National Recovery Plan for the Swamp Everlasting *Xerochrysum palustre*

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This Recovery Plan has been developed with the involvement and cooperation of a range of stakeholders, but individual stakeholders have not necessarily committed to undertaking specific actions. The attainment of objectives and the provision of funds may be subject to budgetary and other constraints affecting the parties involved. Proposed actions may be subject to modification over the life of the plan due to changes in knowledge.

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Summary

The Swamp Everlasting *Xerochrysum palustre* is a relatively large, yellow-flowered native daisy growing in seasonal or permanent wetland habitats. The species is endemic to south-eastern Australia, where it occurs in Victoria, Tasmania, and New South Wales. There are about 35 wild populations containing in excess of 10,000 plants. Major threats to populations include wetland drainage and modification, weed invasion, grazing and climate change. The Swamp Everlasting is listed as Vulnerable under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (listed as *Bracteantha palustris*). *Xerochrysum palustre* is listed as threatened under the Victorian *Flora and Fauna Guarantee Act 1988*.This national Recovery Plan for the Swamp Everlasting 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 Swamp Everlasting *Xerochrysum palustre* (formerly known as *Bracteantha palustris*) is a perennial, erect herb growing to 30–100 cm tall. Leaves are narrow, alternate, sessile, partially stem clasping and lanceolate, to 10 cm x 8 mm, and more or less hairless except for cobweb-like hairs along their margins. The large yellow 'daisy' flowers are up to 50 mm across, terminal at the ends of branches, and consist of numerous small tubular florets in a central 'button', surrounded by a ray of numerous overlapping, broad papery bracts. Flowering occurs from November to March. The fruit is a narrow dry seed to 3 mm long with a crown of yellow bristles about twice as long as the seed. Plants are rhizomatous in habit (description from Flann 1998; Walsh & Entwisle 1999).

Distribution

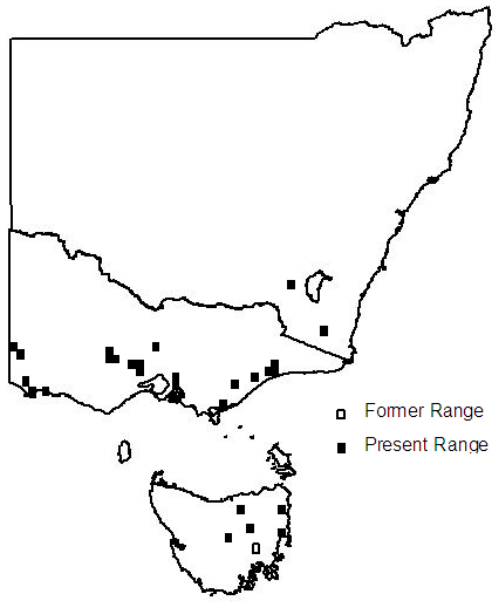

Figure 1. Distribution of Swamp Everlasting in south-eastern Australia

The Swamp Everlasting is endemic to south-eastern Australia, where it is widely distributed from south eastern New South Wales through Victoria to north-eastern Tasmania. It occurs in the following IBRA Bioregions (*sensu* DEH 2000): Naracoorte Coastal Plain, Victorian Volcanic Plain, Victorian Midlands, South East Coastal Plain, South Eastern Highlands, Australian Alps, Tasmanian Northern Midlands and Tasmanian South East.

In New South Wales it occurs as far north as the Southern Tablelands and ranges up to about 1300 m altitude. In Victoria, the species is widely but patchily distributed from the South Australian border to near Bairnsdale, generally below 500 m altitude (Walsh & Entwisle 1999). In Tasmania, the species occurs patchily in the Northeast, East Coast and the Central Highlands, up to 500 m altitude. Maps showing the detailed distribution of the Swamp Everlasting are available from each state nature conservation agency.

Population Information

About 35 populations of Swamp Everlasting are known, with a total abundance estimated at over 10,000 plants. However, the rhizomatous habit and dense clumps with large numbers of stems within clumps makes estimating numbers of plants difficult. In some instances, estimates of abundance have been based on area (square metres) rather than number of individuals. Plant numbers in Victoria have been estimated at 5,000–10,000 (N. Walsh unpubl data 2006). There is incomplete population information from NSW, although there are apparently numerous but sparsely distributed populations throughout escarpment swamps west of the Bega Valley, usually in patches of less than 100 m^2 (Miles 2003). There is also incomplete population information from Tasmania, with the majority of populations discovered during recent flora surveys. Determining populations important to the survival of *X. palustre*, including identifying populations that represent the full geographic and genetic range of this species, is an important objective in this Recovery Plan.

Significant populations of Swamp Everlasting in New South Wales and Victoria occur in the following locations:

NSW

- Kosciuszko National Park (Alpine Creek, Boggy Plain, Rocky Plain): 100 plants (2004)
- South East Forests National Park (Packers Swamp, Nunnock Swamp): 1000 plants (2010)
- Wadbilliga National Park (Wildflower Swamp, Bega Swamp): locally common (2003)
- Tantawangalo State Forest: 100 plants (2003)
- Badja State Forest: abundance not known

VIC

- French Island National Park, Long Swamp; 60 plants (2008).
- French Island National Park, Mt Wellington Road: 700 plants (2008)
- Blond Bay Wildlife Reserve: 150 plants (2008) and 500 plants (2005)
- Gisborne Racecourse Reserve: abundance not known
- Saplings Morass Flora & Fauna Reserve: 6000 plants (2008), 2000 plants (2005)
- Gellions Run, south west of Yarram: abundance not known
- Lal Lal Rail Reserve: 5 plants (2008) and 150 plants (2001)
- Doling Doling Swamp Reserve; abundance not known
- McCutchens Rd Swamp, east of Cavendish (private land): abundance not known
- Chepstowe-Pittong Rd, west of Snake Valley (private land): 1000 plants (2002)
- Limestone Creek (upstream): 1000 plants (2006)
- South Gippsland Hwy, near pipeline track: 200 plants (2009)

TAS

- Friendly Beaches Road, Freycinet National Park: abundance not known (2010).
- Smiths Lagoon, Cleveland (private property covered by conservation covenant under the Tasmanian *Nature Conservation Act 2002*): two discrete patches each occupying approximately 100 to 200 m^2 (2011).
- North of Priory, adjacent to Ansons Bay Road (ECOtas 2009): locally common (2009).
- Bells Marsh (southern section) (ECOtas 2009): large population (2009).
- Powers Rivulet tributary, south of Bass Hwy, along Ericson Road (ECOtas 2009): large population, with tens of rhizomatous rosettes in each patch (2009)
- Thomas Creek catchment (ECOtas 2009): localised population (2009)

- South Lagoon, 6.5 km west South-west from Longford (Flann 1998): abundance not known (1986, 1985)
- Big Den, Lake River (private property covered by conservation covenant under the Tasmanian *Nature Conservation Act 2002):* abundance not known (1990)
- Thompson Marshes, Douglas River, Douglas-Apsley National Park: abundance not known (1980)

Habitat

As its common name suggests, the Swamp Everlasting grows in wetlands including sedge-swamps and shallow freshwater marshes, often on heavy black clay soils. Commonly associated genera include *Amphibromus*, *Baumea*, *Carex*, *Chorizandra, Craspedia*, *Eleocharis*, *Isolepis*, *Lachnagrostis*, *Lepidosperma*, *Myriophyllum*, *Phragmites, Themeda and Villarsia.* Plants have been seen growing in 1 m depth of water on French Island (C. Gordes pers. comm. 2006). The species will also grow in more marginal wetland habitats such as seasonally wet areas of native grassland and heath communities. At higher altitudes in NSW it also grows in Sphagnum moss bogs (Miles 2003). Recovery actions include survey and mapping of habitat that will lead to the identification of habitat critical to the survival of the species.

Threats

The Swamp Everlasting was almost certainly more widespread and abundant prior to European settlement, but populations have probably been substantially fragmented and depleted by wetland drainage and modification. The scattered and sparse distribution of populations across Victoria especially, is undoubtedly a legacy of extensive drainage of wetlands for agriculture. Some wetlands have been totally lost and many that remain have been affected by one or more degrading processes. The main process contributing to wetland loss and degradation in Victoria has been total or partial drainage, and 37% of the State's natural wetland area has been lost in this way (NRE 2000). This decline has been especially severe in shallow wetlands, the preferred habitat of *X. palustre*, with over 90% of this habitat type lost being lost in some parts of the State such as the northern irrigation regions, and the loss has been especially severe on private land (NRE 2000). This decline is almost certainly continuing, especially on private land. Even populations on secure tenure such as in national parks and conservation reserves still face many threats. The main threats to the species are summarised as follows:

Disruption to hydrology: Draining or modification to wetlands containing *X. palustre* has undoubtedly reduced population numbers, and still threatens available habitat and long-term persistence of populations. For example, Blue Gum plantations near wetlands may lower the water table.

Weed invasion: Major weeds in *X. palustre* habitat include Ragwort *Senecio jacobaea*, Spear Thistle *Cirsium vulgare*, Blackberry *Rubus fruticosus* species aggregate and Canary Grass *Phalaris* species. Chemical control of weed species may also impact on *Xerochrysum palustre*.

Road or rail works: Maintenance works may damage sites along road and rail sides. A site at Dorset Rd, Bayswater North in Victoria occurs in the path of the proposed Healesville Freeway.

Grazing: Grazing by kangaroos, rabbits, cattle, feral horses, pigs and deer occurs across the range of the species. Grazing is likely to be more severe during dry years when plants are more accessible to herbivores as water levels drop.

Ploughing: Ploughing threatens populations on private land, affecting an estimated 5% of known occurrences in Victoria (N. Walsh, pers. comm. 2011).

Mining: Mining for brown coal is a potential threat to the Gellions Run site in Victoria.

Climate change: The effects of climate change potentially threaten many, if not all, sites where *X. palustre* occurs. Increased temperatures and decreased rainfall expected with global warming will probably lead to further loss of habitat, as shallow ephemeral wetlands will be especially at risk through reduced rainfall, plus higher temperatures leading to higher evaporation rates. Loss of climatic habitat caused by anthropogenic emissions of greenhouse gases is listed as a Key Threatening Process under the EPBC Act.

Specific threats to significant populations in New South Wales and Victoria are summarised as follows:

NSW

- Kosciuszko National Park: damage by feral horses.
- South East Forests National Park: damage by feral animals (pigs, deer) and occasionally straying domestic livestock. Pig and deer presence encourages shooters who are inclined to drive their vehicles across the drier parts of the swamps. Weed invasion.
- Wadbilliga National Park: damage and grazing by feral animals (pigs, deer, horses, cattle), weed invasion.
- Tantawangalo State Forest:pig and deer grazing.
- Badja State Forest: lease of swamps for livestock grazing, other threats unknown.

VIC

- Blond Bay Wildlife Reserve: grazing by kangaroos, rabbits and hog deer, weed invasion.
- Saplings Morass Flora & Fauna Reserve: weed invasion, disruption to hydrology.
- Gellions Run: possibly livestock grazing, mining.
- McCutchens Rd Swamp, east of Cavendish: drying of swamp, change in grazing regime, hydrological changes via nearby Blue Gum plantation.
- Lal Lal Rail Reserve: weed invasion, rail works and pipeline works.
- Doling Doling Swamp: weed invasion, soil disturbance by worm diggers and altered hydrology.

Recovery Information

Overall Objective

The **overall objective** of recovery is to minimise the probability of extinction of *Xerochrysum palustre* 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 *Xerochrysum palustre* are to:

1. Acquire information on population abundance and trends for management and conservation
2. Identify habitat that is critical, common or potential.
3. Ensure that key populations and their habitat are protected and managed appropriately.
4. Identify and manage threats to populations.
5. Identify key biological characteristics.
6. Monitor the growth response and viability of populations to allow adaptive management.
7. 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 relevant nature conservation agency in each State.

Program Evaluation

This Recovery Plan will be reviewed within five years of the date of its adoption under the EPBC Act by State agencies responsible for implementation.

Recovery Actions and Performance Criteria

Action	Description	Performance Criteria
Specific Objective 1: Acquire information on population abundance and trends for management and conservation		
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. Provide information to appropriate state, local government and other groups **Responsibility: DSE, OEH, DPIPWE**	• Determination or update of conservation status for inclusion on state and national threatened species lists. • Populations accurately mapped. • Significant populations identified.
Specific Objective 2: Identify habitat that is critical, common or potential		
2.1	Accurately survey known habitat and collect floristic and environmental information relevant to community ecology and condition. **Responsibility: DSE, OEH, DPIPWE**	• Habitat critical to survival mapped. • Determination of immediate threats to important populations.
2.2	Identify and survey potential habitat, using ecological and bioclimatic information that may indicate habitat preference. **Responsibility: DSE, OEH, DPIPWE**	• Predictive model for potential habitat developed and tested.
Specific Objective 3: Ensure that key populations and their habitat are legally protected		
3.1	Protect populations on public land. **Responsibility: DSE, OEH**	• Public Authority Management Agreements under the *FFG Act* 1988 at Gellions Run and Lal Lal Rail Reserve negotiated.
3.2	Protect populations on private property. **Responsibility: DSE, DPIPWE**	• Private land management agreements in consultation with private land owners under the *Victorian Conservation Trust Act* 1972, *The Conservation, Forests and Lands Act* 1987 and the *Wildlife Act* 1975 at McCutchens Rd Swamp, east of Cavendish and Chepstowe-Pittong Rd, west of Snake Valley initiated. • Private land management agreements for significant populations in Tasmania.

Action	Description	Performance Criteria
Specific objective 4: Manage threats to populations		
4.1	Identify ecological management regimes to maintain species' habitat. **Responsibility: DSE**	• Preparation of management prescriptions for ecological burning or flooding at French Island NP, Long Swamp and Gellions Run, south west of Yarram in Victoria.
4.2	Control threats from pest plants and animals, and livestock, by preventing access (usually via fencing sites), extremely careful use of herbicides, hand removal of weeds, and erecting appropriate signage. **Responsibility: PV, OEH, DSE, DPIPWE**	• Identify and manage threats for significant populations in Tasmania. • Installation of appropriate signage at Gellions Run and Lal Lal Rail Reserve in Victoria. • Fencing habitat to exclude grazing (ie. swamps or wetlands) at Blond Bay Wildlife Reserve and manage to prevent over-accumulation of biomass. • Pig and deer control and removal of stray domestic stock at important populations in South East Forest and Wadbilliga National Parks. • Weed eradication programs devised and implemented at Blond Bay Wildlife Reserve, Saplings Morass Flora & Fauna Reserve and Lal Lal Rail Reserve, in Victoria. • Measurable seedling recruitment/vegetative regeneration and a measurable reduction in plant mortality. • Negotiate with Forests NSW to exclude domestic grazing from significant populations.
Specific objective 5: Identify key biological characteristics		
5.1	Evaluate current reproductive/regenerative status by determining seed bank status and recruitment levels. **Responsibility: DSE, OEH, DPIPWE**	• Seed bank/regenerative potential quantified for each population.
5.2	Determine seed germination requirements by conducting laboratory and field trials aimed to identify key stimuli. **Responsibility: DSE**	• Stimuli for recruitment/regeneration identified. • Management strategies identified to maintain, enhance or restore regenerative processes.

Action	Description	Performance Criteria
Specific objective 6: Monitor the growth response and viability of populations to allow adaptive management		
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**	• Techniques for monitoring developed and implemented. • Annual census data.
6.2	Collate, analyse and report on census data and compare with management histories. **Responsibility: DSE**	• Population growth rates determined for important populations.
Specific objective 7: Build community support for conservation		
7.1	Promote community involvement in the conservation of *X. palustre*. **Responsibility: DSE**	• Presentation(s) to community nature conservation groups.

Abbreviations

DSE	Department of Sustainability and Environment, Victoria
PV	Parks Victoria
RBG	Royal Botanic Gardens, Melbourne
OEH	Office of Environment and Heritage, New South Wales
DPIPWE	Department of Primary Industries, Parks, Water and Environment, Tasmania

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 *Xerochrysum palustre*. 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 to (i) acquire baseline data, (ii) assess habitat condition including ecological and biological function (iii) protection to maintain or improve viability of populations 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 competition from pest plants, and grazing by pest animals and livestock. 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. Information on distribution, ecology and habitat needs to be provided to land managers to reduce the likelihood of unforseen development activities negatively impacting upon *X. palustre*.

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

Affected interests

Populations of *Xerochrysum palustre* occur on a variety of land tenures and consequently management is the responsibility of a range of land owners and managers including DSE, PV, DPIPWE, OEH, Forests NSW, Forestry Tasmania, the University of Melbourne, VLine (Victoria), Shire of East Gippsland, Shire of Southern Grampians, Shire of Casey, City of Mooroondah and private landholders. Managers of private land populations will be contacted by the designated project officer upon implementation of this recovery plan where appropriate.

Role and Interests of Indigenous People

Indigenous communities on whose traditional lands *Xerochrysum palustre* occurs have been advised, through the relevant regional Indigenous facilitator, of this Recovery Plan and invited to comment and be involved in the implementation of the Recovery Plan.

Biodiversity Benefits

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 *Xerochrysum palustre*, 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. Many populations occur on public land under a variety of tenures, including national park, conservation reserve, state forest and roadside reserve. Protection measures (where required) for these populations will have minimal impact on current recreational or commercial activities. Conservation of populations on private land will be achieved by negotiation with landholders and assistance where required.

Acknowledgments

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Bibliography

Bell, P. (2006). Personal communication. Department of Primary Industries, Parks, Water and Environment, Hobart, Tasmania.

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.

ECOtas (2009). Extension surveys for *Hibbertia rufa* (brown guineaflower) in Northern Tasmania. A report to the Northern Tasmanian Natural Resource Management Association Inc. by Environmental Consulting Options Tasmania.

Flann, C. 1998. *Bracteantha palustris* (Asteraceae: Gnaphalieae), a new species in Victoria and Tasmania. *Muelleria* 11: 97–100.

Gordes, C. (2006). Personal communication. State Forests of New South Wales, Government of New South Wales, Beecroft.

Miles, J. 2003. *Survey of* Xerochrysum palustre *populations of escarpment bogs.* Unpublished report to NSW DEC.

NRE 2000. *Victoria's Biodiversity: Directions in Management*. Department of Natural Resources and Environment, Victoria.

N. Walsh (2006), Unpublished data, Actions for Biodiversity Conservation Information System. Department of Sustainability and Environment, Melbourne, Victoria.

N. Walsh (2011). Personal communication. Royal Botanic Gardens, Melbourne, Victoria.

Walsh, N.G. and Entwisle, T.J. 1999. *Flora of Victoria, Vol 4: Dicotyledons: Cornaceae to Asteraceae*. 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 OEH DPIPWE	$75,000	$0	$0	$0	$0	$75,000
2	**Habitat requirements**									
2.1	Survey known habitat	1	100%	DSE OEH DPIPWE	$90,000	$0	$0	$0	$0	$90,000
2.2	Identify, survey potential habitat	1	75%	DSE OEH DPIPWE	$60,000	$0	$0	$0	$0	$60,000
3	**Legal protection of habitat**									
3.1	Protect public land habitat	1	75%	DSE OEH	$0	$30,000	$30,000	$0	$0	$60,000
3.2	Protect private land habitat	1	50%	DSE	$0	$50,000	$50,000	$0	$0	$100,000
4	**Manage threats**									
4.1	Identify disturbance regimes	2	75%	DSE	$0	$30,000	$30,000	$0	$0	$60,000
4.2	Control threats	1	75%	PV DSE OEH	$10,000	$75,000	$75,000	$50,000	$40,000	$250,000
5	**Identify key biol. characteristics**									
5.1	Evaluate reproductive status	3	75%	DSE OEH DPIPWE	$30,000	$30,000	$0	$0	$0	$60,000
5.2	Seed germination	3	75%	DSE	$30,000	$30,000	$0	$0	$0	$60,000
6	**Growth rates, pop. viability**									
6.1	Conduct censusing	3	100%	DSE	$45,000	$45,000	$45,000	$45,000	$45,000	$225,000
6.2	Collate, analyse and report	3	100%	DSE	$6,000	$6,000	$6,000	$6,000	$15,000	$39,000
7	**Education, communication**									
7.1	Community extension	2	100%	DSE	$18,000	$18,000	$18,000	$18,000	$18,000	$72,000
	TOTAL				**$376,000**	**$326,000**	**$266,000**	**$131,000**	**$130,000**	**$1,211,000**