Wetland Intervention Monitoring Program (WIMP)

Understanding responses of vegetation to grazing management

Project Update April 2025

Key Messages

- Controlled grazing on private land is commonly used to manage vegetation in wetlands, particularly in temporary wetlands (which receive water periodically and experience cycles of filling and drying).
- This study shows that carefully controlled grazing practices can benefit native vegetation in temporary freshwater wetlands when it:
  - Prevents competitive introduced and native species displacing other species
  - Prevents excessive leaf litter loads than can reduced plant species diversity

Project Summary

Victoria is estimated to currently have over 62 000 natural wetlands of which approximately three quarters are on private land. Many of these are temporary freshwater meadows and marshes in agricultural landscapes and potentially subjected to grazing.

Livestock grazing can negatively impact wetland condition and biodiversity, but in certain situations, it can be beneficial if managed carefully.

Guidance to support grazing management decisions in Victorian wetlands was developed by DEECA in 2015 (Peters et al. 2015). But further evidence was needed to build confidence in the principles underpinning these guidelines for Victorian wetlands.

What we did

To evaluate responses of wetland vegetation to grazing management, WIMP has established 21 trial sites across four Catchment Management Authority (CMA) regions since 2017. At each trial site, paired plots have been established. Each plot is about 0.25 Ha in size, with one plot open to livestock grazing and the other plot fenced to exclude livestock.

Some sites are grazed by cattle and others by sheep, and some sites are grazed for short periods (weeks) and others are grazed for long periods (> 3 months to continuous) with various stocking rates.

Vegetation was surveyed before fencing and then annually for 5-6 years after fencing. Annual monitoring ended in 2024.

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What we found

- Grazed temporary freshwater wetlands on farms can support high biodiversity values.
- Under certain conditions, carefully managed grazing in temporary freshwater wetlands can benefit native vegetation (**Figure 1**).

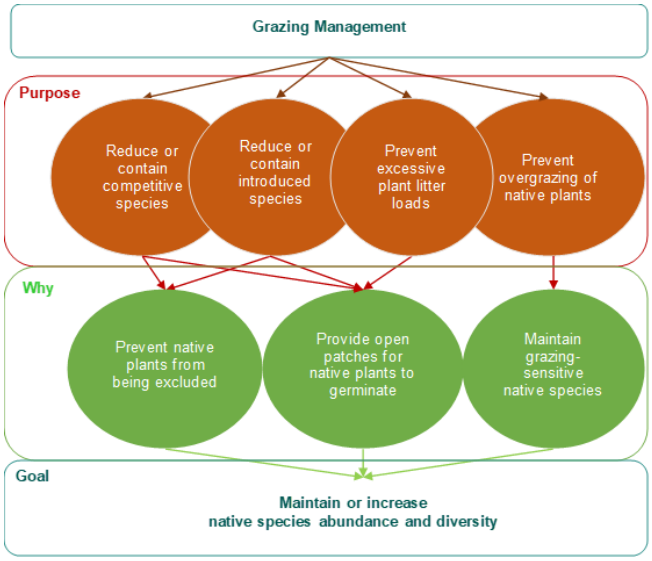

Figure 1: Relationships between livestock grazing management and vegetation condition.

Grazing can control introduced species and prevent native species being displaced.

Where palatable introduced grasses were already present, grazing controlled their abundance. The introduced grass *Paspalum distichum* (Water Couch) became dominant and reduced diversity when livestock were excluded at some sites (**Figure 2**).

Figure 2. Dominance of the introduced grass *Paspalum distichum* (Water Couch) after fencing (right of fence).

Grazing can control plant biomass and provide open patches to promote germination and growth of low growing plants that helps to maintain diversity.

- Livestock exclusion increased plant growth resulting in taller plants and a deep layer of leaf litter compared with open-grazed plots.
- *Glyceria australis* (Australian Sweet-grass, *Eleocharis acuta* Common Spike-sedge and *Paspalum distichum*, Water Couch) contributed the most to increases in leaf litter.
- Species number declined slightly more in livestock exclusion plots compared with open plots at some surveys (**Figure 3**).
- Successive years of La Niña (elevated rainfall) increased plant growth and under these conditions grazing pressure was not always sufficient to prevent excessive leaf litter loads.
- High plant productivity followed by prolonged and deep inundation due to La Niña events was associated with a decline in diversity in both fenced and open-grazed plots.

Figure 3: A diversity of low growing herbs (left of fence) and dominance of *Glyceria australis* with high leaf litter (right of fence).

Grazing can be managed to reduce the risk of eliminating grazing sensitive native species.

- The abundance of species sensitive to disturbances such as grazing did not increase with livestock exclusion. In contrast, the occurrence of this group decreased slightly over time when livestock were excluded.
- Species considered highly sensitive to grazing were mostly absent at WIMP sites and responses observed in this study suggest that the remnant flora is tolerant to the grazing regimes applied at study sites.

Management implications

Is grazing appropriate?

Grazing in temporary freshwater wetlands can be beneficial when it: (i) controls introduced species, (ii) prevents competitive species becoming dominant and excluding other species, or (iii) reduces leaf litter loads so that native plants can establish.

Although grazing offers benefits in some wetlands, it also presents risks. Grazing is not recommended in wetlands where grazing can have severe impacts on hydrology such as peatlands or where grazing impacts the habitat requirements of threatened fauna.

How much grazing?

In most cases where grazing is appropriate, short periods of grazing is recommended after native plants have set seed to prevent losses of grazing-sensitive species and declines in diversity that are expected under higher grazing pressure or poorly timed grazing.

The amount of grazing required will vary with the sensitivity of species present and how productive the wetland is. In wet years, plants can be very productive, and a higher grazing pressure may be appropriate. In contrast, grazing may not be required in years of low productivity.

To optimise biodiversity outcomes, grazing should be adaptive and guided by conditions on site. Depth and patchiness of leaf litter was found in this study to be a useful indicator of when to graze.

Collaboration

Arthur Rylah Institute (ARI) delivered the program in partnership with DEECA Water and Catchments, CMAs and participating landholders. Landholders generously provided access to their wetlands and permitted the construction of livestock exclusion fences. External consultants contributed to annual surveys.

What's next?

Periodic monitoring is proposed to assess long-term responses at sites where landholders wish to continue participation.

WIMP is also engaging with wetland managers, landowners and Landcare groups to understand priority knowledge gaps in wetland management to guide future directions for WIMP.

Funding

The program was funded by DEECA Water and Catchments and the National Landcare Program (NLP).

Further reading

- Morris and Reich (2013). Understanding the relationship between livestock grazing and wetland condition. Arthur Rylah Institute for Environmental Research Technical Report Series No. 252. Department of Environment and Primary Industry, Heidelberg, Victoria
- Peters et al. (2015). A guide to managing livestock grazing in Victoria's wetlands. Decision framework and guidelines — Version 1.0. Arthur Rylah Institute for Environmental Research Technical Report Series No. 265. Department of Environment, Land, Water and Planning, Heidelberg, Victoria.

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We acknowledge Victorian Traditional Owners and their Elders past and present as the original custodians of Victoria's land and waters and commit to genuinely partnering with them and Victoria's Aboriginal community to progress their aspirations.

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