NATIONAL STRATEGY AND ACTION PLAN FOR THE MANAGEMENT OF CYCADS IN SOUTH AFRICA

environmental affairs
Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

NATIONAL STRATEGY AND ACTION PLAN FOR THE MANAGEMENT OF CYCADS IN SOUTH AFRICA

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FOREWORD

South Africa is endowed with "Living Wealth" of biodiversity and ecosystems across the landscape and seascape, ranging from terrestrial and freshwater to estuarine and marine environments. It is also one of the world centres of cycad diversity with more than half of the known African cycads occurring in this country. Through their magnificent shapes and forms, cycads are remarkable living sculptures and the oldest living seed bearing plants and have survived three mass extinction events in the earth's history.

However, cycads are now facing a growing threat of extinction. With their antiquity and endurance properties, cycads represent particular important cultural and heritage natural resources for the country. If we are unable to protect this resource base, our path towards sustainable development, poverty alleviation and enhanced human well-being for all, would therefore be at risk.

It is evident that cycads are the world's most threatened plant species. The rapid rate at which these species are declining in South Africa is mainly due to illegal collection or harvesting from the wild. Hence this Strategy was developed in close consultation with partners and relevant stakeholders who are involved in either collection or management of this valuable resource, to provide the platform for effective conservation measures, including awareness raising campaigns, restrictive legislation, monitoring programmes and enforcement, to protect and conserve our wild cycads species. Without measures in place South Africa risks losing these species within the next 10 years.

This Strategy and Action Plan seeks to capture the challenges and opportunities embedded in South Africa's rich cycads heritage by looking at their management in the context of social and economic change and recognising the relationship between people and their environment, and describe a range of actions to be undertaken for the conservation of cycads in South Africa. The actions will focus on issues such as illegal collection, habitat management, re-introduction programmes and species conservation research amongst others involving a wide range of stakeholders.

Several Biodiversity Management Plans for critically endangered and endangered cycads species are at different levels of development and implementation and are aimed at protecting and managing the species. This Strategy and Action Plan is meant to protect the overall cycad species including and especially those without Biodiversity Management Plans.

With this National Strategy and Action Plan, the Department is taking a practical and holistic approach to the conservation of cycads by providing a platform for all spheres of government and civil society to participate towards a coherent and common goal.

I acknowledge with gratitude the involvement of all contributors from Provincial Conservation Authorities, Non-Governmental Organisation (NGOs) and civil society for their time, energy and effort towards the development of this Strategy and Action Plan. This is another important piece of work that demonstrates that working together we can indeed achieve more!

MRS B E E MOLEWA
MINISTER OF ENVIRONMENTAL AFFAIRS

ACKNOWLEDGEMENTS

The development of this Strategy and Action plan involved a wide range of stakeholders who worked together in a collaborative and consultative spirit.

The Department of Environmental Affairs (DEA), as the author of this Strategy and Action Plan would like to thank all contributors from Provincial Conservation Authorities to NGOs including the members of the Cycads Working Group for their time, energy and effort in the development of this Strategy and Action Plan.

The Department of Environmental Affairs would like to extend sincere gratitude to the late Mr Khangela Baloyi in his contribution to the development of this strategy.

ACRONYMS

AIS:	Alien and Invasive Species
BMP-S:	Biodiversity Management Plan for Species
CBD:	Convention on Biological Diversity
CGA:	Cycad Growers Association
COP:	Conference of the Parties
CITES:	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CR:	Critically Endangered
DNA:	Deoxyribonucleic Acid
EN:	Endangered
EWT:	Endangered Wildlife Trust
GDARD:	Gauteng Department of Agriculture and Rural Development
GSPC:	Global Strategy for Plant Conservation
KZN:	KwaZulu-Natal
IUCN:	International Union for Conservation of Nature
N&S:	Norms and Standards
NEMA:	National Environmental Management Act, 1998 (Act No. 107 of 1998)
NEMPAA:	National Environmental Management: Protected Areas Act, 2003 (Act No 57 of 2003)
NEMBA:	National Environmental Management: Biodiversity Act, 2004 (Act No 10 of 2004)
NGO:	Non-Governmental Organisation
NSPC:	National Strategy for Plant Conservation
TOPS:	Threatened or Protected Species
SANBI:	South African National Biodiversity Institute
SAPS:	South African Police Services
SAHGCA:	South African Hunters and Game Conservation Association
SANA:	South African Nurseries Association
SSC:	Species Survival Commission
SO:	Strategic Objectives
SSO:	Sub- Strategic Objectives
UNEP:	United Nations Environment Programme

EXECUTIVE SUMMARY

South Africa is one of the world centres of cycad diversity with more than half the known African cycads occurring in the country. According to the latest Global Conservation Assessment for cycads conducted by the International Union for Conservation of Nature (IUCN) (October 2010), cycads are now considered to be the most threatened taxonomic group of organisms with many species facing imminent extinction in the wild as a direct result of human activities. Within South Africa, the genus is distributed in a continuous range all the way from the Eastern Cape, through KwaZulu-Natal, Mpumalanga, and Gauteng to Limpopo. In all these regions, cycads occur in most major river systems, at least in the gorges near the coast.

Cycads are a natural group of plants that have been clearly shown to have a single evolutionary origin (i.e., they are monophyletic) by both morphological and molecular studies. There are 308 species of cycads on the planet of which 38 species occur in South Africa. Of the 398 species, 37 are of the *Encephalartos* genus and one is of the *Stangeria* group. Of these 29 (76%) are endemic to the country, meaning that South Africa is one of the global hotspots for threatened cycads. Seventy eight percent of South Africa's cycads are threatened with extinction compared to the global average of 62%. Thirty-one percent of South African cycads are classified as Critically Endangered, compared to the global average of 17%. Twelve species are Critically Endangered, while four are Endangered, and 10 species are classified as Vulnerable. All species of the genus: *Encephalartos* are included in Appendix I of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). South Africa is home to three of the four species classified as Extinct in the Wild (EW), two of which have become EW between 2003 and 2010. Seven of these cycad species have fewer than 100 individuals left in the wild.

South Africa risks losing these species within the next 10 years if various effective conservation measures, such as awareness raising campaigns, restrictive legislation monitoring programmes within an adaptive management process and enforcement are not put in place to protect and conserve wild cycads species. There are reports of dramatic declines in some species over ten years, one of them from ca. 700 plants to fewer than 100, and if this trend continues, it will result in extinctions. The high proportion of threatened cycad species therefore raises the risk profile for any trade in South African cycads. Globally, habitat loss at 60 percent is the highest cause of decline in cycads. This is followed by collection for trade and horticultural purposes (30%); biological invasion (5%) and lastly by traditional use at 5%. In South Africa, cycads are declining at a steady pace, mostly due to illegal collection or harvesting. In curbing the cycad crisis, consideration needs to be given to other threats such as the rise in unsustainable harvesting for muthi and habitat loss.

The July 2011 Scientific Authority Report on Cycads showed that at a national level, loss of plants either by illegal harvesting or collection for trade and horticultural purposes had displayed the highest percentage of the cause of decline at 80%. This was followed by habitat destruction, unsustainable harvesting for muthi use and, lastly, alien invasive species. The report further indicated that analyses of matched photographs showed that nearly 80% of the change in cycad populations over 30 to 90 years was due to loss of individual plants. In many cases, loss of individuals was linked to evidence of physical removal (e.g. holes). Equally important, evidence for other major drivers of decline, such as habitat loss and invasive species, showed that these factors had a relatively small impact on wild populations.

In curbing this crisis, the Scientific Authority made recommendations which were approved by the intergovernmental structures to address the cycad conservation crisis in South Africa in April 2010. Part of the recommendations was a long-term national management strategy with the aim of securing the conservation of wild cycad populations developed in consultation with relevant stakeholders. This resulted in the drafted National Strategy and Action Plan for the Management of Cycads in South Africa document. The National Cycad Management Strategy and Action Plan was developed through a comprehensive stakeholder consultation process to give effect to the urgency in addressing and rectifying the current exploitation and threats to South Africa's wild cycads. A two-day workshop to initiate the process to develop this Strategy and Action Plan took place on 11 and 12 June 2013 in Pretoria. The workshop was attended by representatives from national and

provincial departments as well as representatives from Non-Governmental Organisations (NGOs). Strategic Objectives (SO) and possible actions were identified at the workshop. Further consultations via email was undertaken in finalising the National Cycad Management Strategy and Action Plan.

The vision for the National Strategy and Action Plan for the Management of Cycads in South Africa has been defined as: '*To conserve and sustainably manage populations of all extant South African cycad species throughout their historical range in South Africa, supported through a shared commitment on private, community and State land*.' The aim of the strategy is '*to ensure the persistence in the wild of viable populations of all indigenous cycad species through implementing a suite of integrated activities between now and 2020.*' The objectives were also outlined as follows:

- To reduce (prevent) the illegal collection of cycads from the wild to a level that does not have detrimental impacts on the persistence of indigenous cycad species in their natural habitat;
- To secure, protect and effectively manage critical habitat for wild cycads;
- To develop and implement reintroduction/reinforcement programmes for CR and EN species to ensure they achieve minimum conservation targets for persistence;
- To achieve overall conservation targets through coordination and integration allowing adaptive responses to meet the aim of the strategy;
- To increase public awareness of the cycad conservation crisis, the value of cycads to society, and of the role that the public can play in reducing the impact of wild cycad harvesting; and
- To ensure that the overall strategy is supported by relevant research and knowledge generation.
- To ensure responsible and sustainable use of the resource base to the benefit of people and the species as a whole

The Department of Environmental Affairs (DEA) will oversee the implementation of this Strategy and Action Plan and will consider adopting existing structures, such as the Cycad Working Group coordinated by the South African National Biodiversity Institute (SANBI), for monitoring, evaluation and reporting to the Minister regarding the implementation of this Strategy and Action Plan.

1. INTRODUCTION

South Africa is one of the world centres of cycad diversity with more than half the known African cycads occurring in the country. According to the latest Global Conservation Assessment for cycads conducted by the International Union for Conservation of Nature (IUCN) (October 2010), cycads are now considered to be the most threatened taxonomic group of organisms with many species facing imminent extinction in the wild as a direct result of human activities. Within South Africa, the genus is distributed in a continuous range all the way from the Eastern Cape, through KwaZulu-Natal, Mpumalanga and, Gauteng to Limpopo (Donaldson, 2008). In these regions, cycads occur in most major river systems, in the gorges near the coast.

According to the Status Survey and Conservation Action Plan for Cycads (Donaldson, J S, Ed., 2003), cycads are remarkable living sculptures, the oldest living seed plants and have survived three mass extinction events in the Earth's history. According to the IUCN report of July 2003, with an estimated 270,000 species of plants, cycads make up a small proportion of the total plant diversity. Yet, it is their antiquity and endurance that make cycads so special, providing clues about plant evolution and insights to a prehistoric world. They range in size, from small species found under the forest canopy to tall species either growing in the forest canopy or out in the open. As they are the most ancient seed plants still living today, dating back to the time of the dinosaurs, cycads represent a particularly important cultural and heritage natural resource for the country.

There are 308 species of cycads on the Planet of which 38 species occur in South Africa. Of these, 38 species (37 are Encephalartos species and one is a Stangeria species) shown below in Table 1, occur in South Africa. Of these 29 (76%) are endemic to the country meaning that South Africa is one of the global hotspots for threatened cycads. Seventy-eight percent of South Africa's cycads are threatened with extinction compared to the global average of 62%. Thirty-one percent of South African cycads are classified as Critically Endangered, compared to the global average of 17%. Twelve species are Critically Endangered (CR), while four are Endangered (EN), and 10 species are classified as Vulnerable (VU) (Raimondo et al., 2009).

All species of the genus: Encephalartos are included in Appendix I of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). The aim of CITES is to regulate all international trade in endangered species, or species threatened by international trade. Of all the Encephalartos species in South Africa, four are listed as Extinct in the Wild (EW). South Africa is home to three of the four species classified as EW, two of which have become EW in the period between 2003 and 2010. Three of these species are endemic to South Africa, namely Encephalartos brevifoliatus, Encephalartos nubimontanus, and Encephalartos woodii, and the fourth is endemic to Swaziland (*Encephalartos) relictus* (Raimondo et al., 2009). Figure 1 below shows the declining populations of selected Encephalartos species in South Africa from 1984 to 2010. It is clear from Figure 1 that there is an ongoing decline towards extinction with three of the monitored populations being reduced to zero within the past 10 years.

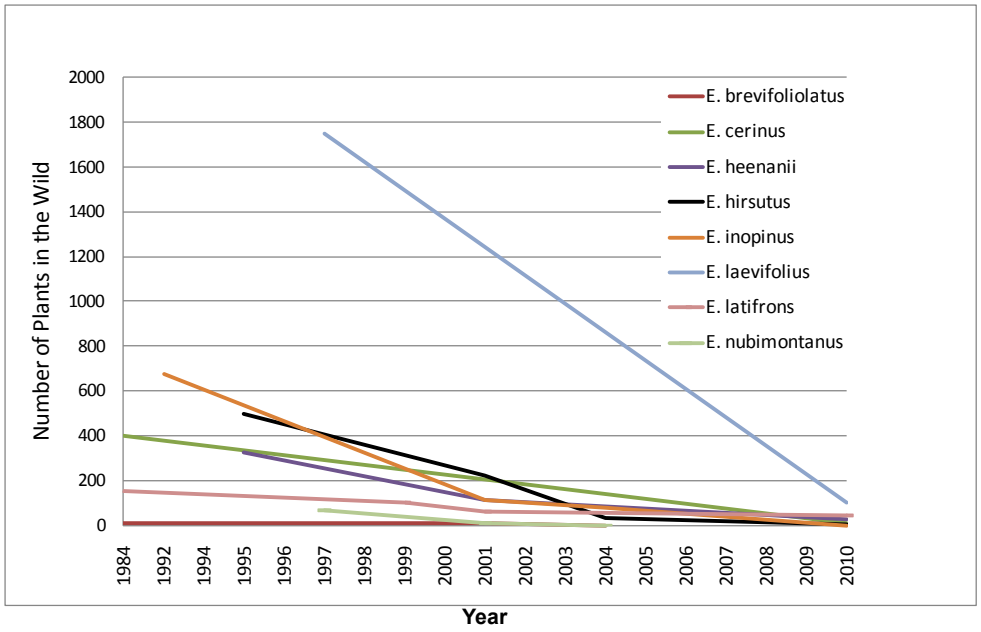

Figure 1: ***Decline in populations of selected South African Encephalartos species (Draft Scientific Authority report - Cycads, July 2011)***

Out of 38 species of cycads in South Africa, seven of these have fewer than 100 individuals left in the wild as per Table 3. South Africa risks losing these species within the next 10 years if various effective conservation measures, such as awareness raising campaigns, restrictive legislative monitoring programmes within an adaptive management process and enforcement are not put in place to protect and conserve wild cycads species. There are reports of dramatic declines in some species over 10 years, one of them from approximately 700 plants to fewer than 100. If this continues, it will result in extinctions (Prof John Donaldson, SANBI). The high proportion of threatened cycad species therefore raises the risk profile for any trade in South African cycads.

Table1: List of all the indigenous cycads, the area of their occurrence and their conservation status

No.	SPECIES	OCCURRENCE	CONSERVATION STATUS	TOPS 2014 STATUS
	Encephalartos aemulans	KwaZulu-Natal	CR	CR
	Encephalartos altensteinii	Eastern Cape and KwaZulu-Natal	VU	EN
	Encephalartos arenarius	Eastern Cape	EN	EN
	Encephalartos brevifoliolatus	KwaZulu-Natal	EW	CR
	Encephalartos caffer	Eastern Cape and KwaZulu-Natal	NT	Protected
	Encephalartos cerinus	KwaZulu-Natal	CR	CR
	Encephalartos cupidus	Limpopo, Mpumalanga	CR	CR
	Encephalartos cycadifolius	Eastern Cape	LC	Protected
	Encephalartos dolomiticus	Limpopo	CR	CR
	Encephalartos dyerianus	Limpopo	CR	CR
	Encephalartos eugene-maraisii	Limpopo	EN	EN
	Encephalartos ferox	KwaZulu-Natal	NT	Protected
	Encephalartos fredericki-gulielmi	Eastern Cape and KwaZulu-Natal	NT	Protected
	Encephalartos ghellinckii	Eastern Cape and KwaZulu-Natal	VU	EN
	Encephalartos heenanii	Mpumalanga	CR	CR
	Encephalartos hirsutus	Limpopo	CR	CR
	Encephalartos humilis	Mpumalanga	VU	VU
	Encephalartos horridus	Eastern Cape	EN	EN
	Encephalartos inopinus	Limpopo	CR	CR
	Encephalartos laevifolius	Eastern Cape, KwaZulu-Natal, Limpopo, Mpumalanga	CR	CR
	Encephalartos lanatus	Gauteng, Mpumalanga	NT	Protected
	Encephalartos latifrons	Eastern Cape	CR	CR
	Encephalartos lehmannii	Eastern Cape	NT	Protected
	Encephalartos lebomboensis	KwaZulu-Natal, Mpumalanga	EN	EN
	Encephalartos longifolius	Eastern Cape	NT	Protected
	Encephalartos middelburgensis	Gauteng, Mpumalanga	CR	CR
	Encephalartos msinganus	KwaZulu-Natal	CR	CR
	Encephalartos natalensis	KwaZulu-Natal	Near threatened	Protected
	Encephalartos nubimontanus	Limpopo	EW	CR
	Encephalartos ngoyanus	KwaZulu-Natal	VU	VU
	Encephalartos paucidentatus	Mpumalanga	VU	VU
	Encephalartos princeps	Eastern Cape	VU	VU
	Encephalartos senticosus	KwaZulu-Natal	VU	VU
	Encephalartos transvenosus	Limpopo	LC	Protected
	Encephalartos trispinosus	Eastern Cape	VU	VU
	Encephalartos villosus	Eastern Cape, KwaZulu-Natal	LC	Protected
	Encephalartos woodii	KwaZulu-Natal	EW	CR
	Stangeria eriopus	Eastern Cape, KwaZulu-Natal	VU	Protected

EW = Extinct in the wild

CR = Critically Endangered

EN = Endangered

VU = Vulnerable

NT = Near Threatened

LC =Least Concern

This strategic framework is based firmly on the adaptive management approach which is loosely defined as: A decision process that promotes flexible decision making and management action that can be adjusted in the face of uncertainty as the outcomes from management actions and other events become better understood.

Key points to note include:

- Adaptive management openly acknowledges uncertainty about how ecological systems function and how they respond to management actions.
- Adaptive management is designed to improve understanding of how a system works so as to achieve management objectives.
- Adaptive management is about taking action pursuant to desired outcomes.
- Adaptive management requires the participation of stakeholders.

The National Strategy and Action Plan for the Management of Cycads was developed through a comprehensive stakeholder consultation process to give effect to the urgency in addressing and rectifying the current exploitation and threats to South Africa's wild cycads. A two-day workshop to initiate the process to develop this Strategy and Action Plan took place on 11 and 12 June 2013 in Pretoria. The workshop was attended by representatives from national and provincial departments as well from Non-Governmental Organisations (NGO's). Strategic Objectives (SO) and possible actions were identified and discussed at the workshop. Further consultation via email was undertaken for the finalisation of this Strategy and Action Plan.

2. BACKGROUND

The Scientific Authority was established in terms of Section 60 of the National Environmental Management: Biodiversity Act (NEMBA) (Act No 10 of 2004) to assist with regulating trade in Threatened or Protected Species (TOPS) and the CITES listed species. CITES requires that an export permit for Appendix I and II species should only be granted when the Scientific Authority of the country of export has advised that the export will not be detrimental to the survival of the species. This is achieved by completing a Non-Detriment Finding (NDF) for each species and providing recommendations based on a scientific and professional review of the available information. Through this process, the Scientific Authority identified the cycad extinction crisis as a priority issue requiring urgent action.

In 2009, the Scientific Authority submitted a report on the Conservation Status, Population Trends, and Trade of South African species of Encephalartos and the Implications for Decisions Relating to Trade to the Department of Environmental Affairs (DEA) for approval. The report, which is attached to this document contains a number of recommendations, and was approved by intergovernmental structures in 2010. The report provided recommendations on:

- A crisis management plan for cycads which was supposed to be adopted urgently and implemented by all management authorities; and
- A longer-term national cycad management strategy, with the aim to secure the conservation of wild cycad populations, which was supposed to be developed by the end of 2010 in consultation with all relevant stakeholders

The recommended issues to be addressed or explored in a long-term National Cycad Management Strategy are:

- Regulation, compliance and enforcement
- Facilities for keeping ex situ cycad collections
- Formal in situ conservation
- Management plans and monitoring of wild populations
- Cycad research programme
- Role of non-governmental organizations
- Awareness campaign

The Scientific Authority's recommendations led the Department to initiate a process to develop a National Strategy and Action Plan for the Management of Cycads in South Africa in an effort to minimise the threats and, where possible, improve the conservation status of cycads in the wild through a series of relevant practically implementable actions aimed at addressing the current cycad extinction crisis.

3. TAXONOMY AND CLASSIFICATION OF CYCADS

Cycads are a natural group of plants that have clearly been shown to have a single evolutionary origin (i.e., they are monophyletic) by both morphological and molecular studies. Based on this classification, the living cycads can be divided into three families, Cycadaceae, Stangeriaceae, and Zamiaceae, with 11 genera and about 297 species and subspecies (2003; Edited by J. Donaldson).

The family Cycadaceae contains only one genus, Cycas, which is regarded as an early offshoot from the rest of the cycads. Stangeriaceae is a small family that appears to have originated on the ancient supercontinent of Gondwana. The extant plants in this family belong to two genera, Stangeria occurring in Africa, and Bowenia in Australia. Zamiaceae is by far the most diverse and widespread cycad family. Today Zamiaceae is represented by Encephalartos in Africa, Macrozamia and Lepidozamia in Australia, and Zamia, Ceratozamia, Dioon, Chigua, and Microcycas in the New World.

Division: Cycadophyta

Order: Cycadales

Family: Cycadaceae

Genus: Cycas

Family: Stangeriaceae

Genera: Stangeria (Africa), and Bowenia in Australia

Family: Zamiaceae

Genera: Encephalartos (Africa); Macrozamia and Lepidozamia (Australia) and Zamia, Ceratozamia, Dioon, Chigua, and Microcycas (New World)

To accommodate the on-going changes in cycad taxonomy, members of the IUCN/SSC Cycad Specialist Group have routinely published a "World List of Cycads", giving an up-to-date record of all recognised species.

4. MAJOR THREATS TO CYCADS IN SOUTH AFRICA

In South Africa, cycads are declining at a steady pace, mostly due to illegal collection or harvesting. In curbing the cycad crisis consideration needs to be given to other threats such as the rise in unsustainable harvesting for muthi use and habitat loss. Unlawfully-harvested rare species are often purposefully misidentified as more common species that are unlikely to raise suspicion among law enforcement officers (Donaldson, 2008). Such misidentifications may have dire consequences for the wild populations from which the cycads are collected, especially since many highly sought-after species and variants thereof naturally occur in low abundance and have extremely restricted geographical ranges (Donaldson, 2003). Hence, an improved forensic approach to rapid routine cycad identification is required in order to circumvent these problems. In addition to this, Cousin et al (2013), identifies an urgent need to develop a comprehensive photographic identification key for the stem material of the complete set of 38 South African cycads species.

According to data presented by Prof John Donaldson at the workshop to develop the draft National Strategy and Action Plan in South Africa in July 2013, globally, the 60% loss in habitat is the highest cause of decline in cycads. This is followed by collection for trade and horticultural purposes (30%); biological invasion (5%) and, lastly, by traditional use at 5%. According to the Scientific Authority report on cycads (July 2011), at a national level, loss of plants either by illegal harvesting or collection for trade and horticultural purposes is the highest cause of decline at 80% (Figure 2), followed by habitat destruction, unsustainable harvesting for muthi use and alien invasive species. The report further indicated that analyses of matched photographs showed that nearly 80% of the change in cycad populations over 30 to 90 years was due to loss of individual plants. In many cases, loss of individuals was linked to evidence of physical removal (e.g. holes). Equally important is the fact that evidence for other major drivers of decline such as habitat loss and invasive species, had a relatively small impact on wild populations.

Causes of decline recorded from 130 repeat photographs of *Encephalartos* localities in South Africa showing changes between an initial photograph (1904-1966) and a repeat photograph (1996). Modified from Donaldson & Bosenberg (1999)

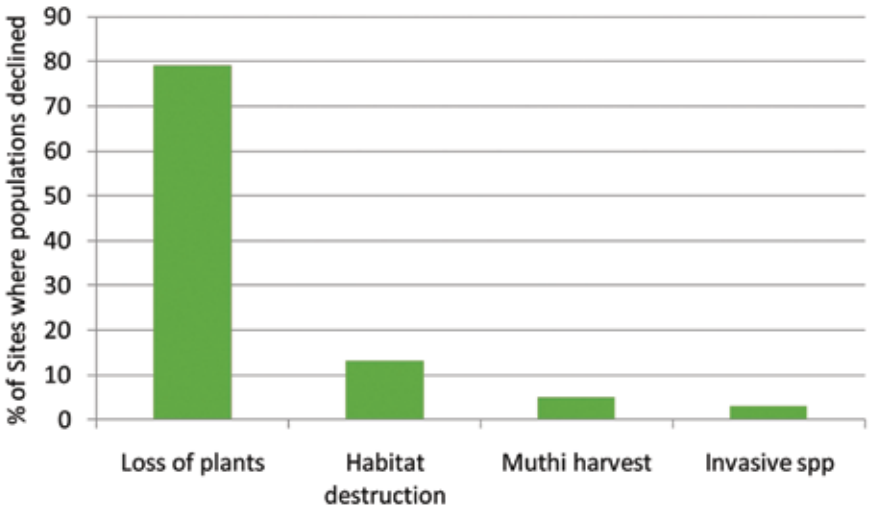

Figure 2: Causes of decline recorded from 130 repeats photographs of Encephalartos localities in South Africa between 1904/1966 and 1996

Cycads across the world face several threats. Apart from natural processes, there are several reasons for the decline of cycads in the wild. The main threats to wild cycads include:

- Habitat loss;
- Illegal collection and harvesting of plants and seeds from the wild for trade and horticulture purposes;
- Illegal collection and unsustainable harvesting of plants and seeds from the wild for muthi use; and
- Biological invasion/Alien Invasive Species invasion

4.1. Habitat loss

Loss and destruction of habitat due to farming (cultivation and stock), mining and urban development, has been identified as the main cause of the decline of cycad populations in the world. This has also been identified as one of the major threats to South African cycads. In South Africa cycad numbers have declined as a direct result of habitat loss or destruction through urban expansion (coastal resort developments have resulted in the destruction of populations of E. horridus and E. altensteinii). Furthermore, bush clearing for agriculture has altered the habitat or directly reduced populations of E. arenarius and E. latifrons. As a mitigation measure, translocation of cycads from threatened habitats has been practised for some time in South Africa (Boyd 1995, cited in Queensland Herbarium 2007).

4.2 Illegal collection and harvesting of plants and seeds from the wild for trade and horticulture

The Encephalartos specimens encountered in the horticultural trade are often uprooted stems with neither leaves nor cones (Cousins et al. 2013). Illegal collection of wild plants affects all of the South African cycad species and is regarded as severe for 15 species. Cycad populations are very sensitive to harvesting. Table 2 shows the estimated number of years that a population of a slow-growing cycad species takes to recover when plants are removed or harvested.

Table 2: Estimated recovery time for cycad populations in the wild (Raimondo & Donaldson, 2003)

No of plants removed at one time	Population recovery time (years)
5	70
10	130
20	290
30	422

Table 3 below indicates the estimated number of plants collected illegally from the wild in the last two decades and the estimated number of plants remaining in the wild for some of the most threatened South

African cycad species:

Table 3: The estimated number of plants collected illegally from the wild in the last two decades and the estimated number of plants remaining

Species	Estimated number of plants collected illegally from the wild in the last two decades	Estimated number of plants remaining
Encephalartos inopinus	+/- 677	0 left
Encephalartos hirsutus	+/- 500	1 left
Encephalartos cerinus	+/- 200	5 left
Encephalartos msinganus	+/- 150	6 left
Encephalartos heenanii	+/- 90	24 left
Encephalartos latifrons	+/- 180	45 left
Encephalartos cupidus	+/- 1060	50 left
Encephalartos laevifolius	+/- 1 670	95 left
Encephalartos dolomiticus	+/- 75	139 left
Encephalartos middelburgensis	+/- 500	350 left
Encephalartos eugene-maraisii	+/- 9 600	360 left

Wild cycad populations are predominantly targeted by illegal collectors to supply the demand for large plants. It is estimated that a large number of cycads exist in private collections, with large numbers having originated from wild populations. Along with the loss of habitat and increased local exploitation of wildlife resources, unregulated international trade can pose a major threat to the survival of endangered species. Illegal trade is the predominant threat to South Africa's cycad populations. According to Prof. John Donaldson, Chair of the IUCN / SSC Cycad Specialist Group, 80% of the decline in populations of Encephalartos species could be attributed to trade in wild-collected plants in South Africa and Swaziland. Figure 3 shows the number of plants exported from South Africa between 1995 and 2007, which are primarily seedlings grown from ex-situ plants. The demand for large cycads by landscapers and cycad collectors means that there is a high risk of mature plants being taken directly from the wild due to their slow rate of growth and the many years of cultivation required to reach an adequate size (Figure 4).

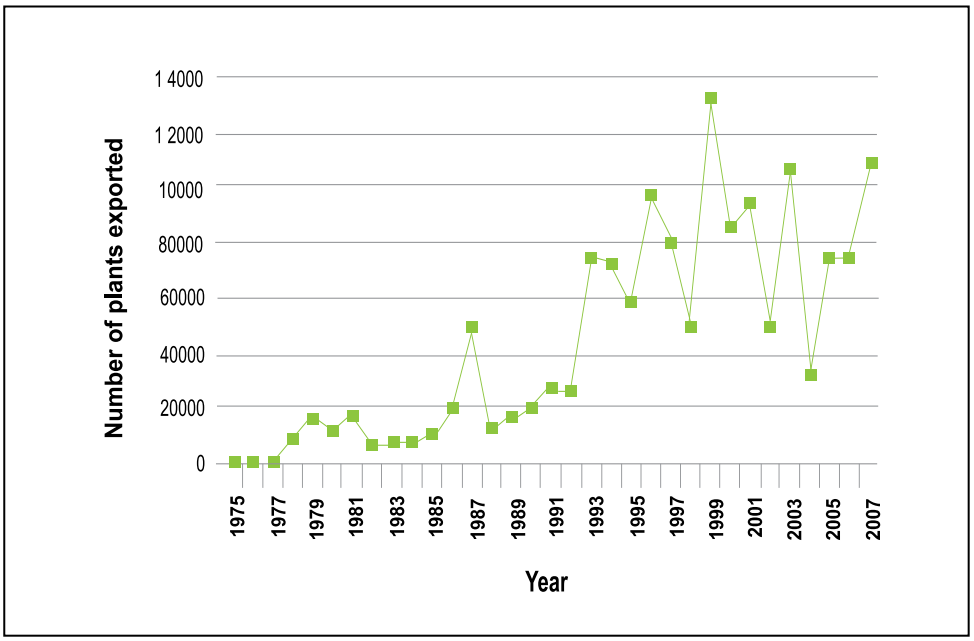

Figure 3: Number of Encephalartos plants exported from South Africa from 1975 to 2007 (CITES Trade Statistics derived from the CITES Trade Database, UNEP World Conservation Monitoring Centre, Cambridge, UK).

Because the demand for wild plants is presently high, there is a greater need to produce cultivated plants to supply a legal trade and alleviate the pressure on wild cycads. Illegal collection or harvesting is certainly the main threat to wild cycad populations and has already resulted in two species becoming extinct in the wild in South Africa.

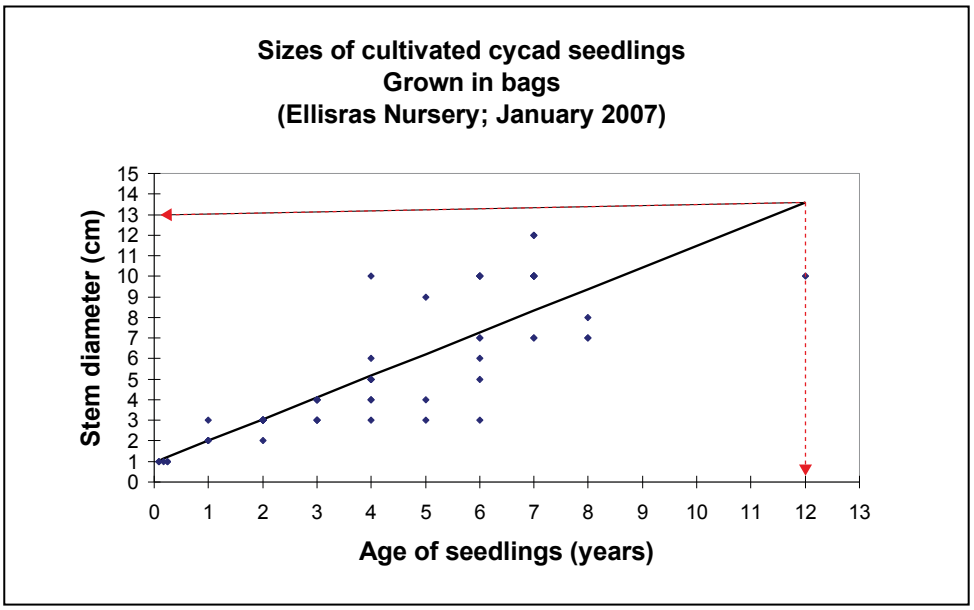

Figure 4: Sizes of cycad seedlings of different ages of a range of species grown in bags in a Limpopo-based nursery (January 2007). The red arrow indicates the size and age at which a cycad is likely to become reproductive. (South Africa's cycad extinction crisis: A failure of our legal system? 2012 Contemporary Conservation Symposium, M. Pfab Scientific Co-ordinator: Scientific Authority

One of the major obstacles to effective cycad monitoring in South Africa is the difficulty associated with determining the correct identity of the Encephalartos spp. in the horticultural and traditional medicine trades, more specifically stems that are illegally trafficked.

4.3 Illegal collection and unsustainable harvesting of plants and seeds from the wild for muthi use

The bark and stems of Encephalartos species are used for traditional medicine across South Africa, and some species are traded in traditional medicine markets (Cousins et al. 2012). South Africa's two largest traditional medicine markets are Faraday in Johannesburg and Warwick in Durban. These two markets were surveyed to ascertain the source areas and species of Encephalartos in trade. The species most commonly recorded in the markets were identified as Encephalartos natalensis, E. villosus and E. ghellinckii; while small quantities of what are likely to be E. ferox and E. senticosus were also observed. Cycads are sold as chopped-up stems and/or 'bark' strips in the traditional medicine market. The use of cycads for medicinal purposes by communities is traditionally done in a sustainable manner. However, traditional use has been overtaken by market value and therefore increased demand for medicinal purposes through the establishment of traditional medicine markets. This in turn has resulted in greater pressure and threat to Encephalartos species collected for medicinal purposes to supply the commercial markets in the country.

More recently, bark harvesting for the medicinal trade has increased in South Africa and resulted in declines in cycad populations in the wild. It has even resulted in the complete loss of populations in KwaZulu-Natal and the Eastern Cape.

4.4 Biological invasion/Alien Invasive Species invasion

Although the threat is considered relatively low (5%), it is nevertheless an important threat to consider. Alien plants have invaded many regions where cycads occur and, in some cases, present a potential threat to existing cycad populations. For example, dense stands of Lantana camara have invaded farmlands in the Eastern Cape Province of South Africa where E. princeps and Stangeria eriopus occur. In addition to the weeds smothering younger plants, chemical control using herbicides may also destroy plants if spraying is not carried out in a selective manner. Similarly, stands of guava (Psidium guajava) have become so dense in parts of Swaziland that it was impossible to locate cycads photographed there earlier this century (Prof Donaldson pers. obs.). Other weeds invading areas where cycads occur include prickly pear (Opuntia ficus-indica L. (Mill.)), and exotic Acacia spp. Despite these examples, at present alien vegetation appears to have caused population decline in relatively few instances (2% of Encephalartos sites according to data from matched photographs). The major impact of alien plants will probably be on cycad recruitment because of reduced coning frequencies due to shading (Donaldson, unpublished data) and the altered environment for germination and recruitment. This means that the effect of invasion by alien plants may be delayed and should be carefully monitored over time.

5. LEGISLATIVE AND POLICY FRAMEWORK

This strategy is in line with the provision of Section 2 (a) (i) and a (ii) and (c) of the NEMBA as well as the recommendations made by the Scientific Authority (See Appendix 1). Additionally, this strategy is in line with the Convention on Biological Diversity (CBD) Aichi targets and the Global Strategy for Plant Conservation.

5.1 INTERNATIONAL LEGISLATION AND TOOLS GOVERNING SPECIES CONSERVATION:

5.1.1 Convention on Biological Diversity (CBD)

South Africa ratified the Convention on Biological Diversity (CBD) in 1995. South Africa is committed to sustainable development and international co-operation on matters relating to the environment, development and human rights. The objectives of this Convention, to be pursued in accordance with its relevant provisions, are the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilisation of genetic resources, including appropriate access to genetic resources and by appropriate transfer of relevant technologies, taking into account all rights over those resources and technologies, and by appropriate funding.

The CBD in 2010 adopted the Strategic Plan for Biodiversity 2011-2020 at the 10th Meeting of the Parties (COP) Nagoya, Japan. The plan outlines 20 Aichi Targets to achieve global biodiversity conservation. Under strategic Goals A and C respectively these include, amongst others:

- Target 1: By 2020, at the latest, people are aware of the values of biodiversity and the steps they can take to conserve and use it sustainably.
- Target 12: By 2020 the extinction of known threatened species has been prevented and their conservation status, particularly of those most in decline, has been improved and sustained.

In addition, the CBD adopted the Global Strategy for Plant Conservation (GSPC). The GSPC, which is a programme of the CBD, aims to slow the pace of plant extinction around the world. It has five objectives with16 targets which respond to the targets of the CBD Aichi Targets. In this regard, South Africa is in the process of developing a National Strategy for Plant Conservation (NSPC) aligned to the global strategy.

5.1.2 The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)

CITES is an international agreement to which South Africa became a signatory in 1975. More than 144 countries are party to this Convention which is the largest wildlife conservation agreement in existence. CITES provisions assist member countries to regulate international commercial trade in live specimens as well as parts and derivatives of fauna and flora. Member countries regulate this trade using a system of permits and certificates which are issued in accordance with the decisions and resolutions taken at the Conference of the Parties. International trade in wild animals and plants is a major threat to the survival of some species. The contracting Parties therefore recognise that international co-operation is essential for the protection of certain species of wild fauna and flora against over exploitation for international trade.

The Convention accords varying degrees of protection to wild animal and plant species depending on their biological status and the effect international trade has, or could have, on them.

- **Appendix I**: The species included in this Appendix are those which are in danger of extinction and that may be negatively affected by trade. Wild specimens of such species cannot be traded among member countries except under exceptional circumstances such as for scientific purposes. Export and import permits are required for such trade and Appendix I specimens cannot be traded for commercial purposes.
- **Appendix II**: This Appendix includes species which are not necessarily currently threatened with extinction but may become so unless trade is strictly regulated so as to ensure sustainability. Appendix II also contains so called look-alike species, which, due to their similarity in appearance to certain regulated species, must be managed to ensure effective control.
- **Appendix III:** This Appendix contains species that are subject to regulation within the jurisdiction of a Party and for which the co-operation of other Parties is needed to prevent or restrict their exploitation.

All *Encephalartos* species are listed on CITES Appendix I. According to the CITES provisions relating to Appendix I species, international trade in cycads for commercial purposes is prohibited unless they are artificially propagated in accordance with Resolution Conf. 11.11 (Rev. CoP15). International trade is regulated in South Africa by the CITES Regulations, which have been promulgated in terms of NEMBA and which came into force on 5 March 2010. Only trade in artificially propagated specimens may be allowed if the Scientific Authority of South Africa has indicated that trade will not be detrimental to wild populations. From 1990 to 2009, South Africa recorded exports in excess of 150 000 of artificially propagated *Encephalartos* specimens. As a signatory to CITES, South Africa has an obligation to assure trading Parties that exports of *Encephalartos* specimens do not impact on wild populations.

5.1.3 The International Union for Conservation of Nature (IUCN)

IUCN was established in France in 1948 as the "International Union for the Protection of Nature". The IUCN brings together States, government agencies and a diverse range of non-governmental organisations (NGOs) working at field and policy levels, together with scientists and experts, to protect nature. The IUCN Red List of Threatened Species is a tool to determine the risk of extinction to species and plays an important role in guiding the conservation activities of government, NGO's and scientific institutions.

South Africa became a State Member of the IUCN on 23 July 1993. The IUCN is playing an increasingly prominent role in guiding the conservation activities of governments, NGOs and scientific institutions with a goal of providing information and analyses on the status, trends and threats to species in order to inform and catalyse action for biodiversity conservation. The IUCN uses a scientifically rigorous approach to determine

risks of extinction that are applicable to all species in order to produce the IUCN Red List of Threatened Species. The IUCN Species Programme working with the IUCN Species Survival Commission (SSC) and members of IUCN, draws on and mobilises a network of scientists and partner organisations working in almost every country in the world, which collectively hold what is likely the most complete scientific knowledge base on the biology and conservation status of species. The IUCN/SSC Cycad Specialist Group (CSG) is one of around 120 specialist groups and task forces within the IUCN's SSC. The CSG is currently comprised of 20 individuals representing seven countries including South Africa. The major role of the SSC is to provide information to the IUCN on the conservation of species and on the inherent value of species and their role in:

- ecosystem health and functioning,
- the provision of ecosystem services, and
- the provision of support to human livelihoods.

Cycads are the only plant groups which have been assessed twice (in 2003 and 2010) in terms of the 2001 IUCN Red List listing criteria. The results of these assessments have been used nationally to inform the development and the revision of the Threatened or Protected Species (TOPS) list which has been developed in terms of Section 56 of NEMBA. The IUCN classifies around 70% of Encephalartos species in Africa as threatened with extinction — four species no longer exist in the wild.

5.2 NATIONAL LEGISLATION GOVERNING CYCAD CONSERVATION

South Africa's legislation and policies for environmental management, including biodiversity conservation, has undergone profound changes in the past decade. South Africa has only recently introduced an obligation for management plans as part of the regulations promulgated in terms of the NEMBA. This policy and legal development process is ongoing. Systems to implement and enforce legislation are in place but the challenge is complex. Collaboration amongst stakeholders is required if the decline of cycad species is to be curbed.

5.2.1 The Constitution of the Republic of South Africa, 1996. (Act No 108 of 1996)

The Constitution of the Republic of South Africa creates the overall framework for environmental governance in South Africa by establishing the right to an environment that is not harmful to health and well-being; balancing the right to have the environment protected with rights to valid social and economic development; allocating environmental functions to a wide range of government agencies in all spheres and requiring co-operation between government agencies and spheres of government (section 24).

5.2.2 The White Paper on Environmental Management (1998)

The South African government developed the White Paper on Environmental Management Policy in May 1998 following, a nationwide consultative process. This informed the National Environmental Management Act 107 of 1998 which is an environmental framework law aimed at achieving sustainable development.

5.2.3 National Environmental Management Act (NEMA), 1998. (Act No. 107 of 1998)

NEMA creates the fundamental legal framework that gives effect to the environmental right guaranteed in section 24 of the Constitution. The Act provides for co-operative governance in relation to environmental matters by establishing the necessary government institutions that will ensure proper implementation of environmental protection and management. NEMA provides a framework in which development or resource use projects are established in a sustainable manner taking into account their possible negative impact on the environment. Within this framework, development or resource use in South Africa is now considered as an economically, socially and environmentally integrated process.

5.2.4 National Environmental Management: Protected Areas Act (NEMPAA), 2003. (Act No. 57 of 2003)

The NEMPAA provides for the protection and conservation of ecologically viable areas representative of South Africa's biological diversity and its natural landscapes and seascapes. In addition it provides for the establishment of a national register of all national, provincial and local protected areas, for the management of those areas in accordance with national norms and standards, for intergovernmental co-operation and public consultation in matters concerning protected areas and for the continued existence, governance and functions of South African National Parks. The NEMPAA distinguishes between several categories of protected areas, namely: special nature reserves, national parks, nature reserves, and protected environments. It also recognises world heritage sites, marine protected areas, specially protected forest areas, and mountain catchment areas. Protected areas are vital for ecological sustainability and adaptation to climate change, serving as nodes in the ecological infrastructure network. Protected Areas in South Africa also house cycad species and are vital to protecting cycads and supporting ecological processes that will ensure the long-term survival of the species occurring in these protected areas. At least 26 of South Africa's cycad species occur within a protected area, with cycads confirmed present in at least 50 formal and five privately owned protected areas.

5.2.5 National Environmental Management: Biodiversity Act (NEMBA), 2004. (Act No. 10 of 2004)

The NEMBA provides for, among others, the management and conservation of biological diversity within the Republic; the use of indigenous biological resources in a sustainable manner; the fair and equitable sharing among stakeholders of benefits arising from bio-prospecting involving indigenous biological resources; and gives effect to ratified international agreements relating to biodiversity which are binding on the Republic.

The Minister may, in terms of Section 56 of NEMBA and by Notice in the Government Gazette, publish a list of species that are threatened or in need of national protection. Currently, with the exception of one or two species, all indigenous cycad species are listed as critically endangered, endangered, vulnerable or protected. Subsequent to the substantial review of the Threatened or Protected species list, all indigenous cycad species will be included in one of these categories. More specifically, NEMBA regulates restricted activities involving listed Threatened or Protected species through a permit system. Section 57(1) of NEMBA specifies that a person may not carry out a restricted activity involving a specimen of a listed Threatened or Protected species without a permit issued in terms of Chapter 7 of the Act. If a person is convicted in terms of NEMBA of an offense involving cycads, such person is liable to a fine not exceeding R10 million or to a fine equal to three times the commercial value of the specimen or activity involved, whichever is greater, or to imprisonment for a period not exceeding 10 years, or to both such a fine and such imprisonment.

Section 57(2) makes provision that the Minister may, by Notice in the Gazette, prohibit the carrying out of a restricted activity if such activity may have a negative impact on the survival of a listed Threatened or Protected species. The Minister, on 14 May 2012 published under section 57(2) the prohibition of certain restricted activities involving certain cycad species in Gazette No. 35344 for immediate implementation. The Notice stipulates that, unless required for conservation or enforcement purposes, the following restricted activities involving wild specimens of listed threatened or protected cycad species are prohibited:

- Collect, pluck, uproot, destroy
- Export from the Republic of South Africa, sell, trade, buy
- Receive, give, donate, accept, acquire, dispose
- Import into the Republic of South Africa, convey, move, translocate
- Possess, exercise physical control (except where permits have been issued, prior to the publication of this notice, for plants that form part of legally obtained parental stock)

Furthermore, the following restricted activities involving artificially propagated specimens of listed threatened or protected cycad species are prohibited:

- The export from the Republic of South Africa of specimens with a stem diameter of more than 15cm, except for the following dwarf species which cannot be exported if the stem diameter is more than 7cm: E.caffer, E.humilis, E.cupidus, E.cerinus and E.ngoyanus.

These measures are intended to provide a framework for co-ordinated action to conserve cycads. In some cases this may include aspects intended to support sustainable use. In this case, SANBI, together with the Department of Environmental Affairs and stakeholders in the Eastern Cape developed a Biodiversity Management Plan for the Albany cycad (Encephalartos latifrons), one of the species with fewer than 100 individuals left in the wild. This was the first species management plan developed so far for cycads and provides incentives to landowners if they manage their cycads effectively.

5.2.6 Threatened or Protected Species Regulations (TOPS) - 2007

To achieve the objectives of NEMBA, the Department promulgated the Threatened or Protected Species (TOPS) Regulations, 2007. The purpose of these regulations, amongst others, is to:

- further regulate the permit system set out in Chapter 7 of the NEMBA in so far as that system applies to restricted activities involving specimens of listed Threatened or Protected species;
- provide for the registration of captive breeding operations, commercial exhibition facilities, game farms, nurseries, scientific institutions, sanctuaries and rehabilitation facilities and wildlife traders;
- provide for the regulation of the carrying out of a specific restricted activity, namely hunting;
- provide for the prohibition of specific restricted activities involving specific listed Threatened or Protected species;
- provide for the protection of wild populations of listed threatened species

In terms of the TOPS Regulations a risk assessment is compulsory if the restricted activity involves a wild population of a listed critically endangered species. The TOPS Regulations require a facility where specimens of plant species that are listed as threatened or protected are grown and/ or sold for commercial purposes, to be registered as a nursery.

5.2.7 CITES Regulations, 2010

It is a requirement of CITES that Parties must regulate international trade through national legislation, hence the promulgation of the CITES Regulations in 2010 under NEMBA, in order to give effect to the provisions of CITES. Provision is made in these regulations for CITES import, export and re-export permits, as well as for persons to register their nurseries with the Management Authority if they intend to produce artificially propagated specimens of plant species included in Annexure 1 of CITES for commercial international trade (also applicable to cycads). Provision is further made that records of parental stock must be kept.

5.2.8 Norms and Standards for Biodiversity Management Plans for Species (BMP-S), 2009

NEMBA makes provision for the development of Biodiversity Management Plans for Species (BMP-S). To realise this, the Department developed Norms and Standards (N & S) for BMP-S which were Gazetted in March 2009 for implementation. The purpose of these N & S is to provide a national approach and minimum standards for the development of a BMP-S. A BMP-S can be developed by any person, or organ of state desiring to contribute to the management of biodiversity in South Africa and achievement of the objectives of the NEMBA. Additionally, a BMP-S can be developed for any indigenous or migratory species. The BMP aims to provide for the long-term survival of a species in the wild and provides the platform for an implementing organisation or responsible entity, as appointed by the Minister, to monitor and report on the progress regarding the implementation of the BMP.

5.3 Provincial legislation (ordinances) governing cycads conservation

The responsibility for managing cycad populations is devolved to the six provincial governments where cycads occur naturally. Prior to NEMBA, most provinces had developed their own cycad management plans and strategies. These include, amongst others the cycads intervention strategy in Limpopo; the development of draft Biodiversity Management Plans such as the management plan for E. ghellinckii in a community stewardship area in 2012, and the development of status reports for monitored cycads in KwaZulu Natal. In addition, to ensure better compliance a press release was published to advise the public to apply for a possession permit according to the TOPS Regulations in Gauteng Provincial Conservation Department.

The following regulatory measures control the trade and movement of cycads within and between provinces and are enforced by different provincial authorities at a provincial level:

- A permit is required to donate, sell export or import and transport cycads (or any part thereof, including seed) to, from or within the Province.
- Nurseries (or individuals) selling cycads must be registered with a provincial authority and be issued with a licence.
- A receipt of purchase must be issued with all cycads sold by registered traders.
- A permit is needed to "pick" a cycad. (Picking refers to wild plants and includes damage, burn, cut, uproot, collection of seed or any part of the plant).

Further to the above legislative provisions, the Eastern Cape Province had placed a notice for all persons who did not have cycad permits to apply for such before the 31st March 2004. No permits are issued if the owner of a property cannot prove legal origin by means of a permit or receipt.

The above regulatory measures are enforced through provincial legislation which currently governs the conservation of cycads. These include, but are not limited to:

- The Natal Conservation Ordinance No.15 of 1974
- The Limpopo Environmental Management Act, 2003 (Act No 7 of 2003)
- The Mpumalanga Nature Conservation Act, 1998 (Act No. 10 of 1998).
- The Ciskei Nature Conservation Act, 1987 (Act No. 10 of 1987).
- The Transkei Decree No 9 of 1992

6. APPLICATION

This Strategy and Action Plan is applicable to all relevant law enforcement and conservation agencies as well as private land owners, NGOs and communities involved in the management of cycad populations. It is intended to provide a framework for coordinated action to conserve cycads. In some cases this may include aspects intended to support sustainable use.

7. VISION, MISSION, AIM AND OBJECTIVES

VISION, MISSION, AIM AND OBJECTIVES OF THE NATIONAL STRATEGY AND ACTION PLAN FOR THE MANAGEMENT OF CYCADS

7.1 Vision

To conserve and sustainably manage viable populations of all extant South African cycad species throughout their historical range in South Africa, supported through a shared commitment on private, community and State land.

7.2 Mission

To communicate with, and coordinate actions between, the relevant role-players in achieving conservation and management goals

7.3 Aim

To ensure the persistence in the wild of viable populations of all indigenous cycad species through implementing a suite of integrated activities between now and 2020.

7.4 Overall objectives of this Strategy and Action Plan

- To reduce (prevent) the illegal collection of cycads from the wild to a level that does not have detrimental impacts on the persistence of indigenous cycad species in their natural habitat.
- To secure, protect and effectively manage critical habitat for wild cycads.
- To develop and implement reintroduction/reinforcement programmes for CR and EN species to ensure they achieve minimum conservation targets for persistence.
- To achieve overall conservation targets through co-ordination and integration allowing adaptive responses to meet the aim of the strategy.
- To increase public awareness of the cycad conservation crisis, the value of cycads to society, and of the role that the public can play in reducing the impact of wild cycad harvesting.
- To ensure that the overall strategy is supported by relevant research and knowledge generation.

8. STRATEGIC OBJECTIVES AND ACTION PLAN

8.1 The National Strategy and Action Plan

The National Strategy and Action Plan for the Management of Cycads sets out the strategic objectives and actions necessary for achieving the over-arching aim of this Strategy and Action Plan. These were agreed at the workshop which took place on 11 and 12 June 2013 in Pretoria and were refined during a consultation process. It further identifies responsible organisations and key partners for implementation of the actions. A more detailed costing exercise will be undertaken in order to determine resource requirements to roll out implementation of this Strategy and Action Plan. Table 4 below, indicates strategic objectives and actions to address six (6) identified focus areas.

8.1.1 Security

Strategic Objective: To reduce (prevent) the illegal collection of cycads from the wild to a level that does not have detrimental impacts on the persistence of indigenous cycad species in their natural habitat by March 2016

8.1.2 Population Management

Strategic Objective: To secure minimum viable population sizes for each South African cycad species by 2023

8.1.3 Habitat Management

Strategic Objective: To secure, protect and effectively manage critical habitat for wild cycads

8.1.4 Sustainable use

Strategic Objective: To ensure that the utilization of cycads is sustainable and to the best advantage of cycad conservation.

8.1.5 Communication, Education and Public Awareness

Strategic Objective: To develop and implement effective communication and collaboration with all cycad landowners/managers and stakeholders

8.1.6 Research

Strategic Objective: To ensure that decisions pertaining to cycad conservation are supported by robust scientific research

Table 4: Focus Areas; Strategic Objectives and Actions

ACTIONS	ACTIVITIES	INDICATOR	TIME FRAME	RESPONSIBLE ORGANISATION/S AND PARTNERS	RESOURCE REQUIRE-MENTS
FOCUS AREA 8.1.1: SECURITY					
Strategic Objective: To reduce (prevent) illegal collection of cycads from the wild to a level that does not have detrimental impacts on the persistence of indigenous cycad species in their natural habitat by 2020					
Develop and implement an overall cycad security management plan for South Africa	Source funding and resources for cycad conservation to enhance capacity, skills and equipment	Funds sourced Procure appropriate equipment for marking the plants provided to each province	2020	DEA, SANBI, Provincial conservation authorities, NGOs, and Cycad Interest Groups1	Financial Resources for the development of the overall cycad security management plan and the procurement of the Microdots/chips/ GPs/scanners/ARCGIS software Financial resources to fill the posts for rangers and to equip them with appropriate resources and technology
	Identify and prioritize species, populations and sub populations for marking	Priority wild plants to improve enforcement and prosecution identified and marked			
	Develop a database for marked populations, GPS populations that have been marked (Should include DNA fingerprinting)	Database developed			
	Develop a Marking protocol	Marking Protocol developed			
	Develop Stable isotope maps for cycad populations for forensic tracing of poached plants	Stable isotope maps developed			
	Increase Security (human resource, surveillance equipment, fencing (etc.) at priority sites to prevent illegal collection	Increased security at priority sites			
	Improve Law enforcement (i.e. improve the ability of law enforcers e.g. an application on phones of regulators to assist in identifying plants)	Improved law enforcement			
Monitor and evaluate the effectiveness of security plan	Develop a monitoring mechanism to assess the effectiveness of the security plan	Monitoring mechanism developed Effectiveness of the security plan evaluated	Beyond 2020	DEA, SANBI Provincial conservation authorities and NGOs	Financial Resources for the development of the monitoring plans

ACTIONS	ACTIVITIES	INDICATOR	TIME FRAME	RESPONSIBLE ORGANISATION/S AND PARTNERS	RESOURCE REQUIREMENTS
Develop and implement regular security risk assessments for priority sites for each species and report on these annually	Identify and assess priority sites and develop a plan for each site for security risk	Priority sites for security risk identified and assessed	Annually	SANBI and Provincial conservation authorities, Cycad Interest Group	Adequate budget and dedicated human resources
FOCUS AREA 8.1.2: POPULATION MANAGEMENT					
Strategic Objective: To secure minimum viable population sizes for each South African Cycad species by 2023					
Identify viable populations for each South African Cycad species and develop a meta-population management strategy	Identify viable populations for each South African Cycad species and develop a meta-population management strategy	Viable populations identified and meta-population management strategy developed	2016	SANBI, Provincial conservation authorities	Human resources
Identify collectors with priority wild-sourced plants and engage with them with a view of collaboration	Identify collectors with priority wild-sourced plants and engage with them with a view of collaboration	Collectors identified and collaboration initiated	2016	SANBI and Provinces, Encephalartos Latifrons Forum (ELF), Cycad Interest Group and NGOs	DEA Budget, NGO partner, WWF
Determine viable population sizes and develop recovering targets for identified priority species	Determine viable population sizes (targets) for identified priority species	Population size determined	2016	Provincial conservation authorities, Wildlife College, SANBI and Cycad Interest Group	Human and financial Resources
Develop and implement management plans to achieve the determined recovery targets for the identified priority cycad species	Develop and implement Biodiversity Management plans (BMP)	BMPs developed and implemented	2018	DEA, SANBI, Provincial conservation authorities	Human and financial Resources
Develop monitoring mechanism to assess the effectiveness of the implementation of BMPs	Develop a monitoring mechanism to assess the effectiveness of the implementation of the BMP	Monitoring mechanism developed Effectiveness of the implementation of the BMP evaluated	2018	SANBI and Provincial conservation authorities	
Identify key management interventions and implement (e.g. pollination and introduction of seedlings)	Identify key management interventions and implement	Key management interventions identified and implemented	2015	SANBI and Provincial conservation authorities, and Cycad Interest Group	Human capacity and financial resources
FOCUS AREA 8.1.3: HABITAT MANAGEMENT					
Strategic Objective 3: To secure, protect and effectively manage critical habitat for wild cycads					

ACTIONS	ACTIVITIES	INDICATOR	TIME FRAME	RESPONSIBLE ORGANISATION/S AND PARTNERS	RESOURCE REQUIREMENTS
Identify and map critical cycad habitat to ensure all cycad populations are included in provincial conservation plans and are included within critical biodiversity areas in bioregional plans	Identify critical habitat for wild cycads map and include the identified critical habitats for wild cycads in the C-Plans Identify and list the properties with wild cycads	Cycad populations included in C-Plans GIS map of cycad distribution and a list of properties.	2016	SANBI and Provincial conservation authorities	Human capacity and financial resources
Protect identified critical habitat through mechanisms provided by NEMBA and NEMPAA and Biodiversity Stewardship Programme	Identify declared and potential stewardship sites with cycads populations	Critical habitat for wild cycads protected and effectively managed	2020	DEA, SANBI, Provincial conservation authorities, NGOs and Cycad Interest Group	Human capacity and financial resources
Identify suitable habitats for re-introduction of wild cycads	Identify suitable sites for introduction or reintroduction. Identify management programmes aimed at increasing reproductive success of cycads	Sites suitable for introduction identified Management programmes aimed at reproductive success of cycads identified	2018	SANBI/DEA/ Provincial conservation authorities and Cycad Interest Group	Human Resources
FOCUS AREA 8.1.4: SUSTAINABLE USE					
Strategic Objective: To ensure that the utilization of cycads is sustainable and to the best advantage of cycad conservation (this would include the establishment of reintroduction/reinforcement programmes for CR and EN species to ensure they achieve minimum conservation targets)					
The national gene bank for cycads is reconstituted to provide representative gene pools for conservation and restoration	Reconstitute gene bank for cycads	Gene Bank reconstituted	2015	SANBI	Human capacity
Promote legal trade of propagated plants and free up resources for conservation of wild cycads	Promote legal trade of propagated plants and free up resources for conservation of wild cycads	Legal trade of propagated plants and availability of resources for conservation of wild cycads	2018	SANBI/DEA/ Provincial conservation authorities and Cycad Interest Group	Human Resources
Investigate where possible incentives for land owners and or communities to protect wild populations	Identify economic incentives for land owners and/or communities to protect wild populations	Incentives for land owners and / or communities identified	2018	DEA, SANBI and Provincial conservation authorities, Cycad Interest Group and NGOs	Financial resources
Initiate public /private partnerships for the establishment of conservation propagation programmes for CR and EN species	Identify potential public/private partnerships aimed at establishing propagation programmes for CR and EN species		2015	DEA, SANBI, Provinces, Cycad Interest Group	Financial resources

ACTIONS	ACTIVITIES	INDICATOR	TIME FRAME	RESPONSIBLE ORGANISATION/S AND PARTNERS	RESOURCE REQUIREMENTS
National botanical gardens to develop and implement a conservation management strategy for cycads (including confiscated cycads)	Develop and implement a conservation management strategy in National Botanical Gardens	Strategy developed for National Botanical Garden	2016	SANBI	Human resources
FOCUS AREA 8.1.5:COMMUNICATION, EDUCATION AND PUBLIC AWARENESS					
Strategic Objective: Develop and implement effective communication and collaboration with all cycad landowners/managers and stakeholders by 2015					
Develop, adopt and implement a national cycad communication strategy (this will include an awareness campaign)	Develop, adopt and implement a national cycad communication strategy (this will include an awareness campaign) Roll out the communication strategy for the conversation of cycads	Communication strategy developed The public is aware of the cycad conservation crisis, the value of cycads to society, and of the public role in reducing the impact of wild cycad harvesting	2015/2016 onwards	DEA, SANBI; Provinces and NGO's	Financial resources from all the parties A known campaigner must be used to drive this i.e. Kay Montgomery Private sponsorships
Develop and conduct cycad identification training to law enforcement officials, magistrates and prosecutors	Develop and conduct cycad identification training to law enforcement , conservation officials, magistrates and prosecutors	Cycad identification training conducted	On-going	DEA, SANBI, NGOs Tertiary institutions, provincial authorities	Financial and Human Resources
FOCUS AREA 8.1.6: RESEARCH					
Strategic Objective: To ensure that decisions pertaining to cycad conservation are supported by robust scientific research					
Identify information gaps for implementation and enforcement of legislation pertaining to the conservation and management of cycads	Identify information gaps for implementation and enforcement of legislation pertaining to the conservation and management of cycads	Information gaps for implementation and enforcement of legislation pertaining to the conservation and management of cycads identified	2015 onwards	SANBI, provincial authorities, and academic institution	Finance and human resources
Develop scientific methods for distinguishing between wild and artificially propagated plants	Develop scientific methods for distinguishing between wild and artificially propagated plants	Scientific methods for distinguishing between wild and artificially propagated plants developed	2018	SANBI, academic institutions	Finance and human resources
Develop a method for identifying ex situ plants that have been poached from the wild	Develop a method for identifying ex situ plants that have been poached from the wild	Method for identifying ex situ plants developed	2016	SANBI	Funds to develop a method for identifying ex situ plants
Identify research priorities for the conservation of cycads	Identify research priorities for the conservation of cycads	Research priorities identified	Ongoing	SANBI, academic institutions	Finance and human resources

9. MONITORING, EVALUATION, REPORTING AND REVISION OF THE STRATEGY AND ACTION PLAN

Monitoring and evaluation form a critical component of all adaptive management programmes and form the basis of performance evaluation. Since components of a management strategy are interdependent, it is important to monitor, evaluate and report on all components of the management strategy in terms of implementation and outcomes.

The key aspects that require monitoring are largely covered by the focus areas, strategic objectives and actions defined in Section 8 of this strategy. Table 5 outlines the key targets to be met and monitored within the five-year period. Each responsible stakeholder will submit a progress report and milestones achieved annually.

The DEA will oversee the implementation of this Strategy and Action Plan. In implementing this Strategy and Action Plan, DEA will look at adopting existing structures such as the Cycad Working Group co-ordinated by the SANBI for monitoring, evaluation and reporting to the Minister regarding the implementation of this Strategy and Action Plan. The Strategy and Action Plan will be reviewed every 5 years.

Table 5: The proposed monitoring plan for actions

Focus Area	Strategic Objective	Activities	Date of Monitoring Inception	Responsibility	Monitoring schedule
Security	To reduce (prevent) illegal collection of cycads from the wild to a level that does not have detrimental impacts on the persistence of indigenous cycad species in their natural habitat by 2016	Source funding and resources for cycad conservation to enhance capacity, skills and equipment	Not yet determined	DEA, SANBI, PROVINCES	
		Identify and prioritize species, populations and sub populations for marking Develop a database for marked populations, GPS populations that have been marked (should include DNA fingerprinting)	Not yet determined	SANBI, PROVINCES	
		Develop a marking protocol	Not yet determined	DEA, SANBI	
		Develop stable isotope maps for cycad populations for forensic tracing of poached plants	Not yet determined	SANBI, ACADEMIC INSTITUTIONS	
		Increase security (human resource, Surveillance equipment, fencing (etc.) at priority sites to prevent illegal collection	Not yet determined		
		Develop a monitoring mechanism to assess the effectiveness of the security plan	Not yet determined	DEA, SANBI	
		Identify and assess priority sites for security risk	Not yet determined	PROVINCES, SANBI	
Population Management	To secure minimum viable population sizes for each South African Cycad species by 2023	Identify viable populations for each South African Cycad species	Not yet determined	PROVINCES, SANBI	
		Identify collectors with priority wild-sourced plants and engage with them with a view of collaboration	Not yet determined	PROVINCES	
		Determine viable population sizes (targets) for identified priority species	Not yet determined	SANBI, PROVINCES	
		Develop and implement BMPs	Not yet determined	DEA, PROVINCES, STAKEHOLDERS	
		Develop a monitoring mechanism to assess the effectiveness of the implementation of the BMP	Not yet determined	DEA, SANBI	
		Develop a method for identifying ex situ plants that have been poached from the wild	Not yet determined	SANBI	
		Identify key management interventions and implement	Not yet determined	SANBI, PROVINCES	

Focus Area	Strategic Objective	Activities	Date of Monitoring Inception	Responsibility	Monitoring schedule
Habitat management	To secure, protect and effectively manage critical habitat for wild cycads	Identify critical habitat for wild cycads map and include the identified critical habitats for wild cycads in the C-Plans	On going	SANBI, PROVINCES	
		Identify and list the properties with wild cycads	Not yet determined	PROVINCES	
		Identify declared and potential stewardship sites with cycads populations	Not yet determined	SANBI, PROVINCES	
Sustainable use	To ensure that the utilization of cycads is sustainable and to the best advantage of cycad conservation	Reconstitute gene bank for cycads	Not yet determined	SANBI	
		Identify suitable sites for introduction or reintroduction. Identify management programmes aimed at increasing reproductive success of cycads	Not yet determined	SANBI, PROVINCES	
		Identify economic incentives for land owners and/or communities to protect wild populations	Not yet determined	DEA, SANBI, PROVINCES	
		Identify potential public/private partnerships aimed at establishing propagation programmes for CR and EN species	Not yet determined	SANBI, PROVINCES	
		Develop and implement a conservation management strategy in National Botanical Gardens	2015	SANBI	
Communication, Education and public Awareness	Develop and implement effective communication and collaboration with all cycad landowners/managers and stakeholders by 2015	Develop, adopt and implement a national cycad communication strategy Roll out the communication strategy for the conservation of cycads	2015/6	DEA	Every five years
		Develop and conduct cycad identification training to law enforcement , conservation officials, magistrates and prosecutors	2015/6	DEA	

Focus Area	Strategic Objective	Activities	Date of Monitoring Inception	Responsibility	Monitoring schedule
Research	To ensure that decisions pertaining to cycad conservation are supported by robust scientific research	Identify information gaps for implementation and enforcement of legislation pertaining to the conservation and management of cycads	2015	DEA, SANBI	Every five years
		Develop scientific methods for distinguishing between wild and artificially propagated plants	2015	SANBI	
		Identify research priorities for the conservation of cycads	2015	DEA, SANBI	

10. REFERENCES

Boyd, W.M. 1995. The translocation and re-establishment of priority Encephalartos species in the Transvaal, South Africa. In P. Forster (ed.), Proceedings of the Third International Conference on Cycad Biology, pp. 39–43. Cycad Society of South Africa, Stellenbosch, South Africa.

Cousins, S.R., Williams, V.L., Witkowski, E.T.F., 2012. Uncovering the cycad taxa (Encephalartos species) traded for traditional medicine in Johannesburg and Durban, South Africa. South African Journal of Botany 78, 129–138.

DEAT: Department of Environmental Affairs and Tourism, 1998 National Environmental Management Act, Act 107 of 1998.

DEAT: Department of Environmental Affairs and Tourism, 2004, National Environmental Management Biodiversity Act 10 of 2004.

DEAT: Department of Environmental Affairs and Tourism, 2005, South Africa's National Biodiversity Strategy and Action Plan.

DEAT: Department of Environmental Affairs and Tourism, 2007, National Environmental Management Biodiversity Act: Threatened or Protected Species RegulationRegulation No. 151, Government Gazette No. 29657.

DEAT, Department of Environmental Affairs and Tourism (2008). South Africa's National Biodiversity Framework. Government Gazette No. 32474, 3 August 2009: Notice 813.

DEA: Department of Environmental Affairs, 2010, South African Scientific Authority Recommendations, (Appendix 1)

DEA/SANBI, National Biodiversity Assessment, 2011, An assessment of South Africa's Biodiversity and Ecosystems. Synthesis Report, South African National Biodiversity Institute and Department of Environmental Affairs, Pretoria.

De Klemm, C. and Shine, C. (1993), Biological Diversity Conservation and the Law, IUCN, Gland, Switzerland and Cambridge, UK.xix + 292 pp.

Donaldson, J.S. (Ed.). 2003, Cycads. Status Survey and Conservation Action Plan. IUCN/SSC Cycad Specialist Group. IUCN, Gland, Switzerland and Cambridge, UK.ix + 86 pp.

Donaldson, J.S. 2008, NDF Workshop Case Studies, WG 3 – Succulents and Cycads, Case Study 4, Encephalartos, Country – South Africa

Ezemvelo KZN Wildlife A Management Plan for Cycads in KwaZulu-Natal, 2004,Threatened Plant Conservation Unit Biodiversity Conservation Advice Division.

Hoffmann et al., 2010, The Impact of Conservation on the Status of the World's Vertebrates, Science express

IUCN Red List of Threatened Species, 2010, Global; Assessment,

IUCN, SSC Cycads Specialist Group, 2003: Status survey and Conservation Action Plan for Cycads,

IUCN, The Cycad Specialist Group, 2004: Putting the action plan to work.

Raimondo, D.C. & Donaldson, J.S., 2003, Responses of cycads with different life histories to the impact of plant collecting: simulation models to determine important life history stages and population recovery times. Biological Conservation, 111 (3), 345-358.

Raimondo, D., Von Staden, L., Foden, W., Victor, J.E., Helme, N.A., Turner, R.C., Kamundi, D.A. &Manyama, P.A. (eds). 2009. Strelitzia 25. South African National Biodiversity Institute, Pretoria.

Rowe, T. and Rowe, C. 1995.Transplanting Cycasophiolitica. Palms and Cycads 47, 15-17.

Scientific Authority Report – Cycads – July 2011, A review of the conservation status, population trends, and trade for South African species of Encephalartos and its implications for decisions relating to trade

S.R. Cousins , V.L. Williams, E.T.F. Witkowski,2012, Uncovering the cycad taxa (Encephalartos species) traded for traditional medicine in Johannesburg and Durban, South Africa.

South African cycads face extinction crisis, 2010, In press Queensland Herbarium. 2007. National Multi-species Recovery Plan for the cycads, Cycad megacarpa, Cycasophiolitica, Macrozamiacranei, Macrozamialomandroides, Macrozamia pauli-guilielmi and Macrozamiaplatyrhachis Report to Department of the Environment and Water Resources, Canberra. zzzQueensland Parks and Wildlife Service, Brisbane.

11. APPENDIX 1:

SCIENTIFIC AUTHORITY RECOMMENDATIONS

The following are the Scientific Authority recommendations for addressing the cycad conservation crisis in South Africa (April 2010).

i. A crisis management plan for cycads should be adopted urgently and implemented by all management authorities. The proposed contents of this crisis management plan are specified below. The crisis management plan should be published for public comment prior to its implementation.

ii. A longer-term national cycad management strategy, the aim of which should be to secure the conservation of wild cycad populations, should be developed by the end of 2010 in consultation with all relevant stakeholders. It should be noted that this is a significant task to complete and in the event that DEA does not have the capacity to complete it, it is recommended that it be outsourced to consultants with strong public participation skills. The issues that should be addressed/ explored in this national strategy are specified below.

iii. Recommended contents of a crisis management plan for cycads

(1) Only CITES registered nurseries should be allowed to export cycads internationally. The following conditions should apply:-

a. Only cultivated cycads with a stem diameter of less than 15cm should be exported internationally, with the exception of the dwarf/slow growing species Encephalartos caffer, E. cerinus, E. cupidus, E. humilis and E. ngoyanus, for which stem diameters should not exceed 7cm. This should apply to both commercial trade and export as personal effects.

b. Parental stock of the plants proposed for export should be present on the nursery premises and be available for inspection.

c. Inspections for CITES exports should be undertaken on the nursery premises and the crates/ containers sealed in the presence of inspectors.

Justification: The above strategy will ensure that international trade in cycads complies with the provisions of CITES and should decrease the theft risk to wild populations by limiting trade to smaller plants that are more likely to have been grown from seed than stolen from the wild. Sealing of crates would mitigate tampering with the contents or adding more plants/seeds. Sealing of crates in South Africa, however, does imply that they will have to be inspected at the endpoint destination. Removing large cycads from the country as personal effects is akin to plundering the country of a precious natural heritage resource and should not be allowed. And once removed from the country, the plants may easily be sold at a high price.

(2) A national moratorium on the domestic trade in and movement/transport of large plants of Critically Endangered and Endangered Encephalartos species should be declared. "Large plants" are cycads with a stem diameter of more than 15cm, but more than 7cm for plants of E. cerinus and E. cupidus. "Trade" includes selling or otherwise trading in, buying, receiving, giving, donating, or accepting as a gift, or in any way acquiring or disposing of any specimen. This national moratorium should remain until such time as the long-term national cycad strategy is in place.

Special provisions should be formulated to allow for the changing of ownership or translocation of large cycads in the case of selling a house/property or under other special circumstances (e.g. divorces and deceased estates). Permanent possession permits valid for up to 50 years could be issued for plants located in gardens on residential property (but with caution so as to avoid the situation of plants being illegally sold during this long time period).

Justification: Limiting the domestic trade to smaller plants is expected to confer a lower conservation risk to wild populations as, due to the extremely slow growth rates of cycads, large plants are more likely to have been stolen from the wild than to have been grown from seed. Furthermore, population viability models indicate that cycad populations are extremely sensitive to harvest of adult plants but less sensitive to removal of juveniles and seedlings.

By preventing the movement/transport of large plants, there will be limited opportunities for people to augment private collections with stolen cycads and thereafter claim that the plants were in their possession for many years. This is particularly important in Gauteng, the core of the cycad market, where cycads not indigenous to the former Transvaal province did not require possession permits in terms of the Gauteng Nature Conservation Ordinance. Furthermore, the interim cycad letter, issued by the provincial management authority to negate the legal requirements for permits to possess, sell, donate or transport cycads in Gauteng, was valid between 1994 and 2001.

(3) The current conservation / Red List status of all cycad species should be re-assessed.

Justification: The trade restrictions in 2 above are proposed for the most threatened cycad species, i.e. those that are Critically Endangered (11 species) or Endangered (6 species). Due to the continuing rapid decline of wild populations and the present high levels of theft, the status of some Encephalartos species may have worsened over the last few years. It is therefore important to ensure that the TOPS Critically Endangered, Endangered, Vulnerable (3 species) and Protected (17 species) categories appropriately reflect the current conservation status of all Encephalartos species so that the most threatened species benefit from the proposed trade restrictions and protective measures.

(4) A mechanism should be put in place to ensure that all people owning cycads apply for and obtain TOPS possession permits. This should be communicated effectively to the public through various media, e.g. local newspapers and electronic media. A time frame during which public must apply for permits as well as a time frame during which management authorities must issue permits is required, but taking into consideration the capacity constraints of the respective enforcement agencies.

Justification: In order for the public to be in compliance with the TOPS regulations, all persons owning cycads must have TOPS possession permits. This is essential for future compliance and enforcement efforts. In order for this process to be practical, implementable and affordable, the capacity constraints of the respective management authorities must be addressed.

(5) Auctioning of large plants of any Encephalartos species should no longer be permitted. "Large plants" are cycads with a stem diameter of more than 15cm, but more than 7cm for plants of E. caffer, E. cerinus, E. cupidus, E. humilis and E. ngoyanus.

Justification: Laundering of large plants through the removal of micro-chips is facilitated through auctions. Furthermore auctions artificially increase the value of large plants as bidders are purposely placed to drive prices higher.

(6) The sizes and gender of cycads should be specified on all permits issued by Management Authorities.

Justification: Specifying the sizes of plants will facilitate future compliance and enforcement efforts. For example, the size information on a permit may be important evidence to prove possession of a wild plant where the plant in question is much larger than that specified on the permit.

(7) All wild cycads with stem diameters larger than 15cm should be micro-chipped using the new super secure micro-chipping technology. These super secure chips must be reserved exclusively for wild cycads. Only the main stems require chipping while suckers should be sprayed with micro-dot paint. Only particularly large individuals (i.e. with stem diameters of 15cm or more) of the dwarf/slow growing species (E. caffer, E. cerinus, E. cupidus, E. humilis and E. ngoyanus) should be micro-chipped, while the remaining plants should be sprayed with micro-dot paint. Critically Endangered and Endangered species, as well as vulnerable populations of any other Encephalartos species, should be prioritized for micro-chipping, but ultimately all large wild cycads should be micro-chipped. During the micro-chipping process, all plants should be photographed and GPS coordinates recorded. Different micro-chips should be used for garden plants and parental stock to distinguish them from plants of wild origin.

The capacity constraints of the respective provincial authorities to implement this undertaking should be addressed.

Justfication: Micro-chipping with this new super secure technology is essential for future compliance and enforcement efforts, e.g. for proving wild origin in a court of law and for returning stolen plants to the wild. Super secure chips cannot be removed after insertion, thereby resolving problems of removal associated with the previous micro-chipping technology. As suckers are vulnerable to harvest but are not large enough for super secure micro-chips, micro-dot paint should be used instead as an indicator of wild origin. As micro-chipping smaller plants, i.e. plants with stem diameters less than 15cm, will damage the plants, most plants of the dwarf/slow growing species should be sprayed with micro-dot paint, while only particularly large individuals should be micro-chipped.

(8) National and provincial management authorities, as well as SANBI, should prepare press releases in readiness for the intended 2010 release of the IUCN cycad status report (expected in May or October 2010) that will detail the extremely poor global conservation status of cycads and highlight the particularly dire situation in South Africa.

Justification: South Africa may become a target for bad publicity by the conservation community when the IUCN cycad status report is released, particularly as 2010 is the year of biodiversity. Not only are cycads the most threatened group of organisms globally, but the percentage of cycad species that are threatened in any one country is highest in South Africa. South Africa is the only cycad range state (out of 52 countries) to have experienced cycad extinctions in recent times (last 30 years). Management authorities should be preparing themselves for addressing the challenges that will be raised from concerned public and the international and national conservation communities.

(iv) Recommended issues to be addressed/ explored in a long-term national cycad management strategy

a. Regulation, compliance and enforcement

- Trade restrictions, including auctions (similar to those proposed in the crisis management plan above)
- Required amendments to the TOPS regulations
- Options for different permits, e.g. breeders permit (15-20 plus plants) and/or collectors permit (5+ species)
- Harmonization of permit conditions across all provinces (including enforceable provisions from norms and standards)

- Strict national requirements for registered nurseries should be formulated in relation to documenting and managing nursery activities, propagation activities as well as parental and seedling stock. These national requirements could be formulated along the lines of the draft KZN Norms and Standards for cycads. Norms and Standards should be made enforceable by means of appropriate permit conditions.
- Declaration of offenders as unfit to trade in or possess cycads
- Trade in cycads for medicinal purposes
- Identification of cycad experts to testify in court
- Image dossier for characteristics of wild plants
- Training of officials in all provinces in the identification of cycads
- New technology for enforcement (e.g. camera traps, satellite technology)
- MOU's with relevant bodies, e.g. SAPS
- Appropriate penalties
- Process to determine numbers of cycads in private collections
- Alternative legal trade methods for large cycads (i.e. in place of auctions)

b. Facilities for keeping ex situ cycad collections

- Confiscated cycads
- Cycads forfeited to the state
- State-owned botanical gardens
- Privately-owned botanical gardens

c. Formal in situ conservation

d. Management plans and monitoring of wild populations

- Mechanisms to link the cycad trade with the status of wild populations
- Collaboration and co-management of cycad populations
- Trade in artificially propagated cycads grown from wild seed (allowed in terms of the provisions of CITES but under very strict conditions)
- Conservation incentives
- Section 21 company for management of cycads

e. Cycad research programme

- Management plan case studies for three different scenarios relating to land ownership
- Population and ecological studies
- Genetic work for re-introductions and augmentation of wild populations

- Research and development of technology to prove artificial propagation of large plants (e.g. carbon dating and DNA fingerprinting)
- DNA barcoding
- DNA banking for future analysis
- Resource economic assessment of the cycad trade and proposed trade restrictions (develop an economic argument for conservation and sustainable use)
- Assessment of traditional and medicinal use of cycads

f. Role of non-governmental organizations

g. Awareness campaign

- General public
- SAPS officials
- Customs officials
- Prosecutors and magistrates

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