CANBERRA SPIDER ORCHID

CALADENIA ACTENSIS
ACTION PLAN

PREAMBLE

The Canberra Spider Orchid (*Caladenia actensis*, D. A. Jones & M. A. Clem, 1999 syn. *Arachnorchis actensis*) was declared an endangered species in the ACT on 11 April 2005 (Instrument No. DI2005- 39 under the *Nature Conservation Act 1980*). The species is currently being considered for listing as Critically Endangered under the *Nature Conservation Act 2014*. Under section 101 of the *Nature Conservation Act 2014*, the Conservator of Flora and Fauna is responsible for preparing a draft action plan for listed species. The first action plan for this species was prepared in 2010 (Frawley 2010).

This action plan supersedes the earlier edition.

Measures proposed in this action plan complement those proposed in the action plans for the endangered *Yellow Box-Blakely's Red Gum Grassy Woodland* and component threatened species such as the Tarengo Leek Orchid (*Prasophyllum petilum*), Small Purple Pea (*Swainsona recta*) and Superb Parrot (*Polytelis swainsonii*).

CONSERVATION STATUS

The Canberra Spider Orchid is declared a threatened species in line with the following legislation:

- **National:** *Environment Protection and Biodiversity Conservation Act 1999* (Critically Endangered)
- **Australian Capital Territory:** *Nature Conservation Act 2014* (Critically Endangered) and *Nature Conservation Act 2014* (Special Protection Status Species).

CONSERVATION OBJECTIVES

The objective of this action plan is to preserve the Canberra Spider Orchid in perpetuity in the wild across its natural geographic range in the ACT and contribute to the regional and national conservation of the species.

Specific objectives of the action plan are to:

- protect sites where the species is known to occur in the ACT from unintended impacts
- manage the species and its habitat to maintain the potential for evolutionary development in the wild
- improve the long-term viability of populations through management of woodlands to increase habitat area and connect populations
- expand the range of the species in the ACT by identifying suitable habitat and establishing new populations by translocation
- improve understanding of the species' ecology, habitat and threats
- strengthen stakeholder and community collaboration in the conservation of the species.

SPECIES DESCRIPTION AND ECOLOGY

DESCRIPTION

The Canberra Spider Orchid is a small terrestrial orchid (40-90mm) that may grow as a single plant or in small groups. It has a densely hairy lanceolate-shaped leaf (between 4-9cm long and 0.6-0.8 cm wide) that is dull green with a purple-blotched base. The flowers of the species are solitary (rarely two) and grow to 12–20 mm in diameter. The base of the flower is greenish and is heavily marked with red- crimson lines and suffusions (Jones and Clements 1999). The Canberra Spider Orchid is a seasonal perennial; it remains as a dormant underground tuber over summer and emerges from the ground following good rains in late autumn or early winter. Flower buds appear in late winter or early spring and plants flower from late September to mid-October. Plants are sexually deceptive, imitating female insects by emitting floral volatiles to achieve pollination by a thynnine wasp, nov. gen. (actensis) sp. 1 (Hayashi 2016). To germinate, seeds of the Canberra Spider Orchid are reliant on a symbiotic association with a mycorrhizal fungus of the Serendipita genus (syn. Sebacina vermifera) (C. Linde 2018, personal communication, 31 July). The species depends on the same fungus to supply them with adequate carbon and nutrients (especially phosphorus) throughout their lives (Milburn and Rouse 2004).

DISTRIBUTION

The Canberra Spider Orchid is endemic to the ACT. Until recently, it was only known to occur within a small area (approximately five hectares) on the lower western slopes of Mt Ainslie and Mt Majura in Canberra Nature Park (Milburn and Rouse 2004). Additional populations of the species have been located at these sites, as well as within the Majura Valley (Department of Defence land) and Kowen Escarpment Nature Reserve.

Populations of the Canberra Spider Orchid recorded on Mt Ainslie (in the suburb of Campbell) and adjacent to Old Weetangera Road (to the north of Black Mountain), are no longer present.

A map of the current distribution of the species is available on the ACT Government's mapping portal, ACTmapi.

HABITAT AND ECOLOGY

The Canberra Spider Orchid grows at an altitude of 645 - 745 m, most commonly on the Burra and Campbell soil landscapes. These soil landscapes consist of shallow, well drained Lithosols and Red and Yellow Earths on upper slopes, and moderately deep, moderately drained Red and Yellow Podzolic Soils on lower slopes. The species less commonly occurs on the Queanbeyan and Williamsdale soil landscapes, which comprise moderately well-drained, shallow Lithosols and moderately deep Red and Yellow Podzolic Soils (Jenkins 2000).

The species occurs within a number of vegetation communities across its range; specifically *Blakely's Red Gum – Yellow Box ± White Box tall grassy woodlands of the Upper South Western Slopes and western South Eastern Highlands Bioregions, Yellow Box ± Apple Box tall grassy woodland of the South Eastern Highlands and Red Stringybark – Scribbly Gum – Red-Anthered Wallaby Grass tall grass-shrub dry sclerophyll open forest on loamy ridges of the central South Eastern Highlands Bioregion* (Armstrong and Turner et al. 2013). Small populations on Mt Ainslie and Mt Majura Nature Reserve occur in *Drooping She-oak low woodland to open forest on shallow infertile hillslopes in the Australian Capital Territory and surrounds* (Baines et al. 2013). The majority of populations across the species distribution occur within the endangered *Yellow Box-Blakely's Red Gum Grassy Woodland*. Canberra Spider Orchid plants occur amid a groundcover of grasses, forbs and low shrubs, often among rocks. The largest populations on Mt Majura are partly shaded from the tree canopy, in otherwise open areas among rocks (Milburn and Rouse 2004).

PREVIOUS AND CURRENT MANAGEMENT

MT AINSLIE AND MT MAJURA

Most populations of the Canberra Spider Orchid located on Mt Ainslie and Mt Majura are protected within nature reserves. Dr Peter Milburn of the Australian National University first began monitoring these populations in the 1990s. The ACT Government has conducted all monitoring of the populations since 2015.

While the size of the populations at Mt Ainslie and Mt Majura fluctuate annually, there has been an overall increase in the total number of individuals at these sites. In 2002, there were approximately 100 individuals; by 2003, 250 individuals were recorded (Frawley 2010). Over 480 plants were recorded from the two populations in 2014 (ACT Government unpublished data). This increase is partially due to an increase in survey effort.

Milburn (2008) highlighted that grazing and disturbance by rabbits, kangaroos and other vertebrates threaten the survival of the populations. In 2010, permanent fences were erected to protect two populations from grazing and other disturbance. Temporary cages have since been used successfully to protect small, dense patches of the species from grazing. The ACT Parks and Conservation Service also conduct extensive rabbit control across Mt Ainslie and Mt Majura.

MAJURA VALLEY

Populations of the Canberra Spider Orchid at Majura Valley grow on Department of Defence land, where access and land use restrictions are enforced. These controls, along with weed and grazing management, have ensured the ongoing persistence of the species within the woodland habitat in the valley.

Monitoring of the population is managed by the Department of Defence.

KOWEN ESCARPMENT

The recently discovered population of the Canberra Spider Orchid on the Kowen Escarpment is located within a nature reserve. No specific management actions have been undertaken to maintain or enhance the population.

THREATS

The Canberra Spider Orchid has a small distribution in the ACT. Urban development and agricultural practices have resulted in the loss, degradation and fragmentation of appropriate woodland habitat for the Canberra Spider Orchid. As a result, populations of the species in the ACT are small and severely fragmented, and thus likely to be genetically depauperate. Poor genetic diversity and life history strategies of the species (including short flowering period, dependence on a single sub-family of wasps for pollination and association with soil fungi) is likely to leave it vulnerable to the impacts of climate change, disturbance and disease. The most common disturbances to the habitat of the Canberra Spider Orchid include animal trampling, grazing pressure, the development and maintenance of infrastructure, and bushfire.

CHANGING CLIMATE

A range of indirect impacts resulting from a changing climate may threaten the persistence of the species at some sites. These include increased drought conditions, and changes in plant species composition (including invasive species) and fire frequency and intensity.

A lack of connectivity and genetic diversity within populations is likely to reduce the resilience of the species to the impacts of climate change.

CONSERVATION ISSUES AND INTENDED MANAGEMENT ACTIONS

PROTECTION

A critical element in the conservation of the Canberra Spider Orchid is the conservation of lowland grassy woodlands including the endangered *Yellow Box-Blakely's Red Gum Grassy Woodland*. The majority of the extant populations in the ACT are protected on reserved land or are located on Commonwealth land (Defence).

ENVIRONMENTAL OFFSET REQUIREMENTS

Environmental offset requirements for species and ecological communities in the ACT are outlined in the ACT Environmental Offsets Policy and associated documents such as the ACT Environmental Offsets Assessment Methodology and the Significant Species Database. In the Assessment Methodology and Database, some of the threatened species have special offset requirements to ensure appropriate protection. The Canberra Spider Orchid has been determined to not be able to withstand further loss in the ACT so offsets for this species are not appropriate.

SURVEY, MONITORING AND RESEARCH

Monitoring of Canberra Spider Orchid populations has improved understanding of the ecology and population trends of the species. The ACT Government monitors the condition of all populations on Territory land and collects data on the size of populations as required.

Surveys for undiscovered populations of Canberra Spider Orchid have previously occurred; continuing to undertake surveys to improve our understanding of the distribution of the species in the ACT is a priority. Other future monitoring and research projects should aim to improve knowledge of:

- the life history and ecology of the species, including plant and seed longevity
- how the frequency, seasonality and intensity of fire impacts the species and its habitat
- the genetic variation within and between populations of the species and the genetic viability of the current seed bank
- how habitat fragmentation and reduced population size impacts genetic variability of the species
- the reliance on, and limitations of, appropriate pollinators and symbiotic fungi
- potential refugia sites for the Canberra Spider Orchid under a changing climate
- suitable seed collection methods and methods for establishing new populations via translocation
- the links between the persistence and fluctuations in abundance of the species, and abiotic and biotic variables (including disturbance, predation, vegetation dominance and structure, and soil moisture, chemistry and temperatures).

MANAGEMENT

The Canberra Spider Orchid persists as small, fragmented populations across the ACT that are at high risk of local extinction. Thus, the management priorities for the species are to maintain and enhance site condition and undertaking translocation projects. Specifically, priority management actions include:

- develop an annual monitoring program for all known sites, including habitat condition assessment
- manage biomass to maintain an open, heterogeneous habitat structure and diverse floristic composition within populations
- control invasive plants that pose a threat to a population or site
- maintain an ex-situ population (seed bank and orchard)
- reduce the impacts of vehicle movement, trampling, soil disturbance and over grazing
- limit the public availability of information regarding the location of populations
- increase the size of existing populations and establish new populations through translocation.

All translocation projects undertaken must be consistent with the principles outlined in the Conservator Guidelines for the Translocation of Native Flora and Fauna in the ACT (ACT Government 2017) and the Guidelines for the Translocation of Threatened Plants in Australia (3rd Ed.) (Commander et al 2018).

IMPLEMENTATION

- Implementation of this action plan and the ACT Woodland Conservation Strategy will require:
- information identified in threatened species actions plans and other relevant documents to inform land planning and management on ACT Government Land
- allocation of adequate resources to undertake the actions specified in the strategy and action plans
- liaison with other jurisdictions (particularly NSW) with responsibility for the conservation of a threatened species or community
- collaboration with universities, CSIRO, ANBG and other research institutions to undertake research
- collaboration with non-government organisations such as Greening Australia to undertake on-ground actions
- collaboration with the community, where relevant, to assist with monitoring and other on- ground actions, and to help raise community awareness of conservation issues.

OBJECTIVES, ACTIONS AND INDICATORS

Table 1: Objectives, Actions and Indicators

OBJECTIVE	ACTION	INDICATOR
PROTECT		
1. Protect all populations from unintended impacts (unintended impacts are those not already considered through an environmental assessment or other statutory process).	1a. Apply formal measures to ensure all populations are protected from unintended impacts (including recreation, infrastructure works and other potentially damaging activities).	All populations are protected from unintended impacts by appropriate formal measures.
	1b. Encourage other jurisdictions to protect sites where the species occurs on their lands from unintended impacts.	
	1c. Ensure protection measures require site management to conserve the species.	Protection measures include requirement for conservation management.
MAINTAIN		
2. Manage the species and its habitat to maintain the potential for evolutionary development in the wild.	2a. Monitor populations and the effects of management actions.	Trends in abundance are known. Management actions are recorded.
	2b. Manage to conserve the species and its habitat.	Populations are stable or increasing. Habitat is managed appropriately (indicated by maintenance of appropriate sward/shrub structure and herbage mass). Potential threats (e.g. weeds) are avoided or managed.
	2c. Maintain a database of sightings of the species, and if available, record habitat information.	Records of sightings are maintained and used to determine the distribution of the species in the ACT.

OBJECTIVE	ACTION	INDICATOR
IMPROVE		
3. Enhance the long-term viability of populations through management of adjacent grassland/woodland to increase habitat area and connect populations.	3a. Manage grassland/woodland adjacent to the species' habitat to increase habitat area or habitat connectivity.	Grassland/woodland adjacent to or linking habitat is managed to improve suitability for the species (indicated by an appropriate sward structure and plant species composition).
	3b. Undertake or facilitate research and trials into techniques for increasing the population size.	Research trials have been undertaken to increase the size of the population. The population is stable or increasing.
4. Expand the range of the species in the ACT by providing suitable habitat and establishing new populations by translocation	4a. Undertake or facilitate research and trials into establishing new populations.	Research and trials have been undertaken to establish new populations. New population(s) established.
5. Improved understanding of the species' ecology, habitat and threats.	5a. Undertake or facilitate research on habitat requirements, techniques to manage habitat, and aspects of ecology directly relevant to conservation of the species.	Research undertaken and reported and where appropriate applied to the conservation management of the species.
COLLABORATE		
6. Promote a greater awareness of, and strengthen stakeholder and community engagement in, the conservation of the species.	6a. Undertake or facilitate stakeholder and community engagement and awareness activities.	Engagement and awareness activities undertaken and reported.

ACKNOWLEDGMENTS

The illustration of the species was prepared for the ACT Government by John Pratt.

COMMUNICATIONS

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