

## Addressing Indigenous values in environmental water management

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**Extended abstract** (The complete version of this paper has recently been accepted by *Ecosystems* for publication).

Although environmental flow assessments and allocations have been practiced in Australia for nearly 20 years, to date they have not effectively incorporated indigenous values. In many cases, even though indigenous people rely substantially on aquatic resources, environmental flows have been assumed to be an acceptable surrogate for the protection of indigenous interests. This paper argues that the need to adapt flow assessments to account for linkages and dependencies between people and rivers is equally applicable to developed world indigenous contexts such as Australia as it is to developing countries where there has been some attempt to address indigenous or subsistence water requirements. Relying on insights gained through a study of indigenous water values in northern Australia recently completed, we outline the limitations of and challenges to current environmental flow determinations for their capacity to assess and protect indigenous instream values. We focus on the economic benefit derived from customary resource use, noting that under Australian law, the *Native Title Act (Cwth) 2004* guarantees native title holders unfettered customary rights in water. Given the large indigenous land holdings in northern Australia and increasing demand for water based economic activity, there are compelling reasons for testing and improving water planning and allocation decisions.

We propose three challenges to conventional environmental flow assessments that, if met, will improve the ability of water resource planning to address indigenous interests. The first challenge is to recognise that in an indigenous context a different suite of species may be considered important when compared to those valued by other stakeholders. While conservation status or rarity may be important, it is common and widespread species that make substantial contributions to indigenous

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household incomes through customary use. In the Daly River region of the Northern Territory, where water use is increasingly, species that had high conservation value due to their low abundances and restricted distributions were seen as the most important endpoints for environmental flow protection. The EFA did not investigate the flow or habitat requirements of other turtle species such as the Long-necked Turtle (*M. rugosa*), an abundant and most important turtle food source for many of the eleven indigenous language groups in the region. Likewise, Barramundi (*Lates calcarifer*) was regarded as a valuable fish species, favoured by the recreational fishing sector. Although Barramundi are harvested by indigenous people for food, no mention was made of fish species that our on-going research indicates makes up a larger percentage of indigenous catch, such as the Black Bream (*Hephaestus fuliginosus*) or the Fork-tailed Catfish (*Neoarius* spp.).

The second challenge is to accommodate a different set of management objectives in environmental flow allocation. Environmental flows will need to meet the requirement of hunting and fishing activities at rates that are socially and economically sustainable. Indigenous people in northern Australia usually harvest relatively common species from river systems as they have population sizes and spatial distributions that maximise catch rates whilst minimising effort. It is possible that river flows that maintain a biologically sustainable population of Pig-nosed Turtles in the Daly River for example, may not provide a sufficiently large population of Pig-nosed Turtles or, importantly, other harvest species from which to achieve a socially desirable and economically viable catch per unit effort. The concept of biological sustainability (i.e. of plant and animal populations) is predicated on the fact that a population will persist through time, rather than a population that it maintained at its highest possible carrying capacity or distribution. Ensuring continued access to wild resources and a carrying capacity that maintains rates of harvest is likely to be a high priority for indigenous people, and this objective will have a bearing on EFAs.

The third and arguably most theoretically challenging task is for environmental flow assessments to take into account indigenous worldviews and the quality of people-place relationships that are significant in indigenous cultures. Australian water management agencies have legislative responsibility for water resources and powers to influence river discharge (via water licensing and allocation), but little power to directly influence other land management practices or tenure conditions

such as access to cultural sites. Indigenous people have been critical of the separate treatment of land and water within natural resource management and the way in which social considerations, like access to country, are so readily divorced from environmental management. Aligning the worldviews to more appropriately manage river discharge and to set appropriate environmental flows will require management agencies to (1) be more willing to build qualitative assessments into their environmental flow assessments by scrutinising the qualities and features of the places that indigenous people use and value highly, and (2) be more supportive of indigenous land and water management practices.

While the intangible and subjective nature of some indigenous values has been seen as insurmountable barriers to their inclusion in EFA, we suggest otherwise. In our research, a range of site-specific qualities have been identified and many of these relate to amenity. At some fishing sites used by indigenous people on the Daly River, the qualities include: shade (for sitting quietly), the number of fish caught, whether it offers privacy (quiet and away from tourists and other outsiders), and whether the water is appropriate for drinking and bathing. It is possible to consider the range of features or qualities that affect values and begin to assess their flow requirements. Establishing potential links between flow regimes and water landscape qualities would provide a useful qualitative analysis and identify components of the flow regime that are a critical feature of socially valuable flows for the area.

We contend that water managers, scientists and planners can all play a part in designing research, management and monitoring programs in such a way that indigenous values are affirmed and sustained by those activities. For example, applying both indigenous and research-based knowledge to a contemporary management problem will affirm the importance of indigenous perspectives and epistemologies. It might also provide a forum through which tacit indigenous ecological knowledge and underpinning values and beliefs are passed on to younger generations. There is a risk that indigenous values may be adopted or incorporated as a relatively fixed set of propositions, whereas in reality such values will always be dynamic in nature. Environmental water management practices, including scientific assessments, should allow for the actualisation 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. Indigenous participation in long-term monitoring of environmental flow outcomes could provide such opportunities; allowing for articulation of both indigenous and non-indigenous values, direct indigenous participation in data collection and processes of exchange and learning across cultures in order to inform and adapt management actions.

Meeting these three challenges to environmental flow assessment will assist water management agencies and other practitioners to protect indigenous interests as water allocation decisions are made.

**Keywords:** Environmental flow, northern Australia, indigenous, water, values, native title, subsistence.