to sea within the Australian Exclusive Economic Zone (EEZ). This area encompasses state and federal jurisdictions and covers over 1.3 million square kilometres of sea country.' (Australian Institute of Aboriginal and Torres Strait Islander Studies 2006: 19)	Yamatji, Noongar peoples' countries of the SWMR. Also includes Mirning, Wirangu, Nawu, Banggarla, Nukunu, Narungga, Kurna and Ramindjeri in SA	'This report forms part of the data gathering and scoping process toward the creation of a marine plan for the SWMR. It will also aid in the creation of specific Indigenous sea country plans that may be developed with discrete Indigenous groups and bodies as an outcome of national and state marine and fisheries planning processes and ILUAs' (Australian Institute of Aboriginal and Torres Strait Islander Studies 2006: 19). 'The aim of this review is to provide specific information about Indigenous interests, values, connections and diversity and to aid future consultation with the Indigenous people of this region. It is also an aid in the negotiation of effective and pragmatic decision-making structures and processes involving Indigenous people in the SWMR.' (Australian Institute of Aboriginal and Torres Strait Islander Studies 2006: 22)	sea and ocean mainly but also rivers and creeks and their relationship to the sea	Literature review, consultation	Economic, historic, social	'This literature review documents a range of consultative processes that are attempting to deal with Indigenous interests in sea country within the SWMR. From recognition of native title claims and negotiated agreements over cultural heritage, to MoUs regarding regional governance and representation, the picture that emerges is one of active engagement by Indigenous peoples in industry, government and conservation forums. Indigenous aspirations to adhere to principles of obligatory responsibility to sea country are expressed through this constant engagement. It is an immutable right of Traditional Owners to utilise and enjoy sea country. It is a responsibility to ensure that it is properly managed in accordance with culturally specific practices located within Indigenous Law. It is an obligation to ensure that the protection of this country occurs for future generations through the transmission of Indigenous ecological knowledge. However, the ability of Indigenous groups to meaningfully engage with this process has been hindered by past policies of exclusion and the inability of government and industry to move beyond consultation into effective management regimes.' (Australian Institute of Aboriginal and Torres Strait Islander Studies 2006: 191)	'This report focuses specifically on the Indigenous coastal groups found within Indigenous 'territories' in the SWMR. The report does not deal explicitly with each Indigenous group found within the region. The intent of this report is to provide an overview of Indigenous peoples' sense of place, space and belonging to sea country. This overview places emphasis on the demonstrable ability of Indigenous peoples to adapt to changing socio-political environments and to continue their cultural traditions and obligations to country within a contemporary setting.' (Australian Institute of Aboriginal and Torres Strait Islander Studies 2006: 19)	

Project name	Study Area	Relevant Aboriginal Stakeholders	Aim of Project	Types of Water Assessed	Methodology	Cultural domain of water identified	Outcomes of Project	Methodological Limitations	Comments
Jackson, S. 2006b. Recognising and Protecting Indigenous Values in Water Resource Management. A Report from a Workshop held at CSIRO in Darwin, NT. CSIRO Sustainable Ecosystems, April 2006.	Kimberley: Ord River	Miriwiung Gajerrong people of the east Kimberley.	<ul style="list-style-type: none"> <li>• To have a good discussion about water issues</li> <li>• For northern Australian Aboriginal groups, especially from the Daly River, to hear about the experiences of other groups, e.g. from the Murray Darling, and vice versa</li> <li>• To think about environmental policy, especially water management, and how it can work for Indigenous people</li> <li>• To talk about the words 'cultural values', how they are being used and whether they reflect Indigenous values</li> <li>• To talk about rivers and water reforms: what worries people about the changes and are there opportunities, or good parts, to the changes</li> <li>• To talk about ways Indigenous people can document their values, promote them and be involved with governments and other groups e.g. catchment management groups.' (Jackson 2006b: 7).</li> </ul>	Riverine, estuarine, wetlands, floodplains, coastal zone, subsurface	Focus group, consultation	Spiritual, economic, social	'This workshop represented the first step in a dialogue that Indigenous groups in northern Australia need to have with each other, and with other sectors of Australian society, in order to overcome the neglect of their interests from the national water reform agenda. For the first time in the context of national changes to the use, regulation and management of water, a number of Indigenous people came together to discuss common issues and progress regional priorities. A firm recommendation arising from the workshop was for more such meetings and discussions, preferably in the bush...' (Jackson 2006b: 23)	Satisfaction that there were 'people from various backgrounds. Aboriginal people in the majority which made a difference to the conduct and course of the meeting and degree of attention given to issues of interest to the Indigenous participants.' (Jackson 2006b: 6) Majority of people were from the Daly River Aboriginal Reference Group. Also visitors from Murray Lower Darling Indigenous Nations and Miriwiung Gajerrong of east Kimberley (Jackson 2006b: 7).	

Project name	Study Area	Relevant Aboriginal Stakeholders	Aim of Project	Types of Water Assessed	Methodology	Cultural domain of water identified	Outcomes of Project	Methodological Limitations	Comments
<b>Jackson S. and O'Leary, P. 2006. Indigenous Interests in Tropical Rivers: Research and Management Issues. A Scoping Study for Land &amp; Water Australia's Tropical Rivers Program. Unpublished Report Prepared for the North Australian Indigenous Land and Sea Management Alliance, March 2006. CSIRO Sustainable Ecosystems, Darwin, NT.</b>	Kimberley: Fitzroy River	Kimberley Land Council, Nygina-Mangala and Ngarinyin language groups	The goal of the Tropical River's Program is: 'To undertake research and knowledge exchange to support the sustainable use, protection and management of Australia's tropical rivers.' (Jackson &* O'Leary 2006: 13). 'The Tropical Rivers Program has four research themes: • Assess river assets and threats; • Support regional planning frameworks; • Assess social, cultural and economic values, and • Understand river ecosystems' (Jackson & O'Leary 2006: 13)	Rivers, wetlands, flood-plains and estuaries	Literature review, interviews, consultation	Spiritual, economic, social	'This study was also seen by NAILSMA as a means of helping it to better understand the issues across the north and to shape its activities in the years to come, as well as those of LWA.' (Jackson & O'Leary 2006: 7). The authors hope this report will serve to assist LWA, NAILSMA and other river research organisations to 'significantly advance the rates and effectiveness of Indigenous participation in river research, planning and management in the tropics.' (Jackson & O'Leary 2006: 7). 'This report outlines a number of priority areas of research interest arising from the literature reviewed and the interviews of representatives or nominees from Indigenous organisations. They fall under two major themes: • The need for a sound understanding of the current condition of river and wetland; need for more effective resource governance arrangements environments and their contemporary role in meeting the subsistence and spiritual needs of Indigenous communities. Increased pressure on resources, places, and sites is felt by many groups who wish to better understand the drivers of change and the consequences for their communities. • The management models and engagement methodologies. In particular research with an action research orientation that seeks to work directly with communities in identifying problems and addressing information and knowledge needs.' (Jackson and O'Leary 2006: 10) 'The report makes three specific recommendations to LWA to improve the rates and quality of research conducted in partnership with Indigenous communities: 1. That the LWA Board considers ways of ensuring high ethical standards in the research it sponsors where Indigenous people are involved, including research conducted by Indigenous organisations. It is suggested that the guidelines developed by the Australian Institute of Aboriginal and Torres Strait Islander Studies should be adopted as a basis for satisfying	'We believe that the organisations covered in the report are a suitably representative subset of Aboriginal organisations involved with these issues across the study region. It is important to note however that the report did not set out to capture the views of every Aboriginal person or organisation in the region, nor would it have been practical to do so, given the project's constraints.' (Jackson & O'Leary 2006: 7). '[S]cepticism towards research in some sectors of the Indigenous community.' (Jackson & O'Leary 2006: 9)	'The field of Indigenous land and water management is rapidly growing and in regions such as the Kimberley, the pace of change is marked. The funding base is inadequate and insecure and this limitation is a source of consternation to many Indigenous organisations surveyed. Short time-frames, piecemeal approaches, constantly shifting eligibility criteria, burdensome reporting requirements and the lack of recurrent core funding constrain the Indigenous sector in its efforts to respond to environmental problems and meet the social and cultural responsibilities of Indigenous community members. This constraint should also be a cause for concern for research organisations for whom a representative Indigenous organisation is often a prerequisite for negotiating a research agreement or relationship with an Indigenous community.' (Jackson & O'Leary 2006: 9)



Project name	Study Area	Relevant Aboriginal Stakeholders	Aim of Project	Types of Water Assessed	Methodology	Cultural domain of water identified	Outcomes of Project	Methodological Limitations	Comments
							<p>LWA's human ethics requirements.</p> <p>2. In recognition of the importance of early engagement with Indigenous communities and the under-resourced nature of Indigenous organisations, that LWA consider mechanisms for bringing researchers and Indigenous organisations together to discuss and negotiate research project ideas.</p> <p>3. Given that the opportunity for Indigenous participation in research is a key ingredient in successful arrangements and relationships nominated by people consulted during this study, LWA should consider tailoring its investments to encourage LWA sponsored researchers to work collaboratively with Indigenous organisations in the tropical rivers region. Training and employment of Indigenous people and effective consultation processes are expensive and time consuming. A standard of paying Indigenous people for their expertise and participation in research activities could then become embedded in research practice. (Jackson &amp; O'Leary 2006: 10)</p>		

Project name	Study Area	Relevant Aboriginal Stakeholders	Aim of Project	Types of Water Assessed	Methodology	Cultural domain of water identified	Outcomes of Project	Methodological Limitations	Comments
<b>Australian Interaction Consultants. 2008. Preliminary Investigation of Aboriginal Heritage. The Changing Cockburn Coast: Appendices – Indigenous Heritage. Report Prepared for Department for Planning and Infrastructure, Perth, WA., June 2008.</b>	Cockburn Coast, including Manning Lake and Park Bushland	Noongar (Independent Aboriginal Environment Group, Bibbulnum Group, Ballaruks Group, Jacobs Family	<p>Identification of known or potential Aboriginal sites. Determine appropriate consultation, and further research</p> <p>'to identify and detail all heritage issues relating to the North Coogee industrial area in Western Australia.' (Australian Interaction Consultants 2008: 4)</p> <p>'The main objectives of a Preliminary Aboriginal Heritage Investigation are to:</p> <p>Identify any known or potential Aboriginal Heritage issues that may affect the proposed development.</p> <p>Identify any further research and/or consultation necessary to meet the requirements of the Aboriginal Heritage Act 1972.</p> <p>Make recommendations regarding the scope of any further research and/or consultation that may be required.' (Australian Interaction Consultants 2008: 10)</p>	Coastal zone, riverine, lakes, wetlands	Desktop research, preliminary archaeological survey	Spiritual	<p>'On the completion of this desktop study, when and where appropriate, the Indigenous people/groups who are acknowledged as being the relevant people to be consulted for the area be approached with a full description of the proposed DPI undertakings for the Cockburn coast project area.</p> <p>The appropriate people should be invited to participate in a preliminary field inspection of the area in order to identify any issues that might become apparent.</p> <p>A full archaeological investigation of the area should be conducted for each development application.</p> <p>Wherever possible, the disturbance of any site (whether previously registered or unrecorded) is to be avoided. In the event that a site must be disturbed, an application should be made to the Minister under Section 18 of the Aboriginal Heritage Act (1972), following consultation with the relevant Indigenous groups/persons.</p> <p>Knowledge and awareness of, and concern for, environmental issues make up an important aspect within Indigenous heritage. As such, the relevant Nyungar Elders should be kept within the consultation circuit for the full duration of the development planning process</p> <p>Australian Interaction Consultants recommends that the developers and/or DPI negotiate a Heritage Management Agreement with the Nyungar Elders who have an acknowledged right, and ability, to speak for the Cockburn development area</p> <p>All staff and contracting personnel involved in the project for the Department for Planning &amp; Infrastructure should be made fully aware of their obligations under The Aboriginal Heritage Act (1972).' (Australian Interaction Consultants 2008: 5, 43)</p>	No involvement of TOs in preliminary survey.	<p>Noted that 'Waterscapes are typically part of the sacred geography in Aboriginal Australia. Consequently, many of these values are also expressed as cultural heritage values recognised by the Aboriginal Heritage Act 1972. Others, however, are not.' (Australian Interaction Consultants 2008: 40)</p>

Project name	Study Area	Relevant Aboriginal Stakeholders	Aim of Project	Types of Water Assessed	Methodology	Cultural domain of water identified	Outcomes of Project	Methodological Limitations	Comments
<b>The North Australian Indigenous Land and Sea Management Alliance 2009b. 'Standing Together for Water Rights'. North Australian Indigenous Experts Water Forum Report. Darwin, Charles Darwin University.</b>	Kimberley	Kimberley Land Council	'NAILSMA supports Aboriginal and Torres Strait Islander land and sea management using strategic approaches to care for country with an emphasis on practical management by Traditional Owners across north Australia.' (North Australian Indigenous Land and Sea Management Alliance 2009a: ii) This forum provided an opportunity to 'raise ideas and concerns about economic development and opportunities; potential impacts of development in north Australia; governance and institutional arrangements as they affect Indigenous community interests, aspirations and issues.' (North Australian Indigenous Land and Sea Management Alliance 2009b: 4)	Rivers, flood-plains, lakes, sea, wetlands	Focus group, consultation	Spiritual, economic, social	'The four outcomes of the Forum were: • the Mary River Statement of intent, that is consistent with other declarations of Indigenous land, sea and water managers, such as Garma International Indigenous Peoples Water Declaration • Principles to guide water policy and management • Recommendations for water reform and management; and • the election of an Interim Working Group to engage other interest groups to develop partnerships that promote understanding, recognition and common goals.' (North Australian Indigenous Land and Sea Management Alliance 2009b: 17).		Productive meeting in which the interim working group was elected with two members each from WA, NT and QLD

Project name	Study Area	Relevant Aboriginal Stakeholders	Aim of Project	Types of Water Assessed	Methodology	Cultural domain of water identified	Outcomes of Project	Methodological Limitations	Comments
<p><b>Barber, M. and Jackson, S. 2011b. Aboriginal Water Values and Resource Development Pressures in the Pilbara Region of North-west Australia. Australian Aboriginal Studies 2011/2. CSIRO, Tropical Ecosystems Research Centre, Darwin. Pp. 32-49.</b></p> <p><b>A companion academic paper was also published that added reporting information:</b></p>	Pilbara	Innawonga, Bunjima, Jurruru, Kuruma Marthudunera, Martu Idja Banyjima, Ngarluma, Nyiyaparli, Puutu Kunti Kurrama and Pinikura, Thalanyji, Yaburara and Yindjibarndi.	'[Rio Tinto Iron Ore Pty Ltd] wished to better understand Aboriginal values and interests in water across the region....but the primary corporate motivations emerged from the desire to proactively manage current and future impacts rather than legal requirements.' (Barber & Jackson 2011a: 33) 'The priority in what follows is to synthesise and describe the major characteristics of Aboriginal water values and Aboriginal water issues in the Pilbara and their relationship to recent developments in wider Aboriginal advocacy around water planning.' (Barber & Jackson 2011a: 34)	surface and sub-surface	Literature review, interviews	Spiritual, economic, social	'Our research suggests that Aboriginal people in the Pilbara would benefit from greater attention from, and greater participation in, wider regional Aboriginal discussions and alliances with respect to water issues, as well as from state and private sector efforts to better plan for increased mine water use. Despite recent activity in the Aboriginal water rights domain at international, national and intra-Australian regional scales, little attention has been given to the Pilbara region, even with its acute water use pressures.' (Barber & Jackson 2011a: 34)	'As the research represented an initial scoping exercise, no attempt was made to cover all the issues in a particular geographic location, to cover all the issues in all the major locations, or to achieve statistically representative coverage of the targeted population. It was also important that any of the opinions expressed by individuals could not be taken to be the collective position of any language or Native Title group of which they were a member. Rather, the emphasis was upon interviewing relevant people occupying critical socio-cultural and institutional positions, and on identifying particular examples in each location that reflected themes or issues important at a broader level — the relationship between people and the country, issues with water storage and extraction, climatic variation etc.' (Barber and Jackson 2011a: 36)	Barber & Jackson (2011a) composed a companion academic paper reporting on this project. The quotes in this column come from that paper: 'This general drying also coincides with a substantial new kind of water extraction, the pumping out of mines lying below the water table, leading to localised excess surface water and groundwater depletion. This mine dewatering is set to increase rapidly [and] means that water resources are a major contemporary issue for Pilbara Aboriginal communities. Resource developers and state resource management agencies will need improved consultation, negotiation and decision-making processes around access to and management of water, and this will require research support and effective Aboriginal advocacy, including the participation of Pilbara people in wider forums discussing Aboriginal water issues.' (Barber & Jackson 2011a: 47). 'The significance Pilbara Aboriginal people ascribe to water reflects its overall scarcity in the region and its fundamental role in creating and sustaining places of importance, places that in turn sustain people in myriad ways.' (Barber & Jackson 2011a: 46)

Tran,T., Strelein, L., Weir, J., Stacey, C., Dwyer, A. 2013 Native Title an Climate Change. Changes to Country and Culture: Strengthening Institutions for Indigenous Resilience and Adaption. Australian Institute of Aboriginal and Torres Strait Islanders Studies. (MULTI STATE)	Kimberley, WA	The Karajarri Traditional Lands Association Aborigina Corporation RNTBC (KTLA) (WA)	Recognising a gap in climate change adaptation literature with regards to how Indigenous groups interact with the socio-institutional structures to assert their knowledge and participate in climate change adaptation activities, this project seeks to bring understanding to these socio-institutional structures for the potential contribution Indigenous knowledge can make in climate change monitoring, observation, and adaptation.	Fresh water springs, water holes, ephemeral water, and coastal waters.	Active community engagement and involvement in the project was a core component of its research process and outcomes. Interviews with community members organised and conducted via a community liaison officer from within the community. Investigators also conducted “extended field work” spending weeks within the communities in order to “build trust and elicit the necessary information for the research, as well as provide something back to the community in recognition of their contribution to the project. (Tran et al. 2013: 23).” Data was collected from large scale meetings of RNTBCs at a regional and national level – focus group method. Literature review; legal and policy analysis.	Karajarri describe these waters as ‘living’ (Yu 1999), thereby expressing the central role of the water in sustaining life in the desert, as well as sustaining Karajarri cultural and economic activities. The freshwater sources support localised ecosystems, plants and animals, and are a focal point for Karajarri hunting and camping trips, as well as more permanent outstations. The waters of the La Grange Basin also provide for the community of Bidyadanga, pastoral stations, and limited horticultural and pastoral activities. It is to a large extent an unallocated water resource, and is one of Western Australia’s largest groundwater resources.	The project met its first aim, to understand the aspiration and capacity of RNTBCs to be effective agents in climate change adaptation; Consultations with key government and shire stakeholders throughout the project has resulted in a greater awareness of RNTBCs roles in relation to land use, water and community planning. 'These research activities contributed to the following findings within the context of our two case studies: • There are synergies between RNTBC caring for country priorities, governance and community development that are consistent with climate change adaptation priorities, yet the lack of development of and RNTBC priorities, such as through land use planning, is a significant barrier to Indigenous participation in adaptation activities. The retrospective recognition of native title has supported traditional owner authority in land use and natural resource management and decision making, whilst simultaneously creating the institutional marginalisation of RNTBCs as a ‘new’ governance sector. • There is a critical need to renegotiate governance arrangements within Indigenous communities, especially where RNTBCs have been created alongside existing governance institutions, resulting in the displacement of previous decision-making processes, causing inconsistencies, tension, and confusion over roles and responsibilities. • The complex interaction between native title and planning can be addressed in a very practical way through the inclusion of RNTBCs at the outset of the planning process and not at the end. • The imperative for a long term approach is driven by the communal and binding nature of decision making over native title lands as well as the intergenerational consequences of climate change. • There has been a lack of respect for the plans and priorities developed by RNTBCs and local communities, coupled with ad hoc and at times divergent development proposals, undermining agreed upon decisions and decision making	Project highlights that while there is “synergy” between RNTBC caring for country priorities, governance and community development consistent with climate change adaptation priorities, there are a number of factors which create a barrier to Indigenous participation in adaptation activities. These include: a lack of development of RNTBC priorities; the need to renegotiate governance arrangements within Indigenous communities that currently displace previous decision-making processes thus creating tension, inconsistencies and confusion over roles and responsibilities; retrospective recognition of native title that creates the institutional marginalisation of RNTCs as a “new” governance sector; lack of respect for the plans and priorities developed by RNTBCs and local communities; underrepresentation of remote Aboriginal communities in the face of regionalisation of planning and local government; the need for integrated planning that is consistent with native title holder’s holistic and intergenerational perspective on country.
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Project name	Study Area	Relevant Aboriginal Stakeholders	Aim of Project	Types of Water Assessed	Methodology	Cultural domain of water identified	Outcomes of Project	Methodological Limitations	Comments
							<p>processes, and affecting sustainable land use planning outcomes that are central to climate adaptation.</p> <ul style="list-style-type: none"> <li>• The former community/Aboriginal councils system, historically used as a means of enabling self-government, has been slowly replaced by mainstream structures that impose new forms of accountability or remove accountability to a broader regional constituency. The regionalisation of planning and local government risks the under-representation of the unique needs and priorities of remote Aboriginal communities. The involvement of RNTBCs in planning and decision-making processes can play a part in mitigating this risk.</li> <li>• Funding preferences created by different regimes to support different Indigenous forms of governance can place Indigenous community/shire councils in competition with RNTBCs, often with an outcome that draws resources away from RNTBCs.</li> <li>• The unrealistic expectation that RNTBCs will be able to effectively engage in equitable and meaningful negotiations over land and water use without funding support creates a spiral of incapacity that distracts from the planning needs of remote communities.</li> <li>• The design of decision-making structures needs to reflect the cultural legitimacy and representative role of RNTBCs and, at the same time, have this reflected in the distribution of resources.</li> <li>• The principle of 'getting the whole system in the room' to look at long-term planning for native title lands is consistent with the successful approach to agreement-making with native title groups in the Dampier Peninsula Planning Process, and is of relevance to RNTBCs facing comprehensive planning challenges.</li> <li>• Integrated planning that is consistent with native title holders' holistic and intergenerational perspective on country holds the greatest potential for RNTBCs to play an effective enabling role in climate change adaptation.' (Tran et al. 2013: 3-4)</li> </ul>		

Table 11-8: Projects examining Indigenous cultural values of water: Western Australia



## 11.6 Conceptual and Methodological Approaches to Identifying Indigenous Values and Water

### 11.6.1 Introduction

The project methodologies are largely determined by the backgrounds of the researchers, the brief provided, and the broader interests of the funding body/bodies. Most projects employed forms of consultation. From the information provided, it seems that none of the projects could involve extensive anthropological fieldwork.

The majority of the projects reviewed in this report were conducted after 1984, when the concept of cultural significance used in the Burra Charter was first established (Australia ICOMOS 1999: 11). The influence of the Burra Charter has been considerable in the field of cultural heritage management and sets the benchmark for similar charters around the world. One of the main contributions of the Burra Charter has been a robust and practical division of heritage values into four main categories: aesthetic, historic, scientific and social (Australia ICOMOS 1999: 12).

In addition to the more intangible cultural significance of water, attention is also regularly paid to the tangible significance of the water as a resource and an environmental condition necessary for many other resources, particularly floral and faunal. This is often referred to as economic significance.

This framework, combining the Burra Charter's heritage values with economic significance, has been utilised by many of the projects reviewed below. Although many of the projects recognise that a place may have a variety of types of significance, it is important to realise that in many cases these divisions are somewhat arbitrary. In fact, economic and cultural value can often be inseparable (Altman and Branchut 2008: 2; Finn and Jackson 2011: 1236). For example a fishing site is of obvious economic significance, but by giving the Aboriginal people that use it an independent source of food and a connection to a traditional way of life, the very act of fishing becomes socially significant as well, while the simple act of preparing the fish or otherwise leaving artefacts or biofacts at the site afford potential for scientific value as well.

This attempt to rigidly define values within certain parameters is useful when initially trying to determine the significance of heritage places and start conversations about why people value a place. However, as the Burra Charter itself notes, this is just one of the possible approaches that might be adopted by researchers, and other categories may present themselves during the course of the research (Australia ICOMOS 1999: 2).

These previously defined categories of value, while not a flaw or limitation of the research, may have influenced the nature of the results and conclusions. For example, Rea and the Anmatyerr Water Project Team (2008: 68) call for a non-licensed water allocation to sustain places of cultural value, and a licensed allocation to sustain places of economic significance. It is possible that a different approach to defining significance may have resulted in a different set of distinctions between the places of importance to the Indigenous community, and resulted in alternative recommendations. Whether these alternative recommendations would be more effective may be equally difficult to measure.

Some projects, such as that conducted by Altman and Branchut (2008: 34), realised that the distinction between cultural and commercial significance or between customary and market activities were false dichotomies. One of the recommendations to come out of almost all of these projects, and one which could ensure a more complete appreciation of the value of water, was the direct involvement of Aboriginal people in managing flows. Cooper and Jackson (2008: 65) specifically recommend the formation of an 'Aboriginal Values Implementation Group' to monitor Aboriginal values of water in the Katherine Region of the Northern Territory (See Table 10-9).



Australian Capital Territory	New South Wales	Northern Territory	Queensland	South Australia	Tasmania	Victoria	Western Australia
n/a	Focus group Consultation	Literature review Focus group Consultation Interviews Physical survey	Consultation	Consultation Interviews	n/a	Consultation	Literature review Focus group Consultation Interviews Physical survey Participatory action research

Table 11-9: Methodological approaches by state and territory

### 11.62 Literature Review

For a number of projects, the first research stage took the form of the literature review. While projects such as Armstrong (2008) solely relied on a literature review for the provision of information, all projects dealt with literature to some degree with earlier projects (such as Jackson 2004, self-identified as a preliminary study) tending to be more reliant on literature information than later projects.

Reviews of appropriate literature, while essential, have now been conducted by several projects, including the present one, in all of the appropriate domains. While useful literature is always being generated, the bulk of work that has been done in this area up until now should perhaps be considered to be a phase of effort that is concluded. The exceptions to this may be:

- new literature that is specific to the groups or regions that new projects focus on
- the gathering of additional current international literature and reports announcing new or successful initiatives in water management that are fundamentally inclusive of indigenous peoples, to which this report has made a small contribution (see section 11 above)

### 11.63 Consultation/Workshops/Focus Groups/Interviews

Consultation, workshops, focus group studies and interviews comprise the bulk of the methodological approaches carried out by projects aiming to identify, record and assess Aboriginal values of water. A number of projects, such as Jackson and O'Leary (2006) and Jackson (2004), use a combination of a number of these approaches.

Constrained by budget and timeframe restrictions (applicable to all project research, as outlined in 12.3 further in the report) projects employing consultation, workshops, focus groups and/or interviews largely involve discussion groups or forums and telephone interviews as opposed to long term ethnographic field work. Jackson & O'Leary's (2006: 7) scoping study for the Tropical River's Program, for example, was only able to interview a "representative subset of Aboriginal organisations", and as such does not claim to or enable a comprehensive understanding of the values ascribed to rivers and wetlands in this region.

One of the key recommendations highlighted within these reports is for the consultation process to expand to incorporate the active involvement of Indigenous stakeholders in the management of culturally significant water bodies (Jackson and O'Leary 2006: 10; Lockie et al. 2003; North Australian Indigenous Land and Sea Management Alliance 2009b). Cranny and Poh-Ling (2010), for example, call for a systematic method to include Indigenous cultural values and ecological knowledge into water management activities of the Queensland Department of Environment and Resource Management (DERM).

### 11.64 Field Work

A smaller number of projects utilised a form of fieldwork as part of their methodological approach. Those that did so, such as Yu (1999), Toussaint et al. (2001) and Rumley and Barber (2004), identified the reason for doing so to be time constraints which necessarily resulted in less than comprehensive results. Even the limited fieldwork itself was sometimes not without its problems. Toussaint et al. (2001:12) noted that their less than adequate field work time frame (three weeks) was hampered by team member unavailability and the resultant lack of trust and familiarity between these researchers and the Indigenous community members. This familiarity is vital for the transmission of often sensitive cultural information.

The scope, effectiveness and even the definition of fieldwork ranges widely between projects and across the states and territories of the country. For example, Yu's 1999 project focussing on the Aboriginal cultural values of the La Grange Basin was limited in scope. While Yu stated that there are numerous springs in the La Grange Sub Basin, only a select number were visited (1999: 3).

In contrast, Toussaint et al. (2001) undertook fieldwork in three distinct stages in three separate areas of the Fitzroy Valley. The longest of these three fieldwork periods lasted for 11 days while the two other lasted for seven days each. The research was carried out both in Aboriginal communities as well as at significant sites or river systems and also during fishing expeditions (Toussaint et al. 2001: 10).

Rumley and Barber (2004: 19-20) used the term 'fieldwork' to mean the interviewing of small groups of Aboriginal people in the regional centres of northern WA including Karratha, South Hedland and Roebourne. It is unclear if any field work occurred at the water sources in question.

While the elucidation of the fieldwork methodologies carried out above is useful, a number of other projects do not provide this level of information. Cooper and Jackson (2008), for example, state that fieldwork was undertaken between May and June and between August and October 2007 while Watts (2012: 11) refers only to 'field trips'. It is not specified in these reports whether the field work undertaken was traditional anthropological research or simply a form of on-site consultation. We are certain that the researchers had detailed information on what fieldwork meant for a particular project, and that this information was likely not included in some cases for expeditious reasons.

### **11.6.5 Cross-disciplinary Research**

Cross-disciplinary research, and the resultant intersection of often diverse research questions, has the potential to skew original research questions and disrupt the conceptual intent of a research project. As Toussaint et al. note, cross disciplinary work can be "disadvantaged by inconsistent attention to cultural etiquette and divergent work practices" (2001:12). As many Western Australian Indigenous groups undertake Law ceremonies from December to February, fieldwork was sometimes hampered by the unavailability of Aboriginal informants (Pursche 2004). Scepticism towards western modes of research among Indigenous informants, and the obvious negative effects this may have on the capture of sensitive information, is also an ongoing issue (Jackson and O'Leary 2006:9; Pursche 2004) and should be addressed by future projects.

### **11.6.6 Assessment**

There is some degree of consistency in terms of project methodology. It is our contention that traditional long-term anthropological fieldwork would be the most comprehensive methodology available to undertake analyses of the relationships between Aboriginal groups and individuals, and water in the current political and economic context. However, constraints - particularly of time and funding, but also of project aim - mean that this approach is unlikely to be viable. Targeted short term anthropological fieldwork would, therefore contribute valuable information. Notwithstanding this, projects that have undertaken site visits, on-site consultations, and face-to-face interviews have already generated valuable information, and appear to be, given the constraints in place, a solid compromise between seeking to understand the beliefs and interests of Aboriginal people, and providing funding bodies with information that has translatability for governmental approaches.

## **11.7 Recommendations from the Projects**

### **11.7.1 Introduction**

Many project reports reviewed for the current report contain recommendations as to future research focuses and methods. Some of these recommendations are common to all reports, some are common to most reports, and a very few are unique to a report. The types of recommendations which have been included in this section are those that have relevance in terms of future water management and planning processes or are directly relevant to cultural values of water and/or cultural flows. Other general themes which have been raised in broader recommendations are also noted.

### **11.7.2 Summary of Recommendations from Multi-State Projects Reviewed in Section 10.5**

Research projects reviewed in section 10.5 which encompass more than one State or Territory are examined here. There are five projects which fall into this category: Jackson (2006b) reports on NSW, NT, SA, Victoria and WA, NAILSMA (2009b) reports on the NT, Queensland and WA, Jackson & O'Leary (2006) report on NT, Queensland and WA, AIATSIIS (2006) reports on the South-west Marine Region (SWMR) in SA and WA and Tran et al. (2013) report on Queensland and WA.

Jackson's (2006b) project report documents a workshop held in NT with participants from NSW, NT, SA, Victoria and WA. The workshop involved discussions, focus groups and presentations concerning cultural values of water. As well as the in depth discussions concerning cultural values of water, the key recommendation from these workshops were for 'more such meetings and discussions, preferably in the bush...' (Jackson 2006b: 23).

The NAILSMA (2009b) report made ten recommendations based on focus groups and consultation in NT, Queensland and WA. None of these recommendations make specific reference to cultural flows, cultural values and uses of water. The report is more concerned with Indigenous participation in water planning and management. The report recommends instituting processes, frameworks, partnerships, communication strategies and principles, so that recognition, consultation, participation and advocacy can be improved. Also included are recommendations concerning rights to negotiate commercial and customary water use, developing sustainable livelihoods and Indigenous economic development opportunities. The recommendations of this report take a rights based approach to water planning and management and include reference to both customary and economic uses of water.

Jackson & O'Leary (2006) carried out research in NT, Queensland and WA. They identify two major areas of future research interest and make three recommendations for improving research with Indigenous communities. None of these recommendations explicitly deal with cultural flows, cultural values or cultural uses of water. However the first major area of research interest they identify may be seen as contributing to knowledge about cultural water requirements. They identify the importance of researching how existing river and wetland environment conditions meet the current 'subsistence and spiritual needs of Indigenous communities'. They also identify importance of improving the effectiveness of 'resource governance arrangements, management models and engagement methodologies' (Jackson and O'Leary 2006: 10). In particular Jackson & O'Leary (2006: 10) identify action research methodologies as useful techniques because they can identify problems and address 'information and knowledge needs'. Three specific recommendations are made addressing research partnerships with Indigenous communities. These are: using the Australian Institute of Aboriginal and Torres Strait Islander Studies guidelines to satisfy human ethics requirements, developing mechanisms to improve discussion and negotiation of research topics between Indigenous communities and researchers, and increasing Indigenous participation in research through collaboration between researchers and Indigenous organisations.

The AIATSIS (2006) report focuses on particular recommendations regarding consultation and collaboration with the Indigenous groups which have interests in the Sea countries of the SWMR. The report emphasises 'collaborative sustainable management practices' in reference to fisheries management in the area (AIATSIS 2006: 15) and is concerned with enabling the South Australian Department of Environment and Heritage (DEH) (now the Department of Environment, Water and Natural Resources) to develop collaborative management practices with the Indigenous groups which have interests in the SWMR.

Tran et al. (2013) examines the impact of a changing climate on water resources, with focus on two case studies relating to water management: one in Queensland and one in WA. The project made reference to improved governance and early inclusion of Indigenous organisations in planning processes. The project, emphasised the importance of Indigenous organisations – particularly Registered Native Title Bodies Corporate (RNTBC) – in the management and care for culturally important water bodies. The report also recommends 'the inclusion of RNTBCs at the outset of the planning process and not at the end' and that efforts are made to ensure '[t]he design of decision-making structures ... reflect[s] the cultural legitimacy and representative role of RNTBCs and, at the same time, ha[s] this reflected in the distribution of resources' (Tran et al. 2013: 4).

Only one multi-state report deals specifically with cultural flows, values and uses of water (Jackson 2006b). This report draws attention to the importance of cultural values however the primary recommendation from the report preference for more research and workshops to be held 'in the bush' (Jackson 2006b: 23). This highlights the importance of providing venues for discussion in rural and remote areas, as well as researching, documenting and disseminating the processes and outcomes of such discussions. The other reports in this section are more focused on improving Indigenous participation in water research as well as in water planning and management, by various means and processes. Although participation is the umbrella theme term used here, it denotes a wide range of terms. Unlike the other multi-State reports, the NAILSMA (2009b) report also took a rights based approach to water planning and management.

### **11.73 Understanding Cultural Flows/Values and Uses of Water**

Morgan, Strelein & Weir (2004: 40, 51) emphasise the importance of identifying cultural flows. Jackson, Moggridge & Robinson (2010: 8) nominate understanding of the 'cultural flows' concept and how it aligns with environmental flows including under differing management models. Jackson, Moggridge & Robinson (2010:7) state the need for a 'holistic approach to economic, social and cultural water uses, aspirations and values' and note the importance of 'understanding the concept of cultural flows'. The NSW Office of Water (2012) provides a summary from consultation workshops carried out during 2009 and emphasise the importance of the cultural values of water.

Cultural aspects of water include the cultural significance of water, the importance of exploring cultural activities and water sharing, and ensuring that water sharing plans cater for cultural activities. The poor understanding of cultural values of water is also noted.

#### **11.74 Identifying and Quantifying Cultural Flows/Values and Uses of Water (baseline measures)**

Morgan, Strelein & Weir (2004: 40, 51) emphasise the importance of determining baseline cultural flow requirements. Jackson, Moggridge & Robinson (2010: 7) state the need for a 'holistic approach to economic, social and cultural water uses, aspirations and values' and note the importance of 'assessing and quantifying Indigenous water use and requirements and identifying baseline information'. Jackson, Moggridge & Robinson (2010: 8) nominate 'techniques to quantify Indigenous environmental and cultural water use and the specification of Indigenous water requirements' as priority areas for research. There is a need for research to specify the water required to sustain cultural values. (NSW Office of Water 2012: 1-7). Jackson and O'Leary (2006:10) state that there is a 'need for a sound understanding of the current condition of river and wetland environments and their contemporary role in meeting the subsistence and spiritual needs of Indigenous communities'.

#### **11.75 Access to Cultural Water Places**

The identified need for contemporary Aboriginal groups to access cultural water sites and places is noted by (Cooper & Jackson 2008: 64-65) who recommend 'Including Aboriginal access to cultural water sites as an objective Water Allocation Plans.' EMS Consultants state that 'Aboriginal people have a range of aspirations about water. ... Ensuring Aboriginal access to cultural water sites is arguably just as important as cultural water allocation' (EMS Consultants 2009: 30). On the basis of statements made by participants in their study, Craig et al. (2009: 27) identify 'the need for greater protection of, and access to the rock hole Mer Ngwurla and surrounding country'.

#### **11.76 Co-Management/Collaborative Management**

The facilities through which Aboriginal people can manage, or co-manage, their traditional water bodies are yet to be adequately put in place. For Aboriginal people, the need to manage their traditional water bodies is often linked to a social obligation to transmit traditional ecological knowledge down to future generations. However, these two interlinked aims have been 'hindered by past policies of exclusion and the inability of government and industry to move beyond consultation into effective management regimes' (AIATSIS 2006: 191). This need for Aboriginal co-management and collaborative management of water and water research has been highlighted by a number of projects:

- A 'co-management model which takes a more holistic account of Indigenous involvement is required to meet the challenges of water planning and governance in the upper Roper' (Barber & Jackson 2011: 51)
- Importance of 'developing the capacity for collaborative aquatic resource management' (Jackson, Storrs and Morrison 2005: 105)
- Encourage 'researchers to work collaboratively with Indigenous organisations in the tropical rivers region'. (Jackson & O'Leary 2006: 10)
- 'Shift from consultation to negotiation and collaborative management' (Jackson & Altman 2009: 41-42).
- Improve 'processes/protocols to advance collaboration between Indigenous communities and researchers' (Lockie, Rockloff and Muir 2003: 4).
- '...the Queensland government is well positioned to move beyond consultation, technical analysis and rhetoric towards genuine collaborative water planning and management with Indigenous groups, working together for shared environmental outcomes. (Cranney & Tan 2011: 112-113)
- '... collaborative research projects on Indigenous community outcomes should always begin with discussions involving potential Indigenous nation partners [and] ... the collaborative, multidisciplinary research model developed as part of this project is used as a template for future research projects with Indigenous communities' (Birkhead et al. 2011: vii-ix)
- Funding should be provided to enable the relevant Aboriginal people to participate collaboratively in further research' (Yu 1999: 40-41)

#### **11.7.7 Rights/Recognition of...**

The need for contemporary Aboriginal groups to access cultural water sites should not be ignored when discussing cultural flows. Ensuring Aboriginal access to cultural water sites is arguably just as important as cultural water allocation. A number of projects (e.g. Cooper & Jackson 2008; Craig et al. 2009) highlight access to cultural water sites as an important subject. The right to a cultural flow is addressed by Morgan, Strelein & Weir (2004: 40). The

NAILSMA (2009b) report also took a rights based approach to water planning and management. One of two key recommendations from Morgan, Strelein & Weir (2004: 59) is that the MDBC 'recognise the distinct rights and interests of Indigenous Nations in the Murray Darling Basin'. Among the future research projects and questions identified by (Lockie, Rockloff and Muir 2003: 4) is 'how Indigenous rights to water ... are recognised and incorporated into decisions'. Cranney & Tan call for a 'requirement for not only granting water as a resource, but also recognising broader concerns regarding Indigenous water rights ...' (Cranney & Tan 2011: 112).

#### **11.7.8 Consultation/Process**

The major recurring theme that is evident from the projects reviewed is the need to include Indigenous input into all aspects of management and research. The reports by Morgan, Strelein and Weir (2004), and Jackson, Moggridge and Robinson (2010) both stress the need to include Indigenous input into processes that determine economic, social and cultural water uses.

The interests of Aboriginal people are often neglected owing to a lack of dialogue between Aboriginal groups and other sections of Australian society (Jackson 2006b: 23). Jackson (2006b: 23) recommends that more meetings and discussions take place in the future.

Cranney and Tan (2011: 112), for example, assert that the assessment of Aboriginal cultural values of water should be a component in any future water planning projects.

Pemberton, Baird and Draper (2009) and Goulding et al. (2008) also emphasise the need for appropriate consultation.

Birkhead et al. (2011: vii-ix) suggest that funds are provided to enable Indigenous people to obtain adequate legal advice with regard to the development of research agreements that favour and protect the interests of the Indigenous group in question. Birkhead et al. also note that all future research projects should engage first with potential Indigenous nation partners (2011: vii-ix).

#### **11.7.9 Participation/Involvement**

Jackson and O'Leary (2006: 10) note that Indigenous participation in future projects is key to 'successful arrangements and relationships'. To aid in incentivising participation, it was also proposed that Indigenous people receive payment for their expertise and that, in time, this could become embedded in the research practice (Jackson & O'Leary 2006: 10).

(Jackson, Moggridge & Robinson 2010: 8) recommend 'facilitating Indigenous involvement in water resource management... [and] ... involving 'Indigenous people in subsequent policy development and decision-making'. The NSW Office of Water notes the 'need for involvement of regionally specific Aboriginal bodies, Aboriginal community Elders and other local Aboriginal people in the water sharing process' (NSW Office of Water 2012: 1-7). Craig et al. write that 'Anmatyerr people explicitly stated their wish to be actively involved in management decisions' (Craig et al. 2009: 27). One of four recommendations put forward by Lockie, Rockloff and Muir (2003: 4) is '[s]trengthening of Indigenous peoples' involvement in planning and management'. Cranney & Tan call for 'recognising broader concerns regarding Indigenous water rights and involvement in water management' (Cranney & Tan 2011: 112). EMS Consultants (2009: 30) note 'Aboriginal people have a range of aspirations about water ... [including] greater involvement of Aboriginal people in water / natural resource management and decision making'.

#### **11.7.10 Research methodologies and strategies recommended**

Case studies are identified by a number of project reports as suitable methods for investigation and methods which some Aboriginal groups have nominated as useful to document matters of importance to them. Both Jackson, Moggridge & Robinson (2010) and the NSW Office of Water (2012) point out the usefulness of case studies. The specific uses of case studies to 'identify deeper understandings [and] ... describe and test multiple cultural and environmental benefits from environmental water allocations' is noted by Jackson, Moggridge & Robinson (2010: 8). Aboriginal people who participated in the project workshops for the NSW Office of Water (2012: 1-7) project were noted to have 'significant enthusiasm for the use of case studies to exemplify key messages regarding Aboriginal water use and participation in the water sharing process'. Future research and investigation concerning cultural flows, values and uses of water should include or consider the use of case study methodology.

#### **11.7.11 Further Research**

Jackson and O'Leary (2006: 10) state that there is a 'need for a sound understanding of the current condition of river and wetland environments and their contemporary role in meeting the subsistence and spiritual needs of Indigenous communities'. The NSW Office of Water echoes this sentiment, noting the need for research into the

water required to sustain cultural values (NSW Office of Water 2012: 1-7). Cooper and Jackson (2008) and Watts (2012) state that research, in some areas and regions of Australia, should also focus on the remediation of damage sustained by Aboriginal cultural sites.

A number of reports also suggest that research should be undertaken into improving the engagement of Aboriginal people in the water management processes (Cooper and Jackson 2008; Jackson and O’Leary 2006; Watts 2012).

Goulding et al. (2008: 23) suggest that research is undertaken to identify areas of overlap between Indigenous and non-Indigenous interests in water and its allocation.

#### **11.7.12 Funding**

Barber et al. (2012: 198) assert that their study highlights the need for ‘sustained funding sources’ in the management of Aboriginal cultural values relating to water.

Birckhead et al. (2011: vii-ix) also state that future funding should be more strategically coordinated to ensure ‘Indigenous capacity building’ and the long-term positive outcomes which result from this capacity building.

According to Yu (1999: 40), funding should also be provided to ensure Aboriginal collaborative involvement in water research (the La Grange Basin in the case of Yu’s report). Yu (1999: 40-41) goes on to suggest that, for the La Grange Basin, funding should be provided by multiple agencies to ‘enable communities to undertake planning processes for resources and develop appropriate cultural and environmental techniques for water and land management’.

#### **11.7.13 Summary**

To identify key words, terms and phrases relating to cultural flows and cultural values and uses of water, along with various activities about water planning and management and water research, relevant recommendations and findings were extracted from the state and territory project tables (Tables 10.3 to 10.8). These extracts were condensed so key words, terms and phrases could be focused on and grouped in the above section. This was not a thematic analysis; it was a method of summarising information from section 10.5 so that types of recommendations and findings could be identified (see Tables 10-3 to 10-8).

It is important to note that in several cases, researchers made explicit links between research focusing on cultural aspects of water, and water planning and management (see Jackson, Moggridge & Robinson 2010: 8). The recommended holistic approach requires Indigenous participation and input into research focusing on cultural aspects of water as well as water planning and management. Such participation is considered by many researchers to be crucial to both to build community and organisational research capacity.

It is possible to identify two broad areas for investigation in terms of cultural flows and cultural values and uses of water. These may be summarised as two branches of potential research:

- The first branch of research requiring further examination is that which increases understanding and identification of cultural flows and cultural values and uses of water
- The second branch of research requiring further examination is the quantification of cultural water requirements and identification of baseline cultural and customary water requirements

## 12 Comparative International Literature and Projects

### 12.1 Introduction

At an international level, there is a trend towards recognition of the synergism and analytical potential of coupling biological and social systems when analysing the complex needs of a changing environment (Johnston 2012). In particular, there is a growing appreciation and understanding of the role traditional knowledge, stewardship and management systems and technologies can play in the development of the science of sustainability. The close relationship between biological and cultural diversity reflected in such knowledge and its holistic nature is increasingly seen to offer valuable insights that may help meet the challenges of an increasingly stressed global environment in the face of unsustainable human population growth and patterns of resource use (Johnston 2012.).

In terms of the practicalities of resource management, the most common approach to water in recent decades has been Integrated Water Resources Management (IWRM). This approach has taken an ecosystem perspective of water together with its human uses, viewing water as an economic commodity to be managed for immediate and long term sustainability (Johnston, 2012: xvi). To date, Johnston (2012) reports that practitioners have found IWRM a powerful tool to develop river system management strategies; however, she also highlights the fact that its use has generated considerable criticism over its failure to incorporate 'lesser-quantifiable values' (Johnston 2012: xvi).

In this regard, the concept of cultural flows is seen as offering a way to further expand the IWRM model - to account for biocultural values and to manage water resources in a holistic, equitable, and sustainable way. The following section presents a selection of international case studies with relevance to the management of cultural flows in Australia. The accompanying Case Study Matrix (Table 11-3 at the end of this section) is designed to identify and highlight specific cultural values pertaining to water, along with the methodologies and methods used to incorporate them into management structures.

### 12.2 Multi-Lateral Agreements/Policies/Manifestos

There are several international agreements and documents that express norms for treatment of Indigenous rights in water allocation. Table 11-1 provides an overview of the most relevant instruments. The utility of such agreements and norms varies among countries based on the degree to which their courts accept international law as a rule of decision.

International Instrument	Protection of Indigenous Peoples' Rights to Water
<b>International Covenant on Economic, Social and Cultural Rights (ICESCR)</b>	The right to water is implicit in the ICESCR, protected through: the right to an adequate standard of living the right to enjoyment of the highest attainable standard of physical and mental health peoples' right to freely dispose of their own natural resources (wherein no case can 'a people be deprived of its own means of subsistence').
<b>International Covenant on Civil and Political Rights (ICCPR)</b>	the right to freely dispose of natural resources the particular rights of 'ethnic, religious or linguistic minorities' to not be denied 'the right, in community with the other members of their group, to enjoy their own culture.
<b>United Nations Declaration on the Rights of Indigenous Peoples (2007)</b>	Indigenous access, conservation and economic development of water a right to maintain and strengthen the distinctive Indigenous spiritual relationship with 'traditionally owned or otherwise occupied and used lands, territories, waters and coastal seas' the right to conservation and protection of Indigenous lands and resources with state assistance the right to development for all Indigenous lands and resources including water.
<b>Convention on Biological Diversity (1992)</b>	objective is to sustain all life on earth, including aquatic ecosystems, with the global goal to reverse and stop the loss of biodiversity provides for the respect, preservation and maintenance of knowledge, innovations and practices of Indigenous and local communities relevant for the conservation and sustainable use of biological diversity many of the decisions of the CBD call for the full and effective participation of Indigenous communities in order to achieve the global goal.
<b>Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention)</b>	the conservation and wise use of all wetlands and their resources 'through local, regional and national actions and international cooperation, as a contribution towards achieving sustainable development throughout the world' provides guidelines for establishing and strengthening local communities' and Indigenous peoples' participation in the management of wetlands focusing on the need for Indigenous engagement and participation, trust and capacity building, knowledge exchange, flexibility and continuity.
<b>Agenda 21 (UN Conference on Environment and Development 1992)</b>	a comprehensive plan of action to be taken globally, nationally and locally by organisations of the UN, governments, and major groups in every area where there are human impacts on the environment provides for the protection and management of freshwater resources recognising the effects that climate change will have on water and Indigenous peoples. Identifies the need to: engage Indigenous people in water management policymaking and decision-making improve Indigenous technologies to fully utilise limited water resources and to safeguard those resources against pollution recognise the interconnection between economic development and access and supply of water.
<b>Rio Declaration</b>	recognises the vital role of Indigenous communities' knowledge and traditional practices in environmental management.
<b>Indigenous Peoples Kyoto Water Declaration (Third World Water Forum 2003)</b>	emphasizes the sacred nature of water and the role of Indigenous peoples as caretakers with rights and responsibilities to present and future generations states that Indigenous peoples' interests in water and customary uses must be recognized by governments, ensuring that Indigenous rights are enshrined in national legislation and policy.

Table 12-1: Indigenous peoples' water rights. (AHRC 2008: 174-176; Johnston 2012: 533-536)



## 12.3 New Zealand

The Preamble to the New Zealand Government Freshwater Management 2011 National Policy Statement says:

*Fresh water is essential to New Zealand's economic, environmental, cultural and social well-being. ... Fresh water has deep cultural meaning to all New Zealanders (3).*

The preamble also states:

*The Treaty of Waitangi (Te Tiriti o Waitangi) is the underlying foundation of the Crown – iwi/hapu relationship with regard to freshwater resources. Addressing tangata whenua values and interests across all of the well-beings, and including the involvement of iwi and hapu in the overall management of fresh water, are key to meeting obligations under the Treaty of Waitangi (3).*

Stated national values of fresh water include cultural and traditional relationships of Māori with fresh water, as well as recognising its use for recreational activities (including waka ama outrigger canoe), food production and harvesting (e.g., fish farms and mahinga kai the customary gathering of food and natural materials, and the places where those resources are gathered), and transport and access (including tauranga waka canoe landing sites) (New Zealand Government 2011: 4).

Tangata whenua (people of the land) roles and interests are identified in subsection D and proclaim that local authorities shall take reasonable steps to involve iwi (peoples/nations/ tribes) and hapu (clans/subtribes) in the management of fresh water and to work with them to identify tangata whenua values and interests and incorporate them into decision making processes (New Zealand Government 2011: 10).

While there is no doubt such formalised rights provide an important basis to the recognition of Indigenous Knowledge and its role in resource management, they can be meaningless and overlooked if presented as just one of many other considerations that decision-makers have to take into account (Te Aho 2010: 285). Despite emerging policies increasingly focussed on integrated water management, there has been considerable uncertainty around how to achieve the incorporation of Indigenous knowledge into mainstream water management approaches (Durette 2010). There are, however, several learnings from the New Zealand experience which provide an opportunity to “re-think how to incorporate Indigenous Knowledge, cultural and social relationships, and social, cultural, and economic well-being in an alternative approach” (Steenstra 2010: 10).

The link between human and riverine health and well-being is exemplified in the following quote in relation to the Waikato River:

*As a result of commercial fishing, the introduction of predatory fish, hydro-electric dams disturbing migration and the inability to survive industrial pollution, river iwi (tribes) are simply unable to gather important food species from a river once teeming with life. Apart from the tangible loss of food sources, this also means that knowledge about species and fishing practices has not been passed down to the next generations. This in turn results in a loss of connection between youth and the elders who possessed such knowledge and a loss to our language as names of different species, and different stages of the life-cycles are no longer spoken (Te Aho 2010: 286).*

In an analysis of the way in which cultural values are accommodated in natural resource management, Steenstra (2010) compared and contrasted approaches used in the Waikato River in New Zealand, the Murray-Darling Basin in Australia, and the Colorado River in the USA. While stating that economics plays an integral part in the management of all these rivers, Steenstra compared two distinct approaches that are used: privatisation and co-management. He concluded that the co-management structure affects management of the river through facilitating a change in governance powers and functions, allowing for greater inclusion of cultural values in the management of natural resources.

Steenstra (2010: 5) has argued that the application of monetary reductionism to cultural and non-monetary aspects of water tends to be somewhat arbitrary, naive and simplistic. In comparison, Steenstra explains through examining the Waikato River Settlement how the principle of co-management incorporates the mana whakahaere (authority, rights of control) of Waikatao river iwi (tribes) into a governance framework, comprising Guardians of the Waikato River, a Waikato River Statutory Board, and a natural resource management framework. A Vision and Strategy developed and implemented by the Guardians includes a Cultural Health Index (CHI), which provides quantity-constraints for cultural values of a natural environment by soliciting qualitative information from Indigenous custodians (Steenstra 2010: 10). While it does not provide a value principle to evaluate policy alternatives, the CHI does give effect to a more holistic, culturally safe approach to resource management.

More than consultation or mere consideration of cultural values, the CHI is a tool aimed at facilitating the input and participation of iwi (tribes) into land and water management processes and decision-making. In 2003, a report was prepared for the Ministry for the Environment to develop Māori stream health indicators for mauri (the essential life force or principle; a metaphysical quality inherent in all things, both animate and inanimate) and mahinga kai (food and other resources, and the areas that they are sourced from or in which they are propagated) (Tipa & Teirney 2003). This report detailed a case study conducted with the Ngāi Tahu rūnanga (Māori) of the Kakaunui (Kakanui River) and Taieri River catchments in Otago (South Island). It described the development of the CHI for streams, linking Western scientific methods and cultural knowledge about stream health (ref. Case Study Matrix, Table 11-3).

The CHI enables qualitative information about people and streams to be translated into quantitative data. In a quantitative form, the information may be more acceptable to, and readily used by, regional councils to inform decisions about how fresh water is managed. The terminology used in ascribing cultural value recorded during the study included the following:

- Mauri (The essential life force or principle; a metaphysical quality inherent in all things, both animate and inanimate)
- Mahinga kai (Food and other resources, and the areas that they are sourced from or in which they are propagated)
- Kaitiakitanga (The exercise of guardianship)
- Ki uta ki tai (From the mountains to the sea - holistic approach)
- Wāhi tapu (Places of sacred and extreme importance)
- Wāhi taonga (Treasured possessions, both tangible and intangible)
- Kōhanga (A breeding and rearing ground for young mahinga kai) (Tipa & Teirney 2003: 6-9)

The CHI has three components: 1) status of the site; 2) a mahinga kai measure; and 3) a cultural stream health measure. The first component is concerned with whether a site is of traditional significance and whether tangata whenua (the Māori group that has chiefly authority over a particular area) would return to a site and use it. The second component involves tangata whenua assessing the mahinga kai values of a site – including, identifying what species are present, comparing these to species traditionally associated with the area, assessing access to the site, and determining whether they would return to the site to source food or materials (Tipa & Teirney 2006). Cultural perceptions about the entire catchment are the basis of the final component, the cultural stream health. This is in contrast to the Western scientific measures of stream health which are focussed on specific measurable components.

From their 2003 report detailing indicators of water body health as identified by the Ngāi Tahu rūnanga (Māori) during interviews with kaumātua (respected Elders) and iwi (tribe) resource managers, Tipa and Tierney (2006) developed eight indicators to assess the health of a waterway. These indicators are:

- catchment land use
- riparian vegetation
- use of riparian margins
- riverbed condition/sediment
- channel modification
- flow and habitat variety
- water clarity
- water quality

Scores are assigned to the sub-components in component one, the mahinga kai values in component two, and the indicators in component three. These scores are then combined and used to assess the health of a waterway from a tangata whenua perspective, and as Durette (2010: 13) writes, being in a quantitative form, the information may be more acceptable to, and readily used by, councils/government departments to inform decisions about how fresh water is managed.

Māori environmental indicators have been increasingly developed by individuals and organisations over the last decade and used to inform the development and implementation of integrative resource management models (Durette 2010). Focussing on a case study of Māori values in fisheries and the water flows related to them, Durette (2010) identified cultural mapping and a fishing survey method as being conducive to Māori centred research

methodology, and developed an integrative model demonstrating how values in customary fisheries may provide a useful starting point in the quantification of Indigenous values for water planning. Using Māori centred research, comprising three principles: whakapiki tangata (enablement, enhancement, empowerment), whakaurunga (integration) and mana Māori (Māori control), Durette identified an approach that can be taken, and tools that can be used, to convert qualitative data into a more quantifiable form that can then be used to inform planning and policy on water allocation. The Integrative Model includes the following steps: 1) gather and record qualitative data; 2) conduct fisheries assessments correlated with water flows; 3) develop management plan and indicators; 4) create governance structure; 5) build external relationships; 6) take action. The model aims at the conversion of Indigenous values regarding their customary fisheries into technical information about flow levels in river bodies, with the ultimate outcome sought being water flows (specific volumes) that reflect Indigenous customary values in fisheries.

Tipa and Nelson (2012) describe another participatory process that has created opportunity to not only identify flow thresholds, but to also ascertain the attributes of concern that Māori want to see addressed when setting the flow regime. Cultural flow preferences were calculated through application of cultural opportunity mapping, assessment, and responses (COMAR) (Tipa and Nelson 2008). The case study provides a comprehensive summary of the six step process used to incorporate the cultural interests of Māori in determining flow regimes, including specific methods employed and outcomes achieved (ref. Case Study Matrix, Table 11-3; see also Tipa 2002; Tipa 2009).

To summarise, the CHI and associated integrative and participatory models for cultural flows are helping overcome the conflict between the neoclassical approach of sustainability that underpins New Zealand's main piece of legislation in regards environmental management – the Resource Management Act (RMA) 1991. Methods and tools have been developed to convert Indigenous knowledge around water and land management into technical data, to help incorporate social and cultural values into environmental flows. In comparison, Steenstra (2012: 9) wrote that Australia's co-management efforts have focussed on cultural values being qualitatively identified without the corresponding development of a method to evaluate the trade-offs between cultural values, environmental values, and domestic and industrial uses of water.

## 12.4 North America (Canada and the USA)

Property rights often constrain the role of local people in the use and conservation of resources. 'Tenure systems provide the rules for governing who gets to harvest a resource, where they can harvest, how much they harvest, and for whose benefit' (Neumann & Hirsch 2000: 18). Four types of property – state, private, communal, and open access – and four basic kinds of rights – use, transfer, exclusion, and enforcement – influence the access to and use of resources, including water, for commercial and subsistence purposes (Neumann & Hirsch 2000).

Effective exercise of reserved property rights, as established in treaties of the 1850s, has contributed to goals of regaining sovereignty for several Indian tribes of the United States. During the colonisation of North America, the Indigenous peoples were dispossessed of the resources that formed the core of their economic and spiritual sustenance. Today, there is great diversity in Indigenous resource and land management strategies, with tribes increasingly regaining power over the resources that define their culture and economies through tribal-state co-management arrangements (Cronin & Ostergren 2007).

The existence of reserved property rights is a result of social justice and equity principles being introduced into the legal regime in the form of prior appropriation. *Winters v. United States* (1908) held that Indian tribes could claim a hybrid riparian and appropriative right to irrigate their reservations so that a nomadic people could be transformed into 'civilized pastoralists'. As Tarlock (2010: 471) explains, the right has a priority date, either the date of the creation of the reservation or time immemorial, and can be asserted by a tribe at any time. In the 1970s, this property right became a source of tribal power when it was recast as a reparations doctrine (Tarlock 2010).

Tarlock (2010: 476) argues that the recognition of property rights in natural resources such as surface and ground waters can play a crucial role in tribal survival and cultural evolution, including promoting economic development. He points to the justice that can be gained from hard property rights for Indigenous people victimized by conquest and compares this to the 'softer, anthropologically sensitive rights' characterising Australian Aboriginal jurisprudence. He concludes that while the Australian High Court's anthropologically centred post-1992 Aboriginal rights jurisprudence has only afforded some groups 'soft' or usufructuary rights, the 'hard' property rights recognized in *Winter* have proven more effective in terms of providing tribes with negotiating power for a variety of purposes, including water resource management (Tarlock 2010: 476-477).

Still, the ability of individual tribes to apply their reserved Indian water rights may be limited by the State having administrative authority and dictating flows. Flanagan and Laituri (2004) provide a comparative examination of the Wind River Indian Reservation Water Code and Wyoming Water Law and note that the tribes needed to submit

requests for their reserved water right to the State Water Engineer for determination – a situation which they considered threatened their sovereign right to manage their water resource according to the Wind River Water Code (Flanagan & Laituri 2004: 264). Through interviews and the development of a cultural database, the cultural milieu of the respective water management systems was established (ref. Case Study Matrix, Table 11-3). Three areas of cultural conflict became apparent between the two water codes: defining and prioritizing beneficial use, the purpose of stream preservation, and the purpose of instream flows (Table 11-2 below).

Purpose	Wind River Water Code	Wyoming Water Law
Beneficial use	Domestic and municipal instream flows; Cultural/religious uses; Pollution control	Property of the state; Economic gain; Drinking purposes; Municipal and industrial uses; Irrigation
Stream preservation	Interconnections with all natural resources; Cultural, spiritual, and economic values to guide use, management, and protection; Values condition all water and land-use activities	Scenic and recreational quality of rivers and streams; Studies to define character, quality, recreational, scenic, historical, aesthetic, and fish and wildlife potential
Instream flows	Maintenance of fisheries for subsistence fishing; Maintenance of riparian plant species for medicinal and cultural purposes; Maintenance of baseflow for ceremonial purposes	Maintain or improve existing fisheries; Cannot impair or diminish rights of any other appropriator

Table 12-2: Comparison of Wyoming and Wind River Water codes.  
(Flanagan & Laituri, 2004: 268)

This research indicates that understanding and identifying cultural practices is an important preliminary step in collaborative resource management. Information must be collected that compares and contrasts ecological and cultural issues to identify their areas of intersection.

One instance of taking multiple perspectives into account is the effort of the government of the Northwest Territories (NWT) in Canada. Their Water Stewardship Strategy (Government of the Northwest Territories 2010) augments credentialed science with traditional knowledge in official decision making. The Strategy's development process was led by a committee of Aboriginal and government representatives who engaged in multiple discussion forums designed to ensure the voices of NWT residents were heard on issues related to ecosystem health, sustainable development and the sociocultural importance of water. The concept of a collaborative approach that recognised a diversity of values developed and received input from Aboriginal leaders, communities, governments, regulatory boards, environmental non-governmental organisations, and industry members. This Strategy offers a solid foundation in water stewardship through its recognition that the appropriate use and consideration of all types of knowledge, including traditional, local and western scientific, are integral to a collaborative, cross-cultural initiative.

These new forms of collaborative governance could prove mutually beneficial, especially for watersheds lacking state resources or expertise to manage them, and provide important opportunities to peoples who may have been deprived of their opportunity to be watershed managers. Thornton (2012) describes how the 1971 Alaska Native Claims Settlement Act turned the Tlingit peoples of the northern Northwest Coast into for-profit landowning corporations with no Aboriginal water, fishing, hunting, or gathering rights. For such peoples, participatory governance frameworks may prove beneficial in maintaining and restoring watersheds through improved monitoring and data collection and respect for Indigenous ethics and "ecosystem justice" (Jones & Williams-Davidson 2000).

Cronin and Ostergren (2007) discuss the significant variation in the success of different tribes in watershed and natural resource management. Based on case studies in the Pacific Northwest and one from the Southwest of the US, their research concludes that developing tribal resources for management is a prerequisite for successful collaborative management, and that the formation of strong local, regional and national partnerships is crucial to intertribal management. They explain how all three tribes in this case study rely heavily upon Western trained

managers and scientists while at the same time using tribal values to frame how the Western science is interpreted and implemented. In this way, tribes must be able to communicate with other stakeholders sharing the watershed. To do this, they highlight the tribes' need to build their capacity to gather and understand Western scientific information. Based on their research, Cronin and Ostergren claim that building capacity and working collaboratively also promises increased levels of trust and respect between tribal and non-tribal communities (ref. Case Study Matrix, Table 11-3).

The Canadian Model Forestry Program (CMFP) offers a useful model to inform research into Indigenous resource management. The Model Forest concept was developed in Canada in the early 1990s by the Canadian Forest Service in response to a need for a forest management approach that would take into account the environmental, social and economic aspects of the forest. The work of the CMFP involves processes that recognise and promote the incorporation of cultural knowledge into forest management practices and has led to many successful collaborations between First Nations and non-First Nations partners in Canada. The concept has since been adopted at an international level, with the International Model Forest Network developing a toolkit (International Model Forest Network 2013) which provides guidance in the development of an integrative model for resource management. The CMFP concept and experience suggests that one of the key success factors in creating a bio-culturally sustainable approach to resource management and use is the provision of financial and technical assistance to Indigenous communities to ensure they are able to gather comprehensive data that will form the base-line of measurable indicators and targets (Canadian Model Forest Network 2013).

To summarise, property rights, historic land use agreements, and treaties have provided Indigenous peoples in North America with an array of rights to the use and economic development of waters on their lands and/or reservations. The right of prior appropriation, as recognised in *Winters v. United States* (1908), has provided many peoples the opportunity to become major stakeholders in natural resource management forums, creating a basis for the development of collaborative management structures. Tribal management capacity needs to be actively developed and supported for such management to be truly bi-cultural. In comparison, Australian land tenure types and their respective provisions in accordance with various Acts specify a strict distinction between subsistence use and commercial use or market exchange in the wider community - distinctions that '... in no way favour Aboriginal people's (economic) interests' (Morse 2005: 82). While legislation does exist for the establishment of benefit sharing agreements with non-Aboriginal parties in relation to resource conservation and use, Land Rights and Native Title legislation focus on traditional customary use of resources, and therefore do not support commercial harvest and associated economic development.

## 12.5 Africa and Asia

King and Brown (2010) provide a summary of concepts and method development and their application in regards to what they term Integrated Basin Flow Assessments (IBFA) in developing countries of Africa and South-East Asia. Their work is based on 15 years of research in these regions and recognises that the final allocation of water for ecosystem maintenance should be a societal choice of trade-offs between resource protection and development. A multi-disciplinary team and scenario-based approach giving equal weight to the ecological, social, resource-economic and macro-economic costs and benefits of development is needed, capturing expert opinion and local wisdom as well as data. They also emphasize that implementation of managed flows is a complex and long term process (e.g., country or region wide implementation could take one to two decades).

From a selection of case studies, King and Brown (2010: 142-143) glean the following eight principles that could help guide the incorporation of Environmental Flows (EFs) into IWRM:

- Principle 1: Ecological and subsistence issues should be factored automatically and in a structured manner into water-resource development plans
- Principle 2: IBFAs should be done at an early stage of water-resource planning and at the basin level
- Principle 3: IBFAs should be holistic in approach, scenario-based and objective
- Principle 4: It is never too early to get started
- Principle 5: Involvement of stakeholders is essential at every stage of the flow-assessment process
- Principle 6: The decision-making process should be structured and transparent
- Principle 7: Infrastructure should be designed and operated to deliver the agreed EFs to the river
- Principle 8: Commitment to EFs is commitment to a long-term complex management process

DRIFT (Downstream Response to Imposed Flow Transformation) is a holistic, multi-disciplinary methodology developed in South Africa for advising on EFs for rivers targeted for water management activities (King, Brown & Sabet 2003). A structured process, based on the production of flow related scenarios for water managers to

consider, it links the natural and subsistence components of river ecosystems, providing information on potential human and ecosystem costs and benefits from water resource management. King, Brown and Sabet (2003) describe how the scenarios can be used as the basis of negotiations between countries, regions or different interest groups.

In regards the role of local culture and traditions in the development of environmental ethics and the sustainable development of resources, research by Voeller (2011) supports the need to strengthen culture and renew local community values in order to ensure biocultural health. A case study analysing the consequences of economic development on traditional cultures and their water resources, this study focuses on the knowledge and lives of the Naxi people of Lijiang, China, exploring how Indigenous values can be used to support sustainable development. The case study reports that an absence in religious teaching, followed by a failure in intergenerational dialogue, has coincided with the loss of an environmental ethic. This study found a correlation between the stories, religion, prayers, songs and language of the Elders that are no longer being passed on to the Naxi youth and a loss of traditions related to protecting water.

Voeller (2011: 227) writes that in the past, strong identity within the Naxi culture and smart management of the environment were so intertwined that they supported each other – there was an equilibrium, a reciprocity between cultural traditions and respect for the environment. This equilibrium is now threatened due to a surge in domestic tourism and increased glacial melt, and it is now necessary to strengthen the Naxi community values in order to conserve and sustainably manage the environment.

To summarise, these studies highlight the need for methodologies to provide decision makers with information that often remains unconsidered in water resource management. They provide insight into public participation processes and transparent decision making that can inform the development of more integrative models of resource management that include sociocultural aspects to flow. Additionally, they point to the need for an environmental ethic to be based firmly on local cultural attitudes and values, strengthening or working with such sociocultural assets rather than merely imposing new approaches

### **12.5.1 Science and Policy**

Science is another conceptual category that evinces myriad meanings. Watts indicates the desire to discover the barriers between 'traditional knowledge' and 'western science' (Watts 2012: 6), and that a balance must be struck between 'quantitative data and qualitative data' (Watts 2012: 37), though the terms are reversed in the second couplet, there is good reason to think that Watts is identifying qualitative data with traditional knowledge (see also for instance NAILSMA 2009b: 28). Craig et al. write that Aboriginal people have their own sciences (Craig et al 2009: 33), as does Pursche (2004: 47), but it is not specified what their relationship might be with institutional understandings of science. At the same time, over the course of an interview conducted by Cranney & Tan with a Kuku Yalanji Traditional Custodian, the Traditional Custodian stated the view that 'the two knowledge systems will never meet' (Kuku Yalanji Traditional Custodian, quoted in Cranney & Tan 2011: 99). There is, therefore, several notions operating throughout the reports concerning what science means and what it is compatible with. Cranney & Tan also discuss how science is integrated into government policy concerning water, and argue cogently that policy does not explicitly recognise Aboriginal knowledge (Cranney & Tan 2011: 107). At the same time, we know that science has a very uncomfortable fit with policy not least because the two domains have different orientations. As Bradshaw & Borchers (2000: 7) explain, science requires failure, risk, and replication for acceptance, whereas government policy aims for success, amelioration of risk, and a commitment to ideology. The assumptions around what science is and does, therefore, demonstrates a high level of complexity in the reports.

## **12.6 Summary and Assessment**

International methodologies and experiences offer valuable insights into incorporating sociocultural values into flows research and promoting bioculturally sustainable approaches to management of river systems and water resources. An expanded IWRM approach which includes Indigenous and/or local communities as partners has the potential for a vast array of adaptive knowledge and practices to inform water use and management, creating an atmosphere conducive to innovation (Johnston 2012). Such an approach that gives fair and equitable consideration to the ecological, sociocultural, and economic costs and benefits to flow management may help meet the challenges of an increasing vulnerability of water resources.

Local water parties, however, do not exist in a vacuum (Johnston 2012: xx). As has been discussed in this section, a myriad of factors contribute to the relative success of Indigenous peoples in the field of natural resource management, including socio-political systems governed by national and international organizational mechanisms. As Johnston (2012) writes, long term sustainability may require a re-embedding of social and political institutions at a local level, to enable sustainable water resource governance. At the same time, there is a need to

move beyond the public/private binary approach to water resource management that views water as either a commodity or as a human right, towards what Bakker (2007) terms 'alter-globalization' strategies, centred on concepts of the 'commons', to create space for alternative community economies of water.

The synergistic links between water, biodiversity, and cultural diversity require a coupled social and biological systems approach to water management (Johnston 2012). As Johnston (2012: xx) concludes,

*Fully inclusive collaboration, both horizontally and vertically, is required to create a more workable balance between national and international aims, and the health and well-being of local communities and ecosystems. Meeting current and future human-environmental challenges depends on the active involvement of all water users.*

Project name	Country and study area	Indigenous Stakeholders	Aim of Project	Types of Water Assessed	Methodology	Comments on the Methodology/ Methods Employed	Cultural domain of Water Identified	Terminology Used in Describing or Ascribing Value	Indigenous Indicators of Water Body Health	Outcomes of Project	Limitations	Comments
Durette, M. 2010. An Integrative Model for Cultural Flows: Using Values in Fisheries to Determine Water Allocations. Synexe, Working paper Series, 2010/01.	New Zealand - Karuma Stream, Hawkes Bay (North Island)	Ngāti Hori - a hapū (clan) of Ngāti Kahungunu ki Heretaunga (Māori)	To develop an integrative model demonstrating how values in customary fisheries may provide a useful starting point in the quantification of Indigenous values for water planning.	Stream	Māori-centred research, comprising three principles: whakapiki tangata (enablement, enhancement, empowerment), whakaurunga (integration) and mana Māori (Māori control).Cultural mapping - involving a group interview and questionnaire; Fisheries assessment (survey) - guided by a fisheries biologist and involving field methods such as trapping and night time observations; Literature review and discussion of methods that might be employed by groups to assist them to integrate their values and knowledge into technical data that can be taken up by water planners and policy makers.	The maps generated discussion and considerable enthusiasm and support among community members for the project work; the maps were also used to identify areas for the subsequent fishing survey as well as future planting projects. The data from the survey was delivered in report form to community members and used everyday language to provide the group with material that could be further used in their planning and management of customary fisheries and the Karuma Stream. Interviewees should include community Elders, those who have lived near the river for a long time, those who are responsible for or active in caring for the environment, and those who rely on the water body as a source of traditional species, including local fishers.	Spiritual, Historic, Economic	Kaitiaki (guardians); Mahinga kai (wild food resources such as fish, waterfowl and plants and the area they are sourced); Identity		The identification of an approach that can be taken, and the identification of tools that can be used, to convert qualitative data into a more quantifiable form that can then be used to inform planning and policy on water allocation. The Integrative Model includes the following steps: 1) gather and record qualitative data; 2) fisheries assessments correlated with water flows; 3) develop management plan and indicators; 4) create governance structure; 4) build external relationships; 5) action. The ultimate outcome sought is water flows that reflect Indigenous customary values in fisheries.	Technical limitations, including minimal resources and lack of capability to undertake a larger mapping project (eg. Involving GIS and the creation of data bases). High turnover of regional council staff means that these initiatives may only serve their purpose for a limited time.	Extensive river diversion, pollutants from vineyards and deliberate dumping of industrial waste has caused loss of wetlands, resulting in loss of habitat and fisheries diversity. The take up of integrated management plans may be strengthened if its lodgement is accompanied with training or education on how to account for Māori values in water planning and policy.



Project name	Country and study area	Indigenous Stakeholders	Aim of Project	Types of Water Assessed	Methodology	Comments on the Methodology/ Methods Employed	Cultural domain of Water Identified	Terminology Used in Describing or Ascribing Value	Indigenous Indicators of Water Body Health	Outcomes of Project	Limitations	Comments
<b>Tipa, G. &amp; Teirney, L. 2003. A Cultural Health Index for Streams and Waterways: Indicators for Recognising and Expressing Māori Values. Report prepared for the Ministry for the Environment, Wellington.</b>	New Zealand - Kakanui (Kakanui River) and Taieri River catchments Otago (South Island)	Ngāi Tahu rūnanga (Māori)	To develop a tool to facilitate the input and participation of iwi (tribes) into land and water management processes and decision making.	Stream; hill country, rain-fed rivers	Case studies/Interviews - with kaumātua (respected Elders) and iwi (tribe) resource managers; Literature review or the written records of Ngāi Tahu; Questionnaire to identify and define cultural stream health.	Three generations were represented in the rūnanga (tribal council) teams - the process was inclusive and accomodating, allowing for a positive sociocultural effect on project participants.	Spiritual, Economic	Mauri (The essential life force or principle; a metaphysical quality inherent in all things, both animate and inanimate); Mahinga kai (Food and other resources, and the areas that they are sourced from or in which they are propagated); Kaitaikitanga (The exercise of guardianship); Ki uta ki tai (From the mountains to the sea - holistic approach); Wāhi tapu (places of sacred and extreme importance); wāhi taonga (treasured possessions, both tangible and intangible); Kōhanga (a breeding and rearing ground for young mahinga kai)	Shape of the river; sediment in the water; water quality throughout the catchment; fow characteristics; flow variations; flood flows; sound of flow; movement of water; fish are safe to eat; uses of the river; natural river mouth environment; water quality; abundant and diverse range of mahinga kai species; riparian vegetation; use of river margin; temperature; catchment land use; riverbank condition; water is safe to drink.	The development of the Cultural Health Index (CHI) for streams, which links Western scientific methods and cultural knowledge about stream health. The CHI has three components: 1) status of the site; 2) a mahinga kai measure; 3) a cultural stream health measure. Recommended recording forms for future use and sample questions have been developed. The CHI enables qualitative information about people and streams to be translated into quantitative data. In a quantitative form, the information may be more acceptable to, and readily used by, regional councils to inform decisions about how fresh water is managed.	It is not certain the the CHI will be valid for very different river types and for other iwi.	Māori need tools based on their cultural values that enable them to meaningfully express their views about the health of freshwater and to participate more fully in environmental management. Māori also need to know that contemporary resource managers support the use of tools such as the CHI, recognise the validity of the data collected, and will respond to the information provided.

Project name	Country and study area	Indigenous Stakeholders	Aim of Project	Types of Water Assessed	Methodology	Comments on the Methodology/ Methods Employed	Cultural domain of Water Identified	Terminology Used in Describing or Ascribing Value	Indigenous Indicators of Water Body Health	Outcomes of Project	Limitations	Comments
<b>Tipa, G. &amp; Nelson, K. 2012. Identifying Cultural Flow Preferences: Kakaunui River Case Study. Journal of Water Resources Planning and Management, 138(6): 660-670.</b>	New Zealand - Kakaunui (Kakanui River) catchment, Otago (South Island)	Ngāi Tahu rūnanga (Māori)	To introduce a cultural flow preference study - a tool developed for Māori to assess opportunities to engage in cultural experiences in a catchment under different stream flows.	Stream; hill country, rain-fed rivers	Case study/interviews - application of cultural opportunity mapping, assessment, and responses (COMAR); statistical analyses	An initial hui (meeting or focus group) with representatives of Te Runanga o Moeraki secured support for the research, confirmed the individuals to be interviewed, and mandated members to participate in assessments to observe the sites under different flows	Spiritual, Economic	Mauri; Mahinga kai; Kaitaikitanga; Whakapapa (genealogy); Manaakitanga (show kindness and respect to); Rangatiratanga (chieftainship, decision making rights); Kotahitanga (unity, working together as one); Hauora (holistic health and well being; Whanaungatanga (kinship)	Oxygen and temperature levels - species are sensitive to and have optimal ranges for survival	The identification, by Māori, of their preferred flows and specification of other management actions. The intent is to use the ratings for 19 flow attributes to inform development of seasonal flow suitability curves specific to cultural values for consideration throughout the processes of existing EFAs.	The danger of focusing solely on the minimum flows, as values such as mahinga kai are sustained by more than just the flows on a particular day To support Māori values, the EFA must be a partnership of biophysical science and Māori expertise.	Analyses are intended to progress beyond descriptions of how indigenous communities attribute meaning to water to an understanding of how river flows affect these meanings and associations.
<b>Flanagan, C. &amp; Laituri, M. 2004. Environmental Assessment: Local Cultural Knowledge and Water Resource management: The Wind River Indian Reservation. Environmental Management, 33(2): 262-270.</b>	USA- Shoshone Arapaho Wind River Indian Reservation, Wyoming	Eastern Shoshone and Northern Arapaho	To address the issue of integration across cultures - Indigenous ecological knowledge with Euro-American scientific knowledge.	River; river basin	Case study/interviews; development of a cultural database; examination and comparison of the Wyoming Water Statutes and the Wind River Water Code	Interviews were conducted with tribal elders, ceremonial elders, healers, and individuals familiar with cultural practices.	Spiritual, Economic	Interconnections; ceremonial significance of holy water; medicinal properties of water; 'the water of life'; recognition of 'pure' water; spiritual offerings; water as elemental to life; ceremonial use of water; importance of water in traditional stories.	Maintenance of fisheries for subsistence fishing; maintenance of riparian plant species for medicinal and cultural purposes; maintenance of baseflow for ceremonial purposes.	This research indicates that cultural perspectives provide a rich arena in which to examine management issues. Understanding and identifying cutlrual practices may be an important first step in collaborative resource management between different cultural groups to prevent conflict and lengthy resolution in court.	How can sensitive or sacred knowledge be incorporated into management strategies that are responsive to the needs of all the cultural participants without compromising such data?	The collection of cultural data can be a contentious process. The community must e fully involved and issues of trust, output of products, access to data, and dissemination of various outputs need to be clearly identified and agreed upon by all participants.

Project name	Country and study area	Indigenous Stakeholders	Aim of Project	Types of Water Assessed	Methodology	Comments on the Methodology/ Methods Employed	Cultural domain of Water Identified	Terminology Used in Describing or Ascribing Value	Indigenous Indicators of Water Body Health	Outcomes of Project	Limitations	Comments
<b>Cronin, A. &amp; Ostergren, D.M. 2007. Tribal Watershed Management: Culture, Science, Capacity, and Collaboration. American Indian Quarterly, 31(1): 87-109.</b>	USA - Pacific Northwest, and Southwest US	Jamestown S'Klallam Tribe, Washington State; the Conferedated Tribes of the Umatilla Indian Reservation (CTUIR) eastern Washington and Oregon; Yavapai-Apache Nation in Central Arizona.	To explore the challenges tribes face to regain partial or complete control of traditional lands and resources.	Watersheds	Comparative Case studies, field research - direct observation, historical and contemporary documents, interviews		Economic			This research finds broad differences in tribal capacities and concludes that developing tribal resources for management is a prerequisite for successful collaborative watershed management.		The tribes reserved their resource rights through the signing of treaties. TEK is a dynamic system of knowledge for working with an evolving environment. Tribal and nontribal communities need to overcome residual feelings of distrust and misunderstanding.
<b>Voeller, E. 2011. Renewing a Naxi Environmental Ethic in Lijiang, China: An Approach for Water Management. Lakes and Reservoirs: Research and Management, 16: 223-229.</b>	China - Lijiang, Yunnan Province	Naxi people	To investigate the effects of tourism on culture and environment - most notably water resources	Aquifer/spring water; river - canal and well systems	Case study - interviews with local residents and experts; participant observation; meetings with local orgnisations; site visits at water treatment facilities	The most valuable information collected during the study was from elderly residents.	Economic		Potable water supply	The identification of the need to renew an environmental ethic among the younger Naxi generation as a crucial step towards better environmental management.		An absence of religious teaching, followed by a failure in intergenerational dialogue, has coincided with the loss of an environmental ethic.

Table 12-3: Case Study Matrix - International

## 13 Gap Analysis

### 13.1 Introduction

This section of the report deals with recommended needs and gaps of cultural flows research in the context of the overall Cultural Flows research program.

#### 13.1.1 Scope of Gap Analysis of Existing Studies and Future Needs

The previous two components provide an overview of the current state of knowledge about Indigenous cultural values of water as represented in the literature. The gap analysis provides a review and assessment of the differences between what is known and what we need to know, to inform needs, purposes and objectives of future research projects.

For example, are there major themes identified in the literature review that have not been captured in the projects? Are there geographic areas or Indigenous groups who are not represented, and what are the reasons for this? Would the application of a different methodology offer benefits in particular circumstances?

The differences between the literature review (results of Part 1) and the projects (results of Part 2) identify the constraints or deficits, and opportunities arising from them. In terms of priorities and importance, the list of needs identified in the gap analysis can be assessed from the perspective of how they relate to the goals, realities and constraints of the remaining components of the National Cultural Flows Project. Which of the needs is worth addressing and which are the most urgent? This may involve consideration of such factors as:

- Current environmental issues eg increasing salinity, floods;
- Changes in the legislative and regulatory environment;
- Industrial pressures on water consumption;
- Urban population growth and water requirements;
- Aging Indigenous populations and the urgency of recording cultural knowledge for future generations;
- Cultural values of water which are under-represented or absent from the projects identified in Part 1.

#### 13.1.2 Methodology

Projects dealing with Indigenous cultural relationships with water operate under a series of interconnected constraints. Broadly, these constraints are, political and economic, ideological and methodological. Constraints are of course necessary for any project work, but the projects dealing with Indigenous cultural relationships with water have emerged in a particularly fraught contemporary political and economic context. As we noted in 10.2, government funding of projects on water and water use in Australia currently should be viewed against the background of tense federal-state power relations and interests, and a constellation of financial interests of variable ranks of power and influence. While water access and use in Australia has long been an arena of struggle, the increasing privatisation of water supply across the continent has made this struggle more acute.

With this in mind, this section focuses on the following:

- the conceptual underpinning of the projects, including terminological use
- the geographical locations of projects
- the methodological approaches of the projects, including advantages and limitations
- Recommendations that have emerged from the projects

This section will conclude with a summary and assessment of prior project work, and recommendations for future project work that aim to consolidate and enhance work already undertaken.

### 13.2 Funding and Time Constraints

Budget and time constraints were no doubt experienced by all people involved in project research and reporting. The impact that these factors can have on the effectiveness of projects cannot be overstated, but budget and time constraints are, of course, unavoidable. It should be noted that the project authors recognise the effects of these limitations, and made best efforts to accommodate them using a variety of strategies.

Because several of the projects involved financial input from a variety of sources with sometimes disparate aims, and because several projects aimed to link with other related contemporaneous work, complications sometimes

arose at the administrative level. Jackson & O'Leary (2006) for instance attempted to link their CSIRO project with another CSIRO project looking at "social and economic values" within the same project region in order to avoid possible duplication of research and results, but delays with contracts prevented this from happening (Jackson & O'Leary 2006: 21).

Limitations of time and budget were also explicitly identified by Jackson & O'Leary (2006: 9), in that short, place-by-place and site-by-site projects do not necessarily enable a regional perspective of significant water bodies and their related ecosystems. Regular changes to reporting and funding eligibility requirements and the absence of reliable and recurrent funding for Indigenous groups attempting to manage environmental systems exacerbate matters (Jackson & O'Leary 2006: 9).

Barber et al. (2012: xiv) identify time limitations as the reason why their study focusses on "knowledge held by men (both Indigenous and non-Indigenous)" to the exclusion of women. The limiting factor caused the researchers to work strategically to capture information from one gender at the outset.

### 13.3 Gaps in Geography

Given the geographical vastness of the Australia, the number of interested Aboriginal groups, and the relatively small number of projects undertaken, the geographical and group coverage of projects is impressive. This section identifies geographical location and group by state and territory, and proposes suggestions for gaps in research.

#### 13.3.1 Australian Capital Territory

##### General Region

No projects have currently been conducted in the ACT relating to Indigenous Values of Water.

##### Gaps in the Research

As no work has yet been undertaken in the ACT it is essential that some understanding be gained in relation to the variation that may have existed throughout the state in regards to water values, knowledge and connection.

Future projects could include a survey of specific locations based on their ability to act as a true representation of the various marine environments in the ACT. Community consultation would also allow access to any traditional knowledge that has been passed on over the generations.

#### 13.3.2 New South Wales

##### General Region

A community consultation was conducted over all of New South Wales with the aim of identifying the way water management in NSW has changed over time (NSW Office of Water 2012). Each region has, or will soon have, its own water sharing plan, which will include the protection of customary and economic values. Active involvement by Aboriginal communities in the water sharing planning process will confirm identity, respect and acknowledgement of Aboriginal rights to water. The manual aims to:

- encourage Aboriginal people to not only know the law of how water is managed by government, but to exercise their rights within this law
- assist Aboriginal people to gain fair and equitable access to water along with other interests including the environment, domestic and commercial
- provide practical ways for Aboriginal individuals and communities to achieve cultural, social and enterprise goals
- encourage and assist government agencies and Aboriginal people to work together

##### Gaps in the Research

The initial project was very wide-ranging and incorporated every region of New South Wales.

Future projects could use the information collected in the initial project to determine which significant marine sites would warrant further investigation either through physical survey or comparative literature review, which would highlight variations in water values between communities.

##### Murray Darling Basin

Three projects have been conducted so far in the Murray Darling Basin region of New South Wales (Jackson 2006b; Morgan, Strelein & Weir 2004; Jackson, Moggridge & Robinson 2010). These include a community consultation, literature reviews and participatory action research involving the following Indigenous groups: Nari Nari (Hay), Ngemba (Brewarrina), Yorta Yorta (Barmah-Millewa). The aim of these projects was to scope out the impacts of

changes in water availability on Indigenous communities of the Murray Darling Basin; to assist with exploring opportunities for addressing Indigenous interests in the Basin Plan.

### **Gaps in the Research**

Comparative studies could be conducted using the initial research and that was previously undertaken in interstate regions of the Murray Darling Basin and Murray River. This would highlight any variations that may have existed between groups at different points along the river system.

### **Hay Plain/Murrumbidgee River**

One project has been undertaken in the Hay Plain/Murrumbidgee River region of New South Wales involving the Nari Nari Tribal Council (Department of Environment and Water Resources 2007). The vision of this project was to protect and enhance our culture and history, while encouraging and protecting the natural environment and conserving biodiversity.

### **Gaps in the Research**

Future projects in the Murrumbidgee River region could include literature reviews comparing similar localised projects in New South Wales to highlight any varying cultural values that may exist between Indigenous groups in other geographical regions.

A physical survey of the Hay Plain/Murrumbidgee region could be undertaken to reinforce the ethnographic information collated in the initial project.

## **13.3.3 Northern Territory**

### **Upper Roper River**

Interviews were undertaken in the Upper Roper River region of the Northern Territory, including the following people: Mangarrayi, Yangman, and Wubulawun language groups as well as people with connections to the Beswick Land Trust area, and a significant number were members of the Mataranka Traditional Owner Water Allocation Reference Group (Barber & Jackson 2011b). The aim of the project was to "document Indigenous people's water values and seasonal and hydrological knowledge in the upper Roper area".

### **Gaps in the Research**

The initial project is reasonably wide-ranging, including multiple Indigenous groups from the one region.

Comparative studies utilising the initial research and similar projects in other regions may provide an understanding of similarities and differences that exist between cultural water values of the Upper Roper River and geographically isolated groups.

### **Daly River Region**

Jackson (2004; 2006a, 2006b) has undertaken two projects to date in the Daly River region of the Northern Territory. These include a focus group and community consultation that involved the Daly River Aboriginal Reference Group, as well as interstate visitors from the MLDRIN and the Miriwiung Gajerrong people of the east Kimberley. The aim of the projects was to have a good discussion about water issues, for northern Australian Aboriginal groups, especially from the Daly River, to hear about the experiences of other groups, e.g. from the Murray Darling, and vice versa. Also for the groups involved to think about environmental policy, especially water management, and how it can work for Indigenous people and to talk about the words 'cultural values', how they are being used and whether they reflect Indigenous values. Water reforms were also discussed during this initial research.

Subsequent projects include community consultation and interviews with the Wadjigan/Kiyuk, Malak Malak and Kamu, Nanggiwumerri, Maramanindji, Marranunggu, Wagiman, Wardaman, Dagoman and Jawoyn groups. The aim of the oral histories was to conduct a study of the indigenous cultural values of the Daly River and associated environments. The intention of the study was twofold: firstly, to provide a foundational document to assist the deliberations of the CRC [Daly River Community Reference Group], and secondly, to assist the Aboriginal members of the CRG.

### **Gaps in the Research**

The projects undertaken in the Daly River region so far have been thorough and wide-ranging; however, there is still opportunity for future research in this region. A physical survey of the Daly River region could help to reinforce the ethnographic information collated in the initial projects.

### **Howard River**

Woodward, Jackson and Straton (2008) undertook literature reviews and community consultations with the Larrakia Nation in order to document the social use and importance of Howard River water resources and aquatic environments to Indigenous and non-Indigenous groups (e.g. hunters, plant enthusiasts, Landcare groups, recreational fishers), including:

The use of surface water and groundwater resources by Indigenous traditional owners and by others with an interest in the cultural values, as defined by the beneficial use concept of the Water Act 1992 (NT);

Community perceptions of change in environmental condition and use, and perceived threats to valued resources, places and traditions or beliefs, and

2) To identify and assess the relative significance of resource impacts possible under different water resource use scenarios, including stakeholder perspectives on the means of protecting or enhancing social and cultural values through water resource management.

An allied aim was to increase community capacity and enthusiasm to participate in water resource management research and planning by facilitating stakeholder input into the research underpinning the identification of the water and flow requirements of user groups. The overarching objective of this project required that we gain an understanding of the way in which potential changes to water use in the greater Darwin area might affect the social and cultural values of the Howard River catchment.

### **Gaps in the Research**

A focus on the Larrakia Nation was achieved in the initial research and this could be expanded to incorporate other Indigenous stakeholders in the area.

A comparative literature review could be achieved utilising the initial research and similar projects in other regions of the Northern Territory, which may highlight variations in cultural water value across the communities.

### **Ti Tree Region**

A project (Rea & Anmatyerr Water Project Team 2008) has been undertaken in the Ti Tree region of the Northern Territory, including a community consultation, physical survey and participatory action research. This project involved the Anmatyerr people and the aim of the project was to maximise the outcomes for Anmatyerr people, land and water in the near future. The aim was to give authority but not visibility to the extensive, rich and active Anmatyerr Law and knowledge about water in the same way other sectors command rights while maintaining privacy.

### **Gaps in the Research**

The project undertaken in the Ti Tree region is comprehensive and wide-ranging.

### **Northern NT**

Several projects have been completed so far in the north region of the Northern Territory, including a focus group and consultation with the Northern Land Council (North Australian Indigenous Land and Sea Management Alliance 2009b). The aim of this project was to support Aboriginal and Torres Strait Islander land and sea management using strategic approaches to care for country with an emphasis on practical management by Traditional Owners across north Australia. A further project (Jackson & Altman 2009) provided an opportunity to raise ideas and concerns about economic development and opportunities; potential impacts of development in north Australia; governance and institutional arrangements as they affect Indigenous community interests, aspirations and issues.

A subsequent project employed interviews, literature reviews and consultations with the Ngukurr and Borroloola people (Finn & Jackson 2011). The aim of these projects was to undertake research and knowledge exchange to support the sustainable use, protection and management of Australia's tropical rivers. The Tropical Rivers Program has four research themes: assess river assets and threats, support regional planning frameworks, assess social, cultural and economic values, and understand river ecosystems.

A community consultation with the Tiwi Islands people was undertaken in order to develop a water resource strategy (Hoverman et al. 2010). A holistic approach to managing the water would be applied, in which water management is seen in a broader context of land management issues. "This holistic approach also reflects the Indigenous worldview of interconnectedness between the natural, cultural and social environment" (Hoverman et al. 2010: 290).

### **Gaps in the Research**

Comprehensive projects have been conducted in this region.

### **Katherine River Region**

Cooper & Jackson (2008) conducted a project in the Katherine River region of the Northern Territory that included a physical survey, consultation and literature review. The results of the report were supported by the Jawoyn and Wardaman Associations. The aim of the project was to describe the social arrangements and cultural practices relating to water and to document the Indigenous knowledge of groundwater and surface water sources held by cultural groups in the vicinity of the regional centre of Katherine.

#### **Gaps in the Research**

Comparative research with similar regions in the Northern Territory would provide an understanding of any variations that may exist regarding Indigenous water values.

#### **Maningrida Region, Arnhem Land**

Altman & Branchut (2008) conducted a project in the Maningrida region of Arnhem Land, involving a literature review and interviews of the Kuninjku/Bininj Kunwok and the Yolngu people. The aim of this project was to focus on fresh water in the Maningrida, north-central Arnhem Land regional economy, and describe the results of one of the case studies undertaken during 2007 and completed in 2008. Each case study has a different emphasis. This one focuses on the issue of fresh water and the hybrid economy.

#### **Gaps in the Research**

A physical survey of the Maningrida region may help to reinforce any ethnographic information collated in the initial community interviews.

#### **Anna's Reservoir Conservation**

Craig et al. (2009) completed a project in Anna's Reservoir Conservation Reserve/Merngwurla in the Northern Territory. The literature review, consultation and interview of the Anmatyerr people aimed to recognise customary law in natural resource management and customary law institutions through a negotiated agreement. The objective of this project was to develop a bi-cultural approach for governance of water through the use of an agreement that reflects both western and customary laws and protocols for managing natural resources, especially water.

#### **Gaps in the Research**

A physical survey of the reservoir could be undertaken in an attempt to reinforce the ethnographic information identified in the initial research.

#### **Tropical Savanna Region**

A literature review focusing on all Northern Indigenous Australian groups was undertaken with the aim to document Aboriginal perspectives from certain areas in northern Australia, defined as the region of tropical savannas stretching from Townsville to Broome, and offers a number of suggestions for improving current knowledge of Aboriginal values and Aboriginal participation rates in water and catchment management (Jackson, Storrs & Morrison 2005).

The paper highlights the cultural significance of rivers and water in selected northern regions, and provides a preliminary outline of research and management priorities as determined by key north Australian Aboriginal land management organizations.

#### **Gaps in the Research**

The initial project is comprehensive, wide-ranging and incorporates all northern Australian Indigenous groups.

#### **Arnhem Land**

A literature review was undertaken focusing on Northern Australia via case studies from the Maningrida (Bawinanga Aboriginal Corporation) and Katherine (Jawoyn Association and Wardaman Association) regions in the Northern Territory (Jackson & Altman 2009). This also included a community consultation with the Bawinanga Aboriginal Corporation, the Jawoyn Association and the Wardaman Association with the aim to articulate, through case studies, issues relating to water property rights, use and management by Indigenous people. To raise awareness of the implications of broad state goals of Aboriginal socioeconomic improvement (or 'closing the gap') and the recent shift to a market-based approach in relation to water. The focus of the project is on learning more about the circumstances of tropical Indigenous Australia, and is targeted at research into local socioeconomic and institutional contexts to provide evidence-based research of value to broader policy processes.

#### **Gaps in the Research**

The initial project is comprehensive and wide-ranging.

#### **Wudjulu Lagoon, Ngukurr**



Watts (2012) conducted a project in the Wudjulu Lagoon area that involved a physical survey, consultations and interviews of the Ngalakan people. The aim of this project was to:

- (1) utilise knowledge of traditional practices;
- (2) integrate Indigenous knowledge with western science; and
- (3) develop a context analysis that informs policy and water management processes.

#### **Gaps in the Research**

The initial projects for the Wudjulu Lagoon region have been comprehensive, but may benefit from a comparative literature review with similar regions may prove beneficial.

#### **Tindall Limestone Aquifer**

A community consultation with the Jawoyn, Wardaman and Dagoman peoples was undertaken in an effort to initiate strategies for sustainably allocating and managing water from this water source (Department of Land Resource Management 2009). These strategies, as detailed in Clause 18 were created by assessing:

- (i) water availability in the context of climatic variability and community, environmental and Indigenous cultural needs;
- (ii) community response to the economic opportunities associated with the use of this water source, including consumption uses such as agriculture, industry and public water supply and non-consumption uses such as tourism and recreation;
- (iii) opportunities and needs arising from growth in existing and emerging activities, including economic development opportunities for Indigenous landowners.

#### **Gaps in the Research**

A physical survey of the Tindall Limestone Aquifer may prove beneficial in reinforcing the ethnographic information already identified in the initial project.

### **13.3.4 Queensland**

#### **Cape York**

Within the Cape York area two projects have been conducted, including a literature review, surveys and interviews of the Kowanyama people. The aim of this project was to provide a socially, economically and environmentally sustainable presence at Oriners Station in south-central Cape York.

A focus group and community consultation was also undertaken with the Carpentaria Land Council Aboriginal Corporation and Balkanu Cape York Development in an effort to establish land and sea management using strategic approaches to care for country with an emphasis on practical management by Traditional Owners across north Australia.

#### **Gaps in the Research**

The project research regarding Indigenous values of water in Cape York, QLD so far has been somewhat specific and focused on two particular regions.

Future projects may include a general consultation with all Indigenous stakeholders across Cape York, which will produce an overview of the variation that may exist between groups and their connection to water.

#### **Southern Gulf of Carpentaria**

The Tropical Rivers Program was undertaken to assess threats to the river system and assess social, cultural and economic values of the river system (Jackson & O'Leary 2006). No specific Indigenous groups were mentioned within the report, suggesting that the project produced a general overview of the entire Tropical Rivers system and did not focus on any individual group or region.

#### **Gaps in the Research**

The project conducted so far in the Southern Gulf of Carpentaria provides a general overview of Indigenous water values and how these may be affected by threats to the river system; however, it does not look at each stakeholder group in detail, which may help to portray any variation that occurs between groups.

Future projects could include localised surveys of regions that have been deemed significant in the previous project. Each survey could include the interested Indigenous groups for that region and the reports could be compared to determine if and where any variations in the value placed on water may occur.

## **Far North Queensland**

Cranney & Poh-Ling (2011) undertook community consultation near the Mitchell River region, including Muluridigi, Kuku, Yalanji, Kuku Djungan, Kuku Minnie, Wakkaman, Barbaram, Kowanyama, and various councils and boards including the Mitchell River Watershed Management Group (MRWMG). The aim of the project was to understand why traditional ecological knowledge is essential for determining environment flows in water plans.

### **Gaps in the Research**

The project conducted in Far North Queensland was highly inclusive of all interested Indigenous groups and produced a report that identifies not only aspects of traditional knowledge from all these groups, but suggests how this knowledge may be utilised to better manage the Mitchell River System.

Future projects could include localised surveys that focus on the variety of marine environments in Far North Queensland which hold significant cultural value to Indigenous stakeholders. Some of these regions may have already been identified by Traditional Owners in the previous project.

## **Central Queensland**

Lockie et al. (2003) undertook a project in the Central Queensland area that included a community consultation. The Indigenous groups consulted during this process include Darumbal Noolar Murree Aboriginal Corporation for Land and Culture; Fitzroy Basin Elders Committee; Springsure area cultural heritage interpretation and protection; Woorabinda Council; Woppa Burra and Sea Forum; Gooreng Gooreng Gladstone. The aim of these projects was to assist in the integration of Indigenous knowledge into all future projects in the Cooperative Research Centre for Coastal Zone, Estuary and Waterway Management in Central Queensland.

### **Gaps in the Research**

Areas of significance identified in the previous project could be used as locations for localised surveys throughout Central Queensland. This would reinforce ethnographic information provided in the initial project.

## **Wet Tropics**

The report produced for this region presents a compilation of information about specific water-related Indigenous cultural values/assets in the Wet Tropics through documented literature reviews and discussions with Indigenous stakeholders. These stakeholders included Bandjin, Djabugay, Djiru, Girramay, Gugu-Badhun, Gulnay, Gunggandji, Jirrbal, Koko Muluridji, Eastern Kuku, Yalanji, Mamu, Ngadjon, Nywaigi, Warrgamay, Warungnu, Wulgurukaba, Yidinji, Yirrganydji and Bar Barrum communities.

### **Gaps in the Research**

Areas identified in the report of the previous project could be used as locations for cultural heritage surveys which may reinforce the information about specific water-related Indigenous cultural values/assets. A wide range of Indigenous groups were consulted in the initial project, which would identify any variation in these values.

## **13.3.5 South Australia**

### **Lower Murray River/ Basin**

Two projects have been conducted to date in the Lower Murray River/Basin region including a community consultation and focus group to assist in ascertaining the meaning of cultural values and its connection to Indigenous water practices in each community. The second project involved interviewing members of the Murray Lower Darling Rivers Indigenous Nations (MLDRIN) regarding their experience with water law and how their interests are reflected within new policy measures.

The Indigenous groups focused upon in these projects were limited to the MLDRIN; however, this organisation is composed of over forty Indigenous groups that reside around the Murray River. Some of these include: Wiradjuri, Yorta Yorta, Taungurung, Barapa Barapa, Wamba Wamba, Mutti Mutti, Wadi Wadi, Latji Latji, Wergaia and Ngarrindjeri Nations.

### **Gaps in the Research**

From the research undertaken in previous stages of this project it has become apparent that, as yet, no dedicated cultural heritage survey of any areas of the Lower Murray River/Basin has been undertaken. Future projects may wish to focus on this element of methodology in order to gain contextual knowledge of the cultural utilisation of the landscape and its connection to marine life and how this may have varied amongst the relevant Indigenous groups.

### **Lower Lakes/Coorong**

Within the Lower Lakes/Coorong region minimal work has been conducted to date; however, a focus group and community consultation with the Ngarrindjeri Nations was undertaken in order to fully engage with CSIRO to recognise Indigenous knowledge systems and Indigenous values of water throughout the whole river system for all Indigenous Nations (Birckhead et al. 2011).

#### **Gaps in the Research**

From the research conducted so far, it appears that a very general project has been undertaken over the entire region; however, as yet, no specific projects have been undertaken. The consultation process achieved by the CSIRO focused its attention on the whole river system and every Indigenous group affected, but the consultation only included members of the Ngarrindjeri community.

Future projects could aim to incorporate the knowledge and marine connections of all interested Indigenous bodies.

#### **Maralinga Tjarutja Lands, Yalata Lands and the Anangu Pitjantjatjara Yankunytjatjara Lands**

Within the Indigenous lands of the Maralinga Tjarutja, the Yalata and the Anangu Pitjantjatjara Yankunytjatjara (APY) a physical survey and a community consultation have been undertaken to discuss issues such as future consultation, water education practices and rainwater tank monitoring (Pemberton, Baird & Draper 2009). Access to the APY lands was restricted during this project.

#### **Gaps in the Research**

The projects undertaken in this region have managed to include multiple Indigenous groups in their discussions and have also completed both a survey of the land and community discussion.

Future research may include site specific projects, focusing on particular utilisations of marine resources and how these may change amongst the three interconnecting communities.

#### **Southwest Marine Region**

One project has been conducted to date within the Southwest Marine Region of South Australia (Australian Institute of Aboriginal and Torres Strait Islander Studies 2006). This project utilised a literature review and community consultation involving the Mirning, Wirangu, Nawu, Banggala, Nukunu, Narungga, Kurna and Ramindjeri nations. The result of these projects was a report which outlined the historical and contemporary information concerning Indigenous connections to the 'Sea countries of the South-west Marine Region'.

#### **Gaps in the Research**

A physical survey could be conducted at multiple locations throughout the South-west Marine Region. Each location could be selected based on its ability to act as a strong example of various marine environments. This would again provide a more specific knowledge base instead of a general overview of such a large area and would also identify those environments that are more likely to have been utilised by Indigenous groups in the past.

### **13.3.6 Tasmania**

#### **General Region**

No projects have currently been conducted in Tasmania relating to Indigenous Values of Water.

#### **Gaps in the Research**

As no work has yet been undertaken in Tasmania it is essential that some understanding be gained in relation to the variation that may have existed between mainland Indigenous groups and island groups and how they thought about and utilised marine environments.

Future projects could include a survey of specific locations based on their ability to act as a true representation of the various marine environments in Tasmania. Community consultation may have significant limitations in terms of recording traditional practices and knowledge, which have slowly been lost with the depletion of Tasmanian Indigenous communities. Unfortunately, this loss of information may impede the outcomes of the proposed project.

### **13.3.7 Victoria**

#### **Northern Victoria**

Goulding et al. (2008) undertook a project in the Northern Region of Victoria. The report produced as an outcome of this project was designed to provide DSE Office of Water with an analysis of the level of previous engagement

with Indigenous people relating to water values in the Northern Region and to identify any gaps in this engagement. No specific Indigenous groups were consulted during this process, which simply involved relevant literature reviews.

### **Gaps in the Research**

The initial project was aimed at identifying any gaps in the research and yet it did not mention Indigenous groups specifically or their individual cultural water values.

A second stage of this project could involve researching water values of specific Indigenous groups and comparing these throughout Northern Victoria to identify if any variations exist.

Physical surveys could be achieved based on the results of the proposed second project which would aim to identify specific sites associated with cultural water values.

### **Murray River**

Jackson (2006b) has undertaken a project involving the Murray River Peoples. This project included a focus group and community consultation with MLDRIN to establish a discussion about water issues, to hear about marine experiences of other groups, discuss cultural values, river reforms and environmental policy.

### **Gaps in the Research**

A wide-ranging initial project has already been conducted for the Murray River region in Victoria; however, there are still many opportunities for future projects in this area.

Literature reviews comparing the research produced in the initial project to that produced in regions of the Murray River in South Australia and New South Wales could be used to identify variations in Indigenous cultural values of other groups.

Physical surveys of areas identified in the literature review process could be achieved to reinforce the ethnographic information outlined in the reports.

### **Southern Victoria**

EMS Consultants (2009) conducted a project from Warrnambool to Ouyen in Southern Victoria that included a focus group and community consultations. The consultations included the following Indigenous groups: Gunditj Mirring–Traditional Owner Group and RAP, Barengi Gadjin Land Council – Traditional Owner Group and RAP, Martang – RAP, Dja Dja Wurrung – RAP, Framlingham Aboriginal Trust – RAP applicant, Ballarat and District Aboriginal Co-operative – RAP applicant, Brambuk Incorporated - RAP applicant, Wadda Wurrung Aboriginal Corporation– RAP applicant, Worn Gundidj Aboriginal Co-operative, Windamara Aboriginal Co-operative, Victorian Indigenous Seafood Committee. The aim of the project was to have as much traditional knowledge and input into the report as possible.

### **Gaps in the Research**

The initial research does include a wide range of Indigenous groups and their associated knowledge and cultural values and would identify marine sites that hold significance. These could be used to conduct physical surveys which would aim to reinforce the ethnographic information from the initial project.

Literature reviews of similar documents in other regions of Victoria and interstate could provide an understanding of any variation that may arise between groups and their beliefs and values associated with water.

## **13.3.8 Western Australia**

### **Kimberley**

A focus group and consultation with the Kimberley Land Council has been undertaken in an effort to support Aboriginal and Torres Strait Islander land and sea management using strategic approaches to care for country with an emphasis on practical management by Traditional Owners across north Australia (North Australian Indigenous Land and Sea Management Alliance 2009b). This forum provided an opportunity to raise ideas and concerns about economic development and opportunities; potential impacts of development in north Australia; governance and institutional arrangements as they affect Indigenous community interests, aspirations and issues.

### **Gaps in the Research**

The initial project was a thorough start point for Indigenous water research in the Kimberley; however, there are multiple other projects that could be conducted in an attempt to fully comprehend cultural water values.

A participatory research action, focus group or physical survey of specific locations would be the next logical step in the research process. This would enable ideas and issues raised in the initial project to be put into action.

## **East Kimberley**

Barber & Rumley (2003) conducted a project involving a literature review, focus group and consultation with the Miriwung, Kuluwaring, Gajerrabeng people has been conducted in the East Kimberley region of Western Australia. The aim of this project was to record and articulate the cultural, environmental, social and economic values which Traditional Owners and Aboriginal communities attach to the Ord River and associated flood-plains and wetlands. To acknowledge past effects on Aboriginal people of the damming of the Ord River.

Two secondary projects have been undertaken involving the Miriwung Gajerrong people of the east Kimberley. Jackson (2006b) undertook a project consisting of a focus group and community consultation was conducted to have a good discussion about water issues, for northern Australian Aboriginal groups, especially from the Daly River, to hear about the experiences of other groups, e.g. from the Murray Darling, and vice versa, to think about environmental policy, especially water management, and how it can work for Indigenous people, to talk about the words 'cultural values', how they are being used and whether they reflect Indigenous values, to talk about rivers and water reforms: what worries people about the changes and are there opportunities, or good parts, to the changes and to talk about ways Indigenous people can document their values, promote them and be involved with governments and other groups e.g. catchment management groups.

Pursche (2004) undertook a literature review and participatory action research project with the Kija, Jaru, Miriwoong-Gadjirrawoong and Balangarra communities in order to design an innovative five-year research and development (R&D) program focused on the Ord River catchment in the East Kimberley, Western Australia.

### **Gaps in the Research**

Comprehensive and wide-ranging research has already been conducted in the East Kimberley region of Western Australia.

## **Fitzroy River**

Three projects have been undertaken to date in the Fitzroy River region of Western Australia. These include a literature review, interview and community consultation with the Kimberley Land Council, Nygina-Mangala and Ngarinyin language groups. The aim of these projects was to undertake research and knowledge exchange to support the sustainable use, protection and management of Australia's tropical rivers.

### **Gaps in the Research**

Physical surveys of sites identified in the initial research could be undertaken in an effort to reinforce any ethnographic information collated by the interviews and community consultation.

## **Pilbara**

A wide-ranging project has been conducted in the Pilbara involving the Innawonga, Bunjima, Jurruru, Kuruma Marthudunera, Martu Idja Banyjima, Ngarluma, Nyiyaparli, Puutu Kunti Kurrama and Pinikura, Thalanyji, Yaburara and Yindjibarndi groups. A focus group and interviews were undertaken by Rio Tinto in order to better understand Aboriginal values and interests in water across the region...but the primary corporate motivations emerged from the desire to proactively manage current and future impacts rather than legal requirements. The priority in what follows is to synthesise and describe the major characteristics of Aboriginal water values and Aboriginal water issues in the Pilbara and their relationship to recent developments in wider Aboriginal advocacy around water planning.

### **Gaps in the Research**

Comprehensive research has been and is currently being undertaken in the Pilbara region of Western Australia.

## **La Grange Sub-basin and Fitzroy Valley**

Three projects have been conducted in the La Grange Sub-Basin and Fitzroy Valley region of Western Australia. These included a literature review, physical survey and interviews with the Yawuru, Nyikina, Karajarri, Mangala and Nyangumarta people. The aim of these projects was to:

- 1) To identify and document the Aboriginal cultural values of groundwater dependent ecological and hydrologic features within the study area.
- 2) To provide an assessment of the significance of these environmental values with respect to the cultural values they possess.
- 3) To identify any registered Aboriginal heritage sites in the study area that are linked to groundwater dependent ecological or hydrological features.

- 4) To involve the Karajarri and other Aboriginal groups with traditional lands in the study area in the research process.
- 5) To make specific recommendations regarding the avoidance of negative impacts on the groundwater dependent cultural values within the study area.
- 6) To ensure that the resultant study report is approved by the Aboriginal community and groups involved.

### **Gaps in the Research**

Comprehensive research has been conducted to date in the La Grange Sub-basin and Fitzroy Valley region.

### **South-west Marine Region**

A literature review and community consultation was undertaken with the Yamatji, Noongar peoples countries of the SWMR. The projects also included the Mirning, Wirangu, Nawu, Banggarla, Nukunu, Narungga, Kurna and Ramindjeri in South Australia. The aim of the project was to form part of the data gathering and scoping process toward the creation of a marine plan for the SWMR. It will also aid in the creation of specific Indigenous sea country plans that may be developed with discrete Indigenous groups and bodies as an outcome of national and state marine and fisheries planning processes and ILUAs. The aim of this review is to provide specific information about Indigenous interests, values, connections and diversity and to aid future consultation with the Indigenous people of this region. It is also an aid in the negotiation of effective and pragmatic decision-making structures and processes involving Indigenous people in the SWMR.

### **13.3.9 Summary**

Across Australia the research conducted to date related to Indigenous cultural water values has been wide-ranging, with the Northern Territory and Western Australia having the most comprehensive coverage.

Regions which have already been involved in initial discussions and scholarly review would benefit from physical survey of any significant marine sites that would help to reinforce the ethnographic information discussed in the initial phases.

Localised regional studies may benefit from comparative analysis with other similar sites, which may act to highlight similarities or differences that exist between geographically isolated Indigenous groups.

Community consultation with groups that have previously been overlooked would assist in filling in the gaps in the research and highlight regions that should be made the focus of future studies regarding cultural water values.

## 14 Identification and Justification of Project Concepts and Terminology

The purpose of this section is to identify and analyse terminology used in the reports that define and describe relationships between Aboriginal people and water. Since the scope of this report does not allow for original field research, we can only provide a textual analysis here. First, we describe how terminological use tends to determine the conception of the research process. Second, we describe how different conceptual domains linked to relationships between Aboriginal people and water function and interact. We show that the uses to which concepts such as culture and economics are put by both researchers and participants sometimes emerge as conceptual oppositions, and sometimes as conceptual confluences. Compiling a precise formal lexicon of terms would be impossible without undertaking original research into the way terminology is used.

### 14.1.1 Terminology and conceptualisation of research

Conceptualisation of research, including focussing on particular terminology sets, largely determines the conduct and framework of results of research projects. As Singleton & Straits (2004: 20) state:

*[A] feature of language, in both conventional and scientific usage, is that it tends to determine what we see in the world. Since what we know about objective reality is represented and communicated with words, words make some distinctions more salient than others.*

While this point may seem by now almost naive, particularly in view of much literary criticism, epistemological and social science literature of the last thirty or so years, it is important to take account of the terms the projects have used, and, as a consequence, the conceptualisations that underpin them.

In a brief and stimulating paper Weir (2009) makes the same point in terms of research into water and the consequent decision-making processes involved. Drawing largely on the work of Bruno Latour (1991), Weir calls for attention to be focussed on the generation and use of concepts for research (Weir 2009: 1). Weir goes on to explain how conceptual and terminological dualisms operate in the context of understandings of water, with a focus on the 'ecology/economy dualism' that Weir sees as a destructive either/or proposition (Weir 2009: 2). We recognise the dualisms Weir identifies from the projects we have examined for this report, and we propose that while they sometimes appear in dualistic fashion, they also operate in subtle and complex ways - for instance, sometimes dualisms become synonyms - as we will show.

The projects under review deal implicitly or explicitly with six main concepts in a variety of combinations and relationships. The concepts are:

- culture
- economics
- science
- policy
- sustainability
- values

A further, perhaps less determining couplet of terms is Indigenous and Aboriginal.

It is worthwhile at this point to examine generally accepted definitions of some of the key terms in play (Table 14-1 below).

Table 14-1: Terms and Definitions

Term	Definition	Supporting References
Culture	"Culture, or civilisation, taken in its broad, ethnographic sense, is that complex whole which includes knowledge, belief, art, morals, law, custom, and any other capabilities and habits acquired by [a human being] as a member of society" (Tylor 1920 [1871]: 1). The question of where the boundaries of a culture lie is highly problematic. Anthropologists do not generally accept that cultures are objectively bounded. This raises important questions concerning the relationship between Aboriginal Australia and the rest of the population.	Tylor (1920)[1871] Regarding boundaries, Harrison (1999).
Economics	"[E]conomics is the study of the link or the relationship between institutions and the creation and distribution of wealth...[A] general theory of economic systems explores a) the impact of various institutional frameworks on individual behavior, b) mechanisms, such as markets or hierarchies, for aggregating individual actions, and c) the nature of institutional change" (Eggertsson 1995: 202). Mankiw (2011) provides a more familiar short definition: "Economics is the study of how society manages its scarce resources" (Mankiw 2011: 4).	Eggertsson (1995), Mankiw (2011).
Science	"a : knowledge or a system of knowledge covering general truths or the operation of general laws especially as obtained and tested through scientific method b : such knowledge or such a system of knowledge concerned with the physical world and its phenomena : natural science" The scientific method includes the operations of verifiability and falsifiability.	Merriam-Webster Online Dictionary <a href="http://www.merriam-webster.com/dictionary/science">http://www.merriam-webster.com/dictionary/science</a>
Sustainability	"[S]ustainable development is not a fixed state of harmony, but rather a process of change in which the exploitation of resources, the direction of investments, the orientation of technological development, and institutional change are made consistent with future as well as present needs" (Brundtland 1987: n.p.).	Brundtland (1987).
Value/Values	Determinations of significance of cultural elements, including but not limited to what is right and what is wrong. These determinations of significance are guidelines or even rules for thinking and behaviour. They may to different degrees be taken for granted, but they are neither absolute nor timeless and may be reassessed or challenged by individuals or groups, particularly in times of conflict. Such a reassessment or challenge can be recognised as ethical freedom. There can be no values that are not cultural values.	Weber (1946), Dumont (1977; 1980), Robbins (1994; 2007).

### 14.12 Culture

Culture is perhaps the most important conceptual assumption in both the literature and the projects. While the term culture has a long, complex pedigree, it has been largely developed and refined by the discipline of anthropology. While there has been variation in the anthropological definition of culture across time, the nineteenth century definition from E. B. Tylor in Table 14-1 above would still be acceptable to most, if not all, anthropologists.

For anthropology, almost everything about human life falls within the domain of culture. Culture therefore tends to act as an organisational concept, rather than a descriptive one. Culture, as employed by the projects dealt with in this report tends to have a variable function. Cranney & Tan (2011: 112) for instance refer to 'developments of law, policy and culture', as if culture was a discrete domain. Likewise, EMS Consultants (2009: 5) write that Aboriginal people struggle to 'sustain, protect and preserve traditional life, and culture' without identifying the difference between two terms 'traditional life', and 'culture' which would seem to refer to the same thing. We



suspect, however, that the term culture is also being used in the anthropological sense at the same time in the above two examples.

#### 14.13 Economics/Economy

The terms economics and economy are used throughout the reports in a way that is consistent with the definition provided in Table 14-1 above.

#### 14.14 Sustainability

Sustainability is used throughout the reports in a way that is consistent with the definition provided in Table 14-1 above.

#### 14.15 Values

The term 'values' is the most used term in the projects. The term values is separated out from culture sometimes, and it stands in for culture at other times. NSW Office of Water (2012: 7) for instance uses the phrase 'traditional Aboriginal knowledge and values', presumably separating out what Aboriginal people know through tradition with what Aboriginal people decide is important, but at the same time it seems clear that the phrase is describing exactly the anthropological understanding of culture. Jackson & O'Leary (2006: 13) write that their project seeks to 'assess social, cultural and economic values'. For Jackson & O'Leary presumably, each domain – social, cultural, economic – has within it a collection of values. Moggridge & Robinson (2010: 8) write as part of their recommendations that there needs to be 'improved mechanisms and frameworks to identify and incorporate Indigenous values'. Here, 'Indigenous values' appears to also stand in for the anthropological understanding of culture. The terms 'economics' (mentioned above), 'environmental' and 'sustainability' are also involved in this pattern of separation and linking of concepts. Barber & Jackson (2011b: 50) write about 'spiritual, cultural, historical, economic and physical dimensions' of life. Barber et al. (2012: xiii) write about 'socially, economically and environmentally sustainable' practices.

#### 14.16 Terminological Complexity

The complexity of terminology used is a result of researchers trying to overcome intellectual and practical problems. The term 'cultural flows' itself is an example of the attempt to overcome terminological and ideological problems, drawing as it does on both culture and the conceptual ('cultural') and an idea of physical nature ('flows'). Altman's (2001; 2010) concept of 'economic hybridity' is yet another example, seeking to link customary life with the market and the state (Altman 2010: 271). Jackson (2006b) provides a very instructive and sustained series of workshop conversations focussed on this terminology used to articulate the nexus of government policy and demands, and Aboriginal relationships with water. Over the course of the conversation, Peter Whitehead (of the NT Department of Natural Resources, Environment and the Arts) made the following remark about "cultural values":

*In my view, 'cultural' literally means anything that people believe or do to cope with their world and each other and is transmitted from generation to generation through learning... It is necessary to present a view of what is important for your well being rather than try and determine or segregate your values and views into cultural or economic or environmental categories. Most bureaucrats like to put things in boxes (Jackson 2006b: 18)*

Marcia Langton (Foundation Chair of Australian Indigenous Studies at the University of Melbourne) remarked that it might be better to jettison the term "cultural" and replace it with "Aboriginal values" (Jackson 2006b: 18). Langton goes on to say that there is not necessarily a conflict between "cultural values" and "economic values" (Jackson 2006b: 19). At the same time, Jackson writes

*Environmental management systems are not sympathetic to Indigenous world views, according to many of the people at the workshop (Jackson 2006b: 20)*

Strang (2008) notes that Aboriginal ways of approaching water 'formulate human-environmental relationships in metaphorical and spiritual terms and use water imagery to express complex ideas about social identity, creativity and productivity' (Strang 2008: 2). These ways of thinking are at a variance with

*conceptual models that are more fragmented and reductive, dividing spiritual and religious meanings from ideas about water as an economic commodity (Strang 2008: 2)*

Again there is, therefore, a pattern of linking concepts (Langton's economics and culture; Strang's social identity and creativity and productivity), and splitting concepts (Jackson's identification of environment verses Indigenous world view; Strang's identification of 'conceptual models' that are 'fragmented and reductive'). The uses to which apparently disparate concepts such as culture and economics are put are not, therefore, simple conceptual

oppositions or simple conceptual conflations. Nor are they mere accidents. It is precisely at the point of slippage in meaning between disparate conceptual domains that the potential link must be found, but this can only be achieved by paying careful attention to the contextual meaning of terms, and this can only be done during the research process.

#### 14.1.7 The Ethnographic Contribution

Toussaint (2008) describes these complex conceptual operations in both theoretical and ethnographic terms in the context of water use and scarcity in the Kimberley, where Aboriginal groups and organisations, pastoralists, and environmentalists united under some conceptual banners, and split apart due to others. This pattern and its often troubling consequences has been well documented in the anthropological literature (further examples are Jackson (2006); Strang (2005, 2006, 2008); Weiner (1999)), and is played out on the national stage every time policy is directed at Aboriginal people.

The anthropological literature reminds us again and again - as do Langton and Strang above - that intractable conceptual distinctions may not appear in the same way, or even exist, in the everyday experiences of people (e.g. Sahlins 1999: xix). As anthropologist Diane Austin-Broos puts it, on the basis of her fieldwork with the Western Arrernte in Central Australia:

*finance capitalism is both economy and culture, meaning and cause - in fact the very stuff of value as it exists in social life (Austin-Broos 2009: 314)*

Here, Austin-Broos alters the conceptual division by re-embedding 'the economy' into culture, and she does so on the basis of her findings arising from long term anthropological fieldwork paying careful attention to the local level (more on anthropological fieldwork below). The statement Austin-Broos makes is a signal to non-Aboriginal Australian society - here also the economy is not separate from social life and tradition. This recognition is important. The economy, or Austin-Broos' 'financial capitalism', cannot therefore be excluded or excused from discussions about an Australian or any other community's morals and values, and nor can it be seen as an inevitable ahistorical force beyond human creation or manipulation.

#### 14.1.8 Assessment of Terminology

While the processes of terminological transformation may be captured through ethnographic fieldwork, we strongly suspect that translatability of project terminology and concepts across Aboriginal terminology, government policy, ideas of sustainability, and other terms is very difficult to achieve without careful attention being paid to contextual definitions. We can only provide a textual analysis of the issues in the present report.

While those who fund projects set an agenda often including definitions of terms, scope of study and desired outcomes, a critical examination of concepts at the outset is nonetheless a vital starting point for projects. The terminology used in projects is appropriate so long as the contextual meaning is clearly identified for a specific project, and so long as there is consistency throughout in the use of terms. Where the research findings challenge concepts and terminology, this too must be clearly identified and described. The danger of misinterpretation is very real, as the above analysis shows. Just as important, if terminology from disparate domains is to achieve translatability, careful definition is critical and will contribute directly to the success of a project. This process of defining terms must be undertaken during the research process, however.

It is assumed that future projects would show increased vigilance in regard to the concepts underpinning a project, and the concepts that are put forward both during the conduct of research and during the phase of recommendations. It is assumed also that future projects will recognise that definition of terms, including 'cultural flows' itself, must form part of the research process, especially when researchers are eliciting information from Aboriginal people.

## 15 Summary and Assessment

The majority of the reports from all states and territories note the importance of recognising the Indigenous values attached to water and of consultation with Aboriginal people. In particular it was noted that resources and species of high economic value to Western stakeholders do not always coincide with those of significance to Indigenous communities. Many of the reports, while stressing the importance of consultation, stress the shortcomings and failures of this process when not followed up with opportunities for Aboriginal people to be actively involved in the planning, monitoring and management of waterways. This is a reflection of the growing appreciation for the role Indigenous knowledge of the environment can inform management plans. The focus of Indigenous consultation is moving beyond simply avoiding negative impacts on Aboriginal communities to ensure environmental management works in cooperation with, rather than alongside, traditional and cultural land use. This is a radical shift from a culture of excluding Aboriginal knowledge as non-expert in even quite recent research projects. Many Indigenous groups contacted through these projects demonstrated a willingness to engage and protect the waterways, but this was often prevented by a lack of opportunity for direct involvement.

Indigenous involvement in the planning and monitoring of management plans may also serve as the solution to another major problem: volumetric water allocations for culturally significant waters. Although economic resources valued by Indigenous people can often be managed in much the same way as other economically important aspects of the environment, there is far greater ambiguity when it comes to determining how much water needs to be set aside for culturally significant places. Often the presence of water effectively 'creates' the site in that it may represent a spiritual entity or mark a place of social significance. Exactly how much water is needed to maintain this kind of site's presence cannot be measured in the same way that economic resource demands can be. In reality there is unlikely to be a clear distinction between sufficient and insufficient water volumes; it is more probable that a continuous spectrum, ranging from fully sufficient to insufficient exist. The direct involvement of Aboriginal people in decision making processes may provide some means of determining whether or not water allocations are sufficient.

A third reason to actively involve Aboriginal people in environmental management is to avoid concepts of value being artificially constrained by Western distinctions between economic and cultural, between social and spiritual and numerous other potential false dichotomies. By giving Indigenous people more responsibility and input into defining and protecting places of significance, management plans would be tapping into a wealth of knowledge regarding the nuances of that significance and how best to maintain it.

The international level offers instructive perspectives on issues raised by the Australian literature and projects. Steenstra's (2010) account of the formulation of the Cultural Health Index for the Waikato River in New Zealand, for instance, goes at least some way towards quantifying cultural information without reducing it to a commodity. The example of the Canadian Model Forestry Program provides a relatively long term model for linking environmental, economic and cultural aspects of a natural resource with what appears to be a good level of success. The Integrated Water Resources Management approach, as described by Johnston (2012), looks like the model of practice for which much of the Australian work appears to be striving.

While projects dealing with Aboriginal relationships to water have a relatively impressive geographical spread, this report has identified a variety of geographical locations that would be suitable for further, illuminating project work. It is acknowledged that some project specifics, such as methodology or limitations, were not able to be elucidated to the extent that had been originally expected at the outset of Component One of the National Cultural Flows Research Project. Budgetary and time constraints played a part, as did the lack of relevant information provided in many of the project reports. Further, it is acknowledged that due to timing and budgetary constraints, the report overall was not as comprehensive as had been expected.

The analysis of terminology used in projects dealing with Aboriginal relationships to water reveals considerable complexity in meaning and usage, and this includes the term 'cultural flows' itself. This report asserts that terms such as 'cultural flows' and 'cultural values' are important and useful descriptive tools which allow for the tangible aspects of cultural water values to be easily defined and therefore understood.

Terminology used, such as 'culture' and 'values', but also 'economics' and 'sustainability', evince a variety of meanings even within the same report. The contention of this report is that the current terminological use is sound, so long as terms used are carefully defined at the outset of a project, are carefully documented within the project report, and that these definitions are kept consistent throughout both the project life cycle and the subsequent report. Where the research findings challenge conceptual assumptions or terminological use, this must also be carefully documented.

This terminological consistency will prove vitally important to the outcomes of Component 2 of the National Cultural Flows Research Project, which requires the development and utilisation of methodologies that allow for the measurement of Aboriginal cultural water uses and values. However, internal consistency within one report or with regard to one Aboriginal group's values of water is only the first step. To really produce meaningful results, this terminological consistency must be carried over from group to group, region to region. The literature and project reviews provided in the above report have formed a baseline of information which will hopefully inform the research questions asked in Component 2, especially with regard to examining both the historical and contemporary cultural uses and values of water for the Aboriginal group or groups within the specified case study areas.

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#### **Legislation**

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## 19 Appendix 3 - Explanatory Notes for Literature Database Entries

The fields used in the literature databases are described below.

### Unique identifying number (ID)

This number is used to identify each record. For every row in the spreadsheet, there will be one use of water. For each new use, a new entry will be made. This means there may be multiple entries for a single Indigenous group or body of water.

### Date recorded

This refers to the date, or date range, when the information about Indigenous water use was recorded by the source. It may be a year, or a decade range, eg 1890, 1890-1900. The dates may not always be specified, in which case they may have to be inferred from the date of the document or the date of publication, or in some cases from the mention of datable events in the document. The date can also be 'unknown' or 'unspecified'.

### Indigenous group name

Historically, Indigenous groups have been defined in a myriad of ways, based on language, group membership, geographic location, political organisation and cultural affiliations. The impacts of European colonisation have complicated the identification of Indigenous groups, both due to massive cultural and social disruption, and the failure of early ethnographers and observers to understand the nature of Aboriginal social structures. Hence, in the literature review, there is likely to be a wide range of names for Indigenous groups with varying degrees of consistency. Many of these may not map easily onto contemporary groups.

For the purposes of the project, the name given to the Aboriginal people discussed in the source will be entered into the database. Where there are multiple versions of group names, orthography will follow the Tindale map by preference to facilitate the mapping of data. The Indigenous group is of interest as there is wide variation in cultural practices and meanings across Australia, and more than once group may have rights and interests in any water body.

### Group type

This category goes into more detail about the type of Indigenous group being described. Some terminology is drawn from native title usage.

*Informal*: in the literature, Indigenous groups may be described or designated in ways that are unrelated to what they called themselves.

*Language*: for groups which are defined by the language they speak.

*Family group*: based around a named person, a kin group, or an extended family or clan grouping

*Society*: a society is governed by the same rules or laws; in some cases this will overlap with cultural groups.

*Unspecified*: a description of water use may be ascribed to Aboriginal people without a name being given.

### Native Title Claim

If the group described corresponds to a contemporary Native Title claim, the name and number from the Native Title Tribunal will be entered here.

### Historical Location

In the literature, this may be defined in a broad variety of ways, ranging from place names, districts, regions, or geographic features, such as rivers or mountains. The most precise location possible from the literature will be entered in here, derived from descriptions and/or maps in the source literature. As maps, names, and places may

have changed since the information was recorded, and Aboriginal people may have moved whether by choice or not, this location is deemed to be historical only.

Please note that this is different to geographic location, which will be generated from the location, state, vegetation, landform, and type of water.

## State

It is recognised that states are a colonial and federation administrative arrangement, and that Aboriginal groups are not constrained by state boundaries. However, the inclusion of state is relevant for relating the database to contemporary water management and regulatory regimes, and in contributing to the geographic location and GIS data. States and territories are: ACT, NSW, VIC, QLD, NT, TAS, SA and WA.

## Vegetation

Vegetation groups are defined to be consistent with the National Vegetation Information System. Information about vegetation is likely to be variable in the literature, and over the centuries since European colonisation vegetation has changed dramatically. Nonetheless, this provides the capacity to map areas and link in with other geographic information.

Vegetation types may relate to an economic or cultural resource sustained by the water body, seasonal use of a water body, and to the geographic location. The categories are as follows:

*Cleared /modified:* this includes land cleared for agricultural and pastoral purposes, urban and industrial areas, vegetation impacted by activities such as grazing, cultivation, etc.

*Rainforest and vine thickets:* rainforest may be tropical or temperate and is characterised by high rainfall and high biodiversity. Tropical rainforests grow between the Tropics of Cancer and Capricorn. Rainforest structure typically consists of the forest floor, understorey, canopy and emergent layers. Vine thickets are dense, frequently tangled growths including vine species, often thought of as 'jungle'.

*Eucalypt forests and woodlands:* these can be wet or dry (eg dry sclerophyll), and are dominated by eucalyptus and related species. They are often thought of as 'bush'.

*Acacia forest and woodlands:* dominated by acacia species such as wattles and blackwoods.

*Unspecified forest or woodland:* forests or open woodlands may be mentioned in the literature without the species being identified.

*Shrublands:* composed of many branched woody plants, generally less than eight m tall.

*Mallee:* a type of woodland or shrubland composed of woody plants with stems that grow directly from the ground. Usually eucalypt species, and associated with semi-arid parts of Australia.

*Heath:* open, low growing woody vegetation, usually on low quality acidic soils. Heathlands can be a result of European land clearing activities.

*Mangroves:* medium height trees and shrubs that grow in intertidal zones, in tropical and subtropical environments.

*Hummock grassland:* spinifex communities, mostly on sand plains and dunefields.

*Tussock grassland:* grasses that grow in bunches or clumps

*Unspecified grassland:* sod, meadow, lawn, which contains grass and forb species

*Unspecified:* vegetation may not be mentioned by the source

## Landform

Landform describes the geographic feature in which the water occurs.

*Beach:* deposit of sand or pebbles on the shore of a sea, ocean, lake or river

*Coast:* the area of land adjacent to a sea or ocean, where the interaction of terrestrial and maritime influences occurs.



*Dune*: bank of sand created by aeolian (wind) or water movement, usually in parallel ridges that become consolidated and vegetated. Usually occur in desert regions or near lakes and oceans.

*Swale*: low lying stretch of land which collects water and is frequently moist or swampy; used to describe troughs between dunes

*Floodplain*: flat land bordering a stream or river, composed of alluvium (sand, silt, clay) deposited during floods. When a stream overflows, the floodplain will be covered in water.

*Hill*: an elevated area of land, often with a summit. Generally considered to be lower and less steep than a mountain.

*Mountain*: there is no universally accepted definition of a mountain, except that is higher and steeper than a hill, and rises more abruptly from the surrounding landscape. Some define mountains as greater than 600 m in height.

*Plain*: a broad area of low relief, flat or gently undulating.

*Valley*: elongated lowlands between ranges or mountains or hills, often with a river or creek at the bottom.

*Desert*: arid, sandy area with sparse vegetation.

*Plateau*: also called a tableland; a flat, elevated region or plain.

### **Origin of water**

This category identifies the source or origin of the water: the form the water exists in when it is accessed or used. The inclusion of water sources beyond rivers and creeks acknowledges that water systems are interconnected, and water flows have an impact on many types of water.

*River*: a large natural stream of water emptying into an ocean, lake or other body of water, and usually fed along its course by converging tributaries.

*Creek*: A stream of water smaller than a river.

*Wetland*: a lowland area like a marsh or swamp, associated with high moisture and distinct ecologies.

*Well*: a deep hole sunk into the earth to obtain subterranean water, or a manufactured hole in rock designed to catch runoff. A human made feature.

*Rockhole*: a naturally occurring hole or depression in a rock formation which collects runoff.

*Aquifer*: an underground layer of rock, sediment or soil which is saturated with water (groundwater)

*Spring*: a site where an aquifer or the water table meets the ground surface (groundwater). The water may seep (a soak) or flow. Where the water is heated by contact with hot rocks far below the Earth's surface, a thermal spring is created.

*Estuary*: a zone where freshwater from rivers meets saltwater from the sea; under the influence of tidal movements the saltwater moves upstream into the lower reaches of the river.

*Sea/Ocean*: a continuous body of saltwater, usually separating the continents and islands.

*Precipitation*: water which falls from the sky in the form of rain, drizzle, hail, sleet or snow.

*Condensation*: this includes mist, fog, frost and dew, forms of water deriving from the condensation of evaporated water which does not come from clouds.

*Sheetwash*: a flow of rainwater that covers the surface the ground with a thin film, rather than forming a stream.

*Flood*: when the volume of water cannot be contained in the stream bed and overflows on to flood plains. This can derived from seasonal rainfall or exceptional rainfall events.

*Spray/mist*: this is a fine suspended mist that arises from abrupt, high speed contact a surface, such as cliff face or stream bed.

## Nature of water

This describes the qualities of the water itself. These are taken from commonly used categories in water literature, but other qualities may emerge from the literature review. The qualities of the water may relate to its use or its cultural significance.

*Fresh*: having low concentrations of dissolved salts and other solids.

*Brackish*: less salty than the sea, but still too salty for use by humans

*Mixing*: this refers to water which has a salinity gradient, or alternating fresh/saline phases. As this is not a static quality, it is expressed as an active rather than passive verb.

*Salt*: salinity has a major impact on which species can survive and breed. Salty waters are usually associated with seawater, estuaries, and lakes. Rising salinity is also a result of poor European river and land management practices.

*Hardness*: hard water is defined by the levels of calcium and magnesium. Water occurring in calcareous geologies can have hard qualities.

## Movement

This describes the movement of the water, related to both use and quality.

*Running*: usually from higher elevations to lower elevations, and in rivers and creeks, from tributary streams to the main drainage channel and ultimately to the sea. Running water is linear.

*Stagnant*: still or motionless water, which as a consequence is poorly oxygenated and hence attracts anaerobic bacteria and parasites, as well as some flora and fauna which prefer these environments. Stagnant water can be a breeding ground for insects. Some anaerobic bacteria can be used in fibre processing.

*Fall (waterfall)*: water which falls vertically in from a high elevation directly to a lower elevation, usually in mountain ranges.

*Tidal*: tidal water movement is controlled by gravitational pull of the Moon, and occurs on a diurnal basis. As such it is cyclical and short term.

## Turbidity

This is a measure of the quantity of sediment particles suspended or stirred up in the water. Low turbidity leads to clear water, while high turbidity impedes the penetration of light. Clear water is important for spear fishing, so that the fish can be seen. Rivers with high sediment load are cloudy or muddy. This may be difficult to gauge from historic literature.

*High*: brown, opaque water with low visibility

*Medium*: unclear at this point how this might be assessed, and this category may be discarded.

*Low*: clear, transparent water

*Unspecified*

## Temperature

Jackson (2006) provides some detail on qualities water may hold that are significant for cultural practices. She records that some Indigenous people have noted that water released from dams into rivers is too cold for river species to live and breed. Temperature is related to season and climate. How each source determines temperature will be different, so this quality will be variable and subjective; but this reflects the human experience of temperature. Temperature can be experienced subjectively in relation to the 37° Celsius body temperature. The assessment of temperature will depend on the source making particular mention of it; otherwise, it may be possible to ascertain a generalised temperature from GIS or other environmental data.

*Cold*

*Warm*

*Hot*

*Unspecified***Flavour**

Flavour can be defined as the sensory impression of a substance determined by both its taste and smell. These are features (together with touch and sound) that are frequently overlooked in describing cultural significance. Flavour is related to the chemical content of the water, and can be an indicator of contamination or pollution. Water from different sources and different locations may have distinctive flavours, and flavours may also change with flow and with the seasons.

*Sulphurous*: hydrogen sulphide due to decaying organic matter: the 'rotten egg' taste

*Saline*: salty

*Odourless/tasteless*: no impurities or contaminants

*Metallic*: this is due to a high concentration of minerals such as iron or manganese

*Oily*: oils can be released from decaying animal corpses and plants in the water, or from industrial contamination

*Musty*: stale, moldy, swampy

*Fishy*: not necessarily derived from fish, but from micro-organisms living in the water.

*Unspecified*

**Sound**

In describing the aesthetic or sensory values, sound may be important. The variables for sound are derived from the recording industry and are to a large degree self evident.

*Dripping*

*Running*

*Lapping*

*Breaking*: eg as in surf

*Trickling*

*Bubbling*

*Falling*

*Splashing*

*Crunching*: from walking on ice or frost

*Unspecified*

**Associated sounds**

Not only may the water itself make sounds that are remembered, or that are part of the experience of being in a place, but characteristic sounds may arise from other animals or effects around the water body.

*Frogs*

*Insects*

*Birds*

*Soughing*: (wind in branches)

**Colour**

Water has a number of optical properties, including refraction and reflection. The colour of water is a result of the back scattering of light upwards, after it has passed through to various depths and undergone selective absorption.

Turbidity has a big effect on this. Pure water tends to absorb infrared wavelengths and reflect blue light back. Colour can range from clear to brown and muddy, covering greens, blues, reds and yellows in between. Colour is provided by organic matter, and sediments; groundwater has fewer organic substances. In water studies, a distinction is made between true colour - due to dissolved minerals and organic substances - and apparent colour, which takes into account suspended particles. True colour can only be measured by a sample of the water put through a centrifuge. For this study, it is apparent colour which will have been observed by Aboriginal people and Europeans. Some colours can be created by algal blooms and salinity. The weather also plays a part in how water colour is perceived. Colour is related to the experience of water, its turbidity, and may also be part of how the potential uses of water were assessed. Variables here are:

*Clear*

*Milky/cloudy*: caused by air bubbles

*Blue*

*Green*

*Yellow*

*Red*

*Pink*

*Brown*

### **Quantity of water**

This is particularly hard to assess without scientific measurements, and like many of the variables in this database, is dependent on the source providing sufficient information. Some features could be estimated from geographic information.

Maximum depth of water body: vertical depth in metres (converted from imperial if necessary) or perhaps just shallow/deep. While there are industrial and scientific definitions of these terms (for example in terms of wavelength), for the purposes of this study the depth is defined most usefully in relation to the adult human body, as this relates directly to the water use. Shallow water is defined as less than 1.5 m in depth (the average depth of a swimming pool) and deep is more than 1.5 m. On an adult person, 1.5 m might be waist or chest high.

Extent: in metres or equivalent. This describes the horizontal extent of the water body. A creek might be a couple of metres across, while a lake might be hundreds of metres. However, depending on how water is described in the literature, this may have to be estimated from the nature of the water body ie whether both sides are visible from the same vantage position.

Speed of flow: Still, slow, fast. The speed of flow is technically measured by how fast a fixed point in the water passes a fixed point in the bank, but it is unlikely that this measure will appear in the literature. Nonetheless, there may be comments about how fast a body of water is flowing that bear some relationship to the type of water and its use.

### **Activity or use related to the water body**

This might be economic or practical, ritual or ceremonial, recreational or experiential. Any activity which involves water in any way is included. The activity could be called the tangible aspect of a relationship with the water.

Season/time when use occurs

*Spring*

*Summer*

*Autumn*

*Winter*

*Wet*

*Dry*

*Low tide*

*High tide*

*Unspecified*

### **Association with past or ongoing practices and knowledge**

This might include songs, stories, ceremonies, travel, scheduling, beliefs, and memories - the intangible aspects of the water use.

*Gender*

*Men*

*Women*

*Neither*

*Both*

*Unspecified*

### **Status**

This category acknowledges that there is not necessarily a straightforward relationship between age and responsibility. Status might be about being young or old, or about being initiated or uninitiated, or having passed through different stages of initiation. Where this is specified, it may be related to restricted knowledge (see below).

*Uninitiated*

*Initiated*

*Young*

*Old*

*Unspecified*

### **Kinship associations of the water**

Most Aboriginal kinship systems are based on a structure of moieties and sections (4) or subsections (8) (also known as skins). The moieties and sections are associated with significant flora, fauna and environmental features, often called 'totems'. These type of kinship systems are networked in a seamless whole uniting human and non-human, and are key to underlying cosmologies and the connections of water. In some parts of Australia, kinship systems are virtually intact; but even in areas most heavily impacted by disease, massacres, and missionisation, it is not uncommon to find knowledge of at least parts of the former structure, often including the names of the sections.

### **Access/sharing**

Which other Indigenous groups have/had access to and use of the water? Under what conditions?

### **Cultural and economic resources dependent on the water**

European values of aquatic flora and fauna tend to be centred on their economic or recreational values. Indigenous people have equal investment in economic resources, but these are also intertwined in defining identity and relationships. Species which may have little significance for a European can be vital from an Indigenous perspective. For example, on the Coorong, pelicans are a Ngati or totem. Rigney (in Jackson 2006b: 29) notes that pelicans are moving to Lake Eyre to breed because of increasing salinity in the Coorong. Flora and fauna may not be exploited in an economic sense, but may be a defining feature of a moiety or skin group: hence they play a role in constituting identity. This may be a general class or a very specific thing; therefore this category has been left open for the time being.

Economic resources may include such things as: fish, yabby, turtle, lily, shellfish, reeds, birds, eggs, medicinal plants and many others.

**Specific places or areas of interest**

This refers to sites, places, locations, both past and present, that have some significance for relationships to water and country. Such places might be an island or islet, rock formation associated with a water body, rapids or waterfalls, the places of particular events or actions, or anything that defines the place or area as having a significance above the rest of the water body and its environs.

**Cultural value of water according to the categories outlined above**

There are a number of value schemes used to capture tangible and intangible aspects of the value ascribed to something, whether a place, an action or a belief. Values may be multiple and overlapping

*Economic:* this relates to the calorific value of a resource, or its use in subsistence.

*Ceremonial:* associated with ceremonial activities (including initiation rites)

*Mythological:* associations of the water with an extant mythic story figure (i.e. legend)

*Spiritual:* associated with cosmology and Creation stories which describe how the current landscape came to be formed

*Historical:* association with an event, phase or person, for example, with a foundational mythological event, a remembered event, a historical event such as a battle

*Social:* this is about the community or individual esteem placed on the water and may include meeting places

**Knowledge restrictions**

This may be based on gender, status or kinship.

**Comments**

Any other information worth noting.

**Full bibliographic reference**

The source of the information

## 20 Bibliography

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