INTERIM RECOVERY PLAN NO. 29

HINGED DRAGON ORCHID

(*DRAKONORCHIS DRAKEOIDES* MS)

INTERIM RECOVERY PLAN

1999-2001

by

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Photo A.P. Brown

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FOREWORD

Interim Recovery Plans (IRPs) are developed within the framework laid down in Department of Conservation and Land Management (CALM) Policy Statements Nos. 44 and 50.

IRPs outline the recovery actions that are required to urgently address those threatening processes most affecting the ongoing survival of threatened taxa or ecological communities, and begin the recovery process.

CALM is committed to ensuring that Critically Endangered taxa are conserved through the preparation and implementation of Recovery Plans or Interim Recovery Plans and by ensuring that conservation action commences as soon as possible and always within one year of endorsement of that rank by the Minister.

This Interim Recovery Plan will operate from May 1999 to April 2002 but will remain in force until withdrawn or replaced. It is intended that, unless the taxon is no longer ranked as Critically Endangered, this IRP will be replaced by a full Recovery Plan after three years.

This IRP was approved by the Director of Nature Conservation on 31 August 1999. The provision of funds identified in this Interim Recovery Plan is dependent on budgetary and other constraints affecting CALM, as well as the need to address other priorities.

Information in this IRP was accurate at May 1999.

SUMMARY

Scientific Name: ***Drakonorchis drakeoides*** **ms**
Common Name: Hinged Dragon Orchid
Family: Orchidaceae
Flowering Period: August - October
CALM Regions: Midwest, Wheatbelt
CALM District: Moora, Merredin
Shires: Coorow, Wongan-Ballidu, Dalwallinu, Moora, Goomalling
Recovery Teams: Merredin and Moora District Threatened Flora Recovery Teams (MDTFRT)

Illustrations and/or further information: Brown, A., Thomson-Dans, C. and Marchant, N. (Eds). (1998). *Western Australia's Threatened Flora*. Department of Conservation and Land Management, Western Australia; Hoffman, N. & Brown, A. (1992) *Orchids of South West Australia.* 2nd Edition. University of Western Australia Press, Nedlands; Hopper, S. D., van Leeuwen, S., Brown, A.P. & Patrick, S. J. (1990) *Western Australia's Endangered Flora*. Department of Conservation and Land Management, Western Australia; Patrick S. J., Brown A. P. & Rose D. (draft) *Declared Rare and Poorly Known Flora in the Moora District*. Department of Conservation and Land Management, Western Australia.

Current status: *Drakonorchis drakeoides* ms was declared as Rare Flora in September 1986 and ranked as Critically Endangered in November 1998 under World Conservation Union (IUCN) Red List Criterion B1+2a-e (IUCN 1994). It is not closely related to any other *Drakonorchis* species. *D. drakeoides* ms is currently known from six populations in the Moora District and eight populations in the Merredin District extending from Coorow to the west, east to Beacon and south to Goomalling. The main threats are inappropriate fire regimes, increasing salinity, grazing, degraded habitat, weeds, poor recruitment and limited genetic diversity.

Habitat requirements: *Drakonorchis drakeoides* ms is mostly confined to the margins of salt lakes in areas which become seasonally wet. The species grows in tall to medium shrubland dominated by *Melaleuca* and *Acacia* species over low shrubs and annuals. The soils are variable but consist mainly of grey sandy loam.

Existing Recovery Actions: The following recovery actions have been or are currently being implemented.
1. Populations 1, 7 and 14 and subpopulation 2b (private property) have been fenced to exclude sheep.
2. All owners of private property populations have been notified of the presence of the species.
3. The Moora and Merredin District Threatened Flora Recovery Teams are overseeing the implementation of recovery actions prescribed in this IRP, and are reporting annually to CALM's Corporate Executive.
4. Regular monitoring of the population is being undertaken by CALM Moora and Merredin District staff.

IRP Objective: The objective of this Interim Recovery Plan is to abate identified threats and maintain viable *in situ* populations to ensure the long-term preservation of the species in the wild.

Recovery criteria
Criterion for success: The number of individuals within populations and/or the number of populations have increased.
Criterion for failure: The number of individuals within populations and/or the number of populations have decreased.

Future recovery actions

1. Install declared rare flora markers.	7. Develop a fire management strategy.
2. Erect fencing.	8. Collect seed.
3. Implement goat control.	9. Conduct further surveys.
4. Plant native shrubs and trees.	10. Disseminate information.
5. Implement weed control.	11. Obtain biological and ecological information.
6. Monitor populations.	12. Develop and implement a translocation proposal.

1. BACKGROUND

History

Drakonorchis drakeoides ms was first collected near Meckering by J. Tonkinson in the 1960s, however it was not seen again until 1984 when R. Bates (an orchidologist visiting from South Australia) found a small population near Goomalling. Subsequent surveys located several more populations further north. In 1988 the species was known from seven populations with a combined total of approximately 1400 plants. Populations 8-12 were discovered by A. P. Brown and S. J. Patrick in 1991-1992. Population 13 was brought to CALM's attention in 1992 by the adjacent landowner. During a survey for the orchid in the Merredin and Moora Districts in 1996, a new population was found, increasing the number of known populations to 14. The total number of plants recorded during the survey was approximately 2000 from seven populations. No plants were found at five populations, and two populations were not surveyed. In recent years there has been a dramatic decline in plant numbers for many populations.

Description

Drakonorchis drakeoides ms is an inconspicuous, erect, tuberous herb 20-30 cm tall. It is usually single flowered. *D. drakeoides* ms differs from other species of *Drakonorchis* in its small hanging petals and sepals (13-17 mm by 2.5-4 mm), its small hinged labellum (5-7 mm long) with two lateral slight swellings (not antenna-like as in *D. barbarossa* ms), and its hump like shoulder calli. The latter is 1.5-2 mm wide, golden brown with small dark red spots, with a cranial depression and two lateral anterior slight swellings. A taxonomic description of *D. drakeoides* ms*,* will be provided by A.P. Brown and S. D. Hopper, when they formally describe the species in *Australian Orchid Research*. This work is still in draft, a copy of which is included under heading 7, "Taxonomic description". On rare occasions *D. drakeoides* ms hybridises with the common spider orchid, *Caladenia exilis* ms and the white spider orchid, *Caladenia longicauda,* and these will be named *X Drakodenia ornata* and *X Drakodenia enigma* respectively.

Distribution and habitat

Drakonorchis drakeoides ms is known from six populations in CALM's Moora District and eight populations in CALM's Merredin District extending from Coorow to the west, east to Beacon and south to Goomalling.

D. drakeoides ms is mainly confined to seasonally wet elevated margins of saline flats. The soils are variable but consist mainly of grey sandy loam. The species grows in tall to medium shrubland dominated by *Melaleuca* and *Acacia* species over low shrubs and ephemeral plant species.

Biology and ecology

Drakonorchis drakeoides ms has an insect-like labellum which emits a pheromone that is similar to that of a female thynnid wasp. Male thynnid wasps attempt copulation with the labellum and in the process remove or deposit pollen. Like other orchids, *D. drakeoides* produces thousands of tiny seeds that contain little testa. These seeds rely on a symbiotic association with soil fungi for germination.

Threats

Drakonorchis drakeoides ms was declared as Rare Flora in September 1986 and ranked as Critically Endangered in November 1998 under World Conservation Union (IUCN) Red List Criterion B1+2a-e (IUCN 1994). This is due to its extremely restricted habitat in a narrow ecotone on the edges of salt lakes, and the wide scale clearing for agriculture in the northern and western wheatbelt, which has resulted in the loss of much of its former habitat. A rise in the water table has caused an increase in salinity and may also be contributing to a decline in numbers and populations over recent years. The main threats are salinity, waterlogging, erosion, weeds, grazing and trampling by sheep and goats, and road maintenance. Details of continuing threats are as follows.

- **Salinisation, waterlogging** and **erosion** are degrading the habitat of populations 2, 3, 4, 5, 6, 7, 10 and 11. Increasing salinity is the greatest threat to this species.

- **Weeds** are invading the habitat of populations 1, 3, 5b, 6, 7, 9 and 10. Inappropriate fire regimes may also promote weed growth and could exacerbate the problem if not controlled.

- **Grazing** and **trampling** by sheep are apparent at the sites of populations 3, 5, 6 and 9.

- **Goats** are invading the habitat of population 12 and are impacting upon *Drakonorchis drakeoides* ms due to heavy grazing and trampling of plants.

- **Road maintenance** in the area of population 12 may accidentally destroy *Drakonorchis drakeoides* ms plants and habitat.

Summary of population information and threats

Pop. No. & Location	Land Status	Year/No. plants		Condition	Threats
1. ENE of Gunyidi	Private	1988 1996	1000+ 1010	Moderate	Weeds, increasing salinity
2a. ENE of Gunyidi	Private	1988 1996	100+ 400+	Moderate	Rising salinity, erosion
2b. ENE of Gunyidi	Private	1996	100+	Poor	Rising salinity, erosion
3. ENE of Gunyidi	Nature Reserve, Class A	1988 1996	3 0	Moderate	Rising salinity, weeds, grazing
4a. ESE of Pithara	Private	1988 1996	20+ 10	Good	Grazing, rising salinity
4b. ESE of Pithara	Private	1988 1991 1996	200+ 100+ 0	Good	Grazing, rising salinity
5a. N of Ballidu	Private	1988 1996	15+ 0	Moderate	Rising salinity, grazing, rabbits
5b. N of Ballidu	Private	1988 1996	15+ 65	Moderate	Rising salinity, grazing, weeds, rabbits
6. SW of Kondut	Private	1988 1996	30+ 0	Poor	Rising salinity, weeds, grazing by sheep, vehicles
7. W of Miling	Private	1987 1992 1996	5 1 0	Moderate	Rubbish dumping, weeds, increasing salinity
8. ENE of Dalwallinu	Shire road reserve	1991 1996	18 8	Moderate	Grazing, weeds
9. NW of Goomalling	Private	1984 1996	2 0	Poor	Rabbits, sheep, erosion, weeds
10. WSW of Ballidu	Private	1990 1996	4 0	Moderate	Rising salinity, weeds, grazing
11. ENE of Gunyidi	Private	1996	167	Moderate	Rising salinity, erosion, grazing
12. SW of Coorow	Nature Reserve, Class C	1992 1993 1996	100+ 30+ 333+	Moderate	Rising salinity, rabbits, goats
13a. N of Beacon	Private	1992	8	Not recently surveyed	Rising salinity, weeds
13b. N of Beacon	Shire road reserve	1992	10	Not recently surveyed	Rising salinity, weeds
14. SE of Coorow	Private	1996	200+	Good	None apparent

2. RECOVERY OBJECTIVE AND CRITERIA

Objective

The objective of this Interim Recovery Plan is to abate identified threats and maintain viable *in situ* populations to ensure the long-term preservation of the species in the wild.

Criterion for success: The number of individuals within populations and/or the number of populations have increased.
Criterion for failure: The number of individuals within populations and/or the number of populations have decreased.

3. RECOVERY ACTIONS

Existing recovery actions

Populations 1, 7 and 14 and subpopulation 2b (all private property) have been fenced to exclude sheep.

All owners of private property populations have been notified of the presence of the species.

The Moora and Merredin District Threatened Flora Recovery teams oversee the implementation of recovery actions prescribed in this IRP, and report annually to CALM's Corporate Executive.

Future recovery actions

Where populations occur on lands other than those managed by CALM, permission has been or will be sought from the appropriate land managers prior to recovery actions being undertaken.

1. Install declared rare flora markers

Four Declared Rare Flora (DRF) markers are required at population 12 (Capamauro Nature Reserve).

Action: Install DRF markers
Responsibility: CALM (Moora District) through the MDTFRT
Cost: $100 in year 1.

2. Erect fencing

The habitat of subpopulations 4a, 5b and population 11 are currently being grazed by sheep. These will be fenced to exclude stock.

Action: Erect fencing
Responsibility: CALM (Moora and Merredin Districts) through the relevant recovery teams, landowners
Cost: $2,000 in years 1 and 2.

3. Implement goat control

Control of goats is required within Capamauro Nature Reserve (population 12) to prevent further degradation of the habitat. Coordinating this program with a goat control program for the nearby Watheroo National Park and Pinjarrega Nature Reserve is desirable.

Action: Implement goat control
Responsibility: CALM (Moora District) through the MDTFRT
Cost: $4,500 in year 1.

4. Plant native shrubs and trees

Native shrub and tree planting is required to protect subpopulations 2a, 2b, 5a and population 11 from further erosion and increasing salinity.

Action: Plant native shrubs and trees
Responsibility: CALM (Moora and Merredin Districts) through the relevant recovery teams
Cost: $2,400 in years 1 and 2.

5. Implement weed control

A weed control program is required as the habitat of populations 1, 5b, 6, 7, 9 and 10 (private), population 3 (nature reserve) and population 8 (Shire road reserve) is badly infested by weeds. CALM will implement a weed control program that will involve:

1. Selection of an appropriate herbicide after determining which weeds are present.
2. Controlling invasive weeds by hand removal and spot spraying when weeds first emerge.
3. Scheduling to include weed spraying of other Declared Rare Flora populations requiring weed control within Moora and Merredin Districts.

The tolerance of native plant species to herbicides at *D. drakeoides* ms sites is unknown and it is recommended that weed control programs are undertaken in conjunction with research (see 11).

Action: Implement weed control
Responsibility: CALM (Moora and Merredin Districts) through the relevant recovery teams
Cost: $2,000 pa.

6. Monitor populations

Monitoring of factors such as goat activity, rising salinity, weed encroachment, population stability (expanding or declining), pollination activity, seed production, recruitment, and longevity is essential.

Action: Monitor populations
Responsibility: CALM (Moora and Merredin Districts) through the relevant recovery teams
Cost: $1,500 pa.

7. Develop a fire management strategy

It is likely that *Drakonorchis drakeoides* ms is not harmed by fire between December and April when the plant is dormant but fires during the growing, flowering and seeding phase (July-October) may be detrimental to the long term survival of the species.

Action: Develop fire management strategy
Responsibility: CALM (Moora and Merredin Districts) through the relevant recovery teams, relevant authorities and landowners
Cost: $600.

8. Collect seed

Preservation of germplasm is essential to guard against extinction if wild populations are lost. Seed collections are needed to propagate plants for translocations (see 12).

Action: Collect seed
Responsibility: CALM (TFSC, Merredin District), Kings Park and Botanic Garden (KPBG) through the relevant recovery teams
Cost: $1,600 in year 1.

9. Conduct further surveys

Further surveys supervised by CALM staff, and with the assistance of the West Australian Native Orchid Study and Conservation Group, wildflower societies and naturalist clubs, will be conducted for *Drakonorchis drakeoides* ms during its flowering period (August- October).

Action: Conduct further surveys
Responsibility: CALM (Moora and Merredin Districts) through the relevant recovery teams
Cost: $2,000 pa.

10. Disseminate information

The importance of biodiversity conservation and the protection of *Drakonorchis drakeoides* ms will be promoted to the public. This will be achieved through an information campaign using the local print and electronic media and by setting up poster displays. This is especially important as most populations of the species are small and all are highly threatened, and increased awareness may result in the discovery of others.

An information sheet, which includes a description of the plant, its habitat type, threats and management actions will be produced. The preparation of a poster illustrating all Critically Endangered flora species in the District is recommended. Formal links with local naturalist groups and interested individuals will be encouraged.

Action: Disseminate information
Responsibility: CALM (Moora and Merredin Districts, Corporate Relations) through the relevant recovery teams
Cost: $500 in the first year and $1,500 in the second year.

11. Obtain biological and ecological information

Research designed to increase understanding of the biology of the subspecies will provide a scientific base for management of *Drakonorchis drakeoides* ms in the wild. Research will include:

1. The effects of weeds on recruitment and establishment.
2. Factors determining level of flower and fruit abortion.
3. Seed germination requirements.
4. Longevity of plants, and time taken to reach maturity.
5. Level of invertebrate grazing of seed pods.
6. Response of *Drakonorchis drakeoides* ms and its habitat to fire.
7. Genetic variability within and between populations.

Action: Obtain biological and ecological information
Responsibility: CALM (CALMScience, Moora & Merredin districts) through the relevant recovery teams
Cost: $1,000 in the first year and $2,000 in the second year.

12. Develop and implement a translocation proposal

Background information on the translocation of threatened animals and plants in the wild is provided in CALM Policy Statement No 29 *Translocation of Threatened Flora and Fauna*. Translocation is considered as desirable for the conservation of a species if populations are in rapid decline. It is recommended that restocking existing populations and translocation to more secure sites be investigated with the former given priority.

Although translocations are generally undertaken under full Recovery Plans it is possible to develop a translocation proposal, search for suitable translocation sites and start growing plants within the timeframe of this Interim Recovery Plan. All translocation proposals require endorsement by the Director of Nature Conservation.

Action: Develop and implement a translocation proposal
Responsibility: CALM (Moora & Merredin Districts) through the relevant recovery teams
Cost: See action 9.

13. Write a full Recovery Plan

At the end of the three-year term of this Interim Recovery Plan, the need for further recovery will be assessed. If the species is still ranked Critically Endangered a full Recovery Plan will be prepared with the benefit of knowledge gained over the period of this Interim Recovery Plan.

Action: Write a full Recovery Plan

Responsibility: CALM (Moora and Merredin Districts, WATSCU) through the MDTFRT
Cost: $17,500 once.

4. TERM OF PLAN

This Interim Recovery Plan will operate from May 1999 to April 2002 but will remain in force until withdrawn or replaced. It is intended that, unless the taxon is longer ranked as Critically Endangered, this IRP will be replaced by a full Recovery Plan after three years.

5. ACKNOWLEDGMENTS

The following people have provided assistance and advice in the preparation of this Interim Recovery Plan:

Claire Welbon — Former Assistant Conservation Officer, Merredin District, CALM
Rebecca Wolstenholm — Former Conservation Officer, Moora District, CALM
Nick Woolfrey — Former Conservation Officer, Merredin District, CALM

We would like to thank the staff of the W.A. Herbarium for providing access to Herbarium databases and specimen information, and CALM's Wildlife Branch for their extensive assistance.

6. REFERENCES

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World Conservation Union (1994). IUCN red list categories prepared by the IUCN Species Survival Commission, as approved by the 40th meeting of the IUCN Council. Gland. Switzerland.

7. TAXONOMIC DESCRIPTION (Draft, S.D. Hopper and A. P. Brown)

Drakonorchis drakeoides differs from other species of *Drakonorchis* Hopper & A. P. Brown in its small petals and sepals (to 13-17 mm by 2.5-4 mm) that are scarcely splayed out from the ovary; its labellum on a loosely hinged claw, 5-7 mm long; its small labellum lamina held below the top of the ovary - the abdomen 5-7 mm by 3-4 mm, scarcely curved and shallowly channelled towards the tail, hirsute only on the margins and should calli, the head globular, 1.5-2 mm wide, golden brown with small dark red spots, with a cranial depression and two lateral anterior slight swellings (not antenna-like as in *D. barbarossa*) and the shoulder calli hump-like, less than 1 mm tall; and its confinements to the margins of salt lakes.