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Institute for Applied Ecology

Ecological Solutions for a Healthy Environment

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Inquiry into the impact of the Murray-Darling Basin Plan in Regional Australia

A submission from the Institute for Applied Ecology and NATSEM at the University of Canberra

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Who are we and why are we making a submission?

The Institute for Applied Ecology (IAE) is a research and teaching institute at the University of Canberra that contributes to the understanding and improved management of species, communities and ecosystems in Australia and internationally.

The National Centre for Social and Economic Modelling (NATSEM) is an affiliated research centre of the University of Canberra. It is one of Australia's leading economic and social policy research institutes, and is regarded as one of the world's foremost centres of excellence for microsimulation, economic modelling and policy evaluation.
Staff and associates from the IAE have worked extensively across the Murray Darling Basin and have made a significant contribution to the science that underpins the management of Australian river systems. We have been instrumental in developing methods to assess the condition of rivers, developing the methods used in most national river health/condition assessment programs. We have also taken a national lead in defining how water can be used to deliver environmental outcomes, working in partnership with agencies to achieve maximum benefit.

Our argument:

1. Rivers provide a broad range of ecological goods and services to rural and regional communities underwriting both agricultural productivity and quality of life. As such:
    a. It is imperative that the benefits arising from ecosystem goods and services are explicitly considered in the debate about the impact of the Murray-Darling Basin Plan
    b. Future planning for the Murray-Darling Basin must consider the relevance and value of ecosystem goods and services and manage for the protection and restoration of environmental assets.

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Ecological Goods and Services

Water is generally viewed as a resource to be used for human purposes, yet rivers and wetlands provide a range of functions that benefit individuals, communities and economies far beyond the provision of water. These functions are intrinsically linked to water dependent ecological processes and can be divided into four groups (adapted from Norris, 2011):

- Regulation functions: ecological processes that regulate nutrient levels, treat waste and balance population numbers, thus maintaining water quality and balancing biological communities
- Habitat functions: providing suitable living and breeding spaces for a diversity of plants and animals thus providing a diverse ecosystem structure that is resilient to the stress
- Production functions: providing natural resources that are sufficiently productive to be harvested (eg fish or plant materials)
- Information functions: ecological processes that provide the cultural, aesthetic, and recreational values that define our rural and regional areas.

These functions, termed 'ecological goods and services' are not captured in the market system that values water only for human consumption or agricultural production. Yet, without them, both the agricultural productivity and the rural and regional communities that rely on them are significantly impaired.

The 1991-2 blue-green algal bloom in the Darling River occurred over a distance of 1000 km, causing the New South Wales government to declare a state of emergency. The cost of the bloom to the Darling River community was immense, both directly (the cost of transporting drinking water supplies for both domestic and stock requirements) and indirectly (lost productivity and also reductions in visitor numbers). This bloom was, in part, caused by the inability of the riverine ecological processes to regulate nutrient concentrations. This is a clear example of the cost to communities when the rivers cannot provide ecological goods and services.

There are many approaches to placing an economic value on ecological goods and services. It is relatively easy to place dollar value on features such as the waste treatment functions provided by rivers and wetlands or the recreational value for a community. Placing a value on the social amenity (such as the aesthetic value) is more challenging and an area for current research. The IAE and NATSEM are working to develop models that can be used to better predict the economic and social consequences of water management scenarios.

The intrinsic value of ecological goods and services for agricultural production and community well-being has not received much attention in the debate about the impact of the Murray-Darling Basin Plan (MDBP) for rural and regional Australia. It is well recognised that water is a finite and limited resource and that

sharing that resource requires a compromise between desired social, economic and ecological outcomes. An important step in developing a compromise is that the full relevance and value of the ecological goods and services be defined. The protection and restoration of environmental assets is not simply a 'feel-good' activity, but essential in maintaining the productivity we expect from our agricultural sector as well as preserving the recreational, aesthetic and cultural values that are an integral part of rural and regional Australia. By defining and valuing ecological goods and services, it is possible to clearly identify the outcomes required from the provision of environmental water. It is only then, that the amount of water required to achieve the desired outcomes can be determined. This is at odds with the current approach to environmental watering that is controlled by economics and availability, neither of which include the value of the ecological goods and services.

Thus, we argue that it is imperative that any debate regarding the socio-economic effects of the MDBP explicitly consider the role of the ecological goods and services in contributing the social and economic well being of the basin.
We refer the inquiry to the following forthcoming publication for a more detailed exploration of these issues: Norris, Richard H. (2011). Environmental Water: The benefits of ecological goods and services. In *Basin Future: Water Reform in the Murray-Darling Basin*, eds. D. Connell and R.Q. Grafton. ANU EPress, Canberra.

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