

National Recovery Plan for the Salt-lake Tussock-grass *Poa sallacustris*

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Australian Government

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Summary

The Salt-lake Tussock-grass *Poa sallacustris* is listed as Vulnerable under the Commonwealth *Environment Protection and Biodiversity Conservation Act* 1999. The species is endemic to south-western Victoria, where it occurs around the margins of salt lakes. There are nine populations with a total coverage of about 0.6 ha. Major threats to populations include weed invasion and grazing. This national Recovery Plan for *P. sallacustris* details the species' distribution and biology, conservation status, threats, and recovery objectives and actions necessary to ensure its long-term survival.

Species Information

Description

The Salt-lake Tussock-grass *Poa sallacustris* is a perennial, rhizomatous grass growing to a height of 30 cm when flowering, which occurs from September to December. Leaves grow to 12 cm in length, are smooth, glabrous, with a firm, sharply pointed blade and a slightly bent or curved ridge. Leaf blades are loosely to closely folded and extend from a sheath with lower tubular sections, and a pointed to round, thinly membranous ligule 1–2 mm long separates the sheath from the blade. The inflorescence consists of 4–6 flowered spikelets, each flower having two sets of bracts. The upper bracts and part of the spikelet are uneven, firm, 3-nerved, hairy on the ridge on the lower half and may be hairy on the lateral nerves near the base, while the lower bracts have few or no hairs at the base (description from Walsh 1991; Walsh & Entwisle 1994). There have been no targeted ecological or biological studies on this species. It appears to occupy a very narrow niche (physically and chemically), always around saline lakes and where mildly saline ground-water is close to the surface.

Distribution

Poa sallacustris is endemic to south-western Victoria, between Colac and Hamilton (Walsh 1991), in the Victorian Volcanic Plain Bioregion (DEH 2000).

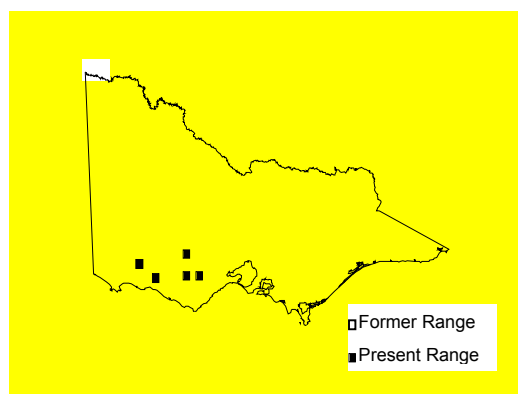


Figure 1. Distribution of *Poa sallacustris* in Victoria

Population Information

There are currently nine known populations of *Poa sallacustris*. Total population size is difficult to estimate given its dense tussock-forming habit, but abundance is best quantified in terms of area of occupancy, with the total area covered only about 0.6 ha (6,000 m²). Major populations of *Poa sallacustris* occur in the following locations:

Lake Goldsmith, near Skipton. Wildlife Reserve managed by Parks Victoria. Locally high abundance with two populations known and more likely to be found with further searches.

Lake Corangamite, Cressy. Lake Reserve managed by Parks Victoria.

Lake Terangpom, Cressy. Wildlife Reserve managed by Parks Victoria.

Black Lake, Skipton. Land status unknown.

Lake Linlithgow and Krause Swamp, Hamilton. Private land.

Several other smaller populations occur on private land and there are likely to be more in suitable habitat.

Habitat

Poa sallacustris occurs in grassland/herbfields on flat to slightly elevated sites at the verges of slightly to strongly saline lakes (Walsh 1991). Associated species include *Epilobium billardierianum*, *Isolepis cernua*, *Lilaeopsis polyantha*, *Phalaris aquatica*, *Plantago coronopus*, *Pratia platycalyx*, *Ranunculus diminitus*, *Ranunculus rivularis*, *Schoenus apogon*, *Schoenus nitens*, *Selliera radicans* and *Wilsonia backhousei*. Soils tend to be sticky grey to black clays on basalt substrate. At Lake Terangpom the species occurs on sandy clays with tuff and ironstone nodules, while at Lake Corangamite the population grows on soils comprising partly decomposed shell beds of the a small aquatic snail *Coxiella striata*. Recovery actions include survey and mapping of habitat that will lead to the identification of habitat critical to the survival of the species.

Threats

Poa sallacustris was almost certainly more widespread and abundant within the region where it currently occurs, but populations have been fragmented and depleted historically as a consequence of habitat modification through clearing and grazing (Walsh 1991). Most populations are degraded by weed invasion and agricultural activities. The main threats to the species are summarised as follows:

Weed invasion: In nearly all cases *Poa sallacustris* grows adjacent to dense stands of the introduced invasive pasture grass *Phalaris aquatica*, although (at least currently) *P. aquatica* seems not to be able to expand into the slightly more saline sites occupied by *Poa sallacustris*. There is some concern that, should more saline-tolerant strains of *Phalaris* be developed, they may have the capacity to invade sites occupied by *P. sallacustris*. Tall Wheat Grass *Lophopyrum elongatum*, which does have some salinity tolerance and is planted in saline-affected areas, is locally common in *Poa sallacustris* areas but currently not so dense as to cause particular problems. Continued expansion of this grass at the current rate would see it becoming a major threat to *Poa sallacustris*.

Grazing: Most sites are grazed by cattle or sheep.

Tree Planting: Some sites have been subject to revegetation projects around lake margins, which could impinge on available habitat and threaten populations, and alter hydrology which could reduce the available habitat for *P. sallacustris*.

Changing land use: Changing land use from grazing to cropping is a potential major threat to populations on private land.

Vehicle movement: Crushing of plants and soil compaction is a problem at some sites on public and private land.

Recovery Information

Overall Objective

The **overall objective** of recovery is to minimise the probability of extinction of *Poa sallacustris* in the wild and to increase the probability of important populations becoming self-sustaining in the long term.

Within the life span of this Recovery Plan, the **specific objectives** of recovery for *Poa sallacustris* are to:

- Acquire accurate information for conservation status assessments.
- Identify habitat that is critical, common or potential.
- Ensure that all populations and their habitat are protected and managed appropriately.
- Manage threats to populations.
- Identify key biological functions.
- Determine the growth rates and viability of populations.
- Establish populations in cultivation.
- Build community support for conservation.

Program Implementation

The Recovery Plan will run for five years from the time of implementation and will be managed by the Department of Sustainability and Environment. A Threatened Flora Recovery Team, consisting of scientists, land managers and field naturalists will be established to oversee threatened flora recovery in Victoria in general. Technical, scientific, habitat management or education components of the Recovery Plan will be referred to specialist sub-committees on research, *in situ* management, community education and cultivation. Regional Recovery Teams will be responsible for preparing work plans and monitoring progress toward recovery.

Program Evaluation

The Recovery Team will be responsible for annual assessments of progress towards recovery. This Recovery Plan will be reviewed within five years of the date of adoption.

Recovery Actions and Performance Criteria

Action	Description	Performance Criteria
Specific objective 1		
Acquire accurate information for conservation status assessments		
1.1	Acquire baseline population data by conducting detailed field and desk top surveys including (a) identification of the area and extent of populations; (b) estimates of the number, size and structure of populations and (c) estimation of population change. Responsibility: DSE	<ul style="list-style-type: none"> Determination or update of conservation status for inclusion on state and national threatened species lists. Target populations accurately mapped.
Specific objective 2		
Identify habitat that is critical, common or potential		
2.1	Accurately survey known habitat and collect floristic and environmental information describing community ecology and condition. Responsibility: DSE	<ul style="list-style-type: none"> Requirements for completion of essential life history stages, recruitment and dispersal identified at known sites. Habitat critical to the survival of the species is mapped.
2.2	Identify and survey potential habitat, using ecological and bioclimatic information indicating habitat preference. Responsibility: DSE	<ul style="list-style-type: none"> Predictive model for potential habitat developed and tested.
Specific objective 3		
Ensure that all populations and their habitat are legally protected		
3.1	Protect populations on public land. Responsibility: DSE, PV	<ul style="list-style-type: none"> Incorporate plant conservation objectives into sites principally reserved for other purposes such as fauna and game protection / management. This includes the Lake Goldsmith, Lake Corangamite and Lake Terangpom sites.
3.2	Protect populations on private property. Responsibility: DSE	<ul style="list-style-type: none"> Initiate private land management agreements in consultation with private land owners under the <i>Victorian Conservation Trust Act 1972</i>, <i>The Conservation, Forests and Lands Act 1987</i> and the <i>Wildlife Act 1975</i> at selected private land sites.

Action	Description	Performance Criteria
Specific objective 4		
Manage threats to populations		
4.1	Identify disturbance regimes to maintain habitat. Responsibility: DSE	<ul style="list-style-type: none"> Identify existing flooding, burning or grazing regimes that maintain populations at Lake Goldsmith, Lake Corangamite and Lake Terangpom sites.
4.2	Control threats from pest plants and animals and vehicular traffic by preventing access, re-routing tracks, careful weeds control and fencing sites. Responsibility: DSE, PV	<ul style="list-style-type: none"> Measurable seedling recruitment/vegetative regeneration and a measurable reduction in plant mortality at Lake Goldsmith, Lake Corangamite and Lake Terangpom sites.
Specific objective 5		
Identify key biological functions		
5.1	Evaluate current reproductive/regenerative status, seed bank status and longevity, fecundity and recruitment levels. Responsibility: DSE	<ul style="list-style-type: none"> Seed bank/regenerative potential quantified for target populations.
5.2	Determine seed germination requirements by conducting laboratory and field trials aimed to identify key stimuli and determine stimuli for vegetative regeneration. Responsibility: DSE	<ul style="list-style-type: none"> Stimuli for recruitment/regeneration identified. Management strategies identified to maintain, enhance or restore processes fundamental to reproduction and survival.
Specific objective 6		
Determine the growth rates and viability of populations		
6.1	Measure population trends and responses against recovery actions by collecting demographic information including recruitment and mortality, timing of life history stages and morphological data. Responsibility: DSE	<ul style="list-style-type: none"> Techniques for monitoring developed and implemented. Census data for target populations.
6.2	Collate, analyse and report on census data and compare with management histories. Responsibility: DSE	<ul style="list-style-type: none"> Population growth rates determined and Population Viability Analysis completed for target populations.

Action	Description	Performance Criteria
Specific objective 7		
Establish populations in cultivation		
7.1	Establish cultivated plants <i>ex situ</i> for inclusion in living collections to safeguard against any unforeseen destruction of wild populations. Responsibility: DSE, RBG	<ul style="list-style-type: none"> • Development of effective propagation and cultivation techniques. • At least 25 mature plants in cultivation.
7.2	Establish a seed bank and determine seed viability. Responsibility: DSE, RBG	<ul style="list-style-type: none"> • Long-term storage facility identified. • Seed from target populations in storage.
Specific objective 8		
Build community support for conservation		
8.1	Identify opportunities for community involvement in the conservation of <i>Poa salacustris</i> . Responsibility: DSE	<ul style="list-style-type: none"> • Presentation(s) to community nature conservation groups.

Abbreviations

DSE	Department of Sustainability and Environment, Victoria
PV	Parks Victoria
RBG	Royal Botanic Gardens, Melbourne

Management Practices

The philosophy of the strategy for recovery is habitat conservation, restoration and management combined with an understanding of the ecological and biological requirements of *Poa sallacustris*. The emphasis is on using knowledge to better implement *in situ* management techniques that protect populations and promote regeneration and recruitment. To achieve this, recovery actions are primarily structured (i) acquire baseline data, (ii) assess habitat condition including ecological and biological function, (iii) protect populations to maintain or improve population growth and (iv) to engage the community in recovery actions.

On-ground site management will aim to mitigate threatening processes and thereby ensure against extinction. Major threats requiring management include accidental destruction, competition from pest plants and grazing by pest animals. A range of strategies will be necessary to alleviate these threats including weed control, fencing, and control of pest animals.

Broadscale protection measures applicable to all populations include legal protection of sites, habitat retention and liaison with land managers including private landholders. In addition, searches of known and potential habitat should continue to better define the distributions and size of populations.

The Recovery Plan also advocates strategies to fill some of the major gaps in our knowledge to date. These include an understanding of the mechanisms underlying recruitment and regeneration. Successful *in situ* population management will be founded on understanding the relationships between *Poa sallacustris* and associated flora, and its response to environmental processes. These are directly linked to biological function and are thus vital to recovery. Demographic censusing will be necessary to gather life history information and to monitor the success of particular management actions.

In addition to the above, *ex situ* conservation measures will be required and will include seed storage and plant cultivation. Cultivating *ex situ* populations will also aim to increase the amount of seed available for reintroduction to sites.

Community participation in recovery actions will be sought, particularly in regard to recovery team membership and implementation of on-ground works.

To reduce the likelihood of unforeseen development activities negatively impacting upon *Poa sallacustris*, the threatened flora team should seek relevant information on its distribution, ecology and/or habitat to relevant land managers. Such increased awareness should allow new populations to be found if they exist, and improve the likelihood of adequate searches being made during environmental impact assessments.

Affected interests

Most important populations of *Poa sallacustris* occur on land managed by Parks Victoria, who have approved the actions outlined in this Recovery Plan, subject to the availability of sufficient funding. At least one important population occurs on private land, and owners/managers of that property will be contacted when negotiations for land conservation take place.

Role and interests of indigenous people

Indigenous communities on whose traditional lands *Poa sallacustris* occurs will be advised, through the relevant DSE Regional Indigenous Facilitator, of the preparation of this Recovery Plan and invited to provide comments if so desired. Indigenous communities will be invited to be involved in the implementation of the Recovery Plan.

Benefits to other species/ecological communities

The Recovery Plan includes a number of potential biodiversity benefits for other species and vegetation communities in Victoria. Principally, this will be through the protection and management of habitat. The adoption of broad-scale management techniques and collection of baseline data will also benefit a number of other plant species growing in association with *Poa sallacustris*, particularly those species with similar life forms and/or flowering responses.

The Recovery Plan will also provide an important public education role as threatened flora have the potential to act as 'flagship species' for highlighting broader nature conservation and biodiversity issues such as land clearing, grazing, weed invasions and habitat degradation.

Social and economic impacts

The implementation of this Recovery Plan is unlikely to cause significant adverse social and economic impacts. Most important populations of *Poa sallacustris* occur on land managed by Parks Victoria, and protection measures will have no impact on recreational activities currently occurring at those sites. Protection of populations on private land will be achieved through negotiation with and assistance to private landowners.

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Bibliography

- DEH 2000. *Revision of the Interim Biogeographic Regionalisation of Australia (IBRA) and the Development of Version 5.1. - Summary Report*. Department of the Environment and Heritage, Canberra.
- Walsh, N.G. 1991. New taxa in Victorian Poaceae. *Muelleria* 7(3): 379–387.
- Walsh, N.G. and Entwisle, T.J. 1994. *Flora of Victoria. Volume 2: Ferns and Allied Plants, conifers and Monocotyledons*. Inkata Press, Melbourne.

Priority, Feasibility and Estimated Costs of Recovery Actions

Action	Description	Priority	Feasibility	Responsibility	Cost estimate					
					Year 1	Year 2	Year 3	Year 4	Year 5	Total
1	Conservation status									
1.1	Collect baseline data	1	100%	DSE	\$10,000	\$0	\$0	\$0	\$0	\$10,000
2	Habitat requirements									
2.1	Survey known habitat	1	100%	DSE	\$20,000	\$0	\$0	\$0	\$0	\$20,000
2.2	Identify, survey potential habitat	1	75%	DSE	\$20,000	\$0	\$0	\$0	\$0	\$20,000
3	Legal protection of habitat									
3.1	Protect public land habitat	1	75%	DSE, PV	\$0	\$10,000	\$10,000	\$0	\$0	\$20,000
3.2	Protect private land habitat	1	50%	DSE	\$0	\$10,000	\$10,000	\$0	\$0	\$20,000
4	Manage threats									
4.1	Identify disturbance regimes	2	75%	DSE	\$0	\$10,000	\$10,000	\$0	\$0	\$20,000
4.2	Control threats	1	75%	DSE, PV	\$10,000	\$8,000	\$8,000	\$4,000	\$4,000	\$34,000
5	Identify key biol. functions									
5.1	Evaluate reproductive status	3	75%	DSE	\$12,000	\$12,000	\$0	\$0	\$0	\$24,000
5.2	Seed germination	3	75%	DSE	\$10,000	\$10,000	\$0	\$0	\$0	\$20,000
6	Growth rates, pop. viability									
6.1	Conduct censusing	3	100%	DSE	\$15,000	\$15,000	\$15,000	\$15,000	\$15,000	\$75,000
6.2	Collate, analyse and report	3	100%	DSE	\$1,000	\$1,000	\$1,000	\$1,000	\$5,000	\$9,000
7	Establish pops. in cultivation									
7.1	Establish cultivated plants	2	50%	DSE, RBG	\$0	\$6,000	\$6,000	\$6,000	\$6,000	\$24,000
7.2	Establish a seed bank	2	50%	DSE, RBG	\$0	\$4,000	\$4,000	\$4,000	\$4,000	\$16,000
8	Education, communication									
8.1	Community extension	2	100%	DSE	\$6,000	\$6,000	\$6,000	\$6,000	\$6,000	\$30,000
TOTALS					\$104,000	\$92,000	\$70,000	\$36,000	\$40,000	\$342,000