

Draft Revision (2009)

Flora and Fauna Guarantee Action Statement No. 126 (part)¹

Red Swainson-pea *Swainsona plagiotropis*

Description

The Red Swainson-pea (*Swainsona plagiotropis*) is a small, prostrate to decumbent perennial herb to 30 cm tall. Its leaves are compound, 5-10 cm long with 17-23 narrow-elliptic or narrow-lanceolate leaflets up to 17 mm in length. Leaflets are sparsely hairy below and usually entirely hairless above. The inflorescence is a raceme, 15-22 cm long, with a glabrous peduncle and between 2 and 5 flowers near the apex. Flowers are bright red, eventually fading to violet, 10-15 mm long and with a characteristically sideways twisted keel. Flowering usually begins in September and finishes by the end of October, with minor geographic and seasonal variation. The hairy, ovoid fruits are 13-20 mm long and 9-10 mm broad enclosing up to 20 seeds usually maturing by late November. For more detailed descriptions see Cunningham *et al.* (1981), Leigh *et al.* (1988), Harden (1992) and Walsh & Entwisle (1996).

Distribution

Red Swainson-pea is apparently restricted to the Riverine Plains of south-eastern Australia. Most Victorian populations occur south and west of Echuca between the Loddon River floodplain and areas just to the east of the Campaspe River (all in the Riverina bioregion), with outlying records from near Warracknabeal (Murray Darling Depression bioregion) in the west and Benalla (Riverina bioregion) in the east. There are currently estimated to be some 240,000 plants occurring in approximately 57 wild populations.

Within Victoria, Red Swainson-pea is found on heavy red soils of the Northern Plains Grassland, between the Loddon and Campaspe Rivers. A significant number of Red Swainson-pea populations occur on private land and adjacent roadsides periodically used for stock movement and supplementary grazing.

Habitat

The Red Swainson-pea is found on heavy red soils and to a lesser degree on the grey clays of the Northern Plains Grassland, between the Loddon and Campaspe Rivers. Populations of Red Swainson-pea occur in relatively open grassland vegetation on red to brown clay loam and clay soils that are usually seasonally waterlogged; annual rainfall is generally within the range 350-450 mm. The vegetation is dominated by perennial native grasses, *Austrodanthonia* spp. (Wallaby-grasses), *Austrostipa* spp. (Spear-grasses) and *Enteropogon acicularis* (Spider-grass), with a range of annual and perennial herbs and scattered small shrubby bluebushes (*Maireana pentagona*, *M. excavata* and *M. humillima*). Herbs include Scaly Buttons (*Leptorhynchus squamatus*), Lemon Beauty-heads (*Calocephalus citreus*), Small Vanilla-lily (*Arthropodium minus*), Rough Burr-daisy (*Calotis scabiosifolia*), Small-flowered Goodenia (*Goodenia pusilliflora*), Common Everlasting (*Chrysocephalum apiculatum*) and the Common Sunray (*Triptilodiscus pygmaeus*).

Life history and ecology

Swainsona species are largely reascent perennials, resprouting in suitable conditions from a persistent rootstock. This gives individual plants the capacity to persist between years given suitable conditions. Growth and flowering among most species of *Swainsona* appear to be stimulated by available moisture, thus plants are most frequently observable following adequate spring rainfall.

Swainsona species, like other members of the Pea family (Fabaceae), produce hard-coated seeds which frequently require some treatment to break dormancy. It is surmised that heat treatments, including fire or extreme soil temperatures, and physical disturbances such as soil scraping which can rupture the seed coat, are required in conjunction with moisture to stimulate germination.

The foliage and flowers of Red Swainson-pea are highly palatable to grazing animals. Although Red Swainson-pea is adversely affected by intense and continuous grazing by stock, rabbits or native herbivores, particularly in spring

¹ The Red Swainson-pea was one of several Swainson-peas and Darling-peas addressed by Action Statement No. 126. That Action Statement remains current for the other taxa, but will be superseded for Red Swainson-pea by this Action Statement once it is approved.

flowering and seeding periods, it appears that light grazing at other times in their life cycle can benefit the plants. Growth of Red Swainson-pea appears to be more vigorous in sites with an open understorey, consistent with many native species in grassy ecosystems. Plants perform better in an environment where there are gaps in the herb layer, high light intensity and low competition from other plants.

Despite the abundance of seed produced by Red Swainson-pea, the incidence of recruitment by this means is believed to be irregular and not great. Scientific data on the persistence of viable seed-banks and germination of *Swainsona* seed is limited. A study by Capuano (1994) investigating seed ecology of Red Swainson-pea found that only a small proportion of seed recovered from the soil was in fact viable (1 seed from a sample of 9). Significant increases in germination of seeds treated by scarification, and in those exposed to temperatures up to 70°C, were recorded in this study, giving some support to the idea that seed treatment or disturbance is a necessary precursor to seedling recruitment in *Swainsona* species.

A number of threatened species co-occur with Red Swainson-pea, including Chariot Wheels (*Maireana cheelii*), Spiny Rice-flower (*Pimelea spinescens* spp. *spinescens*), Turnip Copper-burr (*Sclerolaena napiformis*), Slender Darling-pea (*Swainsona murrayana*) and Small Scurf-pea (*Cullen parvum*).

The Northern Plains Grasslands are recognised as a threatened community in Victoria. The community was nominated for listing as threatened under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), as “Lowland Temperate Grassland/Riverina Plains Grassland”, however the nomination lapsed before it was considered by the Threatened Species Advisory Committee.

Conservation status

National conservation status

The Red Swainson-pea has been listed as “vulnerable” under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*.

Victorian conservation status

The Red Swainson-pea has been listed as “threatened” under the *Flora and Fauna Guarantee Act 1988*.

The Red Swainson-pea is considered “endangered” in Victoria according to DSE’s *Advisory List of Rare or Threatened Plants in Victoria - 2005* (DSE 2005).

Threats

Although it is a perennial species, the Red Swainson-pea dies back to a woody rootstock during the drier months in most years. This characteristic results in the species being susceptible to competition for light (from native and exotic grasses) when re-sprouting each year. The species also seems highly responsive to seasonal moisture conditions and may not be detectable at all in some years with large numbers reappearing when better conditions occur. It is unknown if long series of years with unfavourable conditions lead to a reduction in the potential population of the first ensuing 'good' year and whether competition, overgrazing or other forms of predation (e.g. invertebrate attack) may have a more severe impact in such 'good' seasons (Tonkinson & Robinson 2004).

Unless otherwise stated, the threats listed below occur (or may occur, in the case of potential threats) at all sites. Not all threats act continuously and some may only act seasonally or under particular climatic or socio-economic conditions (Tonkinson & Robertson 2004).

<i>Standard threat</i>	<i>Source Of Threat</i>	<i>Explanation</i>
Competition	Invasion by environmental weeds	Competition from large perennial tussocks, eg. <i>Phalaris</i> , and some large annuals.
Herbivory	Animals - domestic stock	Overgrazing due to high set stocking rates.
Herbivory	Animals - introduced herbivores	Grazing by introduced herbivores, e.g. Rabbits or Hares, is a threat at some sites.
Inappropriate fire regimes	Fire - season or time	Biomass reduction through prescribed grazing or burning during active growth, flowering or fruiting.
Pollution/toxins	Agricultural chemicals / effluent	All roadside populations are prone to weed control measures such as herbicide application.
Soil disturbance (physical)	Construction/maintenance - road, rail or utility	Roads are graded annually and many plants are located on the edge of the roadside and are regularly destroyed if grading extends too

		far.
Surface water - quantity/regime	Water - level / flow changes	Reduced water level and flow may impact on the species.
Taking by humans	Collection/harvesting of target species	Inappropriate amounts of seed collection.
Weather	Weather - climate change	Altered weather patterns, particularly reduced rainfall, may impact on the species as it is highly responsive to seasonal moisture conditions.

Important populations

<i>Location name</i>	<i>Land manager</i>	<i>Catchment</i>	<i>Bioregion</i>
Roslynmead Nature Conservation Reserve (NCR).	Parks Victoria	North Central	Victorian Riverina
Terrick Terrick National Park (NP)	Parks Victoria	North Central	Victorian Riverina
Glassons Grassland	Trust For Nature	North Central	Victorian Riverina
Kotta NCR	Parks Victoria	North Central	Victorian Riverina
Hunter Flora Reserve (FR)	Parks Victoria	North Central	Victorian Riverina
Wishart's Loddon Weir Grassland	Trust For Nature	North Central	Victorian Riverina
Echuca - Serpentine Road near Mitiamo	Loddon Shire	North Central	Victorian Riverina
Fraser Road, Campaspe	Campaspe Shire Council	Goulburn-Broken	Victorian Riverina
Patho West NCR	Parks Victoria	North Central	Victorian Riverina

Other important populations include Tomara Gilgais NCR, Forbes Road Mitiamo, Mitiamo Mologa Road, Sims Road, mixed paddocks, Patho Flora and Fauna Reserve (FFR), Echuca Aerodrome, Rankins Plantation Paddock, Prairie-Rochester/Mitiamo-Elmore intersection, Kotta NCR, and Lake Boort Lake Reserve.

Past management actions

<i>Action</i>	<i>Result explanation</i>
Erect/maintain fence to exclude domestic stock	Fences were erected at relevant sites to protect the plants from droving livestock, pedestrians and vehicles.
Collect reproductive material	Seed was collected at Sims Road, Glassons Grassland, and the Hunter FR.
Apply ecological burning	Ecological burning was conducted on parts of the Echuca Aerodrome site and adjoining land. The Hunter FR was burnt on a 3-5 yearly cycle, with the most recent burn conducted in 2007.
Manage environmental weeds	The management of environmental weeds was not an issue at some sites due to the drought, however ongoing monitoring occurred. DSE worked with VicRoads to manage weeds at the Prairie-Rochester/Mitiamo-Elmore site.
Conduct survey to locate additional populations	Surveys were undertaken with Department of Primary Industries (DPI) Kerang and landholders at multiple sites to find new populations. New populations were located and one site was secured.
Liaise with government agencies	DSE regularly liaised with other government agencies including Campaspe Shire, City of Greater Bendigo and Parks Victoria to manage sites. DSE regularly liaised with VicRoads to manage the site at Prairie-Rochester/Mitiamo-Elmore. All these agencies helped to address threats to specific sites such as illegal grazing and weeds.
Liaise with private landholders	DSE regularly liaised with private landholders regarding the management of

	specific sites.
Identify weed management priorities and develop detailed plan	A weed management plan was completed for the Glassons Grassland site. This action was partially completed for other sites.
Involve community groups and volunteers in recovery activities	DSE has worked with university and TAFE students at the Glassons Grassland site. DSE has worked with a Landcare group to improve the habitat in land adjoining the Echuca Aerodrome site and have arranged for them to assist the Campaspe Shire in managing the site.
Incorporate actions to protect item into planning processes	The Forbes Road Mitiamo site was protected through the Campaspe Shire remnant vegetation plan.
Develop detailed population monitoring protocols	DSE field staff and ARI developed a demographic modelling protocol. Three model sites were established and plants were tagged at Glassons Grassland, Hunter FR and Patho West NCR.
Undertake detailed population monitoring and collect demographic information	Monitoring plots were established and detailed population monitoring was conducted at the three study sites: Glassons Grassland, Hunter FR (commenced 2005) and Patho West NCR (commenced 2007). Bi-annual monitoring of plots was undertaken, recording germination rates in July, and in September recording further germination, flowering, seed production of each plant and total numbers of plants.
Undertake periodic surveillance monitoring of populations	Populations were surveyed and information was recorded on DSE's Rare or Threatened Plant monitoring database (VROTPop) for a number of sites, including Terrick Terrick NP, Forbes Road, Sims Rd private property, Patho FFR Echuca Aerodrome, Roslynmead NCR, Prairie-Rochester/Mitiamo-Elmore intersection, and the Echuca - Serpentine Road near Mitiamo. Selected sites in the North West are in the process of being surveyed for a La Trobe University PhD study on pollination.
Promote community involvement programs (eg. Land for Wildlife, Botanic Guardians, Friends groups)	DSE has worked with Conservation Management Networks to promote the species and to help find new populations and manage current populations. DSE has worked with Landcare groups to submit a Botanical Guardians grant application, worked with local community to promote the programs, and talked with Landcare groups about the management of sites.
Negotiate voluntary acquisition or exchange of land	DSE secured the purchase of the Paradise Piggery for the protection of both Red Swainson-pea and Slender Darling-pea. This was combined with another block of purchased land to become the Patho West NCR.
Restore habitat	DSE is working with private landowners and Vic Roads to manage restoration of the Prairie-Rochester/Mitiamo-Elmore intersection site.
Propagate seedlings and/or cuttings for reintroduction or reinforcement	Seed was collected from the Fraser Road site, Campaspe in 2008. Due to drought conditions, only a small amount of viable seed was collected. Five plants were propagated at Euroa Arboretum. An <i>ex situ</i> population was established in the North West using seed collected in 2005 from Hunter FR, Sims Rd and Glassons, and germinated in 2006.

Conservation objectives

Long term objective

To ensure that the Red Swainson-pea can survive, flourish and retain its potential for evolutionary development in the wild.

Objectives of this Action Statement

- To increase the number of populations or individuals
- To improve condition of habitat
- To increase the extent of habitat

- To secure populations or habitat from potentially incompatible land use or catastrophic loss
- To increase knowledge of biology, ecology or management requirements
- To increase community awareness and support

Intended management actions

The intended management actions listed below are further elaborated in DSE's Actions for Biodiversity Conservation (ABC) system. Detailed information about the actions and locations, including priorities, is held in this system and will be provided annually to land managers and other authorities.

<i>Standard objective</i>	<i>Targets</i>	
To increase the number of populations or individuals.	<ul style="list-style-type: none"> • Populations established in cultivation and in the wild to increase the overall number of populations or individuals. 	
<i>Action</i>	<i>Details</i>	<i>Responsible agents</i>
Propagate seedlings and/or cuttings for reintroduction or reinforcement.	Maintain three existing <i>ex situ</i> populations, and continue to propagate seedlings for reintroduction.	DSE Statewide Services - North East, North West

<i>Standard objective</i>	<i>Targets</i>	
To improve condition of habitat.	<ul style="list-style-type: none"> • Measurable seedling recruitment/vegetative regeneration and measurable reduction in plant deaths achieved. 	
<i>Action</i>	<i>Details</i>	<i>Responsible agents</i>
Apply ecological burning.	Conduct environmental burns when needed on key roadside sites.	DSE Statewide Services - North West
Identify weed management priorities and develop detailed plan.	Develop weed management plan in conjunction with relevant agencies including Trust for Nature and Parks Victoria.	DSE Statewide Services - North West, Trust For Nature
Manage environmental weeds.	Manage and control environmental weeds, especially large pasture grasses, at appropriate times of the year to minimise damage to native species.	DSE Statewide Services - North West

<i>Standard objective</i>	<i>Targets</i>	
To increase the extent of habitat.	<ul style="list-style-type: none"> • Measurable increase in the extent of suitable habitat at important populations. 	
<i>Action</i>	<i>Details</i>	<i>Responsible agents</i>
Restore habitat.	Conduct rehabilitation work in conjunction with VicRoads at the Prairie-Rochester/Mitiamo-Elmore site over the next 3-5 years.	DSE Statewide Services - North West

<i>Standard objective</i>	<i>Targets</i>	
To secure populations or habitat from potentially incompatible land use or catastrophic loss.	<ul style="list-style-type: none"> • No avoidable destruction or damage of Red Swainson-pea populations and habitat. 	
<i>Action</i>	<i>Details</i>	<i>Responsible agents</i>
Incorporate actions to protect and/or manage item into Biodiversity	Continue to incorporate actions into the annual Riverina Biodiversity Action Plan.	North Central Catchment Management

Action Plans (BAPs) or other local plans.		Authority (CMA), DSE Biodiversity & Ecosystem Services
Liaise with government agencies.	Continue to liaise with government agencies including the City of Greater Bendigo, Campaspe Shire, VicRoads and Parks Victoria regarding the management of Red Swainson-pea populations on land which they manage.	DSE Statewide Services - North West
Liaise with private landholders.	Continue to liaise with private landholders where important populations occur on private land.	DSE Statewide Services - North West
Liaise with stakeholder groups.	Continue to liaise with Trust for Nature regarding the management of populations at Glassons Grassland.	DSE Statewide Services - North West

<i>Standard objective</i>	<i>Targets</i>	
To increase knowledge of biology, ecology or management requirements.	<ul style="list-style-type: none"> Demonstrable increase in knowledge of Red Swainson-pea biology, ecology or management requirements. 	
<i>Action</i>	<i>Details</i>	<i>Responsible agents</i>
Conduct survey to locate additional populations.	Undertake surveys to identify other populations that are not within the existing reserve system.	DSE Statewide Services - North West, Trust For Nature
Identify core habitat.	Accurately survey known habitat and collect floristic and environmental information describing community ecology and condition to identify core habitat.	DSE Statewide Services - North West
Undertake detailed population monitoring and collect demographic information.	Continue bi-annual population monitoring at Hunter disused rail reserve, Glassons Grassland, and Paradise Piggery to record the germination, flowering and seed production of each plant. Continue demographic model study initiated in 2005 at Hunter disused rail reserve.	DSE Statewide Services - North West
Undertake periodic surveillance monitoring of populations.	Monitor important populations to measure recruitment and the impact of threats such as weed invasion, herbivory, cattle pugging, inappropriate stock grazing, clearing and inappropriate fire regimes.	DSE Statewide Services - North West, North East, Trust For Nature, DSE Biodiversity & Ecosystem Services

<i>Standard objective</i>	<i>Targets</i>	
To increase community awareness and support.	<ul style="list-style-type: none"> Specific management advice provided to landholders with Red Swainson-pea populations on private land. 	
<i>Action</i>	<i>Details</i>	<i>Responsible agents</i>
Involve community groups and volunteers in recovery activities.	Involve the local community in surveys to raise awareness. Maintain contact with landholders adjacent to the population at Fraser Road, Campaspe, to inform them of the significance of the site. Liaise with community groups to re-establish monitoring transect at Fraser Road.	Trust For Nature, DSE North East, DSE North West, Parks Victoria
Promote community involvement programs.	Promote community involvement at all sites, e.g. support Botanic Guardians grants for the local community.	DSE Statewide Services - North West

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