

SANBI - threatened plants programmes and the plight of Ghaap *Hoodia gordonii* (Masson) Sweet ex Decne, in the wild

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The threatened plants programme (TPP) within the South African National Biodiversity Institute (SANBI)

Within the ambit of the eight regional gardens in SANBI, there are programmes that deal with threatened plants in their various geographical areas. Three programmes pertaining to the threatened plants programme, are dealt with.

- Karoo Desert National Botanical Garden – Worcester, Western Cape South Africa.
- KwaZulu-Natal National Botanical Garden – Pietermaritzburg, Kwazulu- Natal, South Africa.
- Walter Susulu National Botanical Garden – Johannesburg, Gauteng, South Africa.

The Karoo Desert National Botanical Garden – threatened plants programme

The Karoo Desert National Botanical garden based in Worcester has earmarked two threatened succulents growing in the Ceres Karoo for this project: *Didymaotus lapidiformis* and *Lithops comptonii* belonging to the flowering stones group of succulents *Aizoaceae* family. Other examples of flowering stones include *Argyroderma*, *Conophytum*, *Gibbaeum* and *Pleiospilos*.

Didymaotus lapidiformis is known to occur in only one spot. *Didymaotus lapidiformis* occurs in a linear belt approximately 12,500m² in area. It is ironical that when the regional divisional road was constructed in the 1930s a borrow pit for extracting aggregate for road building was excavated right in the middle of this population (Figure 1).

The strategy is to harvest seed in situ, grow plants ex situ and harvest the seed which will eventually be sown in a similar habitat near the existing colony.

Lithops comptonii occurs in a few very isolated patches in the Ceres Karoo. The areas where they occur, are approximately 700m² in extent. The reintroduction strategy is the same as *Didymaotus lapidiformis*.

The KwaZulu-Natal National Botanical Garden – threatened plants programme

The KwaZulu-Natal National Botanical Garden situated in Pietermaritzburg has concentrated on *Gerbera aurantiaca* (Hilton daisy) a tufted perennial which occurs in the Midlands of KwaZulu-Natal. Flowering takes place in spring, from September to October. *Gerbera aurantiaca* develops underground stems to form clones which can grow over a metre in diameter and are thought to be hundreds of years old (Figure 2).

Gerbera aurantiaca is endemic to the mistbelt grassland region of KwaZulu-Natal and is currently known from approximately 15 scattered populations. Of these populations, half may have 50 plants or less growing in them. They occur in a summer rainfall area (October – April), which experiences very cold winters, sometimes with snow in some localities. *Gerbera aurantiaca* typically occurs in rocky grassland from 900 to 1 500 m, on warm slopes in well-drained, shallow soils associated with doleritic formations. Most localities are burnt annually.

Seed harvested in the wild has produced young plants that have been cultivated. The intention is to reintroduce seedlings and seed to an area where the Hilton daisy once grew. It is noted that seed collected for this reintroduction came from very near to where the reintroduction is going to occur.

The Walter Sisulu National Botanical Garden– threatened plants programme

Walter Sisulu National Botanical Garden situated approximately 25 kilometres west of Johannesburg has adopted *Aloe albida* and *Aloe peglerae* for their threatened plants project.

Aloe peglerae, a small stemless aloe, occurs on north facing slopes of the Magliesburg and Witwatersrand in the North West and Gauteng provinces of South Africa. *Aloe peglerae* flowers in winter (July and August). This plant often has a single flower stalk. The flower buds are dull red with purplish stamens protruding from the flower tube.

There are several populations of this aloe in the more remote areas. Recent studies have revealed more plants than were initially thought to occur. However, the greatest threats still remain plant collectors and, to some extent, property developers.

Plants have been cultivated at the Walter Sisulu National Botanical Garden to sell to the general public. In this way it is hoped that by making plants available for sale on a legal basis, it will take the pressure off plants in the wild. Funds raised from the sale of *Aloe peglerae* will be ploughed back into conservation of the species.

Aloe albida is a dwarf grass aloe that occurs in mountain mist belts in the Mpumalanga province in the north eastern part of South Africa. *Aloe albida* has a single inflorescence (90–150 mm) with small white flowers, and may flower as early as February, through to April.

Plants have been grown at the Walter Sisulu National Botanical Garden from seed collected in situ from a number of clones. Once there are enough plants and they strong enough to produce seed, they will be harvested for later introduction.

Reintroduction of these plants is in the form of seed placed in the various rocky niches in hilly terrain where there are small pockets of *Aloe albida* occurring naturally. Seed will be sown at the onset of the summer rains in October.

The plight of Ghaap – *Hoodia gordonii* (Masson) Sweet ex Decne. in the wild

Hoodia gordonii was discovered by Mr. Paterson and Col. R.F. Gordon in December 1778 in the Upington area. Mr Francis Masson, a famous botanist, named this plant *Stapelia gordonii* with the specific epithet named after Gordon. In 1830 the genus was later transferred by Sweet into the genus *Hoodia*, which was named in honour of Van Hood, a keen succulent grower.

Hoodia gordonii is a spiny herbaceous robust succulent shrub. In the early stages, only one stem is produced but, at a later stage, the plant starts branching. Mature plants can have as many as 50 individual branches and weigh

as much as 40 kg. Plants under ideal conditions can attain a height of 1 m – 1.5m. *Hoodia gordonii* falls into the *Apocynaceae* group of plants (Figure 3).

Flowers are borne on or near the terminal apex (top part of the plant). The flowers are large and have a carrion-like smell (a smell similar to rotten meat). Pollination is done mainly by flies. This unusual pollination biology is referred to as myophily. Myophily takes place in some of the following genera, *Stapelia*, *Huernia* and *Ceropegia*. Flowers of *Hoodia* resemble a petunia flower. Flowers may vary in colour from pale flesh-pink to the purple-red of those plants occurring near Gochas in the Auob river valley in central west Namibia. Flowers are normally borne in August or September and can reach a diameter of 75 mm. Seed is produced in October and November. The seed capsules resemble small antelope or goat horns; hence the Afrikaans common name of Bokhorings.

Hoodia gordonii occurs in the winter and summer rainfall areas of Namibia and South Africa. *Hoodia gordonii* is found in two provinces in South Africa, namely the Northern Cape and the Western Cape. *Hoodia gordonii* is restricted to the arid western regions of both these provinces. *Hoodia gordonii* also occurs in the arid parts of Namibia. *Hoodia gordonii* occurs from 21° south to 33° south. *Hoodia gordonii* has been used by the nomadic San for countless centuries in an attempt to stave off thirst and hunger pains. These qualities are well known to Europeans and in recent times *Hoodia gordonii* has been used as a natural weight reduction remedy in countries where obesity is a problem. The genus *Hoodia* is also used to treat indigestion, hypertension, diabetes, and stomach pains.

In the last five years tremendous pressure has been placed on populations in their natural habitat. The multi million dollar industry is growing in leaps and bounds. This has raised concerns that the populations of this plant in the Western Cape province of South Africa, could be impacted negatively if a solution to the existing harvesting programme is not initiated very soon.

Populations have been legally and illegally harvested. In some instances harvesting has been so severe that virtually no recruitment has taken place at all. It is also apparent that land owners are not adhering to the harvesting criteria as laid down by CapeNature. Other reasons for low recruitment include drought conditions experienced over some regions with special reference to the Ceres Karoo in the Western Cape and predation by the stapeliad borer (*Paramcops stapelia*) in some populations – the significance was medium to high.

The long term effects of harvesting wild populations will ultimately have a negative impact on the species, which could lead to the extinction of the plant.

Strategies were drawn up and put into place to actively protect wild populations. One of these strategies is bar coding the product. This bar coding assists not only with quality control, but also tracing the supplier, the miller, the farmer and exactly where the plant grew on the farm. With this strategy firmly in place, it is hoped that wild populations will be spared from over harvesting and natural recruitment of the species can continue.

Other criteria include that land owners cannot sublease sections of their lands where these plants occur. The landowner has to reside on the property where harvesting is to take place. Landowners are thus held accountable for the harvesting of any material on their own farms. Accurate harvesting records are essential. This entails the weights (wet and dry), date of harvesting, what implement was used to harvest and to whom the dried stems were sold, including the price/kilogram.

The following southern African countries, Botswana, Namibia, and South Africa submitted a proposal to the 14th Conference of the Parties of CITES to list all species of *Hoodia* on Appendix II. This proposal was accepted in January 2005 and it is now prohibited to trade in any parts or derivatives of any *Hoodia* species without a permit. A permit can only be obtained from the relevant permitting authorities of each country and can only be

issued for trade in cultivated plants or wild plants where the trade can be shown not to have a detrimental effect on wild populations (a CITES non-detriment finding). The listing of *Hoodia* makes provision for exemption from CITES permits where traders participate in controlled harvesting and production systems in collaboration with the CITES Management Authorities of Botswana/Namibia/South Africa. Unfortunately no such agreements are yet in place. Importing countries must ensure that a valid CITES export permit has been issued by the country of origin for any trade.

Possible solutions

The way forward is seen mainly in harvesting seed from plants in the wild. This harvesting must be closely monitored by the relevant authorities or responsible interested and affected parties. Over harvesting will result in low recruitment and the long term effect could result in the species dwindling to dangerously low numbers. Percentages of seeds harvested in the wild still need to be determined in order to sustain viable recruitment rates in the wild. With time and successful ex situ plantings of *Hoodia gordonii*, it will be possible to eventually harvest seed from these plantings which will in turn be used to cultivate more plants to satisfy the demand.



Figure 1. *Didyaotus lapidiformis* forms part of the Karoo Desert NBG's threatened plants programme in its natural habitat in the Ceres Karoo. Photo: Ian Oliver.



Figure 2. *Gerbera aurantiaca* - threatened plants programme of the KwaZulu-Natal NBG growing in the wild. Photo: Isabel Johnson.

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Figure 3. Hoodia gordonii in its natural habitat in the Ceres Karoo. As a result of aggressive harvesting practices the long term survival of wild populations is at risk of extinction in certain areas. Photo: Ian Oliver