Project Assessment Report

Project title

Burnett-Mary Water Quality Improvement Plan - baseline INFFER assessment.

Project summary

Project goal(s)

End-of-system load targets for the major pollutants addressed in Reef Plan 2009 were set for the entire Great Barrier Reef in Reef Plan 2009. A new set of targets were set for Reef Plan 2013. These targets were not set on the basis of ecological realities for the Great Barrier Reef (GBR) although attempts to design targets of this type have been made. (Brodie and Lewis 2014).
More recently, draft Ecologically Relevant Targets (ERTs)have been developed for a similar range of constituents to those for Reef Plan Targets (RPTs), but with a longer time horizon (2030), and generally with larger required reductions in anthropogenic loads. In contrast to RPTs, the development of ERTs acknowledges the lag time between reducing pollutant loads and a subsequent ecological response from significant assets affected by water quality. (Brodie and Lewis 2014)

The Ecologically Relevant Targets that have been considered as the goal for this project are:

By 2030 to meet Ecologically Relevant Targets on a whole of catchment basis based on reductions in anthropogenic loads from the 2008-09 baseline.

- Total Suspend Sediment = 20% but 50% of 4um (fine) fraction
- Particulate Phosphorus and Nitrogen = 50%
- Dissolved Inorganic Nitrogen = 80%
- Dissolved Inorganic Phosphorus = 50% **[Note that while a 50% DIP target has been set modelling results have revealed this to be infeasible and a revised value of 20% has been used - This requires further discussion as to the ecological importance of DIP]**
- PSII Herbicides = 60%

Reference: Brodie, J. and Lewis S. 2014. Ecologically relevant targets for pollutant discharge from the drainage basins of the Burnett Mary Region, Great Barrier Reef. Draft Report, May 2014. Report by TropWater for the Burnett Mary Regional Group.

More recent revisions to the ERTs (Jon Brodie pers.comm) suggest the following alternative which will be evaluated against the base case ERT outlined above. This alternative maintains the targets above, apart from DIN, which is reset to a 50% reduction, rather than an 80% reduction.

Project developers

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Date

11 Aug 2014 08:00 AM

Project duration

5 years

Project costs

$91.65 million (total)

Maintenance cost

$16.9 million/year (after this project ends)

Present value of total costs

$272.48 million

Benefit: Cost Ratio

0.3

This project is highly unlikely to be a good investment. The estimated value of the benefits from the project is small relative to the costs.

Time lag

10 years

Risk factors

(i) Practice change by private land/water managers.

Predicted shortfall in adoption of required works to acheive the goals of the project (as a proportion).

0.5

(ii) Socio-political risks. Probability of project failure due to non-cooperation by other organisations, or due to socio-economic, administrative or political constraints.

0.38

(iii) Technical feasibility. Probability that specified works and actions would not deliver specified outcomes.

0.13

(iv) Long-term funding. Probability that required long-term funding is not available.

0.5

Positive spin-offs identified

Improved water quality will have positive spin offs for freshwater ecosystems (rivers, creeks and wetlands in particular).Improved ground cover in grazing systems is likely to have soil health benefits (and soil carbon). Improvements in seagrass condition and extent will lead to an increase in fisheries productivity and blue carbon sequestration.

Negative spin-offs identified

Large increases in the area of cane under 'A' practice in cane in order to meet the targets is likely to result in a reduction in productivity and may have flow on impacts to the profitability of mills and the regional economy. Increases in the area of grazing under 'A' practise in order to meet the targets is ....

Quality of Information

Section 1: Threats - Medium

Section 2: Technical effectiveness - Medium

Section 3: Practice change, socio-economic risks - Medium

Knowledge gaps

Section 1: Threats

- There is limited information on the current distribution of sea-grass meadows of all habitat types and the condition of some habitat types within the Burnett Mary region.
- There is very little information on the long term trends and condition of inshore coral reefs.
- There is little information on population trends for some cetacean species.
- Sediment generation processes in the Mary River and the relative contribution of streambank erosion in other systems (eg Burnett River)
- Role of point source contributions in Hervey Bay and other urban areas.
- Impact of other drivers on seagrass condition (ie. desiccation, damage from boats and fishing, wind driven re-suspension)

Section 2: Technical effectiveness

Ecologically relevant targets

- Synergistic effects between pollutants and asset responses
- Time lags
- Interactions with other threats, especially climate change and cyclones/extreme storm events

Limitations of modelling

- Loads estimates - uncertainties around the data has been used.
- Uncertainty about the areas used for cane and what the fallow land is used for.
- No data for urban and horticultural landuse practices
- Knowledge of urban and horticultural landuses

A considerable body of knowledge exists relating to the generation of nutrients and pesticides on

agricultural land at a fine scale. There has also been a considerable amount of modelling of the generation and transport of sediments and nutrients at landscape scales. A key gap in our understanding is how best to link finer-scale understanding with the catchment-scale modelling that has been undertaken.
Addressing such a knowledge gap will be important in order to confirm the nutrient and pesticide reduction efficiency expected with the implementation of BMPs on agricultural land.

Section 3: Practice change, socio-economic risks

- Economic analysis has not been completed for a horticulture - (small row crops and tree crops).
- The economic analysis for cane and grazing has been peer reviewed.

Planned response to knowledge gaps

One or more of the gaps should be addressing during the project

Key knowledge gap and response

1. Asset value - while there is some good information on the commercial value associated with fishing and tourism for the Burnett Mary region, further work would be useful to gain an understanding of ecosystem service values, especially by way of comparison with other regions of the GBR.
2. Asset condition - information on the condition of seagrass and coral across the BM region is patchy as is information on the relationship between these components and water quality conditions and further study is required.
3. Understanding of key future threats, including synergistic effects associated with climate change and pollutants.
4. Ecologically Relevant Targets - while best available scientific information and expert opinion has been used to establish the ERTs, this is a relatively new endeavour and there is significant uncertainty associated with the targets **[Jon Brodie to comment further here]**
5. Improved modelling of horticulture and urban landuses is required.
6. Impact of horticulture and an economic analysis of horticultural practices is required.
7. Time lags and trajectory of ecosystem responses
8. Improved understanding of the economics of adoption in land uses other than sugar cane

Parameters for calculating the BCR

V = 200 (Q1.2b)	W = 0.17 (Q2.4b)	B = 1 (Q3.4b)	C = 91.65 (Q4.5c)
L = 10 (Q2.3a)	F = 0.87 (Q2.5b)	P = 0.62 (Q4.4b)	E = 0 (Q4.5d)
DFb(L) = 0.61	A = 0.5 (Q3.3c)	G = 0.5 (Q4.6d)	M = 16.9 (Q4.6c)
K = 20	BCR=0.3		