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GENERAL NOTICE

NOTICE 501 OF 2011

DEPARTMENT OF ENVIRONMENTAL AFFAIRS

NATIONAL ENVIRONMENTAL MANAGEMENT: BIODIVERSITY ACT, 2004 (ACT NO. 10 OF 2004)

DRAFT BIODIVERSITY MANAGEMENT PLAN FOR *PELARGONIUM SIDOIDES*

I, Bomo Edith Edna Molewa, Minister of Water and Environmental Affairs hereby publish, in terms of section 43(3)(a) read with section 100 of the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004), a draft biodiversity management plan for *Pelargonium sidoides* in the schedule hereto.

Interested persons are requested to submit written representations on, or objections to the draft plan to the Minister. All such representation or objections must be submitted in writing in the following manner: Director-General: Environmental Affairs.

Delivered to:	The Department of Environmental Affairs Attention: Ms Humbulani Mafumo Fedsure Forum Building (North Tower: Office 1305) 315 Pretorius Street **PRETORIA** 0002
By post to:	The Director-General: Department of Environmental Affairs Attention: Ms Humbulani Mafumo Private Bag X447 **PRETORIA** 0001
By fax to:	0865411102; or
By e-mail to:	hmafumo@environment.gov.za

Comments must reach the department within **30 working days** of the publication of this notice. Comments received after the closing date may not be considered.

BOMO EDITH EDNA MOLEWA
MINISTER OF WATER AND ENVIRONMENTAL AFFAIRS

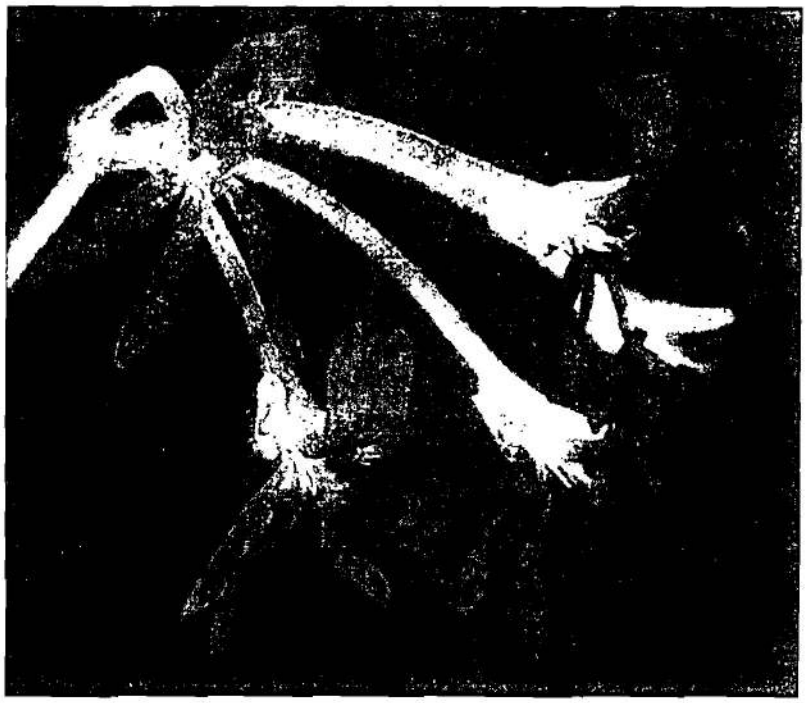
environmental affairs

Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

SCHEDULE

Biodiversity Management Plan for *Pelargonium sidoides* DC.

Compiled by David Newton[1], Domitilla Raimondo[2], Lisebo Motjotji[1], and Christine Lippai[1] in extensive collaboration with the Pelargonium Working Group[3].



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[3] The Pelargonium Working Group, started in 2007, is represented by government, industry and the NGO sector. The group was chaired during the process of drawing up this management plan by the South African National Biodiversity Institute.

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EXECUTIVE SUMMARY

Pelargonium sidoides DC. is endemic to Lesotho and South Africa. It is harvested from the wild for the manufacture of phytomedicines by local and international pharmaceutical industries. The extractive use of the resource requires regulation in terms of a Biodiversity Management Plan for Species (BMP-S) as specified in Chapter 3 of the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004), or NEMBA. In addition Chapter 6 of NEMBA requires that users of indigenous biological resources must obtain a bioprospecting permit for the manufacturing of products such as drugs / medicines.

This BMP-S was drafted following the Norms and Standards prescribed for Biodiversity Management Plans for Species, in terms of Section 9(1)(a)(i) and Section 43 of NEMBA, as well as the criteria and principles detailed in the International Standard for Sustainable Wild Collection of Medicinal and Aromatic Plants (ISSC-MAP), the guidelines of which provide a framework for the conservation and sustainable use of medicinal plants. Management processes are emphasised to ensure environmental protection along the trade supply chain, including the protection of customary rights and laws relating to access and benefit sharing from the resource.

The aim of the BMP-S is to ensure the long-term survival of *P. sidoides* in the wild, whilst ensuring that the livelihoods of stakeholders are respected. Recommendations are made to ensure that all stakeholders retain appropriate control over the wild collection processes and minimise the degree of impact from harvesting. Additional recommendations are made to ensure that those areas harvested receive adequate restoration and long-term environmental degradation is avoided.

This BMP-S calls for all harvesting and trade to follow best management practices in order to minimise the environmental impact of activities associated with trade. It is proposed that sustainable management practices will be developed and endorsed through a Pelargonium Working Group and ultimately formalised through this BMP-S (in terms of the NEMBA) as legally-binding conditionalities on stakeholders for continued harvesting and trade. Through continuous research and monitoring, sustainability and enhancement of the BMP-S will be verified as an iterative process.

Harvest techniques will be improved and harvesters will be trained appropriately. One of the aims of this BMP-S is to ensure that monitoring and control systems are strengthened thereby enabling authorities to oversee harvests from the wild more effectively. This BMP-S provides guidelines on developing appropriate business techniques for enhanced traceability of the products. Coordination of procedures and mechanisms between the South African and Lesotho Scientific Authorities are proposed and a cooperation agreement on this matter between South Africa and Lesotho will be sought.

Specific activities have been designed to protect the species and ensure that monitoring systems are put in place to assist with evaluation of the impacts of use. Three over-arching activities have been identified and defined:

- Regular monitoring of the trade, in order to identify any threats to the sustainable utilisation of the species.
- Continuous scientific research and analysis, to ensure that the survival of the plant in the wild is not affected by the trade.

- Review and revision, where necessary, of relevant legislation, regulations and agreements to ensure that collection, management and trade procedures are in compliance.

The anticipated outcomes of the BMP-S will include the following:

- The establishment of a forum for stakeholders involved in the *P. sidoides* trade through formalisation of the current Pelargonium Working Group, to include managers and implementers of this BMP-S.
- Up-to-date and detailed resource distribution, population data and maps to provide guidance for any conservation measures or management tools to be developed and applied to the industry.
- Stakeholder understanding of the need to conserve and sustainably utilise the resource in the wild for continued and sustainable benefit to all stakeholders.
- Precise targets for completion of tasks within a 5-year period that will ensure the conservation requirements of the species in the wild, whilst also considering the economic potential of the species.
- Coordination between national and provincial environmental protection agencies to ensure traceability as well as adherence to various access, benefit sharing and conservation legislations and regulations.

I. INTRODUCTION

Pelargonium sidoides (common names: Umckaloabo, Uvendle, Kalwerbossie, Rabassam and Khoaara e nyenyane) is endemic to Lesotho and South Africa. The altitudinal range of the plant is wide as it occurs in the Eastern Cape at near sea level and at higher altitudes, while in Lesotho it has been recorded at 2 746m (Newton *et al.* 2008). It is also found in Limpopo, Mpumalanga and southern and southwestern areas of Gauteng provinces of South Africa.

The plant is tolerant of a wide range of environmental conditions and can be found in short grassland as well as in association with shrubs and trees. The substrate is often stony soil ranging from sand to clay-loam, shale or basalt. Over most of its range it experiences winter frost and occasionally snow, although it dies back during winter and in drought conditions, despite being an evergreen plant. It has well-developed tubers that enable it to survive harsh environmental conditions and the annual grass fires that occur across its distribution (Van der Walt *et al.* 1988).

The roots are sought by the pharmaceutical industry, both locally and internationally, for the manufacture of a phytomedicine. Harvesting of *P. sidoides* is mainly from wild populations. The potential threat to the species in the wild arising from the harvest and subsequent bioprospecting ventures for local, national and international trade has led to the development of this management plan which will contribute to the regulation of the wild collection of the species for commercial purposes.

1.1 Process followed for drawing up Pelargonium sidoides BMP-S

This BMP-S for *P. sidoides* is provided for in terms of Chapter 3 of the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004), or NEMBA. The Norms and Standards prescribed for BMP-S, in terms of Section 9(1)(a)(i) and Section 43 of the NEMBA, 2004, have been followed in drafting this management plan.

The IUCN/SSC Medicinal Plant Specialist Group, together with the German Federal Agency for Nature Conservation (Bundesamt für Naturschutz—BfN), WWF Germany and TRAFFIC, have developed an International Standard for Sustainable Wild Collection of Medicinal and Aromatic Plants (ISSC-MAP) (Medicinal Plant Specialist Group 2007). This standard has now been incorporated into the FairWild Standard (FWS). The intention of the FWS is to help private companies, government agencies, research centres and communities to identify and follow good practices to guide the development of management plans for medicinal plants and ensure their sustainable wild collection. The document identifies six key elements for sustainable wild collection of medicinal and aromatic plants:

- Maintaining wild MAP resources.
- Preventing negative environmental impacts.
- Complying with laws, regulations and agreements.
- Respecting customary rights.
- Applying responsible management practices.
- Applying responsible business practices.

These elements are in line with the Norms and Standards of NEMBA's Biodiversity Management Plans for Species and were thus followed during the stakeholder consultation process to draw up this BMP-S.

TRAFFIC East/Southern Africa and the South African National Biodiversity Institute lead the process of developing this BMP-S with funding provided by the German Ministry for Economic Cooperation and Development (BMZ), WWF Germany, and the Norwegian Foreign Ministry. At least 15 stakeholder consultations were held prior to and during the drafting of this BMP-S, with extensive discussions held on the biology, trade, conservation requirements and threats to P. sidoides. This process obtained as much information as possible from a diverse array of stakeholders and lead to consensus on actions required to promote sustainable trade of *P. sidoides*. Details of the process followed to develop this BMP-S are included in Annex I.

1.2 Aims of BMP-S and anticipated outcomes

The **aim** of this BMP-S is to ensure the long-term survival of *P. sidoides* populations in the wild, whilst ensuring that the livelihoods of stakeholders are respected. Specific activities need to be undertaken to protect the species and ensure that systems are in place to monitor the impacts of use.

The six objectives of the management plan are:

- To ensure that wild collection of *P. sidoides* is carried out in a manner that maintains survival of the species in the wild.
- To ensure that wild collection of *P. sidoides* does not affect the environment and ecology.
- To ensure that collection and management activities are carried out under legitimate tenure arrangements and comply with relevant laws, regulations and agreements.
- To ensure that customary rights of local and indigenous communities to use and manage collection areas are recognised and respected.
- To ensure that trade is conducted in an equitable manner resulting in the fair allocation of benefits to all resource stakeholders in accordance with Chapter 6 of NEMBA which deals with Bioprospecting, Access and Benefit Sharing and the associated Bioprospecting, Access and Benefit Sharing Regulations.
- To ensure wild collection of *P. sidoides* is based upon adaptive, practical, participatory and transparent management practices.

In order to achieve these objectives, the following three over-arching **activities** were defined:

- Regular monitoring of the trade, both local and international, in order to identify any threats to the sustainable utilisation of the species.
- Continuous scientific research and analysis, to ensure that the survival of the plant in the wild is not affected by the trade.
- Review and revision, where necessary, of relevant legislation, regulations and agreements to ensure that collection, management, trade procedures etc. are in compliance.

The anticipated outcomes of this Management Plan will include the following:

- A forum for stakeholders involved in the *P. sidoides* trade chain through formalisation of the Pelargonium Working Group, to include managers and implementers of this BMP-S (for example, Department of Environmental Affairs (DEA), the South African National Biodiversity Institute (SANBI), Industry, the NGOs including TRAFFIC and Biowatch.
- Up-to-date and detailed resource distribution and population data and maps that will provide guidance for conservation measures or management tools (such as harvest quotas, harvest seasons, harvest techniques) to be developed and applied in the industry.
- Stakeholder-understanding of the need to conserve and sustainably utilise the resource in the wild for continued and sustainable benefit to all stakeholders.
- Agreement of targets for completion of tasks within a 5-year period that will ensure the conservation requirements of the species in the wild, whilst also considering the economic potential of the species.
- Coordination between national and provincial environmental protection agencies (South Africa) and or district environmental agencies (Lesotho) as well as across different sectorial ministries to ensure traceability and adherence to various legislations and regulations.

Several **actions** have been defined to ensure that the objectives of the BMP-S are achieved. These are presented in the Action plan (see Section III below).

II. BACKGROUND

2.1 Conservation status and legislative context

2.1.1 Threat status

P. sidoides is not listed on the International IUCN Red List of Threatened Species as a global assessment has not yet been carried out. South Africa's Red List (Raimondo *et al.* 2009), representing a comprehensive assessment of all South Africa's indigenous plant taxa, uses the IUCN 3.1. criteria and categories but also includes additional non-IUCN categories required for conservation work in the South African context. *P. sidoides* is classified under one of these South African specific categories, 'Declining'. This indicates that currently this species does not qualify under one of the IUCN categories of threat (Critically Endangered, Endangered or Vulnerable), but it is experiencing loss of individuals due to various influences including habitat loss, habitat degradation from overgrazing by livestock and limited localised loss due to overharvesting.

Although *P. sidoides* also occurs in Lesotho, there has been no Red List assessment carried out for Lesotho. However, there have been two cursory field surveys of *P. sidoides* populations in Lesotho. One by Newton *et al.* (2008) conducted as part of a training exercise for the Lesotho CITES Scientific Authority and a second by De Castro *et al.* (2010) as part of a resource assessment of *P. sidoides* across its entire range. The findings of both these studies indicate that there is limited localised decline due to incorrect harvesting practises and that rangeland degradation due to overgrazing is also a threat to this species. There is a need for a global assessment using the IUCN 3.1. criteria to be conducted by Lesotho and South Africa.

2.1.2 International agreements

The following international treaties and conventions are relevant as South Africa is signatory to each:

- Convention on Biological Diversity (CBD).
- Convention on International Trade in Endangered Species of Fauna and Flora (CITES).

Although a non-enforceable Convention, becoming a Party to the Convention on Biological Diversity (CBD) does entail acceptance of the Articles and Objectives of the Convention, which include *inter alia*, establishing methods to monitor and conserve biodiversity and engaging in fair and equitable benefit sharing. In addition South Africa's Biodiversity Act (NEMBA) has been developed in order for South Africa to meet its commitments to the Convention.

Currently *P. sidoides* is not included in any of the CITES appendices despite it being an internationally traded species. This is due to there being no evidence to date that trade is causing a significant decline to this species.

2.1.3 Regulatory measures

Resource conservation related measures

South Africa has national legislation and provincial legislation to protect indigenous plant species. The Biodiversity Act (NEMBA) lists a number of South African plant and animal species as part of the Act on the national list of Threatened and Protected Species (TOPS). Although this list is specifically aimed at ensuring sustainable utilisation of species, many utilised plant species including *P. sidoides* are not yet included on it. In addition to the national TOPS list, provincial conservation agencies also issue provincial lists of protected species on provincial ordinances to regulate the use of species within the provinces. Activities that are regulated through a permit system include collection/picking, possession, trade or transport of listed species. Provincial legislation for the area in which *Pelargonium* occurs includes:

- Western Cape Nature Conservation Laws Amendment Act, No 3 of 2000 (Western Cape).
- Nature and Environmental Conservation Ordinance, No. 19 of 1974 (Eastern Cape).
- Nature Conservation Ordinance 8 of 1969 (Free State).
- Nature Conservation Ordinance 12 of 1983 (Gauteng).
- Mpumalanga Nature Conservation Act 10 of 1998 (Mpumalanga).
- The Environmental Conservation Decree No. 9 of 1992 (Former Transkei region).
- The Ciskei Nature Conservation Act Ordinance 10 of 1987.
- Qwaqwa Nature Conservation Act 8 1976 (Free State).

Unfortunately of the above ordinances *P.sidoides* is listed as protected only on the Ciskei Nature Conservation Act Ordinance 10 of 1987 and can only be managed with permits in the former Ciskei region. Not being listed on any of the other provincial ordinances limits the level of harvest restrictions that provincial agencies can enforce on the trade. Currently P. *sidoides*, outside of the former Ciskei region, like all other indigenous plant species in South Africa requires a permit only if it is harvested within nature reserves or protected areas. In many provinces, written permission to harvest is required from the landowner before harvest can take place.

As *P. sidoides* is being harvested in many regions of South Africa, not only in the former Ciskei region, there is a need to list this species on the National TOPS list to facilitate sustainable management of the population in the wild.

Access and Benefit-Sharing regulations

Chapter 6 of the National Environmental Management: Biodiversity Act (2004) deals with provisions for Bioprospecting, Access and Benefit-Sharing in South Africa. Associated to the legislation there are Bioprospecting, Access and Benefit Sharing (BABS) Regulations, 2008. The purpose of these regulations is:
(1) to regulate the permit system applicable to indigenous biological resource bioprospecting or export from the republic of any indigenous biological resources for the purpose of bioprospecting or any other kind of research, and (2) to set out the requirements and criteria for benefit-sharing and material transfer agreements.

Despite the lack of ethnobotanical studies to clarify the cultural significance of *P. sidoides* (Brendler & Van Wyk 2008), the largest trader in *P. sidoides* is one of the first industries in the country to comply with the BABS Regulations through concluding benefit-sharing agreements with communities involved in harvesting (Van Niekerk 2009).

2.2 *Information summary on* P. sidoides

2.2.1 Morphology

P. sidoides has been described by Van der Walt *et al.* (1988) as follows:

"*...a somewhat aromatic rosette-like plant with crowded, velvety, heart-shaped, long-stalked leaves and a system of thickened underground root-like branches, aerial parts sparsely branched from base, evergreen in cultivation but in nature probably dying back to varying degrees during winter, two hundred to 500 mm tall when in flower. The inflorescence is a branched system of two (rarely up to four or more) pseudo-umbels, each with three to seven (occasionally up to 14) flowers. The flowers are 15 to 17 mm in diameter, the pedicel is usually very short compared to the well-developed hypanthium, and the petals are very dark reddish purple. Morphologically it is very similar to some forms of* P. reniforme *but it is readily distinguished by its blackish rather than pink petals, and by its much wider geographical distribution.*"

2.2.2 Chemistry and pharmacology

Brendler and Van Wyk (2008) summarise knowledge on the pharmacological and chemical activity of *P. sidoides* extracts. In essence, the main pharmacological research has been performed on a proprietary preparation from Pelargonium roots called EPs7630® of the company Dr Willmar Schwabe in Germany. It has focussed on the plant extracts' antibacterial, antifungal, antimycobacterial and immunomodulatory properties. The main clinical effects stemming from the use of EPs7630® has been to reduce the seriousness and duration of upper respiratory tract infections in children and adults, with negligible toxic side effects.

2.2.3 Look-alike species

In some areas of the Eastern Cape *P. sidoides* is found growing together with a similar-looking Pelargonium, *P. reniforme*. The two species differ mainly in flower colour, the latter having light pink petals while the former has dark petals. When harvesting takes place in the non-flowering season in areas where both species occur, harvesters are unable to distinguish between the two species and harvesting of both species may occur (Newton 2004; White 2007).

2.2.4 Cultural and traditional use

A review of available cultural, scientific and industrial knowledge on the uses of *P. sidoides* over the centuries has been conducted by Brendler and Van Wyk (2008) and indicates that the species is used to treat a range of human and livestock ailments particularly stomach-related ailments. There appears to be a long history of traditional use, however the actual origin of the intellectual knowledge remains unknown (Van Wyk *et al.* 1997) and it is likely to prove impossible to allocate property rights to any particular group or person. Detailed ethnobotanical studies may help to clarify the situation.

2.2.5 Distribution and abundance of the *P. sidoides* resource

P. sidoides is widely distributed in five South African provinces and Lesotho with an Extent of Occurrence of c. 600 000km^2 (Figure 1). As wild harvesting appears to be limited to the Free State, Eastern Cape and Lesotho, a large part of its range is currently not affected by harvest. The majority of *P. sidoides* plants occur on private, communal or state land that falls outside of formal protected areas.

The results of a resource assessment carried out by De Castro *et al.* (2010) which sampled 103 sites in suitable habitat across the species range (Figure 2.) indicate that this species is sparsely distributed, and represented by isolated and mostly small sub-populations in Gauteng, Mpumalanga and Western Cape. However it is widespread and abundant to extremely abundant in the northeastern and southeastern Free State and Lesotho. It is also abundant in the Eastern Cape from around Grahamstown eastwards and northeastwards to about King William's Town. The data indicates that in the areas of the Free State and Lesotho that were surveyed 60% of the survey sites were estimated to have more than 100 000 plants occurring within a 100ha area, and at one site near Harrismith, the size of the population within the 100ha area was estimated to be 652 400 plants. At five of the 30 sites where density counts were conducted in the Eastern Cape, the size of the *P. sidoides* sub-population within a 100ha area surrounding the site was estimated to be more than 100 000 plants, and at a site near Hogsback the size of the sub-population within the 100ha area was estimated to be 297 500 plants. 17.8 milllion plants were estimated to occur in a 50 000ha area near Cathcart, whilst the number of plants in an area of approximately 45 000ha south of Bedford was estimated to be approximately 4 milllion (De Castro *et al.* 2010). These figures indicate that *P. sidoides* is very abundant. The South African National Biodiversity Institute's Threatened Species Programme will work with the Pelargonium Working Group to use the survey data from the resource assessment to calculate a minimum baseline population against which to measure the current impact of trade and to help guide future off-take.

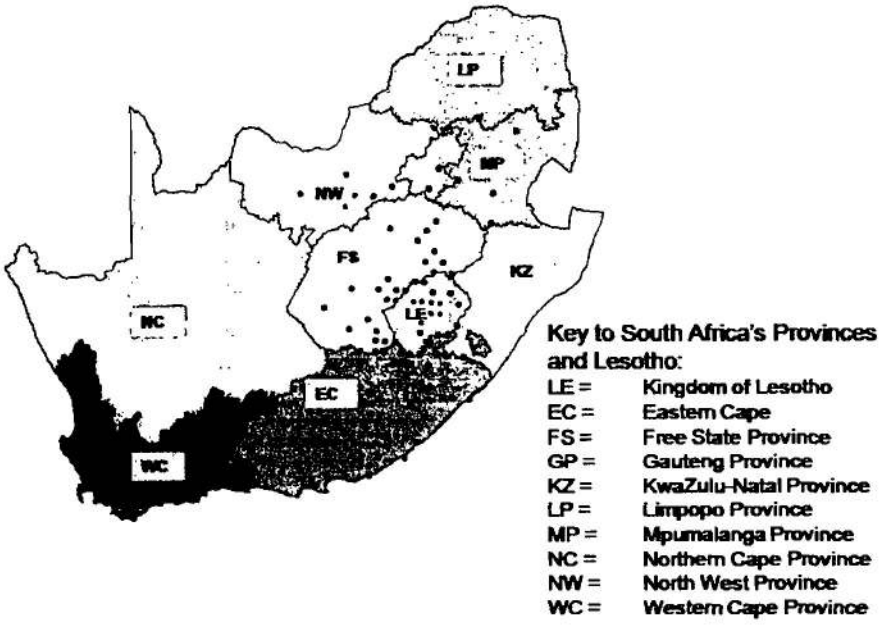


Figure 1.—Distribution map for *P. sidoides* in South Africa and Lesotho. Source: Quarter degree square data from PRE (National Herbarium, SANBI, Pretoria), SAM (South African Museum Herbarium—transferred to NBG in 1956), NBG (Compton Herbarium, SANBI, Cape Town), NMB (Herbarium, National Museum, Bloemfontein), GRA (Selmar Schonland Herbarium, Albany Museum, Grahamstown), NH (KwaZulu-Natal Herbarium, SANBI, Durban), KEI (Herbarium, Walter Sisulu University, Umtata), PUC (A.P. Goossens Herbarium, North-West University, Potchefstroom) and Global Positioning System (GPS) locality data collected during fieldwork conducted in Lesotho during February 2008.

Figure 2.—The 103 sites surveyed within the *P. sidoides* range (red polygon) as part of the resource assessment carried out by De Castro *et al.* (2010). Blue sites represent areas where *P. sidoides* populations occur and red sites represent suitable habitat where no populations where found.

2.2.6 Threats

According to De Castro *et al.* (2010) the greatest threat to *P. sidoides* is currently not harvesting of its rootstocks (lignotubers), but habitat transformation and degradation. Loss of populations to habitat transformation as a result of urban development and agriculture has occurred in most of the historic sites in Gauteng Province as well as at many sites in the Free State. In the Eastern Cape, northeastern Free State and Lesotho, many of the known localities are situated on communal grazing land, much of which has been degraded by historical and ongoing overgrazing and erosion. In the Eastern Cape overgrazing is leading to dense bush encroachment by acacias, which creates unsuitable habitat for *P. sidoides*.

Although harvesting is currently a threat to this species it is only impacting a small proportion of the total population. Even in regions where harvesting is most active, e.g. in the Eastern Cape, harvesting was only recorded by De Castro *et al.* (2010) from 6% of sites where *P. sidoides* occurs.

This same study also reported that, on the whole, populations were resprouting after a harvest events. The majority of harvested plants (average 75%) were observed to be resprouting after being harvested. However population decline due to harvesting is taking place. The survey by De Castro *et al.* (2010) confirms reports that local extinctions occur when harvesting takes place too regularly. Three of the 61 sites surveyed had less than 20% of plants recovering after harvesting due to regular and intense harvest pressure.

Population declines caused by too regular return harvests have also been observed on commonage areas in the Eastern Cape Province of South Africa and in communal

areas particularly those close to large towns (Vlok 2005, De Castro et al. 2010, Mojotji in prep).

2.2.7. Impact of harvesting on *P. sidoides* wild populations

The main part of *P. sidoides* harvested for commercial purpose is the lignotuber, the plants' underground stem and root system. Fieldwork carried out in South Africa and Lesotho shows that plants regrow rapidly within two weeks to one year after harvest from lignotuber segments that commonly break off and remain buried. Although plant remnants left in the soil after harvest re-sprout well, the regrowth of the commercially valuable lignotuber is very slow, severely limiting opportunities for return harvest. Under the harsh *in situ* conditions of wild plants new lignotuber formation from previously harvested re-sprouting plants has been estimated to only reach harvestable size after four to seven or more years (Newton 2004; Newton *et al.* 2008; De Castro *et al.* 2010). Based on recent research conducted by Motjotji (in prep) it appears that seven years may be too short a time period for recovery with 10 and 15 years being suggested depending on environmental conditions.

Newton *et al.* (2008) suggest that local wild populations may be lost entirely if too frequent harvesting occurs, especially in periods of drought. Minimising tuber damage, implementing minimum return harvest intervals and establishing harvest quotas or implementing other appropriate management interventions are high priorities if the harvesting of *P. sidoides* in the wild is to be sustainable.

2.2.8 Impact of wild harvesting of *P. sidoides* on ecosystems

There is currently a lack of information on the impacts of wild harvesting of *P. sidoides* on the ecosystems in which it occurs. However, at a local level, instances have been recorded of damage caused to local ecosystems through uncontrolled and illegal harvesting being carried out by untrained harvesters (Eastern Cape farmer Cotterrell, pers. comm. to D. Newton 2009). As a result of lack of training which results in large holes being dug during harvesting, some communal areas in Lesotho and South Africa as well as privately owned areas in the Eastern Cape have experienced or reported substantial damage to their grazing areas and an increase in soil erosion. In the Eastern Cape there have also been reports of destruction of plants associated with *Pelargonium*, such as *Euphorbia* and *Brachystelma* species.

2.2.9 Cultivation of *P. sidoides*

Cultivation of the species could be considered one way of reducing collection pressures on the wild populations. Field research has shown that the plant propagates easily from shoot and root cuttings, producing leafy regrowths within a relatively short period ranging from weeks to months. By comparing the antibacterial activity of each part of the plant, the possibility of harvesting leaves instead of tubers was investigated (Lewu *et al.* 2006) in an attempt to improve the sustainability of harvest techniques. The results revealed no significant differences in the antibacterial activity between the two plant parts supporting the collection of leaves to support future market demands. However, to support the change in harvest technique to leaves instead of tubers, further research on plant part substitution is required as *in vitro* clinical trials have shown that the efficacy of the plant is not due to its anti-microbial activities alone, but also its immunological properties (Lewu *et al.* 2006).

Cultivation trials to date indicate that it takes several years for plants to generate mature tubers with the desirable commercial characteristics that comply to the monograph as published in the European Pharmacopeia (2008). In addition, industry

players have often reported that less active ingredient is found in the cultivated crop as compared to that collected in the wild (White 2007; Motjotji *in prep.*).

Cultivation efforts have commenced in the Eastern Cape through the Department of Economic Development and Environmental Affairs (DEDEA), the Eastern Cape Development Corporation, Amathole Municipal District and Parceval Pharmaceuticals (Pty) Ltd (private sector involved in the harvest and trade in *P. sidoides*). The Imingcangathelo Pelargonium Project (IPP) involves 40 members of the local community. In addition, the CSIR has identified a 15ha cultivation site owned by the Senqu municipality in the Eastern Cape (Zakhele Village, Rhodes) where approximately 30 000 plants and 350 000 seedlings are being planted. The Department of Science and Technology through its public entity, the CSIR, aims to establish commercial production of *P. sidoides* to provide material for research and development, as well as provide material into the current market for the roots of the plant (www.dst.gov.za/other/gpc/Med%20Plants%20Activities.pdf accessed September 2009). Further propagation and cultivation sites have been established by Parceval in the Free State.

The main drawback to cultivating *P. sidoides* for the medicinal industry is that the tubers do not develop the same concentration of the active substance Umckalin as occurs in wild populations. Results from White (2007) shows that wild-harvested roots have a 10 times higher concentration of Umckalin than plants propagated in the same area. In addition, the root colouration of tubers collected from the wild are a distinctive red colour (Figure 3) which also provides the red colour of the resulting product, whereas the tubers of cultivated plants are much lighter (Figure 4).

It should be noted that White's (2007) research was conducted over a short time period and longer term studies may demonstrate higher Umckalin and colour levels.

Figure 3.—Mature wild collected *P. sidoides* plant with large dark pink to red lignotubers.

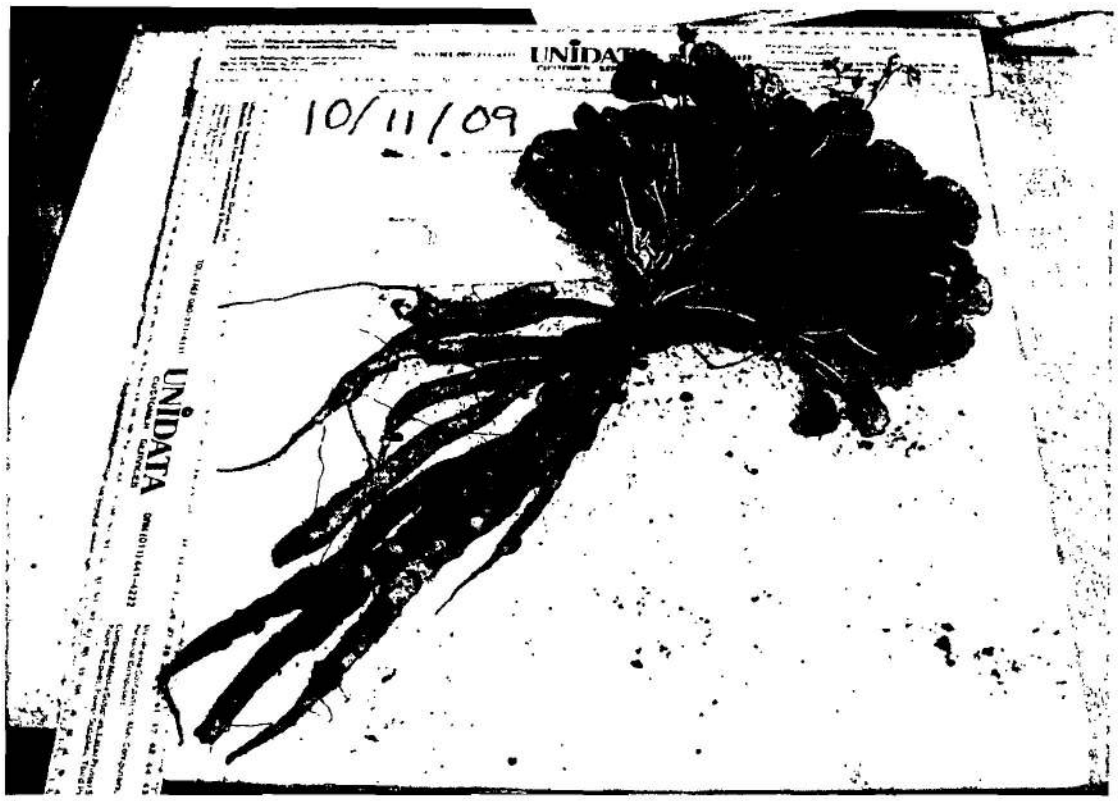


Figure 4.—Prolific eighteen month old regrowth of slender, light coloured lignotubers from mature *P. sidoides* cutting grown under agricultural conditions.

2.2.10 Harvesting permits

Harvest permits are issued in the Eastern Cape, however non-compliance with the permit conditions coupled with uncontrolled harvesting in the wild resulted in a moratorium being issued in 2006 on all harvesting of the plant. During 2009 this collection ban was lifted and two open-harvest permits were issued to two community-based projects supplying one company that had entered into benefit sharing agreements with those communities. These permits, although not specifying harvest volumes are time bound and must be renewed if the programme is to continue.

In 2000 and 2003 arrests were made in the Eastern Cape for permit transgressions, but no successful prosecutions were made since the relevant legislation protects land owners rather than plant species (Van Niekerk 2009). Apart from these arrests no further arrests have been made. Currently the dominant part of the industry is receiving harvesting permits and is complying to NEMBA by applying for bioprospecting permits. Despite this, both harvesters and Eastern Cape DEDEA officials reported at a Pelargonium stakeholder meeting in November 2010, that there are still a number of individuals harvesting Pelargonium in the Eastern Cape without permits. Stricter enforcement of possessions of permits and compliance with permitting conditions is urgently required particularly in the Eastern Cape. In order to facilitate this, Harvester Guidelines have been developed as part of this management plan and are included in Annex II.

2.2.11 Harvester training

Harvesting takes place throughout the year but is rainfall-dependent, taking place during periods of rain as rain stimulates re-sprouting (Motjotji *in prep*). Some harvest and post-harvest training is provided by industry. However, it appears that training is not comprehensively implemented in all harvest areas as there have been a number of observations of harvesting having adverse impacts on wild populations of *P. sidoides*. For example, when harvesters remove the entire root system of the plant, recovery is poor (White 2005). In the Eastern Cape, Vlok (2003; 2005) noted that whilst some harvesters take the effort to replant the stems and other plant parts that are not needed, this was not always the case. In the Cathcart district of the Eastern Cape, open holes were observed where *P. sidoides* plants had been removed and left lying in the open. No replanting of discarded portions of the plant or filling in of harvest holes was observed. These observations indicate that harvest and post-harvest training is required and needs to be implemented across the areas where *P. sidoides* is harvested.

2.2.12 Socio-economic issues

A socio-economic survey that focussed on self-medication and the harvest of *P. sidoides* (and *P. reniforme*) was conducted in four villages in the Peddie and Alice districts of the Eastern Cape during 2002 by Dold and Sizane (2002) and is detailed in Annex IV. The results of that survey illustrated the common usage of *P. sidoides* and *P. reniforme* for self-medication. In addition, observations about the manner in which the industry was conducted, the economic benefits and perceptions about the impact of trade on the resource were captured in this study.

In a survey of plants used in traditional medicine in the Grahamstown area of the Eastern Cape, Matsiliza and Barker (2001) villagers and patients of a traditional healer they interviewed were familiar with *P. sidoides* and its uses. Villagers who need to treat an ailment with *P. sidoides* would simply go out and collect it for personal use from the veld. Traditional collection practice involves digging up small numbers of individual plants for their lignotubers. In addition, traditional healers at a Pelargonium stakeholder workshop held in the Free State in January 2011 noted that despite all traditional healers using *P. sidoides,* they only harvest one or two tubers from each plant and never harvest all tubers. This is to ensure rapid recovery after harvest. The low volumes harvested in this manner for traditional use are completely sustainable and do not have any negative consequences on the population of this species.

2.2.13 Collection intensity

Currently comprehensive records of annual trade volumes are not being collected by provincial nature conservation officials or by the National Department of Environmental Affairs and there is therefore no record of the volumes of the trade and how this is fluctuating from year to year. Data on trade volumes are vital in order to understand the harvest pressure on wild populations and this lack of information is currently one of the biggest challenges impeding sustainable management of this trade.

The only available estimates on trade volumes were conducted by the NGO TRAFFIC in 2003. The resulting report (Newton 2004) estimated volumes of trade for the period 2001 to 2003 to be annual harvest volume of between 9 000kg and 45 000kg (wet weight) of *P. sidoides* for South Africa. The data for these estimates were based on interviews conducted from a wide range of sources and unfortunately

cannot be verified by official records. These figures do however create the impression that trade volumes are substantial and there is a need for accurate monitoring of trade volumes to be recorded.

One of the bioprospecting permit conditions contained in the Bioprospecting, Access and Benefit Sharing (BABS) Regulations is the requirement to submit reports on the bioprospecting project to the issuing authorities. The report should include related trade information on the species utilised for bioprospecting. Most of the major *Pelargonium* industries have submitted BABS permit applications for commercial bioprospecting . Once permits are issued and permit conditions are adhered to, trade information including trade volumes, trade routes, resource origin, product development and beneficiation will become available.

2.2.14 Monitoring of current use

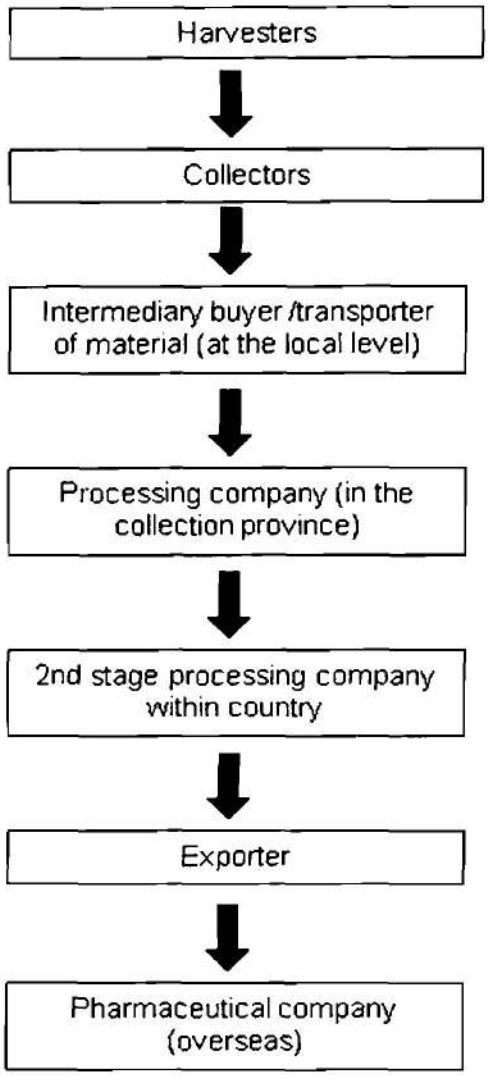
No formal monitoring is currently being carried out by the Governments of South Africa, Lesotho or the main importing countries, such as Germany. For the latter country formal monitoring would only commence if the species was to be listed on the CITES Appendices or when the Nagoya Protocol on Access and Benefit Sharing under the Convention on Biological Diversity enters into force. Placement of the species on CITES is not likely due to this species being wide spread and abundant and there being no concern regarding the conservation status. The Nagoya Protocol will enter into effect ninety (90) days after the fiftieth country has deposited its instrument of ratification. Parties to the Nagoya Protocol will then legally be obliged to ensure that material imported to their area of jurisdiction was obtained in compliance with the legal requirements of the country of origin.

Due to the lack of current monitoring, it is unclear whether the volumes processed by the main importing countries match the volumes exported from South Africa and Lesotho. Supplementary trade studies need to be carried out in Europe to corroborate the findings of previous trade work.

2.2.15 Use-value of *P. sidoides*

Van Niekerk (2009) conducted a valuation of the trade chain for Pelargonium however the figures presented in this study were based on anecdotal evidence and are not considered to accurately reflect the current value chain and are therefore not presented here.

The following stakeholders form part of the trade chain for Pelargonium:



The price paid to each of these trade chain members is currently not known. Industry report striving to pay a consistent price to harvesters however stakeholders consulted during the process of developing this BMP-S report that industry pay intermediary buyers (typically individuals who have access to a vehicle who deliver Pelargonium to designated collection points) and do not pay harvesters directly. There is therefore no control on what intermediary buyers pay the harvesters and a number of reports of exploitation have been reported. A priority for the trade is therefore to set an annual price for payment to harvesters decided upon by Industry but overseen by government officials from the provincial conservation agencies and DEA. This price should be widely publicised and will be published in the government gazette.

III. ACTION PLAN

3.1. Action plan for P. sidoides

OBJECTIVE 1:
Wild collection of *P. sidoides* is carried out in a manner that maintains survival of the species in the wild.

CRITERION 1:
Conservation status of *P. sidoides* is assessed and reviewed regularly.

The regional assessment carried out by SANBI has categorised the species as 'Least Concern: Declining' on the basis of unsustainable and uncontrolled harvesting of the plant in the wild. A global threat assessment should be carried out as a priority action under this BMP-S to determine the conservation status of this species.	
Action	Conduct global conservation assessment.
Actor	SANBI and Scientific Authority of Lesotho.
Indicator	• Conservation status of *P. sidoides* is assessed according to IUCN Red List categories and criteria (Version 3.1, 2001).
Deadline	December 2012.

CRITERION 2:
Collection practices are based on adequate identification, inventory, assessment and monitoring of *P. sidoides*.

Although maps exists showing the areas where collection takes place, these are owned by the industry and the degree of detail is inconsistent. Boundaries and collection sites are not currently included on the maps. Mapping would assist with monitoring of the impact of collection on wild populations. The Bioprospecting, Access and Benefit Sharing (BABS) unit of the Department of Environmental Affairs request industry to submit GPS points of where harvesting takes places. The department maintains a database of where harvesting takes place.	
Action 1a	Industry records localities (in the form of GPS co-ordinates) for all harvesting sites and submits these annually to the BABS unit of DEA and to the provincial nature conservation permitting offices (DEDEA and DETEA).
Action 1b	Collection data is collated, analysed and made available for incorporation into national harvest maps.
Actor	Industry, DEA BABS division, DEDEA, DETEA; Pelargonium Working Group to monitor.
Indicator	• Maps are produced that identify the harvest localities of *P. sidoides* in the wild and distributed to the relevant agencies including SANBI, DEDEA and DETEA.
Deadline	Maps are presented annually at PWG meeting.

Harvesting guidelines for use by industry are required to ensure that the collection of *P. sidoides* in the wild does not impact adversely on the survival of the species.	
Action 2	Harvest guidelines included in Annex II of this BMP-S are implemented by provincial conservation authorities and adhered to by industry.

Actor	DEDEA, DETEA and industry.
Indicators	• Declines in populations of *P. sidoides* in the wild due to harvesting decrease. • Waste through excessive harvest of *P. sidoides* and unnecessary destruction of rangelands and non-target species through poor collection practices is minimised.
Deadline	DEDEA and DETEA implementing guidelines by December 2011. Guidelines annually reviewed by PWG.

When not in flower, harvesters often find it difficult to distinguish between the targeted *P. sidoides* and other similar looking *Pelargonium* species (for instance *P. reniforme*). Strategies need to be developed to avoid confusion and help harvesters to identify accurately the target plant, thereby reducing negative impact on look-alike species, and the adulteration of products.	
Action 3	Implementation of harvest guidelines that include recommendations that in areas where *P. sidoides* occurs with look-alike species harvesting only takes place during flowering time.
Actor	DEDEA, DETEA, industry and harvesters.
Indicator	• Field monitoring indicates that look-alike species are not being harvested.
Deadline	DEDEA and DETEA implementing guidelines by December 2011. Guidelines annually reviewed by PWG.

CRITERION 3:
Collection intensity does not exceed the ability of *P. sidoides* to regenerate over the long term.

In order to ascertain whether the quantities harvested and the locations where harvesting takes place are having any impact on the continued survival of *P. sidoides* in the wild, a resource assessment which surveyed many populations of *P. sidoides* across its range was conducted in 2010. Information from this assessment needs to be analysed to determine baseline population status of *P. sidoides* in South Africa.	
Action 1	Baseline information is made available to provincial conservation authorities on the population size, distribution and structure across the species range.
Actors	SANBI, Pelargonium Working Group.
Indicator	• Provincial conservation authorities are using information from the resource assessment to inform where harvesting is permitted.
Deadline	December 2011

Although basic information on volumes of P. sidoides tubers in trade are available, the veracity of the current data needs to been investigated both within South Africa & Lesotho, as well as in Europe, the main export destination. The volumes required by the industry (both locally and internationally) need to be identified to determine if quotas or other management interventions are required that will promote the sustainable use of populations. Such management guidelines will feed into official government permits as well as internal collection procedures set by the Pelargonium Working Group.	
Action 2	Establish total quantity in trade within the region as well as internationally and cross-check results of resource assessment to determine whether off-take negatively impacts the population of this species and determine if quotas or other management interventions are required.
Actors	Industry will provide records of trade to the Pelargonium Working

	Group, BABS unit to verify figures submitted by industry and to help get tonnage from industry players that are not compliant, TRAFFIC to source international trade figures.
Indicators	• Collection quantities, periods and frequency of collection are recorded and confirm compliance with collection instructions. • Database of trade records per year is created. • Data collection program is established. • Maximum allowed collection quantities or other management guidelines are defined by the Pelargonium Working Groups in collection instructions for use by provincial conservation agencies.
Deadline	December 2011

Too frequent return harvests have been observed in a small proportion (<5%) of areas harvested to date (De Castro *et al.* 2010). Overharvesting has caused declines and in some cases local extirpations of populations. This has occurred mainly in areas of Eastern Cape where *P. sidoides* populations occur close to large towns e.g. King William's Town, Grahamstown and Stutterheim. Declines have also been reported in some communal areas of the Free State that border on Lesotho (De Castro *et al.* 2010). Due to these declines it is important to determine what harvesting practices need to be established to ensure that the resource can be harvested sustainably. A measure of sustainability of harvest techniques for this species is the time required for the lignotubers to regrow to a commercially harvestable size. Excessive once-off harvesting needs to be mitigated through industry guidelines and responsible harvesting techniques.	
Action 3	Establish whether return harvest is possible and if so how often harvesting can be conducted. Also determine how harvest return time should differ between highveld and lowveld areas. Include return harvest time in harvester guidelines.
Actors	TRAFFIC, Pelargonium Working Group.
Indicator	• Collection and harvest instructions and rules are produced that form the basic rules of harvest return intervals for this species.
Deadline	December 2011 and reviewed annually and included in harvester guidelines by PWG.

OBJECTIVE 2:
Wild collection of *P. sidoides* does not affect the environment, other wild species or neighbouring areas.

CRITERION 1:
Sensitive taxa and habitats that could be affected by collection of *P. sidoides* are identified and protected.

In some areas of its range particularly in the Eastern Cape *P. sidoides* occurs with other localised and rare species of plants. It is important to ensure that harvesting *P. sidoides* does not negatively impact other sensitive species with which it occurs.	
Action 1	Determine impact of harvest on the larger ecosystem and if any rare or threatened species are being affected.
Actors	SANBI
Indicators	• Spatial layer of *P. sidoides* localities is overlaid with layer of threatened species using GIS maps.
Deadline	June 2014

Action 2	Develop a decision support tool for BABS unit of DEA and provincial conservation authorities that identifies areas where harvesting should not be permitted as it would result in negative impacts to sensitive ecosystems and species. Areas to be included in decision support tool must include: 1. Threatened ecosystems. 2. Areas where threatened species occur. 3. Areas of exceptional and critical biodiversity.
Actors	SANBI
Indicators	• Spatial layer of *P. sidoides* localities is overlaid with layer of threatened species using GIS maps. • Existing threatened species and habitat conservation strategies are recognised and incorporated into the BMP-S.
Deadline	June 2014

OBJECTIVE 3:
Collection and management activities are carried out under legitimate tenure arrangements and comply with relevant laws, regulations and agreements.

CRITERION 1:
Tenure, management authority and use rights are clearly defined for the collection of *P. sidoides* in the wild.

Government legislation provides for community control over natural resources, environmental protection and other communally owned property. To this end prior informed consent is required from communal leadership before any commercial collection occurs. Approval is also required from farm owners and other private land owners before harvesting can take place on their private lands. Legal access and harvesting must be *de rigueur* and included in harvest guidelines and industry procedures.	
Action 1	Information is provided by collectors and industry to prove legal access or prior informed consent.
Actors	Industry, DEDEA and DETEA.
Indicators	• The area where wild collection is carried out is clearly defined and its boundaries are established. • Ownership, tenure or use rights of the collection area are clearly defined through documents such as land/title deeds, lease agreements, collection permits, prior informed consent, letters of permission from land owners and land registry records.
Deadline	Ongoing

CRITERION 2:
Collection and management of *P. sidoides* is in compliance with relevant laws, regulations, international agreements and administrative requirements.

P. sidoides is not listed as a protected species on any of South Africa's provincial ordinances or on the national list of Threatened and Protected species (TOPS) of the National Environment Biodiversity Act (Act 10 of 2004). There is thus little legal support for the management of this trade by provincial nature conservation authorities.	
Action 1	Evaluate the suitability of *P. sidoides* and the look-alike species *P. reniforme* for inclusion on the TOPS list of NEMBA and provincial ordinances.

Actors	Scientific Authority of South Africa SANBI, DEDEA and DETEA.
Indicators	• *P. sidoides* and *P. reniforme* evaluated for listing.
Deadline	July 2011

Collection in South Africa is mainly on communal and state land. The permitting arrangements and adherence to their conditions are currently unclear. This can be rectified through monitoring of the permit conditions and the level of compliance with conditions.	
Action 2a Action 2b	Monitor permit conditions to insure they are implemented in terms of all NEMBA provisions (including BABS Regulations). Monitor the level of compliance with permit conditions with field visits to harvested areas.
Actors	DEDEA, DETEA, DEA, BABS and Pelargonium Working Group.
Indicators	• Industry provides harvest records in terms of permit conditions to DEDEA and DETEA. • Industry develops a system of 'Collector IDs' proving that harvesters are part of a legal harvest and are trained to meet conditions of permits. • DEDEA and DETEA provides access to permits for record-analysis.
Deadline	By December 2011 and ongoing

BMP-S's are a new element of South Africa's biodiversity management legislation and, as such, the country has little experience in their implementation, including the monitoring of their implementation. There is consequently a need to provide training to relevant conservation officials. A first communication session that introduced the contents of the BMP-S was conducted in November 2010 in the Eastern Cape and in January 2011 in the Free State.	
Action 3	Training and communication workshops are held at provincial level and monitoring implementation plans developed for the implementation of this BMP-S.
Actors	DEA, SANBI, TRAFFIC, DEDEA and DETEA.
Indicators	• At least 50% of available conservation staff in each of the nine provinces are trained in the management of BMP-S's. • BMP-S monitoring reports and interviews with collectors, ensure that laws and regulations are being enforced with the intended effect.
Deadline	Future training on implementation of the BMP-S to be conducted as the need arises. Need for training to be raised by DEDEA and DETEA members of the PWG.

Although NEMBA is the key body of legislation required for the implementation of BMP-S's, it also covers the regulation of bioprospecting involving indigenous biological resources, including the export of indigenous biological resources and fair and equitable benefit sharing arising from bioprospecting involving indigenous biological resources. In addition regulations for the implementation of Bioprospecting, Access and Benefit Sharing (BABS) have been developed and came into force in 2008. As constructed, these measures automatically cover *P. sidoides* and associated industry and community stakeholder harvest and bioprospecting activities but due to their recent development there is little experience in their practical implementation. Consequently, South Africa must fully implement the BABS provisions in NEMBA and the BABS regulations for *P. sidoides* as a test case.	
Action 4	Implement terms of the BABS Regulations for the *P. sidoides* industry

	under the auspices of DEA and in consultation with the Pelargonium Working Group.
Actors	DEA, BABS unit, industry, Pelargonium Working Group.
Indicators	• Documentary evidence proves compliance with Chapter 6 relating to Bioprospecting, Access and Benefit Sharing of the NEMBA and the associated regulations that came into force in April 2008.
Deadline	Ongoing

OBJECTIVE 4
Customary rights of local and indigenous communities to use and manage collection areas are recognised and respected.

CRITERION 1:
Local communities' rights to use and manage the collection areas and wild collected *P. sidoides* shall be recognised and respected.

No thorough ethnobotanical study has been carried out on the cultural significance of a range of red rooted *Pelargonium* species including *P. sidoides*. Such a study is required to clarify the current debates on intellectual property rights of this species.	
Action 1	Ethnobotanical studies are carried out through household surveys and interviews with local traditional healers to secure information on local uses, cultural significance and the quantities of Pelargonium required for local use.
Action 2	Information is translated and inserted into a map of the collection areas.
Action 3	Quantities needed for local use are taken into account when setting quotas in terms of TOPS and BABS.
Actors	UCT—Environmental Evaluation Unit, Pelargonium Working Group.
Indicators	• Ethnobotanical report is produced. • Information on quantities required for local use requirements (this will assist with apportionment of national harvest quota between industry and local users). • Maps are produced showing the boundaries of collection areas (this will assist in minimising unauthorised collection and reduce conflict).
Deadline	December 2013 (funding-dependent)

CRITERION 2:
Agreements with local communities are based on appropriate and adequate knowledge of resource tenure, management requirements and resource value of *P. sidoides*.

P. sidoides collection is currently not well-organised or structured. In many cases agreements between industry and the appropriate community organisation as required by the BABS regulations of NEMBA do not exist. In addition, where agreements are in place harvest management systems tend not to be integrated into agreements. There is also a need for agreements to reflect the limited time-based nature of harvest episodes for *P. sidoides* to ensure that communities are aware that agreements are not long-term commitments. Industry can only engage as long as the resource lasts, due to the fact that the Pelargonium resource must rest in order for the species to be sustainably managed.	
Action 1	During compilation of BABS agreements, all available knowledge on resource tenure, available stock within the areas and likely time for

	which harvesting will take place, the management requirements and value of the *P. sidoides* resource, needs to be incorporated.
Actors	Industry, DEA, BABS section, DEDEA, FSNC, Pelargonium Working Group.
Indicators	• BABS agreements contain details of resource tenure, size of resource and estimate of time for which harvesting will take place, management requirements and resource value (i.e. determining if the economic value of the available resource is sufficient to support a viable business).
Deadline	Ongoing progress needs to be monitored at annual Pelargonium Working Group meetings.

The value chain has not been investigated in detail and has been based on estimates and extrapolations. In order to determine the 'fair' or 'equitable' benefit allocated to communities, the prices per kilogram need to be identified at each point along the trade chain. BABS agreements need to incorporate flexibility for amendments based on market fluctuations, which could impact on local community livelihoods and the survival of the wild population of *P. sidoides*.	
Action 2	Value chain analysis is carried out for material originating in South Africa annually and a price to be paid to harvesters set.
Actors	Industry, BABS (for the implementation of a price to be paid to harvesters), Pelargonium Working Group.
Indicators	• Resource values along the chain are determined and are reflected in BABS and other agreements between stakeholders. • BABS agreements are amended to incorporate adaptive pricing element to allow for changing circumstances that may affect the market price.
Deadline	December 2011

OBJECTIVE 5
Wild collection of *P. sidoides* is based upon adaptive, practical, participatory and transparent management practices.

CRITERION 1
Management of wild collection of *P. sidoides* is supported by resource inventory assessment and monitoring of collection impacts.

The Pelargonium Working Group, which has been in existence since 2007 and has the representative membership from government and industry, is a potentially strong forum that should provide oversight of the BMP-S. The PWG should be formalised and be chaired by DEA. The formalised PWG should be tasked with oversight of this BMP-S to ensure that socio-cultural-economic issues and scientific research and monitoring results and recommendations are incorporated into the industry guidelines and are subject to regular monitoring and updating.	
Action 1	Pelargonium Working Group is formalised based on the terms of reference represented in Annex IIII which incorporates monitoring of the implementation of the BMP-S. Membership to include amongst others: DEA (lead agency), DEDEA, DETEA, SANBI, TRAFFIC, industry, and an NGO working with communities and the environment.
Action 2	TOR of the PWG endorsed by DEA.
Actors	SANBI to amend TOR; DEA to provide formal endorsement of PWG.
Indicators	• Formalised PWG with TOR. The responsibilities of the group will include but not be limited to the following:

	o Monitoring the implementation of the BMP-S for *P. sidoides*. o Ensuring that management of *P. sidoides* wild collection is supported by adequate and practical resource inventory, assessment, and monitoring of collection impacts. o Ensure that *P. sidoides* collection activities are carried out in a transparent manner with respect to management planning and implementation, recording and sharing information, and involving stakeholders. o Assist with establishing procedures for collecting, managing, and sharing information required for effective collection management are established and carried out. o Contribute to the development of skills training for resource managers and collectors that will equip them to implement the provisions of the management plan. o Production of an annual report specifying progress in the implementation of the Biodiversity Management Plan as required by the Norms and Standards for BMP-S. o Drawing up proposals and fund raising for specific projects needed.
Deadline	Endorsement of the PWG and identification of chair end of December 2011.

Action 2	Pelargonium Working Group meets annually to discuss progress with the BMP-S and to ensure that all research findings are incorporated into the BMP-S and other relevant documents for the industry.
Actors	DEA, Pelargonium Working Group.
Indicators	• Monitoring reports, minutes of PWG meetings.
Deadline	A minimum of annually or more frequently if required.

A significant proportion of the range of *P. sidoides* occurs within Lesotho. Harvesting of *P. sidoides* is widespread in Lesotho and harvested material is bought by industry players based in South Africa. Due to the integrated nature of the trade between South Africa and Lesotho it is important that management of the trade is coordinated between the two countries.	
Action 3	Coordinate with Lesotho regarding a range of cross border trade issues including: 1. Sharing representation, minutes and other relevant management data between the formal structures responsible for *P. sidoides* management in each country. 2. Conducting the Global IUCN Conservation Assessment for the species. 3. Sharing experiences on the application of Bioprospecting Access and Benefit Sharing legislation.
Actors	Pelargonium Working Group, National Environmental Secretariat of Lesotho, Parliament of the Kingdom of Lesotho, Scientific authority of the Kingdom of Lesotho.
Indicators	• Cross border trade challenges are resolved via coordination between government authorities of the two countries.
Deadline	Ongoing

Although the processing of *P. sidoides* in South Africa and Lesotho is limited and most harvested materials is exported as raw product internationally, there remains a small but significant local pharmaceutical trade. Currently there is no understanding

of how much the local trade, both in raw and processed product of Pelargonium, contributes to the South African economy. Such knowledge is needed to motivate for government resources to support sustainable management of the trade.	
Action 4	Socio-economic study is carried out to determine contribution to the South African economy and to specify the employment created as a result of the industry.
Actors	Resource economist, DEA (BABS division to raise funds for this), Pelargonium Working Group.
Indicators	• Report is produced on the diversification of southern African economy based on the industry in *P. sidoides*. • Evidence of reasonable provision for local employment and local ownership of or investment in wild collection operations. • Responsible trading principles are compiled and included in industry guidelines.
Deadline	Dependent on funding, December 2012.

3.2. Role players and organisations involved in developing and implementing the BMP-S

Several role players will be involved in implementing the BMP-S:

Name of organisation	Role in BMP-S
Department of Environmental Affairs—South Africa (DEA)	• Facilitate DEA process to secure public comment and ministerial approval for the BMP-S. • Ensure ongoing national coordination of BMP-S implementation by chairing the formalised Pelargonium Working Group.
South African National Biodiversity Institute (SANBI)	• Coordinate the scientific research component of the management plan for South Africa. • Carry out desktop research on conservation status of the species for South Africa. • Participate in Pelargonium Working Group meetings to ensure conservation component of BMP-S is tabled. • Liaise with the LE CITES Scientific Authority to ensure coordination.
Government agencies having a role to play in sustainable resource management (e.g. the Department of Science and Technology, Department of Health, etc.)	• Work in collaboration with leading government agency responsible for BMP-S implementation to implement relevant components of BMP-S.
Industry	• Implement all industry related activities in terms of the BMP-S.
Universities	• Conduct research on the success of implementation of Access and Benefit sharing aspects of the BMP-S as permitted by funding.

Community Based Organisations (CBOs)	• Implement the BMP-S activities relevant to achieving sustainable use of *P. sidoides* within their village or community.
Non-Governmental Organisations (NGOs)	• Conduct various aspects of research or other pertinent activities as required for implementation of the BMP-S, for instance trade-related monitoring and research as permitted by funding.

IV. REFERENCES

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V. Abbreviations

BABS	Bioprospecting Access and Benefit Sharing
BMP-S	Biodiversity Management Plan for Species
CBD	Convention on Biological Diversity
CITES	Convention on International Trade in Wild Flora and Fauna
CSIR	Centre for Science and Industrial Research
DEA	Department of Environmental Affairs
DEDEA	Department of Economic Development and Environmental Affairs
DETEA	Department of Economic Development, Tourism and Environmental Affairs
FWS	Fairwild Standard
GIS	Geographic Information Systems
GPS	Global Positioning System
ha	Hectare
ISSC-MAP	International Standard for Sustainable Wild Collection of Medicinal and Aromatic Plants
IUCN-SSC	International Union for the Conservation of Nature – Species Survival Commission
MAP	Medicinal and Aromatic Plants
NDF	Non-detriment Finding (CITES)
NEMBA	National Environmental Management: Biodiversity Act
NES	National Environment Secretariat (Lesotho)
NGO	Non-Governmental Organisation
NUL	National University of Lesotho
PWG	Pelargonium Working Group
SANBI	South Africa National Biodiversity Institute
TOPS	Threatened or Protected Species list of NEMBA
TOR	Terms of Reference
TESA	TRAFFIC East/Southern Africa
TRAFFIC	The wildlife trade monitoring network
WWF	World Wildlife Fund
UCT-EEU	University of Cape Town Environmental Evaluation Unit
ZAR	South African Rand

ANNEX I Processes Followed in Developing the BMP-S

1.1. Processes followed in developing the BMP-S

This management plan is based on a review of unpublished data as well as published literature and reports, and baseline and inventory data on *P. sidoides* in South Africa. Extensive consultations and meetings were held with stakeholders in the Pelargonium industry on numerous occasions from 2003 to 2011, as recorded below:

- *P. sidoides* stakeholder consultation with stakeholders interested in *Pelargonium sidoides* on 4 December 2003, Grahamstown.
- Field work and interviews conducted with traders and conservation officials in Eastern Cape researching all aspects of legal and illegal harvesting, sustainability, socio-economic issues (15–19 December 2003).
- Field work with community representatives in the Alice district of the Eastern Cape Province researching all aspects of legal and illegal harvesting, sustainability, socio-economic issues (15–19 December 2003).
- Field work, interviews and resulting summary report of a Non-detriment Finding (NDF) conducted as part of a CITES Scientific Training programme in Lesotho during January and February 2008 (Newton *et al.* 2008).
- *Pelargonium sidoides* BMP and ISSC-MAP Stakeholder Consultation Workshop; Grahamstown—3 February 2009 (detailed below).
- BMP-S drafting workshop held in Pretoria, South Africa from 1–2 September 2009 with key government implementers from South Africa and Lesotho.
- Field work and interviews conducted with farmers, conservation officials and industry on five occasions during the period 9–15 November 2009 in Golden Gate National Park (Free State Province), Rhodes, Cathcart, Hogsback and Double Drift Nature Reserve (Eastern Cape Province).
- Pelargonium Working Group meeting to review the draft Pelargonium Management Plan (28 July 2010; 23 August 2010) Pretoria National Botanic Garden and on 28 January 2011 in Bloemfontein, Free State.
- Pelargonium Management Plan training workshop and final consultation on action plan (24 November 2010), Ubukhosi village (Mngqesha Great Place) Eastern Cape (detailed below).
- Pelargonium Management Plan training workshop and final consultation on action plan (28 January 2011) Bloemfontein Protea Hotel, Free State (detailed below).

1.2 Process followed for stakeholder consultation

Information gathered during projects conducted between 2003 and 2008 were collated into background information that was presented to a stakeholder workshop held in Grahamstown on 3 February 2009. Participants representing 15 stakeholder organisations attended the Grahamstown workshop. Participants were drawn from a wide range of stakeholders involved directly in the utilisation or management of *P. sidoides* including individuals, communities, traders, provincial and national conservation agencies and NGOs:

- TRAFFIC East/Southern Africa (TESA)
- South Africa National Biodiversity Institute (SANBI)
- Department of Economic Development and Environmental Affairs (DEDEA)

- DEA Directorate of Resource Unit
- National Environmental Secretariat of Lesotho (NES)
- National University of Lesotho—Biology Department (NUL)/LS CITES Scientific Authority
- Eastern Cape Parks Board
- Rhodes University—Department of Botany
- Rhodes University—Faculty of Law
- University of Cape Town—Environmental Evaluation Unit
- Grassroots pharmaceutical
- Imingcangathelo Community Development Trust
- Parceval Pharmaceuticals
- Gowar Enterprises
- BZH Exporters and Importers—Natural Plant Products for Pharma/Beauty Industry

As part of this workshop key issues that affect the Pelargonium trade were identified via participatory workshopping methodologies. Actions required to address these issues were suggested by participants and these formed the basis of the actions included in Section III of this BMP-S.

The first draft of the Pelargonium Management Plan was produced by TRAFFIC and SANBI by November 2009 and was then taken through various consultation processes. Firstly the Pelargonium Working Group, represented by government, industry and the NGO sector, held three meeting during which the plan was edited: 28 July 2010; 23 August 2010; and 28January 2011. The draft BMP was also circulated to all members of Working Group 1 in November 2010 and comments were received from two provinces by January 2011. Two training and consultation on action plan workshops were held with the two provincial conservation authorities for the provinces where *Pelargonium sidoides* harvesting takes place in the Eastern Cape (meeting 24t November 2010, Mngqesha Great Place) and Free State (28 January 2011, Bloemfontein Protea Hotel). Both meetings were very well represented by officials from the relevant conservation authority DEDEA (Department of Economic Development and Environmental Affairs) for the Eastern Cape and DETEA (Department of Economic Development Tourism and Environmental Affairs) for the Free State. Both meetings also had members of the community represented. These included Pelargonium harvesters and Chief Mavuso from the King Sandile Developemnt State for the Eastern Cape, and a large number of traditional healers for the meeting held in Bloemfontein in the Free State. Industry was represented at both meetings. These consultation processes took the format of training on South African Legislation including the Biodiversity Act and its regulations including the Biodiversity Management Plans for Species Norms and Standards and the Bioprospecting, Access and Benefit Sharing regulations. Following training each action in the action plan that effected DEDEA and DETEA were workshopped.

The BMP-S was ammended in March 2011 to include comments received from Working Group 1 and from stakeholders who attended the training and consultation workshops in the Eastern Cape and the Free State.

1.3 Relevant documents, agreements and policies to be appended to the BMP-S

The main implementer of the BMP-S in South Africa is SANBI/DEA, in collaboration with, or drawing upon, research conducted by, *inter alia,* various NGOs (e.g.

TRAFFIC), industry (e.g. Parceval), provincial conservation agencies (e.g. Eastern Cape), CBOs (e.g. Imingcangathelo Community Development Trust, research institutions (e.g. CSIR) and universities (e.g. University of Cape Town).

In order to complete the tasks outlined in the Action Plan (Section III) and ensure implementation of this management plan, the roles and responsibilities of these institutions will be elaborated upon in separate organisation-specific workplans.

No additional agreements will be required, as each institution has already participated in the drafting of this BMP-S. The funding requirements to carry out the tasks and actions, particularly the monitoring and reporting aspects, will require programme-specific budgets to be drafted and funding inputs solicited from government and other sources. This will require future agreements to be put in place, but are not dealt with in this document.

The draft agreement between SANBI and Parceval in terms of the funding of the resource assessments to be carried out by SANBI has already been finalised and agreed to amongst the parties.

TRAFFIC has a specific Memorandum of Understanding with SANBI that details the agreement to collaborate with regard to all aspects of research and analysis of trade in natural resources.

Other relevant documents that need to be read in conjunction with this BMP-S are the following:

- National Environmental Management Biodiversity Act 2004
- ISSC-MAP criteria and indicators
- Draft Masters thesis on *P. sidoides* lignotuber recovery and harvest techniques (Motjotji *in prep*), due for completion July 2011.
- Current permit arrangements between traders and the governments of Lesotho and South Africa.

1.4 Verification and approval by relevant experts on the quality and context of the species-related issues

Experts from within SANBI's Threatened Species Programme have been involved throughout the development of this BMP-S and have checked the quality of the species-related data. Extensive field visits, research on the ground and stakeholder consultations were carried out to collate the information presented in the BMP-S.

Annex II Pelargonium harvesting guidelines

A: Issuing of permits by conservation authorities

The following guidelines should be observed when issuing permits:

1. Before any permit is granted a field visit by a botanist employed by the relevant conservation authority is required to certify that *P. sidoides* is sufficiently abundant to allow harvesting to take place. Field visits needs to be conducted within two months of an application being lodged. If capacity is limited to conduct site visits the provincial conservation authority should request the applicant to provide a risk assessment drawn up by an independent botanical consultant.
2. Permit conditions need to stipulate that the permit holders need to record:
   2.1. Names, identity numbers and telephone numbers of harvesters and a specific number certifying that training on harvesting techniques has been provided.
   2.2. Quantities to be harvested.
   2.3. General area harvested through the provision of a single set of GPS co-ordinates taken from the centre of the area harvest and an estimate of the number of hectares harvested.
   2.4. Harvesting conditions detailed below in sections B and C need to be adhered to.

   Spot checks of harvested areas need to be undertaken by conservation officials to check if harvesting conditions are adhered to. If these are not adhered to, or if a permit holder does not supply information requested in points 2.1–2.3 listed above, no future permits should be supplied to that permit applicant.
3. In specific areas, such as an area falling under a specific traditional authority, care should be taken to issue only one permit to that traditional authority. If there is more than one permit issued for the same area unsustainable harvesting of plants is likely to occur and the area is likely to be overharvested.
4. Equal care should be taken that traditional authorities only deal with one commercial partner so as to avoid overlapping harvester structures in a specific area resulting in uncontrollable harvesting activities.
5. An area that has been harvested by the certain permit holder for a period of 2–5 years may not be re-harvested for at least 10 years and can only proceed once an assessment has been undertaken by a trained plant ecologist to ensure that recovery of tubers is sufficient. To ensure that repeat harvesting does not take place, conservation officials must keep records of which areas receive harvest permits and when permits were issued. Records should be kept as spreadsheets of GPS co-ordinates linked with the date that a permit was issued and permit identification number.

B: Harvesting conditions for permit holders

1. Harvesters for the area under permit need to be recorded with name, identity number, location address and contact telephone number. Records of this are to be kept by the permit holder and supplied to the relevant conservation authority for the province in which harvesting is taking place within two months of receipt of permits. Additional harvesters that join after the initial two

months should also be registered by the permit holder and details should be sent to the permit office on a six monthly basis.

2. Permit holders are responsible for ensuring that they do not accept resource harvested by non-registered harvesters (i.e. those not registered as above for the harvest permit) to discourage random repeat harvest.
3. Harvesters must be given training by the permit holder which needs to include all components included in section C below.
4. Harvester identification tags should be issued to harvesters once they have received training stating name, ID number, permit holding organisation affiliated to, date of training received and date issued.
5. Permit holders are responsible for monitoring that harvesting only takes place in areas where harvesting permits have been issued and that harvesting only takes place at intervals of a minimum of every 10 years.
6. Prior written consent must be obtained from the land owner (farmers/municipalities/tribal authorities) before harvesting may take place. Harvesting may not take place in conservancies, proclaimed National Parks and Reserves.
7. Harvested quantities, area where harvesting took place and lists of all harvesters involved in harvesting must be reported to the conservation authority. If not provided no future permits will be provided to the applicant.

C: Harvesting conditions for harvesters

1. **Training:** Harvesting may only be conducted once training on harvesting techniques has been completed and a harvester receives an identification tag from a permit holder.
2. **Species to be harvested:** Only the mature roots (roots that have a dark maroon colour) of *Pelargonium sidoides* may be harvested. *Pelargonium reniforme* (which has similar leaves but bright pink flowers) may not be harvested. In areas where the two species co-occur harvesting may only take place during the flowering season of *P. reniforme* so as to ensure that his species is not harvested.
3. **Harvest season:** Harvesting can take place all year round however the period of October to May should be favoured as this is typically the rainy season and the soil will be easier to dig at this time. In addition, higher soil moisture during these months will allow for faster re-sprouting and increased survival of the roots.
4. **Individual plant harvesting:** For harvesting of each Pelargonium plant:
   - the plant must be located and removed from the soil with the help of a pick. Spades, forks or similar larger tools may not be used as they cause too much damage to the soil and the other surrounding plants.
   - only the immediate surrounding soil of the plant should be disturbed, no large holes must be made or left behind after harvest.
   - other plants in the immediate vicinity of Pelargonium being harvested should not be disturbed, damaged or removed.
   - only the main tuber may be removed, smaller side roots must be left behind to stimulate re-growth of tubers.

- the green shoot of the plant must be removed from the root, most of the leaves must be cut off and the remaining piece must be replanted in the hole from which the tubers were removed.
- the soil as well as grass/other plants attached to the soil must be replaced into the hole and lightly compacted by foot.

5. **Transportation:** Woven bags must be used to transport harvested roots from the veld back to each harvester's home. The bags with roots should be kept in a dry place away from direct sunlight. Bags need to be left open to avoid mould and fungi growing on the roots as this will reduce the quality and therefore the purchase price. Bags with fresh Pelargonium roots should not be stored for more than one week before selling. Transport of bags should take place in closed vehicles to avoid contamination by rain etc.
6. **Duration of harvest and return harvest interval:** Harvesting should only take place once in each area and thereafter left to recover for a minimum of 10 years.

These harvester guidelines were assembled in March 2011 by Domitilla Raimondo from the South African National Biodiversity Institute and are based on inputs received from two stakeholder workshops held at the Great Place in the Eastern Cape on 24 November 2010 and in Bloemfontein, Free State on 28 January 2011. Written inputs were received from DEDEA officials, Quintus Handiek and Carin Swart and from the Pelargonium industry specifically from Ulrich Feiter (Parceval) who worked with Chief Mavuso (Eastern Cape), Roy Gowar (Eastern Cape), Kersten Paulsen (Pelargonium industry), Herman Nieuwoudt (Lesotho). The research conducted on harvest return time by Motjotji, L., *in prep.* was also included.

ANNEX III Terms of Reference for the South African Pelargonium sidoides Working Group

1. Preamble

Pelargonium sidoides is an aromatic perennial herb endemic to South Africa and Lesotho, where it is widely distributed in open grasslands. *Pelargonium* species have long been used in local traditional remedies for colic, dysentery, and other abdominal ailments. In recent years *P. sidoides* has increasingly been harvested to supply a growing international market for root tubers, which are used in commercially produced remedies to treat bronchitis and other respiratory tract infections. The sale of wild harvested tubers provides income for rural collectors.

Concerns over the sustainability of this trade led the South African National Biodiversity Institute (SANBI), the NGO TRAFFIC (East and Southern Africa) and the Department of Environmental Affairs (DEA) to develop a Biodiversity Management Plan (BMP)for *P. sidoides* in terms of the National Environmental Management Biodiversity Act No. 10 of 2004 (NEMBA). As stated in the Norms and Standards for Species Management Plans, published in 2009, the implementation of the Biodiversity Management Plan (BMP-S) requires oversight. The Pelargonium Working Group which has been in place since 2008 and consists of a range of members representing government, industry and the NGO sector is the appropriate group to monitor and implement the BMP-S for *P. sidoides*. These Terms of Reference serve to formalise the role of the Pelargonium Working Group and outline: the composition of this working group, the responsibilities of members and the procedures that will be followed to ensure the management plan is effectively implemented.

1. Responsibilities of members of the Pelargonium Working Group:

The main responsibility of the Pelargonium Working Group will include but not be limited to:

- monitoring the implementation of the actions specified in the Biodiversity Management Plan for *P. sidoides*.
- ensuring that management of *P. sidoides* wild collection is supported by adequate and practical resource inventory, assessment, and ongoing monitoring of collection impacts.
- ensuring that *P. sidoides* collection activities are carried out in a transparent manner with respect to management planning and implementation, recording and sharing information, and involving stakeholders.
- assisting with establishing procedures for collecting, managing, and sharing information required for sustainable management.
- contributing to the development of skills training for resource managers and collectors that will equip them to implement the provisions of the management plan.
- production of an annual report specifying progress in the implementation of the Biodiversity Management Plan as required by the Norms and Standards for BMP-S.
- drawing up proposals and fund raising for specific projects needed.

2. Composition of the committee

The following organisations/sectors must be represented on the Pelargonium Working Group: The National Department of Environmental Affairs (lead agency); the Eastern Cape Department of Economic Development and Environmental Affairs (DEDEA); Free State Department of Economic Development, Tourism and Environmental Affairs (DETEA), the South African National Biodiversity Institute; TRAFFIC (East and Southern Africa); Pelargonium industry; and NGOs working with communities and the environment, particularly those assisting communities to engage with legal frameworks to secure environmental and social justice. The Department of Environmental Affairs which will be represented by the staff from the Conservation Management and Resource Use directorates will coordinate and chair the Pelargonium Working Group meetings. Quorum needs to represent four of the above organisations and must always include DEA.

3. Rules of procedure for the Pelargonium Working Group

Meetings

The Pelargonium Working Group will meet at least once a year. The working group may also hold meetings more regularly depending on the requirements of the management plan. At least one month's notice will be given for meetings. The chairperson in consultation with members of the working group will decide when and where the meetings will be held. The chairperson presides at meetings of the working group, but if the chairperson is absent from a meeting, the members present must elect another DEA representative to preside at the meeting. The chairperson will ensure that minutes of each meeting are circulated to all members six weeks after the meeting date. Comments need to be returned to the secretariat no later than four weeks after circulation.

The Pelargonium Working Group chairperson will dispatch a draft agenda and minutes of the previous meeting no later than two weeks before an agreed meeting date.

Confidentiality

During the course of duty, members are required to treat all information shared by members of the working group as confidential and are expected not to reveal information to any third party without prior written consent of the chairperson of the Pelargonium Working Group.

Annex IV. Results of socio-economic harvest survey

Conducted in four Eastern Cape villages where harvest of *P. sidoides* and *P. reniforme* occurred during September 2002.

Question asked	**Response**	**Number of respondents**
Name of Village	• **Nobumba** • **Qamnyana** • **Balteni** • **Woodlands**	• **7** • **1** • **4** • **3**
Respondent age	**27;29;31;33;35;39;42;42;43;45;52;55;58;59;66**	**15**
Gender	**Female : Male**	**9 : 6**
Level of education	• **None** • **Grade 4** • **Grade 5** • **Grade 6** • **Grade 7** • **Grade 8** • **Grade 9** • **Grade 10** • **Grade 12**	• **1** • **2** • **1** • **2** • **1** • **2** • **2** • **3** • **1**
Male/female head-of-household	**Female : Male**	**6 : 9**
How many people in household	**3;5;5;5;6;6;7;7;7;7;7;8;9;12**	**14**
Background information		
1. What is the name of this plant?[3]	Ikhubalo	15
2. What is it used for?	For medicine (stomach ache)	15
3. What part is used (tuber? leaf?)?	Tuber/root	15
4. How is it prepared?	• Not using • Not sure • You take the root, crush it, pour cold water over it and strain • Crush and boil it and then drink • Take one root, crush and boil it and then mix with milk	• 5 • 3 • 2 • 1 • 4
5. How is it administered?	• Not using • Not sure • Drink half of cup for stomach ache • A child—one tablespoon; an adult—half a cup • You take half a bottle per head of cattle	• 5 • 3 • 2 • 4 • 1
6. Do you and your family use the medicine yourself?	• No • Yes	• 8 • 7
a. How much do you collect for your own use (how many plants)?	• No • One root if it is big enough, two if they are small	• 8 • 2

[3] This question was asked referring to *P. sidoides* and *P. reniforme* roots that were being harvested

	• One root • Two or three plants	• 4 • 1
b. How often do you use it (week, month, year)?	• No • When necessary • Often, when a child has a stomach ache	• 8 • 6 • 1
c. How long does the plant last once it has been collected?	• 10 days • 7 days (one week) • Not sure, because I collect it and drink on the same day • 3 to 5 days • A week to two weeks	• 3 • 9 • 1 • 1 • 1
Trade		
7. How did you first get to hear about the demand for this plant?	• Saw people from the village harvesting and asked them • Heard from neighbour • Saw people in town selling from their car and asked them • Saw people in 'Breakfast Vlei' waiting for a car/selling • Learned from people in next village	• 7 • 1 • 4 • 2 • 1
8. When did you first get to hear about the demand for this plant?	• October 2001 • November 2001 • December 2001 • January 2002 • February 2002 • April 2002	• 1 • 4 • 2 • 4 • 2 • 1
9. Do you know why people are buying this plant?	• No; not sure • Yes, for making medicines	• 7 • 9
10. Do you know what they are using it for?	• No • Not sure • For medicine	• 8 • 4 • 3
11. For how long have you been collecting this plant for sale (Since...)	• From October 2001 • From November 2001 (nine months) • From December 2001 • From January 2002 • From January to July 2002 • From February 2002 • Do it once but when she gets less money she stops	• 1 • 4 • 2 • 4 • 1 • 2 • 1
12. Who are you selling the plants to?		
a. Someone in your village?	—	—
b. Someone from further away?	• Yes • From Grahamstown	• 12 • 3
c. Does someone collect it or do you take it to town yourself?	• No answer • The buyers collect it • They hired a vehicle with the people from neighbouring village at ZAR12.00 (USD1.83) per person	• 1 • 11 • 1

	• The buyer comes to collect it but if he does not you have to go to Grahamstown • Sometimes they come and collect it, sometimes you need to take it to Peddie and wait for him	• 1 • 1
13. How often do you sell this material (once a week, once a month, once a year)?	• Once a month • Once a week • Once a year • Fortnightly • After one week	• 10 • 2 • 1 • 1 • 1
14. How much do you sell each time (Checkers, 50kg bag—how many of each)?	• ZAR12.00 (USD1.83) for 15kg bag • ZAR15.00 (USD2.30) for 10 litre bucket • Checkers packet, ZAR24.00 (USD3.67) for approximately 10kg • ZAR34.00 (USD5.20) for 25kg bag • ZAR35.00 (USD5.35) for 15 litre bucket • ZAR35.00 (USD5.35) for 15kg bag • ZAR35.00 (USD5.35) for 25kg bag • ZAR36.00 (USD5.50) for 25kg bag • ZAR45.00 (USD6.88) for 25 kg bag • ZAR48.00 (USD7.34) for 25kg bag • ZAR90.00 (USD13.76) for 50kg bag • ZAR135.00 (USD20.64) for 50kg bag • ZAR135.00 (USD20.64) for 50 kg bag	• 1 • 1 • 2 • 1 • 1 • 1 • 1 • 1 • 2 • 1 • 1 • 1 • 1
15. How long does it take you to collect this amount (hours, day, week)	• One day • Two days • Three days • One week	• 4 • 4 • 5 • 2
16. How much money do you get for the amount you collect each time?	• ZAR15.00 (USD2.29); ZAR24.00 (USD3.67); ZAR24.00 (USD3.67); ZAR34.00 (USD5.20); ZAR35.00 (USD5.35); ZAR35.00 (USD5.35); ZAR36.00 (USD5.50); ZAR45.00 (USD6.88); ZAR48.00 (USD7.34); ZAR90.00 (USD13.76); ZAR135.00 (USD20.64) • Collected once and get ZAR12.00 (USD1.83) • Depends on the amount you collect	• 12 • 1 • 1
17. What will you spend this money on (food, clothes, paraffin)?	Paraffin and/or food	• 15
18. Do you have to pay transport costs?	• No • Yes	• 8 • 7
19. How many people in your family	• One	• 10

also collect?[4]	• Two • Three	• 4 • 1
20. How many people in this village sell this plant?	• More than five • More than eight; • I think it is eight • Approximately 10 • More than 10 • Approximately 15 • More than 20 people • Not sure but less than 20	• 2 • 1 • 1 • 3 • 3 • 3 • 1 • 1
21. Do you all sell to the same buyers?	Yes	• 15
Harvesting		
22. Is this plant common?	• No • Yes	• 4 • 11
23. Where is it found?	Grassland	15
24. Is it easy to find?	• Yes • No • No and sometimes it does not have big roots but when found there is lots of it. • It was plenty but now it is scarce.	• 11 • 2 • 1 • 1
25. Do you think it is becoming more difficult to find since people started selling it?	• Yes • Yes, because many people are collecting • No	• 9 • 2 • 4
26. Do you think it will become more and more difficult to find in future?	• Yes • Yes, if selling continues • Not sure • Not sure, because it is plentiful • No	• 4 • 5 • 4 • 1 • 1
27. Do you think the plants will ever get finished in the veld?	• Yes, because you dig it out • No • Not sure • If more people are harvesting • It will be finished if the selling continues	• 1 • 1 • 10 • 2 • 1
28. Do you collect and sell the whole plant; only the leaves; or only the root?	• Root	• 15
29. Do you think the plant will grow again after you have dug it out?	• Yes • Not sure • Note sure, because we dug out the roots • May be it can grow because it is flowering so it is having seed	• 1 • 11 • 1 • 2
30. Do you belong to any organisation/committee of people who collect plants to sell?	• No	• 15

[4] The respondents answer to this question indicates the total number of people in the family that collect; thus if the answer was 'one' then only the respondent was collecting, if 'two' then the respondent plus one other family member was harvesting.

a. Why do you belong to this organisation; for what benefit?	• No	• 15
31. Do you need to get permission to collect the plant?	• No	• 15
a. Who do you get permission from?	• No permission	• 15
b. Why must you get permission?	• No	• 15
c. Do need to pay a fee/licence to collect?	• No	• 15
d. Are there any village rules regulating the collecting?	• No	• 15
e. What are the consequences if you break the rules?	• No consequences	• 15
32. Do you collect throughout the year or only at certain times of the year?		
a. When?	• Whole year • Throughout the year but it is bigger in summer • Throughout the year but it is not plenty in winter (May to September) • Throughout the year but in winter the roots are thin	• 12 • 1 • 1 • 1
b. Why only at this time?	—	—
33. Do you only collect near your village or do you travel to other places to collect as well?	• Near the village • Only in their villages	• 14 • 1
34. Do you collect on village land, private land, government land, or all of these?	• Village land	• 15
35. What difficulties or problems are there involved in collecting and selling of this plant?	• No comment • Not having the money for transporting this if the buyer doesn't come and it goes rotten • If the buyer didn't come you need to talk to the other people that they must help you by going with your staff to Grahamstown, sometimes they agree sometimes they don't • Sometimes you find the thin roots although the buyer wants the big ones and the amount you find is less. Sometimes you collect it and the buyer did not come and it rots • Sometimes the buyer didn't come so this thing rots • You take it to next village where the car stops and sometimes the buyer didn't come and it rots • It rots immediately • To wake up early for digging. Sometimes the man didn't come	• 1 • 3 • 3 • 1 • 4 • 1 • 1 • 1

Source: Dold & Sizane (2002)