

LOWER LAKES GRAZING TRIALS 2005-2011

Background information

The Lower Lakes environment has supplied graziers' livestock with a valuable source of feed and reliable water. Introduced pasture plants, particularly grasses such as Water Couch, Salt-water Couch and Kikuyu grow well in the fresh water margins of the lakes. Historically, these areas would have been characterised by native plants such as reeds and sedges.

Why conduct a grazing trial?

The introduced pasture grasses commonly form dense mats that dominate the lake edge vegetation, out-competing native plants. These mats of grasses provide little habitat for native fauna and minimal protection for the lake edge from erosion by wave action. A grazing trial was implemented to inform and improve management of the Lake edge.

Grazing trial details

A grazing trial began in the summers of 2005-06 and 2006-07, at 11 sites, to examine the effects of different grazing regimes on the following:

- Lake edge stability;
- Plant diversity;
- Pasture biomass;
- Ground cover; and
- Feed composition and quality.

This fact sheet reports the results for plant biomass (plant dry weight) and diversity (number of species). Other results are available from the Goolwa to Wellington LAP (see last page for contact details). A more detailed description of the methods and results can be found in the full report, available from the GWLAP.

At each site, three grazing regimes were implemented:

1. Summer grazing – grazing only from December to February¹;
2. No grazing – completely exclude livestock grazing; and
3. Year round grazing – continuation of the existing grazing regime (grazing generally year round) with some site-to-site variation.

Vegetation and other attributes were monitored in each of the three grazing regime areas.

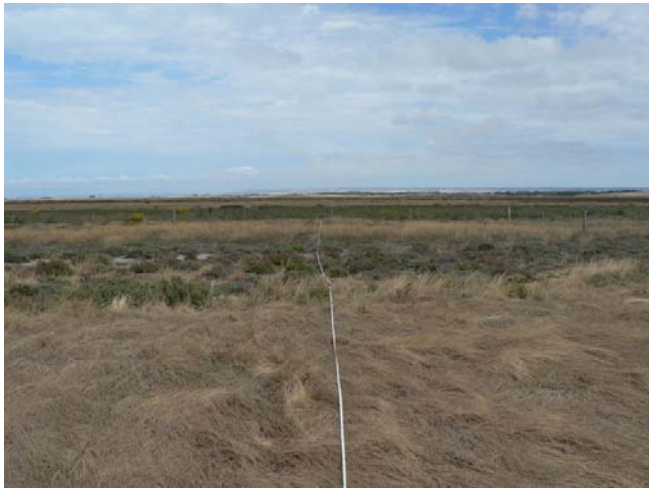


Site locations of Lower Lakes grazing trials

Grazing trial sites

Grazing trial sites varied in their pasture composition, this was generally dependent on their past management and distance from the lake edge. Typically, trial sites consisted of three areas:

1. Higher areas (furthest from lake edge) dominated by areas of Sea Barley-grass and Wimmera Ryegrass;
2. The areas between the high areas and the lake edge characterised by:
 - a. Tall Wheat-grass, Emu-grass, Curly Rye-grass, Salt-marsh grass and/or;
 - b. Samphire wetland with Annual Beard-grass, Seablite and Creeping Saltbush
3. Lake edge with dense Salt-water Couch and native species such as Spiny Flat-sedge, Narrow-leaf bulrush and Common Reed.



Typical site dominated by annual pasture grasses on higher ground, lake edge area characterised by Salt-water Couch and the transitional area of Beaded Samphire, Seablite and Salt-marsh grass.

However, some sites were completely dominated by Salt-water Couch and Kikuyu with areas of Sea Barley-grass.



Site dominated with Salt-water Couch and Kikuyu, few native species are generally present.

Trial Results

General plant observations

A total of 131 different plant species were recorded over the six years of the trial, 56% of plants are classified as introduced and 44% of plants are classified as native. The most commonly occurring introduced plant was Salt-water Couch (found in 87% of sites) and the most common native plant was Beaded Samphire found at 45% of sites. A summary of the ten most common species is listed in the table below.

The ten most commonly occurring plants in the Lower Lakes grazing trial. * denotes introduced plant species

Common name	Frequency (%)
*Salt-water Couch	87.3
*Sea Barley-grass	83.6
*Wimmera Ryegrass	57.9
*Curly Ryegrass	51.1
*Strawberry Clover	47.2
Beaded Samphire	44.9
Austral Seablite	42.4
*Bucks-horn Plantain	41.8
Creeping Brookweed	40.7
*Kikuyu	35.0

Plant contributions to pasture biomass

Many different plant species made up the total pasture biomass, however, most of the biomass consisted of only a small number of species. Results for selected plants are reported below:

Salt-water Couch

Salt-water Couch an introduced perennial pasture grass. The contribution of Salt-water Couch to the pasture biomass, either:

- Generally declined over period of the trial, regardless of grazing treatment; or
- At two sites in the *No grazing* treatment at Campbell Point and Wyndgate, the contribution of Salt-water Couch to biomass remained relatively constant.



Salt-water Couch

The decline in contribution of Salt-water Couch can be attributed to the dry conditions which occurred over the period early in the trial and the decline in water levels in the lakes.

The little or no change in the contribution of Salt-water Couch to pasture biomass, regardless of grazing treatment, was an unexpected result. Observations show that where grazing is removed, Salt-water Couch persists and potentially increases in biomass. Increases in the biomass of Salt-water Couch can result in other plant species being crowded out and areas becoming grass dominated², providing only maintenance feed for livestock³.

Kikuyu

Kikuyu is an introduced matted perennial pasture grass. The contribution of Kikuyu to pasture biomass increased following initial monitoring and



Kikuyu

fencing, regardless of grazing treatment.

Subsequent variation occurred year to year in the *Control* treatment (continuation of existing grazing regime). However, in the *No grazing* treatment, Kikuyu consistently increased its biomass.

Kikuyu biomass can be readily managed through grazing, as the plant is able to withstand close grazing and trampling without falling below critical cover levels for erosion protection. However, in areas, which are not grazed, increases in amount of Kikuyu in the pasture may have long-term ramifications by reducing plant diversity of lake

edge vegetation and habitat suitable for foraging birds and other native animals.

Spiny Flat-sedge

Spiny Flat-sedge is a native perennial sedge. The contribution of Spiny Flat-sedge to pasture biomass



Spiny Flat-sedge

declined in the second year of monitoring. Contributions to pasture biomass have continued to decline over the period of the trial, regardless of grazing treatment.

The observed decline of Spiny Flat-sedge to pasture biomass is attributable to the dry conditions and low water levels, which is not unexpected, and the contributions should increase again following a return to normal conditions.

Plant diversity

Plant diversity varied within each grazing treatment and over time, but the variation was site dependent. For example, at Poltalloch Peninsula Site 1, plant diversity declined in all treatments over the period of the trial. In contrast, at Currency Creek, in the *Control* treatment (continuation of existing grazing regime), diversity remained relatively stable over the period of the trial 2005-06 to 2010-11. Plant diversity in *No Grazing* and *Summer* grazing (continuation of existing grazing regime but only in the summer months) treatments significantly declined over the period of the trial.



Plant diversity at Currency Creek varied depending on grazing treatment

The decline in plant diversity was most likely due to the dry conditions and low lake water levels; as a result of these factors many plants were not recorded in the later years of the trials. However, where grazing pressure is removed or reduced, certain species that are normally managed by

grazing may increase to such an extent that they exclude other species by competition or shading.

Trial Findings & Recommendations

Trial Finding 1: Introduced plants are more common than native species in many lake edge environments; and

Trial Finding 2: Introduced plant species Salt-water Couch and Kikuyu made an ongoing and increasing (in the case of Kikuyu) contribution to pasture biomass despite the dry conditions and low lake water levels.

Recommendation 1: Assessment of management requirements

The lake edge environment where introduced plant species such as Salt-water Couch and Kikuyu dominate should be assessed to determine if these introduced species are having detrimental effects on

- native vegetation;
- animal species including wading birds; and
- the physical environment.



Samphire and seablite swamps where vegetation is relatively intact should not be grazed.



Areas where vegetation is dominated by introduced species such as Salt-water Couch should be managed.

Recommendation 2: Grazing guidelines for lake edge vegetation

Grazing of the lake front environment (generally between the lake edge and 15m from the lake edge) is suggested only for introduced vegetation, which requires management, i.e. where plants such as Salt-water Couch, Kikuyu and Buffalo Grass are dominant. The following conditions should be adhered to when grazing such an environment:

- No grazing at any time on the bed of the lakes or other wetland environment;
- Lake edge must be fenced (e.g. with electric fencing) to stop grazing on the lake bed or in adjoining vegetation which does not require grazing;
- Only graze the lake front environment when dry (i.e. during summer months);
- Graze only for short periods (less than 48 hours); and
- Graze no more than three times per year.

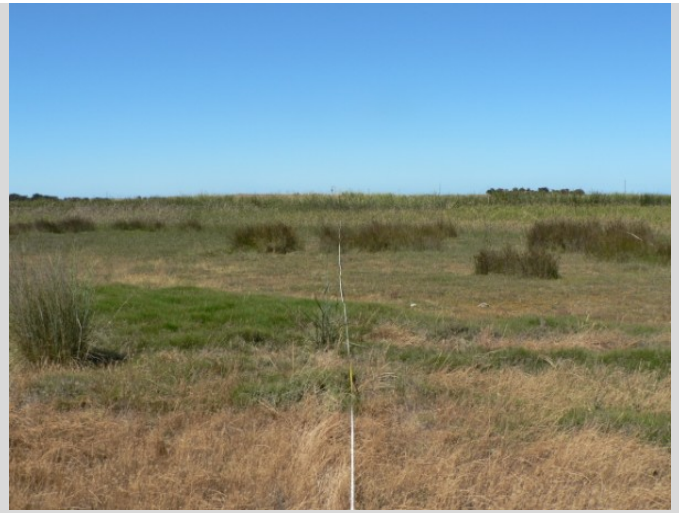
During dry conditions (e.g. extended periods without rainfall, low lake levels or drought), grazing periods and frequencies should be reduced or suspended in order to maintain vegetation cover and soil structure, thereby reducing the risk of erosion.

Trial Finding 3: Plant diversity declined over the period of the trial, most likely attributable to climatic and environmental conditions.



Low lake levels were beyond the control of the trial, and influenced plant diversity.

Finding 4: To detect changes in vegetation composition as a result of grazing treatments, a monitoring period longer than five years is required.



Changes in vegetation composition may take a decade to occur.

Recommendation 3: Continue grazing trial and monitor sites at regular intervals (e.g. every two years) over the next 5-6 years to determine how vegetation composition is changing as a result of the different treatments.

References

- 1 – Earth Tech Engineering (2003). Sustainable Grazing & Land Management to Promote Ramsar Values around the Lower Murray Lakes. Melbourne, Victoria, Earth Tech Engineering Pty Ltd.
- 2 – Lamp, C. and F. Collet (2002). *A field guide to weeds in Australia*. Inkata Press, Melbourne.
- 3 – Fact sheet: Nutritional Value of Common Plants around the Lower Lakes, contact Goolwa to Wellington LAP for copies.

For more information contact

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