

INTERIM RECOVERY PLAN NO. 106

Lesueur-Coomallo Floristic Community A1.2

Interim Recovery Plan

2002-2007

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Photograph: Sheila Hamilton-Brown

May 2002

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FOREWORD

Interim Recovery Plans (IRPs) are developed within the framework laid down in the Department of Conservation and Land Management 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.

The Department is committed to ensuring that Critically Endangered, and where appropriate and feasible, other threatened ecological communities are conserved through the preparation and implementation of Recovery Plans or Interim Recovery Plans. The Department will also ensure that conservation action commences as soon as possible and always within five years of endorsement of the Endangered rank by the Western Australia Minister for the Environment.

This IRP will operate from May 2002 to May 2007 but will remain in force until withdrawn or replaced.

The provision of funds identified in this IRP is dependent on budgetary and other constraints, as well as the need to address other priorities.

Information in this IRP was accurate at 11 February 2002.

SUMMARY

Name: Lesueur-Coomallo Floristic Community A1.2.

Description: Species-rich heath with emergent *Hakea obliqua* on sand with faithful species of *Hakea obliqua* and *Beaufortia* aff. *elegans* and constant species of *Dasypogon bromeliifolius* and *Stirlingia latifolia* over well-drained grey sand over pale yellow sand on lateritic uplands. Associated species include *Allocasuarina humilis*, *Calothamnus sanguineous*, *Hibbertia hypericoides*, *Hypocalymma xanthopetalum* and *Schoenus subflavus*.

IBRA Bioregion: Geraldton Sandplains.

Department of Conservation and Land Management Region: Midwest Region.

Department of Conservation and Land Management District: Moora.

Recovery Team: Moora District Threatened Flora Recovery Team.

Current status: This community was assessed by the Western Australian Threatened Ecological Communities' Scientific Committee on the 28 July 2000 as Endangered; this status was endorsed by the Minister for the Environment on 6 November 2001.

Critical habitat: The area of occupancy of the known occurrence, comprising well-drained grey sand over pale yellow sand on lateritic uplands of the Banovich Uplands.

IRP Objective(s): To maintain the overall health of the community and reduce the level of threat to prevent the community becoming extinct.

Criteria for success:

1. Maintenance of the diversity and composition of the native species in the community.
2. Improvement in terms of the reduction of threatening processes as defined in this document.

Criteria for failure:

1. Loss or modification of any of the components of the threatened ecological community.
2. Reduction in the size of the threatened ecological community.

Summary of recovery actions for the Lesueur-Coomallo Floristic Community A1.2.

1. Locate further occurrences	9. Implement <i>Phytophthora</i> spp. disease treatment if necessary
2. Monitor the boundary of the community	10. Design and implement weed management program if required
3. Design and implement a program for monitoring the flora	11. Implement replanting and rehabilitation if necessary
4. Liaise with surrounding landholders to manage their properties in ways sympathetic to the park	12. Study the effect of feral and native animals on the Threatened Ecological Community
5. Erect environmental markers	13. Design and implement feral and native animal pest control
6. Liaise with the local authorities to manage road activities in ways sympathetic to the park	14. Obtain biological and ecological information
7. Design fire response plan	15. Preserve genetic material of the community
8. Monitor <i>Phytophthora</i> spp. disease and assess the need for disease treatment	16. Incorporate strategies required to protect the community into the National Park Management Plan when it is reviewed

1 BACKGROUND

History, defining characteristics of ecological community, and conservation significance

The Lesueur-Coomallo area has long been known to be "an area of outstanding flora conservation values, complex geological features and unusually rugged terrain in the otherwise subdued landforms of the northern kwongan region" (Burbidge and van Leeuwen 1990). It ranks as one of the three most important areas for flora conservation in southwest Western Australia (Burbidge *et al.* 1990).

Griffin *et al.* (1983) identified the Lesueur-Coomallo area as floristically distinctive and diverse compared to other areas of the northern kwongan region. Within the Lesueur-Coomallo area, Griffin and Hopkins (1990) identified vegetation units strongly associated with landform and soil distribution and observed that sand heath with *Hakea obliqua* occurred only in the south-eastern part of the Banovich Upland landform, characterised by old undulating lateritic slopes. Martinick and Associates (1989) produced a detailed vegetation map of much of the Lesueur-Coomallo area. They mapped 64 vegetation types, distinguished on the basis of soils, landforms and indicator species, and observed that sandplain heath with emergent *Hakea obliqua* (Floristic Community A1.2) only occurred in one 31ha site.

Description of Occurrences

The Lesueur-Coomallo Floristic Community A1.2 is known only from one 31 ha occurrence within Lesueur National Park (Figure 1). It borders a wide gravel road to the north (Banovich road), a firebreak to the east, and remnant vegetation to the south and west.

Critical Habitat

Critical habitat is habitat identified as being essential for the survival of a listed threatened species or listed threatened ecological community. Habitat is defined as the biophysical medium or media (a) occupied (continuously, periodically or occasionally) by an organism or group of organisms; or (b) once occupied (continuously, periodically or occasionally) by an organism, or group of organisms, and into which organisms of that kind that the potential to be reintroduced (sections 207A and 528 of Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)).

The critical habitat for the Lesueur-Coomallo Floristic Community A1.2 is the area of occupancy of the known population comprising:

- well drained grey sand over pale yellow sand
- lower slopes and rises of the undulating lateritic Banovich Uplands.

Biological and ecological characteristics

The floristic composition of the sand heath community correlates with the soil/substrate types and depths. Little is known of the biology and ecology of the community and its components, particularly in response to disease and weed invasion.

Threatening processes

Altered fire regimes

Fire can influence species composition by increasing the number of weeds. As well, an increase in the frequency of fire can prevent species from completing growth and reproductive cycles. In particular, *Hakea obliqua* was identified as one of the most vulnerable species affected by frequent fire. Although there has been no documented incidence of fire in this community since 1966 high fuel loads make the

area susceptible to high-intensity wild fires. Further, the risk of frequent fire is increased by greater human activity (in recent times, fires in the park have been caused by human activity) (Department of Conservation and Land Management 1990).

Disease

Dieback disease caused by the *Phytophthora* sp. plant pathogens is a serious threat as there are a high number of susceptible species in and surrounding the Threatened Ecological Community (TEC) (G. Keighery, personal communication¹). *Phytophthora citricola* already occurs in the park (Mills 1992) although not in the immediate vicinity of the TEC (R. France, personal communication²), while three other species of *Phytophthora*, including the virulent *P. cinnamomi*, are known from within 30 km of the Park (A. Burbidge, personal communication³). These plant pathogens, which cause the roots to rot and results in death from drought stress, are commonly introduced and spread in infected soil, mud and gravel carried on the wheels and underside of vehicles, and mud on walking shoes/boots. The TEC is very close to a gravel road over which the Department has no control.

Other disease-causing pathogens such as *Armillaria luteobubulina* and the canker-causing fungus *Botryosphaeria ribis* are known from the northern kwongan and have the potential to cause significant problems in the native vegetation. *Botryosphaeria ribis* has been found in cankers of *Banksia attenuata* and *Banksia menziesii* on the gravel road that runs adjacent to the TEC (Shearer and Batini 1990).

Weed invasion

Weeds can have significant impacts on a community through competition with the native species, prevention of regeneration and alteration of fire regimes (Hobbs and Mooney 1993). Disturbances such as fires, grazing and death through disease can predispose areas to weed invasion if weed propagules are present. At present there is no evidence of weed invasion in the TEC, but its proximity to a gravel road and a proposed mining site increase the risk.

Mining

Currently there is a proposal to mine coal by open cut mining techniques being assessed by the Environmental Protection Authority (in accordance with the *Environmental Protection Act 1986*) for the land parcel adjacent to the National Park, approximately 500 m south of the TEC. The introduction and spread of disease (discussed above), altered hydrology, dust and road widening are the major concerns for the conservation of the TEC in the event of mining (A. Burbidge, personal communication⁴).

- The introduction of *Phytophthora* species on mining vehicles, and their spread through large-scale soil disturbance, would pose a constant threat during open cut mining operations and could effectively destroy this tiny single occurrence of the community.
- Mining activities are likely to change surface water flows in an area substantially larger than the mining area and are likely to affect ground water flows. The soil profiles in the Lesueur-Coomallo area are known to contain substantial amounts of salt. Mining may also promote acid mine drainage which would also have negative impacts on the native vegetation.
- Dust from mining activities may disperse beyond the mine site and settle on the native vegetation. This may cause damage to the leaf surfaces and restrict evapotranspiration. The dust may also

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³ Dr Andrew Burbidge – Deputy Director Biodiversity Conservation, Nature Conservation Division, Department of Conservation and Land Management, P.O. Box 51, Wanneroo 6946.

contain nutrients that will alter the nutrient status of the native vegetation - well adapted to low-nutrient soils and adversely affected by nutrient inputs or may contain minerals that may have detrimental effects on the plant.

- To accommodate mining equipment and vehicles, the gravel road would probably have to be widened, which will include the removal of some of the TEC. It may also increase water run-off and dust. The Shire road-grading activities may also have the same effects.

Animal pests

Rabbits (*Oryctolagus cuniculus*), foxes (*Vulpes vulpes*) and kangaroos (*Macropus fuliginosus*) occur on the land parcel and may have an impact through disturbance of soil by rabbit warren and fox den construction, increased nutrient levels from their droppings and the introduction of weeds.

Guide for decision-makers

Section 1 provides details of current and possible future threats. Developments in the immediate vicinity of the Lesueur-Coomallo Floristic Community A1.2 require assessment. No developments should be approved unless the proponents can demonstrate that they will have no significant impact on the ecological community.

Current status

The 'Lesueur-Coomallo Floristic Community A1.2' community meets the following criterion for Endangered (EN) ecological communities:

- B) Current distribution is limited, and:
ii) there are few occurrences, each of which is small and/or isolated and all or most occurrences are very vulnerable to known threatening processes*

Recovery strategy

To conduct appropriate research into the ecological characteristics of the community to develop further understanding about the management actions required to maintain or improve its condition.

2 RECOVERY AIM AND CRITERIA

- To improve the status of the threatened ecological community by protecting and maintaining the only known occurrence, and reducing the level of threat as defined in this document so that the community will not become Critically Endangered.
- To locate more occurrences and promote their protection, maintenance and recovery.

Criteria for success

- Maintenance of the diversity and composition of the native species in the community.
- Improvement in terms of reduction of threatening processes as defined in this document.

Criterion for failure

- Significant loss of area or modification of the occurrence (measured by loss of component species and weed invasion) of the threatened ecological community.

3 RECOVERY ACTIONS

3.1 Existing Recovery Actions

The Moora District Threatened Flora Recovery Team (MTFRT) is the recovery team for this community and will continue to report annually to the Department's Corporate Executive.

The Department has already written to the Environmental Protection Authority opposing the mining proposal on the adjacent property in accordance with the *Environmental Protection Act 1986*.

3.2 Required Recovery Actions

The following recovery actions are roughly in order of descending priority. However this should not constrain addressing any of the 'lower' priorities if opportunities arise.

The TEC occurs in Lesueur National Park, which is managed by the Department of Conservation and Land Management. A management plan has been prepared for the National Park and recovery actions in this IRP correspond to the objectives of sections 6.3, 7.1 and 7.2 of the plan (Department of Conservation and Land Management 1995).

3.2.1 Locate further occurrences

It is possible that other occurrences exist on private land elsewhere in the Lesueur-Coomallo area. The best quality colour aerial photographs (stereoscopic pairs) may assist in selecting likely sites, as would geological and soil maps. Radio interviews and other publicity campaigns may also aid in locating further occurrences. The details of new occurrences will be added to the threatened ecological community (TEC) database as recommended in English and Blyth (1999).

Responsibility: WATSCU
Estimated cost: \$2,000
Completion date: Year 2.

3.2.2 Monitor the boundary of the community

The boundary of the community should be monitored regularly, using current aerial photographs, aerial videography and annual ground-truthing. This information will be added to the TEC database.

Responsibility: WATSCU and Moora District through the MTFRT
Estimated cost: \$3000 for the initial monitoring (\$1500 per year for subsequent monitoring)
Completion date: Ongoing.

3.2.3 Design and implement a program for monitoring the flora

Data collected should include plant species diversity and weed levels. The TEC will be monitored regularly to provide information on condition. The program will include erecting permanent quadrats and also entail taking photopoints and photoplots annually (Elzinga *et al.* 2001). This information will be added to the TEC database.

Responsibility: WATSCU and Moora District through the MTFRT
Estimated cost: \$1000 per year
Completion date: Ongoing.

3.2.4 Liaise with surrounding landholders to manage their properties in ways sympathetic to the park

Liaise with surrounding landholders to manage their properties without compromising the conservation values of the National Park, particularly in regard to fire management, disease, weeds and introduced animals such as rabbits.

Responsibility: Moora District through the MTFRT
Estimated cost: \$500 per year
Completion date: Ongoing.

3.2.5 Erect Environmental Markers

Erect environmental markers along the Banovich Road to alert road maintenance workers of the presence of the rare community.

Responsibility: WATSCU through the MTFRT
Estimated cost: \$150
Completion date: Year 1.

3.2.6 Liaise with the local authorities to manage road activities in ways sympathetic to the park

Liaise with the Shire of Dandaragan to carry out road activities adjacent to the TEC and park without compromising its conservation values.

Responsibility: Moora District through the MTFRT in liaison with adjacent landowners
Estimated cost: \$500 per year
Completion date: Ongoing.

3.2.7 Design fire response plan

A TEC fire response protocol should be incorporated into the Fire Control Working Plan in case of fire affecting or threatening the TEC. This would include ensuring that a WATSCU or appropriate District Officer is contacted to provide advice; that the fire is extinguished as soon as possible using only existing fire-fighting access tracks, and if that is not possible, the fire should be allowed to burn; and that the area should be made completely out of bounds to the public after the fire.

Responsibility: WATSCU and Moora District through the MTFRT
Estimated cost: \$500
Completion date: Year 2.

3.2.8 Monitor *Phytophthora* spp. disease and assess the need for disease treatment

Phytophthora sp. infestations are known in Lesueur National Park, with the nearest approximately five kilometres from the TEC. The infestation has already been mapped and will be monitored at least every five years in summer and flagging marking the front replaced regularly. *Phytophthora* hygiene measures as outlined in the Dieback Hygiene Manual (Department of Conservation and Land Management 1992) will be adhered to in the park and have already commenced with restricted access to the area. Maintenance of any of the fire-fighting access tracks in the vicinity of the TEC will be kept to a minimum and conducted in seasons where the risks associated with soil movement are reduced, i.e. summer. Signs advising of the *Phytophthora* risk have been posted at this site.

Responsibility: Moora District through the MTFRT
Estimated cost: \$1000
Completion date: Every five years.

3.2.9 Implement *Phytophthora* spp. disease treatment if necessary

If *Phytophthora* spp. infests the TEC, implement *Phytophthora* spp. disease treatments recommended in the current Dieback Protocol document. This may include using a crop dusting aircraft to spread phosphonate. Additional treatment should be undertaken when active dieback is again noted, or within approximately three years, whichever comes first.

Responsibility: Moora District through the MTFRT in liaison with phosphonate coordinator, Nature Conservation Division
Estimated cost: \$1500 per treatment
Completion date: Ongoing.

3.2.10 Design and implement weed management program if required

If it is determined that weeds are present in the TEC, or in the event of any weed invasion, a weed control strategy is required that takes into account the nature of the community and the need for continuing maintenance. The weed management program should involve (adapted from Panetta and Hopkins 1991):

1. Identifying and mapping the weed species
2. Investigating the effects of herbicide on the native species
3. Eradicating weeds with the selection of the appropriate herbicide
4. The control of invasive weeds by hand or spot spraying as soon as the weeds emerge.

Responsibility: Moora District through the MTFRT
Estimated cost: Moora District to determine costs
Completion date: Ongoing.

3.2.11 Implement replanting and rehabilitation if necessary

Seek to replant and rehabilitate the occurrence after a *Phytophthora* spp. disease outbreak or events involving soil disturbance. The appropriate species can be identified from the flora monitoring data (recovery action 3.2.3). These should then be propagated from seed collections taken from the community or stock from surrounding areas.

Responsibility: WATSCU, Moora District through the MTFRT in liaison with the Threatened Flora Seed Centre
Estimated cost: All parties to determine costs
Completion date: Ongoing.

3.2.12 Study the effects of feral and native animals on the TEC

Seek to determine if rabbits, foxes and/or kangaroos are grazing or affecting the TEC in any way. This would include determining the size of the populations (ie. determining the index of abundance using spotlighting and dung pellet techniques (Arnold and Maller 1987)).

Responsibility: Moora District through the MTFRT
Estimated cost: Moora District to determine costs
Completion date: Ongoing.

3.2.13 Design and implement feral and native animal pest control if necessary

Design and implement a control program if it is deemed that feral and native animals are having an impact on the TEC. Baiting for rabbits and foxes using 1080 is likely to be the best option. Baiting is generally conducted in summer and repeated each year if rabbits reappear. Fencing the TEC may be the best option to prevent kangaroo grazing.

Responsibility: Moora District through the MTFRT
Estimated cost: Moora District to determine costs
Completion date: Ongoing.

3.2.14 Obtain biological and ecological information

If, during the lifetime of this IRP, *Phytophthora* spp. infestations or numerous incidences of fire or some major soil disturbance activity occurs in the TEC, then research designed to increase an understanding of the biology of the component species may be appropriate. Research could include:

1. Study of the soil seed bank dynamics and the role of various factors (disturbance, competition, rainfall, grazing) in recruitment and seedling survival.
2. Quantification of level of seed predation or removal of seed.
3. Determination of reproductive strategies, phenology and seasonal growth.
4. Factors determining level of flower and fruit abortion.
5. Investigation of population genetic structure, levels of genetic diversity and minimum viable population size.
6. Response of the component species to fire.
7. Response of the component species to *Phytophthora* spp., *Armillaria luteobubalina*, *Botryosphaeria ribis* and other potentially destructive diseases.
8. Effects of weeds on recruitment and establishment.

Responsibility: WATSCU and Moora District through the MTFRT in liaison with the Science Division and the Threatened Flora Seed Centre
Estimated cost: All parties to calculate costs
Completion date: Ongoing.

3.2.15 Preserve genetic material of the community

It may be necessary to store germplasm as a genetic resource, ready for use in translocations and as an *ex situ* genetic 'blueprint' of the TEC. The germplasm stored will only comprise seed material. All species should be collected. If it is not possible to collect adequate quantities of viable seed from the TEC, then the material will be taken from surrounding areas to preserve local provenance. If not possible, other methods of germplasm storage will be investigated, such as living collections grown from cutting material.

Responsibility: WATSCU and Moora District through the MTFRT in liaison with the Threatened Flora Seed Centre
Estimated cost: \$8000 per year
Completion date: Ongoing.

3.2.16 Incorporate strategies required to protect the community into the National Park Management Plan when it is reviewed

Ensure protection of the community in the implementation of strategies in the National Park and Nature Reserve Management Plan. Incorporate any new strategies when the Management Plan is reviewed in 2005.

Responsibility: Moora District and Midwest Region
Estimated cost: Nil.

4 TERM OF PLAN

This Interim Recovery Plan (IRP) will operate from May 2002 for 5 years but will remain in force until withdrawn or replaced.

5 ACKNOWLEDGMENTS

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

John Blyth Acting Manager, WATSCU, Department of Conservation and Land Management
Dr Nicky Marlow Senior Research Scientist, Science Division, Department of Conservation and Land Management
Information Management Branch for mapping the Lesueur-Coomallo units

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Summary of costs for each Recovery Action

Recovery action	Year 1	Year 2	Year 3	Year 4	Year 5
Locate further occurrences	\$2000		-	-	-
Monitor the boundary of the community	\$3000	\$1500	\$1500	\$1500	\$1500
Design and implement a program for monitoring the flora	\$500	\$500	\$500	\$500	\$500
Liaise with surrounding landholders to manage their properties in ways sympathetic to the park	\$500	\$500	\$500	\$500	\$500
Erect environmental markers	\$150	-	-	-	-
Liaise with the local authorities to manage road activities in ways sympathetic to the park	\$500	\$500	\$500	\$500	\$500
Design fire response plan	-	\$500	-	-	-
Monitor <i>Phytophthora</i> spp. disease and assess the need for disease treatment	-	-	-	-	\$1000
Implement <i>Phytophthora</i> spp. disease treatment if necessary	\$1500 per treatment				
Design and implement weed management program if required	\$600 per treatment				
Implement replanting and rehabilitation if necessary	*	*	*	*	*
Study the effects of feral and native animals on the TEC	*	*	*	*	*
Design and implement feral and native animal pest control if necessary	*	*	*	*	*
Obtain biological and ecological information	*	*	*	*	*
Preserve genetic material of the community	\$8000	\$8000	\$8000	\$8000	\$8000
Incorporate strategies required to protect the community into the National Park Management Plan when it is reviewed	-	-	-	-	-

* Body responsible for the action to determine costs and obtain funding