

water and environment

Emerging Practice in Active Environmental Water Management in Australia

Nick Schofield



RiverSymposium 2009

Outline

- > Australian environmental water context
- > Why study emerging environmental water practice?
- > Case studies analysed
- > General impressions from case studies
- > Some areas of emerging practice in specific case studies
- > Overall key messages
- > Acknowledgements

Australian EWM Context

- > 1991: Armadale Environmental Flows Conference
- > 1993: National River Health Program (incl. Environmental Flow Management Initiative)
- > 1994: The Strategic Water Reform Framework (COAG)
- > 1996: The National Principles for the Provision of Water for Ecosystems
- > 2004: The National Water Initiative
- > 2007: Water Act
- > 2007: Brisbane Declaration
- > 2008: Intergovernmental Agreement on the Murray-Darling Basin Reform (COAG)
- > 2009: MDBA – the Basin Plan

The Brisbane Declaration 2007

Environmental Flows are Essential for Freshwater Ecosystem Health and Human Well-Being

- > Freshwater ecosystems are the foundation of our social, cultural, and economic well-being
- > Freshwater ecosystems are seriously impaired and continue to degrade at alarming rates
- > Water flowing to the sea is *not wasted*
- > Flow alteration imperils freshwater and estuarine ecosystems
- > *Environmental flow management provides the water flows needed to sustain freshwater and estuarine ecosystems in coexistence with agriculture, industry, and cities*
- > Climate change intensifies the urgency
- > Progress has been made, but much more attention is needed

Global Action Agenda

- > Estimate environmental flow needs everywhere immediately
- > Integrate environmental flow management into every aspect of land and water management
- > Establish institutional frameworks
- > Integrate water *quality management*
- > Actively engage all stakeholders
- > Implement and enforce environmental flow standards
- > Identify and conserve a global network of free-flowing rivers
- > Build capacity
- > Learn by doing

Emerging EWM Practice in Australia: why study it?

- > EWM is a young profession
- > Little operational experience to draw on
- > Environmental water is under severe pressure in many parts of Australia
- > The voice of on-ground practitioners rarely heard
- > NWI has aspirations of 'empowered, accountable and well resourced environmental water managers who have access to best available science and participate in water markets'

Practitioner's workshop

- > eWater/NWC convened a workshop for on-ground EW practitioners.
- > SKM invited to review 8 case studies as input to the workshop

Focal Questions

- > How are environmental water allocations prioritised in face of the continuing drought?
- > What are the knowledge, data and tools that practitioners use in their work?
- > Where are improvements to be found?
- > How can practitioners learn from each other?

Emerging Practice in Australia: Case studies analysed

- > The Living Murray Icon Sites
- > Murray Valley wetlands, NSW
- > Wimmera-Glenelg Rivers, Victoria
- > Mersey River, Tasmania
- > Gnangara Mound, Western Australia
- > Fitzroy River, Queensland
- > Macquarie Marshes, NSW
- > Cotter River ACT

General impressions

- > Condition of many sites 'shocking'
- > Water 'scarcity' is the critical driver of future viability
- > The drought is new territory for management – no precedents or paradigms > responses are empirical, experimental & adaptive
- > Environment is suffering disproportionately
- > Plans (and the water sharing agreements they encapsulate) underpin effective management and outcomes
- > Each site is a highly complex socio-ecological system with substantial knowledge needs
- > Case studies offer voluminous information but generally it has not been synthesised for learning

The Living Murray Icon sites



- > TLM = 2000 km² wetlands (Ramsar sites) + Murray River channel (6 icon sites)
- > 2004 IGA allocated \$500m to recovering 500GL/y as First Step
- > Worst drought on record – ongoing since 1996 – devastating ecosystems
- > Water recovery = water efficiency + water buy-backs
- > Movement away from just icon sites to a regional life support system
- > ‘blueprints’ seen as a massive experiment in delivering TLM water

Mersey River, Tasmania



- > Hydro development dewateres Mersey below Parangana dam
- > Minimum flows installed in 1999 (+ mini-hydro)
- > Longest EF scientific monitoring program in Australia
- > Picked up initial health improvements + climate signal in biota
- > Community driven

Wimmera-Glenelg



- > Lower Wimmera River one of the most regulated in Australia with 85-90% irrigation diversions
- > Complex water quality behaviour > rainbow colour events > hypersaline pools
- > Triage approach focuses on preserving 'well' components
- > 2600 ML targeted release in 2007
- > Water recovery by piping channels
- > In future environmental water reserve allocation to be based on Bayesian ERA model

Gnangara Mound



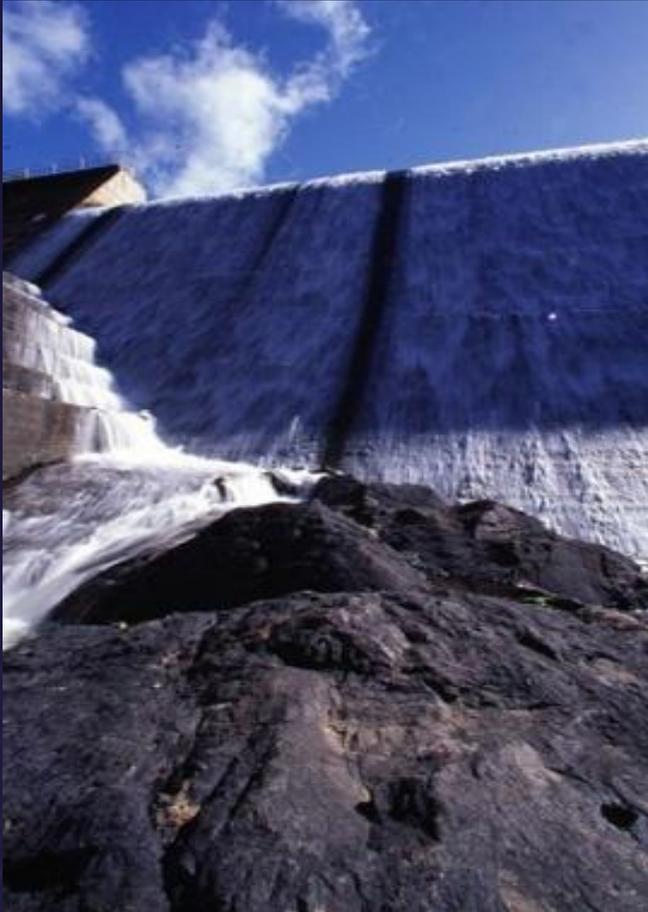
- > GM supports large no. & types of GDEs and is an important water source for SWWA
- > Most comprehensive GDE management in Australia
- > Risk mapping based on spatial mapping allows local decision-making
- > Land use actively managed under GSS
- > Climate change altering the 'goal-posts'

Macquarie Marshes



- > Listed as Ramsar site in 1986 – 200,000 ha terminal wetland
- > Longest EF history in Australia – 50 GL recommended in 1957, first used 1980, now ~190 GL
- > Catastrophic decline since 2001
- > Flexible decision making processes allow real-time management
- > Need high security environmental water
- > In these drier times focus is on maintaining habitat rather than extending breeding events.

Cotter River, ACT



- > Water supply for Canberra – system augmentation includes raising dam wall
- > Environmental flow requirements set using the ‘holistic method’ (flow regime) + temperature below dam
- > In current drought EFs are reduced in line with urban water restrictions
- > Proposal to ‘pipe-in’ some EFs
- > Comprehensive biological monitoring and ‘control’ catchment
- > Intensively monitored and adaptive responses

Murray Valley Wetlands



- > Community based watering of private wetlands with government & private delivery infrastructure
- > 2 GL/y high security and 30 GL/y adaptive water entitlement
- > 201 wetlands covering 65000 ha watered by 82 GL from 2000-6
- > Long-dry wetlands responded rapidly showing resilience
- > EWA can be traded
- > 'seeing is believing and doing more' – positive adaptive feedback loop

Fitzroy River, Queensland



- > Large episodic river system discharging to GBR
- > Surface water not over-allocated – high economic growth plan
- > EFs are delivered through a rules-based approach using the ‘benchmarking methodology’
- > Rules apply to operation of major infrastructure and include seasonal base flows and first post-winter flow
- > Water quality more of an issue than water scarcity - big interaction with land & catchment management

Key messages

- > Environmental water management is a practice in its infancy
- > Environmental water managers comprise a cohort of committed, skilled and knowledgeable people
- > Practitioners have to use their own initiative and enterprise to achieve environmental outcomes with very limited water - they develop their own:
 - delivery practices
 - decision-making strategies
 - risk assessments
 - monitoring tactics

Key messages (continued)

- > In the drought-affected areas, environmental watering has been akin to 'life support systems' rather than restoring long term ecological health
- > Environmental water managers feel the social and economic trade-offs of environmental watering in their regions
- > There is no overall agreed method for EWM
- > There is no manual for EWM
- > The only training is 'on-the-job'
- > There is limited data or research on how to deal with extreme water scarcity or stress on local environments

Key Messages (continued)

Practitioners need:

- > Best practice operational guidelines
- > Administrative procedures that allow real-time action
- > Co-ordination between agencies working to achieve environmental outcomes
- > More sharing of experiences and knowledge
- > Timely data and research for decision-making
- > Development and training in IWRM

ACKNOWLEDGEMENTS

Funding from eWater CRC & NWC

- > Trish Alexander
- > Gary Burgess
- > Hugh Christie
- > Rob Donohue
- > Scott Hardie
- > Ross Knee
- > Debbie Love
- > Bronwyn Ray
- > Jim Thomson
- Chris Bobbi
- Ian Burns
- Ed Donohue
- Greg Fletcher
- Gary Jones
- Jo Kneebone
- Julie Pilon
- Martin Read
- Kirilly Dickson

<http://www.ewatercrc.com.au/reports/ACT%20focus%20catchment%20jun09-1.pdf>

