Non-detriment finding assessment for *Euphorbia umfoloziensis*

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Summary of findings

Euphorbia umfoloziensis 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 *Euphorbia umfoloziensis* and is based on the best available information, current as of December 2021.

Euphorbia umfoloziensis is a dwarf, spiny succulent plant known from just two areas near a single river valley in the KwaZulu-Natal Province of South Africa. Owing to its limited number of known locations and restricted area of occupancy, the species has been assigned a conservation status of Vulnerable (D2). However, neither of the described subpopulations could be located during recent field surveys and it has been postulated that the species is now possibly extinct in the wild (existing only in cultivation).

Not much detail is available on the biology and ecology of *E. umfoloziensis*. It is deemed to be a slow growing and long-lived species with large adult individuals (measuring up to 40 cm in diameter), estimated to be between 30 and 50 years of age. The species in known to regenerate from seed produced by reproductive individuals in late winter - spring. *Euphorbia* plants produce up to three seeds per fruit capsule and the ballistic mode of dispersal is generally limited to short distances. *Euphorbia umfoloziensis* has been described to occur in Valley Bushveld vegetation where groups of plants have been found to grow within quartzite ridges in a well-drained sandy loam on the northern slopes of hills within the river valleys. There is no population data for the species and all available information on *E. umfoloziensis* comes from the initial species description made in 1991.

Habitat degradation due to trampling and overgrazing, as well as collector pressure were identified as likely threats to the species when it was first described. More recently, habitat loss and degradation due to anthropogenic activities were identified within the species purported range of occurrence. The scale and impact of these identified past and ongoing potential threats remains uncertain at this time. Whilst it is not possible to state for certain, there is a high likelihood that this species may have been harvested to very low numbers across known sites as high values are often placed on rarer species. The national population trend is at this stage unclear.

Owing to its attractive growth form, restricted geographic range, and natural rarity, the species is deemed to be a high value, sought after plant amongst specialist collectors. The species is available in cultivation to a limited extent and a moderate but consistent international trade in *E. umfoloziensis* has been noted over the past three decades (CITES Trade Database, UNEP World Conservation Monitoring Centre,

Cambridge, UK). Data for exports of *E. umfoloziensis* 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. A total of 1 781 live plants have been exported from South Africa since the year 1990 (including 230 specimens within the first two years of the species being formally described). All plants exported during this time have been reported as artificially propagated specimens. There is only one local nursery known to be trading in the species and their stocks have been propagated from ten plants that were initially collected from the wild with the permission of the landowner(s). Limited data suggest that current artificially propagated stocks are sufficient to meet the present annual international demand for the species (ca. 56 plants/annum). Although the *E. umfoloziensis* sale plants assessed at the exporting nursery did not display any wild characteristics (and were mostly juvenile plants), some local succulent nurseries have, in the past, been found to launder wild collected plants (of *Euphorbia* and other succulent plant species) into the legal trade, passing them off as artificially propagated. Provincial conservation authorities do not always have the necessary oversight, time, or skills required to address this issue. In the case of *E. umfoloziensis*, Ezemvelo KZN Wildlife officials are reportedly not familiar with the plant and there has been no management or monitoring of the species populations to date.

Given that the exact localities of the *E. umfoloziensis* subpopulations remain unknown, it is uncertain whether or not the species occurs in any formally protected areas. *Euphorbia umfoloziensis* is considered a protected indigenous plant in terms of Schedule 11 of the KwaZulu-Natal Nature Conservation Ordinance [No. 15 of 1974]. The current legislation is unfortunately outdated, providing limited/weak protection to the species at present. Collection of protected plants within state and private nature reserves, as well as along any public road (or within the road reserve), requires a permit from the relevant conservation authority. Landowner permission is also required to gather plants on privately owned (reserve and non-reserve) lands but no additional provisions or restrictions are made with regard to the gathering of protected indigenous plants (outside of these areas) within the ordinance. Ezemvelo KZN Wildlife do not have sufficient nor adequate staff capacity or the required budget and mechanisms to enact the relevant prohibitions particularly as it relates to monitoring populations and detecting any illegal activities involving the harvest and trade of the species. There are, nevertheless, no records of permits having been issued for the collection of *E. umfoloziensis* plants from anywhere in the province. Levels of harvest are presently unknown, and any previous or ongoing offtake remains unmanaged, occurring with no oversight. In the absence of a well-managed legal harvest, no incentives for species or habitat conservation can be accrued from harvesting.

Trade in *E. umfoloziensis* is detrimental at present (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. umfoloziensis* particularly vulnerable to overutilization. As this species is extremely limited in its distribution, wild harvesting of even a few individuals might have had negative impacts on the survival of this species and thereby increased its risk of extinction. The apparent disappearance of *E. umfoloziensis* from its historical range should raise concerns regarding the source of the plants being exported from the country. The demand for *E. umfoloziensis* appears to be largely met by plants propagated in a single South African nursery. These plants cannot, however, be deemed to be artificially propagated as they are not consistent with the definition in CITES Resolution Conf. 11.11 (Rev. CoP18) – specifically, the establishment of the mother stock is likely to have been detrimental to the wild

population. If any trade is to be considered in the future, it should be linked to a restoration programme for the species.

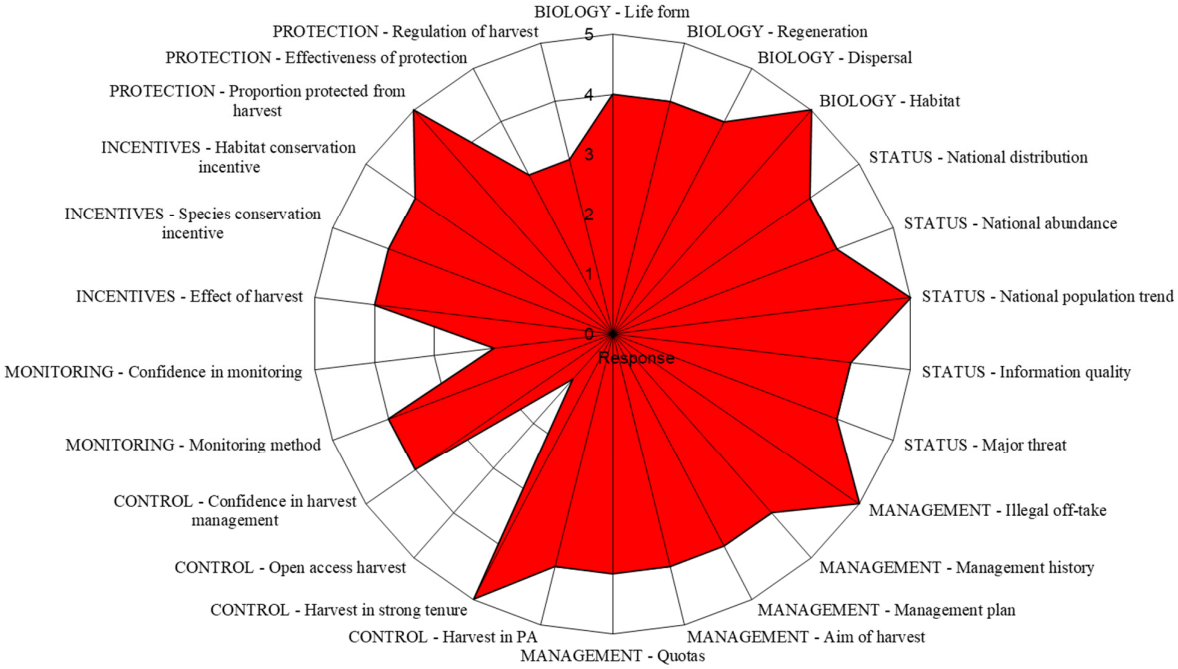

Figure 1: Radar chart summarizing the non-detriment finding assessment undertaken for *Euphorbia umfoloziensis* in accordance with the CITES NDF checklist. Explanations of scores given are detailed in Table 1. Higher scores are indicative of higher risks to the species. The extensive shaded area in the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

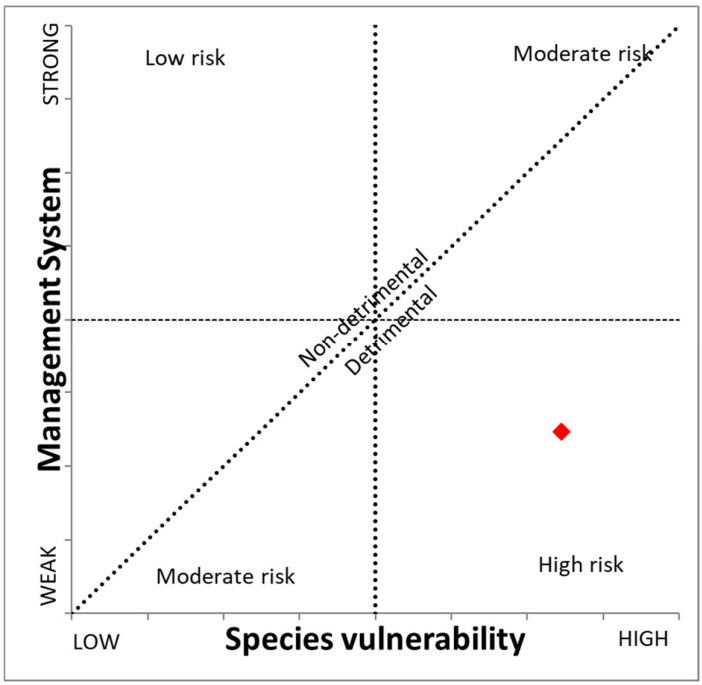

Figure 2: The risk of trading in *Euphorbia umfoloziensis* as represented by the relationship between species vulnerability (biology and status) and the strength of the management system to which the species is subjected (management, control, monitoring, incentives and protection). The figure shows that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

Table 1: Detailed NDF assessment for *Euphorbia umfoloziensis* 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

Euphorbia umfoloziensis is a dwarf, spiny succulent plant with a tuberous root and main stem that forms a large subterranean body (Peckover, 1991; Fig. 3). The taproot system can be up to 300 mm long, up to 100 mm thick, and is seldom branched but occasionally produces secondary roots that may grow near the soil surface. The main stem, which crests the root, is often branched sideways to form several heads that are separated from the root by extended depressions where old branches have fallen off. Some 10 - 20 aerial stems (~50 – 80 mm long and 25 – 40 mm thick) are borne from the stem apex. These stems are 3 - 5 angled, constricted at intervals, not twisting and are a bluish green in colour with lighter green markings. The plant has pronounced tubercles each with a pair of spines that are thin, V-shaped, 5 – 10 mm long and sometimes with tiny basal prickles present. *Euphorbia umfoloziensis* produces numerous inflorescences from new stem growths with individual, solitary, canary-yellow, male or bisexual cyathia forming from each flowering eye. The species is deemed to be slow-growing and long-lived with plants previously observed in habitat - measuring up to 40 cm in diameter and comprising around 5 individual heads - estimated to be between 30 - 50 years old (R. Peckover- Specialist grower and succulent nursery owner, pers. comm.).

Figure 3: *Euphorbia umfoloziensis* plant pictured in cultivation. Photo by Nokukhanya Mhlongo

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

Biological information for *E. umfoloziensis* is very limited, but succulent *Euphorbia* species are generally characterized as having long-lived adults that regenerate predominantly from seed. The species is thought to flower in late winter. Seed capsules of *Euphorbia* species are trilocular, carrying up to three seeds each. The seeds are forcefully ejected by explosive dehiscence of the seed capsules when ripe. Recruitment is episodic and no succulent *Euphorbia* species are known to maintain persistent seed banks (Milton *et al.,* 1999). In cultivation, fresh seeds germinate readily with plants taking up to three years (at which point they measure around 10 cm^2) to reach maturity (R. Peckover, pers. comm.).

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 within a few meters (typically <10m) 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 observed 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 emergent seeds (Jabar, 2019).

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

The species has been described as occurring in Valley Bushveld vegetation within the Savanna biome (Peckover, 1991). More precisely however, the two known subpopulations are thought to occur within the Zululand Lowveld and the Northern Zululand Sourveld vegetation types (Mucina and Rutherford, 2006). These vegetation types are deemed to be Vulnerable (≤60% remaining natural habitat), fully protected and Least Threatened (>60% natural habitat remaining), poorly protected respectively (Jewitt, 2018). Within these areas, plants have been found growing at low altitudes in groups on exposed outcrops of quartzite ridges in a well-drained sandy loam on northern aspects. In one locality, plants were found growing in similar conditions along the hills within a river valley (Peckover, 1991). Mean annual precipitation of the region is between 500 – 1 050 mm/year with daily temperatures reaching close to 40°C in the summer. The limited known distribution of the species suggests that *E. umfoloziensis* has very specific habitat requirements. Habitat restoration and species recovery within delicately balanced mesic savanna ecosystems can be complicated and may take many years, requiring the restoration of the geomorphology and soil properties of an area with the subsequent re-introduction of natural disturbances including fire and herbivory (Buisson *et al*., 2019). Furthermore, niche requirements of habitat-specific species are unlikely to be restored to a state that supports that species following damaging disturbance events and, in the case of savanna ecosystems, conservation is preferred over restoration. Approximately 26% of Zululand Sourveld and 22% of the Lowveld have been transformed by cultivation activities (Mucina and Rutherford, 2006).

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 umfoloziensis is a South African endemic with a very restricted geographic distribution and is known from just two localities in the northern part of KwaZulu-Natal (Peckover, 1991, Fig. 4).

Figure 4: Distribution of *Euphorbia umfoloziensis* within the KwaZulu-Natal Province of South Africa

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

Given the restricted distribution of the species, *E. umfoloziensis* is deemed to be a naturally rare plant comprising only two known subpopulations. Exact locality details are lacking and no plants could be detected during field surveys conducted across the reported distribution range of the species in 2017 and 2018 (Mhlongo, 2020). The plant was first described in 1991 and herbarium records for the species are sparse with only two known specimen collections from 1941 (Bolus Herbarium) and 1994 (Walter Sisulu National Botanical Garden). Conservation officials in the KwaZulu-Natal Province have reportedly never encountered the species. The species was never known to be widespread and there is a high likelihood that the plant may now be extinct in the wild, although further field surveys will be needed to confirm this (Mhlongo, 2020).

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**

The species was last assessed as Vulnerable (D2) owing to the limited number of known locations and restricted area of occupancy (Von Staden, 2008). The population was thought to be stable at the time of the assessment with habitat degradation as a result of overgrazing and trampling noted as a potential threat. Despite recent field searches for the species, neither of the two known *E. umfoloziensis* subpopulations could be found (Mhlongo, 2020).

8. Quality of information: What type of information is available to describe	Quantitative data, recent	1
	Good local knowledge	2
	Quantitative data, outdated	3

abundance and trend in the national population?	**Anecdotal information**	**4**
	None	5

Despite recent field research undertaken for the species (Mhlongo, 2020), estimates of abundance and trends could not be ascertained as no plants could be located across the species reported range of occurrence. Conservation authorities in the KwaZulu-Natal Province also do not have any data for the species and all available details on the two known subpopulations is based on limited information from 1991 (Peckover, 1991).

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

The populations of *E. umfoloziensis* were postulated to be facing the likely threat of habitat degradation due to trampling of seedlings and overgrazing (Von Staden, 2008; Peckover, 1991). Peckover (1991) further suggested that the most direct threat to this species would probably be collection pressure by specialist collectors. Most recently, habitat loss and degradation due to anthropogenic activities were noted within the reported distribution area of the species (including housing developments, forestry plantations as well as agricultural and mining activities; Mhlongo, 2020). Although the scale of these identified ongoing and potential threats remains uncertain at this time, the impact of habitat degradation and transformation across the region is deemed to be irreversible.

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**

Peckover (1991) listed collector pressure as the most serious potential threat to *E. umfoloziensis*. Whilst it is not possible to state for certain, there is a high likelihood that this species may have been harvested to extinction in certain areas as high values are often placed on rarer species (Courchamp *et al.,* 2006). Furthermore, several wild specimens have been noted in the single nursery exporting the species, although these were reportedly obtained in a legal manner with landowner permission (Mhlongo, 2020). Whether or not the nursery applied for the relevant provincial export permits remains uncertain at this time. A total of ~1 741 plants have been legally exported from South Africa since the year 1990, including 370 specimens within the first five years of the species being formally described (i.e. 1991-1995). All exported specimens have thus far been reported as artificially propagated and there is currently no data or evidence available on illegal offtake and/or trade.

The species does not appear to be widely available and the online retail price for individual *E. umfoloziensis* plants averages around R684±1089 per plant, indicating the high value of this rare species (Mhlongo, 2020).

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

There has been no formal management of wild harvesting of *E. umfoloziensis* to date. The single nursery known to be trading in the species, grow their stocks from wild plants collected on privately owned land in

the early 80s with permission obtained from the landowner. The species is considered a protected indigenous plant in terms of Schedule 11 of the KwaZulu-Natal Nature Conservation Ordinance [No. 15 of 1974]. Collection of such plants within state and private nature reserves, as well as along any public road (or within the road reserve), requires a permit from the relevant conservation authority. No additional provisions or restrictions are made with regard to the gathering of protected indigenous plants (outside of these areas) within the ordinance, but landowner permission is required to gather plants on privately owned (reserve and non-reserve) lands (C. Carbutt – Plant Scientist, Ezemvelo KZN Wildlife, pers. comm.). No permits have ever been issued for the collection of *E. umfoloziensis* plants from anywhere in the province. Any offtake at present is unmanaged with no oversight and the harvest is taken in a purely opportunistic manner.		
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
Wild collecting is opportunistic and for the personal benefit 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 *E. umfoloziensis* 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
The species is considered a protected indigenous plant in terms of Schedule 11 of the KwaZulu-Natal Nature Conservation Ordinance [No. 15 of 1974]. Collection of such plants within state and private nature reserves, as well as along any public road (or within the road reserve), requires a permit from the relevant conservation authority. Ezemvelo KZN Wildlife have never issued any permits for the collection of *E. umfoloziensis* plants		

from anywhere in the province and they generally would not issue permits for wild plant collection within any 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**

The percentage of legal harvest in the country is unknown. The species is considered a protected indigenous plant in terms of Schedule 11 of the KwaZulu-Natal Nature Conservation Ordinance [No. 15 of 1974]. Collection of such plants within state and private nature reserves, as well as along any public road (or within the road reserve), requires a permit from the relevant conservation authority. No additional provisions or restrictions are made with regard to the gathering of protected indigenous plants (outside of these areas) within the ordinance, but landowner permission is required to gather plants on privately owned (reserve and non-reserve) lands (C. Carbutt, pers. comm.). A total of 10 wild specimens being used as parental stock at the only nursery known to be cultivating the species have reportedly been collected with permissions from the landowners on whose property the plants grew. The proportion of subpopulations, if any, distributed across privately owned lands is at this time undetermined and it remains challenging to keep track of any harvest occurring on land outside of protected areas.

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 *de facto* or actual open access?	**None**	**1**
	Low	2
	Medium	3
	High	4
	Uncertain	5

It is challenging to keep track of any harvest occurring on land outside of protected areas but there is essentially no land in South Africa, save for coastal public property, that is open access as it relates to the application of the NDF criteria. The species is considered a protected indigenous plant in terms of Schedule 11 of the KwaZulu-Natal Nature Conservation Ordinance [No. 15 of 1974]. Collection of such plants within state and private nature reserves, as well as along any public road (or within the road reserve), requires a permit from the relevant conservation authority. No additional provisions or restrictions are made with regard to the gathering of protected indigenous plants (outside of these areas) within the ordinance, but landowner permission is required to gather plants on privately owned (reserve and non-reserve) lands (C. Carbutt, pers. comm.).

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

There has been no formal management of wild harvesting of *E. umfoloziensis* to date. Officials in the province are not familiar with the species and the exact localities of the *E. umfoloziensis* populations are unknown. 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. Whilst there are good administration systems in place to manage permit applications within the province, on

the ground enforcement remains challenging as there is only one district conservation officer who covers an area of approximately 5 441 km^2 within the Zululand District (C. Mulqueeny- Scientific Manager, Ezemvelo KZN Wildlife, pers. comm.). The implementation of current management and harvest controls (particularly outside of protected areas) is therefore severely limited.

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. umfoloziensis* 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 of South Africa's Scientific Authority. Trade data shows a moderate but consistent international trade in *E. umfoloziensis*. A total of ~1 781 plants have been exported from South Africa since the year 1990 (Figure 5) accounting for 94% of all global exports of the species. Germany is the greatest importer of the species having imported more than 70% of all of all live plants since 1990. All plants exported throughout the years have been declared as artificially propagated and the single nursery known to be cultivating the species has a total of 10 (reportedly legally collected) wild plants designated as parental stock. Due to a lack of information and time, the production capacity of the nursery could not be ascertained although 75 seedlings were present at the facility during a nursery audit conducted in 2018 (Mhlongo, 2020). The number of seedlings is presently greater than the average number of plants being exported annually (~56 plants) although exports have numbered more than 100 (and up to 194) plants during some years (Figure 5).

There is currently no field monitoring programme for the species.

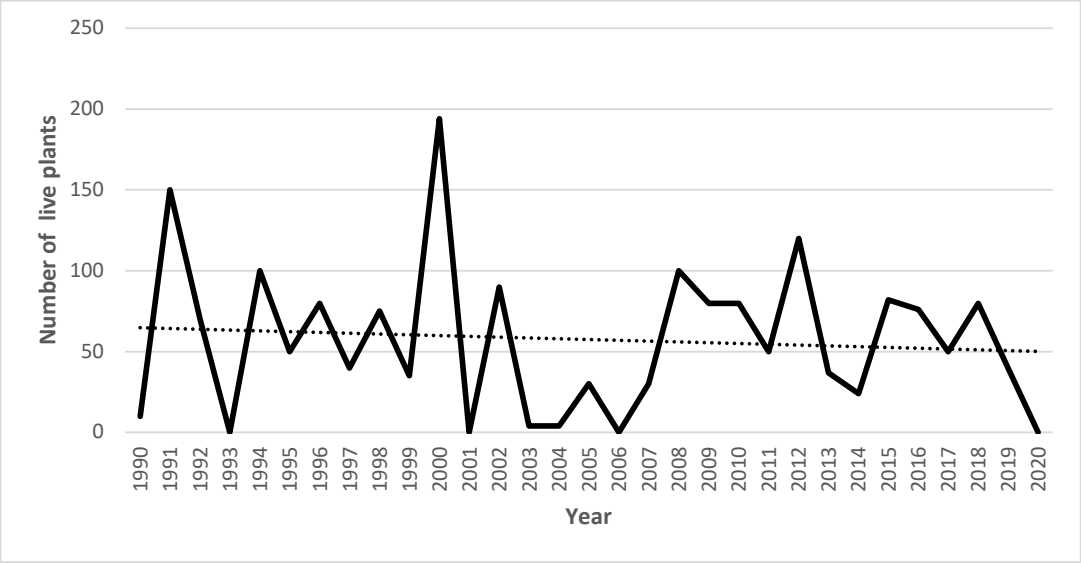

Figure 5: Gross exports of live *Euphorbia umfoloziensis* plants from South Africa (with trend in trade over time indicated by the dashed line). An average of 56 plants (± SD 48.43) have been exported annually since the year 2000 (up to 2020).

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 inconsistences 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 flout 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

Although no concrete evidence exists to prove that wild plants have continuously been removed from habitat, collection pressure was deemed to be the greatest possible direct threat to the species at the time of the species discovery (Peckover, 1991). As this species is extremely limited in its distribution, wild harvesting of even a few individuals might have had negative impacts on the persistence of populations thereby increasing its risk of extinction (Mhlongo, 2020). The scale of impact of other probable threats including habitat loss and degradation have not yet been determined but is most likely irreversible. No plants could be located in habitat during a recent field survey and it is postulated that this species may now be extinct in the wild, existing only in cultivation (Mhlongo, 2020).

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

Levels of harvesting for the species remain unknown. *Euphorbia umfoloziensis* has an extremely restricted range and any harvest is likely to have a negative impact on the species populations.

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

Levels of harvesting for the species remain unknown. The species has an extremely restricted range and any harvest is likely to have a negative impact on the species populations without any benefits to its habitat.

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**

The single river valley in which the species was found to grow extends through a provincial game reserve as well as a private game farm separated by areas of open land spaces. Since no plants could be located during field surveys across these areas, it remains uncertain if any extant populations exist either within or outside of protected areas although there are no records of the species on any of the Ezemvelo protected area databases (C. Mulqueeny, pers. comm.).

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

Although strict and relatively effective protection is afforded to species located in protected areas, recent surveys failed to locate the plant in habitat and it remains uncertain if any extant populations exist within protected areas. Apart from the inadequate protection afforded to the species through the current provincial legislation, officials in the province are not familiar with the species and there is low confidence in the ability to detect and protect this species at present.

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

Euphorbia umfoloziensis is considered a protected indigenous plant in KwaZulu-Natal but the conservation legislation of the province is unfortunately outdated, providing limited restrictions on harvesting outside of protected areas. Past and possible present levels of harvesting for the species are unknown and therefore unmanaged. The limitations with respect to the capacity (including relevant skillsets) and budget within Ezemvelo KZN Wildlife, furthermore, renders existing harvest controls ineffective. There is only one district conservation officer who covers two local Municipalities of Ulundi (3259 km^2) and Nongoma (2182 km^2) within the Zululand District. These limitations hinder effective field monitoring of the species populations and the ability to detect any illegal activities involving the species. The species has been proposed as a schedule 7 threatened plant species on the KwaZulu-Natal Environmental, Biodiversity and Protected Areas Management Bill, 2014. This Bill has not yet been enacted into law as some details are still being finalized, but once approved, the Bill will repeal all the other acts and afford additional legislative protection to the species across its range including by strengthening the current restrictions on harvest.

List of participants

1. Anita Wheeler – Coordinator: Landscape Conservation (CapeNature)
2. Annelise Schutte-Vlok – Regional Ecologist (CapeNature)
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Supporting documents

Buisson, E., Le Stradic, S., Silveira, F.A.O., Durigan, G., Overbeck, G.E., Fidelis, A., Fernandes, G.W., Bond, W.J., Hermann, J., Mahy, G., Alvarado, S.T., Zaloumis, N.P., and Veldman, J.W. 2019. Resilience and restoration of tropical and subtropical grasslands, savannas, and grassy woodlands. *Biological Reviews* 94: 590-609.

Courchamp, F., Angulo, E., Rivalan, P., Hall, R.., Signoret, L., Bull, L., Meinard, Y. (2006). Rarity Value and Species Extinction: The Anthropogenic Allee Effect. *PLoS Biology* 4: 12.

Jabar, L. 2019. *Conservation, management and sustainable use of Euphorbia colliculina, E. schoenlandii and E. susannae.* Potchefstroom – North West University. (Dissertation – MSc).

Jewitt, D. 2018. Vegetation type conservation targets, status and level of protection in KwaZulu-Natal in 2016. *Bothalia* 48(1): 10 pages.

Mhlongo, N.N. 2020. *The Ecology and Sustainable Use of Euphorbia umfoloziensis and Euphorbia bupleurifolia.* MSc thesis, University of the Witwatersrand, Johannesburg, South Africa.

Milton, S.J., Davies, R.A.G & Kerley, G.I.H. 1999. Population level dynamics. (In: Dean, W.R.J. and Milton, S.J., eds. *The Karoo: ecological patterns and processes*. Cambridge University Press, New York).

Mucina, L. & Rutherford, M.C. 2006. The vegetation of South Africa, Lesotho and Swaziland. *Strelitzia*, 19. South African National Biodiversity Institute, Pretoria.

Narbona, E., Arista, M. and Ortiz, P.L. 2005. Explosive seed dispersal in two perennial Mediterranean Euphorbia species (Euphorbiaceae). *American Journal of Botany* 92(3): 510- 516.

Peckover, R.G., 1991. *Euphorbia umfoloziensis* (Euphorbiaceae), a new species from central Natal. Aloe 28, 37-39.

Stamp, N.E. and Lucas, J.R. 1990. Spatial patterns and dispersal distances of explosively dispersing plants in Florida sandhill vegetation. *Journal of Ecology* 78: 589-600.

Tamme, R., Gotzenberger, L., Zobel, M., Bullock, J.M., Hooftman, D.A.P., Kaasik, A., and Partel, M. 2014. Predicting species' maximum dispersal distances from simple plant traits. *Ecology* 95(2): 505-513.

von Staden, L. 2008. *Euphorbia umfoloziensis* Peckover. National Assessment: Red List of South African Plants version 2017.1. Retrieved 22 October 2020, from http://redlist.sanbi.org/species.php?species=574-790.