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OF WILD FAUNA AND FLORA

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Follow-up of CoP11 Decisions

HARPAGOPHYTUM SPP.

1. This document has been prepared under the supervision of Dr John Donaldson, Regional Representative for Africa.

The Trade, Management and Biological Status of *Harpagophytum* spp. in Southern African Range States

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A Report submitted to the CITES Plants Committee

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Executive Summary:

This report summarises the information provided in terms of decision 11.63 and reviews all available data on the biological and trade status of *Harpagophytum* species subject to international trade, as required by decision 11.111. Information used in this report was obtained from range states, stakeholder interviews, visits to harvested populations, and a literature search.

The genus *Harpagophytum* comprises two species that occur in Angola, Botswana, Mozambique, South Africa, Zambia, and Zimbabwe. This report deals mostly with *H. procumbens,* which is the species currently used in the medicinal trade, and which is restricted to the range states Botswana, Namibia, and South Africa.

The trade data show that the total trade for all southern African countries is ca. 700 tonnes per annum. Based on the most recent annual figures, 92 % of exports originate from Namibia, 5 % from Botswana, and 3 % from South Africa. Consultation with stakeholders, and different sources of data, indicate that the total trade is not being recorded by range states.

The overall population status of *Harpagophytum procumbens* is unknown. Nevertheless, the available information suggests that it would not be classified as threatened using IUCN criteria for overall population size, extent of occurrence (range), or area of occupancy. The only threat to *Harpagophytum* spp. would be decline in populations as a result of harvesting. In all three range states, harvesting is not being monitored closely enough to determine the actual impact on plant populations. Despite this many stakeholders argue that decline is unlikely to have had a substantial effect on total population size of *Harpagophytum* spp. as populations occur in protected areas and on commercial farms where harvesting does not occur.

Botswana has existing policies to promote sustainable use of Devil's Claw and government is actively managing the trade in collaboration with NGOs. Devil's Claw is protected in Namibia but policies for sustainable use have only been enforced in the last few years. Recent increases in trade have resulted in revision of policies. The vast range of Devil's Claw in Namibia makes it very difficult to manage the resource and enforce policy throughout its range. Unsustainable harvesting practices are widespread but NGO activity in the Omaheke region is promoting sustainable use. In South Africa, trade has only been recorded in the past two years. *Harpagophytum* spp. are protected by provincial legislation except in some communal areas. Provincial nature conservation authorities are managing the trade in spite of a lack of national legislation or policy.

Namibia and Botswana are opposed to listing *Harpagophytum* spp. on CITES Appendix II because of a perceived negative effect on poor rural communities. If range states remain opposed to a CITES listing, it is important for the Plants Committee to monitor the development of the trade and to request updates from the range states.

1. Introduction

   Species of *Harpagophytum* (Devil's Claw) grow in the savannah areas of southern Africa. The indigenous San and Khoi peoples of southern Africa have used Devil's Claw tubers medicinally for centuries. Europeans discovered the medicinal properties of the Devil's Claw from local people in 1907 and since 1962 dried tubers of *Harpagophytum* spp. have been exported to Europe and used in the production of herbal medicines to treat mainly arthritis and rheumatism.

   Increase in trade has led to concerns about the sustainability of harvesting plants from the wild. In an attempt to promote sustainable utilisation of *Harpagophytum* spp. Germany submitted a proposal to include *Harpagophytum* spp. on Appendix II at the 11th CITES

Conference of the Parties (COP) held in April 2000. Objections to the proposed listing of *Harpagophytum* spp. by the range states, Botswana, Namibia and South Africa, led to the adoption of decisions 11.63 and 11.111.

Decision 11.63

In the light of increasing international trade in the roots of *Harpagophytum* spp. (Devil's Claw), the range and importing States should submit to the Secretariat all available information concerning the trade, management and biological status of *Harpagophytum* species and regulatory measures applying to them

Decision 11.111

The Plants Committee shall:

a) Review information submitted to the Secretariat in accordance with Decision 11.63;

b) Summarise the biological and trade status of *Harpagophytum* species subject to international trade; and

c) Prepare a report on the biological and trade status of *Harpagophytum* species, at least six months before the 12th meeting of the Conference of the Parties, for consideration at that meeting.

This report summarises the information provided in terms of decision 11.63 and reviews all available data on the biological and trade status of Harpagophytum species subject to international trade, as required by decision 11.111. Information used in this report was obtained from range states, stakeholder interviews, visits to harvested populations, and a literature search. Most of the report deals with *H. procumbens*, which is the species currently used in the medicinal trade, and which is restricted to the range states Botswana, Namibia and South Africa.

2. Biological status

2.1 Description

The genus *Harpagophytum* DC. ex MEISSN. (Pedaliaceae) comprises perennial herbs with creeping stems that sprout every year from a tuberous main root (Hachfeld 1999). Secondary root tubers, which can reach a length of 5 – 25 cm, form from the main root (parent tuber) and it is these tubers that are harvested for medicinal purposes and contain active ingredients that have analgesic and anti-inflammatory properties. The plants produce characteristic fruits that give the plant its common name, Devil's Claw. They comprise a flattened woody capsule with spiny appendages on each carpel.

Harpagophytum plants produce numerous seeds that are released slowly from the fruit capsule (Hachfeld 1999). Seeds display high levels of dormancy and germination rates are low (less than 20%) (Ernst et al. 1988 in Sekwhela, 1994). Recruitment rates are also low with few seedlings surviving the first year. Despite these life history traits, Devil's Claw is considered to be a pioneer or even 'weedy' species and is often found growing in areas where the soil has been disturbed or where grazing pressure is high (Taylor and Moss 1982; Sekwhela 1994). In established plants, annual shoot growth from the perennial tuber begins after summer rain (usually December) and the shoots die back between April and June as a prelude to winter dormancy.

2.2 Distribution

The genus *Harpagophytum* occurs in Angola, Botswana, Mozambique, Namibia, South Africa, Zambia, and Zimbabwe (Ihlenfeldt & Hartmann 1970). There are two species, *H. procumbens* (BURCH.) DC. ex MEISSN. and *H. zeyheri* DECNE., with two and three subspecies respectively. The two subspecies of *Harpagophytum procumbens* occur in distinct geographic areas with *H. procumbens ssp. procumbens* (BURCH) DC. ex MEISSN. in southern Namibia, southern Botswana, and the northern part of South Africa (Northern Cape Province and North West Province). Recent studies indicate that this subspecies may occur in greater parts of Bushmanland in Namibia and the northern parts of Botswana. The other subspecies, *H. procumbens ssp. transvaalense* (BURCH) DC. ex MEISSN. occurs in a relatively small area of the Limpopo Province of South Africa and southern Zimbabwe.

Harpagophytum zeyheri comprises three subspecies that grow in the more humid areas of southern Africa. *Harpagophytum zeyheri* ssp. *zeyheri* DECNE. and *H. zeyheri ssp. schiffii* DECNE. have a restricted distribution in the Limpopo Province of South Africa whereas subspecies *H. zeyheri ssp. sublobatum* DECNE. has a wider distribution in northern Namibia, southern Angola, south-western Zambia, Zimbabwe, and probably also Botswana.

Currently, only *H. procumbens* is registered for medicinal use in Europe and it is the only species that is actively harvested for international trade. Specimens of *H. zeyheri* may sometimes be mixed in with harvests of *H. procumbens* in areas where the two species occur together, such as Namibia. For this reason, many aspects of the report refer to *Harpagophytum* spp. and not only to *H. procumbens*.

2.3 Population status

Scattered populations of *Harpagophytum* spp. occur throughout the arid savannah areas of Botswana, Namibia and South Africa (Ihlenfeldt and Hartmann, 1970). The patchy distribution pattern makes it extremely difficult to quantify total population size and none of the range states have been able to estimate the overall population status of *Harpagophytum* spp. Trends in growth of populations utilised for trade could provide information on whether or not harvesting is currently sustainable. There have been few population surveys in the past, resulting in a situation where it is impossible to determine if population numbers have decreased as a result of harvesting. Furthermore, population numbers fluctuate in response to rainfall so decreases in population numbers are not necessarily the result of overexploitation.

2.31 Botswana

A comprehensive survey covering the entire range of *Harpagophytum procumbens* has never been conducted in Botswana. Taylor and Moss (1982) however undertook a countrywide survey to determine the resource status of a number of veld products. Their report contained maps showing densities and distribution of populations around 83 villages. These data were considered unreliable and no follow-up monitoring of these populations took place (Setshogo, pers. comm.). A later study by Sekhwela (1994) investigated Devil's Claw (DC) densities around 8 villages in the Ghanzi, Khgalagadi, Southern and Kweneng Districts. The study included maps of each village with densities of plants per hectare. Population sizes are reported to have varied greatly. Sekhwela's report contains no actual population numbers (the resource size is quoted in kilograms of tubers) and his surveys therefore cannot be used to determine the biological status of Devil's Claw in Botswana.

Despite not reporting population numbers, Sekhwela (1994) noted that the status of populations was found to relate most to the level of commercial harvesting. Villages with long standing commercial activities had severely depleted resources compared to settlements which had recently initiated commercial harvesting. Furthermore, plant population structures around these villages were skewed toward plants with small primary tubers. The primary tuber is an indication of plant age and is strongly correlated to the number of secondary tubers produced (Sekhwela, 1994). The dominance of plants with small tubers indicates over utilisation of older more productive plants.

The results of the Sekwhela study suggest that harvesting is having a negative impact on Devil's Claw populations in Botswana. No follow-up surveys have been conducted so there is no evidence to indicate that this trend is being reversed. Despite this, government officials, the two NGOs who buy Devil's Claw, and many harvesters, all consulted during 2002, state that the resource is not being depleted. During a brief visit in April 2002 healthy populations of plants were encountered around many of the villages where harvesting takes place. Only a small number of villages harvest Devil's Claw as the small amount of income generated by this activity is only of value to the most marginalised, poor rural communities. Given this situation, it is unlikely that Devil's Claw is threatened in Botswana.

A countrywide resource survey is needed in Botswana to determine what percentage of the available resource is presently utilised and what the overall biological status of the species is. A comprehensive survey is also needed for use as a benchmark in future resource monitoring. The government body responsible for veld product management, the Agricultural Resource Board (ARB) is in the process of developing a proposal to carryout a countrywide inventory for all utilised veld products. Should government approve this proposal, these inventories will be used to determine utilisation and jurisdiction areas for communities. *Harpagophytum* spp. will be included in this inventory and resulting data will be used to determine the biological status of these species in Botswana (ARB, 2002 a). The University of Botswana, in collaboration with an NGO (Tusano Lefatsheng) has prepared a research proposal to assess the biological status of *Harpagophytum* spp. and to determine the impacts of harvesting on populations. The study's objectives are to survey and quantify a large number of populations throughout the country and to closely monitor a subset of harvested populations over 5 years. No funding has yet been found for this proposal (Setshogo et al. 2002).

2.3.2 Namibia

Namibia has a National Devil's Claw Working Group (NDCWG) composed of a wide range of stakeholders. This group is currently co-ordinating a resource survey as part of a greater Devil's Claw situation analysis which also includes a socio-economic survey and a marketing survey. The main objective of the resource survey is to provide detailed data on the status of the Devil's Claw resource in selected areas throughout Namibia where Devil's Claw occurs. The survey is concentrating on areas where harvesting is known to take place (Strohbach, 2001). This survey will span a large enough area to provide information on where Devil's Claw is concentrated, the habitat types in which the plants occur, and the proportion of the population presently being harvested. The survey is being conducted by nature conservation officials of the Ministry of Environment and Tourism (MET) and will be completed by July 2002 (CRIAA 2001). Survey results will contribute significantly to determining the Biological

Status of *Harpagophytum* spp.. Despite the present lack of data on the biological status of *Harpagophytum* spp., Namibian officials report that it is unlikely that the resource is being over-utilised as harvesting takes place in less than 50% of the species' ranges (Hamunyela, pers. comm.).

Hachfeld (1999) compared populations on communal and commercial lands and surveyed populations that had previously been sampled. The resulting report concluded that population numbers are higher in communal areas (2-20 plants per $100m^2$) or (2.6-18.8 per $100m^2$ m (Lombard, 1999 in Hachfeld, 1999) from the CRIAA SH-DC area) than on commercial lands (0.1-10 plants per $100m^2$). A re-sampling of sites surveyed 2 to 3 decades ago showed a decrease in the area where populations occurred and in population size. *Harpagophytum procumbens* was present at only 13 sites out of 29 sites where it was previously recorded and reproduction appeared to be taking place at only 6 sites.. Although this decline could be attributed to differences in rainfall in survey years, an independent study of one farm with no history of harvesting showed stable plant densities over time despite differences in rainfall. These data hint at over-utilisation of *Harpagophytum* spp. in Namibia but sample sizes are too small to conclude that harvesting is the cause of population decreases.

M. Strohbach working with the Sustainable Harvested Devil's Claw project, run by the NGO (Centre for Research and Information and Action in Africa, CRIAA), has been monitoring populations that are harvested by project participants. In the year 2000, 36 harvested sites were surveyed, and plant population numbers estimated for a total of 423 hectares. The sum of the 36 populations was 592 234 plants. Strohbach (2000) also reported that 25% of the populations surveyed showed signs of unsustainable harvesting practises. Of the 19 areas surveyed in 1999, four showed a decrease in plant density per $100m^2$ transect.

2.3.3 South Africa

Little is know about the biological status of *Harpagophytum* spp. in South Africa. No surveys were conducted in the past so no trends in population growth can currently be determined. B. Hachfeld has recently conducted a survey for seven sites in the North West Province and 15 sites in the Northern Cape. A number of biological parameters were investigated including the number of plants, the number of old and young plants, the reproductive status of the plants and the degree of harvesting taking place. Results of this study will be available by September 2002. The National Botanical Institute is in the process of seeking funding to conduct a resource and socio-economic survey in South Africa. The proposed resource survey will use Hachfeld's study as a starting point and gaps in Devil's Claw distribution will be surveyed. Together the two surveys will provide information on how large the total population of *Harpagophytum* spp. is in South Africa and what percentage of populations are presently being harvested (Donaldson 2002). If this research initiative receives funding, the biological status of *Harpagophytum* spp. in South Africa will be known by March 2003.

2.4 Conclusion

Even though none of the three range states have carried out comprehensive surveys to assess the biological status of *Harpagophytum* spp., the available information suggests that *Harpagophytum procumbens* would not be classified as threatened using IUCN criteria for overall population size, extent of occurrence (range) and area of occupancy,

(version 3.1, 2000). Populations of *Harpagophytum* spp. are widespread and one survey of *H. procumbens* from a small part of Namibia provided population estimates of > 500 000 plants. The only meaningful criterion for assessing the threat to *Harpagophytum* spp. is an estimation of decline in populations as a result of harvesting. There is insufficient data to make this assessment, but many stakeholders argue that decline is unlikely to have had a substantial effect on total population size of *Harpagophytum* spp. because populations occur in protected areas and on commercial farms where harvesting does not occur. Furthermore, the species thrives in disturbed systems and is considered a pioneer or even "weedy" species (Taylor and Moss, 1982; Sekhwela 1994). The main threat to plant populations in all three countries is restricted to poverty-stricken communal areas where a combination of unsustainable harvesting and heavy grazing pressure threatens local populations (Cole and du Plessis, 2001). Should such populations disappear it would be an economic blow to these communities but is unlikely to be a threat to the species except potentially as a form of genetic erosion.

3. Trade status

3.1 Botswana

A total of 41 551.55 kilograms of Devil's Claw were reportedly exported from Botswana between 1997 and 2001 (Table 1). Trade within Botswana also occurs, but it is relatively small and has not been monitored. However, the data from Botswana highlight some potential problems with existing records. Annual harvesting data provided by the Botswanan Agricultural Resource board (Table 2) differs year by year from export data and also suggests that the quantity of plants harvested between 1997 and 2001 (21 710 kg) is slightly more than half the quantity that was exported out of Botswana during that period (Table 1. and Table 2.). In addition, the export figures mentioned in the CITES proposal (ca. 50t in 1997 and 1998, Dipholo pers. comm. in Hachfeld 1999) differ substantially from those provided by the Botswanan Agricultural resource board.

Table 1: Amount of Devil's Claw (dry weight?) exported from Botswana between 1997 and 2001. Data supplied by Botswana Agricultural Resources Board, Gaborone (2002).

Importing Country	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2001**
Germany	0	0	0	0	–	0	0	0	15000
South Africa	10719	3278	24437	45633	–	2451	501	1550	500
South Korea	0	0	0	0	–	3002	0	500	0
Namibia	0	0	0	0	–	0	0	0	1800
Others	0	0	0	0	–	40	0	0	6
Total	**10719**	**3278**	**24437**	**45633**	–	**5493**	**501**	**2050**	**33506**

Table 2: Data on harvesting of Devil's Claw in Botswana from 1978 to 2001. No harvesting was permitted in 1993 in order to allow the plant to regenerate. Data supplied by Botswana Agricultural Resources Board, Gaborone (2002).

Year	Dry Weight (kgs)	Year	Dry Weight (kgs)	Year	Dry Weight (kgs)
1978	13459	**1986**	6846	**1994**	22533.7
1979	5175	**1987**	9786.4	**1995**	40062
1980	550	**1988**	16745	**1996**	26344.8
1981	7564.8	**1989**	9115.5	**1997**	5549
1982	16974	**1990**	56	**1998**	3016
1983	7712.5	**1991**	3832.5	**1999**	4257
1984	13140.55	**1992**	6896.4	**2000**	4317
1985	2807.5	**1993**	–	**2001**	4571.5

The reasons for these discrepancies are not known but figures could be influenced by unrecorded harvests as well as unrecorded exports. An exporter at the Regional Devil's Claw Conference held in Windhoek 2002 reported importing 4 tonnes of material from Botswana, which is not represented in the records (Davis, pers. comm.). This too indicates that not all exports are being recorded. There were no recorded exports of Devil's Claw in 2000 due to lack of demand. Exporters attribute the lack of demand to buyers stockpiling from the previous year, but the NGO sector argue that the proposal to list *Harpagophytum* on CITES Appendix II in 2000 affected consumer demand.

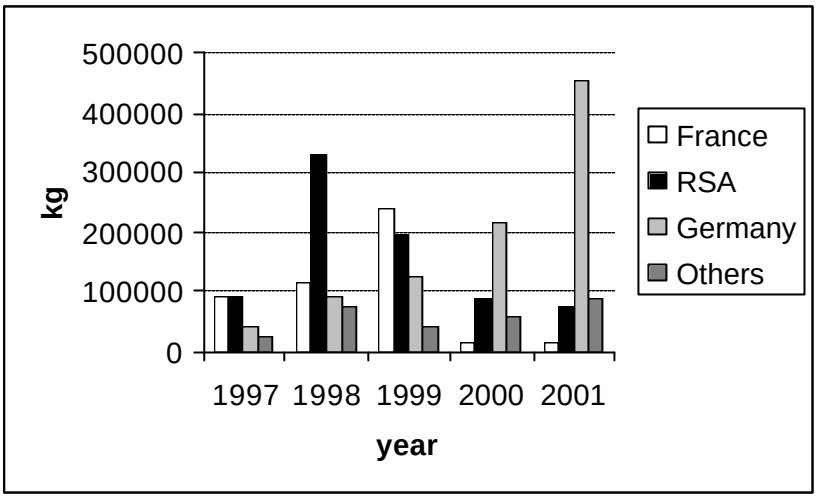
3.2 Namibia

The first large-scale exports took place from Namibia to Germany in 1962. By 1975 exports had risen to 180 tonnes per annum, exports continued to increase resulting in exports of ca. 300 tonnes in 1997 and 600 tonnes in 1998. There was a drop in exports from ca. 600 tonnes in 1999 to ca 400 tonnes (Table 3.) (also seen in Botswana), attributed to the proposal to list *Harpagophytum* spp. on CITES Appendix II, but trade returned to previous levels in 2001 with exports of 600 tonnes.

Table 3: Total quantities (kg) of Devil's Claw exported from Namibia between 1991 and 2001. Data derived from export permits issued by Ministry of Environment and Tourism, Windhoek.

Year	Dry Weight (kgs)	Year	Dry Weight (kgs)
1991	20880	**1997**	251091
1992	96174	**1998**	613336
1993	65767	**1999**	604355
1994	157938	**2000**	379740
1995	284409	**2001**	637032
1996	313652		

Figure 1: Quantities of *Harpagophytum* (dry weight) imported from Namibia between 1997 and 2001 by the main importing countries.



The current management system for Devil's Claw in Namibia requires exporters to obtain a Phytosanitary Certificate from the Ministry of Agriculture, Water and Rural Development (MAWRD) in addition to the export permit required by the Ministry of Environment and Tourism (MET). The figures from these sources often do not tally (Cole 2002). In addition, there are claims of a substantial illicit trade, for which figures are obviously not available (Cole, 2002).

3.3 South Africa

Export permits are not required to export *Harpagophytum* from South Africa. This situation makes it extremely difficult to monitor trade but the consensus is that harvesting of *Harpagophytum* spp. in significant quantities has only recently taken place. Provincial nature conservation organisations are monitoring trade. Permits issued by nature conservation departments to collect and transport plants (Table 4) indicate that quantities of harvested material have increased substantially from 1999 to 2001 and that trade requires closer monitoring. A number of pharmaceutical companies based in South Africa are involved in the processing of the raw *Harpagophytum* material so that not all harvested material is exported. Given this situation, monitoring of actual harvesting in each province should continue even in the event of a national export permit being enforced.

South African exporters and pharmaceutical companies buy large amounts of Devil's Claw from Namibia and Botswana. These trade deals are not monitored in South Africa and South Africa's role in the trade is currently not quantified.

Table 4: Quantities of *Harpagophytum* tubers harvested in Northern Cape (N. Cape) and the North West Province (N.W. Province) in South Africa.

Year	N. Cape Wet material (kg)	N. Cape Dry material (kg)	N.W. Province Wet material (kg)	N.W. Province Dry material (kg)	Total Wet Material (kg)	Total Dry Material (kg)
1999	0	6900	–	–	0	6900
2000	402	1258	–	–	402	1258
2001	500	6248	10904	14780	11404	21029

3.2 Conclusion

At the Regional Devil's Claw Conference held in Namibia (February 2002) it became apparent that trade figures from different sources within range states and from importing countries do not tally. In all three range states, trade is not being monitored closely enough to determine the actual quantities of plants being harvested from the wild.

4. Resource management

4.1 Botswana

Devil's Claw is protected by the Agricultural Conservation Act (1974) and accompanying regulations of 1977. Permits, issued by the Agricultural Resource Board (ARB) are used to control extraction and trade in *Harpagophytum*. There are three types of permits, an extraction permit, a transfer permit, and an export permit. The extraction permit states conditions, which the extractor has to follow to ensure that harvesting is sustainable. Each permit is issued to one individual for three months, is for a specific locality, and stipulates a specific quota. Quotas are decided upon by ARB extension officials, in collaboration with community members, after visual assessments of *Harpogophytum* populations (Ben, pers comm.). Transfer permits are required to transfer ownership of Devil's Claw or its parts from one owner to the next. An export permit is required to export *Harpagophytum* spp. or their parts. The Botswanan legislation includes penalties for committing illegal or unlawful activities regarding Devil's Claw (ARB, 2002 [b]).

Harvesting methods are specified on each extraction permit and are explained to harvesters by extension personnel when permits are issued. Government and NGO's, primarily Thusano Lefatsheng, run regular training workshops to equip harvesters with the skills needed to identify harvestable plant parts and to harvest sustainably (Matlhare, 2002). Secondary tubers and not primary tubers are harvested. Harvesters are advised to dig a few centimetres from the parent stem and to cover all holes after the removal of tubers. Government extension personnel monitor harvesting to ensure that harvesting is done in accordance with permit conditions. These conditions stipulate that the primary tuber may not be harvested so that the plant can regenerate, that holes must be covered once harvesting is complete, and that a rotational harvesting system is practised (ARB, 2002 [b]).

Government officials report that communities appear to be capable of managing their own resource in Botswana. Self-policing among community members takes place, and any harvesting without permits or out of season is reported to ARB officials. Some villages voluntarily implement rotational harvesting by harvesting in different directions away from the village each year. There have been cases where communities have turned down permits for a particular year reporting that the resource needed time to recover (Ben pers. comm.). This is in contrast to the findings of Sekwhela (1994) that harvesters at four of the eight study villages expressed negative attitudes towards resource conservation and were pursuing non sustainable harvesting techniques. A brief field visit in April 2002 found no signs of unsustainable harvesting in three villages including Mahotshwane, where Sekwhela (1994) reported unsustainable harvesting practises. This could indicate that resource conservation practises have improved since 1994 but further investigation of harvesting practises in Botswana is recommended.

In a further effort to promote resource conservation for *Harpagophytum*, Botswana only issues extraction permits during the dry season when the above ground shoots have died back and the seeds have dispersed. Harvesting in the dry season means that

harvesters only find ca 30% of plants and therefore cannot deplete any single population (de Wolf, pers. comm.). Sekwhela (1994) however, reports that harvesting secondary tubers in the dry season leads to increased mortality of plants as the water and nutrient reserves in the secondary tubers are required for plant survival during the dry season. Future research investigating the impact of harvesting in different seasons should be prioritised.

The NGO, Veld Products Research and Development (VPRND) are conducting research that will contribute to the sustainable use of the Devil's Claw resource. They are in the process of developing a methodology for quantifying the number of available tubers in any one population. The aim is to develop a simple method suitable for use by communities to predict resource size and thus set appropriate quotas for harvesting (de Wolf, pers. comm.). VPRND have also prepared a research proposal for establishing "early warning signs" of population overexploitation for use by communities. This research requires detailed ecological data gathered over a number of years from both harvested and non-harvested populations. Such research findings would greatly aid in resource management. As yet VPRND have not been successful in finding funding.

The department of Agriculture is in the process of developing a new act for Community Based Natural Resource Management (CBNRM). The CBNRM act will empower communities to manage their own resource through demarcation of utilisation areas and the development of management plans. This act will be implemented in phases, with specific areas being used as pilot studies. Inventories of all natural resources used by communities, including Devil's Claw, are needed for this act to be implemented. The Devil's Claw inventory will contribute to establishing the biological status of this species. The CBNRM act will not replace the existing Agricultural Conservation Act of 1974 but will provide additional legislation that promotes sustainable use of natural resources including *Harpagophytum* spp. (Ben, pers. comm.).

Collaboration between Government, Non Governmental Organisations (NGOs) and communities currently takes place to ensure sound management of the *Harpagophytum* resources in Botswana. The combination of state policy and harvesting practises are considered adequate by the Botswana CITES management authority to ensure the continued sustainable harvest of this resource.

4.2 Namibia

Concerns about over-utilisation of *Harpagophytum* spp. led to the plants being listed as a protected species under the Nature Conservation Ordinance 4 of 1975 (CRIAA SA-DC, 1999). This resulted in a permit system started in 1977 that required permits for harvesting, transport and export (MET, 2000). The permit system was found to be ineffective due to difficulties in implementation and was suspended from 1987, except for export permits required for commercial trade. Recent increases in exports, and concerns from the international community, led to the re-instatement of this permitting system in 1999. Since then the Ministry of Environment and Tourism (MET) has been developing a new policy for the protection of Devil's Claw involving modification of the old permit system. This policy has not yet been passed but is currently being enforced by MET Nature Conservation Officials managing the *Harpagophytum* trade.

Conditions of the new policy include a harvesting season from March to October. Harvesting in winter, while plants are dormant, is being implemented for the same reasons as in Botswana, i.e. to increase the chance of plants being missed during harvesting. Data for Namibia indicate that ca. 60% of plants in a population are found when harvesting takes place in winter (Hamunyela pers comm.).

Harvesting is subject to a permit which is issued for one harvesting season and contains the following conditions:

- It is not transferable;
- Prior consent must be obtained from the landowner (in case of communal areas, this may be the traditional authority and/or the representative of the regional and local government);
- It is valid only for a particular locality;
- A quota may be set by the MET;
- It stipulates that sustainable harvesting methods must be used.

The permit system for harvesters sets several additional conditions:

- Each harvester must be in possession of a valid permit or a copy;
- Each harvester is required to submit a report in November each year detailing the number of bags or total weight (kg) harvested and sold, the date of sale, and the person or company to whom it was sold.

New permits will only be issued on receipt of the report and confirmation that the permit holder complied with sustainable harvesting techniques (MET, 2000).

In addition to harvesting permits, permits are required for cultivation or research on *Harpagophytum* spp. and persons dealing (purchasing, transporting, selling, exporting, importing) in *Harpagophytum* spp. are required to meet certain conditions.

- Dealers must register annually with MET;
- They must keep records of all transactions with harvesters and sign the harvester's reports;
- Permits issued by MET are required for the export of *Harpagophytum* spp., and applications for export need to be accompanied by copies of the register showing clearly where the material originated;
- Permits are issued separately for the two species of *Harpagophytum*;
- Phytosanitary certificates are only issued upon production of a valid MET export permit and valid import permit / authorization from the country of destination/import (MET, 2000).

MET nature conservation officers are responsible for enforcing the permit system and for issuing quotas. As yet no quota system is in place as MET lacks capacity to carry out resource surveys before the issuing of permits (Hamunyela, pers. comm.). As a result there is no limit to the amount of *Harpagophytum* spp. extracted per harvester. This situation often leads to overexploitation of the resource (Stein pers. comm. and Mothlaping pers. comm.). The MET nature conservation officers are currently conducting the National Devil's Claw Resource Survey. It is hoped that following this activity each officer will have an idea of where the Devil's Claw resource is concentrated in his/ her area. This should enable the authorities to decide where harvesting should be allowed and where quotas need to be enforced (Cole, Pers comm.). However, harvesting of *Harpagophytum* spp. takes place throughout vast areas of eastern Namibia and management of the resource requires additional extension officers and training in resource management. The MET is currently responsible for monitoring harvesting and population recovery, but the current lack of capacity means that no short term or long term monitoring is taking place (Hamunyela, pers. comm.).

In November 1999, Namibia held its first National Devil's Claw Stakeholders' Workshop to address the many national concerns regarding the status of the Devil's Claw resource (Cole, 2002). Workshop participants recommended the establishment of a

Namibian Devil's Claw Working Group (NDCWG). This group consists of a wide range of stakeholders from government, the NGO/CBO sector, harvesters, and exporters, under the chairmanship of an official of the Division of Specialist Support Services (DSSS) in the Ministry of Environment and Tourism (MET). The mandate of this group is to continue the consultative process that was started at the first workshop and to address pressing needs relating to trade in Devil's Claw. One of the first needs addressed was the development of a National Devil's Claw Situation Analysis (NDCSA) (Cole 2002).

The NDCSA will focus on the following three main areas:

- The status of the resource;
- The socio-economic aspects related to resource management, benefits, and social implications with respect to the harvesting and trade in Devil's Claw;
- The nature of the local and export market.

The results of this research will provide the first comprehensive analyses of Devil's Claw in Namibia and will enable important strategic policy decisions to be made with respect to resource management and utilisation, trade and market related factors, and further research needs. The International Development Research Centre (IDRC), based in Canada has funded the NDCSA. It began in January 2002 and is expected to be completed by September 2002 (Cole, 2002).

The NGO, the Centre for Research and Information and Action in Africa (CRIAA) plays an important role in promoting the sustainable utilisation of Devil's Claw in Namibia. CRIAA are of the opinion that sustainable trade requires education and empowerment of harvesters. They currently run the Sustainably Harvested Devil's Claw Project (SHDCP), which works with 328 registered harvesters living on communal farms in the Omaheke region of Namibia. Harvesters working with the SHDCP practise sustainable harvesting by leaving primary tubers undisturbed and harvesting only a proportion of secondary tubers (Cole and du Plessis, 2001). CRIAA sets annual quotas based on a mean tuber growth rate of 200g dry weight produced per plant every two years. An annual harvest quota is calculated by multiplying the estimated population size by 100g (annual growth rate). Follow-up ecological surveys carried out since the inception of the project support the sustainability of such an off-take (Cole and du Plessis, 2001). Harvesters from the SHDCP obtain higher prices for dried tubers because CRIAA has obtained organic certification for this material and CRIAA eliminates the long chain of middlemen that typically operate between the harvester and the exporter. The SHDCP provides a model for sustainable use for other harvested areas within Namibia and other range states and CRIAA is hoping to expand their SHDCP into other areas in Namibia.

The Bundesamt Für Naturschutz, the CITES-Authority for the Federal Government of Germany, is funding a study to determine sustainable harvesting methods in Namibia. This research is being conducted over four years in six permanent plots laid out in communal areas subject to harvesting. The results of this research will be available at the end of 2004.

4.3 South Africa

In South Africa, species in need of protection are listed on provincial ordinances and managed by provincial nature conservation bodies. *Harpagophytum* occurs in three of the nine South African provinces: the Northern Cape, the North West Province and the Limpopo Province. Harvesting for commercial purposes only takes place in the Northern Cape and the North West Province. *Harpagophytum procumbens subsp. procumbens*

has a limited range in the Limpopo Province and is only harvested by traditional healers (Rodgers, Pers Comm.).

4.3.1 Northern Cape

Currently Northern Cape Nature Conservation requires permits for collecting, exporting or importing, moving plant parts across provincial boundaries, growing, and trading in *Harpagophytum*. Permits are issued once a year (Powell, pers. comm.) in terms proclamation 240 of1975 relating to the Ordinance of Cape Nature Conservation 26/1965. A new proclamation has now been drafted that is under review (Powell, pers. comm.). The permit conditions stipulated by the new proclamation include:

- That H*arpagophytum procumbens* may only be harvested outside reserves;
- Applications for harvesting more than 40 plants must be accompanied by a Resource Assessment and Management Report (RAMR).

The intention of the resource assessment is to promote sustainable use of Devil's Claw and to enable officials to monitor resource use. The RAMR is expected to include the following information.

- The number of plants available at the harvesting locality;
- The number of plants to be harvested;
- A description of the environmental impacts and how they will be addressed
- The exact locality of all *Harpagophytum* plants in the area to be harvested marked. on a 1:50000 map;
- A description of public participation during harvesting;
- Details of expected export costs, and payments to harvesters, tribal chiefs and landowners receptively;
- Information on the number of harvesters, harvesting procedures, and monitoring.

The policy also prescribes the following harvesting methods.

- Harvesting must take place during the growing season from November to February.
- Only secondary tubers can be harvested and primary tubers will be left intact in the ground.
- Harvesters will water primary tubers once after harvesting.
- A four-year rotation system must be implemented where the harvesting area is divided into four quadrats and only one quadrat is harvested per year.

4.3.2 North West Province

Policy and regulations for *Harpagophytum* in N.W. Province are confusing because different ordinances apply in different areas due to changes in provincial boundaries after 1994. Most of the harvesting takes place in the communal areas of N.W. province where there is no legislation regulating harvesting. At present, N.W. Province issues permits only to buyers who may only buy from recognised and registered harvesters in possession of an identification card. Harvesters attend training courses where they receive an identification card that is valid for one year. Harvesters are taught to harvest sustainably by practising quadrat rotational harvesting (van der Vyver, 2001). And harvesting takes place during the growing season between November and July. So far, 1250 harvesters from ca 35 villages have been trained. A

collecting form is also placed at each harvesting sight and harvesters fill in how much is collected and sold each day. Both these monitoring procedures have only been in place for one year. Nature conservation officers conduct monitoring on an ad hoc basis (van der Vyver, 2001). N.W. Province Nature Conservation have trained harvesters but they do not have the capacity to monitor all harvesting effectively (van der Vyver, pers. comm.). A visit by the author to NW province harvesting areas found a number of populations that had been unsustainably harvested. The degree to which unsustainable harvesting is taking place in N.W. Province requires further investigation.

4.4 Regional Collaboration

Stakeholders from all three range States have recognised the need for regional collaboration. Namibia initiated collaboration through the hosting of the Regional Devil's Claw Conference in February 2002 in Windhoek, which brought together stakeholders from all sectors of the Devil's Claw trade. An action plan for Devil's Claw has subsequently been formulated based on issues and suggested solutions voiced at the conference. These include the agreement to establish national and regional Devil's Claw Working groups. As with the existing Namibian Devil's Claw working group, national working groups will consist of a range of stakeholders from each range state. The terms of reference for the Regional Devil's Claw Working group (CRIAA, 2002) will include:

- Facilitating and co-ordinating research on the biological status of Devil's Claw;
- Building regional capacity (including identifying and sharing existing capacity);
- Facilitating regional institutional development;
- Ensuring the continued and effective participation of harvesters in the industry and in policy formulation affecting its future;
- Promoting policies and best practices;
- Facilitating inter-governmental co-ordination and coherence;
- Setting standards and/or codes of conduct, especially in so far as they concern market collaboration;
- Establish a Resource Centre;
- Identify funding priorities;
- Informally monitor the trade and share information on malpractices etc.

4.5 Conclusion

All three Range states are addressing the sustainability of the *Harpagophytum* trade through changes in policy. These policies are at different stages of development. Even where legislation is not in existence government authorities in all three states are actively managing resource utilisation. In addition, the NGO sector in Namibia and Botswana are contributing substantially to the development of a sustainable trade. The biggest hindrance to achieving sustainable utilisation is the lack of capacity among government institutions in Namibia and South Africa to monitor harvesting practises. Furthermore, all three range states are not monitoring the actual population numbers. Without such data it is impossible to determine whether trade is negatively impacting on the biological status of *Harpagophytum.* Research on appropriate harvesting practises, including the season of harvesting and the method of tuber removal is vital for informing management. Existing and future research initiatives in all three range states need to be supported.

5. Situation assessments

5.1 Botswana

Botswana currently exports a small proportion (5%) of total DC exports from Southern Africa. The country's strong currency in comparison to its neighbours result in exporters being unable to provide competitive prices on international markets. In addition, as a landlocked country, Botswanan exports are sent via South Africa or Namibia, and this adds another link to the chain of traders between the end-product consumer and the harvester, resulting in the trade being sub-economic in Botswana (Matlhare Pers Comm.). Trade exists in Botswana mainly because of development NGOs and government initiatives to provide a cash income source to rural marginalised communities with limited livelihood options. As a result the government and two NGOs (Thusano Lefatsheng and VPRND) decide which areas will be harvested. Only extremely poor communities are permitted to harvest (Ben Pers. Comm.). At present an average of 30 villages and 900 harvesters are involved in the trade (Matlhare, pers. comm.). The trade is therefore limited, easy to monitor, and unlikely to affect a large proportion of the DC resource in Botswana. Should international demand increase substantially resulting in a rise in export prices, there could be more opportunity for entrepeneurs and an increase in trade from Botswana. At present, however, the government and the NGO's are able to maintain trade at sustainable levels.

5.2 Namibia

Namibia is the world's largest producer of Devil's Claw (92% of the total international trade), with average exports of 600 tonnes per year. Harvesting is estimated to be the sole source of cash income for between 10 000 and 15 000 marginalised rural families (Cole and Lombard, 2000). Harvesting has been conducted since 1962 and is a widespread activity in Namibia. Many areas harvested are extremely remote. The actual magnitude of the trade in Namibia has never been quantified.

Until recently neither the government nor the NGO sector have actively managed the DC trade. This has resulted in widespread exploitation of both the resource and the marginalised peoples who harvest DC. A range of harvesting practises currently take place, from sustainable harvesting of only a proportion of the plant's secondary tubers to the entire plant being uprooted and the primary tubers being left exposed with holes uncovered. Similarly, some harvesters are obtaining fair prices for harvested produce but the majority of harvesters are exploited by middlemen who pay marginal amounts and sometimes give only alcohol for material. Unsustainable harvesting practises are compounded by land jurisdiction issues, with groups of harvesters removing tubers on communal or private lands that do not belong to them. CRIAA is working to improve conditions for the primary producers, and is actively involved in motivating government to institute policies that will protect the DC resource. CRIAA has been responsible for initiating collaboration at both a national and regional level between all stakeholders in the DC trade by organising National and Regional Devil's Claw Workshops. The Namibian government, through the Ministry of Environmental Affairs and Tourism (MET), have committed themselves to improving management through the re-institution of a permitting system and their involvement in the National Namibian Situation Analysis. Although the present conditions of the DC trade in Namibia are far from ideal, initiatives by government and NGOs are being undertaken to address the sustainability of this trade.

5.3 South Africa

Commercial harvesting of Devil's Claw has only taken place in South Africa for the past two years. The number of stakeholders involved in the trade is still low but interest is growing, with harvesters, harvested produce, and number of exporters on the increase. Most harvesting takes place in the communal areas of the N.W. province where 1250 harvesters have been trained. Less harvesting takes place in the Northern Cape, with

only 6 commercial farmers involved. Problems with the South Africa DC trade include the lack of export permits, a lack of co-ordination of policy for management of the resource in the different provinces, and lack of knowledge on the resource status. There is an urgent need to determine the status of the resource in South Africa, to discover how much is being harvested, who is harvesting, and what role this plays in peoples livelihoods. Furthermore, because the trade in Devil's Claw is a relatively new development in South Africa, an assessment of resource status now will provide a benchmark against which future resource utilisation can be measured.

6. Sentiments toward a CITES listing

6.1 Botswana

A comprehensive resource survey has never been conducted in Botswana and there is no scientific evidence to indicate whether or not trade threatens this species. Despite this lack of data, all Botswanan stakeholders consulted, including representatives from the Government, NGOs, and communities, report that DC in Botswana is not threatened by trade. There is a widely held perception that utilisation could be substantially increased without Devil's Claw becoming threatened. The existing legislation is considered more than adequate to protect Devil's Claw populations in Botswana and stakeholders feel that a CITES appendix II listing will not provide any additional protection.

The majority of Botswanan stakeholders oppose a CITES Appendix II listing based on the anticipated effect on Devil's Claw end product consumers. They believe that an Appendix II listing would send out a message that the plant is endangered and this is expected to effect drug sales and the demand for Devil's Claw dried tubers. The end result would be reduced income for thousands of poor rural harvesters.

Botswana does, however, suffer from lack of information pertaining to trade. Trade figures are not consistent. Furthermore, Botswanan exporters struggle to find buyers for their material and exports are erratic. The ability to track movement of DC material originating in Botswana would allow Botswanan stakeholders to improve their understanding of the DC market. The Botswana government is therefore currently considering a CITES Appendix III listing for DC as this would provide a mechanism for tracking trade without providing any negative publicity on the biological status of the species.

6.2 Namibia

The majority of Namibian Stakeholders, like those in Botswana, are against a CITES listing on account of the expected drop in demand that will effect the livelihoods of poor rural harvesters. The NGO, CRIAA, is most strongly opposed to a CITES listing, stating that at present no evidence exists to show that trade may endanger this species. In addition, their opinion is that a CITES listing will not provide any extra capacity to manage the trade because measures are needed at local levels to monitor populations and enforce permitting. Monitoring at the international level will not provide a tool that promotes sustainable utilisation. Despite the negative sentiment towards listing Devil's Claw on CITES, the CITES management authority in Namibia believes that listing on CITES Appendix II or III would provide much needed information on trade. In addition, it is argued that extra resources to manage the trade at local levels could be requested from sources other than government should this species have the international recognition of being on CITES. However, the CITES Management Authority in Namibia is likely to act in accordance with stakeholder interests and will not currently support a

proposal to list *Harpagophytum* spp. on CITES Appendix II, but might consider a CITES Appendix III listing.

6.3 South Africa

The CITES Management Authority, based in the Department of Environmental Affairs and Tourism (DEAT), has not been involved in the management of the DC trade in South Africa. South Africa is not opposed to a listing on Appendix II or III, but will allow Botswana and Namibia to influence their decision regarding a potential listing.

7. Recommendations

The data provided by range states in terms of decisions 11.63 and 11.111 show that the range states are gathering data on the biological status and trade in *Harpagophytum* spp. and either have suitable policies to regulate trade or are busy developing them. At this stage, there are still substantial gaps in the available information. The status of plant populations is still largely unknown in all three range states and trade figures indicate that current permit systems do not capture total trade. South Africa and Namibia also do not have the capacity to enforce compliance with policies on sustainable utilisation throughout the range where Devil's Claw occurs. For the Devil's Claw trade to be sustainable in Southern Africa the following is required:

- Comprehensive policy dealing with conservation and sustainable utilisation of Devil's Claw;
- Effective enforcement of permits and quotas;
- Monitoring of trade and harvested populations to evaluate effectiveness of trade management measures;
- Research related to plant ecology and plant response to harvesting to develop methods of sustainable harvesting that can be used to inform policy.

A listing on CITES Appendix II would contribute to effective enforcement of quotas and the monitoring of trade and its effects on harvested populations. Given the negative sentiment towards CITES at present, what is needed is consultation with range states to determine how CITES can promote sustainable trade. It is particularly important to show that CITES listing does not result in a drop in demand for listed species and products. This could be demonstrated through examples of other plant species. If range states remain opposed to CITES listing, it is still important for the Plants Committee to monitor the development of the trade and to request updates from the range states.

8. References

Agricultural Resource Board (ARB) [a].(2002). Forest, Fisheries and Veld Products Inventory Study: Draft Terms of Reference. Ministry of Agriculture. Botswana

Agricultural Resource Board (ARB)[b].(2002). Botswana National Report on Grapple Plant (*Harpagophytum procumbens*): A Report Submitted to the Africa Regional CITES Plants Committee. Gaborone. Botswana

Cole, D. (2002). The Namibian National Devil's Claw Situation Analysis. Paper presented at the Regional Devil's Claw Conference. CRIAA SA-DC. Windhoek. Namibia

Cole, D. and du Plessis, P. (2001) Namibian Devil's Claw (Harpagophytum spp.) A case Study on Benefit-Sharing Arrangements. Prepared by CRIAA SA-DC for the Ministry of Environment and Tourism. Namibian National Biodiversity Programme. Windhoek. Namibia

Cole, D., Lombard, C. (2000) The Sustainably Harvested Devil's Claw Project in Namibia: Some Primary Producer Issues. Paper presented at the Medicinal Plant Forum for Commonwealth Africa. Cape Town. South Africa.

CRIAA SA-DC (1999) Proceedings of the Namibia National Devil's Claw Stakeholders Workshop. Organised by: Ministry of Environment and Tourism, Ministry of Agriculture and Rural Development and CRIAA SA-DC. Windhoek. Namibia.

CRIAA SA-DC (2001) Namibian National Devil's Claw Situation Analysis: Research Funding Proposal. Windhoek. Namibia

CRIAA SA-DC (2002) Regional Action Plan for Devil's Claw. Document produced by CRIAA following the Regional Devil's Claw Conference. Windhoek. Namibia

Hachfeld, B. (1999). Analysis of the trade potential and possible over-exploitation of a southern African medicinal plant: *Harpagophytum procumbens*. Report for Bundesamt für Naturschutz. Cologne. Germany

Ihlenfeldt, H.D. and Hartmann, H. (1970). Die Gattung *Harpagophytum* (Burch.) DC. Ex Meissn. Mitt. Staatsinst. Allg. Bot. Hamburg, Bd. 13: 15-69

Kgathi, D.L. (1988). The grapple trade in Botswana. Botswnan Notes and Records 20: 119-124.

Matlhare T. (2002). Harvester and Trade Issues in Botswana. Paper presented at the Regional Devil's Claw Conference Windoek February 2002.

Ministry of Environmental and Tourism, 2000, Proposed Policy on Devil's Claw, Government of Namibia

Sekhwela, M.B.M. (1994). Grapple plant (*Harpagophytum procumbens* DC): resource potential and management studies. Final Report. National Intitute of Research and Documentation, University of Botswana.

Setshogo, M.P., Sekhwela, M.B.M., Thusano Lefatsheng. (2002). Project proposal on: The Ecology and Distribution of the Devil's Claw in Botswana. Paper presented at the Regional Devil's Claw Conference Windoek February 2002.

Strohbach, M. (2001) National Devil's Claw Situation Analysis Republic of Namibia: National Resource Inventory Project Design. Prepared for the Namibian Devil's Claw Working Group. Namibia.

Strohbach, M. (2000). The Sustainably Harvested Devil's Claw Project Ecological Survey February 2000. Report for CRIAA SA-DC. Windhoek. Namibia

Taylor, F.W., Moss, H. (1982). Final Report on the Potential for Commercial Utilisation of Veld Products. Volumes I and II. Government Printer. Gaborone.

Van der Vyver, C. (2001). Guidelines on Sustainable harvesting of Wild-craft Devil's Claw (*Harpagophytum procumbens*). Department of Agriculture Conservation and Environment. Vryburg. South Africa.

9. Personal communications

Ben, G. CITES Management Authority for Plants. Agriculture Resource Board, Ministry of Agriculture. Gaborone, Botswana.

Cole, D. Centre for Research Information and Action in Africa (CRIAA). Southern Africa Development and Consulting.

De Wolf, C. Ecologist for Veld Products Research and Development

Davis, G. South African Exporter: East Natural Products. Cape Town

Hamunyela, E. Division of Specialist Support Services (DSSS) Ministry of Environment and Toursim. Namibia

Matlhare, T. Thusano Lefatsheng Director. Gaborone. Botswana

Mothlaping, M. Community Liaison Officer. Sustainably Harvested Devil's Claw Project-Omaheke. Namibia

Powell, E. Nature Conservation Official. Directorate Conservation and Environment. Kimberly. South Africa

Rodgers, S. Nature Conservation Official Limpopo Province. South Africa

Setshogo, M.P. Researcher University of Botswana

Van der Vyver, C. Nature Conservation Official. Department of Agriculture Conservation and Environment N.W. Province. Vryburg. South Africa.