

Non-detriment finding assessment for *Euphorbia globosa*

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Summary of findings

Euphorbia globosa is included in Appendix II of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). In terms of Article IV of the Convention, an export permit shall only be granted for an Appendix II species when a Scientific Authority of the State of export has advised that such an export will not be detrimental to the survival of that species in the wild. This document details the undertaking of a Non-Detriment Finding (NDF) assessment for *E. globosa* and is based on the best available information, current as of September 2022.

Euphorbia globosa is a rare succulent plant, restricted to a small region within the Albany Centre of Floristic Endemism in the Eastern Cape Province. The low rising shrub is slow growing and long-lived. Medium-sized individuals with canopy areas of around 95 cm² are estimated to be ca. more than 20 years old, whilst larger individuals, >500 cm² in canopy area, likely average more than 50 years in age. *Euphorbia globosa* regenerates by seed produced by reproductive individuals in early summer with recruitment linked to periods of summer rainfall. *Euphorbia* plants produce up to three seeds per fruit capsule and the ballistic mode of dispersal is generally limited to short distances. The majority of the extant *E. globosa* subpopulations consist of small to medium sized individuals, with larger individuals uncommon, and limited to no evidence of recent recruitment observed during field surveys conducted in 2018. Given that long-lived plant species typically rely on the survival of larger individuals for population persistence, the observations made in the field may be indicative of a population in decline.

The species has a limited and fragmented distribution, occurring in small subpopulations comprising between three to <500 plants and growing primarily within Karroid Scrub vegetation. Plants grow mostly in open spaces on flat hilltops, between the surrounding vegetation along pathways or, under larger plants in more disturbed areas. Plants of *E. globosa* prefer the calcium-rich, fertile epipetric calcisols and calcic luvisols found closer to the coast. The known national population comprises less than 16 subpopulations with a total of less than 2 500 individuals estimated to be remaining in the wild (based on surveys of 11 subpopulations). Owing to its limited distribution and declining population size, the species has been assigned a national status of Critically Endangered A2acd+4acd in line with the IUCN's (International Union for Conservation of Nature) Red List Categories and Criteria.

The major threats to *E. globosa* include habitat loss, fragmentation and degradation due to anthropogenic change as well as ongoing collection of wild plants to supply the horticultural market. The preferred habitat of the species co-insides with an increasingly urbanised environment within the Nelson Mandela Bay Metropolitan Municipality. As planned initiatives to develop the region progress, the species habitat is becoming increasingly fragmented and degraded with remaining patches falling in between and along

the edges of expanding human settlements and in areas zoned for industrial and coastal development. In addition, several subpopulations (including the larger ones) occur within communal areas where disturbances including cattle grazing, aloe tapping, and medicinal plant harvesting may potentially impact plant growth and recruitment. Several historical localities were found to have no plants owing to complete transformation and/or severe degradation.

Although the active removal of wild *E. globosa* specimens has not been observed, ongoing investigations into the trade and supply of the species have revealed evidence of previous and continued large scale removals of wild plants from the *E. globosa* population. South Africa is the primary exporter of the species, accounting for 66% of the global trade, but the single South African nursery responsible for the majority of the trade in the species has been implicated in the laundering of indigenous wild plants and more than 1 900 wild specimens of *E. globosa* were seized from the property in 2019. The nursery has exported more than 13 000 *E. globosa* plants between 2010 and 2018, yet a total of only 14 parental plants were counted at the nursery during an audit conducted in 2016. The continued opportunistic and targeted removals of large specimens from across the species range is suspected to have contributed to the low numbers of plants and populations currently persisting. It is likely that in the absence of immediate intervention, several of the smaller subpopulations could be lost in the near future.

Data of exports of *E. globosa* from South Africa are monitored on a regular basis, although the quality of the data is not as good as it should be owing to errors in reporting. There has been an increase in the export of the species over the years, and more than 27 500 specimens have been exported from the country since the year 2000. By far, the majority of these specimens were reported as 'artificially propagated'. Whilst most of the demand for the species is purportedly met by plants propagated in nurseries, the six local nurseries known to be exporting *E. globosa* plants do not seem to have sufficient numbers of mother plants to supply the large numbers currently in trade (ca. 1 250 plants/annum). It is thus suspected that the majority of the exports over the years have consisted largely of wild plants laundered under the guise of 'artificially propagated'. There is currently no field monitoring programme for the species.

The species and its habitat are not adequately protected, and it remains uncertain whether *E. globosa* occurs within any formally protected areas. Majority of the subpopulations are easily accessible. The species is listed as a protected plant in the Eastern Capes' Nature and Environmental Conservation Ordinance No. 19 of 1974, but this legislation is outdated and affords limited effective protection to the species at present. According to past records, only one permit has ever been issued (in 2001) for the collection of indigenous species (including *E. globosa*) from two areas that had been zoned for development within the Nelson Mandela Bay Municipality. The permit did not stipulate any restrictions on the number or size of plants to be removed, although the conditions of the permit required details of the harvest to be provided once collection had been concluded. No monitoring data or details of the offtake are available and is suspected that the permit holder has used the permit to illegally harvest plants of *E. globosa* and other indigenous flora for several years. There is currently no quota system for harvesting *E. globosa* from the wild and there is no management plan for the species. The Eastern Cape Department of Economic Development, Environment Affairs and Tourism (DEDEAT) do not have sufficient staff capacity (including the necessary skills mechanisms) or the required budget to implement existing harvest controls or to monitor exporting nurseries. Any current harvest of the species is illegal, and in the absence

of a well-managed legal harvest, no incentives for species or habitat conservation can be accrued from harvesting.

The export of *E. globosa* is currently detrimental to the survival of the species in the wild (Fig. 1 & 2). The species' biology, which is characterized by a poor dispersal ability and slow growing long-lived adults that regenerate predominantly from seed, renders *E. globosa* particularly vulnerable to overutilization. It is suspected that the demand for *E. globosa* is currently met largely by wild collected plants laundered into the trade as artificially propagated specimens. If any trade is to be considered in the future, it should be restricted to strictly artificially propagated specimens (consistent with the requirements of CITES Resolution Conf. 11.11 (Rev. CoP18)), and it should be linked to a restoration programme for the species. Significant improvements to management, control, monitoring, and protection measures would also be essential.

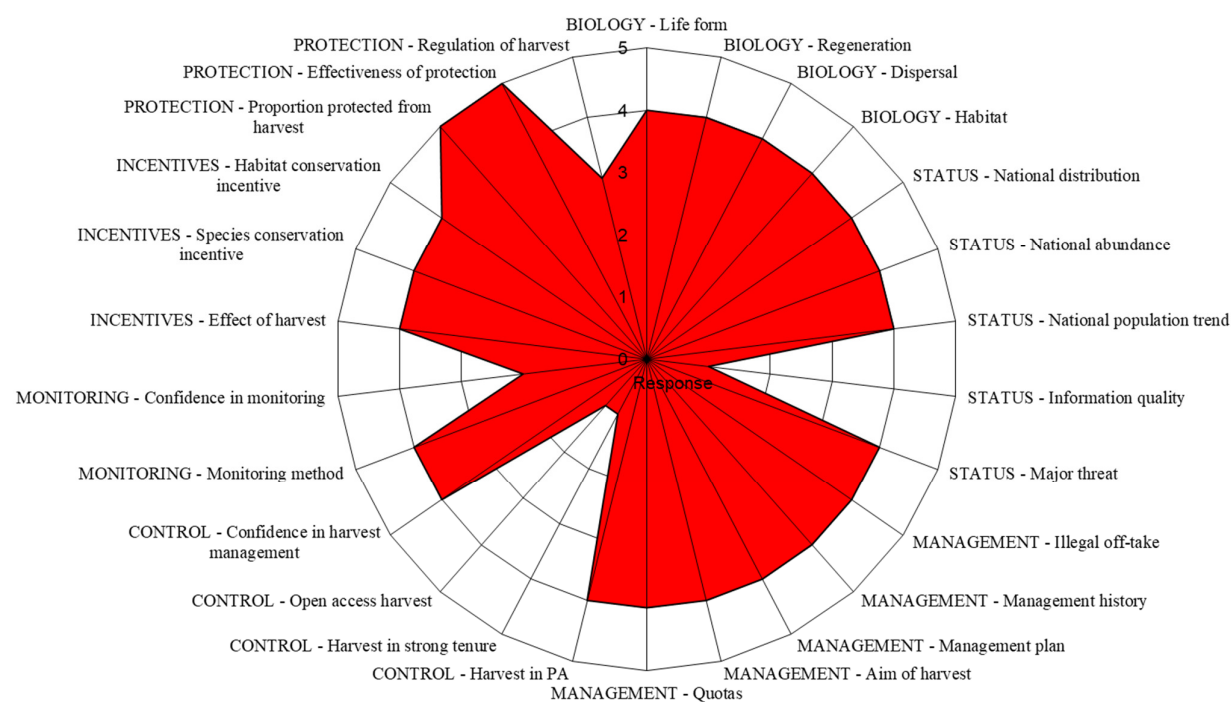


Figure 1: Radar chart summarizing the non-detriment finding assessment undertaken for *Euphorbia globosa* in accordance with the CITES NDF checklist. Explanations of scores given are detailed in Table 1. Higher scores are indicative of higher risks to the species. The extensive shaded area in the radar chart demonstrates a high risk to the species.

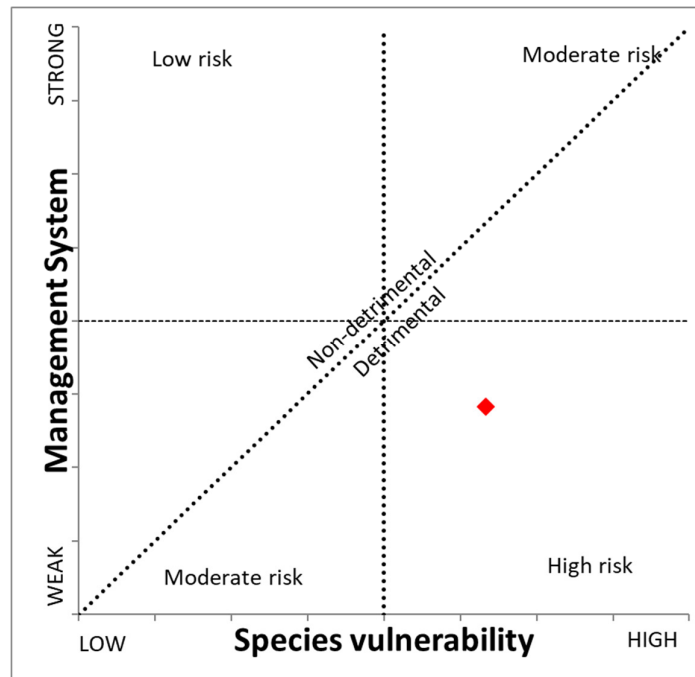


Figure 2: The risk of trading in *Euphorbia globosa* as represented by the relationship between species vulnerability (biology and status) and the strength of the management system to which the species is subjected (management, control, monitoring, incentives and protection). The figure shows that the species is at a high risk and trade is detrimental.

Table 1: Detailed NDF assessment for *Euphorbia globosa* undertaken in accordance with the CITES NDF checklist. Scores assigned to each question are indicated (bold text and shaded blocks) along with detailed explanations/justifications where relevant. Higher scores are indicative of higher risks to the species.

Biological characteristics		
1. Life form: What is the life form of the species?	Annual	1
	Biennial	2
	Perennials (herbs)	3
	Shrub and small trees (max. 12m.)	4
	Trees	5
<i>Euphorbia globosa</i> is a spineless dwarf succulent plant composed of small (2-3 cm wide) globular shaped stem bodies arising from a central subterranean caudex base (White <i>et al.</i>, 1941; Fig. 3). The mode and form of growth of this species is subject to considerable variation (Sims, 1826) dependent on conditions of the growing habitat. In the plants' natural habitat, the growing stems are typically pulled deeper underground as successive branches are produced eventually creating a mat of congested marble-like spherical bodies along the surface of the ground. The plants have tiny rudimentary leaves and the bisexual cyathia (flowering structures) emerge in solitary formation or in cymes of two or more at the apex of both short and long peduncles from the centre of each globular stem (Peirson <i>et al.</i>, 2013). Medium-sized individuals with canopy areas of around 95 cm² are estimated to be ca. more than 20 years old. Individual plants can cover areas of up to 300 mm (in diameter) each and large plants (measuring > 500 cm² in canopy area) are estimated to be more than 50 years in age. The species is slow-growing and long-lived.		
		
Figure 3: <i>Euphorbia globosa</i> plant pictured in habitat. Photo by Tasneem Variawa		
2. Regeneration potential: What is the regenerative potential of the species concerned?	Fast vegetatively	1
	Slow vegetatively	2
	Fast from seeds	3
	Slow or irregular from seeds or spores	4
	Uncertain	5
<i>Euphorbia globosa</i> reproduces sexually by means of seed produced by reproductive individuals in summer. Plants are monoecious and flowering takes place from mid-spring until early summer (October – December).		

Nectar and pollen feeding insects assist in pollination. Successful pollination gives rise to a smooth, curved, trilocular fruit capsule, carrying up to three seeds each. Once ripe, the seeds are forcefully ejected by explosive dehiscence of the capsules. Recruitment is episodic and linked to favorable environmental conditions, particularly good rainfalls. No species of succulent *Euphorbia* are known to form persistent seed banks (Milton *et al.*, 1999).

Extant subpopulations of the species are generally dominated by smaller adult plants (canopy areas 20-100 cm²) with larger plants (>100 cm²) notably absent from several populations. Small numbers of juveniles were observed in just 30% of subpopulations during recent field surveys (Variawa, 2019).

3. Dispersal efficiency: How efficient is the species' dispersal mechanism?	Very good	1
	Good	2
	Medium	3
	Poor	4
	Uncertain	5

Seeds of *Euphorbia* species are dispersed primarily through the mechanism of ballistic dispersal which is generally limited to a distance within a few meters (typically <10 m) around the mother plant (Stamp and Lucas, 1990; Narbona *et al.*, 2005; Tamme *et al.*, 2014). Secondary dispersal by ants (i.e. myrmecochory) has not been assessed for the species, although this process has been discounted for several closely related *Euphorbia* species due to the absence of elaiosomes (i.e. nutrient rich seed coat) on seeds (Jabar, 2019). The less than 10 m dispersal radius estimated for *E. globosa* seed has been observed in several other shrublet *Euphorbia* species (Narbona *et al.*, 2005; Martins, 2010; Jabar, 2019) and is supported by the patchy and clumped pattern of dispersion of plants observed in surveyed subpopulations.

4. Habitat: What is the habitat preference of the species?	Disturbed open	1
	Undisturbed open	2
	Pioneer	3
	Disturbed forest	4
	Climax	5

Euphorbia globosa habitat falls within the Albany Center of Floristic Endemism in the Albany Thicket biome. The species is deemed to be a habitat specialist, preferring calcium-rich, fertile epipetric calcisols and calcic luvisols found closer to the coast. The species distribution appears to be restricted by landscape level factors including soils, geology, altitude and vegetation type. Whilst climatic variables have a less marked impact on the species distribution, plants are sensitive to variation in total monthly precipitation over the course of the year, thriving in areas where variation is low. Populations occur from sea level to 150 meters above sea level and plants are most commonly found growing in open spaces on flat, stoney hilltops amongst the surrounding vegetation, sometimes within the shrub cover of larger plants. The surrounding vegetation is dominated by low to medium sized shrubs (L. Strydom- Environmental Scientist, SRK consulting, pers. comm.) within the Sundays Valley Thicket, Motherwell Karroid Thicket and Albany Alluvial Vegetation types (Mucina and Rutherford, 2006). The species is able to withstand some amount of disturbance but thrives in open areas where disturbance is limited. Approximately 9% of the natural habitat of the Albany Thicket biome has been lost to anthropogenic land uses – croplands (6.6%) & human settlements (1.6%) – and 45% of the biome is in a moderate to severely degraded state (Skowno *et al.*, 2019). Thicket vegetation and the services it delivers can however reportedly be reestablished by the practice of planting cuttings harvested from spekboom (*Portulacaria afra*) shrubs (Mills *et al.*, 2009). Planted cuttings readily take root in suitable areas and a healthy stand of spekboom can be established within several years. As the re-established spekboom plants grow and begin to restore the vegetation structure, other shrubs and trees are able to establish and thicket recovers with time (the full complement of thicket shrub and tree species is able to establish within some 50 years, Mills *et al.*, 2009). The restoration procedure is nevertheless very labour intensive and there

is little evidence of post-disturbance recovery to a thicket type approximating the pristine state of undisturbed sites (Lloyd *et al.*, 2002).

National status

5. National distribution: How is the species distributed nationally?	Widespread, contiguous in country	1
	Widespread, fragmented in country	2
	Restricted and fragmented	3
	Localized	4
	Uncertain	5

Euphorbia globosa has a limited and fragmented distribution across a small area within the Albany Thicket biome of the Eastern Cape province in South Africa (Fig. 4). Distances between subpopulations range from less than 1 km to just under 25 km. The species extent of occurrence (EOO) is estimated to be around 480 km² with subpopulations occupying an area (AOO) no larger than 25 km².



Figure 4: Distribution of *Euphorbia globosa* within the Eastern Cape Province of South Africa

6. National abundance: What is the abundance nationally?	Very abundant	1
	Common	2
	Uncommon	3
	Rare	4
	Uncertain	5

The total population is estimated to consist of less than 2 500 mature individuals (Variawa, 2019). The known subpopulations are small, comprising between three and less than 500 individuals, and severely fragmented, with plants usually present only in clumps within pockets of remaining suitable habitat across the broader region.

7. National population trend: What is the recent national population trend?	Increasing	1
	Stable	2
	Reduced, but stable	3
	Reduced and still decreasing	4
	Uncertain	5

Several subpopulations have been extirpated in the past due to urban development. Habitat loss and fragmentation is likely to continue across the species distribution range. The ongoing trade in the species,

coupled with the lack of artificially propagated stocks in local nurseries, suggest that past and present removals of wild plants have also contributed to the decline in the population size. Most recently, 1 900 wild *E. globosa* plants were seized from a succulent nursery in the Port Elizabeth area (L. Jabar – Analyst: Biodiversity Enforcement, Department of Forestry, Fisheries and the Environment (DFFE), pers. comm.). Whilst there are several healthy subpopulations extant in communal rangelands, other subpopulations are small and are likely experiencing a continuous decline (Variawa, 2019). Patterns observed during field surveys revealed that less than thirty percent of the subpopulations showed signs of recent recruitment, with juvenile plants present. Larger, more well-established plants were also not common.

The species has recently been uplisted from a status of Endangered (B1ab(ii,iii,v)) to Critically Endangered (A2acd+4acd) owing to observed high levels of exploitation coupled with the decline in the quantity and quality of its habitat (Mhlongo and Variawa, 2022).

8. Quality of information: What type of information is available to describe abundance and trend in the national population?	Quantitative data, recent	1
	Good local knowledge	2
	Quantitative data, outdated	3
	Anecdotal information	4
	None	5

A recent field resource assessment and audits of nurseries trading in *E. globosa* conducted by the South African National Biodiversity Institute (SANBI) in 2018 and 2016 respectively, has provided data on the estimated size and condition of 11 extant subpopulations and is likely to be a fair representation of the overall status of the national population.

9. Major threats: What major threat is the species facing (underline following: <u>overuse/ habitat loss and alteration/ invasive species/ other</u>) and how severe is it?	None	1
	Limited/Reversible	2
	Substantial	3
	Severe/Irreversible	4
	Uncertain	5

The major threats to *E. globosa* include illegal collection of wild plants for the succulent horticultural trade as well as habitat loss, fragmentation, and habitat degradation due to increased human activity across the species range. Many of the small subpopulations are found in between and along the edges of expanding human settlements, as well as in areas zoned for industrial and coastal development, whilst several other subpopulations (including the larger ones) occur within communal areas where cattle grazing, aloe tapping, and medicinal plant harvesting takes place. Incidences of trampling can be high in these areas, though potential effects on plant growth and reproductive output have not been assessed. The species appears able to withstand some amount of disturbance, but several historical localities were found to have no plants owing to complete transformation and/or severe degradation. Ongoing removals of large plants from several localities may have contributed to the depauperate state of some of the remaining subpopulations. The species is not difficult to grow outside of its natural distribution, but the characteristic globular stems of the plants typically become elongated and less compact under cultivation and thus wild-grown plants may still often be preferred. Most recently, 1 900 wild *E. globosa* plants were seized from a succulent nursery in the Port Elizabeth area, almost as many as the estimated population size remaining in the wild.

Harvest management

10. Illegal off-take or trade: How significant is the national problem of illegal or unmanaged off-take or trade?	None	1
	Small	2
	Medium	3
	Large	4
	Uncertain	5

Although direct signs of wild plant collection were not observed during the most recent field assessments, ongoing investigations into the trade and supply of the species have revealed indications of previous and continued large scale removals of wild plants from the *E. globosa* population. A single nursery operational in the Eastern Cape Province has exported some 13 033 specimens of *E. globosa* over a nine-year period (2010-2018); equating to around 1 500 plants per year. Although all shipments have and continue to be reported as that of artificially propagated plants, the nursery owners have been unable to provide evidence of sufficient parental stock to be able to produce the large quantities in trade – a mere 14 parental plants were available at the nursery in 2016 (Mhlongo, 2016). In addition, more than 1 900 specimens of suspected wild origin were seized from this facility in May of 2019 as part of an ongoing investigation (L. Jabar, pers. obs.). It is highly likely that the plant stocks seen in this nursery as well as previous shipments from this facility have consisted entirely of, or have been supplemented with wild plants, and that the continued removal of large individuals has contributed to the localized near extinctions and depauperate state of subpopulations across the species' range. An additional five exporting nurseries were also unable to produce an adequate number of mother plants and only one nursery was able to provide proof of legal acquisition of their stock (Mhlongo, 2016). The Eastern Cape Department of Economic Development, Environment Affairs and Tourism (DEDEAT) have only ever issued one permit for the collection of indigenous species (including *E. globosa*) from certain (municipal) areas zoned for industrial and urban development around Port Elizabeth in 2001. Activities under this permit have however not been monitored, and it is suspected that a number of wild *E. globosa* plants as well as other endemic flora have been continually and fraudulently collected under this permit in the absence of any oversight or control.

11. Management history: What is the history of harvest?	Managed harvest: ongoing with adaptive framework	1
	Managed harvest: ongoing but informal	2
	Managed harvest: new	3
	Unmanaged harvest: ongoing or new	4
	Uncertain	5

Euphorbia globosa is listed as a protected plant species in the Eastern Capes' Nature and Environmental Conservation Ordinance No. 19 of 1974. No person may pick any protected plant without a permit from the provincial conservation authority or in the absence of written landowner permission when such a plant occurs on privately owned land (except in the case where a person is the owner of such land (or a relative of such owner and any fulltime employee of such owner acting on the instructions or with the consent of the owner)). The DEDEAT has only ever issued one permit for the collection of indigenous species (including *E. globosa*) from certain areas zoned for industrial and urban development around Port Elizabeth in 2001. The permit holder was required to submit to DEDEAT data on the species and the number of plants collected, but it appears that this permit condition was never complied with. The DEDEAT is limited in its capacity to monitor and inspect nurseries, and certainly the nursery that has been responsible for large volumes of export of *E. globosa* has apparently been exporting wild collected plants under the guise of "artificially propagated" for several years and to the detriment of the wild population. Unmanaged and illegal collection of individual plants for the horticultural trade has been ongoing in a manner that is unsustainable.

12. Management plan or equivalent: Is there a management plan related to the harvest of the species?	Approved and co-ordinated local and national management plans	1
	Approved national/state/provincial management plan(s)	2
	Approved local management plan	3
	No approved plan: informal unplanned management	4
	Uncertain	5

There is no management plan for the species.

13. Aim of harvest regime in management planning: What is harvest aiming to achieve?	Generate conservation benefit	1
	Population management/control	2
	Maximize economic yield	3
	Opportunistic, unselective harvest, or none	4
	Uncertain	5
Harvest of wild plants is opportunistic and for the personal benefit (financial gain) of the harvester.		
14. Quotas: Is the harvest based on a system of quotas?	Ongoing national quota: based on biologically derived local quotas	1
	Ongoing quotas: "cautious" national or local	2
	Untried quota: recent and based on biologically derived local quotas	3
	Market-driven quota(s), arbitrary quota(s), or no quotas	4
	Uncertain	5
There is currently no quota system for harvesting <i>E. globosa</i> from the wild.		
Control of harvest		
15. Harvesting in Protected Areas: What percentage of the legal national harvest occurs in State-controlled Protected Areas?	High	1
	Medium	2
	Low	3
	None	4
	Uncertain	5
There is no legal harvest of <i>E. globosa</i> in South Africa at present. The species has not yet been confirmed to occur in any formally protected areas.		
16. Harvesting in areas with strong resource tenure or ownership: What percentage of the legal national harvest occurs outside Protected Areas, in areas with strong local control over resource use?	High	1
	Medium	2
	Low	3
	None	4
	Uncertain	5
There is no legal harvest of <i>E. globosa</i> in South Africa at present. Majority of the species populations occur on municipal and communal lands with one subpopulation known to occur on a privately owned piece of land. The species is listed as a protected plant in the Eastern Capes' Nature and Environmental Conservation Ordinance No. 19 of 1974. The DEDEAT have only ever issued one permit for the collection of indigenous species (including <i>E. globosa</i>) from certain (municipal) areas zoned for industrial and urban development around Port Elizabeth in 2001. Activities under this permit have however not been monitored, and although historical harvest was legal, it is suspected that a number of wild <i>E. globosa</i> plants as well as other endemic flora have been continually and fraudulently collected under this permit in the absence of any oversight or control.		
17. Harvesting in areas with open access: What percentage of the legal national harvest occurs in areas where there is no strong local control, giving <i>de facto</i> or actual open access?	None	1
	Low	2
	Medium	3
	High	4
	Uncertain	5

There is no legal harvest of *E. globosa* in South Africa at present. Majority of the species populations occur on municipal and communal lands. The species is listed as a protected plant in the Eastern Capes' Nature and Environmental Conservation Ordinance No. 19 of 1974 and DEDEAT have only ever issued one permit for the collection of indigenous species (including *E. globosa*) from certain (municipal) areas zoned for industrial and urban development around Port Elizabeth in 2001.

18. Confidence in harvest management: Do budgetary and other factors allow effective implementation of management plan(s) and harvest controls?	High confidence	1
	Medium confidence	2
	Low confidence	3
	No confidence	4
	Uncertain	5

Capacity within the conservation sector across the country is an ongoing challenge. Apart from the limited number of staff (and budget) available to manage and monitor species, scientists and practitioners are presently ill-equipped to deal with the evolving pressures put on the country's biodiversity - for example, it is increasingly difficult to detect instances of poaching, smuggling and laundering of succulent plants (that is facilitated largely by the internet and rapidly developing social media platforms) with existing mechanisms. Although the species is protected in the terms set out in the protected plant in the Eastern Capes' Nature and Environmental Conservation Ordinance No. 19 of 1974; the implementation of harvest controls as well as any efforts to monitor the status of wild plant populations or any illegal activities involving the species is limited. The department have only ever issued one permit for the collection of indigenous plant species (including *E. globosa*) from certain areas zoned for industrial and urban development around Port Elizabeth in 2001. Activities under this permit have however not been monitored, and it is suspected that a number of wild *E. globosa* plants as well as other endemic flora have been continually and fraudulently collected under this permit in the absence of any oversight or control including across wider areas beyond what had been authorized.

Monitoring of harvest

19. Methods used to monitor the harvest: What is the principal method used to monitor the effects of the harvest?	Direct population estimates	1
	Quantitative indices	2
	Qualitative indices	3
	National monitoring of exports	4
	No monitoring or uncertain	5

Exports of *E. globosa* from South Africa (extracted from the CITES Trade Database, UNEP World Conservation Monitoring Centre, Cambridge, UK) are monitored by the South African National Biodiversity Institute (SANBI) on behalf South Africa's Scientific Authority. South Africa is the primary exporter of the species, responsible for 66% of the global trade. According to the CITES trade records, around 27 532 specimens have been exported from the country since the year 1983, with 95% exported within the last two decades. Of these exports, less than 600 (0.02%) specimens were reported as sourced from the wild (on three separate occasions in 2000, 2003 and 2011). DEDEAT has confirmed that there was a part-duplicating error on their side in 2011 and that the 500 plants exported to Germany during that year was incorrectly reported as 'wild collected'. According to the provincial permit records, all plants that have been exported are "mature cultivated" and CITES permits have been issued for all legal exports and reported as 'artificially propagated'. Audits of nurseries trading in the species have however revealed that wild plants are being laundered into the international trade, this finding supported by the observation that local exporting nurseries currently do not have the capacity to supply an international demand for the species.

Subsequent to a peak in exports between 2005 and 2011, international trade in *E. globosa* from South Africa appears to have stabilized, with annual exports of between one and 1000 plants (average of 630) exported since 2012 (Fig, 5). Belgium is by far the greatest consumer of this species, accounting for more than 75%

of all imports from South Africa followed by the Germany (21%) and Japan (1%). Further analyses of the trade data also show a recent trend of large supplies coming out of the Netherlands and Taiwan, with these countries having exported large quantities of *E. globosa* (9 724 and 2 496 plants respectively) over a period of five years between 2016 and 2020.

There is currently no field monitoring programme for the species.

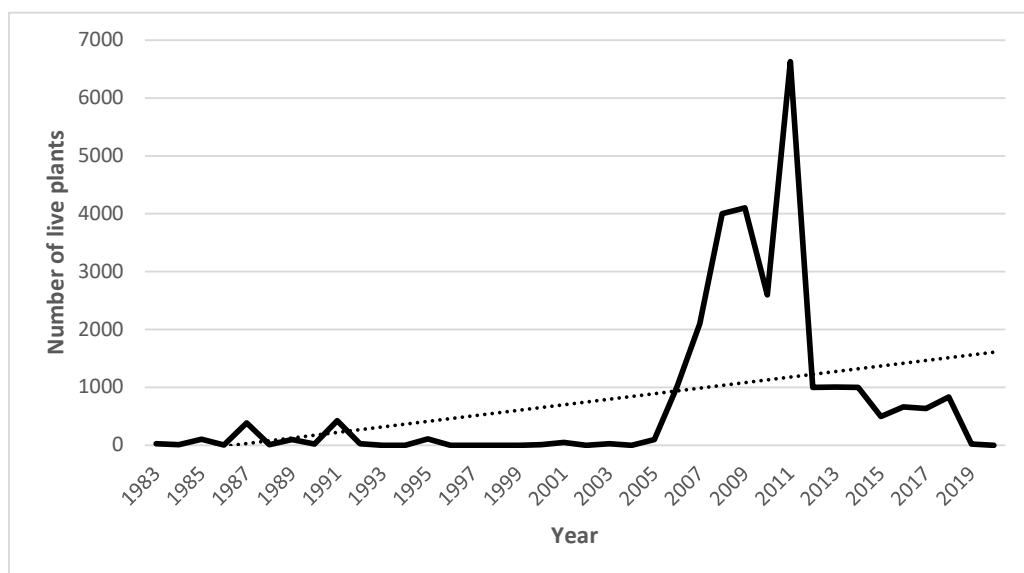


Figure 5: Gross exports of live *Euphorbia globosa* plants from South Africa (with trend in trade over time indicated by the dashed line). An average of 1 252 plants ($\pm$ SD 1743.70) have been exported annually since the year 2000 (up to 2020).

20. Confidence in harvest monitoring: Do budgetary and other factors allow effective harvest monitoring?	High confidence	1
	Medium confidence	2
	Low confidence	3
	No confidence	4
	Uncertain	5
Trade data are regularly extracted from the CITES Trade Database (UNEP World Conservation Monitoring Centre, Cambridge, UK) and analysed. The quality of the data is not always as good as it should be owing to errors and inconsistencies in reporting by both exporting and importing countries. Lack of monitoring across local nursery facilities also undermines the accuracy of the trade data as some nurseries have been known to take advantage of poor oversight loopholes by mis-declaring wild plants of many species as artificially propagated. With an increase in the illegal collection and laundering of wild succulents noted across the country in recent years, provincial conservation authorities are now more aware of the issue and understand the need to commit more resources towards increased and improved monitoring efforts of local exporting nurseries.		
Incentives and benefits from harvesting		
21. Utilization compared to other threats: What is the effect of the harvest when taken together with the major threat that has been identified for this species?	Beneficial	1
	Neutral	2
	Harmful	3
	Highly negative	4
	Uncertain	5

It is suspected that continued large scale removals of wild plants (and possibly entire subpopulations) have contributed to the current depauperate state of the *E. globosa* population, which has further aggravated the impacts from ongoing habitat loss and fragmentation on the species. The removal of large plants is particularly harmful owing to the importance of these long-lived plants for population persistence.

The single South African nursery responsible for the majority of the trade in the species has recently been implicated in the laundering of indigenous wild plants, and more than 1 900 wild specimens of *E. globosa* were seized from the property in 2019.

22. Incentives for species conservation: At the national level, how much conservation benefit to this species accrues from harvesting?	High	1
	Medium	2
	Low	3
	None	4
	Uncertain	5

There is no legal harvest of *E. globosa* in South Africa at present and thus any conservation incentives associated with a well-managed wild harvest cannot be generated.

23. Incentives for habitat conservation: At the national level, how much habitat conservation benefit is derived from harvesting?	High	1
	Medium	2
	Low	3
	None	4
	Uncertain	5

There is no legal harvest of *E. globosa* in South Africa at present and thus any conservation incentives associated with a well-managed wild harvest cannot be generated.

Protection from harvest

24. Proportion strictly protected: What percentage of the species' natural range or population is legally excluded from harvest?	>15%	1
	5-15%	2
	<5%	3
	None	4
	Uncertain	5

All known subpopulations of *E. globosa* fall outside of protected areas. Although pockets of marginally suitable habitat are projected to fall within one or two formally protected areas, it has not yet been confirmed if any subpopulations actually occur there.

The species may be confused with *Euphorbia tridentata*, another Eastern Cape endemic dwarf succulent that closely resembles *E. globosa* through its thick cylindrical re-branching bodies that also arise from an underground main stem, and thus reports of *E. globosa* occurring within any protected areas around the Eastern Cape will need to be properly verified.

25. Effectiveness of strict protection measures: Do budgetary and other factors give confidence in the effectiveness of measures taken to afford strict protection?	High confidence	1
	Medium confidence	2
	Low confidence	3
	No confidence	4
	Uncertain	5

There appears to be no incentives/ urgency to safeguard the species or its habitat at this time. Should *E. globosa* be present within a protected area, it is uncertain whether this would confer any adequate protection to the species.

26. Regulation of harvest effort: How effective are any restrictions on harvesting (such as age or size, season or equipment) for preventing overuse?	Very effective	1
	Effective	2
	Ineffective	3
	None	4
	Uncertain	5
The provincial conservation legislation is outdated, providing limited protection to the species at present. The species is listed as a protected plant in the terms set out by the Eastern Capes' Nature and Environmental Conservation Ordinance No. 19 of 1974. Harvest is allowed under permit or with written landowner permission when plants occur on privately owned land. It is difficult to enforce the current regulations owing to limited resources, including in respect to relevant skillsets, mechanisms and budget, within DEDEAT. The DEDEAT has only ever issued one permit for the collection of indigenous species (including <i>E. globosa</i>) from certain areas zoned for development in 2001. The permit did not stipulate any restrictions on the number or size of plants to be removed, although the conditions of the permit required details of the harvest to be provided once collection had been concluded. No monitoring data or details of the offtake are available, and it is suspected that the permit holder has actively flouted the conditions of the permit for several years.		

List of participants

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7. Ruida Stanvliet – Conservation Scientist (CapeNature)
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