

## CONSERVATION IN SOUTH AFRICA: AN ORCHIDIST'S PERSPECTIVE

LOURENS GROBLER

P.O. Box 358, Nelspruit, 1200, South Africa. Email: lourens@wegmar.co.za

**ABSTRACT.** Thus far, the ex-situ cultivation of most South African terrestrial orchids has been largely unsuccessful. This is mainly the result of the close relationships between these orchids and mycorrhizal fungus and their highly specialized habitats. The main aim of conservation in South Africa is to protect and manage centers of high biodiversity. Many rare and endangered species grow in these centers, and it is of utmost importance to manage terrestrial orchid habitats to ensure the survival of important ecosystems and, in particular, the orchids that grow in them. The presentation conveyed an overview of the past, present, and future of conservation efforts in South Africa, with special emphasis given to afforestation (such as converting grasslands to pine plantations) and the muthi (traditional African medicine) trade.

*Key words:* habitat loss, plantations, muthi trade, high biodiversity, private landowners, endemism

### INTRODUCTION

Approximately 1500 species of orchids occur in Africa, excluding the Indian Ocean islands. In all, Southern Africa (South Africa, Namibia, and Botswana) has 470 orchid species, representing ca. 31% of all orchid species on the continent (Stewart et al. 1982, Linder & Kurzweil 1999). Terrestrial orchids make up 90% of the species, because most of Southern Africa has two distinct seasons, namely a dry season and a rainy season; and epiphytes require moisture. The rich diversity of orchids can be accredited largely to the Cape Floristic Region, where 190 orchid species occur in a very small area. The major threats to most of the winter-rainfall species (those occurring in the winter-rainfall region) of the Western Cape are urban development and sprawl. Orchids in both summer- and winter-rainfall regions are under tremendous pressure, mainly as the result of habitat loss. With endemism the focal point of conservation, and 65% of South African orchids endemic, these species play a major part in efforts to conserve areas of high biodiversity. Of the Western Cape orchids, 99% are endemic, as are 40% of the summer-rainfall region species (TABLE 1). The following in-depth look at orchid habitats under threat in the summer-rainfall regions features Mpumalanga (see FIGURE 1).

### MATERIALS AND METHODS

The South African Plant Red Data List (Golding 2002) includes 38% of all South African orchids (TABLE 2). Disturbingly most of the orchid species listed are endemic. A key part of my research has been the assessment of orchid species on the Red Data List and the assessment of other species of concern. Those orchid species, presumed to be extinct, are known only from type vouchers preserved in herbaria. Current re-

search includes investigations of the possible "re-occurrence" of some presumed-extinct species.

### Conservation in Mpumalanga

In the past the main priority of conservationists was to protect South Africa's magnificent wildlife, in particular, the large mammals. A good example is Kruger National Park (7580 mi<sup>2</sup> or 19,633 km<sup>2</sup> in size). In South Africa, parks and game reserves are key to conservation, as they generate income through tourism, a portion of which is allocated to manage botanical reserves. Presently, the main aim of the Mpumalanga Parks Board is to get at least 10% of each landscape type protected. The emphasis is on areas of high biodiversity, which are mostly high rainfall landscapes (FIGURE 1) located at high elevations (1300–2200 m).

Another effective way to protect landscapes involves the formation of conservancies, whereby neighboring private landowners place all natural habitats on their properties under the management of a single governing body. More than 280,000 ha currently are managed by conservancies. Much can be said for the members of these conservancies, as the future of many habitats will depend completely on private landowners.

"Working for Water" is a government-funded project that supports removal of invasive alien vegetation from properties, especially in major catchments and along watercourses, which often also serve as orchid habitats.

The ex-situ cultivation of terrestrial orchids in South Africa remains unsuccessful, although in-vitro propagation of some species has been achieved. In-vitro propagation can be a powerful tool in conserving endangered species and colonizing undisturbed suitable habitats, but hopefully this will not be necessary.

TABLE 1. Orchid endemism in Southern Africa (South Africa, Namibia, and Botswana).

Habit	All orchids		Winter rainfall CF* region		Summer rainfall region		Namibia & Botswana	
	Total no.	Endemic %	Total no.	Endemic %	Total no.	Endemic %	Total no.	Endemic %
Terrestrial	420	70	192	99	220	45	24	—
Epiphytic	50	20	—	—	50	20	1	—
Total	470		192		270		25	

\* Cape Floristic (CF).

Source: Stewart et al. (1982), Linder & Kurzweil (1999).

“Operation Wildflower,” which originated in the Western Cape, is aimed at relocating orchids (and other plants) under threat by development to protected areas. Volunteers mostly do this work.

### Threats

Among the various threats to South African orchids, the first is habitat loss and, to a lesser degree, commercial trade and mismanagement of current reserves.

### Habitat Loss

The leading threat to orchids in Mpumalanga (and elsewhere) is habitat loss through exotic plantations. The two major orchid landscape types are the wet mountainous landscape and the wet undulating landscape. Almost half of the wet mountainous landscape has been transformed by plantations of mainly pine trees (*Pinus* spp.) and blue gums (*Eucalyptus* spp.). Only 17% of the wet mountainous landscape is protected. Of the wet undulating landscape, only 5% is protected, and exotic tree plantations have

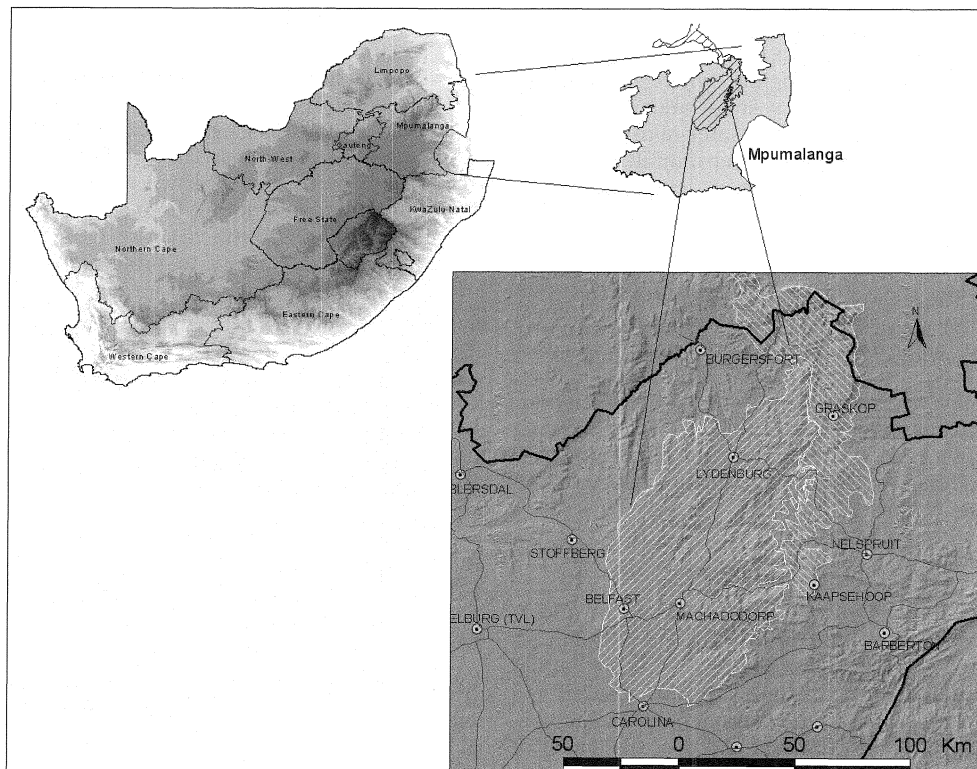


FIGURE 1. Centers of plant endemism in Mpumalanga, South Africa. Source: Lydenburg and Wolkberg Centre of Plant Endemism (Emery et al. 2003).

TABLE 2. South African Plant Red Data classification of orchids.

Red Data Classification	Winter rainfall CF* region no. spp (%)	Summer rainfall region no. spp (%)	Total no. spp (%)
Critically endangered	2	1	3
Endangered	8	7	15
Vulnerable	13	20	33
Rare	2	1	3
Lower risk	53	60	113
Indeterminate	6	1	7
Extinct (presumed)	1	5	6
Total	85 (49)	95 (31)	180 (38)

\* Cape Floristic (CF).

Source: Golding (2002).

transformed a staggering 77%. Pines and blue gums spread vigorously and quickly, and if the islands of grassland in between the plantations are not managed properly, they too will disappear soon. Forestry companies wanting to plant in any untransformed landscapes must firstly obtain the approval of the parks board concerned. The presence of a plant or animal species listed on the Red Data List serves as a deterring factor in granting approval.

Other causes of habitat loss include agriculture, urban development, dams, roads, and invading alien plants. Although not considered to be serious threats, as they are not usually in orchid-diverse areas, development and invasive plants may threaten single species. Invading plants often are associated with plantations and the disturbed areas surrounding plantations, which created an added threat to orchids in the wet mountainous and wet undulating landscape types.

#### Commercial Trade

The commercial trade in orchids, i.e., orchid nurseries, poses hardly any threat to South African orchids when compared to the threats of habitat loss. Terrestrial orchids, which are very difficult to cultivate, therefore have not been collected. Epiphytic orchids, on the other hand, are easy to cultivate, but few of them have horticultural appeal and thus have not been cultivated to any great extent.

The muthi (traditional African medicine) trade has a greater commercial value. Thousands of orchids are harvested for medicinal use each year, especially species in the genera *Eulophia*, *Satyrion*, *Ansellia*, and *Bulbophyllum*. *Ansellia africana* is used to produce love charms and antidotes for bad dreams. *Eulophias* and *satyriums*

are used as protective charms and aphrodisiacs (MacDonald & Duckworth 1994).

The muthi collectors also harvest the barks of many forest trees, with the result that trees often become ring-barked. A ring-barked tree soon dies and with it many epiphytic orchids. In the past, traditional healers (inyangas) or diviners (sangomas) would harvest wild orchids in a sensible and sustainable way, because they only used certain areas and knew that the plant populations needed to survive for the healers to survive. Because of urbanization, however, commercial collectors are harvesting entire populations to supply the incredible demand for medicinal products in the cities. This unsustainable collecting puts huge pressure on various orchid populations, especially in areas that are easily accessible.

Currently the damage caused by the traditional medicine trade is significantly less than the damage caused by forestry and exotic tree plantations. It is essential to find solutions for the remaining wild orchid populations. Firstly, the education of collectors is essential followed secondly by cultivation of muthi plants to offer alternative supplies to meet the demand. Limiting factors exist, such as the difficulty in cultivating terrestrials and a strong belief in traditions among consumers.

#### RED DATA ORCHID SPECIES

A selection of the most threatened orchid species in Mpumalanga is presented. All but one of these species are threatened by afforestation—planting of non-native trees in grasslands where forests never grew.

*Platycoryne mediocris* is critically endangered because of urban development. Robert and Michele Kunitz discovered it for the first time in South Africa in January 2001 on the outskirts of Nelspruit, Mpumalanga. The next closest known population is in northern Zimbabwe, more than 1000 km away. Approximately 25 plants make up the Nelspruit population, and thus far, no other populations have been discovered in South Africa. A new housing estate, adjacent to the population was being developed at the time of the discovery. The boundary of the development cuts the population in two. The developer was approached and decided to help protect the eight plants inside the property boundaries. Subsequent visits to the site have been promising, but further development in the surrounding area makes for a very uncertain future. Searches are planned to locate more *P. mediocris* popu-

lations and to find suitable habitats to transplant these plants if needed.

**Disa aff. montana**, a new species, was discovered only recently by John Burrows and Elisabeth Parker on the Long Tom mountain range in Mpumalanga. Only one population is known to exist, and although there are ca. 200 plants, they occur only in one small area (3 ha) of high-elevation grassland. A pine plantation existed just 20 m from this population, but subsequently the landowner has logged the trees and decided not to replant the area with pines. *Disa aff. montana* is classified as critically endangered.

In addition, the following orchid species have been classified as endangered. *Disa amoena*, *D. clavicornis*, *D. alticola*, and *Schizochilus lilacinus* are species found in high-elevation grasslands. *Disa zuluensis* and *Satyrium microrhynchum* are wild orchids that grow in grasslands at elevations greater than 2000 m. *Disa maculomarronina* and *Schizochilus crenulatus*, both endemic to South Africa, and *Disa extinctoria* all grow in the escarpment grasslands at an elevation of 1200–1700 m. The escarpment grasslands also are under great threat.

### CONCLUSIONS

Conservationists in South Africa would like to have at least 75% of all species, plant and animal, protected either in reserves or in conservancies. Although this approach may seem idealistic, private landowners can and will play a major role in achieving it. The conservation of private land is the most effective tool in securing a future for South Africa's indigenous orchids. Conservationists in South Africa are discussing the probability of conservation grants or incentives by the government to private landowners who protect and manage natural landscapes on their properties. If promulgated, incentives may include tax relief to landowners contributing to conservation.

In the short term, the government is encouraging the work of private individuals in assess-

ing orchid populations, in perfecting ex-situ cultivation of orchids, and in educating other people about South Africa's wild orchids. The big forestry companies also have a key role to play by managing the remaining islands of grasslands properly to prevent the uncontrolled spread of pines, blue gums, and other alien vegetation on their properties.

In the longer term, funds will be needed to buy key properties, manage existing properties, and educate the public (Emery et al. 2002). Through education, more people will become aware of the need to protect the nation's biodiversity, which may have a snowball effect on the rest of South Africa, the "rainbow nation."

### ACKNOWLEDGMENTS

I thank the IOCC II committee for sponsorships that enabled my participation in the Congress. I thank Mervyn Lotter, of the Mpumalanga Parks Board, for his cooperation and assistance in preparing this manuscript but, more importantly, for the work he is doing along with other Parks Board members to protect South Africa's orchids.

### LITERATURE CITED

- Emery, A.J., M.C. Lotter, and S.D. Williamson. 2002. Determining the Conservation Value of Land in Mpumalanga. Mpumalanga Parks Board, Nelspruit, South Africa.
- . 2003. Lydenburg and Wolkberg Centre of Plant Endemism. In Mpumalanga State of the Environment Report. Mpumalanga Parks Board, Nelspruit, South Africa.
- Golding, J.S., ed. 2002. South African Plant Red Data Lists. Southern African Botanical Diversity Network Report no. 14. Sabonet, Pretoria, South Africa.
- Linder, H.P. and H. Kurzweil. 1999. Orchids of Southern Africa. A.A. Balkema, Netherlands.
- MacDonald, G. and A. Duckworth. 1994. The uses of orchids in traditional healing. So. African Orchid J. 25: 75–79.
- Stewart, J., H.P. Linder, E.A. Schelpe, and A.V. Hall. 1982. Wild Orchids of Southern Africa. Macmillan, Johannesburg, South Africa.