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## A CYCAD

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**Class:** CYCADOPSIDA  
**Order:** CYCADALES  
**Family:** ZAMIACEAE  
**Year assessed:** 2009



### **Distribution:**

This cycad species occurs in South Africa in the biodiversity hotspot region known as the Maputaland-Pondoland-Albany hotspot, which is an important centre of plant endemism. It is uncertain how widespread or abundant this species was prior to human settlement, but there are historic records of populations being scattered through the Albany and Bathurst districts of the Eastern Cape Province. This scattered distribution could be because these plants often grow on rocky outcrops, habitats that are naturally widely spaced within the landscape (Kemp 1986, Norstog and Nicholls 1997, Whitelock 2002) or it could be an artifact of habitat transformation, i.e. the cycads have persisted in areas least affected by land use. The altitude at which the plants are found varies between 200 and 600 m asl.

The extent of occurrence for this species is estimated to be 560 km<sup>2</sup>. Because of its widely scattered distribution, the species is estimated to occupy a total area of only 9 km<sup>2</sup>. A continuing decline in the area of occupancy is likely, as there is intense collection pressure on the species and harvesting of individuals from the wild is expected to continue into the future.

### **Countries of Occurrence:**

South Africa (Eastern Cape Province)

### **Population:**

The current wild population is estimated to number between 60 and 100 mature individuals. The actual number is uncertain because the last official count was done more than 10 years ago, when microchips were inserted into all remaining plants. Since then, not all plants have been monitored and, in a recent survey of plants to gather DNA material, there seemed to be less than 60 plants in the wild (da Silva et al. MS). The population is extremely fragmented, as plants are widely scattered, with most individuals separated from each other by >1 km.

This cycad is in a precarious state with no natural seed set, and populations continue to decline. Based on plants in collections and studies of matched photographs, the population is estimated to have declined by 80-85% over the past 100 years. Data prior to this time period are not available.

The sex ratio is ca. four males to one female, so that the effective population size is extremely small. All subpopulations comprise less than 20 plants, which is non-viable for supporting pollinators; there appears to have been no recruitment for more than 50 years. A further population decline of at least 30% is expected to take place within the next 30 years.

This is a very slow-growing, extremely long-lived species. Females reach maturity at 30 years of age, while males reach maturity at 25 years. Longevity can be 300 years. Based on these figures, the generation length is estimated to be at least 100 years.

**Population trend:** ↓ Decreasing

### **Habitat and Ecology:**

Plants grow on rocky outcrops and hill slopes, usually amongst scrub bush vegetation, but also in open grassland. They can also be found along dry river courses. The distribution area of this cycad occurs in the following vegetation units: Kowie Thicket, Suurberg Quartzite Fynbos and Suurberg Shale Fynbos.

The soils in this region are mainly Glenrosa and Mispah forms. Other soils may occur. Lime soils are rare or absent. The underlying geology of this area is quartzitic sandstone, shale and micaceous siltstone.

The annual rainfall varies between 600-1,250mm and is fairly evenly distributed during the year, though a summer peak in rainfall usually occurs. Frost does not normally occur. The summers may be hot and fairly dry.

### **Use and Trade:**

This species is highly prized by cycad collectors, and is frequently taken illegally from the wild. Captive bred individuals that are replanted into the wild are often illegally collected as well, and are sometimes illegally sold as individuals and/or seeds.

### **Threats:**

This cycad now occurs in areas where the predominant land uses are cultivation (pineapples and chicory) as well as stock farming. The impact of land use on this species is difficult to assess, but the early reports of Pearson (unpublished letters) and Chamberlain (1919) imply that at least some habitat was lost as a result of agricultural activity. Repeat photography, using photographs first taken between 1906 and 1945, indicated that all the plants occurring at seven different sites had disappeared by 1996 (Donaldson and Bösenberg 1999). However, the disappearances at these sites cannot be attributed directly to land use as, in most cases, the areas in which the plants occurred were neither ploughed nor cleared. Nonetheless, in other sites plants have likely disappeared due to habitat clearing.

Trade in cycads is currently the greatest threat and probably explains the decline observed in the repeat photography study (this species became popular among collectors in the late 1800s/early 1900s). The removal of relatively large numbers of plants by collectors has been recorded with some plants recovered by law enforcement and conservation agencies. The demand for wild collected plants remains high because this species is regarded as scarce and it is one of the most highly valued species in the cycad trade. Based on collection patterns and the species' distribution, experts consider there to be 2 locations.

Population modelling of other species in the same genus showed that species such as this one are extremely sensitive to the removal of adult plants, as population persistence over long periods relies on adult survival and not seedling recruitment (Raimondo and Donaldson 2003). As a result, the species is very vulnerable to trade in mature plants.

It also seems likely that the natural pollinators are extinct. No natural seed set has been recorded in recent years and the current cohort of adult plants indicates that the last recruitment event was more than 50 years ago.

**Conservation Measures:**

This species is listed on Appendix I of the CITES Appendices and is listed in the national Threatened or Protected Species regulations, which prohibit trade in wild plants. None of the plants occur naturally within any reserves but plants have been introduced to two small nature reserves within the original distribution range. At one site, mature plants were replanted in the reserve after they were illegally removed from the wild. In the second case, a trial planting of seedlings was also undertaken to establish a new population.

A Population and Habitat Viability Assessment was developed in July 2006 and this was followed by the development of a species management plan in 2009. The plan will be implemented in 2010.

*Ex situ* conservation collections have also been established at several botanic gardens. One of the largest, is at Kirstenbosch National Botanical Garden, which has 19 mature plants. Genetic studies showed that the Kirstenbosch collection has similar levels of genetic diversity to wild stocks and represents all wild genotype groups.