NATURALISTE NANCY

(*Wurmbea calcicola*)

RECOVERY PLAN

Heather Taylor, Val English and Andrew Webb

Australian Government

Government of Western Australia

Department of Environment and Conservation

FOREWORD

Interim Recovery Plans (IRPs) are developed within the framework laid down in WA 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 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This Interim Recovery Plan, will operate from December 2005 to November 2010 but will remain in force until withdrawn or replaced. It is intended that, if the taxon is still ranked Vulnerable (WA), this IRP will be reviewed after five years.

This IRP was given regional approval on 21 November 2005 and was approved by the Director of Nature Conservation on 13 December 2005. The allocation of staff time and provision of funds identified in this Interim Recovery Plan is dependent on budgetary and other constraints affecting DEC, as well as the need to address other priorities.

This IRP has been updated with information contained herein and is accurate as at January 2008.

This IRP was prepared with financial support from the Australian Government and has been adopted as a National Recovery Plan under the provisions of the Commonwealth *Environment Protection and Biodiversity Conservation Act* (EPBC Act).

ACKNOWLEDGMENTS

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

Anne Cochrane	Manager, DEC's Threatened Flora Seed Centre
Amanda Shade	Horticulturalist, Botanic Garden 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 Wildlife Branch for assistance.

SUMMARY

Scientific Name: *Wurmbea calcicola* **Common Name:** Naturaliste Nancy
Family: Colchicaceae **Flowering Period:** June to July
DEC Region: Southwest **DEC District:** Blackwood
Shires: Busselton **Recovery Teams:** South West Region Threatened Flora and Communities Recovery Team (SWRTFCRT)

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; CALM (1998) *Florabase – Information on the Western Australian Flora* (http://www.calm.wa.gov.au/science/); Macfarlane, T.D. (1993) *Wurmbea calcicola* (Cochicaceae), a new species from Cape Naturaliste, south western Australia. *Nuytsia* Vol 9; pp 233-236.

Current status: *Wurmbea calcicola* was declared as Rare Flora under the Western Australian *Wildlife Conservation Act 1950* in September 1987 as *Wurmbea* sp., Cape Naturaliste, *S.D. Hopper* 5871. It currently meets World Conservation Union (IUCN) Red List Category Vulnerable (IUCN 2001) under criterion D1 as it is estimated that there are less than 1000 mature individuals. The species is currently known from a single population (4 subpopulations) at Cape Naturaliste in the south west of Western Australia. Recreational activities and weed invasion in nearby areas are minor threats to the single known population. The species is listed as Endangered under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999.*

Distribution and habitat: *Wurmbea calcicola* is found only in a restricted area on Cape Naturaliste in the south west of Western Australia. The species tends to form colonies on the coastal limestone cliffs, which are a part of the Leeuwin-Naturaliste National Park. The habitat for the species is the brown pockets of loamy soil found on the cliffs. It generally inhabits open areas, in low shrubland of chenille honey-myrtle (*Melaleuca huegelii*), coastal honey-myrtle (*M. acerosa*), native rosemary (*Olearia axillaris*), basket bush (*Spyridium globosum*), pinkwood (*Beyeria viscosa*), cockies tongues (*Templetonia retusa*), acacias and Preiss's prickle fruit (*Acanthocarpus preissii*).

Guide for decision-makers: Section 1 provides details of current and possible future threats. Developments in the immediate vicinity of the population or within the habitat that is defined as critical to survival require assessment. Any on-ground works (clearing, firebreaks, roadworks, spraying of herbicides, burning, drainage etc) in the immediate vicinity of *Wurmbea calcicola* will require assessment. Proponents should demonstrate that on-ground works will not have an impact on the species, or on its habitat or potential habitat.

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 - these areas provide potential habitat for natural range extension and/or for allowing pollinators or biota essential to the continued existence of the species to move between populations; and additional occurrences of similar habitat that may contain important populations of the species or be suitable for future translocations or other recovery actions intended to create important populations. The single population is considered important for the long-term recovery and survival of the species.

Benefits to other species/ecological communities: Recovery actions implemented to improve the quality or security of the habitat of *Wurmbea calcicola* will also improve the status of remnant vegetation in which it is located.

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. The taxon is not listed under any specific international treaty, however, and therefore this IRP does not affect Australia's obligations under any other international agreements.

Role and interests of Indigenous people: Involvement of the Indigenous community is being sought through the advice of the Department of Indigenous Affairs to determine whether there are any issues or interests identified in the plan. A search of the Department of Indigenous Affairs Aboriginal Heritage Sites Register has

identified that there are no sites of Aboriginal significance at or near populations of the species covered by this IRP. 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.

Social and economic impacts: The implementation of this recovery plan is unlikely to cause significant adverse social or economic impacts, as the only known population is located in a National Park.

Evaluation of the Plan's Performance: The Department of Environment and Conservation, in conjunction with the Recovery Team will evaluate the performance of this IRP. The plan is to be reviewed within five years.

Completed Recovery Actions: The following recovery actions have been implemented:

1. The population has been accurately mapped and monitored following its initial identification.
2. An original walk trail was re-directed to avoid the *Wurmbea calcicola* population.
3. Staff from the Threatened Flora Seed Centre (TFSC) collected 237 seeds from the population in September 1998 and the initial viability was variable.
4. Staff from DEC's Blackwood District staff monitor the population.

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

Recovery criteria

Criteria for success: The number of individuals within populations and/or the number of populations have increased by ten percent or more over the five year life of this plan.

Criteria for failure: The number of individuals within populations and/or the number of populations have decreased by ten percent or more over the five year life of this plan.

Recovery Actions:

1. Coordinate recovery actions	5. Obtain biological and ecological information
2. Conduct further surveys	6. Promote community awareness
3. Liaise with relevant groups and individuals	7. Review this plan
4. Monitor population	

1. BACKGROUND

History

S.D. Hopper and A.P. Brown first collected *Wurmbea calcicola* in 1986 during a flora survey in the Leeuwin Naturaliste National Park. The species was tentatively identified as *Wurmbea* in fruit, and was declared a new species in June 1987 by T.D. Macfarlane (Brown *et al.* 1998). It was noted that the population was in healthy condition in subsequent surveys and 650 plants were recorded in the last detailed population survey in 1998. A subsequent survey undertaken in 2006 recorded 220 mature plants.

Description

W. calcicola is an inconspicuous, erect, 8-18 cm high bulbous herb. It has three leaves and two of these are long, glossy and flattened, and 10-18 mm wide. The third, uppermost leaf is erect and exceeds the flowers in height; its base is also dilated; giving the appearance of a hood around the base of the inflorescence. Each plant has 2-5 white, bisexual flowers with pink nectaries that are barely separated from each other. The perianth is 11-15.5 mm long with 6 narrow tepals. For 1/4 of the length of the perianth, the tepals form a well-developed perianth tube and are white except for the nectary. Stamens are about half the length of tepals with oblong, purple anthers ca 1 mm long. The styles are free. A full taxonomic description of *W. calcicola* is provided in Macfarlane (2003).

Distribution and habitat

W. calcicola is endemic to Western Australia and is found only in a restricted area on Cape Naturaliste in the south west of Western Australia. The species tends to form colonies on the coastal limestone cliffs in the Leeuwin-Naturaliste National Park. The habitat for the species is the brown pockets of loamy soil found on the cliffs. *W. calcicola* inhabits open areas, in low shrubland of chenille honey-myrtle (*Melaleuca huegelii*), coastal honey-myrtle (*M. acerosa*), native rosemary (*Olearia axillaris*), basket bush (*Spyridium globosum*), pinkwood (*Beyeria viscosa*), cockies tongues (*Templetonia retusa*), acacias and Preiss's prickle fruit (*Acanthocarpus preissii*) (Brown *et al.* 1998).

Biology and ecology

Wurmbea calcicola is similar to variants of *Wurmbea centralis*, which occurs in desert habitat, in biology and ecology. It flowers in June-July and fruits in July-August. The major differences between the two species is that *W. calcicola* has white flowers instead of pink, less shelf-like flowers with little separation between nectaries, and narrower sepals and petals with a tube over twice as long as *W. centralis*. Some specimens of *W. centralis* differ further from *W. calcicola* in one of the following ways: having a greater number of flowers per inflorescence; styles are basally connate; and the leaves are separated by exposed internodes and are different in shape (Brown *et al.* 1998; Macfarlane 1993).

Initial germination studies at DEC's Threatened Flora Seed Centre (TFSC) indicated that the seed viability varied from 26-53%, however only a small amount of seed was tested.

The susceptibility of *Wurmbea calcicola* to dieback disease (caused by *Phytophthora* spp.) is not known although it is believed not to be susceptible to the disease (A. Brown[1] personal communication). *Wurmbea calcicola* produces a corm, which is a bulb like structure formed by enlargement of the underground stem base. Corms store food reserves, and are also characteristically utilised to reproduce asexually through production of smaller cormels. It has been observed that wurmbeas that occur in higher rainfall areas in the south west of Western Australia are typically fire responsive, and flower following fire (A. Brown personal communication). It is likely that the developed corms produce flowers following fire, although the species can also reproduce from seed (A. Brown personal communication).

[1] Andrew Brown, Threatened Flora Coordinator, WATSCU

Threats

Wurmbea calcicola was declared as Rare Flora under the Western Australian *Wildlife Conservation Act 1950* in September 1987 as *Wurmbea* sp., Cape Naturaliste, *S.D. Hopper* 5871. It currently meets World Conservation Union (IUCN) Red List Category Vulnerable (IUCN 2001) under criterion D1 as it is estimated that there are less than 1000 mature individuals. The species is currently known from a single population (4 subpopulations) at Cape Naturaliste in the south west of Western Australia. Recreational activities and weed invasion in nearby areas are minor threats to the single known population. The species is listed as Endangered under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999.*The main threats are the taxon's restricted distribution, and recreational activities.

- **Restricted distribution** is a threat to *Wurmbea calcicola*. As there is only one known population that occurs over a restricted area, an extreme event, such as climatic change, or possibly sequential fires over a very short period may impact on the taxon's survival. The effects of fire on the taxon are unknown, although it is likely to recover quickly from fire as it produces a corm that is likely to have the ability to survive most fire conditions (A. Brown, personal communication).

- **Recreational activities** in the Leeuwin Naturaliste National Park, such as bush walking can lead to incidental trampling of vegetation. As well as the direct effects of trampling, such recreational use could in turn exacerbate wind erosion in exposed areas, and aid the spread of weeds through the Park.

Summary of population information and threats

Pop. No. & Location	Land Status	Year/No. plants		Habitat Condition	Threats
1a Cape Naturaliste	National Park	2006	20	Habitat in good condition	Recreational activities, restricted distribution
1b Cape Naturaliste	National Park	2006	100	Habitat in good condition	Recreational activities, restricted distribution
1c Cape Naturaliste	National Park	2006	50	Habitat in good condition	Recreational activities, restricted distribution
1d Cape Naturaliste	National Park	2006	50	Habitat in good condition	Recreational activities, restricted distribution

Guide for decision-makers

Section 1 provides details of current and possible future threats. Developments in the immediate vicinity of the population or within the defined habitat critical to the survival of *Wurmbea calcicola* require assessment for the potential for a significant level of impact.

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 - these areas provide potential habitat for natural range extension and/or for allowing pollinators or biota essential to the continued existence of the species to move between populations; and additional occurrences of similar habitat that may contain important populations of the species or be suitable for future translocations or other recovery actions intended to create important populations. The single population is considered important for the long-term recovery and survival of the species

Benefits to other species/ecological communities

Recovery actions implemented to improve the quality or security of the habitat of *Wurmbea calcicola* populations will improve the status of the remnant vegetation in which the population is located.

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. The taxon is not listed under any specific international treaty, however, and therefore this IRP does not affect Australia's obligations under any other international agreements.

Role and interests of Indigenous people

Involvement of the Indigenous community is being sought through the advice of the Department of Indigenous Affairs to determine whether there are any issues or interests identified in the plan. A search of the Department of Indigenous Affairs Aboriginal Heritage Sites Register has identified that there are no sites of Aboriginal significance at or near populations of the species covered by this IRP. 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.

Social and economic impacts

The implementation of this recovery plan is unlikely to cause significant adverse social or economic impacts, as the only known population is located within the Leeuwin Naturaliste National Park.

Evaluation of the Plans Performance

The Department of Conservation and Land Management, in conjunction with South West Region Threatened Flora and Communities Recovery Team (SWRTF&CRT) will evaluate the performance of this Interim Recovery Plan. The plan is to be reviewed within five years. Any changes to management / recovery actions will be documented accordingly.

2. RECOVERY OBJECTIVE AND CRITERIA

Objectives

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

Criteria for success: The number of individuals within populations and/or the number of populations have increased by 10% or more during the five year life of this plan.
Criteria for failure: The number of individuals within populations and/or the number of populations have decreased by 10% or more during the five year life of this plan.

3. RECOVERY ACTIONS

Completed recovery actions

All subpopulations have been accurately surveyed by DEC staff.

A walk trail has been re-directed away from the edge of the species' cliff habitat, and this has helped to prevent recreational trampling and weed invasion into the habitat.

Staff from DEC's Threatened Flora Seed Centre (TFSC) collected 237 seeds from the population in September 1998. Initial germination viability tests varied from 26-53%, however only a small amount of seed has been tested.

Ongoing and future recovery actions

The SWTF&CRT is overseeing the implementation of this IRP and will include information on progress in its annual report to DEC's Corporate Executive.

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

The following recovery actions are roughly in order of descending priority; however this should not constrain addressing any of the priorities if funding is available for 'lower' priorities and other opportunities arise.

1. Coordinate recovery actions

The SWTF&CRT will continue to coordinate recovery actions for *Wurmbea calcicola* and other Declared Rare Flora in the Region. They will include information on progress in their annual report to DEC's Corporate Executive and funding bodies.

Action: Coordinate recovery actions
Responsibility: DEC (Blackwood District) through the SWRTFCRT
Cost: $1,500 per year.

2. Conduct further surveys

Further surveys supervised by DEC staff will be conducted in likely habitat to search for new populations of *Wurmbea calcicola* during its flowering period (June - July). Local volunteer groups such as the Cape to Cape Group Inc., Naturalist Clubs and the Wildflower Society will be encouraged to be involved in these surveys.

There are many unexplored limestone cliff areas (similar habitat) that may not have been surveyed in the taxon's flowering period (winter). Several surveys have been conducted, however no new populations have been found to date.

Action: Conduct further surveys
Responsibility: DEC (Blackwood District) through the SWRTFCRT
Cost: $4,000 pa.

3. Liaise with relevant groups and individuals

Staff from DEC's Blackwood district will continue to liaise with relevant land managers, including managers of areas adjacent to populations of the taxon, to ensure that the known populations are not accidentally damaged or destroyed. Input and involvement will also be sought from any Indigenous groups that have an active interest in areas that are habitat for *Wurmbea calcicola*.

The Cape Naturaliste lighthouse walktrail, although offset from the cliff edge, does still impact on the *Wurmbea calcicola* habitat. There is evidence that visitors of the park have walked off the main path to the edge of the cliff, hence trampling *W. calcicola* habitat. Instead of a traditional fence to stop the trampling, brush will be used to cover the ground to the cliffs. This will help to deter walkers, but will have little impact on the aesthetics of the area.

DEC Parks and Visitor Services staff will be provided advice with regard to the maintenance of these brushing trails, and the need for signage to indicate the locations of lookouts on the trail. This will help to prevent new trails being made to the cliffs by recreational users.

Action: Protect habitat from recreational use
Responsibility: DEC (Blackwood District) through the SWRTFCRT
Cost: $2,000 in year 1, $500 pa thereafter.

4. Monitor population

Monitoring of factors such as weed encroachment, population stability (expansion or decline), pollination activity, seed production, recruitment, and longevity is essential. The population is being monitored annually.

Action: Monitor population
Responsibility: DEC (Blackwood District) through the SWRTFCRT
Cost: $1,000 pa.

5. Obtain biological and ecological information

Better knowledge of the biology and ecology of *Wurmbea calcicola* will provide a scientific basis for management of wild populations. An understanding of the following is necessary for effective management:

- Soil seed bank dynamics and the role of various disturbances (including fire), competition, rainfall and grazing in germination and recruitment.
- Effects of weeds on recruitment and establishment.
- Longevity of plants, and time taken to reach maturity.
- The longevity of the corm, its viability and time taken to develop.
- The reproductive strategies, phenology and seasonal growth of the species.
- The population genetic structure, levels of genetic diversity and minimum viable population size.

Action: Obtain biological and ecological information
Responsibility: DEC (Science Division, Blackwood district) through the SWRTFCRT
Cost: $18,000 for Years 1, 2 and 3.

6. Promote community awareness

The importance of biodiversity conservation and the protection of *Wurmbea calcicola* is being promoted to the public through an information campaign using the local print and electronic media and by setting up poster displays. Formal links with local naturalist groups and interested individuals will be encouraged.

An information sheet will include a description of the plant, its habitat type, threats and management actions.

Action: Promote community awareness
Responsibility: DEC (Blackwood District, Corporate Relations) through the SWRTFCRT
Cost: $1,500 in year 2 and $500 in years 1, 3, 4 and 5.

7. Review this plan

If the taxon is still ranked as Vulnerable (WA) at the end of the fourth year of the five-year term of this Interim Recovery Plan, the need for further recovery actions, or to review this IRP will be assessed and a revised plan prepared if necessary.

Action: Review this Plan
Responsibility: The Department (SCB, Blackwood District) the SWRTFCRT
Cost: $10,000 in the fifth year (if required).

4. TERM OF PLAN

Western Australia

This Interim Recovery Plan will operate from December 2005 to November 2010 but will remain in force until withdrawn or replaced. If the taxon is still ranked as Vulnerable (WA) after five years, the need for further recovery actions, or to review this IRP will be determined.

Commonwealth

In accordance with the provisions of the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) this adopted recovery plan will remain in force until revoked.

The recovery plan must be reviewed at intervals of not longer than 5 years.

5. REFERENCES

Atkins, K. (2008) *Declared Rare and Priority Flora List for Western Australia.* Department of Conservation and Land Management, Western Australia.

Brown, A., Thomson-Dans, C. and Marchant, N. (Eds). (1998). *Western Australia's Threatened Flora*. Department of Conservation and Land Management, Western Australia.

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IUCN (2000). IUCN red list categories prepared by the IUCN Species Survival Commission, as approved by the 51st meeting of the IUCN Council. Gland. Switzerland.

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Williams, K., Horan, A., Wood, S. and Webb, A. (2000). Western Australia Wildlife Management Program No. 33: *Declared Rare and Poorly Known Flora in the Central Forest Region*. The Department of Conservation and Land Management, Western Australia.

TAXONOMIC DESCRIPTION

From: Macfarlane, T.D. (1993) *Wurmbea calcicola* (Cochicaceae), a new species from Cape Naturaliste, south western Australia. *Nuytsia* Vol 9; pp 233-236.

Plant 8-18cm tall. *Leaves* 3: lower 2 basal, close together, upper one slightly to much higher, separated by an exposed internode (not enclosed by leaf sheaths); lowest leaf ascending, tapering, 10-18mm wide, flat to somewhat conduplicate, not dilated basally, glossy; middle leaf similar, not or lonely slightly dilated basally; upper leaf erect, exceeding the flowers, dilated and concave in the lower half, the upper half narrow, tapering. *Inflorescence* open, the rachis zig-zag; growing well beyond leaves, erect in flower, decumbent in fruit. *Flowers* 2-5, bisexual. *Perianth* 11-15-5cm long; tepals 6, narrow, narrowly ovate to narrowly elliptical or almost linear, connate for ¼ of their length into a well developed tube, white except for the nectary; nectaries 2 per tepal, scarcely separate, only narrowly separated in young flowers by a central longitudinal groove (sometimes appearing undivided in dried material), more widely separated by spreading of the groove in older flowers, at or slightly below the middle of the tepal, each rhomboidal in outline, together forming a curved slightly interrupted band, not shelf-like (i.e. not rising abruptly at lower margin with the remainder more or less flat and horizontal) but with a distinct thickened lower margin and indistinct upper margin, pink. *Stamens* about half as long as tepals, reaching to slightly below or to slightly above the nectaries; anthers c. 1mm long, oblong, purple. *Styles* free, abruptly delimited from the ovary; ovules 6-12 per locule.