

Action Statement

Flora and Fauna Guarantee Act 1988

No. 90 (Revised in 2008)

Shiny Nematolepis *Nematolepis wilsonii*

This revised Action Statement is based on the draft national Recovery Plan prepared for this species by DSE under contract to the Australian Government Department of the Environment, Water, Heritage and the Arts.

Description

Shiny Nematolepis (*Nematolepis wilsonii* N.G. Walsh & Albr.) is a shrub or small tree which grows to 10 m high. This species was formerly known as Shiny Phebalium (*Phebalium wilsonii*) (Elliot & Jones 1997). It resembles Satinwood (*Nematolepis squamea* subsp. *squamea*), which is largely restricted in Victoria to the Otway Ranges. Shiny Nematolepis can be distinguished from Satinwood by its glossy leaves, scaly petals and ovaries, and its branchlets which are covered in small protuberances (Costermans 1993).

Distribution

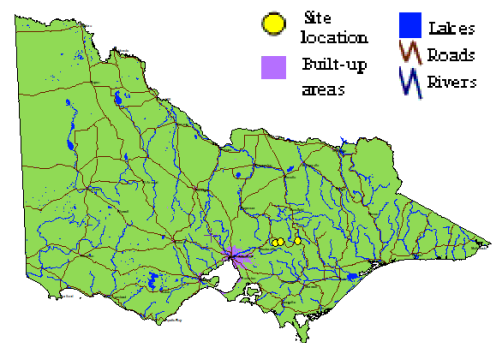
Shiny Nematolepis is a Victorian endemic, which was apparently first collected in 1892 and is represented by a specimen at Melbourne Herbarium labelled 'Goulburn R., Woods Point'. It was not formally described, however, until nearly 100 years later (Wilson 1970, Walsh and Albrecht 1988). The Woods Point record has not been substantiated this century and may be a result of vague locality recording by the original collector. Shiny Nematolepis is now known from a single population at the type locality, 720 m above sea level in the O'Shannassy Catchment, Yarra Ranges National Park.

Habitat

The population is scattered over an area of approximately five hectares. It is an understorey component in Cool Temperate Mixed Forest which occurs between old-growth wet forest, dominated by Mountain Ash (*Eucalyptus regnans*), and Cool Temperate Rainforest, dominated by Myrtle Beech (*Nothofagus cunninghamii*). Sites are characterised by high rainfall and deep, well-structured gradational soils derived from granite. Walsh and



Shiny Nematolepis (Photo: Downe)



Distribution in Victoria
(Flora Information System DSE 2007)

Albrecht (1988) reported about 500 plants in the population, including numerous seedlings. A small road bisects the population.

Abundance

Surveys in spring 2005 found 400 live and 50 dead mature plants, and ~1000 seedlings (estimated). These plants occur in a single population. The extent of range and abundance of Shiny Nematolepis prior to European settlement is unknown.

Important populations

The sole population of Shiny Nematolepis occurs in the Yarra Ranges National Park.

Life history and ecology

The species is considered to be vulnerable because it is known from only one small population. The small size and fragmented shape of the population renders it susceptible to random events such as wildfire and disease. Virtually nothing is known of its ecological requirements, although the presence of seedlings along track margins suggests that disturbance is a stimulus to germination. This lack of knowledge is a concern if active management is deemed necessary for the *in situ* and *ex situ* conservation of Shiny Nematolepis (Cropper 1993).

Little is known about the response of Shiny Nematolepis to fire. Like other ecotonal species that occur at the rainforest-sclerophyll forest interface, Shiny Nematolepis may be adapted to recurrent natural disturbances such as wildfire (Cameron unpubl.). This theory is supported by the profuse regeneration of Shiny Nematolepis from seed along the disturbed margins of a fire access track which bisects the population, and the absence of successful seedling establishment in the undisturbed forest. Because the similar Satinwood (*N. squamea*) is killed by fire, it seems unlikely that Shiny Nematolepis can survive wildfire by resprouting from perennating buds protected on underground lignotubers, as do two co-occurring species: Musk Daisy-bush (*Olearia argophylla*) and Blanket-leaf (*Bedfordia arborescens*) (Gill 1981). Further data collection and analysis to describe the autecological characteristics of Shiny Nematolepis is required (e.g. fire behaviour, longevity of plants, fecundity and seed bank dynamics).

Conservation status

National conservation status

Shiny Nematolepis is listed as vulnerable under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*.

Victorian conservation status

Shiny Nematolepis is listed as threatened under the Victorian *Flora and Fauna Guarantee Act 1988*.

It is considered vulnerable in Victoria according to DSE's *Advisory List of Rare or Threatened Plants in Victoria - 2005* (DSE 2005).

Decline and threats

The one known population occurs within the Yarra Ranges National Park. This population is also within the O'Shannassy Catchment, a proclaimed water catchment for which a permit is required to enter. The catchment is recognised as an 'essentially natural catchment' (LCC 1991) and has been included under the Commonwealth *Heritage Rivers Act 1992*.

At least part of the population extends into the Deep Creek Reference Area and its associated buffer, which is proclaimed under the *Reference Areas Act 1978* (LCC 1994). Reference area status confers further protection from deliberate and inadvertent interference.

Recent visits during the development of this Recovery Plan highlighted current threats to the Yarra Ranges National Park population. Sambar Deer (*Cervis unicolor*) use the trees to remove the velvet on their antlers, leading to the loss of cambium from the trunk and effectively ringbarking trees. Trampling by deer has also been observed and is likely to threaten the population by inhibiting regeneration.

Other current threats include low level weed invasion on road verges by Cat's Ear (*Hypochoeris radicata*), and excessive roadside slashing. Although roadside slashing may promote recruitment, different vegetation removal regimes may lead to direct damage to plants and facilitate weed invasion or the spread of myrtle wilt disease, which could lead to alteration of the microclimate and the associated plant community.

A plan to fence half the *Nematolepis wilsonii* site will be developed and implemented. The feasibility of constructing a fence may depend upon site features such as slope and vegetation density. Any fence should extend past the population to measure possible increases in population size as a result of deer exclusion. Fencing will include slashed and un-slashed vegetation and be combined with a regular censusing program. Data collected will then be analysed to determine the effects of deer activity and slashing.

If the location of the 1892 Woods Point collection is correct, there are no subsequent records of Shiny Nematolepis near this site, and so the range of the species has probably diminished. The causes of the presumed decline of *Nematolepis*

wilsonii are not known, but Walsh and Albrecht (1988) suggest that alteration of the area by wildfire, settlement and gold prospecting may have been responsible. Wildfire and disease should be viewed as potential threats to the remaining population. Searching activities will be conducted as part of the recovery for this species, possibly with the assistance of other community groups. The Field Naturalists Club of Victoria has expressed interest in providing assistance in these survey activities. Such cooperative activities will also help raise awareness of the conservation issues relating to the species and its habitat.

The Royal Botanic Gardens Melbourne has successfully propagated plants, which are now held both there and at the Cranbourne annexe. Shiny Nematolepis has been offered for sale by at least one specialist plant nursery (Kuranga Nursery, Croydon and Mt Evelyn). *Ex situ* conservation in the form of cultivation and germplasm storage will take place in order to protect the species from stochastic events.

Current threats/perceived risk

Trampling and ringbarking by deer

High – such activity is likely to kill adult trees and prevent the growth of juveniles.

Weed invasion

Low – weed invasion currently only occurs on disturbed sites.

Inappropriate vegetation removal

Low – slashing might assist the establishment of the species, but inappropriate vegetation removal might be deleterious. Care should be taken not to damage Myrtle Beech (*Nothofagus cunninghamii*) trees as damage may facilitate the spread of Myrtle

Long term objective

To ensure that the Shiny Nematolepis can survive, flourish and retain its potential for evolutionary development in the wild.

Specific Objectives, Actions and Targets

The intended management actions listed below are further elaborated in DSE's Actions for Biodiversity Conservation (ABC) system. Detailed information about the actions and locations, including priorities, is held in this system and will be provided annually to land managers and other authorities.

Objective I To increase knowledge of biology, ecology and management requirements

Action	Targets	Responsible
1. Acquire baseline population data including: identification of the area and extent of the population; estimates of the number, size and structure of the population; and inference or estimation of population change.	<ul style="list-style-type: none"> ▪ Determination or update of conservation status for inclusion on state and national threatened species lists. 	DSE, Parks Victoria

Wilt. This, in turn, may alter the structure of the habitat.

Potential threats/perceived risk

Disease

Unknown / High – the risk of disease to this species is unknown but could potentially be very serious. Myrtle Wilt may threaten the surrounding habitat.

Wildfire

Unknown / High – the risk of fire to the population is unknown but may be high. Further research or *ex situ* conservation will be required to prevent extinction resulting from wildfire. Alternatively, recruitment may be enhanced by disturbances such as bushfires.

Previous management action

- Habitat was surveyed in detail in 2005. Information was collected on the size, distribution and health of nine patches at the single location.
- 281 plants were tagged in 2005 for ongoing monitoring.
- Deer-proof fences have been erected around Patches 4 and 6. Surveys in 2006 found a high incidence of deer damage but healthy crown foliage.
- Seed has been collected by the Royal Botanic Gardens and *ex situ* propagation has commenced. The 250 plants being grown await identification of a suitable recipient site.
- Parks Victoria, Melbourne Water and DSE have been liaising to determine impacts of any future works at the site and appropriate protection measures.

2. Assess habitat characteristics and/or condition. Accurately survey known habitat, and collect floristic and environmental information describing community ecology and condition.	<ul style="list-style-type: none"> Requirements for completion of essential life history stages, recruitment and dispersal identified. 	DSE, Parks Victoria
3. Conduct survey to locate suitable habitat. Identify and survey potential habitat using ecological and bioclimatic information which may indicate habitat preference.	<ul style="list-style-type: none"> Surveys undertaken with the assistance of community groups. Predictive model for potential habitat developed and tested. 	DSE
4. Identify disturbance regimes to maintain habitat or promote regeneration and recruitment	<ul style="list-style-type: none"> Preparation of management prescriptions in relation to prescribed burning. 	DSE
5. Undertake research to identify key biological functions. Evaluate current reproductive and regenerative status, seed bank status and longevity, and fecundity and recruitment levels. Determine seed germination and vegetative regeneration requirements by conducting field trials aimed at identifying key stimuli.	<ul style="list-style-type: none"> Seed bank and regenerative potential quantified for target population. Stimuli for recruitment and regeneration identified. Management strategies identified to maintain, enhance or restore regenerative processes fundamental to reproduction and survival. 	DSE
6. Undertake periodic surveillance monitoring of populations. Measure population trends and responses against recovery actions by collecting demographic information including recruitment and mortality rates, the timing of life history stages and morphological data	<ul style="list-style-type: none"> Techniques for monitoring developed and implemented. Census data for population collected periodically. 	DSE
7. Analyse population trends. Collate, analyse and report on census data and compare with management histories.	<ul style="list-style-type: none"> Population growth rates determined and Population Viability Analysis completed for the population. 	DSE

Objective II To increase the number of populations or individuals

<i>Action</i>	<i>Targets</i>	<i>Responsible</i>
8. Store reproductive material.	<ul style="list-style-type: none"> Long-term storage facility identified. Seed viability determined. Seed from target population in storage (if viable seed available). 	DSE, Royal Botanic Gardens
9. Determine seed viability.	<ul style="list-style-type: none"> Seed viability determined. 	Royal Botanic Gardens, DSE

Objective III To improve the condition of habitat

<i>Action</i>	<i>Targets</i>	<i>Responsible</i>
10. Manage plant pathogens. Control threats from disease by ensuring no damage whatsoever occurs to Myrtle Beech (<i>Nothofagus cunninghamii</i>) trees.	<ul style="list-style-type: none"> Measurable reduction in plant mortality. Measurable seedling recruitment. 	Parks Victoria, DSE

11. Fence to exclude introduced animals. Control threats from pest animals by erecting deer-proof fencing and ensuring no damage whatsoever occurs to Myrtle Beech trees (<i>Nothofagus cunninghamii</i>).	<ul style="list-style-type: none"> ▪ Measurable decrease in damage to trunks. ▪ Protection of population (or part) from deer browsing. 	Parks Victoria, DSE
Objective IV To secure populations or habitat from potentially incompatible land use or catastrophic loss.		
Action	Targets	Responsible
12. Establish cultivated plants <i>ex situ</i> for inclusion in living collections to safeguard against any unforeseen destruction of wild populations	<ul style="list-style-type: none"> ▪ Development of effective propagation and cultivation techniques. ▪ At least 10 mature plants in cultivation. 	Royal Botanic Gardens
Objective V To increase community awareness and support		
Action	Targets	Responsible
13. Involve community groups and volunteers in recovery activities.	<ul style="list-style-type: none"> ▪ Opportunities for involvement identified, promoted and supported 	DSE

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