

THREATENED SPECIES SCIENTIFIC COMMITTEE

Established under the *Environment Protection and Biodiversity Conservation Act 1999*

The Minister's delegate approved this Conservation Advice on 16/12/2016.

Conservation Advice

Caladenia drakeoides

Hinged dragon orchid

Conservation Status

Caladenia drakeoides (hinged dragon orchid) is listed as Endangered under the *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth) (EPBC Act) effective from the 16 July 2000. The species was eligible for listing under the EPBC Act as on 16 July 2000 it was listed as Endangered under Schedule 1 of the preceding Act, the *Endangered Species Protection Act 1992* (Cwlth).

This species is also listed as Critically Endangered under the Western Australian *Wildlife Conservation Act 1950*.

The main factors that are the cause of the species being eligible for listing in the Endangered category are small area of occupancy, populations that are severely fragmented and an observed decline in the area of occupancy, quality of habitat

Description

The hinged dragon orchid is a member of the *Caladenia* genus. It is inconspicuous, erect 20 - 30 cm tall and tuberous. The orchid usually has one flower that has small hanging petals and sepals and a small hinged labellum, which differs to other *Caladenia* species.

Distribution

The hinged dragon orchid is confined to seasonally moist rises above salt lakes between Coorow, Beacon and Lake King in the Merredin district of Western Australia (Brown et al., 2003). The species occurs on a variety of land tenures including private property, nature reserve and Shire road reserve (Brown et al., 2003).

Relevant Biology/Ecology

The habitat of the hinged dragon orchid is tall to medium shrub land dominated by *Melaleuca* and *Acacia* species over low shrubs and annuals. The hinged dragon orchid occurs on soils are variable but consist mainly of grey sandy loam (Brown et al., 2003).

Threats

The hinged dragon orchid is threatened by habitat loss and fragmentation, altered moisture regimes, invasive species and too frequent fire. These threats and their effects on the species are described in the table below. The threats outlined below have corresponding conservation managements.

Table 1 – Threats impacting the hinged dragon orchid in approximate order of severity of risk, based on available evidence.

Threat factor	Threat type and status	Evidence base
Invasive species		
Invasive weeds	known	Invasive weeds compete with orchid species for resources and over time change the species composition of invaded areas (Duncan et al., 2005). This may result in the elimination of native species as they are out competed (Duncan et al., 2005). There are a number of known invasive weeds to the Moora, Katanning and Merredin districts of Western Australia, these include both declared and non-declared weeds that threaten the hinged dragon orchid.
Grazing and trampling by Goats (<i>Capra hircus</i>)	known current	Trampling and grazing by goats cause physical damage to the hinged dragon orchid. Pastures where the orchid grows are susceptible to over grazing. Goats are identified as a known threat to the hinged dragon orchid under the threat abatement plan for competition and land degradation by feral goats (DEWHA 1999).
Domestic species		
Grazing and trampling by Sheep (<i>Ovis aries</i>)		Trampling and grazing by sheep cause physical damage to the hinged dragon orchid. Areas that are grazed beyond their carrying capacity or are not grazed appropriately may cause damage to the hinged dragon orchid (Brown et al., 2003)..
Fire		
Too frequent burning	suspected current	Fires that occur in autumn, winter and spring, after the species shoots but before seed is set, may pose a threat. Too frequent fire may pose a threat by killing any growth stimulated by initial summer fires (Brown et al., 2003).
Habitat loss and fragmentation		
Damage roadside maintenance	potential	Potential development in the known area of the hinged dragon orchid may damage plants (Brown et al., 2003).

Conservation Actions

Conservation and Management priorities

Invasive species (including threats from grazing, trampling, predation)

- Manage sites to control and reduce the spread of invasive species particularly feral goats. Consider culling goats where appropriate using guidelines provided in the Threat Abatement Plan for Competition and Land Degradation by Feral Goats (Commonwealth 1999). Note that the hinged dragon orchid is specifically mentioned in the plan.
- Identify and remove new weeds and undertake control of weeds in the local area that could become a threat to the hinged dragon orchid, using appropriate methods which may include hand weeding noting that there is potential to increase weeds as a result of soil disturbance (Brown et al., 2003). Consider the possible disturbance/overspray threats associated with the control method.

- Collaborate with public and private land managers to control and reduce the spread of invasive species. Consult with local experts in determining the most appropriate physical, chemical or other control methods for these weeds that will not have a detrimental effect on the hinged dragon orchid.

Impacts of domestic species

- Ensure that landowners are aware that the species occurs on their property, particularly where grazing and cropping are conducted.
- If livestock grazing occurs in the area, ensure land owners/managers use an appropriate management regime and density that does not detrimentally affect this species by trampling and manage total grazing pressure at important sites through exclusion fencing or other barriers.

Fire

- Fires must be managed to ensure that prevailing fire regimes do not disrupt the life cycle of the hinged dragon orchid, and that they support rather than degrade, the habitat of the orchid, they do not promote invasion of exotic species, and they do not increase impacts of grazing.
- Ensure that prescribed fires only occur within the habitat during the dormant phase of the hinged dragon orchid life cycle (summer to late autumn).
- Physical damage to the habitat and individuals of the hinged dragon orchid must be avoided during and after fire operations. Ensure retention of surface soil organic material and leaf litter on soil as it is important for many terrestrial orchids that rely on these materials for regeneration from seed.
- Fire management authorities and land management agencies should use suitable maps and install field markers to avoid damage to the hinged dragon orchid.

Habitat loss disturbance and modifications

- Prevent habitat disturbance. Control access routes by installing gates to suitably constrain stock access to known sites on public land and manage access on private land and other land tenure to prevent grazing and damage to the hinged dragon orchid. Implement the use of Declared Rare Flora Markers (DRF) to identify location of the species on road sides¹
- Ensure land managers are aware of the species' occurrence and provide protection measures against key and potential threats as outlined in the table above and through the use of DRF markers.

Seed collection, propagation and other ex-situ recovery action

- Establish plants in cultivation in appropriate institutions such as the Kings Park and Botanic Gardens, Western Australia.
- To manage the risk of losing genetic diversity, undertake appropriate seed and mycorrhizal fungi collection and storage in appropriate institutions, such as the Western Australian Seed Technology Centre, Kings Park and Botanic Gardens, and determine viability of stored seed. Best practice seed storage guidelines and procedures should

¹ DRF markers are used in Western Australia and are two standardised yellow markers at either end of a site, which are bent to face towards each other, indicating that DRF plants may occur anywhere between the markers, from the road's running surface to the fence. They alert people working in the vicinity to the presence of DRF, and the need to avoid work that may damage vegetation in the area (DEC 2013)

be adhered to, to maximise seed viability and germinability. Seeds from all natural populations to be collected and stored.

Stakeholder Engagement

- Identify partners including traditional owners, landholders, community-based organisations and conservation management organisations that may be associated with recovery of the hinged dragon orchid.
- Promote opportunities for partners to participate in recovery of the hinged dragon orchid, as appropriate.
- Determine objectives for any public engagement to improve management on private land to raise awareness of its presence on land that is not currently managed as native reserve land and ensure recent scientific knowledge is incorporated into this public land management. Separate engagement processes will likely be required where there are different objectives.
- Prepare a management strategy with the input and from local experts. Actions should be stated for each engagement process identified e.g. Indigenous consultation, a specific community consultation, or land manager consultation.

Survey and Monitoring priorities

- Undertake survey work when plants are flowering in August and September in suitable habitat and potential habitat to locate any additional occurrences.
- Undertake survey work when plants are flowering in August and September of previously identified known and potential populations to establish baselines where required to identify changes (if any) in population size, distribution, ecological requirements and relative impacts of threatening processes.
- Monitor the progress of recovery, including the effectiveness of management actions and the need to adapt them if necessary.
- Monitor the size, structure and reproductive status of populations of the hinged dragon orchid after planned and unplanned fires in order to improve understanding of the fire response of this species.
- Precise fire history records must be kept for the habitat and extant populations (confirmed and suspected) of the hinged dragon orchid.

Information and research priorities

- Investigate options for linking, enhancing or establishing additional populations.
- Investigate reproductive status, longevity, fecundity and recruitment levels for this species in order to understand the vulnerability of this species to known and potential threats and adjust conservation actions as required.
- Continue to undertake seed germination and/or vegetative propagation trials to determine the requirements for successful establishment, including disturbance and mycorrhizal fungi requirements.
- Improve understanding of the response to different fire regimes and identify appropriate fire regimes for conservation of this species by undertaking appropriately designed experiments in the field and/or laboratory.

- Where appropriate, use understanding and research on fire response among related (e.g. congeneric) or functionally similar species to develop fire management strategies for conservation.
- Identify optimal fire regimes for regeneration (vegetative regrowth and/or seed germination), and response to other prevailing fire regimes.

References cited in the advice

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