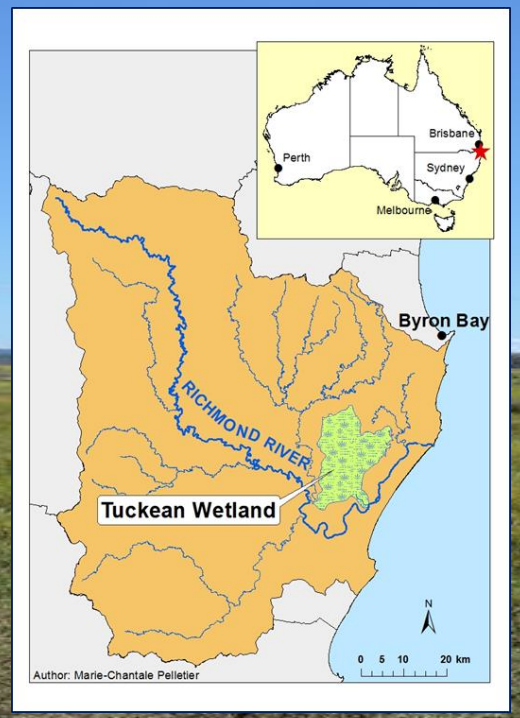
Ecosystem Based Approaches and IWRM:

Demonstrating operational linkages with a wetland buyback scheme



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Key messages

- 21st century water management must recognise, value and incorporate natural and human capital assets
- Climate uncertainty means engineering solutions have become unreliable, so incorporating these with ecosystem based components builds financial and ecological resilience
- Recognising the value of natural assets more explicitly in landuse planning, results in both greater ecosystem health and stronger social wellbeing
- Schemes which recognise the need for value transfer from ecosystem service beneficiaries are likely to lead to more sustainable outcomes
- Ecosystem based approaches inevitably require negotiations with multiple jurisdictions, at multiple scales
- Efforts towards more effective integrated economic and environmental accounting must be enhanced if ecosystem based approaches are to be selected by decision-makers

build natural capital more explicitly into macroeconomic planning

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The Tuckean Wetland - background

- The Tuckean wetland makes up 8,500 ha of the 7,000 Km^2 catchment of the Richmond River, east coast Australia. It is an estuarine wetland of national significance, home to 42 native flora and fauna, and 3 migratory endangered species.
- Due to poor land management and agricultural legacy issues, this wetland is a major driver of deoxygenation in the lower catchment.
- Major fish kill events regularly occur, leading to loss of estuarine food webs and closure of estuaries to recreational and commercial fisheries.
- The area also has important cultural values embodied in Aboriginal cave painting and early European colonial settlement in Australia, contributing to potential tourism values.

Natural, social and economic capital not currently used to the full

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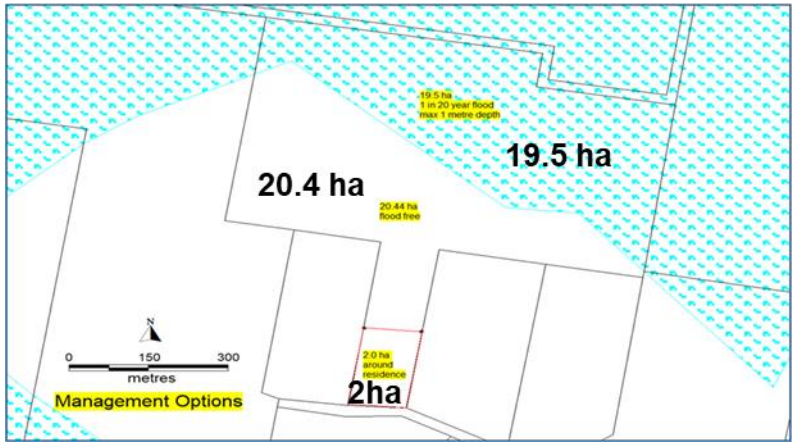
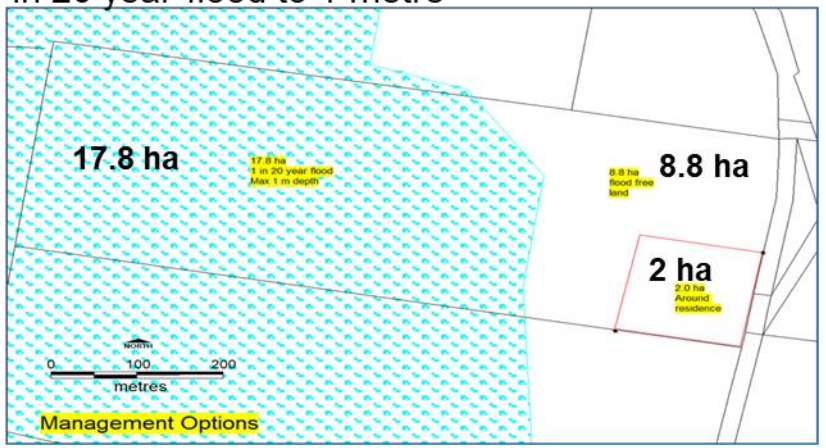
The Tuckean Wetland: 3 options for future development

- **Status Quo:** Ageing population of landholders retain current holdings and increasingly ineffective land management continues to drive river degradation
- **Revolutionary:** Compulsory buy back of all land in the wetland area – politically unacceptable
- **Evolutionary:** Compromise solution – landholders persuaded to sell flood-prone land and retain homesteads with smallholdings. This removes the risk of soil and water degradation, and retains the social capital of the local community

Blue areas shows land flooded in 1 in 20 year flood to 1 metre





Using a choice experiment: Valuation of the Tuckean

A series of choice sets like this are provided to respondents, in addition to other questions about their household expenditure, income etc.

Features	Option A Maintain Current Situation	Option B	Option C
Facilities at the site 	No facilities available	Toilets, parking, picnic area, bird hides	Parking only
Improving native vegetation 	No additional planting	Plant additional 200 hectares	Plant additional 500 hectares
Walking tracks 	No walking tracks	6 km of walking tracks	4 km of walking tracks
Water quality 	Very poor	High	Poor
Household cost *One-off payment*	$0	$40	$60
In a referendum, I would vote for this option:	Option A [X]	Option B [ ]	Option C [ ]

In this example, the respondent has chosen option A. This process is repeated 6 times so that the data collected can be analysed statistically to identify the unbiased value that the respondents hold for the environmental attribute in question

for the people of NSW, the value of restoring the wetland functions to achieve improved water quality, comes to Au$51.5million (€ 32.5m).

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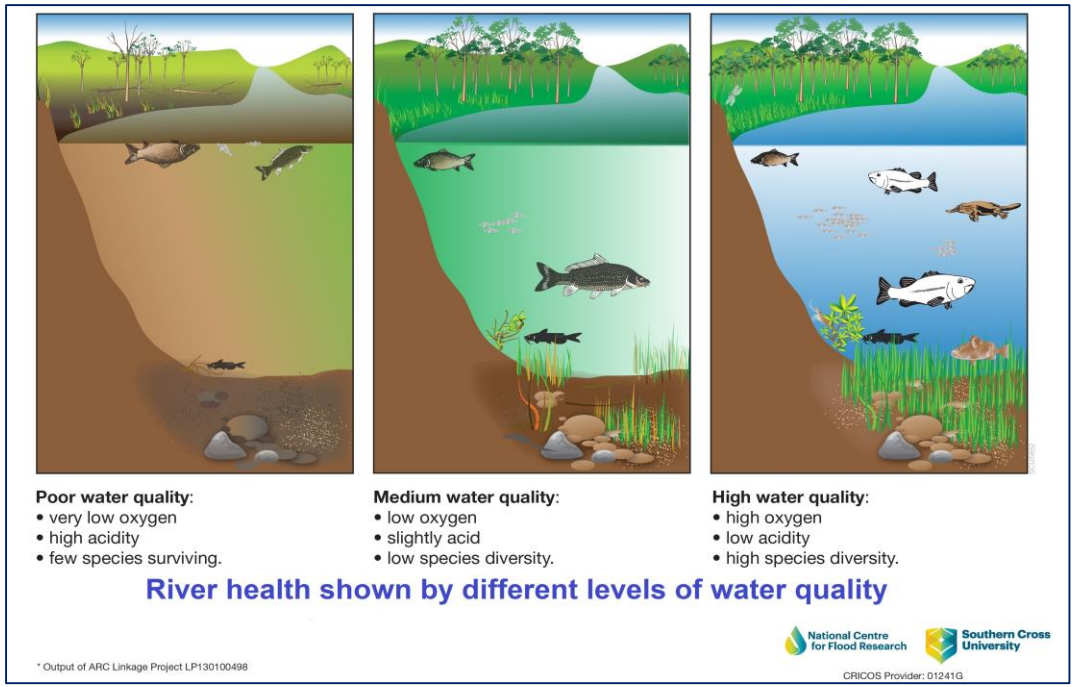
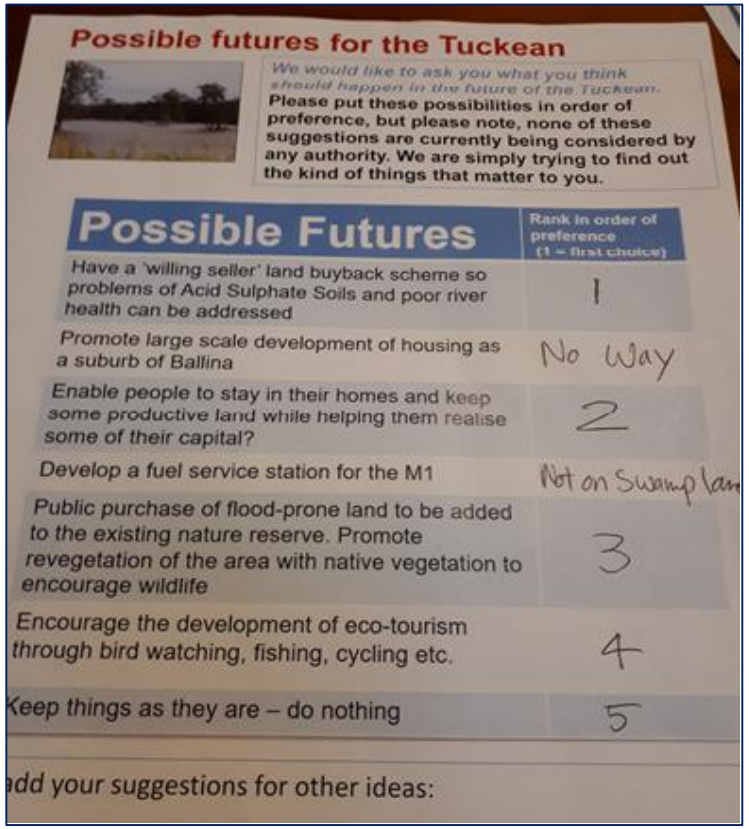
Essential stakeholder consultation

- In any attempt to change the way land is managed, consultation with the landholders is essential, so local landholders were invited to a drop-in public information session
- Information was provided on past conditions in the Tuckean, and on different levels of water quality
- Suggested future options were presented for consideration and discussed with individuals and groups

LANDHOLDER PREFERENCES	
1	public purchase of flood prone land added to existing nature reserve
2	willing seller land buyback
3	enable people to stay in homes while selling some land





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Building the evolutionary case: an ecosystem-based approach for the Tuckean

1. Assess of the cost of land values involved in the public purchase of redundant and flood prone farmland
2. Assess public value of the Tuckean wetland for NSW residents
3. Consult with local landholders on development options and potential futures
4. Compare options within a cost-benefit framework
5. Evaluate flexibility of local governments to permit changes in land use options
6. Establish institutional mechanisms needed to oversee a new management structure
7. Present to state and federal policy makers to gain funding for the land buy-back.

Au$ with 7% discount rate	**Low Restoration**	**High Restoration**	**High Restoration and high Recreation**
NPV costs	- 28,044,739	- 47,552,544	- 54,614,694
NPV (non-use)	51,482,382	90,094,168	92,159,819
NPV (recreation)	547,371	711,657	5,393,179
NPV (benefits)	52,029,753	90,805,825	97,552,998
BCR	1.9	1.9	1.8
NPV (project)	23,985,014	43,253,281	42,938,304

Low restoration	Buyback 2,434 ha flood prone land; **replant 170 ha** as a 50m strip around the edge of wetland, improving **water quality to "medium"**; construct **4 km of walking tracks**.
High restoration	Buyback 2,434 ha flood prone land; **replant 500ha** of native vegetation around the wetland, improving **water quality to "high"**; construct **12 km of walking tracks.**
High restoration-high recreation	Buyback 2,434 ha flood prone land; **replant 500ha** of native vegetation around the wetland, improving **water quality to "high"**; construct **20 km of walking tracks**.Provide **additional visitor infrastructure** (car park, toilets, sheltered picnic tables, BBQ).

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Operational steps delivering an ecosystem based approach, supporting IWRM and downstream beneficiaries

ACTIONS:

- Increase public ownership of wetland areas
- Reduce marginal agriculture
- De-engineer the floodplain
- Legislate riparian buffer zones
- Reinstate riparian/flood zone vegetation
- Build biodiversity corridors
- Build institutional cooperation

OUTCOMES:

- Increased ecosystem functionality and improved river health
- Reduction in fish kills
- More resilient communities
- Increased tourism potential
- Wetland preserved for future generations

Garima gala nyabay. Gala nyabay garima ngali ngih. (traditional Wijubal saying)

Look after the water.... The water looks after us

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