

Flora & Fauna Guarantee Action Statement

#22

This Action Statement was first published in 1992 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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Wedge Diuris *Diuris cuneata*



Wedge Diuris (*Diuris cuneata*)



Distribution in Victoria (DSE 2002)

Description and Distribution

Wedge Diuris (*Diuris cuneata* R.D. FitzG.) is a deciduous terrestrial orchid that annually produces one or usually two linear, grass-like leaves to 30 cm x 0.5 cm from a subterranean storage organ (tuberoid). The single flower stem (to 40 cm) bears, depending on the nutritional and climatic factors, one to nine flowers, about 35 mm across, which are pale lilac with a few darker spots and striations. Diuris flowers from late October to early December. A detailed description is contained in Jones (1988).

Wedge Diuris is endemic to central and south-coast NSW and north-eastern Victoria, where it is widespread but generally uncommon. It grows in colonies in open forest, grassland and low coastal scrub communities (Jones 1988). In Victoria, Wedge Diuris is restricted to a sole locality in north-eastern Victoria. To protect the species the precise location will not be disclosed. Its habitat consists of remnant

grassy woodland dominated by *Themeda triandra* (Kangaroo Grass), *Daviesia latifolia* (Hop Bitter-pea) and various eucalypt species.

Conservation Status

Current Status

Gullan *et al.* (1990)

Vulnerable

In view of the species' rarity and associated threats it is considered that the status should be revised to 'endangered'. Wedge Diuris has received the Scientific Advisory Committee's final recommendation for listing as a threatened taxon on Schedule 2 of the *Flora and Fauna Guarantee Act 1988*.

Reasons for Conservation Status

Wedge Diuris was formerly present at Goornong, north-east of Bendigo (Allen 1986) and was widespread throughout north-eastern Victoria (Scarlett 1987). Only 13 plants (1991), including one clump of five, which may be vegetatively reproduced daughter plants, are known from one locality in Victoria.

In its final recommendations, the Scientific Advisory Committee (SAC) determined that the Wedge Diuris is

- in a demonstrable state of decline likely to result in extinction;
- significantly prone to future threats which are likely to result in extinction; and
- very rare in terms of distribution and abundance.

Major Conservation Objective

To ensure the long term viability of Wedge Diuris by:

- permanent reservation of its critical habitat;
- enhancement and expansion of habitat at the known site from 5 ha to at least 8 ha;
- restoration of at least 5 ha of additional nearby public land habitat; and
- through natural regeneration and propagation, increase the total population to 750 within the next 10 years.

Management Issues

Ecological Issues Specific to the Taxon

For long-term viability, the taxon requires an ecologically diverse environment. This exists at the known locality where over 40 native grassland plant species have been recorded. However, the small size of the habitat, its isolation and the inability to reinstate former influences on the natural environment—such as wildfire and macropod grazing—may hinder conservation. Furthermore, the Victorian population may be at the edge of the species' geographical range, with abiotic factors, particularly climate and soils, being sub-optimal, thus reducing the species' ability to survive and reproduce.

Although the Land Conservation Council (LCC 1986) recommended the known locality, which is on public land, to be permanently reserved for nature conservation, the permanent reservation has not proceeded because the land is owned by a government agency. The area is temporarily reserved and managed under existing agreements by the Department of Conservation and Environment (DCE).

Furthermore, part of the area is a road reserve where past grading, slashing and road widening has caused habitat modification and weed invasion.

Domestic stock still graze on a valuable extension to the reserve and this, while unregulated, threatens the integrity of this remnant grassland community. Rabbit numbers are currently low but may pose a future threat.

Occasional horse riding in the reserve contributes to ongoing threats from soil compaction, trampling and, to a lesser extent, grazing. The reserve is small (5 ha) and linear with a high perimeter to area ratio, making edge effects, particularly weed invasion, significant. Thirty-two exotic

species have been recorded, 50% of which are a significant threat to the grassland community.

The dominant native grass *Themeda triandra* (Kangaroo Grass), while important to the ecology of the reserve, also poses a threat. Stuwe & Parsons (1977) and McDougall (1989) demonstrated that most *Themeda* grasslands require burning (or some other form of canopy removal) every two to five years to prevent the vigorous Kangaroo Grass from smothering smaller native herbs. This phenomenon has been observed in *Themeda* dominant sections of this reserve, with a substantial increase in the cover-abundance and flowering of smaller herbs, particularly members of the Liliaceae family, in inter-tussock spaces created following ecological burns. It is interesting that the reserve is likely to have been originally an open forest community; however, clearing and frequent burning that followed settlement probably favoured the development of the grassy woodland that exists today. Prescribed ecological burns and weed control to reduce competition may inadvertently also threaten the community. While burns reduce the cover-abundance of Kangaroo Grass and at least the short term reproductive potential of some weeds (e.g. *Lolium perenne* (Perennial Rye Grass), other weeds, such as *Briza maxima* (Large Quaking-grass) and *Cirsium vulgare* (Spear Thistle), proliferate, necessitating additional weed control which may then affect non-target native species. Furthermore, our knowledge of the ecological requirements of Wedge Diuris and its grassland community is inadequate, in particular the response to varying frequency, intensity and season of burn is insufficiently understood. This, coupled with seasonal hazards that make it difficult to implement burns at what would be the most effective time, precludes optimal management.

Eucalypt regeneration is prolific in some areas and if unchecked the site may gradually revert from open grassy woodland to open forest, perhaps with adverse consequences. Natural pollination has rarely been recorded. Jones (1988) indicates that pollination is primarily achieved by small native bees. These are generally few and virtually absent at the time of Wedge Diuris flowering (late Oct./early Dec.). Most other small native herbs have passed their peak flowering period by this time, and perhaps this general flower scarcity prevents the site from being a viable foraging area for bees, and so lowers the potential for pollination.

Natural regeneration has been at best negligible. Overall population numbers have increased marginally from the first confirmed records in 1984, with three new plants recorded in 1991. However, it is likely that these have been present for years and have not been observed before, perhaps because they had not flowered for some time.

Wedge Diuris has an extremely high potential reproductive ability. Propagation using modern flasking techniques can produce over 1000 plants from a single pod containing fertile seed (Branwhite pers. comm.). Unlike *Diuris punctata* (Purple Diuris), Wedge Diuris is relatively easy to propagate as the mycorrhizal fungus required is common (Clements pers. comm.). Invertebrate grazing (Case Moth larvae-*Psychidae*) has previously been observed to defoliate plants and destroy flower spikes, possibly causing a significant reduction in the

reproductive potential. Spittle Bug nymphs (*Cercopoidea*) have also been observed on *Diuris*, but their effect is not known.

The gene pool is extremely small and totally isolated, making the species more vulnerable to extinction through a natural or human-induced disaster. It may also contribute to inbreeding. Galahs (*Cacatua roseicapilla*) have been observed extracting bulbs of *Romulea rosea* (Common Onion-grass) at the site and pose a potential threat to *Diuris* tuberosids. Orchid collectors pose a serious threat as the species is highly prized for its striking appearance and rarity in the wild as well as in cultivation. Allen (1986) documented the demise of the Goornong population in this manner. Removal of any plants from the remaining population would have a significant impact.

The *Diuris* genus is currently undergoing revision. Wedge *Diuris* is likely to revert to an earlier name, *D. dendrobiodes*, as described by Fitzgerald in 1882 (Jones pers. comm.)

Wider Conservation Implications

The biological and taxonomic significance of this reserve is further heightened by the presence of two additional Rare or Threatened Plants in Victoria-Purple *Diuris* and *Acacia decora* (Western Silver Wattle)-both classified as 'vulnerable'.

Achieving the conservation objective will complement the protection and enhancement of Purple *Diuris* (12 plants-1991) and is likely to benefit most other indigenous grassland flora and fauna and the ecological community as a whole. In so doing it is consistent with and helps achieve the objectives of the Draft Conservation Program for Native Grasslands and Grassy Woodlands in Victoria (Baker-Gabb & Lunt 1991).

The small Western Silver Wattle stand (eight plants) represents the eastern limit of the species' geographical range; production of seed has been limited and only one seedling has ever been observed. This species can be protected and enhanced without compromising Wedge *Diuris*. The reserve contains a number of regionally important grassland-dependent reptiles including *Delma inornata* and *Ctenotus regius*. While periodic burning is necessary to maintain a species-rich grassland, ultimately beneficial to the reptiles, it can in the short term cause the death of some animals.

Achieving the conservation objective will help illustrate the importance of retaining and managing other fragmented public land, such as road and rail reserves-including disused rail lines-that contain remnant native vegetation.

Social and Economic Issues

Achieving the conservation objective will not create any major social or economic issues. All known colonies occur on public land.

- Because the areas involved are small, costs associated with habitat management are comparatively low. Ecological burns, however, are relatively labour intensive. More personnel than would otherwise be the case are required when burns are conducted during the optimal, post-flowering period in summer, to prevent

fire escape and to warn motorists of smoke hazard. Furthermore, to avoid broad area impact on reptiles, burning programs may consist of several small burns conducted over a number of years, rather than one large burn. Community participation, for instance from the CFA, would help defray costs. Weed control is similarly labour intensive, particularly in the beginning, but costs progressively reduce as the habitat improves.

- Grazing, previously unregulated on the reserve extension to the east (3 ha), will be restricted to the summer period. This land is publicly owned and grazed under lease. Under the new regime, fees will not be charged for seasonal grazing as part of a mutually beneficial co-operative agreement. Loss of grazing potential and overall impact will be minimal.
- Alternative Telecom cable alignments may increase the costs of up-grading works.
- Restrictions imposed on the road reserve authority would be easily incorporated and involve minimal impact on current operations. Furthermore, curbside slashing would reduce potential roadside ignition points and therefore minimise fire hazard. Fire hazard itself would be reduced by periodic ecological burns, producing *Themeda*-dominated grasslands that remain relatively green in summer compared to exotic pastures.
- Expanding the reserve to the south and implementing an ecologically-based grazing regime would only be done after voluntary agreement by the private landholder.
- The need for site confidentiality reduces the potential for community participation in habitat management works.
- While the opportunity exists for limited, passive recreation, it will not be promoted as it is likely to conflict with the conservation objective. Social impact will be low as there is negligible recreation use of the area.
- Propagation and cultivation of Wedge *Diuris* by an authorised agent for sale to native orchid societies, and in turn the general public, is one way in which illegal collection from the wild may be substantially reduced. However, inadequate knowledge of the social and economic factors underlying illegal collection hinders solution of the problem. Cultivation of the species and its sale to the public would allow it to be appreciated by a significantly larger number of people. Furthermore, our understanding of the species' ecological requirements in the wild is likely to be greatly improved from lessons learnt in cultivation.

Management Action

Previous Management Action

Pre 1950: First unconfirmed record of Wedge *Diuris*. Prior and subsequent management consisted of periodic burning and occasional tree lopping for fuel reduction.

1970s: Unconfirmed reports of prolific *Diuris* flowering (Jones pers. comm.).

Nov 1984: First confirmed documentation of Wedge *Diuris* (then *Diuris punctata* var. *longissima*) at site-six flowering plants recorded.

Dec 1984: The then managing authority informed of the sites' significance; burning recommended.

April 1985: La Trobe University requested the LCC to reserve the site.

Nov 1985: Land management authority again informed of sites' significance. Management at this time and up until 1988 involved hand pollination of all flowers produced, with all pods thereafter taken from the site. Such actions reduced the opportunity for natural pollination and precluded natural regeneration. Seedlings subsequently raised from limited propagation trials mostly died, although three plants are still held.

Jan. 1986: LCC recommended permanent reservation of site for nature conservation.

April 1986: First DCE-prescribed ecological burn to control Wild Oats (*Avena fatua*).

Sept. 1986: Road Reserve Authority informed of the site's significance and management guidelines.

Oct 1986: Ten plants recorded.

1987: Management Agreement ratified between DCE and management authority. Reserve slashed.

Oct 1988: Telecom advised of site's significance and requested to conform with management prescriptions.

April 1989: First of ongoing manual and chemical weed control programs implemented.

April 1990: Large-scale ecological burn conducted.

Throughout remainder of year, chemical control of post-fire Spear Thistle (and other broad leaf) regeneration and established *Paspalum dilatatum* (*Paspalum*) infestations conducted.

March 1991: Ecological burn conducted (sections not burnt in recent years).

Oct 1991: Grazing tenancy issued over adjoining section of reserve already leased by DCE. Grazing prohibited by DCE and management agreements reiterated. Other government agencies informed again of the site's significance.

Jan. 1992: Comprehensive weed control and eradication program undertaken.

Feb. 1992: Negotiations with Telecom regarding forthcoming upgrades to underground cables, which until then had dissected the reserve, resulted in new cables being relocated entirely outside the reserve area.

Intended Management Action

Monitoring Continue monitoring Wedge and Purple Diuris (and Western Silver Wattle) growth, flowering and pod production. Establish ten permanent vegetation quadrats and photographic points in three principle management units (western ungrazed extension, central core orchid area, and eastern grazed extension) of the reserve. Gather data on native pollinators. Obtain ecological data on the nearest NSW population.

Ecological burns Conduct prescribed burns in Kangaroo Grass dominant sections of the management units excluded from domestic grazing, according to need as determined by monitoring. Burning will begin when grass canopy closure reaches 85% and inter-tussock spaces are reduced to 25% (subject to further research). As a general guide, a two to five year burning regime will be implemented. A

representative area will be designated in which burning will be permanently excluded as a control for comparative monitoring. **Weed control** Eradicate *Chondrilla juncea* (Skeleton Weed), *Echium plantaginium* (Paterson's Curse), *Juncus acutus* (Spiny Rush) and *Hypericum perforatum* (St. John's Wort) from the western and central management units, and the eastern unit within three and five years respectively. Reduce dominant exotics *Paspalum*, Spear Thistle, Wild Oat and *Bromus* sp. (and other weeds as required) to 10% of existing levels within the units excluded from stock grazing.

Re-establishment of Kangaroo Grass Restore degraded areas, where appropriate and following weed control works, consistent with techniques described by McDougall (1989).

Expand reserve Expand the reserve eastwards to include the 3 ha section of public land currently grazed under lease. Manage this section as the third unit. Investigate the feasibility of widening the reserve to the south.

Regulate grazing Negotiate an ecologically based summer grazing regime, at low to moderate grazing intensity, with former tenants of the eastern unit. Negotiate, if considered feasible, an ecologically based grazing regime with private landholders to the south.

Conservation Status Recommend that *Diuris cuneata* be revised to 'endangered' status.

Signposting Erect routed wooden 'Native Plant Reserve' signs at two roadside locations and additional smaller signs, with similar wording, within the reserve.

Public Authority Management Agreement Liaise with the road reserve management authority and Telecom to negotiate and formalise agreements under the *Flora and Fauna Guarantee Act*.

Reservation Ensure the permanent reservation of Wedge Diuris habitat.

Rabbit control Implement rabbit control as required.

Critical Habitat Determine and ensure protection of the critical habitat of Wedge Diuris.

Pollination Undertake, in the absence of natural pollination, hand pollination (ensuring cross fertilisation) of a maximum of one flower per plant.

Propagation Utilise one to three pods (depending on seed viability) of those held in store at La Trobe University (4), DCE (20) and Australian National Botanic Gardens (2) and arrange for propagation by one or all of these bodies to produce, as an initial goal, 1000 plants. Future removal of pods or seed from the reserve is not to be permitted, at least for the next three years, and will only be considered if existing seed proves to be unviable. DCE should give consideration to the careful introduction of plants, or plants raised from seed from nearby localities in NSW, to avoid inbreeding depression and improve quality of genetic stock.

Cultivation Provide, through an authorised, licensed agent, Wedge Diuris seedlings in order to establish stock in cultivation for sale to native orchid societies, and in turn to the general public.

Planting Plant, subject to further investigation, 350 propagated tuberosities into the reserve and 250 into additional restored habitats.

Seed storage Prepare an inventory of existing seed held and ensure proper storage. Use seed in propagation works.

Research Encourage research on *Diuris*, and grassland communities in general, to determine biological and ecological requirements.

Reptiles Undertake pit-fall trapping, providing the conservation objective is not compromised, to determine the small reptile fauna of the reserve.

Additional habitat Restore remnant grassland habitat on nearby public land for planting propagated orchids to establish additional gene pools and thereby reduce threat of extinction.

Other Desirable Management Action

Weed control Investigate methods to control onion weed and *Hypochoeris radicata* (Cat's Ear), insidious weeds that are generally difficult to control, on a broad scale, by conventional techniques.

Research Consistent with the conservation objective, undertake genetic studies to establish whether and to what degree inbreeding is present. Also undertake ecological studies to determine the role of invertebrates in grazing and pollination.

Illegal collection Research the social and economic factors underlying illegal collection as a basis for developing solutions.

Legislative Powers Operating

Legislation

Conservation, Forests and Lands Act 1987-provides for Land Management Co-operative Agreements.

Country Fire Authority Act 1958-provides the legal requirements for fire protection and suppression.

Crown Land (Reserves) Act 1978-provides for the creation and protection of reserves. *Fences Act 1968*-provides the requirements for maintenance and repair of fences dividing landholders.

Flora and Fauna Guarantee Act 1988-regulates the taking of listed biota and protected flora from the wild and provides for critical habitat protection. *Diuris cuneata* is protected flora under this Act.

Land Conservation Act 1970-provides for the determination of uses and reservation of Crown land.

Planning and Environment Act 1987-provides for land use controls and possible follow-up to Interim Conservation Order controls, and the establishment of covenants with local landholders and local governments.

Vermin and Noxious Weeds Act 1958-provides for control of pest, plants and animals.

Victorian Conservation Trust Act 1972-provides for the establishment of conservation covenants on land titles.

Licence/Permit Conditions

Permits for the collection of Wedge *Diuris* pods or vegetative material will only be given for work which is in accordance with the conservation objectives and prescribed management actions. No permits will be issued for the taking of tuberoids.

Consultation and Community Participation

All relevant public authorities and adjoining landholders have been informed of the reserve's significance and consulted regarding its management-particularly past ecological burns. Consultation will continue with the aim of formalising various co-operative agreements.

Implementation, Evaluation and Review

The DCE Regional Manager, North East, will be responsible for co-ordinating the implementation and annual evaluation of this Action Statement.

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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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