



Steps the public sector has taken to value, protect and enhance water ecosystem services

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Key questions

- What tools can the public and private sectors use to protect and increase water ecosystem services?
- How have ecosystem services concepts been used in law or policy or decision-making dealing with water?
- In your experience, what successes and challenges have arisen?
- What existing or planned policies and projects examine links between *groundwater and ecosystem services*?
- Is there potential to extend existing projects that consider water ecosystem services, to groundwater?

Tools (one)

Identified in objectives of the (Cwlth) Water Act 2010:

protect, restore and provide for the ecological values and ecosystem services of the Basin

to promote the use and management of the Basin water resources in a way that optimises economic, social and environmental outcomes

to maximise the net economic returns to the Australian community from the use and management of the Basin water resources

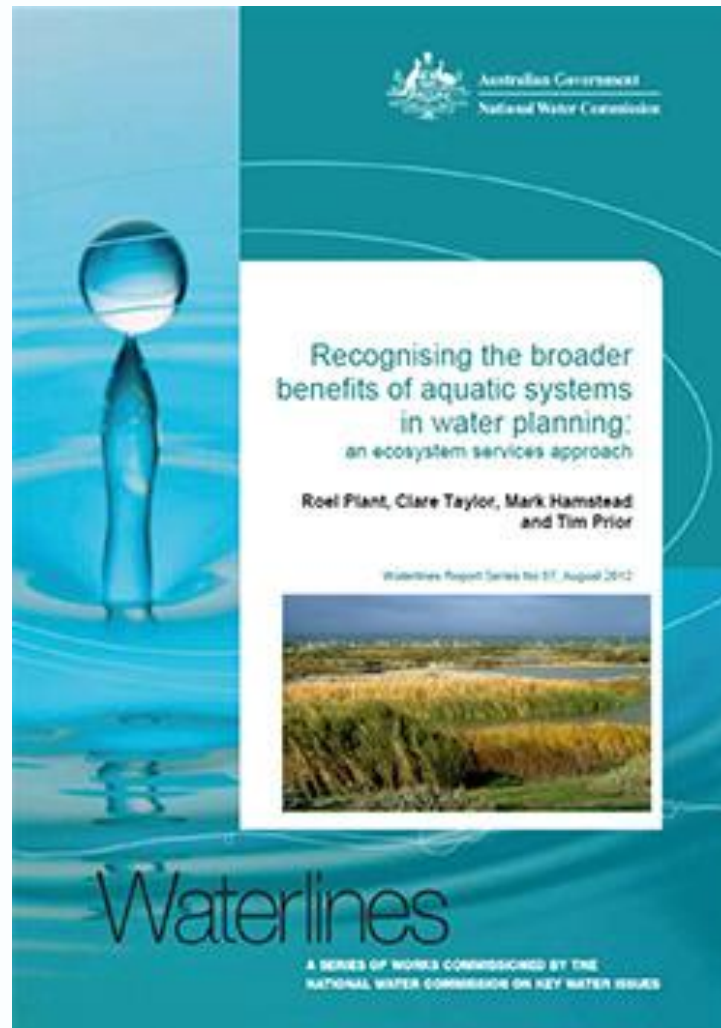
Use of ecosystem services

Major focus of Australian Government has been primarily on 'ecological values'

Some exceptions:

- Federal (National Water Commission, MDBA, Commonwealth Environmental Water Holder, Bureau of Meteorology and Australian Bureau of Statistics, Office of Northern Australia, AusAID)
- State – explored 'Market-based Instrument' projects
- Local – SEQ work; Goulburn CMA; SAMDB (Simomnw will talk more)

National Water Commission



Murray Darling Basin Authority

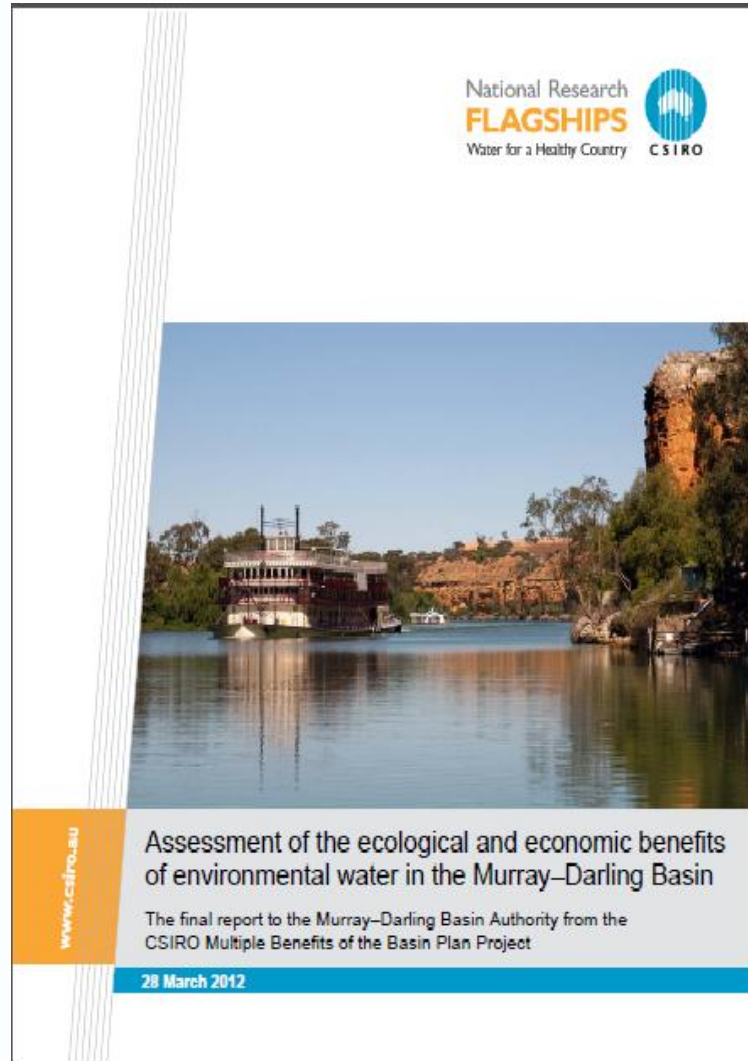




Fig. 1. Connections between management changes, river flows and inundation, modelled ecological responses, incremental change in ES and monetary valuation of incremental changes.

Table 1. Sources, valuation methodology and values of incremental ecosystem service benefits within the Murray-Darling Basin following implementation of the proposed Murray-Darling Basin plan (CSIRO 2012).

Ecosystem service	Source of benefit	Valuation method	A\$ million p.a.
Provisioning Services			
Fresh water quantity	Increased river flows; higher water level Lower Lakes	Benefit transfer: avoided cost	17.8
Fresh water quality	Increased river flows; reduced salinity; reduced risk of cyanobacterial blooms and blackwater events	Benefit transfer: avoided cost	10.3
Food (fishing)	Increased river flows; reduced salinity	Production cost	22.8
Regulating Services			
Carbon sequestration	Improved health and extent of river red gum and black box forest and woodland	Carbon market	697.0
Erosion prevention and maintenance of soil fertility	Higher river levels	Benefit transfer: avoided cost	23.7
Moderation of extreme events (flood control)	Storages better managed for multiple objectives	Benefit transfer: avoided cost	0.2
Cultural Services			
Aesthetic appreciation	Increased river flows and frequency of meeting environmental water requirements	Original study: hedonic property	337.0
Indigenous values	Increased river flows and frequency of meeting environmental water requirements	Qualitative assessment using detailed geo-referenced cultural site data	+
Tourism	Improved water quality	Benefit transfer: travel cost (avoided losses)	161.4 10.3-20.6
Habitat Services			
Native vegetation Native fish Colonial waterbird breeding	Increased flows to meet ecological targets for floodplain vegetation, breeding of waterbirds and native fish	Benefit transfer: choice modelling (Hatton MacDonald et al, 2011a) with updated ecological data	2,303.9 339.9 693.1
Coorong, Lower Lakes and Murray Mouth	Higher water levels in Lower Lakes; higher flows through Murray Mouth	Benefit transfer: choice modelling (Hatton MacDonald et al, 2011a) with updated ecological data	480.0/4,000.0/4,300.0*
*Values according to one of three scenarios			

Other Federal Agencies

1. Commonwealth Environmental Water Holder/Office
 - Nothing explicit – but interested in how water can be managed for multiple outcomes
2. Bureau of Meteorology and Australian Bureau of Statistics
 - SEEA
3. Office of Northern Australia
 - Investing in understanding ‘triple-bottom-line’ impacts of water resource development in Far North Queensland
4. AusAID
 - Investing in ‘water-food-energy nexus’ challenge for development

Some challenges (to overcome)

- Credibility of ecosystem service values
 - Defensibility of methods; needs change in paradigms
- Complexity
 - Multi-disciplinarity; scale (temporal, spatial); definitions and methodologies
- ‘Un-standardisation’
 - Models; valuation methods; indicators; definitions; typologies
- Risk aversion
- Understanding of biophysical processes