

Larsen, Austin, Ross, Hermans and Eldridge: Know your reach – a co-design approach to assessing waterway protection across the Wimmera

Know your reach – a co-design approach to assessing waterway protection across the Wimmera

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Key Points

- Quantifying the proportion of waterways protected is a difficult task that is yet to be consistently undertaken across Victoria, Australia.
- A methodology was co-designed and applied to assess the protection of over 1,600 kilometres of waterways in the Wimmera Catchment in Victoria
- The assessment methodology could also be adapted for use in other locations, with consideration of local management practices and issues
- The overall proportion of priority waterways protected from stock access was 63%. This equates to 2,013 of 3,203 km of priority waterway frontage protected in the Wimmera CMA region.

Abstract

Quantifying the proportion of waterways protected is a difficult task that is yet to be consistently undertaken across Victoria. Waterways are protected through the construction of riparian fences to protect them from stock. Waterways are also protected through adjacent land uses including formal protections such as National Parks and through independent landholder management practices.

Understanding the proportion of waterways protected offers a range of benefits to organisations with waterway management responsibilities including helping to prioritise and quantify future waterway protection activities, informing strategy and providing meaningful figures that can be reported to the community.

In this project, Wimmera Catchment Management Authority (CMA) partnered with RM Consulting Group (RMCG) in the co-design of a methodology to assess the proportion of waterways that are protected from stock access. A three-stage methodology was developed including the use of automated Geographic Information System (GIS) modelling, manual aerial imagery analysis, and review and on-ground verification of priority reaches by Wimmera CMA staff.

A complete assessment of the length of over 1,600km of priority waterways in the Upper, Middle and Lower Wimmera catchments has now been completed. Providing an understanding of the protection in place and informing planning and investment for further waterway protection.

Keywords

Stock, protection, GIS, fencing, riparian, waterway, strategy

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Introduction

The construction of riparian fences to protect priority waterways from stock is identified as a key management action in the Wimmera Waterway Strategy 2014-2022. Significant lengths of waterways have been protected from stock through Catchment Management Authority (CMA) and land manager collaborations to fence and change grazing management practices along rivers and streams.

Waterways are also protected through other means, including formal protection such as National Parks, adjacent land use and independent landholder management practices.

RM Consulting Group (RMCG) were appointed by Wimmera CMA to conduct assessments of over 1,600km of priority waterways in the Upper, Middle and Lower Wimmera catchments to determine if they were protected from stock.

Project purpose

The project objectives were to:

- Develop a methodology to assess the proportion of waterways that are protected from stock access which can be replicated by the Wimmera CMA across the catchment
- Complete assessments of priority waterways in the Upper, Middle and Lower Wimmera catchments using the methodology to determine the proportion of waterways that are protected from stock access.

Methodology

A three-stage assessment methodology was co-designed with the Wimmera CMA and refined throughout the project. It included automated Geographic Information System (GIS) modelling, manual aerial imagery analysis, and review and on-ground verification of priority reaches by Wimmera CMA staff. The methodology was used to determine the proportion of the waterways that are protected from stock and can be used again to assess other reaches throughout the catchment or adapted to use in other areas.

Stages one and two

The first two stages of the assessment are guided by the decision-making framework outlined in Figure 1. The framework guides the user through a series of questions to determine whether a waterway is protected.

Table 1 provides a list and description of the datasets to be utilised to inform the decision-making framework.

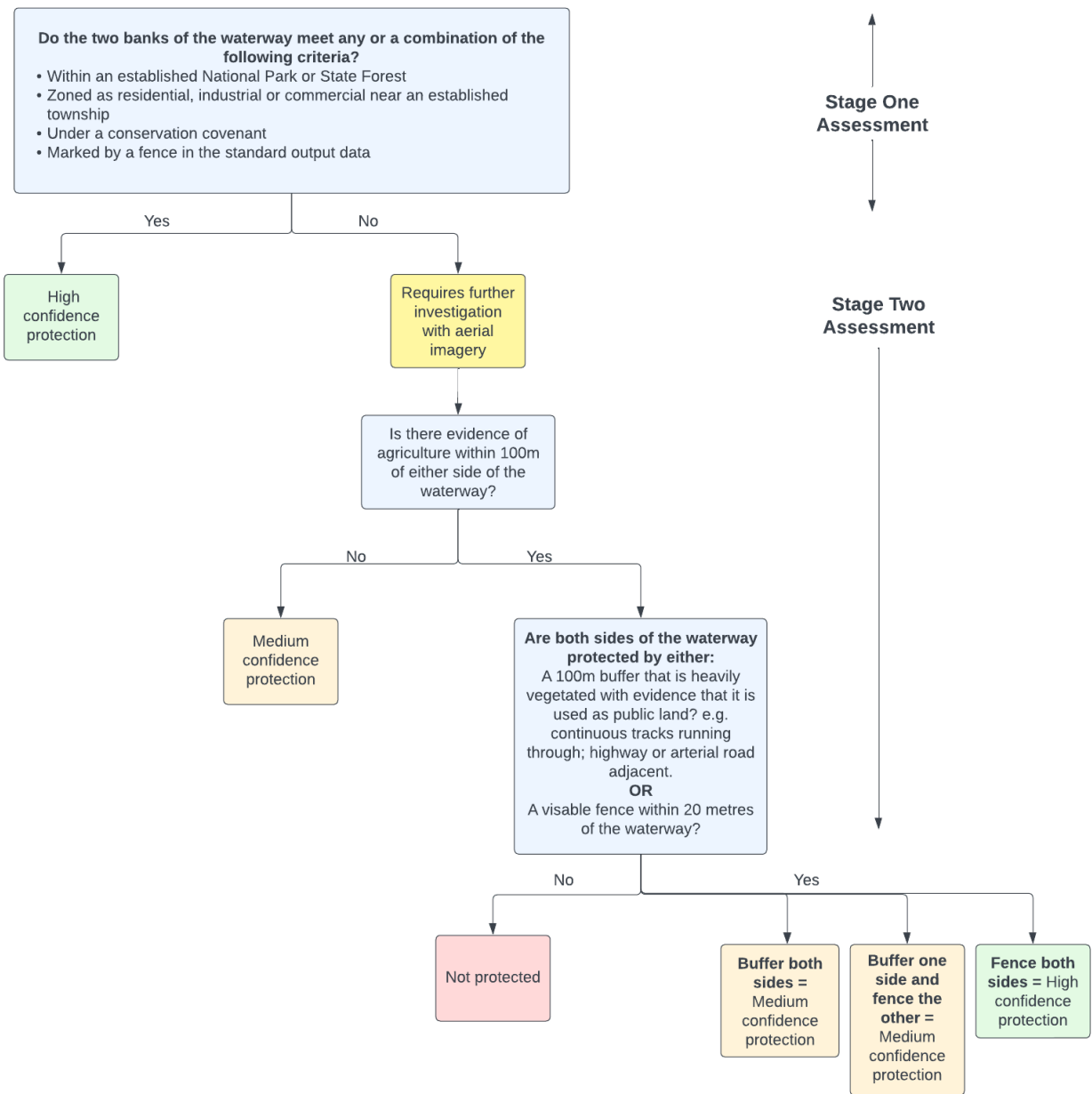


Figure 1. Decision-making framework to determine the protection of waterways

Table 1. Datasets utilised to inform the decision-making framework

METHOD	DATASET	NOTES	SOURCE
Stage 1 Do the two banks of the waterway meet any or a combination of the following	Standard output fencing	Output type attribute = fence (regardless of other attributes or installation date).	Wimmera CMA
	Public Land Management Types include: <ul style="list-style-type: none"> ▪ National Park 	Public land outside of these categories was further investigated for evidence of stock access.	Victoria DataShare: datashare.maps.vic.gov.au

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METHOD	DATASET	NOTES	SOURCE
criteria?	<ul style="list-style-type: none"> State Park/Forest 		
	Private land conservation covenant data	Conservation covenants on private land.	Wimmera CMA/Trust for Nature
	Planning Zones	<p>In built up/township areas planning zones in the following categories were used to determine if a bank was protected:</p> <ul style="list-style-type: none"> Residential Industrial Commercial. <p>All other land in rural zones, including Farming and Rural Living was further investigated.</p>	Victoria DataShare: datashare.maps.vic.gov.au
	Victorian Landuse Information System (VLUIS)	Category 5 Primary production land was further investigated, particularly evidence of grazing (520: Domestic Livestock Grazing; 530: Mixed farming and grazing (>20ha)).	Victoria DataShare: datashare.maps.vic.gov.au
Stage 2 Further investigations	Aerial Imagery	<p>Aerial imagery was used to analyse for presence of:</p> <ul style="list-style-type: none"> Width and characteristics or waterway buffers Evidence of fences Other evidence that may indicate an unprotected waterway e.g. absence of riparian vegetation. <p>Evidence of fences perpendicular to the river that adjoin adjacent grazing land fences could indicate that stock may have access.</p>	Wimmera CMA
	Roads	The classification of roads was used to help determine the likelihood of stock access, in conjunction with additional land use information and inspections of aerial imagery.	Victoria DataShare: datashare.maps.vic.gov.au
	Public land leasehold	Riparian frontages that have grazing licences.	Wimmera CMA (not required, could be used in subsequent assessments)
	Index of Stream Condition rating or Lidar condition assessments	Condition of waterway and riparian vegetation where available.	Wimmera CMA (not required, could be used in subsequent assessments)

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Stage three

Following the stage one and two assessments, data was reviewed, and priority reaches verified by Wimmera CMA staff. The CMA verification process used additional historic spatial data, local knowledge of waterways to determine the accuracy of the assessment and where required on ground inspections.

The priority reaches verified were predominately those assessed as ‘not protected’ in the Stage one and two assessments.

The final status of the assessment was determined following of the stage three assessment.

Methodology in action

To demonstrate the application of the methodology a visual example is provided in Figure 2.

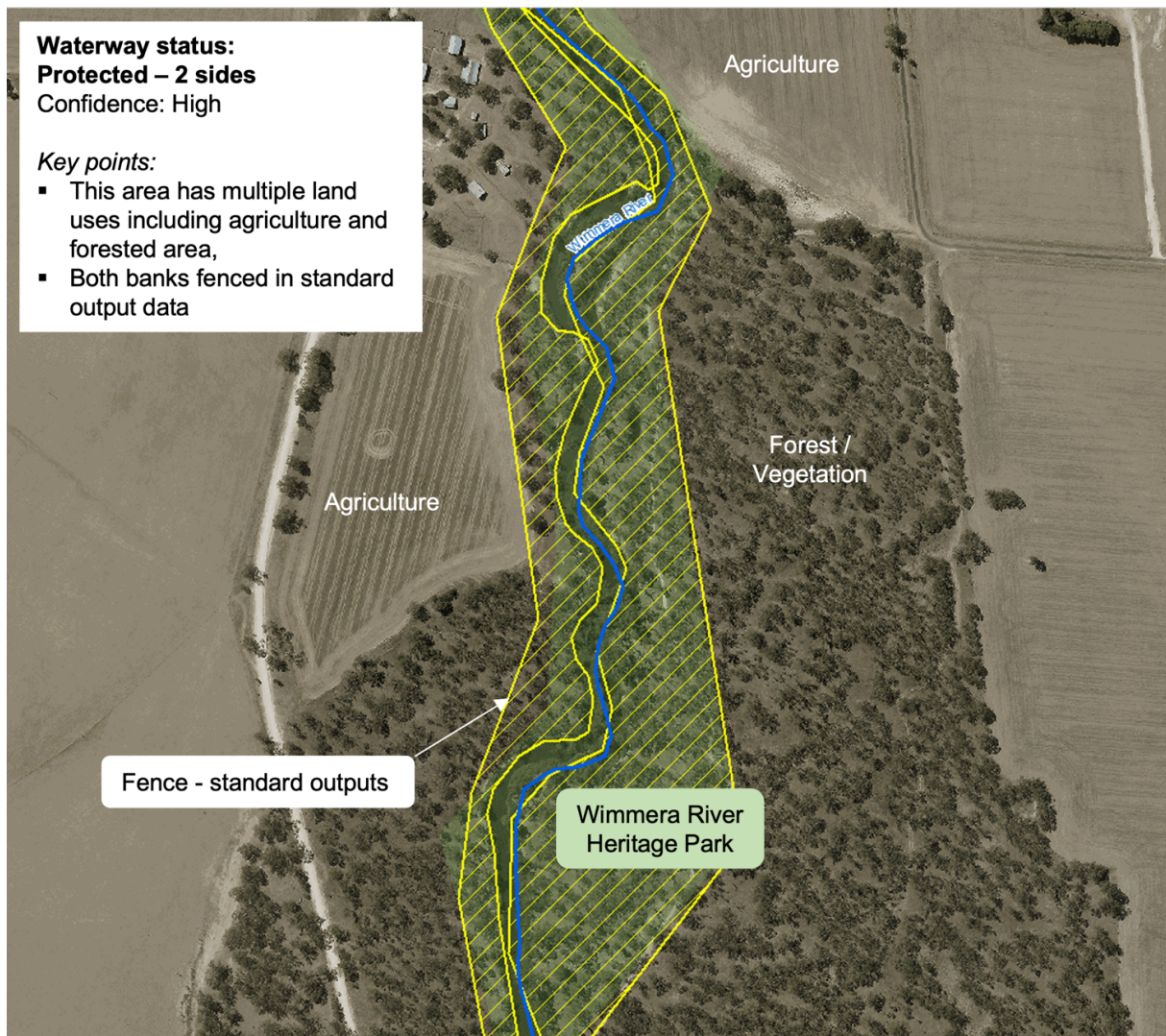


Figure 2. Example of using the methodology to assess protection

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Results

A total of 1,602 km of priority waterways were assessed for protection from stock access, and of this:

- 907 km were protected on two frontages, which was 57% of all waterways assessed
- 199 km was protected on one frontage (12%)
- 495 km was not protected on either frontage (31%).

When considering protection along each frontage, this equates to 2,013 of 3,203 km or 63% of priority waterway frontage protected from stock access in the Wimmera CMA region.

Conclusions

Understanding the proportion of waterways protected offers the Wimmera CMA a range of strategic benefits including the ability to:

- Inform the review and renewal of the Wimmera Waterway Strategy 2014-2022
- Combine the data with other decision-making criteria to support the strategic prioritisation of on-ground works and programs to achieve the Wimmera Waterway Strategy goals
- Quantify the amount of waterway protection work still outstanding to support the establishment of targets, budgets, and provide evidence for funding applications
- Provide meaningful figures that can be reported to the community and influence increased participation in the protection of waterways.

The assessment methodology could also be adapted for use in other locations, with consideration of local management practices and issues.