



Lower Goulburn Floodplain

Evaluating changes in ecosystem services and the economic costs and benefits of production on the northern floodplain of the Goulburn River under scenarios of future land management

Summary

The Goulburn Broken Catchment Management Authority proposes to reutilise the floodplain on the northern side of the Goulburn River by removing sections of existing levees and converting Loch Garry to a spillway. This will alter the flooding regime on the floodplain and affect agricultural production. Rates and patterns of native vegetation regeneration are also likely to be significantly affected by a changed flood regime. How will this new vegetation pattern influence the delivery of ecosystem services? This Ecosystem Service project identifies some of the services delivered by a floodplain and explores how the value of these services might change over time under a different flooding regime and with different land management practices.

Background

The Goulburn is one of Victoria's largest rivers, delivering on average more than 1400 gigalitres of water to the Murray River each year. The capacity of the river channel progressively declines as the river flows north from Shepparton reducing to just 37,000 megalitres/day at the Yambuna Choke, a natural constriction near the confluence of the Goulburn with the Murray River. Within the northern floodplain area the predominant agricultural activity is rotational 'dry land' cropping and grazing (mostly beef and some sheep for meat and wool) with some minor areas of irrigated cropping. Approximately 20% of the floodplain is public land, which includes streams and adjacent land. Native vegetation cover is generally greatest on the public land

Project components

The project has four major components.

Firstly, through a series of workshops catchment stakeholders identified key goods and services provided by the floodplain ecosystem and defined scenarios of future land use and management.

Secondly, soil, vegetation and flood data were used to define a map base.

Thirdly, a review of vegetation responses to land management was undertaken.

Fourthly, a model was developed using available data and expert opinion incorporating management options and underlying biophysical processes driving the delivery of ecosystem services.

1.1.1 Project outputs include

- tables of vegetation transitions in response to different land management including estimates of changes in habitat value;
- a dataset of the extent and duration of flooding events across the floodplain as a time series; and
- a model for the generation and evaluation of future management options on the floodplain.

Key observations from workshops and analyses are that

- significant information deficiencies exist, particularly about the floodplain scale behaviour. What information is available data is of variable quality;
- key ecosystem services have values that are significantly affected by management;

- these ecosystem services are underpinned by the same biophysical processes;
- the key determinant of woody vegetation on the floodplain are frequency and extent of flood controlled germination events, competition from existing woody vegetation and herbaceous species, management practices such as ‘thinning’ and mortality associated with flooding and grazing and
- increases in vegetation biomass is most sensitive to changes in the management regime in the medium term (20-30 years) settling down in the longer term as the woody vegetation matures.

Key considerations are that:

- the flood plain is a highly interconnected system – the ecosystem services framework has provided some insights into this complexity, identified the key drivers of the system and is a good basis for exploring trade-offs;
- improved management of a single service (ie regulation of river flows) has implication for the provision of a suite of other services many of which may have substantial benefits or returns to the community;

- as extremely long time scales are involved in the vegetation change process the benefit from managing for ecosystem services varies over time with some benefits not being fully realised in a conventional management time frame and
- the significant interconnections between different goods and services of the floodplain mean that issue by issue policy making is inappropriate.

Contact us

If you would like more information or an update on project progress please contact:

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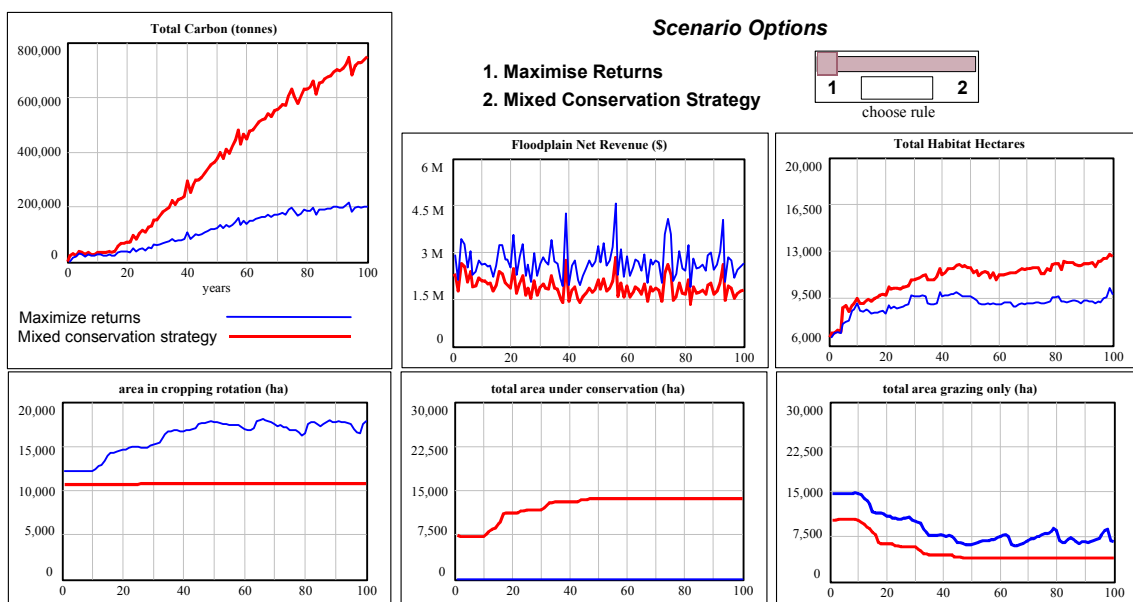
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Example of Model output showing land use patterns and sample ecosystem service responses to two different management options.