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Meeting Indigenous peoples' objectives in environmental flow assessments: Case studies from an Australian multi-jurisdictional water sharing initiative

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SUMMARY

The multi-dimensional relationships that Indigenous peoples have with water are only recently gaining recognition in water policy and management activities. Although Australian water policy stipulates that the native title interests of Indigenous peoples and their social, cultural and spiritual objectives be included in water plans, improved rates of Indigenous access to water have been slow to eventuate, particularly in those regions where the water resource is fully developed or allocated. Experimentation in techniques and approaches to both identify and determine Indigenous water requirements will be needed if environmental assessment processes and water sharing plans are to explicitly account for Indigenous water values. Drawing on two multidisciplinary case studies conducted in Australia's Murray–Darling Basin, we engage Indigenous communities to (i) understand their values and explore the application of methods to derive water requirements to meet those values; (ii) assess the impact of alternative water planning scenarios designed to address over-allocation to irrigation; and (iii) define additional volumes of water and potential works needed to meet identified Indigenous requirements. We provide a framework where Indigenous values can be identified and certain water needs quantified and advance a methodology to integrate Indigenous social, cultural and environmental objectives into environmental flow assessments.

1. Introduction

Societal values and attitudes relating to water use and management have undergone substantial change over recent decades in response to environmental degradation from resource development, over-allocation, land use change and pollution. Governments and water agencies have become more receptive to calls for new models of knowledge generation to integrate decision making, address social complexity and enable wider democracy in environmental management (Pahl-Wostl et al., 2011; Norman and Bakker, 2009; Godden, 2005).

Changes in community attitudes to river and water management are reflected to a very large extent in Australia's current national program of water reform (Connell et al., 2005). The aim of national policy includes establishing clear pathways to return all surface and groundwater systems to environmentally sustainable levels of extraction. Signatory governments must take a 'whole-of system approach', agree to the level of modification appropriate for a given hydrological system and prioritise provision of water sufficient to stabilize environmental conditions and resource security (Connell and Grafton, 2008: 70). In those parts of Australia where rivers and wetlands have experienced severe ecological degradation from reduced inflows and extended drought, such as the Murray–Darling Basin (MDB), the policy response has been to reallocate water from agricultural uses to improve the health and resilience of its aquatic ecosystems, whilst seeking to balance environmental, economic and social considerations (MDBA, 2012a, 2010). Recovering water for the environment from agriculture is warranted in this region because over-allocation of water entitlements is estimated to be about 25% relative to total sustainable yield (National Water Commission, 2007).

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A legal mandate to allocate water to the environment is integral to the transformation in Australian water policy. It is driving the development of techniques to assess and determine environmental flows across scales and the emergence of an environmental water governance system with institutional arrangements to acquire and manage environmental water under a multi-billion dollar program. In the MDB, the Commonwealth government is purchasing consumptive water rights from willing sellers to reallocate to river environments (Foerster, 2012). When the purchasing program is complete, the Commonwealth Environmental Water Holder will hold more than one-quarter of all water entitlements in the MDB (Connell, 2011). Substantial sums are also being invested in irrigation infrastructure to achieve further water savings.

The National Water Initiative (NWI) represents a further significant shift in water policy because, for the first time in the nation's history, it seeks to incorporate Indigenous rights, interests and values in water management (Jackson et al., 2012). The NWI requires jurisdictions to take into account native title interests, to assess and include Indigenous customary, social and spiritual objectives in water plans, and to engage with Indigenous communities in their development.

Although the requirements of the NWI provide an impetus to improve Indigenous access to water and participation in water management, governments across Australia have only just begun to formally recognize Indigenous peoples' relationships with water for spiritual, cultural and economic purposes. Progress toward meeting Indigenous claims and expectations has been slow for a range of reasons (Tan and Jackson, 2013; Bark et al., 2012; NWC, 2011, 2014) and there is insufficient appreciation from wider society of the negative social and cultural impacts of aquatic ecosystem degradation on Indigenous communities (Behrendt and Thompson, 2004; Jackson, 2006; Weir, 2009; Weir et al., 2013).

The (third) biennial assessment of national progress on water reform found that where assessments of Indigenous values have been made, they usually involved cursory desktop reviews (NWC, 2011; see also NWC, 2014). Finn and Jackson (2011) also note the prevalence of an assumption that biophysical assessment of environmental flows can adequately serve as a surrogate for a targeted mechanism or assessment process to meet Indigenous social, cultural or spiritual requirements, perceived to obviate the need for more rigorous assessments.

The number of Indigenous consultative groups and processes pertaining to water management has grown considerably in recent years. Nonetheless, ecologists, hydrologists and water resource managers face an outstanding challenge to use 'those engagement processes to more explicitly account for Indigenous water values and requirements in water planning' (NWC, 2011: 44). Meeting this important challenge will require a strong evidence base and experimentation in techniques and approaches to the identification and determination of Indigenous water requirements, alongside reforms to planning practice and policy frameworks (see for example, Jackson et al., 2014; Jackson and Barber, 2013; Mooney and Tan, 2012; Bark et al., in press).

To improve Indigenous access to water and environmental water governance, managers and Indigenous organisations require information that will enable them to: (i) assess the full range of impacts of changes in water availability, and (ii) understand the benefits that Indigenous people might derive from improvements in environmental condition and participation in management institutions, as well as (iii) the benefits accruing to wider society from Indigenous management of natural resources such as water.

In Australia, the research need is arguably most acute in the MDB for two reasons. Firstly, the basin has experienced relatively severe ecological losses as a result of over-allocation of water and these pose a threat to Indigenous identity and well-being (Weir, 2009; Weir et al., 2013). Secondly, the imperative to achieve environmental sustainability across the basin is driving substantial reforms to water governance which have the potential to redress the historical exclusion of Indigenous interests, rights and values (Jackson, 2011). The multi-jurisdictional water sharing initiative (the Basin Plan), enacted to address over-allocation of water resources to irrigation and other consumptive uses, provides an impetus to integrate Indigenous objectives in environmental flow assessments and in environmental water management.

This paper describes the results from two multidisciplinary studies of Indigenous water values and benefits from re-allocating water to the environment in the state of New South Wales (see CSIRO, 2012; Maclean et al., 2012). The case studies focused on water dependent ecosystems that are of environmental and cultural significance to Indigenous land owners and are formally recognized by the wider Australian public for their heritage and conservation values. The paper contributes to two related areas of water policy that have been relatively neglected: assessing and accounting for social benefits from water (Syme et al., 2008) and, more specifically, including Indigenous or local knowledge and valuations in integrated environmental flow studies (Pahl-Wostl et al., 2013; King and Brown, 2010; King et al., 1999; Lokgariwar et al., 2014; Tipa and Nelson, 2012).

The paper addresses a broad need identified by Syme et al. (2008) for methodologies that generate social and cultural information in a manner that can be incorporated into a systems view of sustainability within a catchment context. It achieves this by advancing methodologies designed to integrate social and environmental objectives within environmental flow assessments (EFAs); thereby fulfilling a wider role for environmental flows in the context of sustainable water resource management (Matthews et al., 2014). It employs a collaborative approach to water resource assessment and describes methods that rely on Indigenous input to improve the scope, legitimacy and fairness of water allocation processes. At each case study site, we engaged Indigenous communities to (i) understand their values and explore the application of methods to derive water requirements to meet these values; (ii) assess the impact of alternative water planning scenarios on these values; and (iii) define additional volumes of water and potential works needed to meet identified Indigenous requirements. We provide a framework where Indigenous values can be identified and their water needs quantified.

The paper is organized as follows. First, we situate the Australian problem in the context of international developments in integrated assessments of environmental flows, particularly efforts to address the social aspects of water use and its availability for local Indigenous communities. We then provide an overview of Indigenous water-related interests and describe the planning framework that is driving and shaping river restoration in the MDB. In the methods section we introduce the case studies and their context and outline our approach to data collection and analysis. We then present and discuss findings from the assessment, outline remaining information needs and research questions, and provide suggestions for a more comprehensive approach for future application.

2. Integrating social factors into environmental flow assessments

Environmental flows are defined as the 'quantity, timing and quality of water flows required to sustain freshwater and estuarine ecosystems and the human livelihoods and well-being that depend on these ecosystems' (Brisbane Declaration, 2007). There is an extensive set of methodologies in use around the world to define water requirements of species and ecosystems, ranging from simple rule-based approaches, such as a fixed percentage of mean