INTERIM RECOVERY PLAN NO. 66

Perched wetlands of the wheatbelt region with extensive stands of living sheoak (*Casuarina obesa*) and paperbark (*Melaleuca strobophylla*) across the lake floor (occurrences other than Toolibin Lake)

Interim Recovery Plan 2000-2003

by

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Photograph: Sheila Hamilton-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 ecological communities 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 CALM's Director of Nature Conservation.

This Interim Recovery Plan will operate from 11 September 2000 but will remain in force until withdrawn or replaced. It is intended that, if the ecological community is still ranked Critically Endangered after three years, this IRP will be replaced by a full Recovery Plan.

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 18 August 2000.

SUMMARY

Name: Perched wetlands of the Wheatbelt region with extensive stands of living sheoak (*Casuarina obesa*) and paperbark (*Melaleuca strobophylla*) across the lake floor.

Description: The lake-bed community is characterised by seasonal fresh water inundation. The main species and other biota depend on relatively fresh water and regular drying out of the lake-bed for survival. This is the first occurrence confirmed outside the Toolibin Lake catchment.

CALM Region(s): Wheatbelt

CALM District(s): Merredin

Shire(s): Dowerin

Recovery Team: The Merredin District Threatened Flora Recovery Team (MDTFRT) will act as recovery team for this community. The team will give consideration to including members to represent landholders or the catchment group and the Water and Rivers Commission.

Current status: Occurrence 2 was assessed by the Threatened Ecological Communities' Scientific Advisory Committee on 10 November 1998 as another occurrence of the Critically Endangered community 'Perched wetlands of the Wheatbelt region with extensive stands of living sheoak (*Casuarina obesa*) and paperbark (*Melaleuca strobophylla*) across the lake floor'. The assessment that the community as a whole remained Critically Endangered was endorsed by CALM's Director of Nature Conservation on 23 March 1999.

Habitat requirements: Seasonal fresh water inundation and regular drying out of the lake-bed for survival and regeneration.

IRP Objective(s): To maintain or improve the overall condition of the lake-bed community and reduce the level of threat to secure its long-term survival.

Criteria for success: The maintenance and/or improvement of the lake-bed community dominated by stands of *Casuarina obesa* and *Melaleuca strobophylla* across the lake floor.

Critical Habitat

Criteria for failure: Loss of area or significant modification of the lake-bed community due to increased salinity or other threats.

Recovery Actions:

General
1. Establish a Recovery Team
2. Locate further occurrences
3. Liaise with owners, land managers and other interested groups
4. Design and conduct research towards understanding the conservation needs of each occurrence
5. Fence occurrences and mend fences, where appropriate
6. Seek to acquire occurrences for conservation
7. Write a Full Recovery Plan

Specific to Occurrence 2
8. Erect diversion barrier
9. Liaise with landowner to continue to manage water quality and ensure stability in hydrological regimes
10. Monitor wetland health
11. Liaise with the catchment group to continue programs to improve hydrological regimes likely to affect Occurrence 2

1. BACKGROUND

History, defining characteristics of ecological community, and conservation significance

The ecological community 'perched wetlands with extensive stands of Swamp Sheoak (*Casuarina obesa*) and paperbark (*Melaleuca strobophylla*) across the lake floor' used to be a common vegetation association in the Wheatbelt before land-clearing, but suffered secondary salinisation and excessive water-logging as a result of large-scale clearing of their catchments (Froend *et al.* 1987, Halse *et al.* 1993). Prior to 1998, Toolibin Lake (Occurrence 1) was the only known remaining example and was formally considered by CALM's Threatened Ecological Communities Scientific Advisory Committee and classified as Critically Endangered in 1995. This moderately modified occurrence was threatened by salinity, water logging, weed invasion and grazing. Toolibin Lake has been declared a Natural Diversity Recovery Catchment under the State Salinity Strategy and a Recovery Team - implementing a formal Recovery Plan addressing both in-lake and catchment processes - has been in place for some years.

In 1998, Occurrence 2 was determined as another example of this Critically Endangered community. Occurrence 2 is the first extant occurrence confirmed outside the Toolibin Lake catchment and the Toolibin Lake Recovery Team is not appropriate to address the issues regarding this occurrence - this IRP is written to deal with the urgent actions required for Occurrence 2 and any other subsequently identified occurrences.

Extent and location of occurrences

Occurrence 2 is a small fresh water wetland, located in the Dowerin Shire, and is approximately 200 km north of Occurrence 1 (Table 1).

Table 1: Summary of occurrence information and threats (Occurrence 1 is included for comparison)

Occurrence number and location	Land Tenure	Area (ha)	Condition	Threats
1 – Shire of Narrogin	'A' Class Nature Reserve	296.4	Moderately modified	Salinisation, water logging, weed invasion and grazing.
2 – Shire of Dowerin	Private land	13 ± 2	Slightly modified	Salinisation, water logging and weed invasion.

Critical Habitat

Critical habitat is habitat identified as being critical to 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)).

Biological and ecological characteristics

Occurrence 2 is dominated by extensive stands of *Casuarina obesa* and *Melaleuca strobophylla* trees, the samphires *Halosarcia pergranulata* and *Sarcocornia quinqueflora*, the bluebushes *Maireana brevifolia* and *Maireana enchylaenoides*, and the occasional *Acacia ligustrina* shrubs scattered across the southern portion of the lake bed. Surrounding the wetland is a narrow strip of *Eucalyptus loxophleba* woodland that is surrounded by cleared farmland (originally *E. loxophleba* and *E. salmonophloia* woodland). The lakebed community is characterised by seasonal inundation by fresh water. The main tree species and other biota depend on relatively fresh water and regular drying out of the lake-bed for survival. It is not known how long the samphires and bluebushes have been in the wetland, but they are likely to be an artefact of increasing salinity.

Information on the biological and ecological characteristics of the dominant species on the lake bed community is limited. Both *Casuarina obesa* and *Melaleuca strobophylla* naturally occur in habitats that are periodically inundated by fresh, brackish or moderately saline water (Barlow and Cowley 1988, WA Herbarium 2000, Wilson and Johnson 1989). Studies on Toolibin Lake, however, indicate that the mortality of *Casuarina obesa* and *Melaleuca strobophylla* is affected by a combination of saline soil conditions and increasing water logging (Froend *et al.* 1987).

Hydrology and Water Quality

Occurrence 2 is located on a tributary of a creek - that itself flows into a highly saline lake - that has become increasingly saline over the last 20 or so years. Residual salt has accumulated in the drainage lines from a breakout of surface salinity around 16 km upstream over 1985-1992. This is now under control, however there is a second area likely to be producing significant surface salt around 9 km upstream (C. Walker, personal communication[1]).

Occurrence 2 was a heavily wooded wetland that used to fill regularly during periods of high run-off, usually in winter (occurred more than once every eight years) with regular drying out of the lake-bed. An earthen diversion bank to prevent saline water entering the wetland was constructed by the landowners in 1991. This bank diverted water back to the main creek, which itself flows into a wetland, the ecological community of which has been destroyed by saline water. Water has run over the top of the diversion bank twice (1991 and 1999) during very heavy rainfall events. Because only very high flows enter the wetland over the diversion bank, the first and last poorer quality water are excluded and the wetland fills with water of relatively low salinity. Thus the action by the landowners has prevented the wetland from becoming more saline. However, the diversion bank is absolute, inasmuch as it keeps out all water in all but very high rainfall years.

Historical and current threatening processes

In the recent two decades the water flowing to the wetland has had elevated salinity levels. If allowed into the wetland this water will eventually kill the dominant tree species. All the catchment groups in the Dowerin Shire rank water logging and rising water tables as processes threatening the wetlands and surrounding farmland (J. Silver, personal communication[2]). There is currently no information on the depth or salinity of the water table below Occurrence 2 and gathering this information is a priority under this IRP. From the research conducted at Toolibin Lake it is clear that the interaction between saline water and inundation that is too frequent or too prolonged constitutes a major threat to Occurrence 2.

Since the erection of the earthen diversion bank, the living trees may suffer drought stress for a part of the very long period between inundations and the wetland does not fill sufficiently for the health and adequate regeneration of the lake-bed community. To date, only a 1991 cohort of *Casuarina obesa* and *Melaleuca strobophylla* has regenerated, and some of the older trees are 'dying back' (author, personal observations).

Conservation status

The 'Perched wetlands of the Wheatbelt region with extensive stands of living sheoak (*Casuarina obesa*) and paperbark (*Melaleuca strobophylla*) across the lake floor (occurrences other than Toolibin Lake)' meets the following criteria for Critically Endangered (CR) ecological communities:

> *A) The estimated geographic range, and/or total area occupied, and/or number of discrete occurrences since European settlement have been reduced by at least 90%:*
> *i) Geographic range, and/or total area occupied and/or number of discrete occurrences are continuing to decline such that total destruction of the community is imminent (within approximately 5 years).*
> *ii) Modification throughout its range is continuing such that in the immediate future (within approximately 5 years) the community is unlikely to be capable of being substantially rehabilitated.*
>
> *C) The ecological community exists only as highly modified occurrences that may be capable of being rehabilitated if such work begins in the immediate future (within approximately 5 years).*

[1] Colin Walker – Geo and Hydro Environmental Management Pty Ltd, Perth.
[2] John Silver – ex-Community Landcare Coordinator, Dowerin.

Recovery Strategy

To identify more occurrences and liaise with landowners and catchment groups to implement recovery actions identified in this IRP.

2. RECOVERY AIM AND CRITERIA

Objective

- To maintain or improve the vigour of the lake-bed community (with *Melaleuca strobophylla* and *Casuarina obesa* as dominants) and reduce the level of threat to it.

Criteria for success

- No deterioration in the health of the lake-bed vegetation.
- Successful regeneration of the lake-bed vegetation.
- Reduction of threatening processes as defined in this document, in particular, limiting water entering the wetlands to fresher water under normal rainfall conditions.
- The expansion of catchment wide management likely to result in stabilising the hydrological regime of the catchment of the wetland.

Criteria for failure

- Significant loss of area or modification of the lake-bed community.
- Lack of regeneration of the lake-bed vegetation.
- Continuing rise in the regional water table and the expansion of secondary salinisation in the catchments.

3 RECOVERY ACTIONS: ALL OCCURRENCES OTHER THAN TOOLIBIN LAKE

The landowners of Occurrence 2 have been notified of the importance of this community and they have ensured that future on-farm activities will not affect the occurrence. If any other occurrences are found, the cooperation of the landholders will be sought to ensure that on-farm activities do not affect the occurrences. Prior to any recovery actions being taken, their permission and cooperation will be sought.

3.1 Establish a Recovery Team

The Merredin District Threatened Flora Recovery Team (MDTFRT) will act as recovery team for this community. The team will give consideration to including members to represent landholders or the catchment group and the Water and Rivers Commission. The Recovery Team will continue to report annually to CALM's Corporate Executive.

Action:	Establish a Recovery Team
Responsibility:	CALM (WATSCU)
Estimated cost:	$Nil
Completion date:	Completed

3.2 Locate further occurrences

It is possible that other occurrences occur on private land. Radio interviews and articles as well as field days demonstrating the actions taken to secure Occurrence 2 may also aid in locating further occurrences.

Action:	Locate further occurrences
Responsibility:	CALM (WATSCU)
Estimated cost:	$2,000

Completion date: Year 1

3.3 Liaise with owners, land managers and other interested groups

Occurrence 2 is and any other occurrences located are likely to be managed by authorities other than CALM or be privately owned. The involvement of land managers, local community groups and industry in the recovery of the community wherever possible and practical is therefore essential to the recovery process.

Action: Liaise with owners, land managers and other interested groups
Responsibility: Merredin District Threatened Flora Recovery Team (MDTFRT)
Estimated cost: $2,000 per year
Completion date: Ongoing

3.4 Design and conduct research towards understanding the conservation needs of each occurrence

Research should be designed to increase the understanding of the characteristics of the community to assist future management decisions. Research topics should include:

- Determination and monitoring of ground and surface water processes.
- Techniques to manage water quality and ensure stability in hydrological regimes.
- Determination and monitoring of the condition of the lake-bed community.
- The optimum conditions for the success of the key lake-bed species of the community, specifically, the quality and quantity of water needed to initiate regeneration.
- Determination of the optimum infiltration rate of the lake bed and seeking ways to improve it.
- The role of disturbance in regeneration of the community.
- The impact of weeds on the occurrences leading to the design and implementation of a weed control strategy.

Action: Design and conduct research towards understanding the conservation needs of each occurrence
Responsibility: MDTFRT
Cost: MDTFRT to determine costs and likely funds available through other sources and to recommend a research program and sources of funds
Completion date: Ongoing

3.5 Fence occurrences and mend fences, where appropriate

Fence occurrences to ensure stock are excluded and vehicle access can be limited to management needs only. For those occurrences that are already fenced (eg. Occurrence 2), seek funds to assist in the maintenance and repair of the fences.

Action: Fence occurrences and mend fences, where appropriate
Responsibility: MDTFRT in liaison with landowners
Estimated cost: MDTFRT to determine costs
Completion date: Ongoing

3.6 Seek to acquire occurrences for conservation

If blocks containing occurrences of the community become available, CALM will seek funds and negotiate to acquire occurrences and adequate buffer areas. Such areas should then be declared Class A reserves for the purpose of 'Conservation of Flora and Fauna' vested in the National Parks and Nature Conservation Authority (NPNCA).

Action: Seek to acquire the occurrence for conservation
Responsibility: CALM (Land Acquisitions Section)
Estimated cost: CALM to negotiate costs on a market/valuation basis
Completion date: When available

3.7 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.

Action:	Write a full Recovery Plan
Responsibility:	CALM (WATSCU) in consultation with the MDTFRT
Cost:	$20,000
Completion date:	At the end of Year 3

4 RECOVERY ACTIONS; SPECIFIC TO OCCURRENCE 2

4.1 Existing recovery actions

Piezometers/monitoring bores have been installed in and around the wetland and will be monitored for two years. Monitoring stations have been placed along the creek into the wetland to determine the influx of salts. Funding for these actions came from Bankwest *Landscope* Visa Card Trust Fund.

CALM (WATSCU) commissioned a hydrologist to design a more robust adjustable diversion barrier to replace the current earthen barrier. The landholders have considered a design and are in the process of erecting it themselves.

4.2 Recovery actions

4.2.1 Erect diversion barrier

Erect a robust adjustable diversion barrier to manage the quality of water entering the wetland.

Action:	Erect diversion barrier
Responsibility:	Landowners
Estimated cost:	$1,750
Completion date:	Year 1

4.2.2 Encourage the landowners to continue to manage water quality and ensure stability in hydrological regimes

This would include ensuring surface water quality are regularly monitored and liaising with the landowners to respond to the results with the opening and closing of the diversion barrier.

Action:	Liaise with landowners to continue to manage water quality and ensure stability in hydrological regimes
Responsibility:	MDTFRT
Estimated cost:	$300
Completion date:	Ongoing

4.2.3 Monitor wetland health

This would include taking measurements of tree height, diameter and assessment of the canopy of a representative number of the wetland trees similar to that used by Ogden and Froend (1998) every two years and link the results with the hydrological data.

Actions:	Monitor wetland health
Responsibility:	MDTFRT and Tin Dog Creek/Dowerin Lakes catchment group
Estimated cost:	$350 every two years
Completion date:	Ongoing

4.2.4 Liaise with the Tin Dog Creek/Dowerin Lakes Catchment Group to continue programs to improve hydrological regimes likely to affect Occurrence 2

Liaise with the Tin Dog Creek/Dowerin Lakes Catchment Group to continue their involvement in catchment revegetation and promote agronomic practices that increase water usage and help in lowering the water table.

Actions:	Liaise with the Tin Dog Creek/Dowerin Lakes Catchment Group to continue programs to improve hydrological regimes likely to affect Occurrence 2
Responsibility:	MDTFRT
Estimated cost:	$1,000 per year
Completion date:	Ongoing

5. TERM OF PLAN

This Interim Recovery Plan will operate from 11 September 2000 to 10 September 2003 but will remain in force until withdrawn or replaced. It is intended that, unless the ecological community is no longer threatened with total destruction, this IRP will be replaced by a full Recovery Plan after three years.

6. ACKNOWLEDGMENTS

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

Gary Lee	Tin Dog Creek catchment group, Dowerin
Mike Fitzgerald	Project Officer, CALM Merredin
Paul Roberts	District Manager, CALM Merredin

7. REFERENCES

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Summary of costs for each Recovery Action

	Year 1		Year 2		Year 3	
Recovery action	**NHT***	**Other**	**NHT***	**Other**	**NHT***	**Other**
General						
1. Establish a Recovery Team		$Nil		$Nil		$Nil
2. Locate further occurrences	$2,000					
3. Liaise with owners, land managers and other interested groups	$2,000		$2,000		$2,000	
4. Design and conduct research towards understanding the conservation needs of each occurrence		**		**		**
5. Fence occurrences and mend fences, where appropriate		**		**		**
6. Seek to acquire occurrences for conservation				(market value)		
7. Write a Full Recovery Plan		-		-		$20,000
Specific to Occurrence 2						
1. Erect diversion barrier		$1,750				
2. Liaise with landowner to continue to manage water quality and ensure stability in hydrological regimes		$300		$300		$300
3. Monitor wetland health		$350				$350
4. Liaise with catchment groups to continue programs to improve hydrological regimes likely to affect Occurrence 2		$1,000		$1,000		$1,000

*Funds already contributed
** Merredin District Threatened Flora Recovery Team to calculate costs