CONSIDERATION OF PROPOSALS FOR AMENDMENT OF APPENDICES I AND II

Other proposals

A. PROPOSAL

It is proposed that *Orothamnus zeyheri* be transferred from Appendix I to Appendix II in accordance with precautionary measure B.2.b) as specified in Annex 4 of Resolution 9.24.

B. PROPONENT

The Republic of South Africa

C. SUPPORTING STATEMENT

1. Taxonomy

1.1 Class	Dicotyledonae
1.2 Order	Proteales
1.3 Family	Proteaceae
1.4 Genus and species	*Orothamnus zeyheri* Pappe ex Hook.f. 1848 (Boucher 1981; Vogts 1982; Rebelo 1995)
1.5 Synonyms	*Mimetes zeyheri* Meisn.
1.6 Common names	Marsh rose (Rebelo 1995)
1.7 Code number	

2. Biological Parameters

2.1 Distribution

This monotypic species is known only from two small areas in the southwestern Cape, South Africa (Boucher 1981; Vogts 1982; Rebelo 1995). There are several populations on the high peaks of the Kogelberg mountains (southern portion of the Hottentots Holland range) and a single small population on the Klein River Mountains near Hermanus, some 40 km to the east. It is not certain whether the latter population is natural or the result of a reintroduction (Boucher 1981). It occurs in Mesic Mountain Fynbos, a widespread vegetation type found on mountains throughout the Cape Floristic Kingdom. Although there are many areas where this species could grow, it is a very localised endemic which does not appear to have occurred outside of its presently known range, probably because of its very specific habitat requirements. *Orothamnus* only grows in seepage areas generally on very steep, cool south facing slopes (Boucher 1981). It is on these slopes that clouds brought in by the southeasterly trade winds

regularly condense to release their moisture in the summer months. This precipitation is very important in maintaining the water-logged conditions of the soil. The substrate is a dark and very acid peaty soil. It is a very porous medium through which water percolates continuously and this is apparently essential for the occurrence of the species (Rourke & Lincoln 1982).

The first plants of *Orothamnus* were collected from an unknown locality in the Hottentots Holland Mountains by Zeyher in the 1840s and there were no additional records until sixty years later when plants were purchased from a roadside flower seller in Cape Town (Boucher and McCann 1975; Boucher 1981, Rourke & Lincoln 19982). The population on the Klein River Mountains was the first to be discovered by a botanist in 1907 and the Kogelberg populations were only located in 1920 (Rourke & Lincoln 1982). It was, however, only in 1968 that the exact locations of all the populations in the Kogelberg were pinpointed (Boucher 1981).

2.2 Habitat availability

Mesic Mountain Fynbos is well protected as most of the mountain ranges have been declared Forest Reserves, provincial Nature Reserves or Mountain Catchment Areas. Within Mesic Mountain Fynbos there are only a few places where *Orothamnus* can occur, fortunately all of the known populations of *Orothamnus zeyheri* fall within conservation areas.

2.3 Population status

In 1981 there were 18 populations of *Orothamnus*, 17 in the Kogelberg and one at Hermanus (Boucher 1981). All the Kogelberg populations, except for two, were still in existence in 1995 (M. Johns pers. obs.). Two additional populations have also been found since 1981. One of the populations which has disappeared was only a small one, easily accessible to the public, and the remaining plant was trampled to death recently. The other population which has apparently disappeared, comprised 120 young (5 year old) plants in 1992 but was accidentally burnt in March 1995 and no regeneration has been recorded as yet. This also happened to one of the recently discovered populations, which comprised 722 young plants in 1992 (M. Johns pers. obs.).

2.4 Population trends

As a seed regenerator, the normal life-span of *Orothamnus zeyheri* is closely linked to the occurrence and periodicity of fires. Directly after a fire, seeds lying dormant in the soil begin to germinate in large numbers and plants grow rapidly in the first few years (Boucher and McCann 1975; Lückhoff 1977; Boucher 1981). Flowering commences after three years, reaching its peak after nine years. After twelve years, plants start becoming senescent as growth is reduced and flowering diminishes, and after twenty years most of the population is greatly reduced by senescence. This decline can be as dramatic as from several hundred plants to a few dozen or less. At this stage fire becomes necessary to initiate a new regeneration cycle. Boucher (1981) has established that seeds can retain their viability and germinate after 19 years in the soil and has therefore suggested that this species could survive a fire-free period of 30 years, but that a 15 year cycle would be optimal.

If fires are infrequent plants become moribund and die and there is no regeneration, however, following the next suitable fire there is usually good regeneration and recruitment The increased frequency of fires, especially as a result of human activities, has a negative effect on the species as it kills all the plants and reduces the soil stored seedbank. This factor combined with the depredations of flower pickers resulted in the marked decline of populations earlier this century (Lückhoff 1977; Boucher 1981). One of the best known populations had approximately 450 seedlings in 1947, by 1951 there were between 200 and 300 plants which declined further to 75 in 1961 and only 17 by 1963. These plants were rapidly becoming senescent and by 1967 only six were left (Boucher and McCann 1975). During this whole period the area had been protected from fire and after it was burnt in 1968, many seedlings started making an appearance. During an intensive survey of the area in the late 1960s and early 1970s, a total of 1956 plants was counted in the Kogelberg, but the numbers were probably higher than this as some populations were only discovered after they had reached flowering maturity and some had already died (Boucher 1981). A count in 1980 produced a total of 1213 plants (Boucher 1981). In 1992 1955 plants were counted, although there was no data for 12 of the populations and by 1995 only 846 plants were counted in 13 of the 19 populations (six were not counted).

The population at Hermanus has also fluctuated considerably and several times it was thought to have become locally extinct, only to reappear after the next fire (Van der Merwe 1974, 1975). The population never seems to have exceeded about 50 plants. The population was destroyed once again by a fire in early 1996.

2.5 Geographic trends

Although populations have disappeared and reappeared over time, the geographic range of the species has remained constant for the last 150 years.

2.6 Role of the species in the ecosystem

As a very localised endemic, *Orothamnus* does not seem to have a major role in the functioning of the ecosystem. It does not appear to be a keystone species, as it is pollinated by generalist pollinators and its ant-dispersed seed phenomenon, is a syndrome shared by many other fynbos species. It is, however, a very good and useful indicator species for managers of the area, as the population fluctuations provide a useful cue to help direct and determine the management practices for the area.

2.7 Threats

Initial anxiety about this continued existence of *Orothamnus*, stemmed from the depredations by professional wild-flower pickers during the first half of this century (Rourke & Lincoln1982). The extremely attractive flowers of *Orothamnus*, plus its exceptional lasting qualities of more than a month in a vase, made it a highly sought after cut-flower (Lückhoff 1977; Boucher 1981). As a result large bunches of flowers were frequently seen for sale on the streets of Cape Town. It has since been found that the indiscriminate picking of flowers together with all the foliage and leaving only the bare stem, proves fatal to the

plants (Boucher 1981; Vogts 1982). In addition, trampling and disturbance around the plants causes root damage and soil compaction thus impeding soil water movement, which often leads to the death of plants.

The picking and peddling of *Orothamnus* was effectively controlled and largely curtailed by the Cape Provincial Wild Flower Protection Ordinance No. 15 of 1938. However, the promulgation of this ordinance took place at a time when the then Department of Forestry was being persuaded by botanists to enforce a policy of strict fire protection in fynbos, with the object of protecting the Cape flora from what were believed to be the destructive effects of fire. But despite these apparently good intentions, populations of *Orothamnus* continued to decline alarmingly. It was only in the late 1960s that it was realised that this 'over-protection' was a mistake and that fire was necessary at suitable intervals to ensure regeneration and good recruitment (Lückhoff 1977; Boucher 1981). Research has since shown that, although the species can survive a fire-free period of 34 years, hot fires in summer approximately every 15 years would probably be best for optimal recruitment (Boucher 1981). Fires at a more frequent intervals could pose a threat, especially wildfires in young vegetation which has not had time to flower and set seed.

The most serious threat to the species at present is from *Phytophthora cinnamomi*, a fungal root pathogen which has been isolated from dead plants in a number of the populations (Lückhoff 1977; Boucher 1981). The presence of this fungus is probably due to human disturbance.

There is also a natural threat which has had a serious effect on some populations. The vlei or marsh rat *Otomys saundersiae* appears to be partial to the young growing tips of *Orothamnus* seedlings and it was responsible for the destruction of more than half of the 180 plants in one population (Boucher 1981).

3. Utilization and Trade

3.1 National utilization

The species would certainly be used by the cut-flower trade, however, strict controls imposed initially by the Department of Forestry and now maintained by the Western Cape Nature Conservation Department, ensure that no harvesting from the wild takes place.

3.2 Legal international trade

Trade has been prohibited by listing on CITES Appendix I and by strict control measures in South Africa. The only record of trade according to TRAFFIC was of 60 seeds or seedlings which were sent from South Africa to the United States of America for scientific purposes. The fate of those seeds or plants is unknown. There is a possibility that trade could develop using artificially propagated material.

3.3 Illegal trade

This is very unlikely to occur given the current domestic controls on the species.

3.4 Actual or potential trade impacts

As there is no trade at present there is no impact and the potential trade that may occur as a result of downlisting, will also not have an impact provided current domestic protection measures are maintained. Such trade will be purely of artificially propagated material.

3.5 Artificial propagation for commercial purposes

A commercial nursery man in South Africa is growing plants with permission from the Cape Nature Conservation Department, but he has stated that he does not intend selling any plants or flowers commercially and so has not been issued with a permit to do so. A recent application from the Agricultural Research Council at Elsenburg to obtain cuttings for commercial propagation was turned down by the conservation authorities (M. Johns pers. comm.).

4. Conservation and Management

4.1 Legal status

4.1.1 National

Orothamnus is listed as 'Endangered Flora' in terms of the Cape Nature and Environmental Conservation Ordinance 19 of 1974. In terms of this Ordinance, no person may without a permit possess, sell, donate, receive as a donation, pick, or import into, export from, or transport through the province, any 'Endangered Flora'. The species has in fact been the target of conservation attention since 1938 when it was first protected from picking activities. In 1968, it was decided that in order to protect the species from any human disturbance, the Kogelberg would be closed to the public for five years (Lückhoff 1977; Boucher 1981). In 1971 the closure was extended indefinitely, although entry to the area was permissible for research purposes provided one obtained a permit from the authorities (Boucher 1981).

4.1.2 International

The species has been protected from international trade by its listing on CITES Appendix I.

4.2 Species management

4.2.1 Population monitoring

The initial monitoring programmes in the Kogelberg were set up by the Department of Forestry in conjunction with C. Boucher, then of the Botanical Research Institute. The Hermanus population was the focus of a major research project by staff of the Cape Nature Conservation Department (Van der Merwe 1974, 1975). The Kogelberg populations are now monitored annually by staff of the (Western) Cape Nature Conservation Department.

4.2.2 Habitat conservation

Both of the populations occur in conservation areas, namely the Kogelberg State Forest (a mountain catchment area) and the Maanskynkop Nature Reserve. Both areas are managed by the (Western) Cape Nature Conservation Department,

with access to the former very strictly controlled. Attempts are underway to have the Kogelberg declared as either a Biosphere Reserve or a World Heritage Site, in which the Kogelberg State Forest will form the core area.

4.2.3 Management measures

A series of management measures have been implemented over the years to save the species from extinction. In 1967 when the species was thought to be on the brink of extinction, the reserve was closed to the public and the known sites were fenced off (Boucher 1981). Regular patrols were implemented to safeguard the surviving plants and a series of controlled block burns was started. Clearing of the ground by hoeing in order to build the fences, resulted in the appearance of nine seedlings. This prompted the hoeing of the whole fenced area and resulted in the germination of a further 70 seedlings (Boucher and McCann 1975; Boucher 1981). Hives of bees were also introduced into the area to enhance the success of pollination (Boucher 1981). All these remedial measures have been extremely successful in ensuring the continued existence of strong viable populations in the wild. At present fire frequency is restricted to intervals of 15 to 20 years, wildfires are controlled, any invasive alien plants are cleared from the area and access is still strictly controlled (M. Johns pers. comm.).

A great deal of research has been done on the propagation of *Orothamnus*, especially on the germination of its seed, how to grow it from cuttings, the possibilities of grafting it on to other members of the Proteaceae such as *Leucospermum conocarpodendron* and *L. cordifolium* which are less susceptible to trampling and fungal attack, when and how to pick flowers and how to hand pollinate flowers (Van der Merwe 1974, 1975; Boucher 1981, Vogts 1982). Many hundreds of grafted plants were produced and distributed by Cape Nature Conservation Department's nursery in the late 1970s to many interested commercial protea growers. Unfortunately, grafted plants do not live more than a few years, but as regrafting is a relatively straight forward procedure, a continuous supply can be maintained (Rourke & Lincoln 1982). Given this information it would be quite feasible to set up a commercial propagation programme to satisfy any demands for flowers or plants. Grafted plants are in cultivation at both Kirstenbosch National Botanical Garden and the Agricultural Research Council at Elsenburg.

4.3 Control measures

4.3.1 International trade

The listing of the species as 'Endangered Flora' in the Cape Nature Conservation Ordinance, is sufficient to control all international trade in this species. Controls imposed by a CITES listing are therefore unnecessary.

4.3.2 Domestic measures

There is adequate domestic legislation to protect this species from over exploitation. No harvesting is allowed at present.

5. Information on Similar Species

There are no other species which could be confused with *Orothamnus*.

6. Other Comments

Discussions were held with the conservation authority responsible for the protection of this species. In addition the proposal was discussed at a workshop attended by the CITES Management Authorities in South Africa.

7. Additional remarks

Downlisting of this species to Appendix II and eventual removal from CITES may stimulate increased demand for the species. However, because access to the natural populations is so strictly controlled and because there is adequate domestic legislation to protect this species, CITES listing is not necessary. The protection measures imposed have been so successful that the conservation status of this species has been changed from Endangered to Vulnerable and it is currently rated as Rare (in terms of the old IUCN Red Data categories) (Hilton-Taylor 1996). Unfortunately no plants or flowers are available commercially at present, however this situation could easily be remedied if there were a demand for the plants.

8. References

Boucher, C. 1981. Autecological and population studies of *Orothamnus zeyheri* in the Cape of South Africa. In: H. Synge (ed.) *The Biological Aspects of Rare Plant Conservation*, pp. 343-353. John Wiley & Sons, Chichester.

Boucher, C. and McCann, G. 1975. The *Orothammus* saga. *Veld and Flora*, 61(2): 2-5.

Hilton-Taylor, C. 1996. *Red Data List of southern African plants*. Strelitzia 4. National Botanical Institute, Pretoria.

Lückhoff, H.A. 1977. Die redding van die vleiroos - 'n suksesverhaal. *Environment RSA*, 4(10): 1-2.

Rourke, J.P. and Lincoln, T. 1982. *Mimetes*. An Illustrated Account of *Mimetes* Salisbury and *Orothamnus* Pappe, Two Notable Cape Genera of the Proteaceae. Tiyan Publishers, Cape Town.

Rebelo, A.G. 1995. *SASOL Proteas: A Field Guide to the Proteas of Southern Africa*. Fernwood Press, Vlaeberg.

Van der Merwe, P. 1974. The rarest protea of the fairest Cape. *African Wildlife*, 28(3): 28-29.

Van der Merwe, P. 1975. Impossible to save the marsh rose protea? *Veld and Flora*, 61: 4-5.

Vogts, M. 1982. *South Africa's Proteaceae. Know them and grow them*. Struik, Cape Town.

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