Government Gazette
Staatskoerant

REPUBLIC OF SOUTH AFRICA
REPUBLIEK VAN SUID AFRIKA

Vol. 713 27 November / November 2024 No. 51662

ISSN 1682-5845

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DEPARTMENT OF FORESTRY, FISHERIES AND THE ENVIRONMENT

NO. 5592 **27 November 2024**

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

THE DRAFT BIODIVERSITY MANAGEMENT PLAN FOR THE *PELARGONIUM SIDOIDES* IN SOUTH AFRICA FOR PUBLIC COMMENT

I, Dion Travers George, Minister of Forestry, Fisheries and the Environment, hereby in terms of sections 43(1)(b), 43(3), 99 and 100 of the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) (NEM: BA), publish the draft Biodiversity Management Plan for the *Pelargonium Sidoides* in South Africa (draft BMP) for public comment as set out in the Schedule hereto.

The draft BMP aims to ensure that all sub-populations of *Pelargonium sidoides* continue to persist in nature across its extent of occurrence in South Africa through effective conservation management and sustainable consumptive utilisation for both traditional and commercial purposes with equitable benefits accruing to rightful beneficiaries.

The draft BMP for the *Pelargonium Sidoides* will replace the BMP for the period 2011 – 2020 published in Government Notice No. 433, Government *Gazette* No. 36411 on 26 April 2013. This BMP is focused on ensuring the long-term survival of *P. sidoides* in the wild, whilst ensuring that the livelihoods of stakeholders are respected.

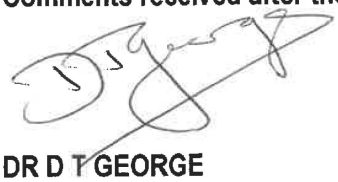
In terms of section 43(2) and 43(3)(c) of NEM: BA, I intend to assign the responsibility for the implementation of the draft BMP for *Pelargonium Sidoides* to the Pelargonium sidoides Working Group which is already established through the first iteration of the BMP for this purpose.

Members of the public are invited to submit written comments on the draft BMP for *Pelargonium sidoides*, within 30 (thirty) days from the date of publication of this notice in the Government *Gazette* or in the newspaper, whichever date is the last date, to the following addresses:

By post to: The Director General: Department of Forestry, Fisheries and the Environment
Attention: Ms Humbulani Mafumo
Private Bag X447
PRETORIA
0001
By hand at: Environment House, 473 Steve Biko Road, Arcadia, Pretoria, 0083.
By email: ConservationManagement@dffe.gov.za

Any enquiries in connection with this Notice can be directed to Ms. Mashudu Mahada at mmahada@dffe.gov.za Tel number: 012 399 9586

Comments received after the closing date may not be considered.



DR D T GEORGE
MINISTER OF FORESTRY, FISHERIES AND THE ENVIRONMENT

SCHEDULE

Draft Pelargonium sidoides Biodiversity Management Plan

Compiled by Katrina Mole[1], David Newton[2], Lemóne Sebastian[3], and Kevan Zunckel[4] in extensive collaboration with the Pelargonium Working Group[5].

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[5]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 Department of Forestry, Fisheries and the Environment.

EXECUTIVE SUMMARY

Pelargonium sidoides DC. is a medicinal plant species endemic to Lesotho and South Africa. Its tuberous roots are harvested from the wild for the manufacture of phytomedicines by local and international pharmaceutical industries. The National Environmental Management Biodiversity Act, 2004 (Act No. 10 of 2004) provides for the development of Biodiversity Management Plans for Species (BMP-S), which aim to ensure the long-term survival of a species in the wild. In addition, Chapter 6 of NEM:BA requires that users of indigenous biological resources must obtain a bioprospecting or biotrade permit for the manufacturing of products such as drugs/ medicines.

This Biodiversity Management Plan (BMP) was amended following the Norms and Standards for BMPs for Species, as provided for in terms of Section 9(1)(a)(i) and Section 43 of NEM:BA, as well as the criteria and principles specified in the FairWild Standard, the guidelines of which provide a framework for the conservation and sustainable use of wild harvested medicinal plants. Management processes are emphasised in the BMP 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 long-term vision of the Biodiversity Management Plan is that:
All sub-populations of *Pelargonium sidoides* continue to persist in the wild across its extent of occurrence through effective conservation management and sustainable consumptive utilisation for both traditional and commercial purposes with equitable benefits accruing to rightful beneficiaries.

In order to achieve this vision, a series of objectives, as listed below, need to be effectively implemented:

- Ensure that the harvesting of *P. sidoides*, for both traditional and commercial purposes, takes place according to best practice guidelines which ensures the persistence of wild populations as well as avoiding and mitigating negative environmental impacts.
- Ensure that collection and management activities are carried out in respect of and under legitimate tenure arrangements and comply with relevant laws, regulations, and agreements, while meeting the best practice requirements of being adaptive, practical, participatory, and transparent.
- 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 NEM: BA which deals with BABS and the associated BABS Regulations.
- Ensure that habitat conservation needs are mainstreamed into provincial biodiversity sector plans and local government planning tools (Land Use Management Scheme, Strategic Environmental Assessment, Environmental Management Framework).
- Ensure the advancement of community participation, empowerment, and improved access to *P. sidoides* for sustainable traditional and commercial use.

These objectives are further unpacked into specific actions designed to achieve the outputs that will ultimately and collectively ensure the achievement of the vision. Each action includes an indication of the entity/ies responsible for implementation as well as the associated time frames within which these are to be carried out or repeated. Importantly, this BMP was compiled, and these actions were derived and populated in close collaboration with the members of the Pelargonium Working Group (PWG) and other relevant role players to ensure that they are realistic and achievable, while also generating ownership for

implementation. While not reflected in the structure of the BMP, four over-arching goals summarise the many actions as follows:

- Regular monitoring of the species in order to identify any threats.
- Continuous scientific research and analysis, to ensure that the survival of the plant in the wild is not affected by unsustainable use of the species.
- Inform the review and revision, where necessary, of relevant agreements and other management tools to ensure that collection, management and trade procedures are in compliance with relative legislative frameworks.
- Foster partnerships and collaborations to establish progressive arrangements that facilitate access to *P. sidoides*, particularly for sustainable traditional use purposes.

The many stakeholders who need to adhere to the requirements of and guidance provided in this BMP will be supported by the members of the PWG and other relevant role-players who will work in close collaboration to implement the actions and achieve the objectives and the vision.

While the aim provides an all-encompassing statement reflecting the desired outcome from the implementation of this BMP, the following are anticipated outcomes of the BMP and which the effectiveness of implementation will be measured against:

- A well-resourced and effective forum for stakeholders involved in the *P. sidoides* sector such as conservation and trade value chain through widening membership of the Pelargonium Working Group, to include managers and implementers of this BMP for example, Relevant National Departments and Entities, relevant provincial conservation agencies and their entities, Industry and Non-governmental organization and communities.
- Up-to-date and detailed resource distribution and population data and maps that will provide guidance for species conservation measures or management tools to be developed or modified and applied in the industry.
- Stakeholder understanding of the need to conserve and sustainably utilise the resource in the wild for the continued and sustainable benefit to all stakeholders.
- Agreement of targets for completion of tasks within their specified time frames that will ensure the conservation requirements of the species in the wild, whilst also optimising the economic potential of the species.
- Coordination between national and provincial conservation agencies as well as across different sectorial ministries to ensure traceability and adherence to various legislation and regulations.
- Inclusive and equitable value chain that ensures redress, full access, and fair benefits from the use of *P. sidoides*.

It is opportune that the BMP was amended parallel to the development and publication of the White Paper on Conservation and Sustainable use of South Africa's Biodiversity (hereafter known as the White paper). The BMP aligns with the goals and enablers of White Paper which was published for implementation on the 14th of June 2023. It acknowledges that South Africa's rich biodiversity is under immense pressure resulting from various threats and promotes to conserve the biodiversity and ecological

infrastructure that supports ecosystem functioning for livelihoods and the well-being of people and nature. This is predicted to direct the country on a strong path of sustainable development, considering the historical, socio-economic, and environmental context of South Africa, including the aspirations and needs of the people. The implementation of the White paper will aid in attaining the goals set out by the Sustainable Development Goals, the National Development Plan 2030, the Africa Agenda 2063, and key relevant Multilateral Environmental Agreements that South Africa has ratified.

The implementation of the White paper rests with a range of stakeholders, including, but not limited to, the state, traditional leaders, traditional health practitioners and communities, private landowners, industry, academia, non-government organisations, and civil society.

DEFINITIONS

In this BMP, unless the context indicates otherwise, a word or expression defined in relevant legislation and polices such as, the NEM: BA or National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003) (NEM: PAA), the Norms and Standards for the development of BMPs and the White Paper has the same meaning.

Benefit: is as defined in section 1 of NEM: BA.

Cordate: a heart-shaped leaf

Ecosystem: is as defined in section 1 of NEM: BA.

Ethnobotany: the scientific study of the traditional knowledge and customs of a people concerning plants and their medical, religious, and other uses.

Endemic: an organism that is restricted or peculiar to a defined locality or region.

Export: is as defined in section 1 of NEM: BA.

Genetic material: is as defined in section 1 of NEM: BA.

Genetic resources: is as defined in section 1 of NEM: BA.

Geophyte: plants typically with underground storage organs, where the plants hold energy and water.

Indigenous biological resource: is as defined in section 1 of NEM: BA.

Indigenous species: is as defined in section 1 of NEM: BA.

Inflorescence: a group or cluster of flowers arranged on a stem that is composed of a main branch or a complicated arrangement of branches.

Invasive species: is as defined in section 1 of NEM: BA.

Listed invasive species: any invasive species listed in terms of section 70(1) of NEM: BA.

Listed threatened or protected species: any species listed in terms of section 56 (1) of NEM: BA.

Local community: is as defined in section 1 of NEM: BA.

Management authority: is as defined in section 1 of NEM: BA.

National Environmental Management Act: the National Environmental Management Act, 1998 (Act No. 107 of 1998).

Non-detriment Finding: is as defined in section 1 of NEM: BA.

Permit: is as defined in section 1 of NEM: BA.

Protected species: is as defined in section 1 of NEM: BA.

Pharmacology: the study of the origin, chemistry, and uses of drugs and their effects on the body.

Stakeholder: is as defined in section 1 of NEM: BA.

Sustainable: is as defined in section 1 of NEM: BA.

Sympatrically: two related species or populations are considered sympatric when they exist in the same geographic area and thus encounter one another.

Threatening process: is as defined in section 1 of NEM: BA.

ACRONYMS

ABS: Access and Benefit-sharing

AOO: Area of occupancy

BABS: Bioprospecting, Access and Benefit Sharing

BMP: Biodiversity Management Plan for Species

BRAM: Biodiversity Research and Monitoring

CITES: Convention on International Trade in Endangered Species of Wild Fauna and Flora

CBD: Convention on Biological Diversity

DFFE: Department of Forestry, Fisheries, and the Environment

FWS: FairWild Standard

EOO: Extent of occurrence

GEF: Global Environment Facility

GPS: Global positioning system

MAP: Medicinal and aromatic plants

M&E: Monitoring and evaluation

NDF: Non-detriment Finding

NEM: BA: National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)

NEM: PAA: National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003)

NGO: Non-governmental organisation

PWG: Pelargonium Working Group

SANBI: South African National Biodiversity Institute

SANParks: South African National Parks

TOPS: Threatened or Protected Species

TRAFFIC: Wildlife Trade Monitoring Network

UNDP: United Nations Development Programme

IUCN: International Union for the Conservation of Nature

ACKNOWLEDGEMENTS

This Biodiversity Management Plan (BMP) on *Pelargonium sidoides* is one component of the United Nations Development Programme (UNDP)/Global Environment Facility (GEF) 6 project titled *"Development of Value Chains for Products derived from Genetic Resources in Compliance with the Nagoya Protocol on Access and Benefit Sharing and the National Biodiversity Economy Strategy".* It is acknowledged that the development of this BMP would not have been possible without the funding provided by the GEF, with the UNDP acting as the executing agency. Management of the project outputs was provided by South Africa's Department of Forestry, Fisheries and the Environment (DFFE), Project Management Unit as well as the Chair of the Pelargonium Working Group (PWG) and implementation of the *P. sidoides* component was carried out by TRAFFIC (Wildlife Trade Monitoring Network). In addition to this, the stakeholders listed in the Contributors Database in Annex II all contributed to the development of this BMP through the attendance of, and participation in planning workshops and the review of draft versions of the BMP and various other project documents and activities.

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1 INTRODUCTION

This BMP for *Pelargonium sidoides* is a revision and update of the BMP published in 2013 (DEA, 2013) and valid until 2020 (Government *Gazette* No: 36411, Notice 433 of 2013) (DEA, 2013). The BMP is an output of a process that has included collaboration with key stakeholders involved in the conservation and utilisation of this valuable indigenous biological resource. As such, its implementation may be seen as a mechanism that seeks to enhance this collaboration between relevant stakeholders at all levels; specifically, between the relevant national and provincial authorities responsible for its conservation, industry stakeholders who rely on the plants persistence in the wild, and communities who benefit from harvesting the plant for their own medicinal uses as well as to supply the commercial demand. In many cases, the harvesting of *P. sidoides* is a primary, if not exclusive source of income for these communities; and due to this, community leaders and harvesters similarly become actively involved in ensuring its sustainability.

1.1 Process followed for amending the BMP for *Pelargonium sidoides*

This BMP for *P. sidoides* is provided for in terms of section 43 of NEM: BA. The Norms and Standards for BMPs for species developed in terms of section 9(1)(a)(i) have been followed in amending this BMP. The updated version of the Fair Wild Standard (FWS) (V2) (FairWild Foundation, 2010) was also incorporated into the structure and content of this BMP. The intention of the FWS is to help private companies, government agencies, research centres and communities to identify and follow good practices and guide the development of management plans for medicinal plants and ensure the sustainability of their wild collections. The FWS identifies six key elements for sustainable wild collection of medicinal and aromatic plants (MAP):

- 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 for BMPs for Species developed under NEM: BA and were thus followed during the stakeholder consultation process to develop this BMP and have been carried through to the structure of the plan as well.

TRAFFIC Southern Africa led the process of reviewing and amending this BMP for *P. sidoides* which forms part of the larger DFFE's – UNDP-GEF 6 project entitled: *"Development of Value Chains for Products derived from Genetic Resources in Compliance with the Nagoya Protocol on Access and Benefit Sharing and the National Biodiversity Economy Strategy".* The project is funded by the GEF, with the UNDP acting as the executing agency.

A number of stakeholder consultations were held to support the process to review and amend this BMP, with extensive discussions held on the biology, utilisation, conservation requirements and threats to *P.*

sidoides. These consultations were a combination of workshops and targeted engagements as the need dictated. This process obtained as much information as possible from a diverse array of stakeholders and led to consensus on actions required to promote the sustainable utilisation and trade of *P. sidoides*. Details of the stakeholders and the stakeholder consultations followed to develop this BMP are included in Annex II.

1.2 Aim of the BMP and Anticipated Outcomes

The aim of the BMP is to ensure that all sub-populations of *P. sidoides* continue to persist in nature across its extent of occurrence (EOO) in South Africa through effective conservation management and sustainable consumptive utilisation for both traditional and commercial purposes with equitable benefits accruing to rightful beneficiaries. In order to realise this aim, it is necessary to achieve the following management objectives which effectively unpack, and are derived from this broad statement (note that these objectives are not in order of priority):

- Ensure that the harvesting of *P. sidoides*, for both traditional and commercial purposes, takes place according to best practice guidelines which ensures the persistence of wild populations as well as avoiding and mitigating negative environmental impacts.
- Ensure that collection and management activities are carried out in respect of and under legitimate tenure arrangements and comply with relevant laws, regulations, and agreements, while meeting the best practice requirements of being adaptive, practical, participatory, and transparent.
- 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 NEM: BA which deals with BABS and the associated BABS Regulations.
- Ensure that habitat conservation needs are mainstreamed into provincial biodiversity sector plans and local government planning tools (Land Use Management Scheme, Strategic Environmental Assessment, Environmental Management Framework).
- Ensure the advancement of community participation, empowerment, and improved access to *P. sidoides* for sustainable traditional and commercial use.

The following over-arching activities have been developed to ensure that the objectives for the BMP are achieved:

- Regular monitoring of the species in order to identify any threats.
- Continuous scientific research and analysis, to ensure that the survival of the plant in the wild is not affected by unsustainable use of the species.
- Inform the review and revision, where necessary, of relevant agreements and other management tools to ensure that collection, management and trade procedures are in compliance with relative legislative frameworks.
- Foster partnerships and collaborations to establish progressive arrangements that facilitate access to *P. sidoides*, particularly for sustainable traditional use purposes.

While the aim provides an all-encompassing statement reflecting the desired outcome from the implementation of this BMP, the following are anticipated outcomes of the BMP and from which the effectiveness of implementation will be measured against:

- A well-resourced and effective forum for stakeholders involved in the *P. sidoides* sector such as conservation and trade value chain through widening membership of the PWG, to include managers and implementers of this BMP for example, Relevant National Departments and Entities, relevant provincial conservation agencies and their entities, Industry and Non-governmental organisation (NGOs) and communities.
- Up-to-date and detailed resource distribution and population data and maps that will provide guidance for species conservation measures or management tools to be developed or modified and applied in the industry.
- Stakeholder-understanding of the need to conserve and sustainably utilise the resource in the wild for the continued and sustainable benefit to all stakeholders.
- Agreement of targets for completion of tasks within their specified time frames that will ensure the conservation requirements of the species in the wild, whilst also optimising the economic potential of the species.
- Coordination between national and provincial conservation agencies as well as across different sectorial ministries to ensure traceability and adherence to various legislations and regulations.
- Inclusive and equitable value chain that ensures redress, full access, and fair benefits from the use of *P. sidoides*.

Specific actions have been defined to ensure that the objectives of the BMP are achieved. These are presented in the Action plan in Section 3 and will also require annual reflection and review by the PWG to gauge progress and allow for active adaptive management.

1.3 The Pelargonium Working Group

The PWG is a multi-stakeholder forum with representatives from relevant national, provincial and local government departments, community members, traditional leaders and healers, industry and NGOs whose purpose is to facilitate the annual review of implementation of the Action Plan (see Section 3) of the BMP. The PWG is chaired by the DFFE. While it is recognised that the PWG is not a comprehensively representative body, it has the ability to co-opt stakeholders to its ranks as may be required from time to time. In addition to the annual review and monitoring of implementation, the PWG will also lead the review and amendment of the BMP towards the end of its lifespan. The Terms of Reference (TORs) for the PWG are included in this BMP as Annex I.

1.4 Structure of the BMP

The structure of the BMP has been derived from an analysis of the content of the Norms and Standards for the Development of the BMPs for Species, FairWild Standard (FWS), the 2013 BMP for *P. sidoides* and a Non-detriment Finding (NDF) for the species.

The process of developing the BMP followed the guidance provided in the Norms and Standards for the Development of the BMP for Species, namely:

1. Appropriate stakeholders should be invited to participate in the development of the BMP-S.

2. Stakeholders may be identified according to: (a) The stakeholder group to which they belong; or (b) Their interests and mission.

3. Background information on the species may be compiled and circulated to all appropriate stakeholders prior to development of the BMP-S.

4. The background information should contain: (a) Criteria used to select the species; (b) Information on the current status of the species; (c) Information on known threats; and (d) Their impacts on the species.

5. Compilation of the first draft of a BMP-S can be done by either: (a) A consultant; (b) An expert on the species; (c) A panel of experts on the species; or (d) During a stakeholder workshop.

6. (a) The first draft of the BMP should be made available to stakeholders for comment; (b) The comment period should be at least 30 working days; (c) Relevant comments received should be included in a final draft of the BMP.

7. The final draft of the plan should be sent to all implementers of identified actions for validation within 60 days of date of notice.

The BMP is structured as follows (FairWild Foundation, 2010):

- Principle 1: Maintaining Wild Plant Resources;
- Principle 2: Preventing Negative Environmental Impacts;
- Principle 3: Complying with Laws, Regulations and Agreements; and
- Principle 4: Respecting Customary Rights and Benefit-Sharing.

The former two principles are captured under Section I entitled “Wild Collection and Conservation Requirements” while the latter two are dealt with under Section II “Legal and Ethical Requirements”. These two Sections include all the relevant background information and what is currently known about the species in terms of biological, social, economic and governance aspects; thus, providing all that is needed to understand the status quo and to identify the actions required to achieve the long-term vision for the conservation and management of the species. The future actions are then captured in Section 3 of the BMP and are structured according to the four objectives listed in the Introduction.

Finally, a full list of all the literature referred to in the BMP is provided in Section 4 and a series of Annexes provides for the inclusion of relevant additional and supporting information.

2 SECTION I: WILD COLLECTION AND CONSERVATION REQUIREMENTS

2.1 Principle 1: Maintaining Wild Plant Resources

2.1.1 Biological Characteristics

2.1.1.1 Morphology and Life Form

Pelargonium sidoides is a herbaceous perennial geophyte endemic to Lesotho and South Africa and which forms a rosette-like plant with crowded leaves (Figure 1a). The description provided below is from Motjotji (2011):

"The flowers of *P. sidoides* are dark-red or reddish purple in colour and are positioned at the top of 20-30 cm long stalks (Dreyer and Marais, 2000; van der Walt and Vorster, 1988; Breyer-Brandwijk and Watt, 1962 and Lawrence, 2001; pers. obs.). These flowers are present almost throughout the year but occur mostly from late spring to summer peaking in December (October-January) (Dreyer and Marais, 2000; Lawrence, 2001; van der Walt and Vorster, 1988; Breyer-Brandwijk and Watt, 1962) (Figure 1b). The inflorescence comprises of a branched system of two-four pseudo-umbels, each with three to seven (occasionally up to 14) flowers (van der Walt and Vorster 1988). The flowers are 15 to 17 mm in diameter with a short pedicel (Vlok, 2005). It is very easy to confuse *P. sidoides* with another similar species called *Pelargonium reniforme* Curtis as discussed in Section 1.1.1.2 and illustrated in (Figure 2a). The species identification becomes problematic in South Africa as the two plants often occur together whereas there is no species confusion in Lesotho as *P. sidoides* occurs on its own (Newton *et al*., 2008). *Pelargonium sidoides* undergoes both sexual (by seed) and asexual propagation (by means of tuber fragmentation).

According to van der Walt and Vorster (1988), *P. sidoides* has a thickened underground system as well as aerial parts sparsely branched from the base. The plant is evergreen in cultivation but dies back in the wild during winter. In large plants, the underground tuber system can produce more than one aboveground stem (Vlok, 2003). Therefore, it becomes extremely difficult to determine the number of aboveground stems (ramets) that one clump of plants (genet) has, because it is not easy to excavate the often-extensive tuber system without breaking part of the system (Vlok, 2003).

The thickened underground system that penetrates deep into the ground appears to be a special adaptation which enables the plant to survive grass fires which occur almost annually throughout much of its range (Vlok, 2003) (Figure 2b). *Pelargonium sidoides* prefers periodic disturbance, such as fire and/or grazing, to remove competition from other plants (Vlok, 2003). The species also seems to be displaced by *Vachellia karroo*, as plants growing under these trees die back once the trees are large. Thus, bush encroachment by *V. karroo*, a common feature in the Eastern Cape where rangelands are mismanaged by overgrazing, threatens *P. sidoides* wild populations (Vlok, 2003). *Pelargonium sidoides* is more abundant in partially disturbed sites, but seemingly absent from transformed habitats such as fields (Vlok, 2003)."

Figure 1: (a) Appearance of *P. sidoides* plants with leaves arranged in a basal cluster and (b) dark-red flowers (Source: Motjotji, 2011).

Figure 2: (a) The pink to purple flowers of the look-alike species , *P. reniforme* (b) and *P. sidoides'* extensive root system (Source: Afrigetics Botanicals and Motjotji 2023 respectively).

2.1.1.2 Look-alike species

Pelargonium sidoides is morphologically very similar to *P. reniforme*, both species having a similar flowering time (October to January) and grow sympatrically in some areas of the Eastern Cape. During the flowering season *P. sidoides* and *P. reniforme* can be differentiated by their flower colour and shape (Van der Walt *et al.* 1988). Unlike *P. sidoides'* darker flower colour, *P. reniforme* has pink to purple petals that are oblanceolate to ovate, and red sepals with pink margins (Dreyer and Marias, 2000). Molteno (2022a) found that in the far north of the *P. reniforme* distribution range (near Cathcart), *P. sidoides* and *P. reniforme* were almost indistinguishable when comparing their leaf shape, colour, texture, and dimensions. Thus, during the non-flowering season it may be difficult for harvesters to distinguish between *P. sidoides* and *P. reniforme* in certain areas where they occur sympatrically (Newton, 2004; White, 2006). Molteno (2022a) also raised this as a concern for subsequent assessment surveys and monitoring accuracy but has provided additional diagnostic distinctions as follows:

1. The smell of the leaves when crushed, even though this varies slightly for the same species in different habitats, once recognised with practice, it can be used to distinguish between the two species.
2. The structure and branching pattern of the inflorescence (see Figure 3) is another characteristic that can be studied even on dried peduncles in cases where these persist from previous seasons:

- The inflorescence of *P. sidoides* resembles a raceme, with a single branch born at each node. One of the lowest two nodes will often have leaf-like bract, but this is very small (usually c.10mm long).
- The inflorescence of *P. reniforme* has an intermediate shape slightly more analogous to that of a panicle or thyrse, usually with at least one of the lowest two nodes bearing two branches, or a relatively large leaf-like bract.

3. The colour of the fruit, calyx and pedicel differs with those of *P. sidoides* being green and those of *P. reniforme* being pink (Figure 4).

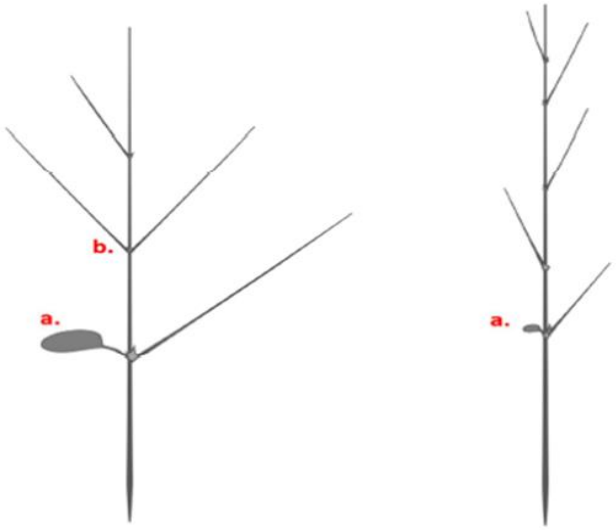

Figure 3: Typical inflorescence branching structure of *P. reniforme* (left) and *P. sidoides* (right), showing characters useful for distinguishing the two species even from seeding or dried inflorescences. The lowest node of the inflorescence usually bears a leaf-like bract (a), which in *P. reniforme* is very much larger. The second node of the *P. reniforme* inflorescence usually either bears two branches (b). If it bears a single branch, this is then accompanied by another relatively large leaf-like bract, similar to the first node below it (Molteno, 2022a).

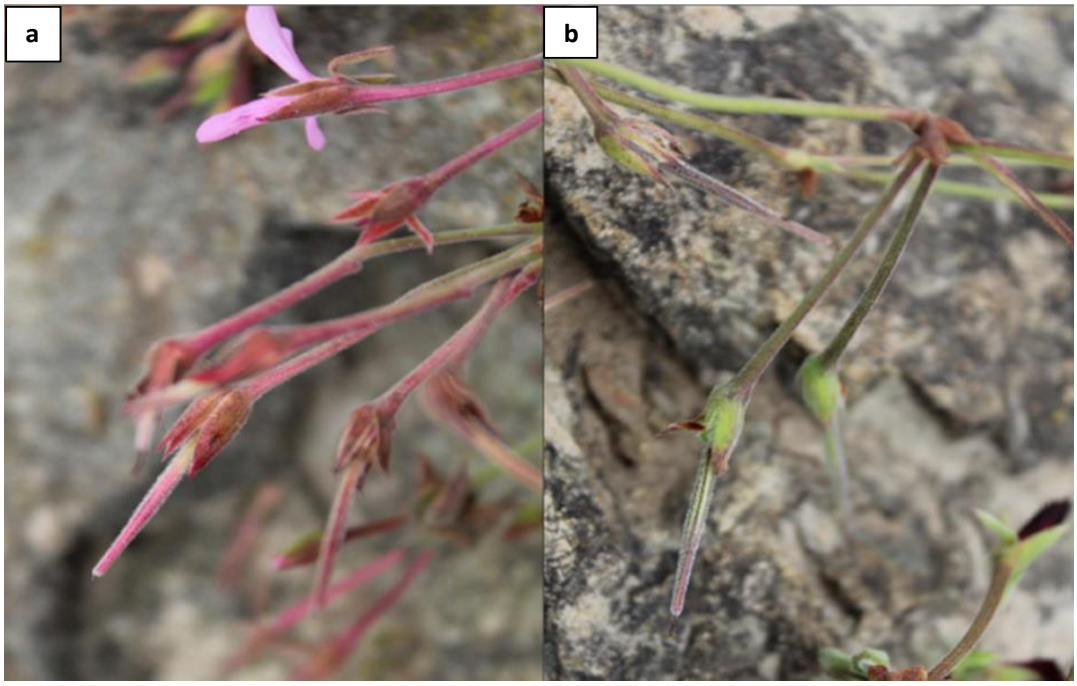

Figure 4: Comparison of the fruit, calyx and pedicel colouration of (a) *P. reniforme* and (b) *P. sidoides* (Molteno, 2022a).

- Differences in habitat preferences (Molteno 2022a; Figure 5):
  - *Pelargonium sidoides* tends to occur on gentler slopes or even level terrain, in soils that tend to be slightly deeper. However, at numerous sites in Golden Gate and Phuthaditjhaba, *P. sidoides* occurs on slopes of 45 degrees or more and in Gauteng, northern and eastern Free State, it is closely associated with shallow to skeletal soils around exposed basalt, sandstone or dolomite sheetrock (De Castro *et al*. 2010; De Castro, 2018 and De Castro, 2021). The substrate can be very rocky but usually contains a higher percentage of transported matter – silts or gravels – and a lower percentage of exposed bedrock. As a very broad generalisation, the substrate could be described as lithic cambisols or leptosols, of the Glenrosa soil form (MacVicar, 1991).
  - *Pelargonium reniforme* tends to occur on steeper slopes, in soils that are often very shallow, overlying bedrock that is usually exposed over much of the surrounding terrain. This type of terrain can be found on the steeper hill and mountain slopes at higher altitudes. However, it can also be found on the steep banks and scarps of river gorges, at relatively low altitudes. For this reason, in several instances, a *P. sidoides* population on gentler medium-altitude slopes, was found to be situated in between *P. reniforme* populations at both higher and lower altitudes. As a broad generalisation, the typical *P. reniforme* substrate could be described as lithic leptosols, of the Mispah soil form (MacVicar, 1991).

Figure 5: Different habitat preferences in the southern parts of the *P. sidoides* distribution range with *P. reniforme* habitat in blue and *P. sidoides* in yellow (Molteno, 2022a).

Additional guidance as to the differences between *P. sidoides* and *P. reniforme* is also provided in the Harvesting Guidelines included in this BMP as Annex III.

2.1.1.3 Chemistry and Pharmacology

Pelargonium sidoides has traditionally been used to treat ailments such as diarrhoea, colic, and dysentery, as well as illnesses such as tuberculosis (Mativandlela *et al*, 2007). Brendler and Van Wyk (2008) and Kolodziej (2007) have provided comprehensive summaries of the pharmacological knowledge and chemical activity of *P. sidoides* extracts for commercial utilisation. Kolodziej (2007) provided an overview of pharmacological *in vitro* investigations of a few species, including *P. sidoides*, whilst Brendler and Van Wyk (2008) focused on the proprietary preparation from Pelargonium roots called EPs7630® of the company Dr Willmar Schwabe in Germany.

These studies focused on the plant extracts' antibacterial, antifungal, antimycobacterial and immunomodulatory properties. The main clinical effects stemming from the use of Umckaloabo (EPs®7630) and Linctagon have been to reduce the seriousness and duration of upper respiratory tract infections in children and adults, with negligible toxic side effects (Brendler and van Wyk, 2008; Kolodziej, 2007). Extracts of greenhouse-acclimatized wild plants exhibited comparable antimicrobial and antioxidant properties (Moyo, *et al*., 2013). Studies also exist that identified protein targets of isolated compounds to determine whether this would provide some insight into the anti-proliferative activity of *P. sidoides* (Pereira, *et al*., 2017). More recently studies have been looking at *P. sidoides* extracts in conjunction with other agents such as lactoferrin which can interfere with the early stages of SARS-CoV-2 infection (Lacovelli *et al*., 2022).

2.1.1.4 Natural Regeneration and Dispersal Potential

Pelargonium sidoides regenerates through both sexual reproduction via seed, as well as asexual (vegetative) reproduction through its tubers (Dreyer and Marias, 2000; van der Walt and Vorster, 1988). It is capable of resprouting after a disturbance such as harvesting where segments that have broken off allow for new tuber propagation (Motjotji, 2011; Vlok, 2003). This form of clonal growth is a survival strategy that also allows plants to grow and thrive when conditions are unfavourable (Werger and Huber, 2006). According to Motjotji (2011), the minimum amount of time needed for wild *P. sidoides* tubers to develop the typical dark-red colouration, which seems to be preferred by the industry, is 10 to 15 years. However, plants may be left to grow for longer periods to ensure sustainable harvesting and the persistence of wild populations. Clonal propagation is a more established reproductive technique because of the restricted seed supply within the soil (Motjotji, 2011). It is also important to note that because of the wide distribution and habitat range of the species, the time required for regeneration to pre-harvesting biomass will vary considerably.

Once the root fragments resprout, flowering takes place soon afterwards, i.e. within four months (Rautenbach. F, Afrigetics, in litt. to Zunckel. K, February 2023). Therefore, sexual reproduction does continue relatively soon after a harvest takes place with climatic variables influencing the timing of this life stage.

The seeds of *P. sidoides* seem to be poorly adapted to rapid dispersal over long distances, which partly explains the discontinuous (or disjunct) distribution of this species across its geographic distribution range (De Castro *et al*., 2010).

2.1.2 Cultivation

The majority of *P. sidoides* harvested for local and international medicinal use is sourced from wild populations. Therefore, cultivation of the species could be considered an option for reducing pressure and over-exploitation of these wild populations (Mofokeng *et al.* 2015, White *et al.* 2008). Commercial cultivation is also considered a control mechanism to ensure that international clients are supplied with a suitable plant product (Meyer. E, CEO at Kirklington Nature Farm, pers. comm. to Mole. K, August 2022) , where environmental factors and bioactive compounds can be controlled (White *et al.* 2008). During the cultivation process, seeds are picked by hand from February to May from existing cultivation in fields to be saved for planting later in the year (Meyer. E, CEO at Kirklington Nature Farm, pers. comm. to Mole. K, August 2022)). Seeds are then planted by hand during August and September to produce seedlings required for planting into new fields during November and December. Approximately 33,000 seedings are planted per hectare into prepared fields during the summer months (Figure 6a) (November & December) and irrigated if rain does not arrive in time (Meyer. E, CEO at Kirklington Nature Farm, pers. comm. to Mole. K, August 2022). After monitoring the growth of the seedlings, dead seedlings will be replaced by spare seedlings which are available for replanting. This process occurs in late summer (i.e. February to March). Mature *P. sidoides* tubers are then harvested (Figure 6b) by hand in December and January, from the four-year-old field crop. These mature cultivated plants are chopped into small pieces, dried to 12% moisture content and packaged for export (Meyer. E, CEO at Kirklington Nature Farm, pers. comm. to Mole. K, August 2022). It is important to note that *P. sidoides* plants cannot be replanted in previously harvested fields due to remnant parasites and fungi in the soil. Thus, each year, *P. sidoides* cultivation

requires new virgin grassland to be converted into cultivated fields and old harvested fields will eventually return to natural grasslands (Meyer. E, CEO at Kirklington Nature Farm, pers. comm. to Mole. K, August 2022). Kirklington Nature Farm, located in the Free State, is the only cultivator of *P. sidoides* and their material is all exported to Germany (Meyer. E, CEO at Kirklington Nature Farm, pers. comm. to Mole. K, August 2022).

Previous studies show that wild-harvested roots have 10 times higher concentration of Umckalin than plants propagated in the same area (White 2006). However, there are indications that Umckalin concentration is directly related to rainfall and soil PH, where the highest Umckalin concentrations is found in plants occurring in areas of low rainfall and high soil pH (White *et al.* 2008). White *et al*. (2008), supports the commercial cultivation of *P. sidoides* as plants with high root Umckalin concentration can be selected from regions with low rainfall and subsequently cultivated using irrigation, leading to a marked growth increase in the plants. Additionally, 'the concentration of Umckalin of field selected plants appears not to be significantly reduced by greenhouse cultivation, suggesting the maintenance of medicinal value' (White *et al.* 2008).

Figure 6: (a) Cultivated *P. sidoides* field during the planting season (b) *Pelargonium* roots from Kirklington farm, after three years of cultivation (front) and contrasted with wild material (back) (Kirklington).

It should be noted that there is no clinically proven link between the presence or level of Umckalin in either the roots or a medicinal preparation and their effectiveness. The European Pharmacopoeia monograph on *P. sidoides* root does not specify a level or prescribe a method for testing for Umckalin (Ph. Eur. 2023). Umckalin is a marker and has no influence on the clinical efficacy of products manufactured from *P. sidoides* roots (EMA, 2012).

Previous cultivation efforts (i.e. community gardens) in the Eastern Cape, which were established by the Department of Economic Development and Environmental Affairs (DEDEA), the Eastern Cape Development Corporation, Amathole Municipal District and Parceval Pharmaceuticals (Pty) are no longer in existence and most of the sites are now dormant and unmaintained. Community leaders remain willing to engage with cultivation efforts, but funding needs to be sourced to support the start-up of these gardens (Gwiji. T., Biodiversity Officer, Department of Economic, Developments, Environmental Affairs and Tourism (DEDEAT), pers. comm., to Mole. K., August 2022 and Zunckel. K., February 2023). However, the feasibility of re-establishing these gardens needs to be measured against the current low level of exploitation of the natural populations, the plant's capacity to regenerate and recover after harvesting, and the potential impact of cultivation on untransformed grasslands. Other considerations are the need

to ensure that expectations of contributions to community livelihoods are well managed and that a diversified approach is applied as the cultivation of *P. sidoides* by communities requires a long-term vision, dedicated champions, sound planning and sustained support to realise the potential contribution that can be made.

2.1.3 Distribution, Population Trends and Conservation Status

2.1.3.1 Distribution

Pelargonium sidoides is endemic to Lesotho and South Africa. The species has a wide distribution range, occurring at a variety of altitudes from sea level to more than 2000 masl, and has been recorded in several provinces of South Africa including the Eastern Cape, Free State, KwaZulu-Natal, Mpumalanga, North-West and the southern and south-western areas of Gauteng (De Castro *et al.,* 2021). Wild harvesting appears to be limited to Eastern Cape and Free State provinces. According to Raimondo, *et al*. (2022) the species has an estimated EOO[1] of 381054 km^2 – 702764 km^2 and an Area of Occupancy (AOO)[2] of 1204 km^2 – 1260 km^2. The predicted distribution area is 27 180.58 km^2 (Molteno, 2022a). Figure 7 illustrates the current knowledge of the plant's distribution range where it can be seen that it occurs more densely in Lesotho and in South Africa's Eastern Cape and Free State provinces and less so in the other provinces.

[1] **Extent of occurrence** is defined as the area contained within the shortest continuous imaginary boundary that can be drawn to encompass all the known, inferred or projected sites of present occurrence of a taxon, excluding cases of vagrancy. This measure may exclude discontinuities or disjunctions within the overall distribution of a taxon (e.g., large areas of obviously unsuitable habitat).

[2]**Area of occupancy** is defined as the area within its extent of occurrence, which is occupied by a taxon, excluding cases of vagrancy. The measure reflects the fact that a taxon will not usually occur throughout the area of its extent of occurrence, which may contain unsuitable or unoccupied habitats. In some cases (e.g. colonial nesting sites, feeding sites for migratory taxa) the area of occupancy is the smallest area essential at any stage to the survival of existing populations of a taxon. The size of the area of occupancy will be a function of the scale at which it is measured, and should be at a scale appropriate to relevant biological aspects of the taxon, the nature of threats and the available data. Unless the area of occupancy is estimated through high intensity sampling, the estimated area of occupancy should generally be calculated by conceptually using a standard grid cell size of 2 km (a cell area of 4 km2) in order to ensure consistency and comparability of results. (Source: Burgman and Fox, 2002).

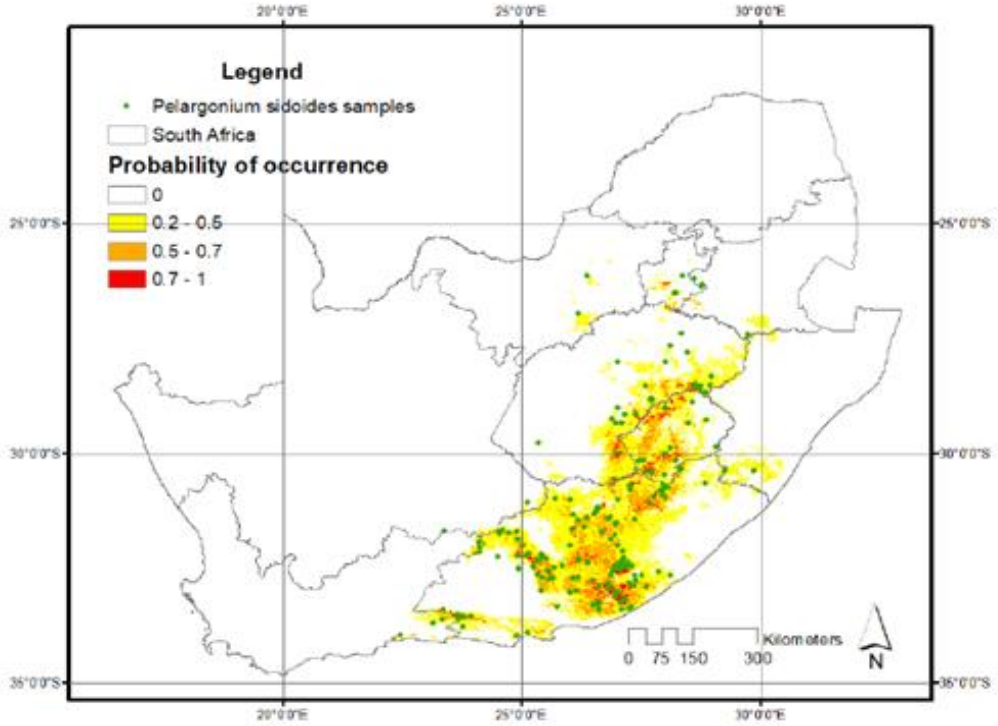

Figure 7: ***Pelargonium sidoides present distribution area with 481 sample records obtained from accurately georeferenced herbarium records, virtual museum observations from iNaturalist and records gathered during resource assessments conducted for this species (de Castro et al. 2010, de Castro 2018, Molteno 2022a, Newton et al 2008). The study area is based on 40 km buffer constraints used, as this species has limited dispersal (Source: Raimondo and Guo, 2022).***

2.1.3.2 Population Trends

The results of a resource assessment carried out by Molteno (2022a) estimated population sizes for *P. sidoides* in South Africa to be approximately 6 300 000 (mean), 14 700 000 (upper), and 2 000 000 (lower bounds) and were based on 25% and 75% quantiles of observed plant density. During this study, 53 sites were sampled across South Africa, the majority of which were located in the central and southern core distribution area of *P. sidoides* where the plants occur in abundance (including the eastern Free State and northern parts of the Eastern Cape). Fewer sites were sampled in the peripheral distribution areas where *P. sidoides* is less abundant (including Gauteng, western Mpumalanga, eastern North West province, as well as the western areas of the Free State and Eastern Cape provinces; Molteno 2022a).

In 2010, De Castro *et al.* conducted a resource assessment across 103 sites in South Africa and Lesotho. Quadrat counts and estimates for 100ha areas at sites repeated by Molteno in 2022 were similar to the 2010 figures / estimates and often higher. A site near Harrismith had a population size of 652 400 plants per 100ha (De Castro *et al.*, 2010). In the Eastern Cape, at five of the 30 survey sites (where density counts were conducted) more than 100 000 plants were estimated to occur within 100ha survey sites, and an estimated 297 500 plants were found near Hogsback. In a 50 000ha area near Cathcart, a total of 17.8 million plants were estimated to occur, whilst an estimated 4 million plants were found in 45 000-ha area

south of Bedford (De Castro *et al.*, 2010). It can be said that although *P. sidoides* experiences intense harvesting pressures in some areas, it is still very abundant in the wild across its EOO (De Castro *et al*., 2010).

Overall, the 2022 population estimates are much lower than the estimates recorded in the 2010 assessment (De Castro *et al*. 2010) and should be considered within the context of the report, i.e. while the same survey method was applied to ensure consistency, it was noted that the 2010 survey may have included *P. reniforme* specimens in the counts due to their close morphological features with important distinguishing characteristics only recently being noted; as well as there being a relative lack of randomness applied in the original positioning of the 50m x 2m transects (Molteno, 2022a). However, *P. reniforme* only occurs over ca. 10% of the *P. sidoides* EOO and therefore the influence of this potential inclusion over the entire EOO would be negligible. In relation to the lack of randomness, De Castro (pers comms) states that applying strict randomness in transect selection would have rendered the 2010 study highly inaccurate in terms of its stated goals (i.e. it would have failed to record the confirmed presence of the species at numerous sites). Furthermore, only one transect was selected so as to ensure the presence of at least one plant and the other transects were selected randomly.

A comparison of the 2010, 2021, 2022 assessments and the Red List assessments is provided here in Table 1. From this it can be seen that it is currently not possible to determine irrefutable trends in the population numbers and that it is important for the monitoring recommendations made in this BMP to be followed.

2.1.3.3 Conservation Status

Pelargonium sidoides is listed on the International Union for the Conservation of Nature (IUCN) Red List of Threatened Species as well as the Red List of South African Plants as 'Least Concern' with a stable population trend (Raimondo *et al*., 2022). This listing indicates that this species is at a low risk of extinction according to the IUCN categories of threat. The 2022 *P. sidoides* resource assessment found an increase in plants recorded across South Africa, where plant numbers were on average greater by 5 (per $100m^2$) when compared to the 2010 resource assessment (Molteno, 2022a). However localised declines are possibly due to factors such as habitat loss, habitat degradation from overgrazing by livestock, bush encroachment, and unsustainable harvesting practices.

A comparison of plant density (individual plants/100 sqm) between the 2010 and 2022 resource assessments showed that the highest average growth in the plant's numbers was on state land or commonage; with moderate-to-low growth on privately owned land; and the lowest growth recorded in conservation areas (Molteno, 2022a). It is possible that these differences in population numbers on the different land tenure systems is as a result of the plant's ability to re-sprout from pieces of ligno tuber left behind after harvesting. However, this may give a false indication of population health as it does not account for ligno tuber growth and while the above ground situation may look promising, limited ligno tuber growth contradicts apparent population health.

Another factor that may contribute to these differences between land tenure systems is that there is less disturbance on private land and conservation areas, while more frequent fires and over-grazing on communal land cause the above ground situation to appear favourable to the plant's population size as

P. sidoides seems to favour limited levels of disturbance. It is therefore important to note this as above ground appearances do not necessarily translate to strong ligno tuber production below ground.

2.1.3.4 Threats

One of the primary threats affecting *P. sidoides* populations is habitat loss through irreversible transformation and degradation (De Castro *et al*. 2010; Molteno 2022a; Newton *et al.* 2008). Historically, *P. sidoides* was found in Gauteng in areas such as Boksburg and Benoni. However, due to habitat transformation in the form of urbanisation, these populations have experienced localised extirpations (De Castro *et al.* 2010). In addition to this, both commercial and subsistence agriculture dominate the grassland biome, causing substantial habitat loss with examples of habitat degradation evident in the Eastern Cape, north-eastern Free State and Lesotho where *P. sidoides* populations on communal grazing land are experiencing declines due to habitats which have been degraded by both overgrazing and soil erosion (De Castro *et al.* 2010). Whilst the species can withstand some amount of disturbance and may even benefit from moderate rates of grazing which reduces the competition for resources (light and water) by grasses, heavy grazing pressure accompanied by trampling and soils compaction or erosion negatively impacts the species (De Castro *et al*., 2012). Overgrazing in the Eastern Cape has resulted in bush encroachment by *Vachellia* species which has created an unsuitable habitat for *P. sidoides* (DEA, 2013). Molteno (2022a) identified that although bush encroachment is a potential threat, relatively few cases of bush encroachment which threatened *P. sidoides* populations were observed in the 2022 resource assessment. It must also be noted that bush encroachment is a symptom of over-grazing and the injudicious use of fire and occurs where grasslands lose their vigour. In addition to this, climate change projections suggested that woody species will be favoured over grasses and that grasslands will become increasingly encroached by woody species.

Over-harvesting is noted as a threat to this species, although 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 and was only recorded by Molteno (2022a) on 1.8% of sites where *P. sidoides* was sampled. It is important to note that the 2022 assessment followed the same survey protocols as those used in the 2010 assessment to ensure that the results would be comparable. In both studies resprouting was evident on previously harvested sites (De Castro *et al*, 2010; Molteno, 2022a). Local extinctions may occur when harvesting takes place too regularly. De Castro *et al.* (2010) reported that at three of the 61 sites which were surveyed, less than 20% of plants recovered after harvesting due to regular and intense harvest pressure. Thus, recurrent harvesting does not allow the species time to recover properly and has notably resulted in declines in communally owned areas in the Eastern Cape, specifically those close to large towns (De Castro *et al*, 2010). Should harvesting occur too frequently and in a poor manner, it would lead to a loss of *P. sidoides* sub-populations, especially during periods of drought (DEA, 2013).

Table 1. A comparison of the 2008 NDF, 2010, 2021, 2022 Resource Assessments and 2022 Red List Assessment, illustrating the need for more consistent and robust monitoring to evaluate population trends.

	STUDY/ASSESSMENT				
	Newton, *et al* (2008)	**De Castro *et al* (2010)**	**De Castro and Brits (2021)**	**Molteno (2022a)**	**SANBI Red List Assessment (2022)**
SURVEY METHOD	**Desktop review** of mainstream scientific and grey literature for the period 2001 to 2008 was conducted at the South African National Biodiversity Institute (SANBI), Pretoria and University of Witwatersrand, Johannesburg. **Field surveys and interviews** at 20 sites in Lesotho to obtain information on distribution, density, trade volumes and harvest methodologies. At each of the 20 sites, five transects were conducted. First a 100 metre baseline was measured that ran perpendicular to the direction of the slope. Each of the five 50-metre-long individual transects were laid out up the slope. The altitude and Global positioning system (GPS) coordinate were recorded at the start and finish of each transect. A team of three proceeded to walk up the line of the transect holding a 1.8-metre-long pole over the transect line and counting each plant occurring within the pole's breadth. A separate team dug out one plant within each transect using a pickaxe. The harvested plants were photographed and labelled with GPS coordinates,	**Desktop review** of herbarium records to compile distribution maps. **Field surveys** at 56 sample* sites with precise locality data in three regions, i.e. northern, central and southern. Density counts carried out within five 50 m by 2 m (100 m^2) transects selected within habitat where *P. sidoides* was recorded. Transects all started from a central point and radiated outwards to a point 50 m from the central point**. Opportunistic sampling of suitable habitat was also carried out. **Estimates of Sub-Population Size** using formula - mean density measured within five 100 m2 transects multiplied by 100, multiplied by the estimated number of hectares of potentially suitable habitat, multiplied by the frequency value expressed as a fraction of one. Three additional areas of relatively uniform untransformed habitat were also sampled, i.e. one in Suikerbosrand Nature reserve and two in the Eastern Cape***. *no reference to the sampling intensity provided. **no reference to how the transects were fixed to	As per the survey method used in the 2010 survey but not over the full EOO but including 63 sample sites in six monitoring surveys from 2003 to 2017.	Fitting species distribution models (SDMs) to existing occurrence records. Due to the need to conduct comparisons between this work and the 2010 study, the statistical methodology used for working out the subpopulation estimates follows that used in the 2010 study. AOO was calculated using the IUCN endorsed and Red List assessment compliant Kew Geospatial Conservation Assessment Tool (geocat.kew.org) with the IUCN recommended grid size of 2 x 2km.	Assessment of 481 occurrence records. Occurrence records were used to calculate the Red List parameters: EOO, AOO, the number of locations and subpopulations. The population size parameters were calculated using data collected from transects undertaken as part of the 2010 and 2022 resource assessments. A species distribution model was generated using the occurrence records and a range of bioclimatic variables. Expert workshop and international peer review of draft assessment.

	altitude, photograph number and locality name. The ligno-tuber fresh and dry weight, diameter, length, and presence of white, pink and red ligno-tuber age-groups were recorded. **Estimates of Sub-Population Size** used a Rule-Based Model for distribution modelling. The model used vegetation, altitude, aspect, climate and precipitation as its main parameters. This model was used to estimate the total population of *P. sidoides* in Lesotho.	radiate, e.g. using compass points. ***no indication of the sampling intensity.			
EOO (incl. Lesotho)		1,036,374.1 km^2	1,036,374.1 km^2	702 764.77 km^2	381054km^2 – 702764km^2
AOO (incl. Lesotho)		111,928.4 km^2	111,928.4 km^2	1 196 km^2	1204km^2 – 1260km^2
PREDICTED DISTRIBUTION AREA	2 100km^2 in Lesotho			27 180.58 km^2 (excluding Lesotho)	
OVERALL POPULATION SIZE ESTIMATES FOR SOUTH AFRICA				Estimates for South Africa only (excluding Lesotho) included a mean of approximately 6 300 000, with upper and lower bounds of 14 700 000 and 2 000 000 were based on 25% and 75% quantiles of observed plant density. Overall, an increase in the number of *P. sidoides* plants was recorded, with the number of plants per 100m2 being on average greater by 5 (4,72) than the number counted for the same areas in 2010.	44 897 437 - 132 508 186

18

OVERALL POPULATION SIZE ESTIMATES FOR LESOTHO	5 000 000

Climate change is an additional factor that may exacerbate some of the threats related to habitat degradation, particularly bush encroachment that is generally associated with poor rangeland management practices such as over-grazing and the injudicious use of fire as a management tool. The recent Red List assessment by Raimondo *et al*. (2022) included a robust study of the response of *P. sidoides* to a range of future climate scenarios and suggests that due to the high level of resilience of the species, the projected population decline as a result of climate change is between 5% – 10% by the timeframe 2061-2080.

2.1.4 Knowledge-based Collection Practices & Sustainability of Collection Rates

2.1.4.1 Harvest Management

2.1.4.1.1 Harvest Guidelines

Parceval (Pty) and Afrigetics Botanicals have earlier developed sustainable harvesting guidelines for *P. sidoides* (Afrigetics, 2021; Parceval 2019). These guidelines are educational documents designed specifically for harvesters to provide guidance on techniques and best practices for the sustainable harvesting of the species. Updated and consolidated harvester guidelines have been developed by TRAFFIC in close collaboration with relevant stakeholders and are included as part of this BMP in Annex III.

The results of the resource assessment carried out by Molteno (2022a) found only one record (C17) of harvesting across all study sites. At this site, located near Phutaditjhaba in the Free State, harvesting appeared to be moderately sustainable, but plants lay discarded and harvesting holes were not refilled, exposing bedrock and promoting soil erosion (Figure 8) (Molteno, 2022a). This is a potential indicator that on-going pre and post harvesting training is needed. It is, however, positive that a decrease in harvesting sites was observed between the 2010 (20% of localities showed signs of harvesting) and 2022 resource assessments (de Castro *et al*. 2010; Molteno, 2022a). However, closer collaborative work with the industry, relevant government stakeholders and communities, particularly harvesters, is essential to ensure that a more accurate assessment of the sustainability of harvesting is obtained.

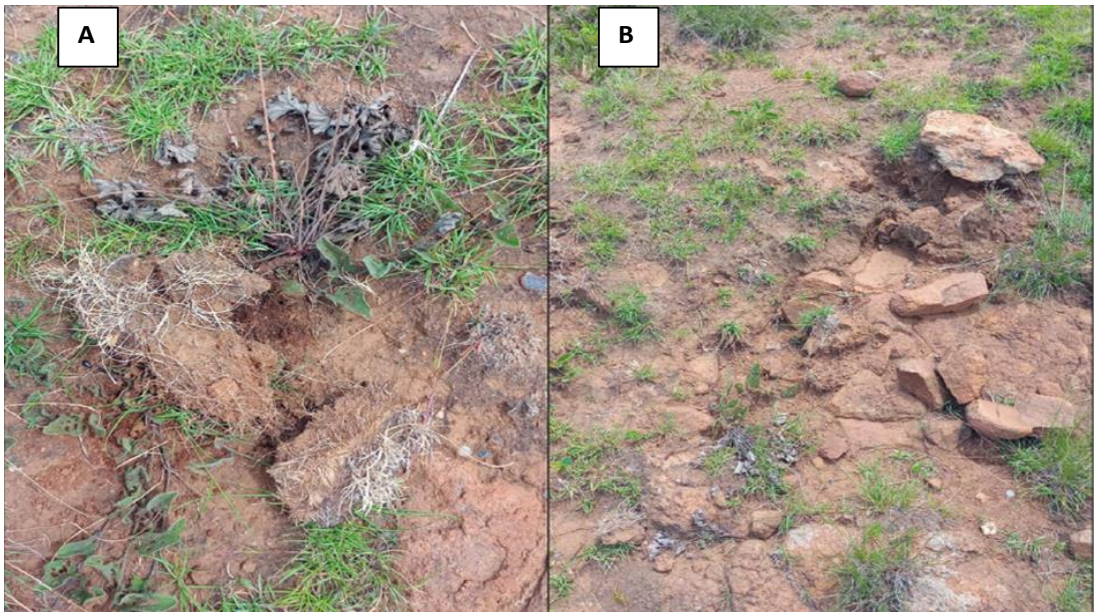

Figure 8: ***(a) Evidence and effects of harvesting. Discarded foliage and upturned sods of earth where a plant has been dug out (b) Cutting away of the thin soil covering, exposing the underlying bedrock, (Molteno, 2022a).***

It must be acknowledged that what is depicted in Figure 8 above is from one observation where unsustainable harvesting practices appear to be limited, but these are likely to occur from time to time. As such, sustained efforts to train harvesters and to secure commitments to the required harvesting standards should limit the occurrence of such unsustainable practices from reoccurring.

2.1.4.1.2 Training

Currently harvester training takes place before the harvesting season begins and the harvesters in each village are trained in sustainable harvesting practices on the basis of the existing guidelines. Training is directed at the harvesters who will perform the wild harvest. The training is open to anyone including the Chief, headmen, council members and any other community members who show an interest. Training is implemented by the representative of the commercial entity who will also be responsible for the collection of the harvested root stocks. A meeting is convened in the relevant village at a place where people normally gather, or people are transported to the agreed venue if necessary, where the harvesting guidelines are presented and discussed. Records are kept of all those who undergo the training and who are thus eligible to become harvesters. After the training each harvester signs a commitment form in which they confirm that they have been trained in sustainable harvesting and that they will adhere to the guidelines. A copy of this form, as used by Parceval, is included as Annex IV.

2.1.4.1.3 Harvesting Permits

A *P. sidoides* harvesting permit, that is valid for one year, is issued by the Eastern Cape Provincial Department to both the Traditional Leaders and private landowners at no cost. Traditional Leaders work with industry to decide on the quantity of *P. sidoides* to be harvested per area (Gwiji. T, Biodiversity Officer, Department of Economic, Developments, Environmental Affairs and Tourism (DEDEAT), pers. comm., to Mole. K, August 2022 and to Zunckel. K, February 2023). Industry has a list of harvester names

and identification numbers for each area, controlled and overseen by the respective Traditional Leaders (Gwiji. T, Biodiversity Officer, Department of Economic, Developments, Environmental Affairs and Tourism (DEDEAT), pers. comm., to Mole. K, August 2022 and to Zunckel. K, February 2023). A bioprospecting/biotrade permit, valid for five years, is issued by DFFE to industry to trade *P. sidoides*. Six of these permits currently exist in South Africa and have been issued to four Bio-Traders and two Bioprospecting entities (BABS unit report, 2022).

In the past, permit transgressions and over-harvesting occurred when community members and village headman were issued with permits instead of the Traditional Leaders or Chiefs, which could suggest that the latter have greater control over the process. Illegal harvesting also occurs when collection demand is too high which incentivises harvesters to enter private farms to source *P. sidoides* (Gwiji. T, Biodiversity Officer, Department of Economic, Developments, Environmental Affairs and Tourism (DEDEAT), pers. comm., to Mole. K, August 2022 and to Zunckel. K, February 2023).

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 applicant must submit a report on the volumes of material harvested and from where on an annual basis to the department within 30 days before the end of the year, containing all the details of the trade in *P. sidoides* plant material, including but not limited to:

(i) quantities and format of the species bought and traded;
(ii) GPS coordinates/location or source of information;
(iii) total amount paid to the harvesters;
(iv) details of the buyers; and
(v) progress on implementation of non-monetary benefits to the communities.

A critical review of the data provided by the BABS unit revealed the following against each of the criteria listed above:

- quantities and format of the species bought and traded: the report provides some information on what is being bought and traded, such as whether the material is wet/dry/fresh and how many tonnes, but it would be helpful if the data requirement could be standardised, i.e. preferably to report on the mass of wet material harvested as a more realistic estimate of plant numbers may then be generated.
- GPS coordinates/location or source of information: no GPS coordinates are provided, whereas the general location and source of information is provided but could be made to be more specific, i.e. indicate the exact GPS coordinates.
- Total amount paid to the harvesters: the price ranges are provided for raw and processed material, but it is not provided per annum. The information requirement could be expanded to include an indication of annual harvest volumes.
- Details of the buyers: The details of the buyers are not provided. The report only states whether it was a biotrader, bioprospector or both. Detailed information on the buyers needs to be provided while respecting confidentiality requirements.

- Progress on implementation of non-monetary benefits to the communities; the report only provides the monetary benefits and not the non-monetary benefits. A more comprehensive account of all benefits resulting from the harvesting of the plants would provide valuable insight.

In addition to the above, the provincial conservation authorities only receive data on what has been collected from DFFE and therefore have limited data upon which to base decisions on the renewing of collection permits on an annual basis. However, provincial authorities do receive report back from permit recipients and should be able to capture these data and with improved communication between the national and provincial authorities, more comprehensive reports should be forthcoming.

2.1.4.1.4 Collection Intensity

The permitting systems and subsequent data collection at both the national and provincial level are currently not robust enough to provide adequate data and information needed to track legal harvesting activities. However, from what can be gleaned from the national data set held by the BABS Unit of the DFFE, a total of just more than 1140 tons was harvested in 2022. By applying a very rough estimate of 6000 plants per ton (400grms wet weight/plant), this equates to just more than 6,840,000 plants and 5.16% to 15.23% of the population (based on the highest and lowest estimates from Raimondo *et al* (2022)). Given the uncertainties inherent in the available population estimates and the lack of a scientifically determined limit of acceptable change it is not feasible to apply any significance to these proportional harvesting intensity estimates. However, as confidence in the application of resource assessment methods improves and more accurate population estimates can be made, it will be necessary to generate a more robust understanding of the harvesting proportions relative to a limit of acceptable change.

2.1.4.1.5 Monitoring of Current Use

No formal monitoring of the use of *P. sidoides* is currently implemented by the national and/or provincial conservation authorities. The species has been proposed for listing under the South African Threatened or Protected Species (TOPS) list, in terms of section 56 of NEM: BA, which would then be regulated through the TOPS Regulations, 2007. The proposed listing would further entrench the permitting requirements currently imposed on collection and trade and enhance the data collection and monitoring opportunities inherent in the permitting.

The Nagoya Protocol on access and benefit-sharing (ABS) came into force on the 12 October 2014. The *Access and Benefit-sharing Clearing House* is a tool for facilitating the implementation of the Nagoya Protocol by 'enhancing legal certainty and transparency on procedures for ABS, and for monitoring the utilisation of genetic resources along the value chain, including through the internationally recognised certificate of compliance' (https://www.cbd.int/abs/). Although these tools exist for implementation of the protocol and monitoring of the international use of the resource, no known integrated monitoring system exists for monitoring the utilisation of *P. sidoides* at either the provincial or national level.

The situation was improved to some extent through the development of the BMP for *P. sidoides* (DEA, 2013) which facilitated a baseline resource survey of the population, as well as a mechanism for estimating volumes in trade through the Bioprospecting, Access, and Benefit Sharing (BABS) Regulations. Updated

information on trade volumes, resource estimates and management has also been provided in this document. To assist in the development of a formal monitoring process for the species, a monitoring guideline has been developed (Molteno, 2022b) in order to ensure that the resource can be systematically monitored over time with repeatable data collection techniques and methodology. This monitoring guideline (Molteno, 2022b) provides guidance to help inform future monitoring activities for *P. sidoides* and provide improved methodology for future resource assessments.

Due to the current lack of comprehensive domestic monitoring, it is unclear whether the volumes processed by the main importing countries match the volumes exported from South Africa and Lesotho. The most recent study of trade in *P. sidoides* within Europe (TRAFFIC, 2023) aimed to understand trade volumes in Europe, however this study was inconclusive. This serves to highlight the need for a concerted effort on the part of all concerned stakeholders to establish and implement a robust domestic monitoring and evaluation (M&E) system that includes all aspects of the trade in this species, e.g. population trends in nature, number and/or volumes of plants harvested from nature, regeneration studies including tuber recovery, and benefits generated.

2.2 Principle 2: Preventing Negative Environmental Impacts

This section addresses aspects other than the obvious impacts of harvesting which have been addressed in Section 1.1.4.1, i.e. the *in situ* and *ex situ* management of the populations with the former speaking to habitat management and the latter to cultivation (see Section 1.1.2).

2.2.1 Habitat Management

As the species occurs in the grassland biome, reference to the Grassland Ecosystem Guidelines (SANBI, 2013) is recommended to inform the management of the habitat. Essentially it needs to be recognised that grasslands are a fire climax vegetation type in which the use of fire as a management tool is an essential element. It also needs to be recognised that the grassland biome is an important provider of fodder to both wild and domestic herbivores and that their utilisation of the biomass needs to be carefully managed to ensure that it does not exceed the production capacity, selective utilisation is prevented, utilisation of new growth after burning is limited and rest is implemented as an integral part of habitat management. Further to this, the use of fire must be managed to ensure that burning takes place only during the season of dormancy and in synchronisation with rainfall patterns, i.e. more frequent burning can be accommodated with above average rainfall periods and less frequently with below average rainfall periods.

It is critical that a good basal cover and species diversity are maintained in the habitat for this species as this will ensure resilience to severe rainfall events and the retention of topsoil. Should the basal cover and species diversity become compromised in any way, the habitat will become vulnerable to erosion and infestations of invasive alien plants. The latter is particularly relevant in the context of climate change where increased carbon in the atmosphere is favouring the growth of woody plants over grasses and this therefore exacerbates infestations of invasive alien woody plants which shade out the species and cause population declines.

It must be acknowledged that the grassland biome is not uniform and that there are a number of grassland types within the biome that may require variations to the broad guidelines provided above. The Grassland Ecosystem Guidelines published by SANBI in 2013 recognises five grassland types, i.e., Dry Highveld Grasslands, Mosaic Highveld Grasslands, High Altitude Grasslands, Sub-escarpment Grasslands and Coastal Grasslands. In addition to providing guidelines for the biome in general, they have provided specific guidelines for the management of these five grassland types.

3 SECTION II: LEGISLATIVE CONTEXT AND ETHICAL REQUIREMENTS

3.1 Principle 3: Complying with Laws, Regulations and Agreements

3.1.1 International, National, Provincial laws and implementation

Internationally, South Africa is a signatory to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), but *P. sidoides* is not listed on any of the CITES appendices. Therefore, the plant does not have protection at the international level. There is also no evidence to date that the trade is causing a significant decline to this species populations.

In addition to CITES, South Africa is also a signatory to the Convention on Biological Diversity (CBD) and The Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilisation to the CBD also known as the Nagoya Protocol on ABS, with the latter being the most relevant to this BMP. The Nagoya Protocol on ABS came into force on the 12 October 2014. The *Access and Benefit-sharing Clearing House* is a platform for facilitating exchange of information on the implementation of the Nagoya Protocol by 'enhancing legal certainty and transparency on procedures for ABS, and for monitoring the utilisation of genetic resources along the value chain, including through the internationally recognised certificate of compliance' (https://www.cbd.int/abs/).

Although not legally binding, becoming a Party to the 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. As a result, NEM: BA was developed to, amongst others, give effect to commitments agreed upon in the CBD. At the national level, it has been proposed to list *Pelargonium sidoides* as a protected species within the medicinal category pursuant to section 56(1)(d) of NEM: BA. This proposal is provided for in Government *Gazette* No. 47984, Notice No. 3012, which was officially published on 03 February 2023 for implementation, with the intended commencement date set for 01 April 2023. This particular section of NEM: BA list species of high conservation value or national importance or require regulation in order to ensure that the species are managed in an ecologically sustainable manner. This would enhance the ability of provincial conservation authorities to regulate the collection and trade of the species (amongst other activities) through a permitting system (DEA, 2013).

However, it is important to note that the aforementioned species list was withdrawn by notice in Government *Gazette* No. 48349, Notice No. 3238, which was published on 31 March 2023. The revised TOPS Regulations and Species list was again published for public comment on 12 October 2023, in

Government *Gazette* No. 49469 and 49470, respectively, and *P. sidoides* was also included in the list as protected species within the medical category.

According to DEA (2012), bioprospecting – the exploration of biodiversity for commercially valuable genetic resources and biochemicals – is regulated through Chapter 6 of NEM: BA and the Bioprospecting, Access, and Benefit-Sharing (BABS) Regulations, 2015 as amended. The Department of Environmental Affairs (DEA) (now the Department of Forestry, Fisheries and Environment – DFFE) administers these laws and also acts as the National Focal Point, for ABS.

Table 2 provides extracts from the relevant provincial legislation pertaining to the protection and regulation of the utilisation of *P. sidoides* and which confirms that current levels of protection and regulation are limited in that the species is not recognised as a 'protected species'.

Table 2. Extracts from provincial legislation which provides some protection and regulation of the utilisation of *P. sidoides*.

ORDINANCE/ REGULATION	SECTION	CONTENT
Nature and Environmental Conservation Ordinance No. 19 of 1974 (applied in the Eastern Cape)[3]	63 (1) (c)	No person shall - pick any protected or indigenous unprotected flora on land of which he is not the owner, without the permission of the owner of such land or of any person authorised by such owner to grant such permission.
	63 (2)	No permission granted in terms of subsection (1) (c) shall be valid unless it is reduced to writing
	68 (1)	A local authority may in respect of the sale of indigenous unprotected flora within its area of jurisdiction set aside such places as it may deem suitable for the sale of such flora.
Free State Nature Conservation Ordinance No. 8 of 1969.	31 (1) (a)	No person shall pick any indigenous plant on land of which he is not the owner except with the written permission of such owner and unless he has such permission with him while picking such plants.
	32	No person shall pick any indigenous plant on land within 100m of any side of a roadway of a public road, except under authority of a permit.
Nature Conservation Ordinance No. 12 of 1983 as amended by Gauteng General Law Amendment Act 4 of 2005.	88 (1)	No person shall pick an indigenous plant in a nature reserve, unless he or she is the holder of a permit which authorizes him or her to do so:
	89 (1) (a) and (b)	no person shall pick an indigenous plant- (a) on a public road; (b) on land next to a public road within a distance of 100 m measured from the centre of the road, unless he or she is the holder of a permit which authorizes him or her to do so:
	90 (1)	no person shall pick an indigenous plant which is not a protected plant or specially protected plant on land of which he or she is not the owner or occupier: Provided that- (a) a relative of the owner of land may pick on the land of such owner; (b) a relative of the occupier of land may pick on the land of such occupier; (c) any person who has obtained the written permission of the owner or occupier of land beforehand and who carries it with him or her, may pick on the land of such owner or occupier, such a plant.

[3] Note that at the time of writing, the Eastern Cape Department of Economic Development, Environmental Affairs and Tourism announced a public participation process for their Eastern Cape Environmental Management Bill and Eastern Cape Parks and Tourism Agency Amendment Bill, dated 26 June 2023.

ORDINANCE/ REGULATION	SECTION	CONTENT
Natal Nature Conservation Ordinance No. 15 of 1974	193	Subject to the provisions of section 192, nothing contained in this chapter shall apply to unprotected indigenous plants.
Mpumalanga Nature Conservation Act No. 10 of 1985	71 (1)	No person shall pick an indigenous plant in a nature reserve, unless he or she is the holder of a permit which authorizes him or her to do so:
	72 (1) (a) and (b)	no person shall pick an indigenous plant- (a) on a public road; (b) on land next to a public road within a distance of 100 m measured from the centre of the road, unless he or she is the holder of a permit which authorizes him or her to do so:
	73 (1) (a), (b) and (c)	no person shall pick an indigenous plant which is not a protected plant or specially protected plant on land of which he or she is not the owner or occupier: Provided that- (a) a relative of the owner of land may pick on the land of such owner; (b) a relative of the occupier of land may pick on the land of such occupier; (c) any person who has obtained the written permission of the owner or occupier of land beforehand and who carries it with him or her, may pick on the land of such owner or occupier, such a plant.
Western Cape Nature Conservation Laws Amendment Act, No. 3 of 2000	68 (1) and (2)	Places for sale of indigenous unprotected flora: (1) A local authority may in respect of the sale of indigenous unprotected flora within its area of jurisdiction set aside such places as it may deem suitable for the sale of such flora and erect such shelters or other structures as it may deem necessary thereon. (2) No person shall sell any indigenous unprotected flora at any place other than a place set aside in terms of subsection (1) or on the premises of a registered flora seller or registered flora grower.
	69	Sale of indigenous unprotected flora by owner of land. —Notwithstanding the provisions of section 68 (2), an owner of land on which indigenous unprotected flora is being propagated or cultivated or on which such flora occurs in a natural state may sell such flora which has been so propagated or cultivated or which so occurs to any person: (a) on such land; (b) at a place set aside in terms of section 68 (1), or (c) carrying on business under a licence issued to him or her under section 65 (2).

The White Paper on Conservation and Sustainable Use of South Africa's Biodiversity is a government document that was published for implementation on the 14th of June 2023. It acknowledges that South Africa's rich biodiversity is under immense pressure resulting from various threats and promotes to conserve the biodiversity and ecological infrastructure that supports ecosystem functioning for livelihoods and the well-being of people and nature. This is predicted to direct the country on a strong path of sustainable development, considering the historical, socio-economic, and environmental context of South Africa, including the aspirations and needs of the people. The implementation of the White paper will aid in attaining the goals set out by the Sustainable Development Goals, the National Development Plan 2030, the Africa Agenda 2063, and key relevant Multilateral Environmental Agreements that South Africa has ratified.

With this in mind, the White Paper consists of four Goals:

• Goal 1: **Enhanced Biodiversity Conservation** – All biological diversity and its components conserved;

• Goal 2: **Sustainable Use** – The sustainable use of biodiversity enhances thriving living land- and seascapes and ecosystems, livelihoods, and human well-being, while a duty of care avoids, minimises, or remedies adverse impacts on biodiversity;

• Goal 3: **Equitable Access and Benefit Sharing** – Benefits are derived and shared from the use and development of South Africa's genetic and biological resources, without compromising the national interests;

• Goal 4: **Transformed Biodiversity Conservation and Sustainable Use** – Effect is given to the environmental right as contained in Section 24 of the Constitution which facilitates redress, and promotes transformation;

As well as two cross-cutting Enablers:

• Enabler 1: **Integrated, Mainstreamed and Effective Biodiversity Conservation and Sustainable Use** – Integrated policy and practice across government and the effective implementation of Multilateral Environmental Agreements; and

• Enabler 2: **Enhanced Means of Implementation** – Expanded and developed ability to effectively conserve biodiversity, to manage its use and benefits, whilst addressing factors threatening biodiversity.

The alignment of the four aims of the BMP with that of the four goals set out by the White Paper are shown in Annex V.

3.1.2 Illegal Off-take

Feedback from the Eastern Cape conservation authorities suggests that illegal harvesting is taking place where harvesters find that their resource base in the wild is insufficient to meet the commercial demand and they move on to surrounding farms and other communal areas outside of that provided for in their permits. No assessments of the capacity of the populations to meet the demand precede the issuing of permits (Gwiji. T, Biodiversity Officer, Department of Economic, Developments, Environmental Affairs and Tourism (DEDEAT), pers. comm., to Mole. K, August 2022 and to Zunckel. K, February 2023). Despite this, provincial conservation officials at the NDF workshop and other PWG meetings have not reported any cases of illegal harvesting.

3.2 Principle 4: Respecting Customary Rights and Benefit-Sharing

3.2.1 Ethnobotany

Ethnobotany is the study of a region's plants and their practical uses through the traditional knowledge of a local culture and people. Brendler and van Wyk (2008) have provided a detailed description of the

ethnobotanical uses of *Pelargonium* species such as *P. sidoides*. They have reviewed the ethnobotanical history of *P. sidoides* back to the early mid-19th century, where the species was successfully commercialised locally and internationally (Brendler and van Wyk, 2008; van Niekerk, 2009; van Wyk, 2011). The uses for *P. sidoides* fall within the treatment categories for stomach ailments, liver problems, and reproductive illnesses (Harvey and Sonder, 1860; Hutchings *et al*., 1996; Lewu *et al*., 2007; Matsiliza and Barker, 2001; Smith, 1966) as well as respiratory ailments (Mativandlela *et al*, 2007).

A PhD study is currently under way to update some of the information on the ethnobotanical uses of the species. To date, a critical literature review was conducted on the ethnobotany of *P. sidoides* by Motjotji (2022). Motjotji (2022) also highlights the urgency to undertake an ethnobotanical study for *P. sidoides* to shift the narrative to a more unbiased approach during the commercialisation of biodiversity. It is important that local and indigenous communities are brought into conversations about the resource as they are more knowledgeable when it comes to the use of their plants (Motjotji, 2022). This would allow collaborations between communities and various stakeholders and would promote better social, economic, and ecological outcomes (Motjotji, 2022).

3.2.2 Access and Benefit Sharing

According to DEA (2012) Bioprospecting [and trade] is regulated in South Africa by the NEM: BA and the BABS Regulations, 2015 as amended. The DFFE administers these laws and also acts as the clearing house, or national focal point, for ABS. However, Motjotji (2022) has highlighted the ineffective implementation of the ABS mechanism in both South Africa and Lesotho which is perpetuating the colonial history of bio imperialism.

Data provided by DFFE, shows that for the six permits issued in 2022, there is a record of payments for two of them. The four permits where no payment data is available is because the permits were only recently issued. Monetary values captured in the data appear to be relatively significant, i.e. R103,021.55 and R49,031.33 paid to the beneficiaries, but there is no way to determine the number of beneficiaries involved and how the payments were used for the benefit of greater communities. The extent to which the harvesting of *P. sidoides* for commercial buyers adds value to community livelihoods remains to be determined. It must be noted however, that no matter the contribution, be this monetary and/or non-monetary, it is unlikely to be sufficient to support communities entirely. Expectations therefore need to be managed carefully and any attempts at enhancing community livelihoods through cultivation projects must be coupled to a diversity of other opportunities.

The DEFFE in collaboration with the Environmental Evaluation Unit of the University of Cape Town compiled a guideline entitled “South Africa’s Bioprospecting, Access and Benefit Sharing Regulatory Framework: Guidelines for Providers, Users and Regulators” for the Department of Environmental Affairs (DEA, 2012) which can be accessed at https://www.dffe.gov.za/sites/default/files/legislations/bioprospecting_regulatory_framework_guideline_0.pdf. This document provides guidance to the providers, users and regulators of biological resources within the context of relevant background information. The latter introduces the concepts of BABS; provides a clear summary of the key elements of the Biodiversity Act and BABS Regulations and the groups involved in bioprospecting. It goes on to address each of these three groups; the providers, users and

regulators; to guide them in terms of their rights, obligations, opportunities within the relevant policy and legal framework. It is recommended that this BMP be read in conjunction with these guidelines.

In addition to the above and in recognition of the fact that both globally and in South Africa, biodiversity conservation considerations are lacking in ABS arrangements; a series of guidelines aimed at addressing this gap were compiled for the DFFE and are entitled "Guidelines for integrating the conservation and sustainable use of biodiversity in ABS approaches in South Africa" (Wynberg *et al*, 2022). To quote the guidelines they aim to enhance "understanding of the many direct and indirect ways that research and commercial activities related to biotrade and bioprospecting may affect and promote biodiversity conservation." It is therefore also recommended that this BMP be read in conjunction with these guidelines.

4 FUTURE ACTIONS AND PRIORITIES - ACTION PLAN FOR *Pelargonium sidoides*

The future actions have been structured according to the four objectives listed in the Introduction. The latter are not in order of priority but are all relevant and necessary to achieve the overall aim of this BMP. Each action includes a statement of the intended outcome, a detailed description of the action required to achieve the outcome, an indication of who is responsible for implementation of the action, what indicator/s will provide evidence of successful implementation, and timeframes for implementation. As far as the responsible actors are concerned, it is assumed that the PWG will take overall responsibility for monitoring implementation; but those members representing specific sectors, agencies, authorities and/or NGOs, will take responsibility for ensuring implementation where the members themselves will not necessarily carry out the action. In regard to timeframes, these may be a deadline or a frequency at which an action is repeated.

4.1 Objective 1: Wild Populations and Ecosystem Integrity Persist

Ensure that the harvesting of *P. sidoides*, for both traditional and commercial purposes, takes place according to best practice guidelines which ensures the long-term persistence of wild populations as well as avoiding and mitigating negative ecological and environmental impacts.

4.1.1 Criterion 1: Resource status of *P. sidoides* is assessed and reviewed regularly

Outcome: Resource assessments provide quality information on the national distributions, population trends, harvesting pressure and threats of *P. sidoides* populations through the replication of the survey methodology across resource assessments.	
Action 1.1.1	Standardise the methodology for resource assessments for *P. sidoides*, including thorough review of the recommendations of Molteno (2022a and b) and the Monitoring Guidelines, and following consideration by PWG and independent ecological reviewer.
Actor/s	Lead: SANBI (Biodiversity Research and Monitoring (BRAM)); TRAFFIC; Collaborators: de Castro & Brits ecological consultants; Steven Molteno
Indicator	The production of PWG-approved Resource Assessment guidelines as part of monitoring guidelines.
Deadline	Two years after the publishing of the *gazette*.

Outcome: The extent to which commercially acceptable cultivated material of the species can relieve pressure on wild populations is well understood and underpins future cultivation initiatives, if shown to be viable.	
Action 1.1.2	Investigate and collate lessons learned from community cultivation initiatives and provide recommendations related to *P. sidoides.*
Actor/s	Lead: Afrigetics; collaborators: Eastern Cape and Free State provincial conservation authorities; communities involved in cultivation; Parceval.
Indicator	Assessment on lessons learned and recommendations
Deadline	Two years after the publishing of the gazette.

Outcome: The quantities of unregulated trade and its source are established.	
Action 1.1.3.	Design and implement a study/investigation into the quantity of the resource originating within its range and what can be defined as legal and unregulated harvest percentage.
Actor/s	Lead: TRAFFIC; Collaborators: DFFE (BABS unit)
Indicator	Study report with recommendations.
Deadline	Three years after the publication of the gazette.

Outcome: Relevant information from the reports obtained from bioprospecting/biotrade permit holders of how much *P. sidoides* material is permitted and exported is shared to assist in monitoring the utilisation of the species.	
Action 1.1.4.	In collaboration with BABS unit, establish key data requirements for M&E based on reports received by BABS units from permit holders.
Actor/s	DFFE (BABS unit); TRAFFIC; SANBI (BRAM).
Indicator	Annual report on harvesting data coordinated and compiled.
Deadline	Permitting data to be shared as and when available but no less frequently than annually.

It must be noted that certain data provided by industry role players, such as prices paid to harvesters and the sales prices of products, needs to be treated as confidential; and only data that adds value to the work of the PWG and the achievement of the aim and objectives of this BMP should be divulged.

4.1.2 Criterion 2: Harvesting intensity does not exceed the ability of *P. sidoides* to regenerate over the long term.

Outcome: Plant and population recovery rates post harvesting is re-assessed and confirmed in terms of pre-harvesting biomass and Action 1.3.2 is adapted accordingly.	
Action 1.2.1.	Undertake study to understand recovery rates of harvesting of *P. sidoides* across landscapes and integrate the findings to inform the regulatory process
Actor/s	Student (MSc/PhD) – University; TRAFFIC; SANBI (BRAM)
Indicator	Study report/publication confirming recovery rates.
Deadline	Short-term study on *ex situ* recovery and a long-term study on *in situ* recovery.

4.2 Objective 2: Legal Requirements

Ensure that collection and management activities are carried out in respect of and under legitimate tenure arrangements and comply with relevant laws, regulations, and agreements, while meeting the best practice requirements of being adaptive, practical, participatory and transparent.

4.2.1 Criterion 1: Sensitive taxa and habitats that could be affected by harvesting of *P. sidoides* are identified and protected.

Outcome: The environmental impacts associated with harvesting activities are well understood.	
Action 2.1.1.	Ensure that the standardised M&E system includes sections that call for data and information related to identifying the occurrence, intensity and the scale of environmental impacts associated with harvesting activities.
Actor/s	SANBI, DFFE and collaborators identified in Action 1.1.1.
Indicator	Development of a standardised M&E system (as per Action 1.1.1) which includes the recording of data and information related to environmental impacts associated with harvesting activities.
Deadline	Within 6 months of final gazetting of the BMP: Monitoring of habitat loss - every three years, Field monitoring - every 10 years, and Monitoring of off-take - annually.

Outcome: Environmental impacts associated with harvesting are either avoided or successfully mitigated by harvesters and the ecological integrity of all harvested populations is maintained.	
Action 2.1.2.	Integrate environmental management requirements into the training material and training provided to harvesters.
Actor	Industry role players supervised by provincial conservation authorities (FS and EC).
Indicator	All potential and actual environmental impacts related to harvesting and their avoidance and mitigation measures are fully integrated into all training material and harvesters are compliant with harvesting guidelines as included in the BMP.
Deadline	Within six months of final gazetting of BMP (environmental management requirements integrated) on-going with every engagement with harvesters.

Outcome: Plant material is only purchased from harvesters who demonstrate the application of sustainable harvesting measures.

Action 2.1.3.	Ensure that all harvesters are equipped with, understand, and implement the Harvester Guidelines (see Annex III).
Actor/s	Industry, Traditional Authorities, harvesters and landowners
Indicator	Signed agreements with traditional authorities and or private landowners. Records of harvesters trained.
Deadline	To be applied immediately and on an on-going basis.

Outcome: The environmental management standards applied to harvesting for commercial purposes, as per the Harvester Guidelines, are also adhered to by those harvesting for traditional use.	
Action 2.1.4.	Ensure that the harvesting guidelines are shared through existing channels within the government and community structures.
Actor/s	Traditional and provincial authorities with support from TRAFFIC.
Indicator	Provincial authorities to provide record of engagement with the traditional healers' organisations.
Deadline	Within six months of the final gazetting of the BMP and monitor at least annually.

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

Outcome: The requirements of this BMP are translated into a training manual and all relevant stakeholders and role-players; especially law enforcement officials and resource managers are trained in all aspects pertaining to the sustainable use of the resource.	
Action 3.1.1.	Implement training sessions for law enforcement officials and resource managers through workshops facilitated by the lead agency to roll out the BMP.
Actor/s	DFFE & Provincial Conservation Authorities
Indicator	Certificates of course completion. Records of workshops.
Deadline	Within one year of publication of the BMP and then every three (3) to five (5) years.

Outcome: Collaboration between South Africa and Lesotho in terms of regulating and monitoring the utilisation and trade of *P. sidoides* is secured through an appropriate bi-lateral agreement.	
Action 3.1.2.	Investigate and facilitate the bi-lateral processes necessary to establish an agreement between South African and Lesotho which seeks to manage the utilisation of and trade in *P. sidoides.*
Actor/s	DFFE (Transfrontier Conservation Area (TFCA))
Indicator	Bi-lateral agreement between South Africa and Lesotho.
Deadline	Before the end of 2025.

4.3 Objective 3: Equitable Benefit Sharing

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 NEM:BA which deals with BABS and the associated BABS Regulations.

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

Outcome: Community members are recruited and trained to harvest *P. sidoides* according to the harvesting guidelines.	
Action 3.2.1	Engagement with the community regarding recruitment of harvesters and training of harvesters.
Actor/s	Industry role players and Traditional Authorities and community representatives.
Indicator	Number of harvesters recruited and trained. Number of training events. This to form part of the annual reporting to the provincial permit office.
Deadline	Within one year after gazetting of reviewed BMP.

Outcome: Benefit sharing payments are made to the rightful access providers.	
Action 3.2.2	Follow up to ensure payments are made to the Traditional Authorities
Actor/s	Industry role players and DFFE, Provincial Conservation Authorities
Indicator	Payments are made in agreed time frames.
Deadline	Before the end of 2024 and then at least annually.

Outcome: Monetary benefits arising from the utilisation of *P. sidoides* are shared equally with the custodians of the resource.	
Action 3.2.3	Traditional Authorities to report how funds are being distributed or utilised for the benefit of the entire community. Training of Traditional Authorities on financial trade information.
Actor/s	Traditional Authorities, DFFE (BABS Unit)
Indicator	Report from Traditional Authorities on how community members are benefiting from the commercial utilisation of *P.sidoides.*
Deadline	Before the end of 2025 and then at least annually.

Outcome: Information on all other forms of benefits ensuing from Trade Agreements is well known and available.	
Action 3.2.4	Record and compile a report on additional investments made into the community.
Actor/s	Industry role players
Indicator	Reports are compiled and shared with Traditional Authorities, provincial permit offices, BABS unit of DFFE.
Deadline	Before the end of 2025 or within a year after the next BMP has been gazetted.

4.4 Objective 4: Mainstreaming habitat conservation requirements

Ensure that habitat conservation needs are mainstreamed into provincial biodiversity sector plans and local government planning tools (Land Use Management Scheme, Strategic Environmental Assessment, Environmental Management Framework).

Outcome: Habitat conservation needs are mainstreamed into provincial biodiversity sector plans.	
Action 4.1.1.	Provide existing species data (digital format) to relevant provincial biodiversity planning divisions for integration into their Biodiversity Sector Plans.
Actor/s	Lead: SANBI (BRAM); support: Provincial authorities in collaboration with DFFE

Indicator	Data provided to provincial biodiversity planning divisions.
Deadline	Within one year of publication of the BMP.

Outcome: Habitat conservation needs are mainstreamed into local government planning tools.	
Action 4.1.2.	Provide existing species data (digital format) to relevant local government planning departments.
Actor/s	Lead: SANBI (BRAM); support: Provincial authorities in collaboration with DFFE
Indicator	Data provided to provincial biodiversity planning divisions.
Deadline	Within one year of publication of the BMP.

4.5 Objective 5: Community involvement and Empowerment

Ensure the advancement of community participation, empowerment, and improved access to *Pelargonium sidoides* for sustainable traditional and commercial use.

Outcome: Community cultivation initiatives are established to alleviate pressure on wild harvesting in the long term.	
Action 5.1.1.	Support community empowerment through the development of cultivation initiatives to alleviate pressure on wild harvesting of *P. sidoides*.
Actor/s	Lead: DFFE (Biodiversity Economy and Sustainable Use Unit (BESU) and Environmental Programmes (EP)), Provincial Departments, Industry
Indicator	Annual report on number of initiatives implemented
Deadline	One year after the publication of the gazette.

Outcome: Community empowerment to benefit economically from the use of the species.	
Action 5.1.2.	Capacitate communities and traditional leaders to ensure the development of benefit sharing agreements to promote community-owned businesses.
Actor/s	Lead: DFFE (BESU) and provincial departments
Indicator	Number of capacity building initiatives
Deadline	Within one year of publication of the BMP.

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ANNEX I: TERMS OF REFERENCE FOR THE PELARGONIUM WORKING GROUP

BACKGROUND AND OVERVIEW

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 SANBI, the NGO TRAFFIC (Southern Africa) and the DFFE to develop a BMP for *P. sidoides* in terms of the National Environmental Management Biodiversity Act No. 10 of 2004 (NEM:BA). As stated in the Norms and Standards for Species Management Plans, published in 2009, the implementation of the BMP requires oversight. The PWG 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 PWG 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.

KEY ACTIVITES:

The key responsibilities of the members of the PWG will include but not be limited to:

1) Monitoring the implementation of the actions specified in the BMP for *P. sidoides*.
2) Ensuring that management of *P. sidoides* wild collection is supported by adequate and practical resource inventory, assessment, and ongoing monitoring of collection impacts.
3) 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.
4) Assisting with establishing procedures for collecting, managing, and sharing information required for sustainable management.
5) Contributing to the development of skills training for resource managers and collectors that will equip them to implement the provisions of the management plan.
6) Production of an annual report specifying progress in the implementation of the BMP as required by the Norms and Standards for BMP-S.
7) Drawing up proposals and fund raising for specific projects needed.
8) Implementation of the BMP for *P. sidoides*.

COMPOSITION OF THE COMMITTEE

The following organisations/sectors must be represented on the PWG:

- DFFE (lead agency) – will be represented by the staff from the Conservation Management and Resource Use directorates will coordinate and chair the PWG meetings.
- The Eastern Cape - Department of Economic Development and Environmental Affairs and Tourism (DEDEAT)
- Free State - Department of Small Business Development, Tourism and Environmental Affairs (DESTEA)

- Local government support
- South African National Biodiversity Institute (SANBI)
- TRAFFIC (Southern Africa)
- Pelargonium industry (Afrigetics, KP Botanicals, Parceval, Gower Enterprises and others as they may emerge)
- Traditional Leaders, Healers and Chiefs
- University representatives
- Private cultivators
- Ecological consultants
- NGOs working with communities and the environment, particularly those assisting communities to engage with legal frameworks to secure environmental and social justice.

*Quorum needs to represent four of the above organisations and must always include DFEE.

REQUIREMENTS FOR THE PWG

Meetings:

- The PWG 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 DFFE 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 PWG chairperson will dispatch a draft agenda and minutes of the previous meeting no later than two weeks before an agreed meeting date.

Confidentiality

- During 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 PWG.

ANNEX II: CONTRIBUTORS DATABASE

Name	Surname	Title/Role	Organization	Role in *P. sidoides* utilisation/management	Province	Email	Workshops Attended			
							Non-detriment Finding	Harvesting Guidelines	Red List Assessment	BMP
Alithemba	Mome	Harvester	Lloyd Village		Eastern Cape	n/a		P		
Anita	Lagenge	Environmental Officer	DEDEAT	-	Eastern Cape	anitalagenge@gmail.com		P		
Azwinaki	Muingi	Biodiversity Officer	DFFE	-	Gauteng	AMUINGI@dffe.gov.za				P
Bridgette	Modiba	Biodiversity Officer	DFFE	-	Gauteng	BModiba@dffe.gov.za				P
Buchule	Zimema	Chief	EC-DEDEAT	Community representative	Eastern Cape	zimemabuchule@gmail.com				P
Buntu	Mzamo	Control Biodiversity Officer	DEDEAT	-	Eastern Cape	Buntu.Mzamo@dedea.gov.za	P			
Danni	Guo		SANBI			D.Guo@sanbi.org.za			P	
David	Newton	Programme Office Director	TRAFFIC	Compilation of the BMP (and other resources) for *P.sidoides*	Gauteng	david.newton@traffic.org	P	P		P
Dhiraj	Nariandas	Senior Section Ranger	South African National Parks (SANParks)		Free State	dhiraj.nariandas@sanparks.org	P	P		
Domtilla	Raimondo		SANBI			D.Raimondo@sanbi.org.za			P	
Elvis	Thwani	Harvester	Lloyd Village		Eastern Cape	n/a		P		
Eric	Meyer	CEO	Kirklington Nature Farm Pty Ltd	Involved in the cultivation of *P. sidoides*	Free State	eric.kirklington@gmail.com	P	P		
Finn	Rautenbach	Sustainble Sourcing	Afrigetics	Industry player involved in *P. sidoides*	Eastern Cape	finn@afrigetics.com finngrows@gmail.com	P	P	P	P
Fusi	Kraai	Ecologist	DESTEA		Free State	kraaifm@gmail.com		P		P
Greg	Nicolson		Capensis	Resource Assessment		greg@capensis.co.za			P	
Humbu	Mafumo	Department Director: Conservation Management	DFFE	PWG chairperson	Gauteng	HMAFUMO@dffe.gov.za	P			P
Idah	Manduna	Researcher	CUT		Free State	imanduna@cut.ac.za				P

Name	Surname	Title/Role	Organization	Role in *P. sidoides* utilisation/management	Province	Email	Workshops Attended			
							Non-detriment Finding	Harvesting Guidelines	Red List Assessment	BMP
Joseph	Mulders	Project Management Unit	DFFE	Project Management Unit for the UNDP-GEF 6	Gauteng	jmulders@dffe.gov.za		P		P
Katrina	Mole	Project Manager	TRAFFIC	Compilation of the BMP (and other resources) for *P.sidoides*	Gauteng	katrina.mole@traffic.org	P	P		P
Lazola	Mazwayi	Assessor/Manager	Parceval	Industry stakeholder involved in *P. sidoides*	Eastern Cape	lmazwayi@yahoo.com		P		P
Lefu	Mofokeng	Control Environmental Officer	DFFE	-	Free State	LMofokeng@dffe.gov.za				P
Lemone	Sebastian	Project Assistant	TRAFFIC	Compilation of the BMP (and other resources) for *P.sidoides*	Western Cape	lemone.sebastian@traffic.org	P	P	P	P
Lesitsi	Kobo	Founding member	Kinatlampa Ukhahlamba NGO		Free State	lesitsik@gmail.com				P
Lisebo	Motjoji	PhD Student	UCT	Produced scientific information on the tuber recovery of the resource, as well as literature review on the ethnobotanical and socio-economic components of *P. sidoides.*	Lesotho	lisebomotjotji@yahoo.co.uk		P	P	P
Lwazi	Marawu	Business Owner	2556/Mazoyi	Works with *P. sidoides*	Eastern Cape	lwazilenin91@gmail.com				P
Marli	Burger	Project Assistant	TRAFFIC		Gauteng	Marli.burger@traffic.org				P
Mukondi	Masithi	Director: Sector Expert Environmental Sustainability	DEDEAT	PWG Chairperson	Eastern Cape	MMasithi@dffe.gov.za	P			
Mzuzile	Kleinbogi	Harvester	Lloyd Village		Eastern Cape	Cell number: 0719431843		P		

Name	Surname	Title/Role	Organization	Role in *P. sidoides* utilisation/management	Province	Email	Workshops Attended			
							Non-detriment Finding	Harvesting Guidelines	Red List Assessment	BMP
Neil	Crouch	Department Director:	SANBI	Involved in bioprospecting economy. He was also very involved in the reviewing of the 2022 resource assessment.	Kwazulu Natal	N.Crouch@sanbi.org.za		P		P
Nokhukanya	Mholongo		SANBI Red List Research Assisstant			N.Mholongo@sanbi.org.za			P	
Noluthando	Bam	Department Director: Biodiversity Conservation	EC-DEDEAT	-	Eastern Cape	noluthando.bam@dedea.gov.za				P
Nomusa	Mbuyazi	Biodiversity Officer	DFFE	-	Gauteng	NMBUYAZI@dffe.gov.za				P
Okuhle	Pontia	Environmental Officer	DEDEAT		Eastern Cape	okuhle.pontia@dedea.gov.za		P		
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Siya	Tyali	Chief	ICDT		Gauteng	smtyali@gmail.com				P

Name	Surname	Title/Role	Organization	Role in *P. sidoides* utilisation/management	Province	Email	Workshops Attended			
							Non-detriment Finding	Harvesting Guidelines	Red List Assessment	BMP
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Tasneem	Variawa	Botanist	SANBI	-	Gauteng	T.Variawa@sanbi.org.za	P		P	P
Thabo	Gwiji	Environmental Officer	DEDEAT	Provided information on communities, legal requirements, permitting etc	Eastern Cape	thabo.gwiji@dedea.gov.za	P	P		P
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Ulrich	Feiter	CEO	Parceval	Industry player involved in *P. sidoides*	Western Cape	ulrich.feiter@parceval.co.za	P	P	P	P
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Total number of stakeholders involved per event							20	21	15	26

ANNEX III: HARVESTER GUIDELINES

HOW DO I TRANSPORT AND STORE THE ROOTS?

When the roots are brought back home, the bags should be emptied of unwanted items such as excess soil, leaves, rocks, feathers, pieces of plastic, manure, and fungus.

The roots should dry for a day or two before placing them back into the bags. Do not mix the uVendle/Umsongelo roots with other plant material. The bags should be left open to reduce the growth of mould. An alternative to the bag could be a crate.

If mould develops, the roots with mould need to be removed and replanted back into the garden of the harvester to harvest in the next season. Under no circumstances should the mould be removed from the roots.

The bags or crate collection should occur every 1 – 2 weeks after harvesting.

HOW OFTEN AND HOW LONG CAN I HARVEST?

Harvesting of uVendle/Umsongelo can occur all year round. Where uVendle/Umsongelo (maroon flower) and the plant with the pink flower co-exist, it is preferable to harvest during the rainy season (October to May) as this makes it easier to differentiate between the two plants.

Harvesting in an area should follow a rotational process. This allows the plants to rest while moving to another area.

Once the number of mature and, therefore, harvestable plants becomes less, harvesters should stop harvesting in that area and move on to the next area. Ideally, subsequent harvesting in the same area should occur 8 – 10 years later, but this resting period is weather, soil and area dependent.

Firstly, we would like to thank the community members that kindly assisted us in the finalisation of these guidelines. Their knowledge and guidance on the plant provided great insight. We would like to thank our donor the Global Environmental Facility (GEF), the executing agency United Nations Development Programme (UNDP), and the Project Management Unit at the Department of Forestry, Fisheries, and Environment (DFFE) who have enabled us to produce these guidelines. We would also like to thank Afrigetics, Parceval, Gowar Enterprises, and KP Botanicals for providing their knowledge and input to help develop these guidelines.

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TRAFFIC

SUSTAINABLE HARVESTING GUIDELINES FOR *PELARGONIUM SIDOIDES* (UVENDLE/UMSONGELO)

PLEASE NOTE: Pelargonium sidoides (uVendle/Umsongelo) is listed as protected on the TOPS list and a permit is therefore required to harvest the plant. Harvesting of uVendle/Umsongelo without a permit is illegal.

Harvesting Guidelines developed by TRAFFIC.

forestry, fisheries & the environment
Department: Forestry, Fisheries and the Environment
REPUBLIC OF SOUTH AFRICA

gef

UNDP

WHAT CAN BE HARVESTED?

uVendle/Umsongelo with the maroon flower has commercial medicinal value whereas the plant with the pink flowers does not.

Only uVendle/Umsongelo should be harvested.

Plants with many leaves above the surface should be selected because it indicates a larger more mature root system below the surface. Plants with fewer leaves above the surface should not be harvested as this shows an immature, smaller root.

WHAT TOOLS SHOULD BE USED TO HARVEST?

A sharp-edged tool should be used when harvesting uVendle/Umsongelo such as a leafspring or pickaxe. Harvesting tools should minimise damage to the roots and to soil surrounding the plant.

WHAT SHOULD BE HARVESTED?

The thickness of the root should be measured using the "rule of thumb" method. Only roots larger than your thumb should be harvested. Roots smaller than your thumb should be placed back in the harvest hole and covered with soil.

Roots should have a deep maroon colour indicating a mature and suitable root for harvest. If the root is light in colour and not the correct size it should be placed back in the harvest hole and covered with soil, allowing it to grow and mature into a harvestable quality.

The next steps should be followed:

1. Once a mature root is harvested;
2. Break off the leaves together with a little bit of the root;
3. Remove 50% of the leaves from the crown;
4. Place the crown and small piece of the root into the harvesting hole and cover with soil.

Soil should be placed in the hole around the replanted plant; and compacted

ANNEX IV: HARVESTER TRAINING AND SUSTAINABLE COMMITMENT FORM

PARCEVAL
PHARMACEUTICALS

Harvester Training Record and Personal Commitment to Conduct Sustainable Harvesting of Pelargonium

I, _____,

SA ID No _____ and Harvester Code _____
Herewith confirm that I have received training in the sustainable harvesting of Pelargonium on this date

_____ conducted by _____

I further commit myself to adhere to the practices outlined in the training such as:

- Harvesting only in areas for which a harvesting permit exists
- Harvesting only on land where permission of the landowner, tribal authority etc. has been granted
- Harvesting only during the months as instructed
- Harvesting only Pelargonium sidoides (the one with the dark red/black flower) and not harvesting Pelargonium reniforme (the one with the pink flower) or Pelargonium lobatum (the one with the yellow flower)
- Conduct sustainable harvesting by:
    - Carefully removing the Pelargonium root without turning large sods of soil and plants
    - Closing the holes after removing Pelargonium roots
    - Replanting the aerial part of the plant (some leaves and a piece of root/stem) as instructed
    - Avoiding damage to the surrounding plants and landscape
    - Leave approx. 40 - 50% of the Pelargonium plants in one area unharvested for future harvesting
    - Only harvest mature roots (with strong red colouring) because I know that the light coloured roots are too young and will be needed for the future

Signature harvester _____

Signature training provider _____

Place _____ **falling under Chief** _____

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PARCEVAL

ANNEX V: ALIGNMENT OF THE BMP WITH THAT OF THE WHITE PAPER

Table 3: Alignment of the White paper's goals with the aims of the BMP

White Paper Goals	**Aims of the BMP**	Alignment
Goal 1: Enhanced Biodiversity Conservation: All biological diversity and its components conserved.	1. Ensure that the harvesting of *P. sidoides*, for both traditional and commercial purposes, takes place according to **best practice guidelines** which **ensures the persistence of wild populations** as well as avoiding and mitigating negative environmental impacts.	The first aim of the BMP (use of best practice guidelines, long-term persistence of wild populations, and mitigation of negative impacts) would link to policy objective 1.7 (and the outputs and outcomes) of the first goal of the White paper: Support, complement, and enhance in-situ biodiversity conservation through sustainable ex-situ practices.
Goal 2: Sustainable Use: The sustainable use of biodiversity enhances thriving living land- and seascapes and ecosystems, livelihoods, and human well-being, while a duty of care avoids, minimises, or remedies adverse impacts on biodiversity.	2. Ensure that **collection and management activities are carried out in respect of and under legitimate tenure arrangements** and comply with relevant laws, regulations and agreements, while meeting the best practice requirements of being adaptive, practical, participatory, and transparent.	The first and second aim of the BMP would speak to policy objectives 2.1, 2.4, and 2.5 that falls under the white paper's second goal: enhance sustainable use of components of biodiversity in terrestrial, freshwater, marine, and coastal ecosystems; Prevent ecological degradation, through enhancing ecological integrity and resilience; Promote duty of care towards all components of biodiversity.
Goal 3: Equitable Access and Benefit Sharing: Benefits are derived and shared from the use and development of South Africa's genetic and biological resources, without compromising the national interests.	3. Ensure that **trade is conducted in an equitable manner** resulting in the fair allocation of benefits to all resource stakeholders.	The third aim of the BMP (Equitable Benefits) are in line with policy objective 3.1 of the third goal of the White paper: South Africa's genetic and biological resources are sustainably leveraged for national and global benefits; Providers of genetic and biological material, and associated indigenous or traditional knowledge, benefit fairly and equitably.

Goal 4: Transformed Biodiversity Conservation and Sustainable Use: Effect is given to the environmental right as contained in Section 24 of the Constitution which facilitates redress and promotes transformation.	4. Ensure that **habitat conservation needs are mainstreamed** into provincial biodiversity sector plans and local government planning tools.	Activities of the BMP support sustainable use of *Pelargonium* and communities have been involved in the BMP process and Sustainable Harvesting Guidelines, which speaks to policy objective 4.3 of the fourth goal of the White paper (4.3 Promote and enable use that is sustainable, and socially and economically inclusive). One of the outcomes of the third aim of the BMP, is that community members are recruited and trained to harvest *P. sidoides* according to the harvesting guidelines. All members of communities (including designated groups) are encouraged to partake in the training and harvesting. The most recent Harvesting guidelines community engagement that took place in Eastern Cape from 11-27/10/2023, consisted of **53% women,** and **47% men,** of which **16%** were **below the age of 35**.

Printed by and obtainable from the Government Printer, Bosman Street, Private Bag X85, Pretoria, 0001
Contact Centre Tel: 012-748 6200. eMail: info.egazette@gpw.gov.za
Publications: Tel: (012) 748 6053, 748 6061, 748 6065