

# Action statement No.47

Flora and Fauna Guarantee Act 1988

Australian Anchor Plant / Hairy Anchor Plant *Discaria pubescens*



© The State of Victoria Department of Environment, Land, Water and Planning 2015



This work is licensed under a Creative Commons Attribution 4.0 International licence. You are free to re-use the work under that licence, on the condition that you credit the State of Victoria as author. The licence does not apply to any images, photographs or branding, including the Victorian Coat of Arms, the Victorian Government logo and the Department of Environment, Land, Water and Planning (DELWP) logo. To view a copy of this licence, visit <http://creativecommons.org/licenses/by/4.0/>

Cover photo: Natalie Tapson

Compiled by: Judy Downe

ISBN: 978-1-74146-667-6 (pdf)

**Disclaimer**

This publication may be of assistance to you but the State of Victoria and its employees do not guarantee that the publication is without flaw of any kind or is wholly appropriate for your particular purposes and therefore disclaims all liability for any error, loss or other consequence which may arise from you relying on any information in this publication.

**Accessibility**

If you would like to receive this publication in an alternative format, please telephone the DELWP Customer Service Centre on 136 186, email [customer.service@delwp.vic.gov.au](mailto:customer.service@delwp.vic.gov.au), or via the National Relay Service on 133 677, email [www.relayservice.com.au](http://www.relayservice.com.au). This document is also available on the internet at [www.delwp.vic.gov.au](http://www.delwp.vic.gov.au)

## Action Statement No. 47

# Australian Anchor Plant / Hairy Anchor Plant *Discaria pubescens*

## Description

The Australian Anchor Plant, or Hairy Anchor Plant (*Discaria pubescens* (Brongn.) Druce), is a densely-branched, spiny shrub that grows to around 1 m in height. Plants are often multi-stemmed at ground level or may produce a main trunk that can reach a diameter of 15 cm (Humphries 1993). The leaves are short-lived, so plants are virtually leafless, with stout spines up to 4 cm long. Flowers are small (approximately 3 mm long) and white with five sepals and five petals and occur at the base of the spines either solitary or in few to many flowered clusters (10–50 flowers). Flowers are produced from November to January. The seeds are produced in small lobed capsules, 4-5 mm in diameter (Walsh and Entwisle 1999). They are brown, shiny and numerous and are dispersed by explosive splitting of the capsule (Hall and Parsons 1987).

## Distribution

The Australian Anchor Plant formerly had a widespread distribution in all eastern Australian states. It has not been recorded in Queensland since 1898 (Willis 1955) and is considered endangered in Tasmania (Coates 1991) and in New South Wales (Harden 1990). In Victoria, the species is now restricted to fragmented populations in the eastern highlands and to the west of Melbourne (Willis 1973, Beauglehole 1980, AVH 2014). The eastern Victorian populations are scattered through the Snowy Range, Benambra, Wulgulmerang, Cobberas and Bendoc areas (Walsh and Entwisle 1999). Populations were previously recorded from the Delatite area, near Mansfield in 1853, but have not been recorded there since 1895 (N. Walsh

pers. comm. 2008). It was also formerly known from the Wodonga and Mitta Mitta areas (Walsh and Entwisle 1999). In western Victoria, small populations and individual plants occur along the Campaspe River (north of Kyneton), along Birch Creek (at Smeaton and near Clunes) and on Lal Lal Creek and Moorabool River West Branch (near Lal Lal Reservoir). In western Victoria most populations are critically low in numbers. The populations in eastern Victoria are larger. Several populations occur in the Bendoc Nature Conservation Reserve, the largest consisting of up to 500 plants (K. Seaton pers. comm. 2010).

## Habitat

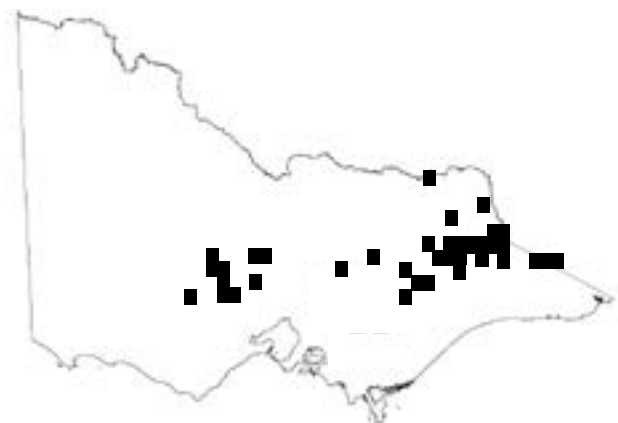
The Australian Anchor Plant usually occurs in grassy open woodlands and forests in the east of Victoria (Hall and Parsons 1987) and in stream and river valleys in western Victoria (Lunt 1987). In western Victoria, it typically occurs in high rainfall areas on rocky, basalt-based soils. In the eastern highlands, plants are usually associated with basaltic substrate near streams, in cool, elevated areas (Walsh and Entwisle 1999). Occasionally populations occur some distance from drainage lines and streams (K. Seaton pers. comm. 2010).

## Life History and Ecology

Lunt (1987) and Humphries (1993) reported that seedlings of Australian Anchor Plant have not been recorded in the wild in Victoria, despite detailed surveys over many years. However, more recently several seedlings were found at Windmill Bridge, following weed control work (B. Smith pers. comm. 2010) and at Bendoc (A. Trumbull-Ward pers.



Australian Anchor Plant / Hairy Anchor Plant (DELWP)



Distribution in Victoria (DELWP, 2015)

comm. 2008). The rarity of seedlings is not likely to be due to problems with seed production or germination (Hall and Parsons 1987). Viable seed has been collected from plants in western Victoria and germinated readily in a glasshouse after cold treatment (Humphries 1993). B. Smith (pers. comm. 2008) found that seeds germinated readily, irrespective of treatment with heat, boiling water or stratification. Very young and old seeds are slower to germinate and less viable (B. Smith pers. comm. 2008).

Hall and Parsons (1987) and Downe (pers. obs. 2007) report that mature plants resprout after low intensity burns. B. Smith (pers. comm. 2010) observed that mature plants burnt by high intensity wildfire in 2009, along the Campaspe River, had resprouted vigorously. However, seedlings transplanted to the area in 2007 showed only 10% survival. The Bendoc area was burnt by wildfire in 2003. Post-fire surveys indicated that Australian Anchor Plant successfully regenerated, however the size of monitored populations reduced by almost half between 2004 and 2007. This may be due to the effects of drought conditions (A. Trumbull-Ward pers. comm. 2007).

Plants are known to have a life span exceeding 30 years (Humphries 1993) and possibly up to 60 years (B. Smith pers. comm. 2008). Willis (1955) noted that the general trend for most natural populations has been a reduction in plant number as mature plants senesce and die.

## Conservation status

### Victorian conservation status

The Australian Anchor Plant is listed as threatened under the *Flora and Fauna Guarantee Act 1988*.

The Australian Anchor Plant is considered rare in Victoria according to the Department of Environment, Land, Water and Planning (DELWP)'s *Advisory List of Rare or Threatened Plants in Victoria - 2014* (DEPI 2014).

### Threats

Grazing by stock, predominantly cattle (*Bos taurus*) and sheep (*Ovis aries*), and by introduced herbivores, particularly European rabbits (*Oryctolagus cuniculus*), European hares (*Lepus europeaus*) and feral horses (*Equus caballus*), poses a major threat, especially as the majority of plants grow where such animals commonly graze (roadsides, paddocks and water courses). Competition by exotic species is of serious concern for all populations. Habitat loss and accidental damage during weed eradication programs or construction and maintenance work (especially roadsides and streams) are ongoing issues. Some populations have recently been burnt by wildfire. The effect of inappropriate fire regimes (intensity, season or frequency) on long term survival is not known and may be exacerbated by climate change. Also of concern is erosion of road batters, especially in the Bendoc area, and stream banks particularly to the west of Melbourne. It has been observed that unseasonal frosts have severely burnt plants in the Bendoc area.

Standard threat	Source of threat	Explanation
Competition	Invasion by environmental weeds	Weeds are a widespread and ubiquitous problem in the habitat of the Australian Anchor Plant. They impact on the species by competing for moisture, nutrients and light. Annual and perennial grasses are problematic at all sites. Other common environmental weeds are Gorse ( <i>Ulex europaeus</i> ), Blackberry ( <i>Rubus spp.</i> ), Hawthorn ( <i>Crategus spp.</i> ) and Willow ( <i>Salix spp.</i> ). Needle grass ( <i>Nassella spp.</i> ) may pose a threat at Turpins Falls (B. Smith pers. comm. 2008).
Genetic decline	Genetic decline - other	Willis (1955) noted that insufficient germination and juvenile recruitment had been evident for many years. As mature individuals senesce and die, they are not being replaced, causing local extinctions of populations (Willis 1955). This trend is still continuing.
Habitat damage or loss	Land use changes - cultivation and construction	Vegetation clearance is an ongoing potential threat as many populations occur on private land or unprotected public land (road sides, state forest and public water frontages).

Habitat damage or loss	Vegetation control activities (incl. slashing and mowing)	Roadside slashing may result in accidental destruction, especially where plants are obscured by exotic species of similar appearance, such as Gorse and Hawthorn. In the Bendoc area many populations occur on roadsides.
	Soil erosion	Erosion of road batters, especially in the Bendoc area, and stream banks, particularly to the west of Melbourne, may threaten plants growing in these habitats. Even though grazing in the Alpine National Park ceased in 2005, erosion caused by cattle grazing may still be affecting populations (Humphries 1993).
	Animals - domestic stock and introduced herbivores	Trampling of plants may occur by large hooved domestic animals, such as cattle, sheep and goats ( <i>Capra hircus</i> ), in association with grazing. Deer ( <i>Cervidea spp.</i> ), feral horses and feral goats also cause trampling.
Herbivory	Animals - domestic stock	Populations are exposed to grazing and browsing by cattle, sheep and goats. In western Victoria, most populations occur on private land where livestock may be present or public water frontages which maybe grazed under licence. In parts of eastern Victoria, roadside grazing is common, especially over drought years. Grazing occurs in state forest and, although prohibited in the Alpine National Park, stock may wander in from the adjoining state forest.
	Animals - introduced herbivores	Introduced herbivores, including rabbits, hares, feral horses, goats and deer are known to graze Australian Anchor Plants. Rabbits pose a major threat to plants regenerating after fire along the Campaspe River.
	Animals - native herbivores	Plants at Turpins Falls have been grazed by macropods, most likely Swamp wallaby ( <i>Wallabia bicolour</i> ) and Kangaroo ( <i>Macropus spp</i> ) (B. Smith pers. comm. 2015).
Human disturbance	Agricultural chemicals / effluent	Accidental destruction of populations of Australian Anchor Plant has occurred in some areas during weed eradication programs, following misidentification with similar looking weed species (in particular Gorse). Herbicide or pesticide spray drift may harm plants during weed or pest animal eradication programs.
	Construction/ maintenance - road, rail or utility	Grading road verges and dumping of soil is a problem in the Bendoc area, where some populations have been destroyed.
Weather	Weather - temperature extremes	Plants have been severely burnt following unseasonable frosts, in the Bendoc area (A. Trumbull-Ward pers. comm. 2007).

Inappropriate fire regimes	Fire - intensity	Many plants were burnt in 2003 in eastern Victoria and populations along the Campaspe River, near Redesdale were burnt in 2009 . In the wild, this species depends on resprouting for post-fire regeneration. Intense fire or frequent burning could damage or destroy the rootstock. Burning at inappropriate times of the year may hinder or prevent seed production. Seedlings have not been observed regenerating after fire.
	Fire - season or time	Frequent burning could prevent vegetative regrowth from producing sufficient photosynthetic compounds for storage in the root system of mature plants. This may eventually lead to plant death. Seed production would also be prevented thus affecting potential seedling recruitment.

## Important locations

Catchment	Location name	Land manager	Bioregion
CORANGAMITE	Lal Lal Creek and Moorabool Falls	Moorabool Shire	Victorian Volcanic Plain
EAST GIPPSLAND	Bendoc area	DELWP, East Gippsland Shire, VicRoads (VR) Parks Victoria (PV), Landholders	Victorian Volcanic Plain
	Black Mountain Road - Limestone Road Intersection - Wombargo	PV	Monaro Tablelands
	Cowombat Flat	PV	Victorian Alps
	Limestone Creek	PV	Victorian Alps
	Nunniong Plain Natural Features and Scenic Reserve - Big Nunniong Plain	DELWP	Victorian Alps
	Snowy River National Park	PV	Monaro Tablelands
NORTH CENTRAL	Birch Creek, Clunes	Central Highlands Water (CHW), Landholders	Victorian Volcanic Plain
	Birch Creek, Smeaton	CHW, Landholders	Victorian Volcanic Plain
	Creswick Creek	Creswick Creek	Victorian Volcanic Plain
	Hodges Bridge	Private	Victorian Volcanic Plain
	Mitchells Falls	Private	Victorian Volcanic Plain

NORTH CENTRAL	Old Kyneton Hospital	Private	Victorian Volcanic Plain
	Queens Falls	Private	Victorian Volcanic Plain
	Turpins Falls Natural Feature Reserve	PV	Victorian Volcanic Plain
	Windmill Bridge Natural Feature Reserve	PV	Victorian Volcanic Plain
NORTH EAST	Jim Jack Creek	VR	Highlands - Northern Fall
	Lake Omeo Flora Reserve, site A and site B	Committee of Management (CoM)	Highlands - Northern Fall
	Lake Omeo White's Road	CoM	Highlands - Northern Fall
	Spring Creek, near Cobungra	DELWP	Victorian Alps
	Victoria River crossing A	DELWP	Highlands - Northern Fall

## Past management actions

Action	Result explanation
Manage environmental weeds	Willows ( <i>Salix sp.</i> ) were removed along Lal Lal Creek prior to 2004 and shoots were treated by herbicide application (E. Swan pers. comm. 2008). Gorse and Hawthorn have been slashed at Windmill Bridge with hand cutting occurring near plants of Australian Anchor Plant. Parks Victoria has carried out hand weeding around original plants at Turpins Falls and Windmill Bridge. Herbicide control was done in close proximity to a sample of revegetated seedlings, with no negative impacts observed (B. Smith pers. comm. 2008).
Erect/maintain fence to exclude domestic stock	<p>Fencing has occurred at the following populations:</p> <ul style="list-style-type: none"> <li>• in western Victoria at Lal Lal Creek (1988) (E. Swan pers. comm. 2008), Turpins Falls (1989), Birch Creek, Clunes (2004) and along the Campaspe River at Windmill Bridge (2008), Hodges Bridge and Queens Falls (on private land) (2009) (B. Smith pers. comm. 2013)</li> <li>• in eastern Victoria at Lake Omeo Flora Reserve (sites A and B) (1990's) and Big Nunniong Plain (2010).</li> </ul> <p>This action has been effective at most sites in western Victoria (E. Swan and B. Smith pers. comm. 2015) but rabbit browsing is masking the effectiveness at sites in eastern Victoria (K. Seaton pers. comm. 2015).</p>
Protect habitat from fire	At Lal Lal Creek, a burn was carried out in April 2006, to reduce the fuel load in the reserve adjacent to the fenced off Australian Anchor Plants. In March 2009, the opposite end of Lal Lal Creek reserve, close to the Moorabool Falls plant, was also burnt to reduce fuel (E. Swan pers. comm. 2010).

Apply ecological burning	Lake Omeo Flora Reserve was burnt in autumn 1986 resulting in good regeneration (resprouting) of Australian Anchor Plant (C. Beardsell pers. comm. to S.C. Cropper Feb 1998 - VROTPop form P01717). An ecological burning trial was planned for the Bendoc Nature Conservation Reserve in 2012-2013, to monitor the effect of fire on the Australian Anchor Plant. However the area containing the target species did not burn. It has been planned to burn this section in Autumn 2015 (Kerry Seaton pers. comm. 2014)
Undertake detailed population monitoring and collect demographic information	Population monitoring has been undertaken as follows: <ul style="list-style-type: none"> <li>• In western Victoria at Birch Ck Smeaton, Birch Ck Clunes, Creswick Ck, Moorabool Falls, Windmill Bridge and Turpins Falls, where the original plants at most sites are still persisting. (B.Smith and E. Swan pers. comm. 2015).</li> <li>• In eastern Victoria at several locations: 1. Spring Creek, Victoria River and Lake Omeo (2009 and 2015), 2. the Wombargo area and Nunniong Plateau (2009 and 2015) and 3. the Bendoc area in 2007, 2010 and 2015 (J. Ricciardello pers. comm. 2010, K. Seaton pers. comm. 2015). In eastern Victoria plants are persisting at all locations but not flourishing due to severe browsing by rabbits. It was noted that fruit set was low. It was also observed that plants growing where rabbits are unable to browse appeared healthy (K. Seaton pers. comm. 2015).</li> </ul>
Control/reduce human disturbance	Vegetation clearance at Cobungra Station ceased in 1998 and the site was rehabilitated.
Promote community involvement programs (eg. Land for Wildlife, Botanic Guardians, Friends groups)	In 1994/1995, Ballarat Field Naturalists Club received funding under Adopt a Plant scheme (now Botanic Guardians) to monitor populations of Australian Anchor Plant. In 2005/2006, Ballarat Environmental Network (assisted by DSE Ballarat) received funding from the City of Ballarat Crown Land Grant to undertake environmental weed control work at Lal Lal Creek.
Erect/maintain signs to restrict or discourage access	Vulnerable roadside populations of Australian Anchor Plant in the Bendoc area were signposted to avoid accidental destruction in June 2011.
Construct/maintain information board	An information board describing the appearance of Australian Anchor Plant was prepared and displayed at Bendoc to assist landholders and weed contractors to distinguish introduced species such as Gorse and English Broom from Australian Anchor Plant. Information signs were placed at Turpins Falls and are in the process of being upgraded (B. Smith pers. comm. 2013)
Liaise with private landholders	Prior to 1993, consultation with two land holders adjacent to Birch Creek occurred. Grants under the Save the Bush Scheme were made to these landowners to assist with protection of plants. Fencing and management agreements have been negotiated with private landowners near Hodges Bridge and seed has been collected from their properties, propagated and replanted in-situ with landowner support (B. Smith pers. comm. 2008).
Erect/maintain fence to exclude introduced animals	Two areas at Windmill Bridge have been fenced to exclude rabbits and protect remnant individuals in preparation for reintroduction of Australian Anchor Plant seedlings (B. Smith pers. comm. 2008). Fences were constructed in 2010 at Big Nunniong Plain to exclude feral horses. The effectiveness of this fencing is masked by the effects of severe browsing by rabbits (K. Seaton pers. comm. 2015).



Modify domestic grazing regimes	A grazing licence over uncommitted public land frontage on Birch Creek, Clunes was cancelled in 1991. Stock was removed from Windmill Bridge and grazing pressure was reduced in the Lal Lal Creek area. Grazing was prohibited in the Alpine National Park in 2005. Cattle were removed from Bendoc Nature Conservation Reserve in January 2011, to allow regeneration and growth of indigenous species.
Erect/maintain cages, fences or other structures to exclude native animals	The fencing at Turpins Falls was upgraded in 2008 to exclude macropods (B. Smith pers. comm. 2008). Fencing was upgraded at the Moorabool Falls site in association with a new walking trail that allows better visitor access to the site (E. Swan pers. comm. 2008).
Collect reproductive material	A small seed collection is present at the Victorian Conservation Seedbank, Royal Botanic Gardens Melbourne, Victoria. Seed viability tests indicated a germination rate of 75% (J. Jeanes pers. comm. 2008).
Propagate seedlings and/or cuttings for reintroduction or reinforcement	<p>Prior to 1989, seed was collected and propagated at Creswick nursery from populations at Birch Creek and Lal Lal Falls (A. Arnold pers. comm. 2008). Approximately 1,000 plants were grown.</p> <p>Since 2002 seed has been collected and propagated from remnant plants growing at Turpins Falls, downstream of Queens Falls and near Hodges Bridge. The single plant downstream of Queens Falls has not produced any seed since 2007 – it was severely burnt by wildfire in 2009 and has resprouted vigorously, but flowers have not been produced (B. Smith pers. comm. 2010). Plants have also been successfully propagated from cuttings in East Gippsland (J. Ricciardello pers. comm. 2010).</p>
Establish and maintain a reintroduced/translocated population	Seedlings have been planted in 15 localities in western Victoria, including Mooramong Nature Reserve, Creswick Creek and Carisbrook Reservoir (Humphries 1993). More recently plants have been reintroduced into several other west Victorian reserves including Turpins Falls, Windmill Bridge, Milking Yard SSR (Little Coliban River) and Kyneton Hospital (with varying success) (B. Smith pers. comm. 2015). Plants reintroduced at Lal Lal Creek and Moorabool Falls have not survived (E. Swan pers. comm. 2015). Two plants have been established and are currently fruiting in the Royal Botanic Gardens, South Yarra, Victoria (P. Milne pers. comm. 2014)
Involve community groups and volunteers in recovery activities	In 2007, an active community group formed an advisory committee to oversee the Lal Lal Creek Reserve Management Plan, which includes the Moorabool Falls area. A Botanic Guardians grant has provided funds for the collection and propagation of seed for replanting in the reserve (E. Swan pers. comm. 2008). In 2004 and 2007 local school children planted about 50 and 100 seedlings respectively at Turpins Falls and roughly 120 seedlings were planted in 2008 at Windmill Bridge by Windarring community group (with approximately 10% survival) (B. Smith pers. comm. 2009).
Negotiate voluntary acquisition or exchange of land	The Bendoc Nature Conservation Reserve was declared in 2001 from the purchase of 233 ha of private land by the Department of Sustainability and Environment (Robertson and Fitzsimons 2005).

## Conservation objectives

### Long term objective

To ensure that the Australian Hairy Anchor Plant can survive, flourish and retain its potential for evolutionary development in the wild.

### Objectives of this Action Statement

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

### Intended management actions

The intended management actions listed below are further elaborated in DELWP'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.

Standard objective	Objective explanation	
<b>To maintain or improve condition of habitat</b>	<p>Biomass of, and competition from, introduced species are maintained at levels that enable natural regeneration of Australian Anchor Plant, by herbicide treatment, weeding, slashing or ecological burns.</p> <p>Herbivory levels are controlled so that natural regeneration of Australian Anchor Plant occurs.</p> <p>Ecological burning is undertaken at appropriate intensity and frequency to preserve populations of the Australian Anchor Plant.</p> <p>Habitat availability is maintained through the use of erosion control works.</p>	
Standard action	Details	Responsible agents
Erect/maintain fence to exclude domestic stock	Fence high priority populations or sections of such populations (where plants are widely dispersed) from sheep, cattle and goats, where possible. In particular fence populations in the Wombargo and Bendoc areas and small populations along the Campaspe River, that were burnt in 2009. Cage any seedlings found in the fire area.	DELWP, PV, CoM, Landholders
Erect/maintain fence to exclude introduced and native animals	<p>Erect rabbit proof fencing around significant populations in eastern Victoria, in particular the Spring Creek and Victoria River Wombargo, Nunniong Plain and Bendoc areas and in western Victoria at Windmill Bridge.</p> <p>Erect macropod proof fencing around plants at Turpins Falls.</p> <p>Erect suitable fencing to deter deer and goats where required.</p>	DELWP, VR, Shires, PV, CoM, Landholders

Manage environmental weeds	<p>Minimise competition by exotic species and reduce biomass, using herbicide (selective) application, slashing, hand weeding or ecological burns. Careful hand weeding must be done around any seedlings that are identified.</p> <p>Undertake follow up herbicide treatment on slashed Gorse and Hawthorn at Windmill Bridge (B. Smith pers. comm. 2009).</p>	DELWP, VR, Shires, PV, CoM, Landholders
Manage the inappropriate use of pesticide/herbicides and non-target impacts	Apply herbicides only when weather conditions are suitable to ensure that spray drift and damage to non-target species is minimised. Work crews must be able to distinguish between similar weed species (in particular Gorse and English Broom) and the Australian Anchor Plant.	DELWP, VR, Shires, PV, CoM, Landholders
Control introduced animals	Control impacts of introduced herbivores such as rabbits, hares, feral horses, goats and deer around Australian Anchor Plant populations by appropriate methods. Explore techniques used by Parks Victoria and National Parks and Wildlife Service (NSW) to manage the impacts of feral horses (Pascoe and Foster 2004).	DELWP, PV, CoM
Apply ecological burning	<p>Burn sections of Bendoc Nature Conservation Reserve that contain Australian Anchor Plant (planned for late Autumn / Winter 2015) as part of the ecological burning trial (Kerry Seaton pers. comm. 2015).</p> <p>Where appropriate, burn degraded sites invaded by exotic species to reduce biomass and competition. Populations to be assessed on a site by site basis to determine if an ecological burn would be beneficial. Weather conditions and season need to be carefully considered to ensure that the burn is low to medium intensity to promote resprouting of Australian Anchor Plant.</p>	DELWP, VR, Shires, PV, CoM, Landholders
Identify fire management priorities and develop detailed plan	Develop ecologically based fire management regimes for Australian Anchor Plant populations on public land including the Alpine and Snowy River National Parks and state and council reserves.	DELWP, PV, CoM, Shires
Manage erosion	Carry out erosion control works where populations are under threat, due to close proximity to watercourses, roads or cliff tops.	DELWP, VR, Shires, PV, CoM, Landholders

Standard objective	Objective explanation	
<b>To secure populations or habitat from potentially incompatible land use or catastrophic loss</b>	Abundance of Australian Anchor Plants maintained or increased by signposting priority populations.	
	Long term security of Australian Anchor Plant increased through liaison with and support of private landholders.	
Standard action	Details	Responsible agents
Erect/maintain signs to restrict or discourage access	Replace stolen signs at the Lake Omeo.	CoM
Liaise with private landholders	Consult with landowners and discuss appropriate management of stands on private land. This may involve assisting landowners to apply for grants through the local Catchment Management Authority. If appropriate, inform landholders of their responsibilities under the <i>Flora and Fauna Guarantee Act 1988</i> .	DELWP
Negotiate voluntary management agreements with private landholders.	Protect private land sites with conservation covenants to ensure their long-term viability. Private land could be investigated as reintroduction sites, to provide additional security for extant sites on public land.	DELWP

Standard objective	Objective explanation	
<b>To increase the number of populations or individuals</b>	Genetic diversity maintained through seed collection and propagation from cuttings.	
	Size of populations increased by translocation.	
	Plants reintroduced to sites where no longer present.	
Standard action	Details	Responsible agents
Establish and maintain a reintroduced/translocated population	Select suitable habitat for reintroduction of propagated material and manage threats to reintroduced plants, in particular herbivory and competition.	DELWP
Prepare a plan for reintroduction/translocation	Plan reintroduction program using seedlings of known provenance to establish populations at sites where population size is reduced or plant is extinct.	DELWP
Propagate seedlings and/or cuttings for reintroduction or reinforcement	Propagate cuttings and collect seed for reintroduction to safeguard the gene pool of remnant plants. Seed should be collected, especially from small extant populations in western Victoria, to enhance the Victorian Conservation Seedbank (Royal Botanic Gardens Melbourne). This would enable future reintroductions of plants into the former range of the species.	DELWP, Royal Botanic Gardens Melbourne

Standard objective	Objective explanation	
<b>To increase community awareness and support</b>	<p>Community awareness of Australian Anchor Plant raised and behaviour changed to help prevent accidental destruction.</p> <p>All high priority populations supported by Committees of Management or Friends Groups.</p>	
Standard action	Details	Responsible agents
Conduct stakeholder awareness activities regarding compliance	Prepare a fact sheet on the Australian Anchor Plant to distribute to landholders where knowledge gaps are perceived.	DELWP
Involve community groups and volunteers in recovery activities	Encourage the formation of Committees of Management or Friends Groups for high priority populations.	DELWP

Standard objective	Objective explanation	
<b>To increase knowledge of biology, ecology or management requirements</b>	<p>Factors affecting seed recruitment of Australian Anchor Plant understood.</p> <p>Number of populations remaining in Victoria more accurately determined by surveying known suitable habitat in the species' former range.</p> <p>Accurate and current data on abundance, change over time, extent and origin of populations and other relevant information in appropriate databases</p> <p>Increase in the number of organisations undertaking research into the Australian Anchor plant.</p>	
Standard action	Details	Responsible agents
Undertake detailed population monitoring and collect demographic information	<p>Confirm all existing records from the Victorian Biodiversity Atlas (VBA), literature and personal communications to enable accurate census of population size and demographics. Undertake population monitoring for all populations.</p> <p>Monitor the populations burnt by wildfire along the Campaspe River in 2009 to assess seedling recruitment and long term survival of recruits.</p>	DELWP, PV
Conduct priority research projects as specified	Conduct experimental trials to monitor the lack of natural regeneration.	DELWP
Conduct survey to confirm existing records	Determine the survival of plants at the 15 sites in western Victoria where they were introduced in 1989. Sites included Mooramong Nature Reserve, Creswick Creek and Carisbrook Reservoir.	DELWP

Conduct survey to locate additional populations	Continue to survey areas of suitable habitat within the species former range, particularly the Loddon River area near Newstead, the Campaspe River system (including the Coliban River and tributaries) and the Middle Creek area, near Mount Cole. Assess potential habitat in the Bendoc area.	DELWP, PV
Facilitate/promote research	Investigate potential projects with research institutes and universities.	DELWP
Undertake threat monitoring	Monitor invasion by environmental weeds. This is especially critical in areas burnt by wild fire where weed growth is likely to be excessive, due to increased levels of soil nutrients and availability of habitat (bare soil).	DELWP

## Personal Communications

Andrew Arnold, Project Leader, DELWP, 402 - 406 Mair Street, Ballarat, Victoria, 3350

Cameron Beardsell, Park Ranger, Westerfolds Park, Parks Victoria, Fitzsimmons Lane, Lower Plenty Victoria, 3093

Jeff Jeanes, Identifications Botanist, Royal Botanic Gardens, Melbourne, Victoria

Jonathon Ricciardello, formerly A/Senior Biodiversity Officer, DSE, 574 Main St, Bairnsdale, Victoria 3875

Kerry Seaton, Biodiversity Project Officer, DELWP, 171-173 Nicholson Street, Orbost, Victoria, 3888

Brendan Smith, Ranger, Northern Goldfields, Parks Victoria, Castlemaine, 3450

Elsbeth Swan, Biodiversity Officer, DELWP, 402 - 406 Mair Street, Ballarat, Victoria, 3350

Allen Trumbull-Ward, Biodiversity Officer, DELWP, 171-173 Nicholson Street, Orbost, Victoria, 3888

Neville Walsh, Senior Conservation Botanist, National Herbarium of Victoria, Private Bag 2000, South Yarra, Victoria, 3141

Pina Milne, Manager Collections, National Herbarium of Victoria, Private Bag 2000, South Yarra, Victoria, 3141

## References

AVH 2014 Australia's Virtual Herbarium [http://avh.ala.org.au/occurrences/search?q=state%3AVictoria%20matched\\_name\\_children%3A%22Discaria%20pubescens%22#tab\\_mapView](http://avh.ala.org.au/occurrences/search?q=state%3AVictoria%20matched_name_children%3A%22Discaria%20pubescens%22#tab_mapView)

Beaglehole, A.C. 1980 *Victorian Vascular Plant Checklists. 13 Study Areas and 24 Grid Distributions*, Western Victoria Field Naturalists Association: Portland.

Coates, F. 1991 *Discaria pubescens Flora Recovery Plan: Research Phase*. Prepared for Australian National Parks and Wildlife Service Endangered Species Program. Department of Parks, Wildlife and Heritage. Hobart, Tasmania.

Department of Environment, Land, Water and Planning (DELWP) 2015. Victorian Biodiversity Atlas, retrieved May 2015 <http://mapshare2.dse.vic.gov.au/MapShare2EXT/imf.jsp?site=bim>

Department of Environment and Primary Industries (DEPI) 2014. *Advisory List of Rare or Threatened Plants in Victoria - 2014*. Department of Environment and Primary Industries, Melbourne. [http://www.depi.vic.gov.au/\\_\\_data/assets/pdf\\_file/0005/277565/Advisory-List-of-Rare-or-Threatened-Plants-in-Victoria-2014.pdf](http://www.depi.vic.gov.au/__data/assets/pdf_file/0005/277565/Advisory-List-of-Rare-or-Threatened-Plants-in-Victoria-2014.pdf)

Hall, K.F.M. and Parsons, R.F. 1987. Ecology of *Discaria* (Rhamnaceae) in Victoria. *Proceedings of the Royal Society of Victoria*, 99 (3), 99-108.

Harden, G.J. (ed) 1990. *Flora of New South Wales* Volume 1, 373. University of New South Wales Press, Sydney.

Humphries, R.K. 1993. Hairy Anchor Plant - *Discaria pubescens*. Flora and Fauna Guarantee Action Statement No. 47. Department of Natural Resources and Environment, Melbourne.

Lunt, I.D. 1987. The Australian Anchor Plant (*Discaria pubescens*): Distribution and status west of Melbourne. *Victorian Naturalist*, 104, 68-75.

Pascoe, C. and Foster, D. 2004. Parks Victoria: Feral horse management in Victoria. In Feral horse management: Report of a Workshop, Thredbo, NSW 29-31 March, 2004. Australian Alps Liaison Committee.

Robertson, H. and Fitzsimons, J. 2005. *Bendoc Nature Conservation Reserve Management Statement*. Department of Sustainability and Environment, Melbourne.

Walsh, N.G. and Entwisle, T.J. (eds) 1999. *Flora of Victoria* Volume 4. Dicotyledons: Cornaceae to Asteraceae, Inkata Press, Melbourne.

Willis, J.H. 1955. The Australian Anchor Plant (*Discaria pubescens*). Its distribution and present status, an occurrence along Creswick Creek, Vic., and notes on the fruiting structure. *Victorian Naturalist*, 72, 51-55.

Willis, J.H. 1973. *A Handbook to Plants in Victoria Vol II. Dicotyledons*. Melbourne University Press, Melbourne.

[www.delwp.vic.gov.au](http://www.delwp.vic.gov.au)