National Recovery Plan for the Yellow Swainson-pea *Swainsona pyrophila* 

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Australian Government



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## Summary

The Yellow Swainson-pea *Swainsona pyrophila* is a short-lived, fire-adapted species that occurs in mallee vegetation communities in inland south-eastern Australia, where it is widely distributed from the northern Eyre Peninsula, South Australia, east to north-western Victoria and western New South Wales. The number and size of populations is unknown. It only appears above ground for a few years after fire, and there are currently no above-ground populations known, with the species surviving as seed in the soil. Current threats are not well known, although considerable areas of habitat have been cleared within its range, and altered fire frequency and intensity may impact on germination and growth. The Yellow Swainson-pea is listed as Vulnerable under the Commonwealth *Environment Protection and Biodiversity Conservation Act* 1999. This national Recovery Plan for the Yellow Swainson-pea is the first recovery plan for the species, and presents known information on the species' distribution and biology, as well as its conservation status, threats, and recovery objectives and actions necessary to ensure its long-term survival.

## **Species Information and General Requirements**

#### Description

The Yellow Swainson-pea *Swainsona pyrophila* is an erect, mostly glabrous, short-lived shrub growing to one metre tall. The pinnate leaves have 15–20 obovate to oblong leaflets 5–25 mm long and 4–12 mm wide. Large broadly ovate stipules up to 15 mm long and 10 mm wide are almost leaf-like. The yellow pea flowers (sometimes with reddish-brown suffusions) are about 10 mm long and 12 mm wide and held in erect racemes of 15–20 flowers. Pods are inflated, crescent-shaped to broadly ellipsoid, 20–30 mm long and 10–15 mm wide, with up to 14 small brown seeds to 2 mm long (description from Harden 1991; Walsh & Entwisle 1996).

Little is known about the species' ecology or biology. It is apparently adapted to flower after fire and subsequent rain, which stimulate seed germination and growth. Plants will flower in their first year, from July to October, but often only live for two years after fire. It then survives as seed in the soil, waiting for a subsequent fire to stimulate germination and growth again. Some disturbance such as maintenance activities along roadside and rail reserves is thought to influence *Swainsona* germination and survival (Earl *et. al.* 2003). Some *S. pyrophila* records on the Eyre Peninsula (SA) were apparently associated with areas of soil disturbance such as firebreaks and roadsides (K. Pobke UniSA pers. comm.), so disturbance may also be a factor in germination.

#### Distribution

The Yellow Swainson-pea occurs from the northern Eyre Peninsula east to north-western Victoria and south-western and central-western New South Wales (Figure 1), generally within the 250–400 mm rainfall zone. The species occurs in the following IBRA bioregions (*sensu* DEH 2000): Eyre-Yorke Block (SA), Naracoorte Coastal Plain (SA), Murray-Darling Depression (SA, Vic, NSW) and Darling Riverine Plains (NSW). Maps showing the detailed distribution of the Yellow Swainson-pea are available from each State environment agency. The Yellow Swainson-pea was once included in *Swainsona laxa*, another yellow-flowered species generally occurring further north and in more open vegetation types. It is likely that some records of *S. pyrophila* from further inland are erroneous, resulting from mid-identifications of *S. laxa*. *Swainsona laxa* has much smaller leaflets (to 12 mm long and 7 mm wide) than S. pyrophila.

#### Habitat

The Yellow Swainson-pea occurs in mallee vegetation communities on a variety of soil types including well-drained sands, sandy loams and heavier clay loams. The only detailed habitat information is from South Australia, where the species was recorded from mallee woodland with *Eucalyptus* species including *E. brachycalyx*, *E. calycogona*, *E. dumosa*, *E. gracilis*, *E. incrassata*, *E. leptophylla*, *E. oleosa* and *E. socialis*, sometimes with Broombush *Melaleuca uncinata* tall shrubland. There are some records apparently from riverine vegetation

communities, although these are believed to be in error. Recovery actions include survey for common and potential habitat that will lead to the identification of habitat critical to the survival of the species.



Figure 1. All recorded occurrences of Swainsona pyrophila

### **Population Information**

The number and size of populations of Yellow Swainson-pea is unknown, as there are currently no known above-ground populations. Seedbank abundance and persistence is unknown. Important populations of the species are believed to occur in the following reserves: Hattah-Kulkyne and Murray-Sunset National Parks (Vic); Hambidge, Munyaroo, Heggaton and Messent Conservation Parks (SA); and Nombine Nature Reserve (NSW).

### **Decline and Threats**

As Yellow Swainson-pea is only recorded after fire, and no populations have been seen in recent years, few accurate location records exist. Consequently it is difficult to identify threats to specific populations. Populations occurring within protected habitat are believed to be at relatively low risk, but there is nothing known about current persistence. However, the above-ground appearance of most (if not all) of the population (from the soil-stored seedbank) in the same 1–2 year period after fire may make a population particularly susceptible to some high intensity activities (either natural or imposed) at this time.

It is not known if mechanical disturbance of the soil within a population triggers significant germination, as can occur in some other native legumes.

Many records of Yellow Swainson-pea are decades old, and some populations occurring in areas where habitat has since been cleared may well have been lost. Some habitat within the species' range is still being cleared for agriculture and open-cut mining developments. Repeated burning and associated fire management activities on short rotations may be a threat, through depletion of the soil seedbank. Very long periods between fires may also be a threat as the seed may not remain viable for long periods. The impact of grazing is poorly understood but heavy grazing after fire may be a considerable threat, as plants may not be able to flower and set seed.

## **Recovery Information**

#### **Recovery Objectives**

The **Overall Objective** of recovery is to minimise the probability of extinction of the Yellow Swainson-pea in the wild and to increase the probability of important populations becoming self-sustaining in the long term. Within the period of this Recovery Plan, the **Specific Objectives** of recovery for Yellow Swainson-pea are to:

- 1. Determine distribution and abundance
- 2. Identify habitat requirements
- 3. Ensure that all populations and their habitat are protected and managed appropriately
- 4. Manage threats to populations
- 5. Identify key biological characteristics
- 6. Determine life history and viability of populations
- 7. Maintain an ex situ seedbank
- 8. Build community support for its conservation

Most of these objectives are reliant on suitable fires within the habitat of the Yellow Swainsonpea. In the absence of such fire during the period of this Recovery Plan, these objectives will need to be carried over into the next Recovery Plan period.

#### **Program Implementation and Evaluation**

This Recovery Plan guides recovery actions for the Yellow Swainson-pea and will be implemented and managed by the Department for Environment and Heritage (for South Australia), the Department of Sustainability and Environment (for Victoria) and the Department of Environment, Climate Change and Water (for New South Wales), supported by other agencies, educational institutions, regional natural resource management authorities and community groups as appropriate. Technical, scientific, habitat management or education components of the Recovery Plan will be referred to specialist groups on research, *in situ* management, community education and cultivation as required. Contact will be maintained between the State agencies on recovery issues concerning recovery of the Yellow Swainson-pea.

The unpredictability of occurrence of Yellow Swainson-pea is likely to pose major difficulties in the implementation some of the actions listed in this Recovery Plan. The 'window of opportunity' in which to gain data on the species following suitable fire events is short, and similar occasions might not arise again for many years. The availability of resources needs to be responsive to suitable fire events, and take advantage of the short period of time in which to collect data and undertake recovery actions for this species.

The Recovery Plan will run for five years from the date of its adoption under the EPBC Act, and will be reviewed and revised within five years of the date of its adoption.

# **Recovery Objectives, Actions and Performance Criteria**

No.	Action		Performance Criteria				
Specific Objective 1: Determine distribution and abundance							
1.1	Clarify the identity of herbarium records from NSW to assist in developing an accurate assessment of distribution.	•	Correct identifications and updated distribution records.				
	Responsibility: DECCW						
1.2	Search recently burnt areas of suitable habitat to determine population presence.	٠	Surveys determine ongoing presence/ number of plants.				
	Responsibility: DSE/DECCW/DEH						
1.3	Map newly located populations.	٠	Population maps prepared and used in conservation				
	Responsibility: DSE		management.				
Specific	Objective 2: Identify habitat requirements						
2.1	Survey known habitat and collect floristic and environmental information describing community ecology and condition where there is detailed locality information.	٠	Habitat critical for survival identified and defined.				
	Responsibility: DSE/DECCW/DEH						
2.2	In the event of fire within the species habitat, collect floristic and environmental information describing community ecology and condition.	•	Predictive model for potential habitat developed and tested.				
	Responsibility: DSE/DECCW/DEH						
2.3	Map areas of known important and potentially suitable habitat.	٠	Habitat critical for survival and potential habitat mapped.				
	Responsibility: DSE/DECCW/DEH						
Specific	Objective 3: Ensure that all populations and their habitat are protected and manag	jed a	ppropriately				
3.1	Develop and incorporate conservation actions for populations in relevant park or reserve management plans, where detailed locality information is known.	•	Actions to protect species incorporated in relevant management plans.				
	Responsibility: DSE/PV/DECCW/DEH						
3.2	Initiate private land management agreements in consultation with private landowners using provisions within Vic, SA and NSW legislation, if populations are found on private land.	•	Effective ongoing protection for important populations on private land.				
	Responsibility: DSE/DECCW/DEH						
3.3	Develop further recovery actions and new information becomes available.	•	Recovery actions revised and developed throughout the life of				
	Responsibility: DSE/PV/DECCW/DEH		the plan.				

No.	Action	Performance Criteria					
Specific Objective 4: Manage threats to populations							
4.1	Identify fire regimes to maintain habitat.	Prescriptions prepared and implemented for fire management.					
	Responsibility: DSE/DECCW/DEH						
4.2	Control threats from pest animals after fire (if required).	A measurable reduction in the impact of pests on all sites;					
	Responsibility: DSE/PV/DECCW/DEH	Swainsona population sizes maintained (or increased) and increased seed production at treated sites.					
4.3	Incorporate known record localities, and known and modelled habitat mapping into relevant development and clearing assessment tools.	Known and potential habitat not cleared.					
	Responsibility: DSE/DECCW/DEH						
Specific Objective 5: Identify key biological characteristics							
5.1	Evaluate current soil seedbank status and viability.	• Seed bank/regenerative potential quantified for each population.					
	Responsibility: DSE/DECCW						
5.2	Determine seed germination requirements.	Stimuli for recruitment/regeneration identified.					
	Responsibility: RBG						
Specific	Objective 6: Determine life history and viability of populations						
6.1	Develop population monitoring protocols.	Techniques for monitoring developed and implemented.					
	Responsibility: DSE/DECCW/DEH						
6.2	Monitor population trends and responses against recovery actions if any populations are located post-fire.	<ul> <li>Census data collected, population growth rates determined and Population Viability Analysis completed.</li> </ul>					
	Responsibility: DSE/DECCW/DEH						
Specific	Objective 7: Maintain an <i>ex situ</i> seedbank						
7.1	Establish an ex-situ seedbank and develop seed viability profile.	At least 10 mature genetically distinct plants in cultivation.					
	Responsibility: DSE/DECCW/DEH						
Specific Objective 8: Build community support for its conservation							
8.1	Identify opportunities for community involvement in the recovery plan and implement	Presentation(s) to community nature conservation groups					
		undertaken.					
	Responsibility: DSE/DECCW/DEH						

Abbreviations: DECCW = Department of Environment, Climate Change and Water (NSW); DEH = Department for Environment and Heritage (SA); DSE = Department of Sustainability and Environment (Vic); PV = Parks Victoria; RBG = Royal Botanic Gardens, Melbourne

#### **Affected Interests**

Key agencies with an interest in the conservation of the Yellow Swainson-pea include the Department of Environment, Climate Change and Water (NSW), Department of Sustainability and Environment (Vic), Department for Environment and Heritage (SA) and Parks Victoria. Apart from the likely occurrence of Yellow Swainson-pea on conservation reserves and possibly some other public land, it is not known if the species occurs in areas of other land tenure. It is therefore not possible to identify affected interests beyond state government agencies at this time.

#### **Role and Interests of Indigenous People**

Indigenous communities on whose traditional lands the Yellow Swainson-pea occurs are being advised, through the relevant 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.

#### **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, in particular the implementation of appropriate fire regimes and post-fire management. The adoption of broad-scale management techniques and collection of baseline data may also benefit other plant species growing in association with the Yellow Swainson-pea, particularly those species with similar obligate post-fire 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. No above-ground populations of Yellow Swainson-pea are currently known, and likely areas of occurrence are on public land, much of which is managed for nature conservation.

### **Management Practices**

Until such time as the Yellow Swainson-pea is relocated again, little can be said about beneficial and detrimental management practices for the species. In general however, where accurate population locality records are known, and suitable habitat still persists at the site, management actions that could degrade or destroy habitat should be avoided. Currently, the most beneficial action for the species' conservation would be to be able to respond to fires occurring in suitable habitat by undertaking surveys and, if populations are located, to undertake demographic censusing to gather life history information in the short time available. The majority of recovery actions are wholly or partially dependent on summer wildfires occurring within suitable habitat for the species. As such, many of the actions listed may not occur during the lifespan of this Recovery Plan. The unpredictability of occurrence of suitable conditions for the implementation of many of these recovery actions is likely to pose difficulties for the funding of those actions. Availability of resources needs to be responsive to suitable fire events to take advantage of the short period of time in which to search and collect data, recognising that the window of opportunity is short and similar occasions might not arise again for many years.

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# Priority, Feasibility and Estimated Costs of Recovery Actions

Note: year for funding is indicative only, as many actions will be dependent upon suitable fires stimulating flowering and then surveys to locate populations.

Action	Description	Priority	Feasibility	Responsibility	Cost estimate					
					Year 1	Year 2	Year 3	Year 4	Year 5	Total
1	Distribution, abundance				\$0	\$0	\$0	\$0	\$0	\$0
1.1	Check herbarium records	1	100%	DECCW	\$3,000	\$0	\$0	\$0	\$0	\$3,000
1.2	Search burnt areas	2	75%	DSE/DECCW/DEH	\$15,000	\$0	\$0	\$0	\$0	\$15,000
1.3	Map populations	2	75%	DSE/DECCW/DEH	\$0	\$0	\$0	\$0	\$5,000	\$5,000
2	Habitat requirements				\$0	\$0	\$0	\$0	\$0	\$0
2.1	Survey known habitat	1	75%	DSE/DECCW/DEH	\$10,000	\$0	\$0	\$0	\$0	\$10,000
2.2	Identify, survey potential habitat	2	50%	DSE/DECCW/DEH	\$0	\$10,000	\$0	\$0	\$0	\$10,000
2.3	Map habitat	1	50%	DSE/DECCW/DEH	\$0	\$0	\$0	\$0	\$6,000	\$6,000
3	Habitat protection				\$0	\$0	\$0	\$0	\$0	\$0
3.1	Public land management plans	1	100%	DSE/DECCW/DEH	\$2,000	\$0	\$0	\$0	\$2,000	\$4,000
3.2	Private land agreements	3	50%	DSE/DECCW/DEH	\$0	\$0	\$0	\$0	\$8,000	\$8,000
3.3	Develop new recovery actions	3	25%	DSE/DEC/DEH	\$0	\$0	\$0	\$0	\$0	\$0
4	Threat management				\$0	\$0	\$0	\$0	\$0	\$0
4.1	Identify fire regimes	2	75%	DSE/DECCW/DEH	\$20,000	\$0	\$0	\$0	\$0	\$20,000
4.2	Control pest animals	2	50%	PV/DECCW/DEH	\$0	\$0	\$0	\$0	\$5,000	\$5,000
4.3	Record localities	3	25%	PV/DEC/DEH	\$0	\$0	\$0	\$0	\$0	\$0
5	Biology & ecology				\$0	\$0	\$0	\$0	\$0	\$0
5.1	Evaluate soil seedbank	2	50%	DSE/DECCW/DEH	\$0	\$0	\$8,000	\$8,000	\$0	\$16,000
5.2	Determine seed germination	2	50%	DSE/DECCW/DEH	\$0	\$0	\$0	\$0	\$5,000	\$5,000
6	Growth rates, pop. viability				\$0	\$0	\$0	\$0	\$0	\$0
6.1	Develop monitoring protocols	1	100%	DSE/DECCW/DEH	\$2,000	\$0	\$0	\$0	\$0	\$2,000
6.2	Monitor population trends	2	50%	DSE/DECCW/DEH	\$0	\$0	\$0	\$8,000	\$8,000	\$16,000
7	Seedbank				\$0	\$0	\$0	\$0	\$0	\$0
7.1	Establish ex-situ seedbank	2	50%	DSE/DECCW/DEH	\$0	\$0	\$0	\$3,000	\$3,000	\$6,000
8	Community support				\$0	\$0	\$0	\$0	\$0	\$0
8.1	Community extension	3	100%	DSE/DECCW/DEH	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$5,000
	TOTAL				\$53,000	\$11,000	\$9,000	\$20,000	\$43,000	\$136,000