

# Flora & Fauna Guarantee Action Statement

#63

This Action Statement was first published in 1995 and remains current. This version has been prepared for web publication. It retains the original text of the action statement, although contact information, the distribution map and the illustration may have been updated.

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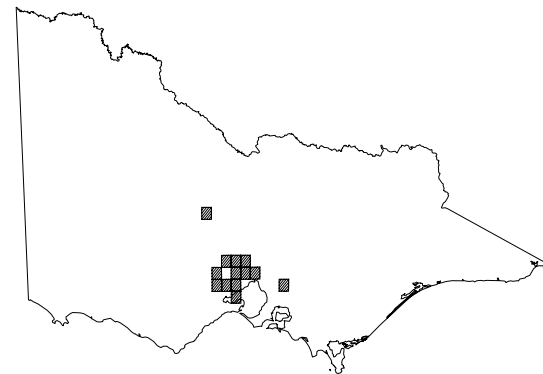
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## Brittle Greenhood

### *Pterostylis truncata*



Brittle Greenhood (*Pterostylis truncata*)



Distribution in Victoria (DSE 2002)

### Description and Distribution

The Brittle Greenhood (*Pterostylis truncata* Fitzg.) is a ground-dwelling orchid which emerges in autumn from an underground tuberoid and dies back in early winter. Individuals may emerge as solitary flowers (rarely two) with stem leaves or as rosettes with two to six leaves. The majority of Brittle Greenhoods, however, emerge as non-flowering plants several weeks after the flowering individuals appear. The percentage of individuals that flower is influenced by climatic conditions. According to Carr (pers. comm.), flowering is enhanced by cool summers followed by a wet autumn.

The forward-leaning, large squat flowers are aptly described by the orchid's other common name, Little Dumpty. The flowers have a greenish white hood with darker green or reddish stripes and a curved, tapered dark brown labellum. The flower stem can reach up to 15 cm and is closely sheathed with two to five narrow tapered stem leaves up to 3 cm long. Non-flowering

plants form a rosette of two to six leaves up to 30 mm by 18 mm. The leaves are bright green, ovate and bluntly pointed, or sometimes drawn into a long point, and have entire margins (Jones 1988). The rosette may be pressed very flat to the ground. The Brittle Greenhood is a clonal species; that is, it can reproduce vegetatively. Depending on the season, apart from producing a replacement tuberoid, an individual may give rise to several other daughter tuberoids. These daughter tuberoids may then go through three or more cycles of emergence and dormancy, i.e. three years, before they are able to flower. Daughter tuberoids may develop on the end of runners (stolons) near the parent and so form clusters or may form several centimetres away. The end result is often a patch (colony) consisting of one or several clones which cannot be distinguished morphologically. Brittle Greenhood populations consist of one or more patches of orchids ranging from several square decimetres up to several

square metres. The size of a patch can be correlated to the age of a clone (Peakall & James 1988).

The Brittle Greenhood has a disjunct distribution. It is found at many sites in New South Wales and the Australian Capital Territory (Western, pers. comm.). In Victoria the orchid's distribution is limited to an area within a 65 km radius of Melbourne. Willis (1970) reported six locations: the Brisbane Ranges, the You Yangs, the Coimadai district, the Tottenham-Sunshine region, Belgrave South (Mount Morton) and Beaumaris. Three further sites have been found, at Point Wilson, Lara and Black Hills (between Gisborne and Toolern Vale).

The Brittle Greenhood is known to survive in only three of these nine locations, namely the You Yangs, Black Hills and the Long Forest Mallee area near Bacchus Marsh.

Carr (pers. comm.) considers it likely that the Brittle Greenhood may once have occurred (and possibly still does) on the volcanic plain between the You Yangs and Melbourne on organically rich, friable soils on the upper slopes of well drained rocky rises.

The remaining populations are on both private and public land. The Long Forest Mallee populations occur in the Long Forest Flora and Fauna Reserve, as well as on private property. The Black Hills populations are on private land. The You Yangs population is within the Regional Park. There have been no detailed habitat assessments of the Brittle Greenhood populations, although the orchid is known to occur in habitats ranging from grasslands to woodlands, and on a variety of soils.

At the You Yangs, there are several populations in habitats that vary from grassy woodland to open woodland (with open or closed understorey) to both, on or around exposed granite boulders. The soils are of granitic origin and range from nutrient-poor, gravelly and shallow to organically rich, deep fine sands.

There are two known populations at Black Hills. They occur in a Long-leaf Box (*Eucalyptus goniocalyx*) and Yellow Gum (*E. leucoxylon*) woodland on fine soils derived from shale and sandstone. The populations spread over several hectares and consist of small colonies, often in mossy areas, covering one or two square metres.

The Long Forest Mallee populations occur at various sites on nutrient-poor sandy clay dominated by Grey Box (*E. microcarpa*) woodland. The degree of moss cover at these sites varies from very little to total ground cover. One population occurs in a thick sphagnum moss bed under Moonah (*Melaleuca lanceolata*), on a shallow humus-rich loamy soil. It has yet to be determined whether the orchids occur within the woodland dominated by Bull Mallee (*E. behriana*).

Populations at Lara and Point Wilson grew in rocky areas of Western (Basalt) Plains grassland.

Variation in flower morphology has been observed between populations from basaltic and granitic sites. Orchids from Point Wilson and Lara, now only in cultivation, have larger and more colourful flowers than those elsewhere (Backhouse, pers. comm.). The variation is considered minor however and not worthy of further taxonomic treatment (Carr, pers. comm.).

To minimise the risk of trampling by enthusiasts and the likelihood of collection, the precise locations of the orchid populations will remain confidential.

## Conservation Status

### Current Status

Gullan <i>et al.</i> (1989)	Endangered
SAC (1991)	Threatened

The Brittle Greenhood is listed as a threatened taxon on Schedule 2 of the *Flora and Fauna Guarantee Act 1988*.

### Reasons for Conservation Status

The Brittle Greenhood is threatened to varying degrees at its three remaining sites, namely the You Yangs, Black Hills and Long Forest Mallee.

It appears most threatened at the You Yangs, where once there were thousands of Brittle Greenhoods in populations covering many hectares (Carr, pers. comm.). The number of orchids has declined dramatically in the last few decades. The disappearance of two local occurrences in the You Yangs is attributed to the impact of feral Goats and to road maintenance (Gayner, pers. comm.). Remaining You Yangs populations are threatened by European Rabbits (*Oryctolagus cuniculus*) and, to a lesser extent, by feral Goats (*Capra hircus*) and Eastern Grey Kangaroos (*Macropus giganteus*). The major cause of decline, however, and still the greatest threat, is probably competition from Boneseed (*Chrysanthemoides monilifera*). This highly invasive weed has spread rapidly over the You Yangs and now grows throughout the area (Pescott, pers. comm.).

The orchid appears more secure at the two remaining locations. Potential threats to the Long Forest Mallee populations include trampling by enthusiasts, weed invasion, and possibly consumption by White-winged Choughs (*Corcorax melanorthamos*). At Black Hills the orchid is potentially threatened by the large numbers of rabbits and kangaroos. The Brittle Greenhood disappeared from Tottenham-Sunshine and Beaumaris many years ago. Urban development is thought to have led to the loss of the orchid from the Tottenham-Sunshine region (Willis, 1970) and probably also from Beaumaris. There has been no confirmation of the orchid's existence in the Brisbane Ranges: Jeanes and Foster (pers. comm.) consider it unlikely that the orchid was ever there. Searches on property nearby have also failed to detect the orchid (Foster, pers. comm.).

The Brittle Greenhood can no longer be found at Lara, Mount Morton and Point Wilson for reasons which are reasonably well documented. The Lara population was lost in the late 1970s when earth was dumped on the site during construction of a second rail line between Melbourne and Geelong (Jeanes, pers. comm.). Urban development was the main cause of decline at Mount Morton, but the last known colony disappeared after the clearing of undergrowth for fire prevention in the early 1980s (Robinson, pers. comm.). The Point Wilson population disappeared in the late 1980s having only been discovered in the Murtcaim Wildlife Area earlier in the decade (Carr, pers. comm.). According to Williams (pers. comm.) the disappearance of the Point Wilson

population is thought to have been caused by abnormally high numbers of Rabbits disturbing the soil. Plants from Point Wilson and Lara were rescued by private collectors before their demise in the wild and still survive in cultivation. Several collections are known to be genetically pure and therefore provide a valuable source of material for re-establishing wild populations at the original sites. The Lara site is considered unrecoverable (Backhouse, pers. comm.) but the Point Wilson population could be re-established. Discussions have begun over re-establishment of the Point Wilson population into the Murtcaim Wildlife Reserve. The land managers, Melbourne Water, have agreed in principle to the orchid being re-established. In its final recommendations, the Scientific Advisory Committee (1991) determined that the Brittle Greenhood is:

- in a demonstrable state of decline which is likely to result in extinction; and
- significantly prone to continuing threats which are likely to lead to extinction; and
- rare in terms of its abundance and distribution.

### Major Conservation Objectives

- To secure all remaining populations and actively encourage their expansion.
- To re-establish the Point Wilson site by reintroducing plants in cultivation of that provenance.

### Management Issues

#### Ecological Issues Specific to the Taxon

There are three groups of issues: conservation genetics, monitoring and surveying, and habitat management.

#### Conservation of Genetic Diversity

Maintaining genetic variation is considered vital to the long-term survival of a species (Frankel & Soule 1981). Brittle Greenhood is a clonal plant, so populations are likely to consist of a limited number of individuals. Until genetic studies can determine the variation within the species it must be assumed, given its demise over half its range, that the orchid has already suffered a significant loss of genetic diversity, so its potential for evolutionary development and its ability to adapt to changing environmental conditions may have been severely compromised.

In the absence of genetic information it is important to attempt to conserve all colonies of all populations of the Brittle Greenhood. Some neighbouring populations, however, may be very similar and not warrant concerted efforts to secure them. An understanding of the genetic make-up of the orchid may therefore help with important financial management decisions (see Social & Economic Issues).

#### Genetic Manipulation

Genetic manipulation to enhance the species' prospects of long-term survival may or may not be warranted. There is presently no knowledge about the mechanisms for gene flow between populations. Although not essential, it could be desirable for long-term management if research was

undertaken into the orchid's breeding system and mechanism of pollination. Such knowledge may also be very important for the successful re-establishment of the orchids at Point Wilson. For example, should genetic material from the Lara plants now in cultivation be used?

- *Breeding System* While many Australian orchids are self-compatible (Peakall, pers. comm.) the breeding system of the Brittle Greenhood has yet to be studied. Peakall & Beattie (1991) have demonstrated that significant pollen transfer occurs within clones, which in effect is self pollination. According to Wells (1979) this may be an advantage for colonising species where populations are founded by one individual. The dust-like seeds of the orchid can lead to the establishment of clones vast distances away from the parent population.
- *Pollination* The orchid is probably pollinated by small male flies attracted by its mimicking of the sexual stimuli of females flies (Jones, 1988). Peakall (pers. comm.) believes that such pollination promotes long-distance pollination between populations (outcrossing) and may be an important evolutionary strategy among Australian orchids which are self-compatible (i.e. it may be important for increasing genetic variation in clonal species).

The magnitude of pollinator movement in relation to the distance to the nearest genetically different individual is critical to outcrossing, but there have been few studies of this nature with small flying pollinators (Peakall & Beattie 1991). It is not known how far the Brittle Greenhood's pollinators can travel or whether the habitat or distances between populations have been altered in a way that prevents outcrossing.

#### Surveying and Monitoring

Several aspects of the orchid's biology have a bearing on when to survey and monitor and how to interpret the information. Surveys for new populations and the monitoring of existing sites may need to be undertaken at different times. Flowers are needed for a positive identification as the rosette is similar to several other Greenhood species which may occur in the area, in particular the Autumn Greenhood (*Pterostylis revoluta*). When monitoring it may be more informative for studies on detailed population dynamics to count the non-flowering individuals, given the likelihood of flowers being eaten by Rabbits in most locations. This would require the establishment of quadrats in areas where the orchids had been positively identified.

Monitoring may be needed to check on a potential threat, or to help evaluate the success of any management. This may entail constructing exclusion plots.

Climatic influence needs to be taken into account when interpreting annual monitoring information. A comparison of annual monitoring information, if taken at the same time each year, may provide misleading information. Non-flowering individuals may not emerge in the same numbers if weather conditions are not optimal, or they may emerge several weeks earlier or later than previous years.

Only the You Yangs is believed to have been thoroughly surveyed, and it is likely that other populations will be found (see the Intended Management Actions section).

## Habitat Management

### Fire

The orchid's ability to survive in habitats altered by fire needs investigation. The Brittle Greenhood may be like many other autumn and winter flowering Greenhoods whose flowering is inhibited after summer fire.

According to Jones (1988), the reduction of flowering is believed to be due to inhibition rather than tuberoid destruction. Most tuberoids are believed to be capable of surviving fires. The reduction in flowering usually lasts for one season.

A fire in the You Yangs in the mid 1980s caused a dense regrowth of wattles (*Acacia mearnsii* and *A. paradoxa*) where there had been a Brittle Greenhood population. The dense nature of the regrowth prevented searching until 1993. The orchid has been found growing here again in almost the same location as previously observed (Pescott, pers. comm.). It is not known whether the orchids emerged annually, whether they survived in a dormant state for many years or whether the site has been recolonised by seedlings of other populations.

### Trampling and Collection

Some populations of the Long Forest Mallee and the You Yangs may need protection from inadvertent damage or trampling by the numerous orchid enthusiasts who visit the site, sometimes in quite large groups (Foster, pers. comm.). The cumulative effects of trampling could threaten some of the Long Forest Mallee populations, particularly those on dense mats of moss. Barriers may be needed to protect some populations while still enabling viewing, but the cooperation of orchid groups with self regulation is the preferred approach.

The Brittle Greenhood may be threatened by collectors unaware that it is available commercially. Orchid collection has been recognised as a potentially threatening process.

### Roadside Works

Roadside maintenance and other works are potential threats for some populations at Long Forest Mallee. Signs and barriers are needed to help prevent accidental disturbance to these roadside populations.

### Choughs

White-winged Choughs have been seen at the You Yangs, Black Hills and Long Forest. Choughs actively seek out orchid tuberoids. A problem arises if their numbers increase because of people feeding them.

Choughs consume orchid tuberoids at the Long Forest Mallee, particularly from those populations on moss. It is doubtful that the current level of consumption is natural given that some local residents of Long Forest are known to feed native birds. The Chough numbers may have already increased, though to an unknown extent. Numbers may increase further with the increasing settlement of the area. Culling has been necessary to protect the Rosella Spider-orchid (*Caladenia rosella*) at Dunmoochin. The suitability of this approach at Long Forest would need to be demonstrated, particularly as there is likely to be

community reaction against culling Choughs at Long Forest. Monitoring White-winged Chough numbers over the term of this Action Statement would be essential before any culling measures were considered. The impact the birds have on individual colonies should also be determined. While exclusion plots may help gauge any increase in tuberoid consumption there are several issues to consider:

- vandalism of orchids near roads or residences;
- a change in grass dominance or some other plant within such an enclosure which may require management; and
- the construction of extra enclosures to differentiate between the impact of Rabbits and Choughs.

Part of the solution may be an education program for the residents about the problems of feeding Choughs and other wildlife. (See Community Participation in the Social and Economic Issues section.)

### Grazing

Rabbits are present in all the Brittle Greenhood locations but their impact has yet to be determined. Carr (pers. comm.) believes that:

- Rabbits eat the orchid's flowers but they don't graze the orchid's leaves as these are thin and pressed close to the ground
- Rabbits disturb the Brittle Greenhood by digging for other food. (There is no evidence for or against the notion that Rabbits actively search out tuberoids).
- rare in terms of its abundance and distribution.

Scarlett (pers. comm.) speculates that Rabbits may relieve competition from weeds and other plants in areas where there are few or no native herbivores. Domestic stock may also have this effect: for example, the Brittle Greenhood's survival at Point Wilson is thought to have been aided by stock grazing on the exotic herbs and grasses. Once hundreds of Brittle Greenhoods grew at Point Wilson on a rocky knoll in an area heavily grazed by sheep, cattle and rabbits. Stock also camped at this site. The demise of the orchid here, however, is attributed to an increase in soil disturbance with an increase in rabbit numbers.

Soil disturbance by Rabbits and Eastern Grey Kangaroos has been recorded at Black Hills. Residents have been granted permits to cull the kangaroos in attempts to control erosion. One Black Hills population near Toolern Vale is on a property that has suffered extensive soil erosion where cattle were once grazed. The orchids are near some erosion-affected areas, but the impact on the orchids has yet to be evaluated. Kangaroos, goats and rabbits have affected several orchid populations at the You Yangs. Rabbit and goat control measures have since been successful in reducing numbers. Some populations have been disturbed by rabbits at Long Forest, although probably not as severely as by the Choughs.

### Weeds

Boneseed invasion at the You Yangs is a threat to several populations. The Brittle Greenhood may have been affected by herbicides sprayed to control Boneseed. While this approach is not currently used, any future use of a herbicide would have to take the orchid into consideration.

Trials on the biological control of Boneseed with beetles in the You Yangs may prove vital to the Brittle Greenhood's survival. Predation by ants and lacewing larvae may have caused the initial failure of Black Boneseed Beetle (*Chrysolina* sp.) to establish after release in 1990 (Adair, pers. comm.). Until biological control proves effective, Boneseed will need to be manually removed.

One population is threatened by invasion of an exotic grass, Annual Veldt Grass (*Ehrharta longiflora*), but not from Boneseed as the soil is too shallow. This small population is uniquely positioned on an exposed granite boulder shelf covering several square metres. The grass does not appear to grow very tall, but the significance of the threat is being monitored by the Geelong Field Naturalists. It appears that the orchid has completed the above-ground part of its life cycle before the grass begins to dominate.

Weeds are not a problem for the known Black Hills populations although several Long Forest Mallee populations require attention. The habitat of one roadside population has been invaded by Annual Veldt Grass. Again, a monitoring program is needed to determine the significance of the threat and the need for any management. The merits of various approaches need to be considered carefully.

### Wider Conservation Issues

The Brittle Greenhood occurs on a property near Toolern Vale which has been the subject of ongoing concern about extensive erosion. The presence of the orchid has now been taken into consideration in efforts to secure the remnant woodland by the Victorian Conservation Trust (now Trust for Nature). The area is rich in native species, including nearly 30 orchid species (Stajic, pers. comm.).

Efforts to conserve the orchid at the You Yangs will be aimed predominantly at controlling the Boneseed invasion. Such efforts will form only a small part of measures already being undertaken to eradicate the weed. There are problems for populations in higher areas as Boneseed removal can leave the site susceptible to erosion. The focus of Boneseed removal to date has been on the lower slopes. A program of revegetation may need to be adopted for sites higher up.

The re-establishment of the Brittle Greenhood at Point Wilson will enhance the already significant flora and fauna values of the area-internationally significant wetlands, and potential habitat for Orange-bellied parrots (*Neophema chrysogaster*).

Barriers and road signs to protect one roadside population of the Long Forest Mallee may help to protect several Turkey-bushes (*Eremophila deserti*) from physical damage. Turkey-bush is not rare but it is considered threatened because the populations are declining due to problems with regeneration (Gullan *et al.* 1990). The measures taken to conserve the orchid however are not likely to enhance the regeneration potential of the Turkey-bushes.

### Social and Economic Issues

Conservation of the orchid raises both economic and social issues of varying significance.

### Management Costs

There may be some benefit in undertaking genetic comparisons of populations of this species in order to determine their significance. This will enable informed decisions and hence ensure that the most effective protection is achieved for minimum economic cost and social disruption. Off-site conservation may be necessary as an interim measure where management is unlikely to secure a population or where the costs are prohibitive. This approach is a safeguard in the absence of knowledge of the orchid's genetic variation.

### Point Wilson

Cooperation is needed with Melbourne Water for the successful re-establishment of the Brittle Greenhood back into this area. The orchid does not occur on the site of the proposed East Coast Armaments Complex.

### Long Forest Mallee

Cooperation is needed from the Shire of Moorabool as this body is responsible for managing the roadside and planning approvals on private property. Populations in these areas are covered by controls in the Long Forest Conservation Zone of the Bacchus Marsh Planning Scheme.

The cooperation of a landholder is required for the conservation of one orchid population of Long Forest Mallee. Even though planning controls apply to this population, the goodwill of the landholder is necessary for its survival. Initial discussion indicates enthusiasm for conserving the orchid. Community help is also needed. It is hoped that assistance with weed control and monitoring Choughs may be given by the local Friends group.

### Community Participation

The community can help to conserve the orchid. This has already been demonstrated in the efforts to eradicate weeds at the You Yangs and the searches already undertaken for the orchid. It is anticipated that community groups can become involved with further surveys under the Botanic Guardians Scheme. Weed eradication is also a form of management for which community assistance is needed at the You Yangs and possibly for some Long Forest Mallee populations. Removing Boneseed at the You Yangs around the Brittle Greenhood populations on higher slopes is additional work for CNR staff. There is scope for more community involvement with Boneseed control. Such help is currently given by groups working in certain areas under the Adopt-a-Block scheme. Such help needs overseeing to ensure that Boneseed eradication doesn't affect the orchids, create erosion or spread the seeds elsewhere. The reliability of such help is of some concern. Controlling Boneseed at Brittle Greenhood sites may form an ideal ongoing project for students of environmental management or may be taken on by naturalist or orchid groups, other than the Geelong Field naturalists (see Previous Management Actions).

Cooperation is needed with residents at Long Forest Mallee, and possibly those around Black Hills, to not feed the Choughs. The Friends of Werribee Gorge and Long Forest may be important in helping educate the residents about the

significance of the area and the problem with feeding wildlife. They might be able to participate in Botanic Guardians projects to protect orchids with some form of cover.

Culling Choughs at Long Forest would concern the residents and Friends Group. Even if the management problem could be demonstrated there would still be a strong reaction against culling.

Cooperation will be needed from large groups arriving to view the orchids. The Australasian Native Orchid Society (ANOS) attempts to minimise trampling; such self regulation should be encouraged by other groups. This may include seeking cooperation to avoid annual visits or to keep people off the site if trampling is evident despite attempts to prevent it. This also applies to collection if it is evident after such tours. Informing CNR beforehand of group visits may help monitor these threats.

## Management Action

### Previous Management Action

#### Black Hills

Discussions have been held with the landholder, the Victorian Conservation Trust (VCT), CNR and Melton Shire over management of the property near Toolern Vale. A covenant has been placed on the title for flora and fauna conservation, a move prompted by the presence of the Brittle Greenhood. This population was monitored in 1994.

#### Point Wilson

Cattle and sheep were removed from the Murtcaim Wildlife Area in 1991 in accordance with management suggestions by Cropper & Calder (1987). A variety of thistles have invaded other rocky knolls in the Murtcaim Wildlife Area since stock removal in 1991, but not the Brittle Greenhood site.

Cropper & Calder (1987) also recommended a three to four year summer fire regime for the Point Wilson site. The fire regime has not been put into practice, according to Williams (pers. comm.), for want of a status report and management consideration for both the Fat-tailed Dunnart (*Sminthopsis crassi-caudata*) and the Little Whip Snake (*Suda flagellum*).

In 1995 members of the Geelong group of the ANOS commenced a feasibility study for the reintroduction of the Brittle Greenhood into Point Wilson.

#### You Yangs

Members of the Friends group and Geelong Field Naturalists have assisted with the orchid's conservation by keeping some populations free of Boneseed seedlings for a number of years. They have also undertaken some trials of the removal of the Annual Veldt Grass from the population on the exposed granite ledge.

#### Long Forest Mallee

An on-site discussion was held with the Shire of Bacchus Marsh (Moorabool) with regard to conserving roadside

populations. A fence has been erected at one site to prevent further encroachment by vehicles and the erection of roadside signs has been agreed to.

### Searches

Members of the Geelong branch of ANOS have searched for the Brittle Greenhood since 1993. The work was undertaken under CNR's Botanic Guardians Scheme.

In 1993 the group searched the Long Forest Mallee and part of the Black Hills north of Toolern Vale. The group searched these areas again in 1994 as well as the Wombat State Forest, Lerderderg Gorge and Avalon Airfield. In 1995 the group made further searches in the first three sites, as well as the You Yangs, Point Wilson and sites east of Melbourne in Lysterfield Lake Park, and two areas near South Belgrave. The group has since found many new populations, thereby greatly enhancing the knowledge of the species' distribution.

## Intended Management Action

### Critical Habitat

- Determine critical habitat for the Brittle Greenhood

### Monitoring

- Monitor populations annually. Undertake detailed monitoring of population dynamics as well as a quantitative assessment of the structure and floristics of the vegetation. Adopt methods advised by CNR's Flora and Fauna Branch, and record precise locations.
- Establish experimental plots in order to evaluate and monitor threats such as weeds invasion, trampling, and damage from Choughs and Rabbits.
- Register all data on appropriate CNR databases.

### Re-establishment at Point Wilson

- Enter into an agreement with Melbourne Water in 1996 to re-establish and manage the orchid at the original site, pending the recommendations of the ANOS feasibility study. This could involve:
  - an evaluation of the significance of the area for Fat-tailed Dunnarts and Little Whip Snakes
  - fencing trials to investigate means of controlling Rabbits followed by orchid establishment trials at the original site and other suitable sites nearby.

### Weed Control

- Assess weed problems annually and determine management action in line with current practices for sensitive areas.
- Continue to involve Geelong Field Naturalists with Boneseed and veldt grass removal at the You Yangs.

### Search

- Identification should be based on flowers rather than rosettes (see Survey and Monitoring in the Ecological Issues section). CNR will coordinate systematic searches in:
  - granite areas on property near Brisbane Ranges
  - Lerderderg Gorge
  - the Pyrete Ranges

- Register all data on appropriate CNR databases.
- Identify threats to any newly discovered populations, and undertake appropriate management actions.

## Protection

### Long Forest Mallee

- Monitor White-winged Chough numbers and food preferences, and take appropriate action if numbers increase. Inform residents of problems associated with feeding Choughs and other wildlife. Seek help from local Friends group.
- Install 'Significant Roadside' signs to prevent accidental damage from work by various authorities.

### You Yangs

- Continue weed control in existing populations.
- Organise community groups or students to participate in Adopt-a-Block.

## Other Desirable Management Actions

### Research

Encourage research into genetic variation between populations and the ecological requirements of the orchid including dormancy, pollination and germination requirements.

### Survey

Encourage enthusiasts to search stony rises on basaltic plains between the You Yangs and Melbourne.

## Legislative Powers Operating

### Legislation

*Flora and Fauna Guarantee Act 1988*: provides for protecting flora and fauna through a range of mechanisms including Public Authority Management Agreements.

*Planning and Environment Act 1987*: provides for land use controls and the establishment of covenants with local landholders and local governments.

*Victorian Conservation Trust Act 1972*: provides for establishing conservation covenants on land titles.

### Licence/Permit Conditions

Permits for collecting seeds and tuberoids will only be given in accordance with the conservation objectives.

### Consultation and Community Participation

CNR has consulted with the following agencies and individuals:

- Australasian Native Orchid Society (Geelong)
- Aero Space Technology of Australia
- Victorian Conservation Trust
- Shire of Melton
- Landholder at Black Hills
- Friends of Werribee Gorge and Long Forest Mallee
- Melbourne Water, Werribee Treatment Complex Wildlife Officer and Murtcaim Wildlife Area Committee of Management.
- Geelong Field Naturalists.

## Implementation, Evaluation and Review

The Manager of CNR's Port Phillip Area will coordinate the implementation of action proposals and evaluate their effectiveness in meeting the aims of the conservation objectives.

## Contacts

### Management

Flora and Fauna Guarantee Officer, CNR Port Phillip Area.  
Wildlife Liaison Officer, Murtcaim Wildlife Area, Melbourne Water.

Shires of Moorabool, Melton.

### Biology

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## Compiler

Hugh Bramwells

## Further information

Further information can be obtained from Department of Sustainability and Environment Customer Service Centre on 136 186.

## Flora and Fauna Guarantee Action

Statements are available from the Department of Sustainability and Environment website:  
<http://www.dse.vic.gov.au>

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## Personal Communications

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G. Gayner, Secretary, Geelong Field Naturalists; Jeanes, J., naturalist, authority on orchids.

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