

INTERIM RECOVERY PLAN NO. 285

Dryandra fuscobractea

INTERIM RECOVERY PLAN

2008-2013



June 2008

Department of Environment and Conservation
Kensington



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. Note: the Department of CALM formally became the Department of Environment and Conservation (DEC) in July 2006. DEC will continue to adhere to these Policy Statements until they are revised and reissued.

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.

DEC is committed to ensuring that Threatened taxa are conserved through the preparation and implementation of Recovery Plans (RPs) or IRPs, and by ensuring that conservation action commences as soon as possible and, in the case of Critically Endangered (CR) taxa, always within one year of endorsement of that rank by the Minister.

This IRP will operate from June 2008 to May 2013 but will remain in force until withdrawn or replaced. It is intended that, if the species is still ranked as CR at the end of the five-year term, this IRP will be reviewed and the need for further recovery actions assessed.

This IRP was given regional approval on 25 July 2008 and was approved by the Director of Nature Conservation on 22 August 2008. The provision of funds identified in this IRP is dependent on budgetary and other constraints affecting DEC, as well as the need to address other priorities.

Information in this IRP was accurate at June 2008.

IRP PREPARATION

This IRP was prepared by Kym Pryor¹, Benson Todd² and Rebecca Hayes³

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ACKNOWLEDGMENTS

The following people have provided assistance and advice in the preparation of this IRP:

Andrew Brown	Threatened Flora Coordinator, DEC Species and Communities Branch
Andrew Crawford	Principal Technical Officer, DEC Threatened Flora Seed Centre
Amanda Shade	Assistant Curator of Displays and Development, Botanic Gardens and Parks Authority

Thanks also to the staff of the W.A. Herbarium for providing access to Herbarium databases and specimen information, and DEC's Species and Communities Branch for assistance.

Cover photographs by S.J. Patrick, Accessed from Florabase (Western Australian Herbarium 2007), and Kym Pryor

CITATION

This IRP should be cited as:

Department of Environment and Conservation. (2008). *Dryandra fuscobracteata* Interim Recovery Plan 2008-2013. Interim Recovery Plan No. 285. Department of Environment and Conservation, Western Australia.

SUMMARY

Scientific Name:	<i>Dryandra fuscobracteata</i>	Common Name:	N/A
Family:	Proteaceae	Flowering Period:	July - October
DEC Region:	Midwest	DEC District:	Moora
Shire:	Dandaragan and Victoria Plains	Recovery Team:	Moora District Threatened Flora Recovery Team (MDTFRT)

Illustrations and/or further information: George A.S. (1996). New taxa and a new infrageneric classification in *Dryandra* R. Br. (Proteaceae: Grevilleoideae). *Nuytsia* **10(3)**: 313-408; Mast A.R. and K.R. Thiele (2007). The transfer of *Dryandra* R.Br. to *Banksia* L.f. (Proteaceae). *Aust. Syst. Bot.* **20**: 63-71; Western Australian Herbarium (2008). *FloraBase 2 – Information on the Western Australian Flora*. Department of Environment and Conservation, Western Australia. <http://www.florabase.calm.wa.gov.au>.

Current status: *Dryandra fuscobracteata* was declared as Rare Flora under the Western Australian *Wildlife Conservation Act 1950* in July 2004 and is currently ranked as Critically Endangered (CR) under World Conservation Union (IUCN 2001) Red List criteria C2a(i); D due to the species being in decline with no subpopulation containing more than 50 mature individuals, and the total population size estimated to number fewer than 50 mature individuals. The species is not currently listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

Dryandra fuscobracteata has a restricted distribution in the Shires of Dandaragan and Victoria Plains where it is known from two populations (4 subpopulations) growing on Shire road reserve and private property. The main threats to the species are firebreak/fence maintenance, farming activities, road maintenance, lack of suitable disturbance (physical and fire) to promote germination of soil-stored seed, competition from introduced weeds, gravel extraction and lack of recruitment.

In 2007, all *Dryandra* species were transferred to the genus *Banksia*, with *Dryandra fuscobracteata* being renamed *Banksia fuscobracteata* (Mast and Thiele 2007). Formal transfer to this name for reference as Declared Rare Flora is dependent on the publication of the change in the Government Gazette. This is anticipated in 2008.

Description: *Dryandra fuscobracteata* is a small non-lignotuberous shrub to 1m high with stems covered in thick, short matted hairs. Leaves are wedge-shaped, tapering to a long point, and serrated along the edges. Inflorescences are yellow and contain 180-190 flowers each. The bracts below the inflorescences are narrowly linear and covered in thick, unmatted hair, the outer being grey and the inner tapering to a dark rusty brown apex (George 1996).

Distribution and habitat: *Dryandra fuscobracteata* has a restricted distribution of approximately 0.26km² east of Gillingarra. Plants grow in grey sand over laterite in areas of low heath and appear to favour gravel ridges. The two known populations occur within 2km of each other.

Habitat critical to the survival of the species, and important populations: Habitat critical to the survival of the species includes the area of occupancy of important populations, areas of similar habitat surrounding important populations (i.e. grey sand over laterite, in low heath on gravel ridges), additional occurrences of similar habitat and the local catchment for the surface and/or groundwater that maintains the habitat of the species.

Given that *Dryandra fuscobracteata* is ranked as CR, it is considered that all known habitat for wild populations is critical to the survival of the species, and that all wild populations are important populations.

Benefits to other species or ecological communities: Recovery actions implemented for *Dryandra fuscobracteata* will improve the health of associated native vegetation. *Dryandra fuscobracteata* is not known to occur in association with other Threatened and Priority species or Threatened Ecological Communities.

International obligations: This plan is fully consistent with the aims and recommendations of the Convention on Biological Diversity, ratified by Australia in June 1993, and will assist in implementing Australia's responsibilities under that convention. However, *Dryandra fuscobracteata* is not listed under any specific international treaty and this IRP does not affect Australia's obligations under any other international agreements.

Indigenous Consultation: Although a search of the Department of Indigenous Affairs Aboriginal Heritage Sites Register has revealed that Population 2 occurs approximately 5 km from an Aboriginal Reserve, no population is known from a site of Aboriginal significance. Involvement of the Indigenous community is being sought through the Department of Indigenous Affairs to assist in the identification of cultural values for land occupied by *Dryandra fuscobracteata*, or groups with a cultural connection to land that is important for the species' conservation and to determine whether there are any issues or interests identified in the plan. Where no role is identified for the indigenous community in the development of the recovery plan, opportunities may exist through cultural interpretation and awareness of the species. Indigenous involvement in the implementation of recovery actions will be encouraged.

Continued liaison between DEC and the indigenous community will identify areas in which collaboration will assist implementation of recovery actions.

Social and economic impact: The implementation of this recovery plan may have some social and economic impact as one *Dryandra fuscobractea* subpopulation occurs on private land. Where plants are located on private land, recovery actions refer to continued liaison between stakeholders with regards to these areas.

Affected interests: Stakeholders potentially affected by the implementation of this plan are the owners of private property, on which the species occurs, and the Shires of Dandaragan and Victoria Plains.

Evaluation of the plan's performance: DEC, in conjunction with the Moora District Threatened Flora (and Communities) Recovery Team (MDTFRT) will evaluate the performance of this IRP. In addition to annual reporting on progress and evaluation against the criteria for success and failure, the plan will be reviewed following five years of implementation.

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

Recovery criteria

Criteria for success: The number of populations has increased and/or the number of mature individuals has increased by twenty percent or more over the term of the plan.

Criteria for failure: The number of populations has decreased and/or the number of mature individuals has decreased by ten percent or more over the term of the plan.

Completed Recovery Actions

1. The Shires of Dandaragan and Victoria Plains and Private land owners have been made aware of the threatened nature of this species, its location and their legal obligations to protect it.
2. DEC's Threatened Flora Seed Centre (TFSC) has seed of *Dryandra fuscobractea* in storage.
3. Rare Flora markers have been installed to demarcate roadside populations of *Dryandra fuscobractea*.

Ongoing and future recovery actions

1. The AMDTFRT and MDTFRT are overseeing the implementation of this IRP and will include it in their annual reports to DEC's Corporate Executive and funding bodies.
2. Staff from DEC's Moora District are monitoring all known populations.

Recovery actions

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| <ol style="list-style-type: none"> 1. Coordinate recovery actions 2. Nominate <i>Dryandra fuscobractea</i> for listing as Critically Endangered under the Commonwealth EPBC Act 3. Liaise with relevant land managers and indigenous groups 4. Fence Subpopulation 2b 5. Monitor populations 6. Collect seed 7. Promote awareness | <ol style="list-style-type: none"> 8. Map habitat critical to the survival of <i>Dryandra fuscobractea</i> 9. Conduct further surveys 10. Obtain biological and ecological information 11. Prepare and implement a translocation proposal 12. Undertake weed control 13. Review the IRP and assess the need for further recovery actions |
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1. BACKGROUND

History

The first collection of *Dryandra fuscobracteata* was made during a survey of remnant vegetation in the Gillingarra area by Ted Griffin in 1983. The species was formally described by Alex George in 1996 (George 1996).

The Gillingarra area was resurveyed in 1988 and further surveys were conducted by staff of the Western Australian Herbarium and a *Dryandra* specialist during the flowering seasons of 1999 and 2001. All failed to locate new populations of *D. fuscobracteata*.

In 2004 the species was resurveyed, however Subpopulation 1a was not located and it was suggested by DEC staff that the soil type at that location was not suitable for the species. It was later discovered that the location of Subpopulation 1a had been incorrectly recorded, and is actually the same location as Subpopulation 1c. Subpopulation 1a has since been modified in all records to reflect that it is now named Population 1c.

The extent of *Dryandra fuscobracteata* prior to clearing for agriculture is unknown. However, it is possible that the species once occurred over a larger area as land surrounding known populations has been cleared.

It appears that private property where Subpopulations 2b occurs changed ownership sometime in 2006. As DEC was not informed of the change, the new owners were not immediately notified of the presence of the species and the area containing the subpopulation was largely cleared. Surveys conducted in May 2007 found only a small percentage of the subpopulation remaining and evidence of many dead plants.

Despite numerous searches, *Dryandra fuscobracteata* is known from just 2 populations (4 subpopulations) totalling 49 mature individuals in the Gillingarra area southwest of Moora.

In 2007, all *Dryandra* species were transferred to the genus *Banksia*, with *Dryandra fuscobracteata* being renamed *Banksia fuscobracteata* (Mast and Thiele 2007). Formal transfer to this name for reference as Declared Rare Flora awaited the endorsement by the WA Herbarium for this nomenclatural concept, and is dependent on the publication of the change in the Government Gazette. This is anticipated in 2008.

Description

Dryandra fuscobracteata is a small shrub to 1 m high with stems covered in thick, short matted hairs. Leaves, 4-7 cm long and 1-3 cm wide, are smooth, wedge-shaped, tapering to a long point, and serrated along the edges with 4-9 teeth each side. The leafstalk is 5-10 mm long. Inflorescences develop on short lateral branchlets and contain 180-190 yellow flowers each. The perianth is 20-23 mm in length and covered in hairs (soft and shaggy near the base, extending to long and stiff at the ends) on a dark, grey limb 2.5 mm long and covered in long, stiff hairs. The pistil is 22-26 mm long, smooth and cream coloured with a narrow rusty brown pollen presenter 1 mm in length. The bracts below the inflorescences are linear and covered in thick unmatted hair, the outer being recurved at the tip and grey, and the inner being 8-11 mm long and tapering to a dark rusty brown apex. (George 1996).

The species is most closely related to *Dryandra cuneata* which is distinguished from *Dryandra fuscobracteata* by the conspicuous dark brown bracts at the base of the inflorescences and the larger number of smaller flowers with dark pollen presenters (George 1996).

Distribution and habitat

Dryandra fuscobracteata has a restricted distribution east of Gillingarra where it grows in grey sand over laterite, in low heath. The species appears to favour gravel ridges. The two known populations are within 2km of each other. Associated species include *Allocasuarina humilis*, *Dryandra kippistiana*, *Hakea incrassata*, *H. scoparia*, *Calothamnus sanguineus*, *Acacia stenoptera* and *Adenanthos cygnorum*.

Summary of population land vesting, purpose and tenure

Pop. No. & Location	DEC District	Shire	Vesting	Purpose	Manager
1b. East of Gillingarra	Moora	Dandaragan	Shire of Dandaragan	Shire Road Reserve	Shire of Dandaragan
1c. East of Gillingarra	Moora	Dandaragan/ Victoria Plains	Shires of Dandaragan and Victoria Plains	Shire Road Reserve	Shires of Dandaragan and Victoria Plains
2a. East of Gillingarra	Moora	Dandaragan	Shire of Dandaragan	Shire Road Reserve	Shire of Dandaragan
2b. East of Gillingarra	Moora	Dandaragan	Freehold	Private Property	Landholders

Populations in **bold text** are considered to be important populations

Biology and ecology

Dryandra fuscobracteata is a member of the Proteaceae family and is likely to have a similar biology and ecology to other members of this family.

Dryandra fuscobracteata seed is stored in the canopy and is usually released after a fire event. Disturbance (physical or fire) is not necessarily required for seeds to germinate, but is useful in providing an open site for seedling establishment. This is supported by field observations of plants growing in areas that have been disturbed for gravel extraction or fence line construction.

Scarification should not be required to germinate this species as no seed treatment (apart from surface sterilization) has been used by staff from the Threatened Flora Seed Centre. Under laboratory conditions fresh *Dryandra fuscobracteata* seed has a high viability with a germination rate of 95-100%.

Threats

Dryandra fuscobracteata was declared as Rare Flora under the Western Australian *Wildlife Conservation Act 1950* in July 2004 and is ranked as Critically Endangered (CR) under World Conservation Union (IUCN 2001) Red List criteria C2a(i); D due to the species being in decline with no subpopulation containing more than 50 mature individuals and the total population size estimated to number fewer than 50 mature individuals. The main threats to the species are firebreak/fence maintenance, lack of recruitment, gravel extraction, road maintenance, competition from introduced weeds, farming activities and lack of suitable disturbance (physical or fire). The species is not listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

Firebreak/fence maintenance threatens Subpopulations 1c, 2a and 2b. Plants are in danger of being damaged or destroyed during firebreak maintenance and maintaining/replacing fences. Although plants are believed to germinate following suitable disturbance (physical or fire), regular maintenance would kill plants before they are large enough to set seed. Several plants in subpopulations 1c and 2b appear to have succumbed to this threat.

Gravel extraction is a threat to Subpopulations 1c and 2a. Gravel, from lateritic ridges within the road reserve, is occasionally extracted and used for roadworks. Subpopulation 1c has been affected by extraction activities.

Weeds are becoming a threat to Subpopulation 2a. Weeds compete with mature plants and seedlings for nutrients, sunlight and water within the landscape. Following disturbance (physical or fire), weed species are generally able to grow more rapidly than native species, which can lead to smothering and a lack of recruitment of native seedlings.

Farming Activities have the potential to further affect Subpopulations 1c, 2a and 2b. Chemical drift from the spraying of pasture can travel across fence lines and affect the health of plants in remnant adjacent vegetation. Land clearing has also severely damaged Subpopulation 2b.

Grazing of plants may be a future issue for Subpopulation 2b. Grazing livestock has the potential to remove new growth and seedlings and may also result in trampling of plants.

Poor recruitment is a threat to all populations, especially Subpopulation 1b. Natural disturbance events (physical or fire) stimulate germination, and a lack of appropriate disturbance combined with an aging

population has resulted in plants being in poor condition. Remnant vegetation surrounding Subpopulation 1b is otherwise healthy.

The intent of this plan is to propose actions that will deal with immediate threats to *Dryandra fuscobracteata*. Although long-term threats such as climate change may have an impact on the species, actions taken to protect the species from climate change are beyond the scope of this plan.

Summary of population information and threats

Pop. No. & Location	Land Status	Year/No. plants		Current Condition	Threats
1b. East of Gillingarra	Shire Road Reserve	1999	10	Poor	Poor recruitment
		2004	7 (3) [1]		
		2007	4 (2) [6]		
1c. East of Gillingarra	Shire Road Reserve	1983	Not recorded	Moderate	Gravel extraction, Firebreak/fence maintenance, Farming activities
		1994	Not recorded		
		1999	15		
		2001	19		
		2004	42 (14) [7]		
		2007	36 (21) [20]		
2a. East of Gillingarra	Shire Road Reserve	2001	17 – including 2b	Poor	Poor recruitment, weeds, firebreak/fence maintenance
		2004	6 [2]		
		2007	2 (1) [11]		
2b. East of Gillingarra	Private Property	2001	see 2a	Poor	Farming activities, firebreak/fence maintenance
		2004	41 [1]		
		2007	7 [22+]		

Populations in **bold text** are considered to be important populations; Note: () = number of seedlings, [] = number dead

Guide for decision-makers

Section 1 provides details of current and possible future threats. Developments or land clearing in the immediate vicinity of populations of *Dryandra fuscobracteata* require assessment. No developments or clearing should be approved unless the proponents can demonstrate that their actions will not have a significant negative impact on the species, its habitat or potential habitat or on the local surface hydrology, such that drainage in the habitat of the species would be altered.

Habitat critical to the survival of the species, and important populations

Habitat critical to the survival of the species includes the area of occupancy of important populations, areas of similar habitat surrounding important populations (i.e. grey sand over laterite, in low heath on gravel ridges) as these areas provide habitat for pollinators and population expansion, additional occurrences of similar habitat that may contain the species or be suitable sites for future translocations and the local catchment for the surface and/or groundwater that maintains the habitat of the species.

Given that *Dryandra fuscobracteata* is ranked as Critically Endangered, it is considered that all known habitat for wild populations is critical to the survival of the species, and that all wild populations are important populations.

Benefits to other species or ecological communities

Recovery actions implemented for *Dryandra fuscobracteata* will also improve the health of associated native vegetation. *Dryandra fuscobracteata* is not known to occur in association with any other Threatened or Priority species or Threatened Ecological Community.

International obligations

This plan is fully consistent with the aims and recommendations of the Convention on Biological Diversity, ratified by Australia in June 1993 and will assist in implementing Australia's responsibilities under that convention. However, *Dryandra fuscobracteata* is not listed under any specific international treaty and this IRP does not affect Australia's obligations under any other international agreements.

Indigenous consultation

A search of the Department of Indigenous Affairs Aboriginal Heritage Sites Register has revealed that Population 2 occurs approximately 5 km from an Aboriginal Reserve. However, as no population occurs at a site of Aboriginal significance, involvement of the Indigenous community is being sought through the Department of Indigenous Affairs to assist in the identification of cultural values for land occupied by *Dryandra fuscobracteata*, or groups with a cultural connection to land that is important for the species' conservation and to determine whether there are any issues or interests identified in the plan. Where no role is identified for the indigenous community associated with this species in the development of the recovery plan, opportunities may exist through cultural interpretation and awareness of the species. Indigenous involvement in the implementation of recovery actions will be encouraged.

Continued liaison between DEC and the indigenous community will identify areas in which collaboration will assist implementation of recovery actions.

Social and economic impact

The implementation of this recovery plan may have some social and economic impact as *Dryandra fuscobracteata* Subpopulation 2b occurs on private land, and Subpopulations 1b, 1c and 2a occur on local government road reserves. Where plants are located on private land, recovery actions refer to continued liaison between stakeholders.. The management of roadsides where subpopulations occur may require altered management practices by the road managers.

Affected interests

Stakeholders potentially affected by the implementation of this plan are the owners of private property on which the species occurs and the Shires of Dandaragan and Victoria Plains.

Evaluation of the plan's performance

DEC, in conjunction with the Moora District Threatened Flora (and Communities) Recovery Team (MDTFRT) will evaluate the performance of this IRP. In addition to annual reporting on progress and evaluation against the criteria for success and failure, the plan will be reviewed following five years of implementation.

2. RECOVERY OBJECTIVE AND CRITERIA

Objective

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

Criteria for success: The number of populations have increased and/or the number of mature individuals have increased by twenty percent or more over the term of the plan.

Criteria for failure: The number of populations have decreased and/or the number of mature individuals have decreased by ten percent or more over the term of the plan.

3. RECOVERY ACTIONS

Completed recovery actions

The private land owners and the Shires of Dandaragan and Victoria Plains have been made aware of the threatened nature of this species, its location and their legal obligations to protect it. This will ensure that areas containing *Dryandra fuscobracteata* will be managed to minimise the risk of negative impacts on the species, and that no further gravel extraction occurs in these areas.

DEC's Threatened Flora Seed Centre (TFSC) has 3 collections of *Dryandra fuscobracteata* seed; two bulk collections (from 10 and 11 plants respectively) and 1 segregated collection from 12 individual plants. Collections were made in 1994, 1996 and 2000 and total 510 seeds. The bulk collections of 1994, 1996 and

2000 were taken from Population 1. The initial germination rate of seed from these collections was between 95 and 100%.

The Botanic Gardens and Parks Authority (BGPA) held several *Dryandra fuscobracteata* plants in their native gardens for some years, although the last died in 2001. They currently have no seed or live plants in their collections.

DRF markers have been installed at Subpopulations 1b, 1c and 2a. A rare flora marker at Subpopulation 1b was moved to include a new plant found outside the previously demarcated area.

Similar habitat in the Gillingarra area was extensively surveyed between 1999 and 2001 with no new populations found.

Ongoing and future recovery actions

The MDTFRT and AMDTFRT are overseeing the implementation of this IRP.

Staff from DEC's Moora District are monitoring all known populations.

Where recovery actions are implemented on lands other than those managed by DEC, permission has been or will be sought from the appropriate land managers prior to actions being undertaken. The following recovery actions are roughly in order of descending priority, influenced by their timing over the term of the plan. However this should not constrain addressing any recovery action if funding is available and other opportunities arise.

1. Coordinate recovery actions

The Moora District Threatened Flora Recovery Team (MDTFRT) will coordinate recovery actions for *Dryandra fuscobracteata* and other Declared Rare Flora in their District and will include information on progress in their annual report to DEC's Corporate Executive and funding bodies.

Action: Coordinate recovery actions
Responsibility: MDTFRT
Cost: \$1,400 annually.

2. Nominate *Dryandra fuscobracteata* for listing as Critically Endangered under the Commonwealth EPBC Act.

Staff from DEC's Species and Communities Branch (SCB) will develop a Species Profile and Threats (SPRAT) and nomination form for this species, and forward it to the Commonwealth Department of Environment, Water, Heritage and the Arts for referral to the Threatened Species Scientific Committee (TSSC) for endorsement under the EPBC Act.

Action: Nominate *Dryandra fuscobracteata* for listing as Critically Endangered under the Commonwealth EPBC Act
Responsibility: DEC (Species and Communities Branch)
Cost: \$1,400 in the first year.

3. Liaise with relevant land managers and indigenous groups

Staff from DEC's Moora District will liaise with land managers to ensure that populations are not accidentally damaged or destroyed. Input and involvement will also be sought from any indigenous groups that have an active interest in the area that is habitat for *Dryandra fuscobracteata*.

Action: Liaise with relevant land managers and indigenous groups
Responsibility: DEC (Moora District) through the MDTFRT

Cost: \$500 annually.

4. Fence Subpopulation 2b

Staff from DEC's Moora Districts will negotiate with land owners to ensure that Subpopulation 2b is protected from grazing through installation of fencing.

Action: Fence Subpopulation 2b
Responsibility: DEC (Moora District) through the MDTFRT
Cost: \$2000 in year 1.

5. Monitor populations

Annual monitoring of factors such as habitat degradation (including weed invasion, soil erosion and grazing), population stability (expansion or decline), pollinator activity, seed production, recruitment, longevity and predation is essential and will be met under this action.

Action: Monitor populations
Responsibility: DEC (Moora District) through the MDTFRT
Cost: \$2,200 annually.

6. Collect seed

Preservation of genetic material is essential to guard against extinction of the species if the wild populations are lost. Further to current accessions, seed will be collected and stored by DEC's TFSC. Collections should aim to sample and preserve the maximum range of genetic diversity possible. The "Germplasm Conservation Guidelines for Australia" produced by the Australian Network for Plant Conservation (ANPC) should be used as a minimum standard to guide this process (ANPC 1997).

Action: Collect seed
Responsibility: DEC (TFSC, Moora District) through the MDTFRT
Cost: \$2,800 in years 1, 3 and 5.

7. Promote awareness

The importance of biodiversity conservation and the protection of *Dryandra fuscobracteata* will be promoted to the public. This will be achieved through an information campaign using local print and electronic media and by setting up poster displays. An A4 sized information sheet that provides a description of the species and information about threats and recovery actions is being developed for *D. fuscobracteata* and will be distributed to local land owners, relevant authorities and volunteer organizations, libraries and schools. It is hoped that the poster will result in the discovery of new populations. Formal links with local naturalist groups and interested individuals should also be encouraged.

To minimise the risk of accidental or deliberate destruction, the exact location of *Dryandra fuscobracteata* will be kept from the general public. Such information will, however, be given to relevant landowners and government authorities.

Action: Promote awareness
Responsibility: DEC (Moora District, SCB and Strategic Development and Corporate Affairs Division) through the MDTFRT
Cost: \$1,000 annually.

8. Map habitat critical to the survival of *Dryandra fuscobracteata*

While this species is not currently listed under the EPBC Act, this is a future intention, and it is a requirement of the EPBC Act that spatial data relating to habitat critical to the survival of *Dryandra fuscobractea* be determined. Although this is described in Section 1, the areas described have not yet been fully mapped and will be addressed under this action. If additional populations are located, habitat critical to their survival will also be determined and mapped.

Action: Map habitat critical to the survival of *Dryandra fuscobractea*
Responsibility: DEC (Moora District, Species and Communities Branch (SCB)) through the MDTFRT
Cost: \$3,100 in year 1.

9. Conduct further surveys

Areas of potential habitat (i.e. heath vegetation on grey sand over laterite) will be surveyed for the presence of *Dryandra fuscobractea* during the species flowering period. All surveyed areas will be recorded and the presence or absence of *D. fuscobractea* documented to increase survey efficiency and reduce duplicate surveys. Where possible, volunteers from the local community, wildflower societies and naturalists clubs should be involved in surveys, supervised by DEC staff.

Action: Conduct further surveys
Responsibility: DEC (Moora District) through MDTFRT
Cost: \$3,500 in years 1, 3 and 5.

10. Obtain biological and ecological information

Improved knowledge of the biology and ecology of *Dryandra fuscobractea* will provide a better scientific basis for managing wild populations, and will include:

1. Investigation of conditions necessary for germination.
2. Investigation into life history characteristics.
3. Longevity of plants, and time taken to reach maturity.
4. Investigation into the species' pollination biology and identification of pollinators.
5. Investigation into the species response to disturbance,(physical and fire)..
6. Determination of population vulnerability to changes in the water table and salinisation.

Actions: Obtain biological and ecological information
Responsibility: DEC (Science Division, TFSC, Moora District) and BGPA through the MDTFRT
Cost: \$13,000 in years 2 and 3, and \$18,000 in year 4.

11. Prepare and implement a translocation proposal

A translocation proposal for *Dryandra fuscobractea* will be prepared and implemented. Information on the translocation of threatened animals and plants in the wild is provided in CALM's *Policy Statement No. 29: Translocation of Threatened Flora and Fauna* (CALM 1995). All translocation proposals require endorsement by the Director of Nature Conservation.

Action: Prepare and implement a translocation proposal
Responsibility: DEC (Moora District, Science Division) through the MDTFRT
Cost: \$1,500 in year 2 (to prepare) and \$3,200 in years 3-5 for implementation.

12. Undertake weed control

Weeds are a threat to road reserve areas where *Dryandra fuscobractea* populations are located. The following steps will be taken to control and minimise this problem:

1. Identify weed species present;

2. Determine the most appropriate time of year to apply control methods, selecting the most suitable and effective control method available;
3. Control invasive weeds by hand removal or spot spraying when weeds first emerge;
4. Schedule weed control to include spraying at other threatened flora populations within the District;
5. Monitor populations following weed control and undertake follow-up control if necessary.

Action: Undertake weed control
Responsibility: DEC (Moora District, Science Division) through the MDTFRT
Cost: \$1,500 annually.

13. Review the IRP and assess the need for further recovery actions

At the end of its five-year term this IRP will be reviewed and the need for further recovery actions assessed.

Action: Review the IRP and assess the need for further recovery actions
Responsibility: DEC (SCB, Moora District) through MDTFRT
Cost: \$6,000 in year 5.

Summary of recovery actions

Recovery Actions	Priority	Responsibility	Completion date
Coordinate recovery actions	High	MDTFRT and AMDTFRT	Ongoing
Nominate <i>Dryandra fuscobracteata</i> for listing as Critically Endangered under the Commonwealth EPBC Act	High	Species and Communities Branch	2009
Liaise with relevant land managers and indigenous groups	High	DEC (Moora District) through the MDTFRT	Ongoing
Fence Subpopulation 2b	High	DEC (Moora District) through the MDTFRT	2009
Monitor populations	High	DEC (Moora District) through the MDTFRT	Ongoing
Collect seed and genetic material	High	DEC (Moora District) through the MDTFRT	Ongoing
Promote awareness	High	DEC (Moora District, SCB and Strategic Development and Corporate Affairs Division) through the MDTFRT	Ongoing
Map habitat critical to the survival of <i>Dryandra fuscobracteata</i>	High	DEC (Moora District, SCB) through MDTFRT	2009
Conduct further surveys	High	DEC (Moora District) through the MDTFRT	2013
Obtain biological and ecological information	High	DEC (Science Division, TFSC, Moora District) and BGPA through the MDTFRT	2012
Prepare and implement a translocation proposal	High	DEC (Moora District) through the MDTFRT	Implemented by 2009 with ongoing follow-up
Undertake weed control	High	DEC (Moora District) through the MDTFRT	ongoing
Nominate <i>Dryandra fuscobracteata</i> under EPBC Act	High	DEC (SCB)	2009
Review the IRP and assess the need for further recovery actions	Moderate	DEC (SCB, Moora District) through the MDTFRT	2013

4. TERM OF PLAN

This IRP will operate from June 2008 to May 2013 but will remain in force until withdrawn or replaced. If the taxon is still ranked CR after five years, the need for further recovery actions and an update of this IRP will be assessed.

5. REFERENCES

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6. TAXONOMIC DESCRIPTION

Excerpt from: George A.S. (1996). New taxa and a new infrageneric classification in *Dryandra* R. Br. (Proteaceae: Grevilleoideae). *Nuytsia*. **10(3)**: 313-408.

Shrub to 1 m without lignotuber. *Stems* closely tomentose. *Leaves* cuneate, those about the involucre narrower, obtuse but prominently mucronate, pungently serrate; teeth 4-9 each side; lamina 4-7 cm long, 1-3 cm wide, glabrous above and below except pits; margins flat to slightly recurved; petiole 5-10 mm long. *Inflorescence* terminal or on short lateral branchlet; involucre bracts linear, obtuse to almost acute, the outer ones squarrose, innermost 8-11 mm long, all villous, the outer ones grey, the inner dark rusty brown towards the apex; flowers 180-190 per head. *Perianth* 20-23 mm long, villous above base, then hirsute, pale yellow; limb 2.5 mm long, hirsute, dark grey, the apical hairs white. *Pistil* 22-26 mm long, glabrous, cream; pollen presenter narrow, 1 mm long, rusty brown. *Follicles* 3 or 4 per head, obliquely ovate, 9-12 mm long, loosely hirsute. *Flowering period* Flowers July-October. Named from the Latin *fuscus* (dark) and *bractea* (a bract), in reference to the involucre bracts. Related most closely to *D. cuneata*, differing in the dark brown involucre bracts (the outermost squarrose) and the heads with more flowers that are smaller, with a grey perianth limb and small, dark pollen presenter. Flowers not scented. Follicles loosely attached.

