



# Valuing the Ecosystem Services of the South Australian Murray-Darling Basin

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# Context

- Guide to the Proposed MDB Plan

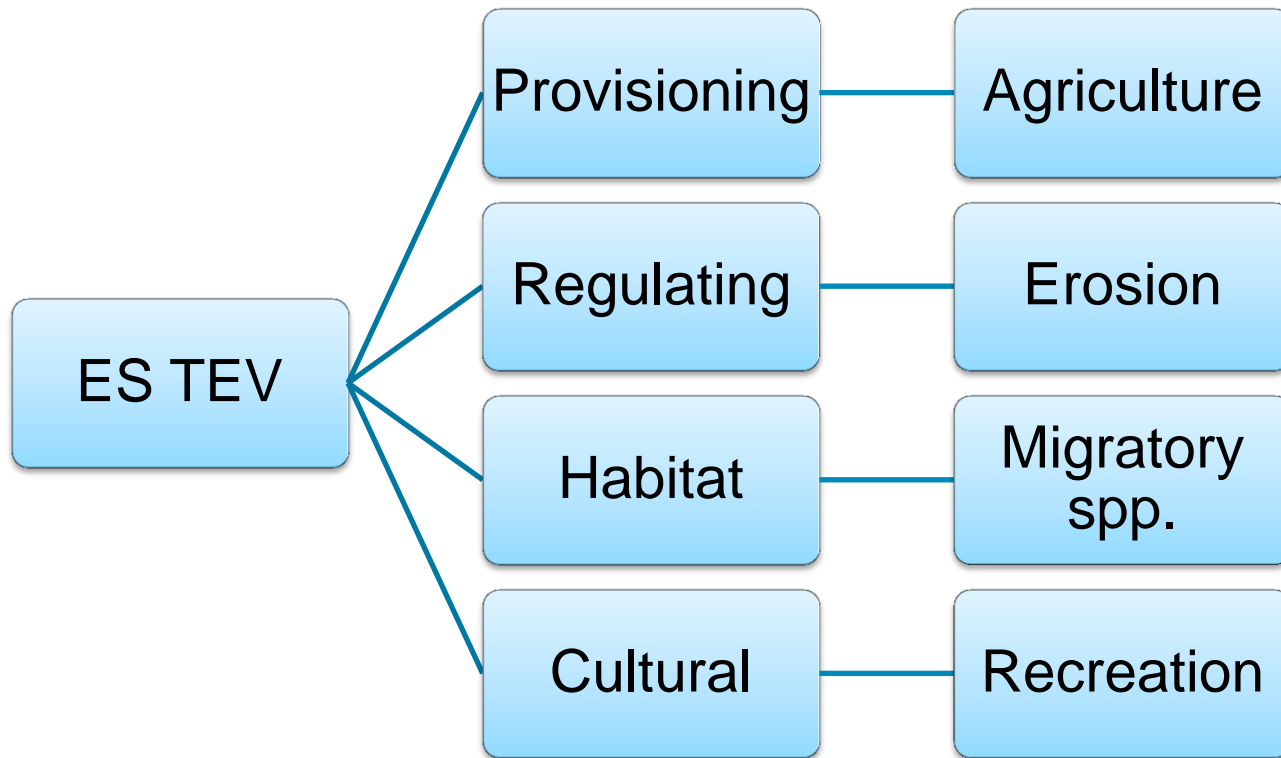


- Water Act, 2007

- Section 3d(ii): “to protect, restore and provide for the ecological values and ecosystem services of the Murray-Darling Basin...”

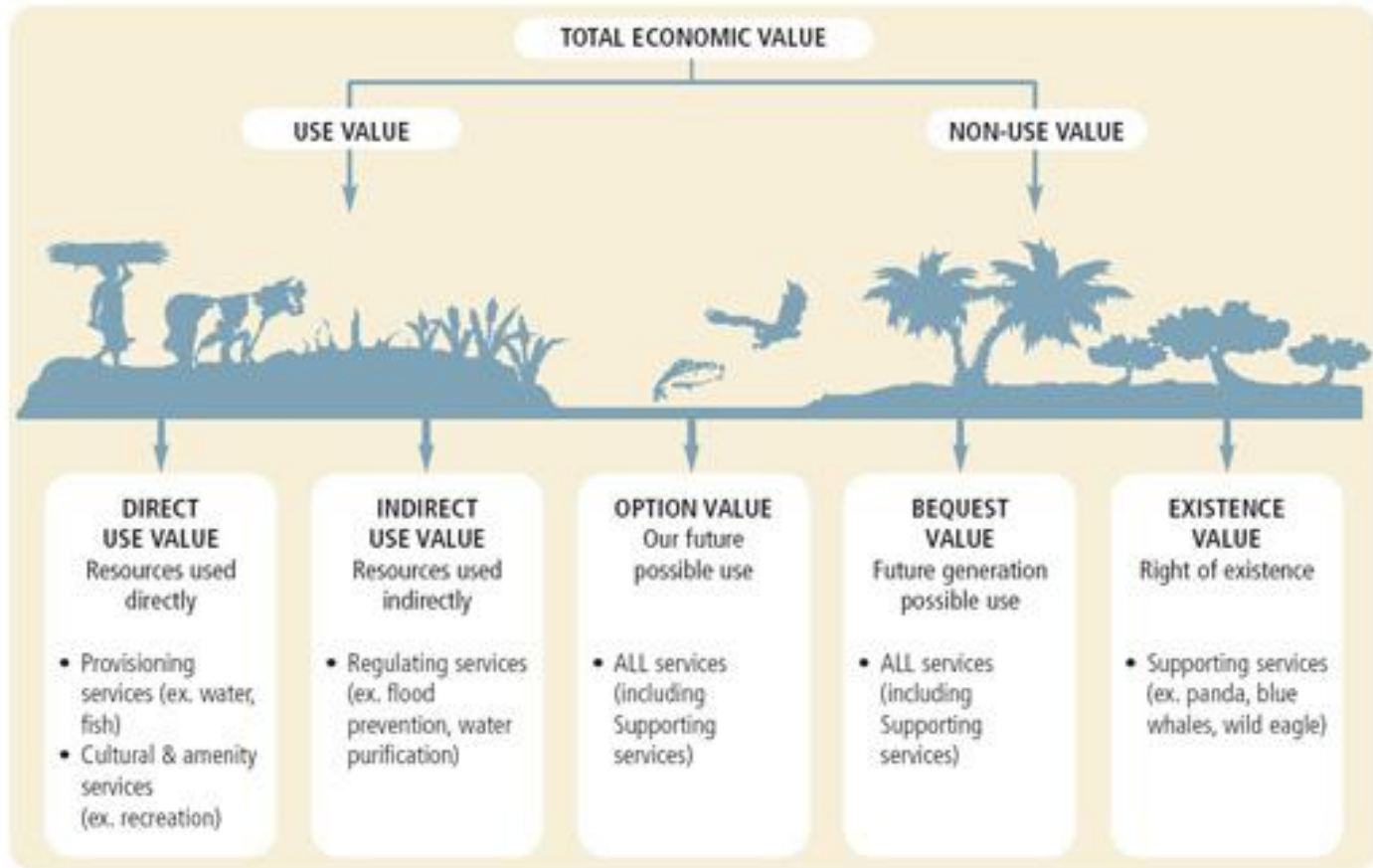


# Ecosystem Service Framework



Following Costanza et al. (1997); De Groot et al (2002); MA (2005); Daily et al. (2009); Kumar (2010).

# Total Economic Value



Source: FAO 2010.

# Ecosystem Service Valuation Methods

- Direct Market Methods

- Market price:



- Cost-based:

- Avoided
- Replacement
- Mitigation
- Damage



- Production function:  $Q = A \cdot L^{\alpha} \cdot K^{\beta} \cdot EV$

# Revealed Preferences

- Indirect Market Methods (Revealed Preferences)

- Travel Cost:



- Hedonic Pricing:



# Stated Preferences

- Stated Preferences
- Contingent Valuation
- Choice Modelling

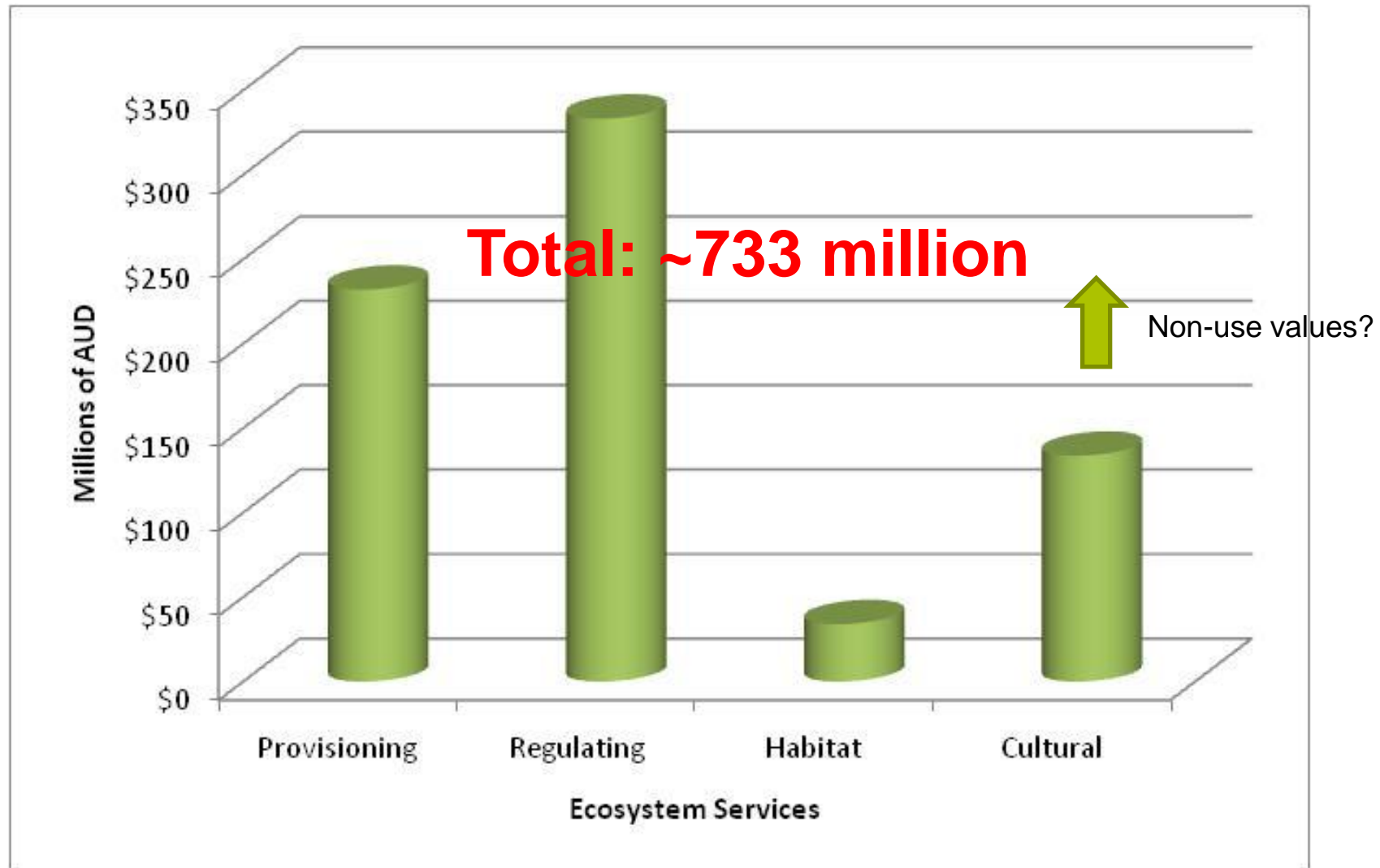


Management Implications	Option 1*	Option 2	Option 3
<b>Loss of unique ecosystems</b> (000s of hectares)	none	70	250
<b>Direct employment in region</b> (currently 36,000 jobs)	Decrease by 3 percent	Increase by 1 percent	Increase by 12 percent
<b>Hectares of Native healthy vegetation</b> (currently 42 million)	Decrease by 8 percent	Decrease by 13 percent	Decrease by 7 percent
<b>Annual levy on your income tax (\$)</b> (per household to fund initiative scheme)	none	25	75
<b>Number of endangered species lost</b>	none	20	120
<b>Increase in regional income in 2006</b> (\$ million / per annum)	40	30	25
<i>Please indicate your preference (check only one option)</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

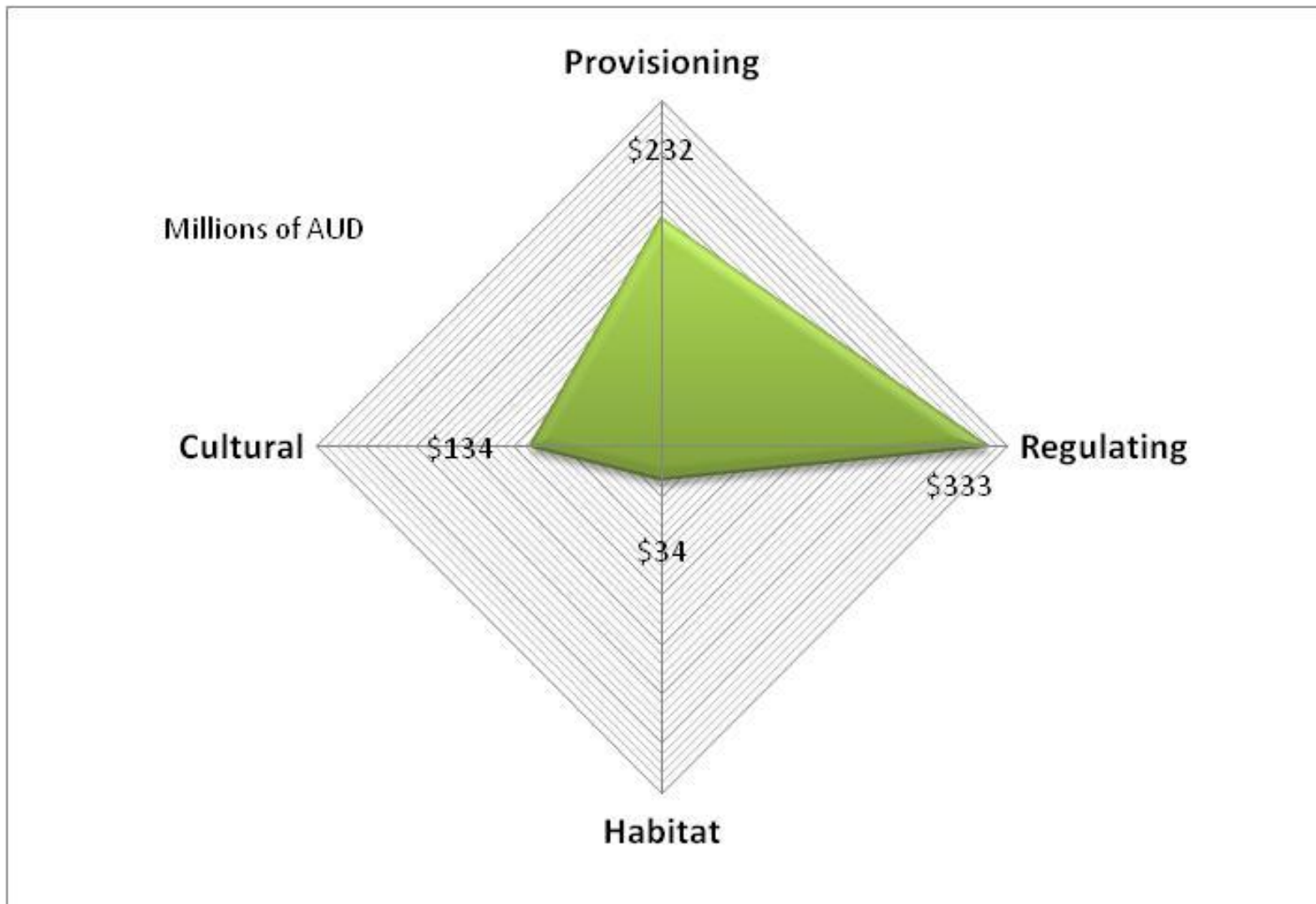
(\* current forest management regime)

# Cost-Based Results

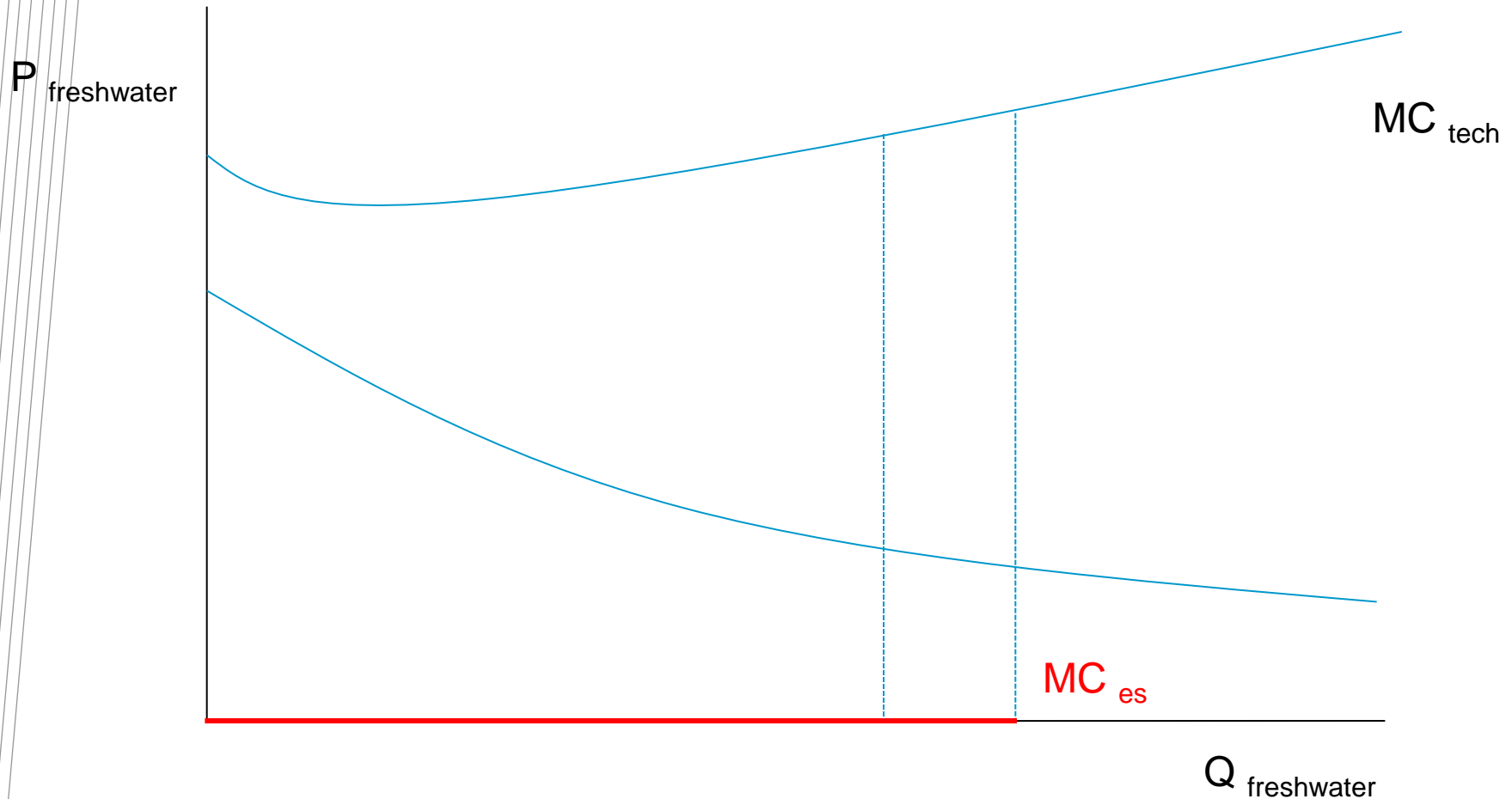
# River Flow Related Ecosystem Service Values of the South Australian Murray-Darling Basin



# Regulating and Provisioning Services- the first to be affected



# Challenges with Cost-Based Assessment- greater costs than benefits?



Following Barbier, 2007.

# Stated Preferences

## Morrison and Hatton MacDonald (2010)

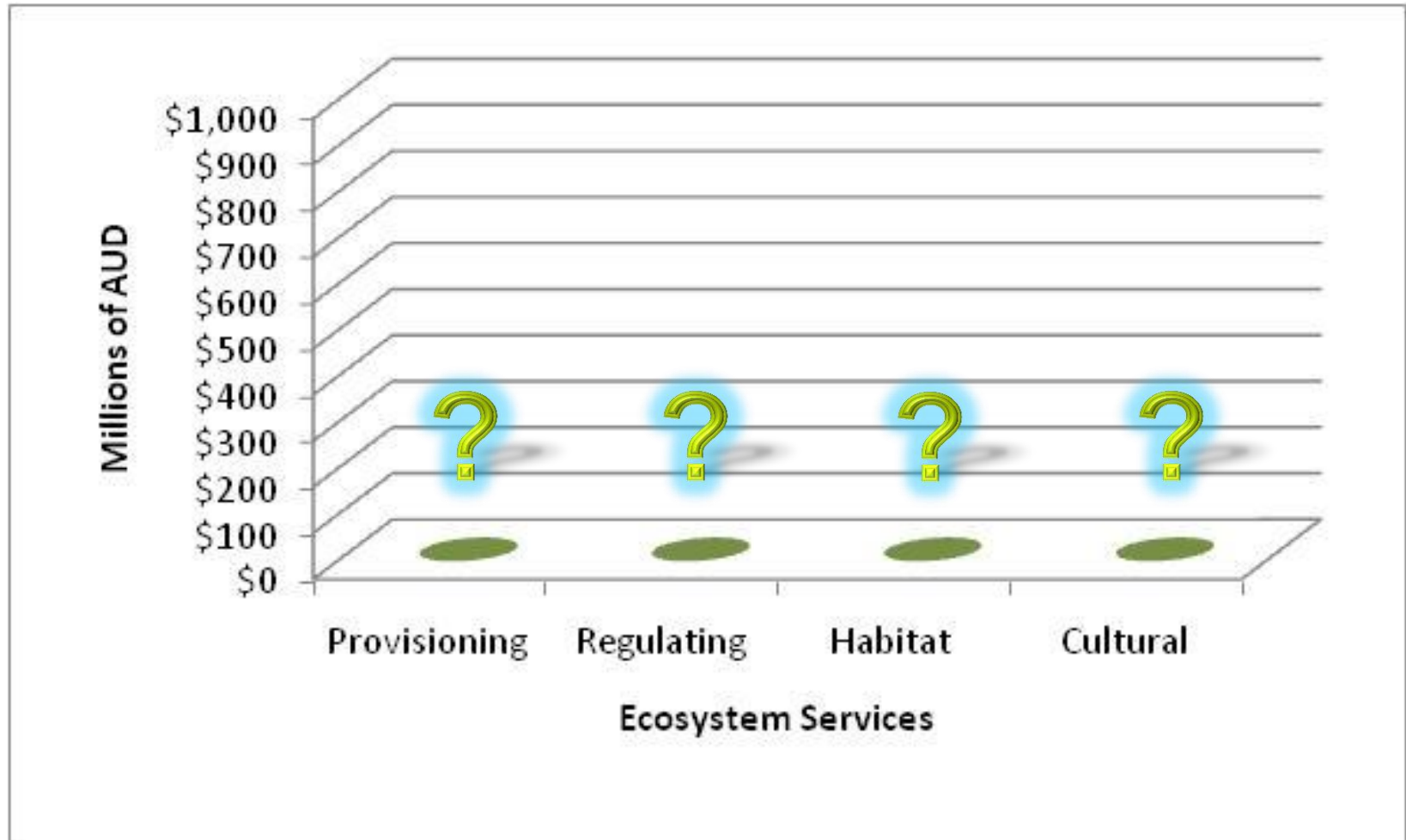
# Stated Preference-Based Assessment

## Aggregate Values (millions of AUD) for Murray Region

1% Increase in Native Vegetation	79
1% Increase in Native Fish Populations	74
1 Year Increase in Colonial Waterbird Breeding	375
Unit Increase in Number of Waterbirds and Other Species	12
Improving the Coorong from Poor to Good	4300
Total	4840
Without Coorong	540

Source: Morrison and Hatton MacDonald, 2010

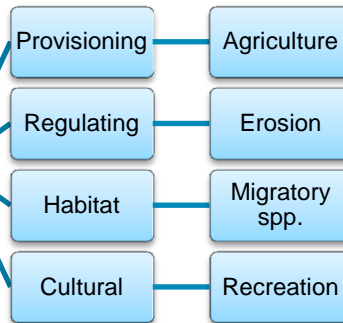
# Challenges with Stated Preference-Based Assessment



# A Proposition: An Integrated Approach



ES TEV



Management Implications	Option 1*	Option 2	Option 3
Loss of unique ecosystems (000s of hectares)	none	70	250
Direct employment in region (currently 26,000 jobs)	Decrease by 3 percent	Increase by 4 percent	Increase by 12 percent
Hectares of Native healthy vegetation (currently 42 million)	Decrease by 8 percent	Decrease by 13 percent	Decrease by 7 percent
Annual levy on your income tax (\$) (per household to fund initiative scheme)	none	25	75
Number of endangered species lost	none	20	120
Increase in regional income in 2006 (\$ million / per annum)	40	30	25
Please indicate your preference (check only one option)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

(\* current forest management regime)

## Ecosystem Sciences

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# Thank you

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# References

FAO. 2010. Payments for Environmental Services from Agricultural Landscapes. What are Ecosystem Services. Retrieved February 7, 2011 from:  
<http://www.fao.org/es/esa/pesal/aboutPES3.html>