

NATIONAL RESPONSE STRATEGY AND ACTION PLAN TO ADDRESS THE ILLEGAL TRADE IN SOUTH AFRICAN SUCCULENT FLORA

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TABLE OF CONTENTS

LIST OF TABLES	IV
ACRONYMS AND TERMS	V
EXECUTIVE SUMMARY	VII
1. BACKGROUND	1
1.1. THE ILLEGAL TRADE IN SUCCULENT FLORA IN SOUTH AFRICA	1
1.2. PURPOSE OF THE NATIONAL RESPONSE STRATEGY	1
1.3. WORK SESSIONS TO DEVELOP THE NATIONAL RESPONSE STRATEGY	2
1.4. DEVELOPMENT OF THE NATIONAL RESPONSE STRATEGY	2
2. NATIONAL RESPONSE STRATEGY	3
2.1. OBJECTIVE 1: ENSURE THE LONG-TERM SURVIVAL OF REPRESENTATIVE POPULATIONS OF SOUTH AFRICAN SUCCULENT FLORA WITHIN THE ARID ZONE	3
2.1.1. <i>Rationale</i>	3
2.1.2. <i>Anticipated outcomes</i>	3
2.1.3. <i>Key Actions</i>	4
2.2. OBJECTIVE 2: ENSURE THE ESTABLISHMENT OF WELL-MANAGED <i>EX SITU</i> COLLECTIONS FOR SOUTH AFRICAN SUCCULENT FLORA FROM THE ARID ZONE	6
2.2.1. <i>Rationale</i>	6
2.2.2. <i>Anticipated outcomes</i>	6
2.2.3. <i>Key Actions</i>	7
2.3. OBJECTIVE 3: CAPACITATE THE COMPLIANCE AND ENFORCEMENT SECTOR TO ENABLE MORE EFFECTIVE ACTION AGAINST ILLEGAL COLLECTION AND TRADE OF INDIGENOUS AND ENDEMIC SUCCULENT FLORA	9
2.3.1. <i>Rationale</i>	9
2.3.2. <i>Anticipated outcomes</i>	9
2.3.3. <i>Key Actions</i>	10
2.4. OBJECTIVE 4: ENSURE THE POLICY AND REGULATORY ENVIRONMENT FRAMEWORKS ARE STREAMLINED TO SUPPORT IMPROVED COMPLIANCE AND ENFORCEMENT, WHILST ALSO ENHANCING SUSTAINABLE USE AND MANAGEMENT OF SOUTH AFRICAN SUCCULENT FLORA WITHIN THE ARID ZONE	13
2.4.1. <i>Rationale</i>	13
2.4.2. <i>Anticipated outcomes</i>	13
2.4.3. <i>Key Actions</i>	14
2.5. OBJECTIVE 5: REDUCE PRESSURE ON WILD POPULATIONS OF SOUTH AFRICAN SUCCULENT FLORA WITHIN THE ARID ZONE BY ENGAGING LOCAL COMMUNITIES AND FACILITATING DIVERSIFICATION OF LIVELIHOODS (WHERE APPLICABLE)	15
2.5.1. <i>Rationale</i>	15
2.5.2. <i>Anticipated outcomes</i>	15
2.5.3. <i>Key Actions</i>	16
2.6. OBJECTIVE 6: DEVELOP EFFECTIVE AND CONSISTENT COMMUNICATION BRIEFS ABOUT THE IMPACT OF ILLEGAL PLANT COLLECTION AND TRADE THAT FOSTER BIODIVERSITY POSITIVE ATTITUDES AND DO NOT LEAD TO UN-INTENDED CONSEQUENCES ..	18
2.6.1. <i>Rationale</i>	18
2.6.2. <i>Anticipated outcomes</i>	18
2.6.3. <i>Key Actions</i>	19
2.7. OBJECTIVE 7: EXPLORE OPTIONS FOR THE DEVELOPMENT OF A FORMAL ECONOMY AROUND SOUTH AFRICAN SUCCULENT FLORA THAT BENEFITS THE COUNTRY, AND CONTRIBUTES TO SOCIO-ECONOMIC DEVELOPMENT AND CONSERVATION WITHIN THE ARID ZONE.....	20
2.7.1. <i>Rationale</i>	20

2.7.2.	<i>Anticipated outcomes</i>	20
2.7.3.	<i>Key Actions</i>	21
3.	NEXT STEPS / IMPLEMENTATION	23
4.	REFERENCES	24

LIST OF TABLES

TABLE 1.	KEY ACTIONS, LEAD AGENTS AND ROLE PLAYERS IDENTIFIED AS NECESSARY TO ACHIEVE OBJECTIVE 1.	4
TABLE 2.	KEY ACTIONS, LEAD AGENTS AND ROLE PLAYERS IDENTIFIED AS NECESSARY TO ACHIEVE OBJECTIVE 2.....	7
TABLE 3.	KEY ACTIONS, LEAD AGENTS AND ROLE PLAYERS IDENTIFIED AS NECESSARY TO ACHIEVE OBJECTIVE 3.	10
TABLE 4.	KEY ACTIONS, LEAD AGENTS AND ROLE PLAYERS IDENTIFIED AS NECESSARY TO ACHIEVE OBJECTIVE 4.	14
TABLE 5.	KEY ACTIONS, LEAD AGENTS AND ROLE PLAYERS IDENTIFIED AS NECESSARY TO ACHIEVE OBJECTIVE 5.	16
TABLE 6.	KEY ACTIONS, LEAD AGENTS AND ROLE PLAYERS IDENTIFIED AS NECESSARY TO ACHIEVE OBJECTIVE 6:.....	19
TABLE 7.	KEY ACTIONS, LEAD AGENTS AND ROLE PLAYERS IDENTIFIED AS NECESSARY TO ACHIEVE OBJECTIVE 7.....	21

ACRONYMS AND TERMS

ARC	Agricultural Research Council
Arid Zone	Arid and semi-arid parts of South Africa including the Desert, Succulent Karoo and Nama Karoo Biomes
NBES	National Biodiversity Economy Strategy
BotSoc	Botanical Society of South Africa
CapeNature	Western Cape Nature Conservation Board
CBA	Critical Biodiversity Area
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CREW	Custodians of Rare and Endangered Wildflowers Project
CSA	Conservation South Africa
DAERL	The Northern Cape Provincial Department of Agriculture, Environmental Affairs Rural Development and Land Reform
DEA&DP	The Western Cape Provincial Department of Environmental Affairs and Development Planning
DEDEAT	The Eastern Cape Provincial Department of Economic Development, Environmental Affairs and Tourism
DPCI	Directorate for Priority Crime Investigation (within the South African Police Service)
DFFE	Department of Forestry, Fisheries and the Environment
EEFC	Environmental Enforcement Fusion Centre (within Chief Directorate: Sector Enforcement at DFFE)
EMI	Environmental Management Inspectorate
EWT	The Endangered Wildlife Trust
<i>ex situ</i>	Away from their natural habitat
FloraGuard	FloraGuard is an AI (Artificial Intelligence) tool or digital resource that combines innovative and cross-disciplinary ways of analysing online marketplaces for the illegal trade in endangered plants and analyses of existing policing practices to assist law enforcement in the detection and investigation of illegal trades of endangered plants
GCBR	Gouritz-Cluster Biosphere Reserve
GDARD	Gauteng Provincial Department of Agriculture and Rural Development
<i>in situ</i>	In their natural habitat
IUCN	International Union for Conservation of Nature
LHST	Leslie Hill Succulent Karoo Trust
MoU	Memorandum of Understanding
MPTA	Mpumalanga Tourism and Parks Agency
MSBP	The Millennium Seed Bank Partnership, South Africa
NBG	National Botanical Gardens
NBIF	National Biodiversity Investigators Forum
PAES	Protected Area Expansion Strategy

NEM:BA	Refers to the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004), and includes its subordinate legislation issued in terms of any provision.
NEM:PAA	Refers to the National Environmental Management: Protected Areas Act 2003 (57 of 2003)
NGO	Non-governmental organisation
NP	National Park
NPA	National Prosecuting Authority
NR	Nature Reserve
OECM	Other area-based effective conservation measures
RBG Kew	Royal Botanic Gardens, Kew, United Kingdom
SAHGCA	SA Hunters and Game Conservation Association
SANBI	South African National Biodiversity Institute
SANParks	South African National Parks
SAPS	South African Police Service
Scientific Authority	Respective countries' Scientific Authorities assist with regulating and restricting trade in specimens of ToPS- and CITES-listed species nationally.
ToPS regulations	Refers to the regulations on listed Threatened or Protected Species (ToPs) and promulgated in terms of section 97 of the NEM:BA
TRAFFIC	Non-governmental organisation working globally on trade in wild animals and plants in the context of both biodiversity conservation
UCT	University of Cape Town
UWC	University of the Western Cape
WFA	The Wilderness Foundation Africa
WWF	Worldwide Fund for Nature, South Africa

EXECUTIVE SUMMARY

In recent years there has been a dramatic and catastrophic increase in the illegal harvesting of succulent plants across South Africa's arid zone, particularly in the Succulent Karoo Biome. Due to the high levels of diversity and endemism of species, this has become a national concern as the Succulent Karoo Biome is identified as a global biodiversity hotspot and protecting the unique flora and ecosystems in the region is of both national and international importance. The high demand for southern Africa's unique succulents on the international market, coupled with the lack of sustainable economic opportunities in regions where these plants occur, and limited *in situ* protection measures have resulted in the indiscriminate collection of plants from the wild. This has driven several species to the brink of extinction. In addition, the lack of cultivated material to supply the demand, the growing number of confiscated plants from criminal investigations, and the lack of resources and capacity to manage *ex situ* collections have highlighted the need for a strategic response.

The Department of Forestry, Fisheries and the Environment (DFFE) with support from the South African National Biodiversity Institute (SANBI) and the Worldwide Fund for Nature South Africa (WWF) convened a two-day workshop with key role players towards the development of a multi-faceted National Response Strategy to tackle this issue. The response strategy is a collaborative effort by government departments, conservation authorities, NGO's and local communities to ensure the survival of our rich succulent flora whilst promoting sustainable socio-economic development within the country.

This strategy encompasses several high-level objectives relating to the succulent flora of the arid zone and sets out key actions required to successfully meet the objectives, namely (1) Ensure the long-term survival of representative populations; (2) Ensure the establishment of well-managed *ex situ* collections; (3) Capacitate the compliance and enforcement sector to enable more effective action against illegal collection and trade; (4) Ensure the policy and regulatory environment frameworks are streamlined to support improved compliance and enforcement, whilst also enhancing sustainable use and management; (5) Reduce pressure on wild populations by engaging local communities and facilitating diversification of livelihoods (where applicable); (6) Develop effective and consistent communication briefs about the impact of illegal plant collection and trade that fosters biodiversity positive attitudes and does not lead to un-intended consequences; and (7) Explore options for the development of a formal economy that benefits the country and contributes to socio-economic development and conservation. Under each objective, key actions, sub-actions, lead agents, supporting role players, priority and timelines have been assigned.

1. BACKGROUND

1.1. The Illegal Trade in Succulent Flora in South Africa

South Africa's rich and unique diversity of succulent plants is currently under pressure from a growing international demand. Over the past three years or so, there has been a significant increase in incidences of illegal harvesting of South African succulents, most notably across the Succulent Karoo region. This illegal harvesting has been to supply a global and largely online horticultural trade. The impacts of this trade have been severe for several endemic species and the supply chain has also fostered some negative socio-economic consequences within the country.

In-demand succulent species are often not available in nurseries and thus there is a notable lack of cultivated material to supply the current demand. People in South Africa as a whole, and particularly remote areas of the Northern Cape are often faced with very scarce and limited economic opportunities. Of late, local South Africans are increasingly being enticed by either criminal syndicates or middlemen in the illegal horticultural trade to indiscriminately collect large numbers of succulent plants, including some very rare species and populations that are now faced with imminent extinction.

Conservation authorities and botanical gardens are struggling to adequately deal with the volume of confiscated material arising as a consequence of the growing number of ongoing criminal investigations. The limited resources and capacity to deal with this material, and lack of space to house these specimens are leading to further losses of plants, some which have very specific care requirements. The evolution of online social media platforms, lucrative overseas markets, coupled with local socio-economic challenges (made worse by the impacts of Climate Change – an extended drought has been experienced since 2016 and is ongoing – and the COVID-19 pandemic), limited *in situ* protection measures as well as the relative ease of poaching and laundering operations, are all contributing to and escalating this significant threat. Several thoughts and ideas on how to address these challenges have been briefly discussed over the past few months. The DFFE in partnership with a range of state and Not for Profit partner agencies is exploring some of these ideas towards the development of a National Response Strategy to the succulent plant poaching problem, as well as to identify how various role players can contribute towards the success of such a strategy.

1.2. Purpose of the National Response Strategy

To develop a list of actions to address and manage the current challenges posed by illegal harvesting pressures, and to identify key actors that can undertake these actions through national collaborative efforts thereby ensuring the conservation of South Africa's rich succulent flora.

1.3. Work Sessions to develop the National Response Strategy

A work session with relevant conservation agencies and other important partners and stakeholders was convened to plan and discuss the development of the National Response Strategy.

The work session was held virtually over the 24th and 25th of June 2021. The programme included focused sessions on:

- Conservation and management
- Compliance and enforcement
- Legislation and regulatory framework
- Community engagement, awareness and education
- Exploring options for a formal economy in succulents

The work sessions were attended by 103 attendees representing 22 different organisations and several independent individuals including:

- ARC (3)
- CapeNature (19)
- CSA (2)
- DEA&DP (3)
- DEDEAT (1)
- DAERL (1)
- Department of Tourism (1)
- DFFE (11)
- GDARD (3)
- IUCN (1)
- Kamiesberg Municipality (1)
- RBG Kew (2)
- Namakwa District Municipality (2)
- SAHGCA (1)
- SANBI (21)
- SANParks (7)
- SAPS (3)
- Stellenbosch University (1)
- TRAFFIC (3)
- UCT (2)
- WFA (2)
- WWF (4)
- Other (8)

Each session began with a summary of the issues followed by an open discussion with the aim of trying to identify actions that are needed, as well as key stakeholders and responsible implementing parties.

Leaders from each work session pulled together the key actions from each session that were presented to the group at the end of the 2-day workshop.

1.4. Development of the National Response Strategy

Following the work sessions, the organising committee collated the feedback from the workshop and developed this into key actions from each session. These key actions have been grouped into a framework of seven overarching objectives as presented below:

- **Objective 1:** Ensure the long-term survival of representative populations of South African succulent flora within the Arid Zone
- **Objective 2:** Ensure the establishment of well-managed *ex-situ* collections for South African succulent flora from the Arid Zone
- **Objective 3:** Capacitate the compliance and enforcement sector to enable more effective action against illegal collection and trade of indigenous and endemic South African succulent flora
- **Objective 4:** Ensure the policy and regulatory environment frameworks are streamlined to support improved compliance and enforcement, whilst also enhancing sustainable use and management of South African succulent flora within the Arid Zone
- **Objective 5:** Reduce pressure on wild populations of South African succulent flora within the Arid Zone by engaging local communities and facilitating diversification of livelihoods (where applicable)
- **Objective 6:** Develop effective and consistent communication briefs about the impact of illegal plant collection and trade that foster biodiversity positive attitudes and do not lead to unintended consequences
- **Objective 7:** Explore options for the development of a formal economy around South African succulent flora that benefits the country, and contributes to socio-economic development and conservation within the Arid Zone

2. NATIONAL RESPONSE STRATEGY

2.1. Objective 1: Ensure the long-term survival of representative populations of South African succulent flora within the Arid Zone

2.1.1. Rationale

The Succulent Karoo is one of only two arid zone biodiversity hotspots recognised globally (Mittermeier *et al.* 2005), and supports the richest diversity of succulent flora on Earth (Mucina *et al.* 2006). About 40 percent of the hotspot's ~6 356 plant species are endemic or near-endemic found nowhere else, and many (most notably the Aizoaceae and bulbs) are narrow or point endemics, occurring within a limited range of environmental conditions and across very limited areas (Driver *et al.* 2003). The region therefore contains the most important and significant natural habitat for the *in situ* conservation of significant biological diversity. Presently, more than 900 Succulent Karoo species are known to be threatened with extinction owing to several factors including climate change, habitat destruction and the growing impact of illegal collection and trade. South Africa's ability to effectively manage these threats and associated risk of extinction is currently impeded by limited data on the biology, ecology, distribution and size of extant populations for many of the species. In order to prevent the extinction of already threatened species and also ensure that no additional species become threatened, it is necessary to have detailed baseline population data that can be used in updated Red List assessments, to inform species prioritisation and monitoring efforts, and ultimately to guide the development of conservation needs such as protected area expansion strategies. This will require dedicated personnel who will be responsible for documenting populations in the field over time and implementing ongoing monitoring of priority populations amongst other duties. Up to date information on the location of succulent species of conservation concern must be incorporated into identifying priority sites for protected area expansion. Furthermore, management authorities with existing protected areas must receive support on how to most effectively protect populations of succulent species occurring within protected areas.

2.1.2. Anticipated outcomes

In situ conservation measures and management tools that are developed across the region for succulent flora are guided by and based on up-to-date and detailed species distribution records, population data and necessary maps.

2.1.3. Key Actions

Table 1. Key Actions, lead agents and role players identified as necessary to achieve Objective 1.

KEY ACTIONS	SUB- ACTIONS	LEAD AGENT	SUPPORTING ROLE PLAYERS	PRIORITY	TIMELINE
1.1 Develop and implement an effective field monitoring strategy and plan.	1.1.1 Develop a field monitoring strategy and plan, including identifying gaps in baseline data for succulent flora populations as well as a prioritisation of areas for monitoring and collections.	SANBI	MSBP	HIGH	2022
	1.1.2 Begin to fill immediate gaps in baseline data and start priority monitoring identified out of the field monitoring strategy and plan.	SANBI	(WWF can assist in some priority areas), CapeNature	HIGH	Starting 2021 and ongoing monitoring annually
	1.1.3 Identify hot spot areas (both species under pressure currently as well as those at risk due to restricted range/distribution). Link to 3.2.4 .	SANBI	WWF, TRAFFIC	HIGH	Starting 2021 and ongoing
	1.1.4 Grow the botanic capacity within the Succulent Karoo to enable the continued and effective monitoring of plant populations. These positions could also be linked to achieving 1.1.1, 1.1.2, 1.1.3, 1.1.5, 1.1.7, 2.2.4. & 2.1.4 .	SANBI	WWF (potential funder)	HIGH	Early in the 2022 financial year
	1.1.5 Implement on-going monitoring for succulent plant populations.	SANBI Reliant on 1.1.4	CapeNature, relevant local /international universities	MEDIUM	TBD
	1.1.6 Explore technological solutions to secure and monitor populations in-field. Links to 3.2.2 .	SANBI	RBG Kew & DFFE	MEDIUM	TBD
	1.1.7 Link the monitoring plan and actions to engagement with landowners and land users, private and communal – (e.g., explore the possibility to assist in monitoring on their own land).	SANBI	(with assistance from partners on the ground e.g., SAHGCA, CapeNature)	LONG TERM	TBD
1.2 Ensure South Africa has a representative & well-managed protected area network.	1.2.1 Prioritisation of sites for inclusion into formally protected area expansion plans and decision-making support tools using data on sensitive areas for succulent species (CBA, NCPAES, Park inclusion plans).	WWF	SANBI, SANParks & Provincial Conservation Agencies, WFA	MEDIUM	TBD
	1.2.2 Engage with management authorities of Succulent Karoo protected areas to understand gaps in management effectiveness or resources. Link to 3.2.7 .	WWF	SANParks & Provincial Conservation Agencies, WFA	HIGH	TBD
	1.2.3 Conduct proactive and disruptive compliance and monitoring activities within protected areas to minimise/reduce incidents. Collect and feed information on incursions into centralised analyses. Link to 3.2.2 .	SANParks & Provincial Conservation Agencies	NBIF & EEFC	HIGH	TBD

KEY ACTIONS	SUB- ACTIONS	LEAD AGENT	SUPPORTING ROLE PLAYERS	PRIORITY	TIMELINE
1.3 Encourage conservation actions outside of formal protected areas through landowner engagement.	1.3.1 With oversight from SANBI, WWF to organise meeting/workshop (WWF, GCBR, SAHGCA, BotSoc, WFA, relevant conservancies, CapeNature, DAERL, Agriculture) to begin a process of mapping partners working on landowner engagement within the region to better understand what approaches are being used by which organisations and where.	WWF	BotSoc, WFA	MEDIUM	TBD
	1.3.2 Prioritisation of sites for inclusion into formal stewardship, OECMs or other means of conservation action with landowners.	WWF	SANBI & Provincial Conservation Agencies, WFA	HIGH	TBD
	1.3.3 Workshops and training with landowners to assist with monitoring, seed collection, who they must contact, etc. linked to 1.1.7.	SANBI to build into monitoring plan.	Other NGOs and Provincial Conservation Agencies to implement	LONG TERM	TBD

2.2. Objective 2: Ensure the establishment of well-managed *ex situ* collections for South African succulent flora from the Arid Zone

2.2.1. Rationale

The current scale of illegal collection is significant, and conservation authorities together with SAPS officials are confiscating substantial quantities of plant material each month. More than 400 000 wild plants of some 450 species (majority endemic) have been confiscated over the past three years alone, and these numbers continue to increase (A. Harrower and P. Van Wyk Pers. Comm). This material can play a critical role in *in situ* conservation through reintroductions and recovery management of wild populations. *Ex situ* collections are becoming increasingly important in succulent plant conservation but there are presently many more confiscated plants than the country's conservation infrastructure can store and manage. Furthermore, the management of items seized for the purposes of criminal proceedings must comply with requirements set out in the Criminal Procedure Act.

If *ex situ* conservation is to play an effective role in conserving wild plant diversity, appropriate levels of infrastructure and capacity need to be established, quantifiable goals need to be set, and progress toward those goals needs to be measured (Havens *et al.* 2006). This will require continued investment of human, operational, and capital resources across institutions that are required to collect, store, safeguard, and manage comprehensive *ex situ* collections of valuable seed and live specimens (of Succulent Karoo plant species).

2.2.2. Anticipated outcomes

Comprehensive and well-maintained *ex situ* collections of succulent plant species are maintained within South Africa and at the Millennium Seed Bank Partnership and are supported by long term investment in both facilities and staff.

2.2.3. Key Actions

Table 2. Key actions, lead agents and role players identified as necessary to achieve Objective 2.

KEY ACTIONS	SUB- ACTIONS	LEAD AGENT	SUPPORTING ROLE PLAYERS	PRIORITY	TIMELINE
2.1 Conduct an audit of existing <i>ex situ</i> collections to inform priority collection activities.	2.1.1 Audit inventory of what is currently available in Succulent flora collections (of both seed and living specimens) across all priority NBGs (Kirstenbosch, Karoo, Richtersveld & Pretoria) taking into account quality of associated accession data.	SANBI	MSBP	HIGH	TBD
	2.1.2 Conduct a Gap Analysis based on audit to identify gaps in seed collections.	SANBI	MSBP	HIGH	March 2022
	2.1.3 Conduct a Gap Analysis based on audit to identify gaps in living collections.	SANBI		HIGH	TBD
	2.1.4 Prioritise species and identify immediate needs for collection	SANBI	MSBP	HIGH	March 2022
2.2 Establish <i>ex situ</i> collections of priority species	2.2.1 Undertake the collection of living plants and seeds for the establishment of cultivated living <i>ex situ</i> collections of priority species identified in 2.1.4 at relevant NBG's	SANBI	MSBP	HIGH	TBD
	2.2.2 Undertake the collection of seeds of priority species identified in 2.1.4 for long-term storage at SANBI's Biodiversity Seedbank and the MSB, UK.	SANBI	MSBP	HIGH	TBD
	2.2.3 Establish and maintain well documented cultivated living <i>ex situ</i> collections at relevant NBG's (dedicated capacity to manage collections must be available).	SANBI	BCGI		TBD
2.3 Improve the management of confiscated plant material for <i>ex situ</i> collections or alternative conservation purposes (bearing in mind the legal prescripts of the Criminal Procedure Act)	2.3.1 Identify needs at relevant NBG facilities (Kirstenbosch, Karoo, Richtersveld as primary gardens for succulent collections, and Pretoria and Walter which hold some seized collections) to allow effective management and care of current living collections (infrastructure, security upgrades, potting resources etc.) as well as those required for propagation of key species.	SANBI		HIGH	TBD
	2.3.2 Investigate funding sources and establish new, or upgrade current facilities in relevant NBG's based on identified needs in 2.3.1	SANBI	BotSoc	HIGH	TBD
	2.3.3 Ensure relevant NBG facilities are adequately protected to ensure safety and security of high-value collections and species.	SANBI		HIGH	TBD
	2.3.4 Ensure collections of key species are adequately split across gardens to minimise risk.	SANBI		HIGH	TBD
	2.3.5 Create dedicated capacity within the Succulent Karoo for processing confiscated materials (counting, sorting, writing statements) in compliance with the Criminal Procedure Act.	SANBI	WWF, BotSoc, Provincial Conservation Agencies	HIGH	TBD
	2.3.6 Explore potential ways to link excess confiscated material (not required for conservation collection, and post finalization of criminal case proceedings) into formal economy as motherstock for propagation to legitimate and licenced/registered nurseries (Link to 7.1).	SANBI & WWF	Provincial Conservation Agencies (to assist regarding permitting)	HIGH	TBD

KEY ACTIONS	SUB- ACTIONS	LEAD AGENT	SUPPORTING ROLE PLAYERS	PRIORITY	TIMELINE
	2.3.7 Explore technological solutions to monitor/mark <i>ex situ</i> populations for security and tracking purposes (potential links with 1.1.6).	SANBI	RBG Kew & DFFE	MEDIUM	TBD
2.4 Explore re-introduction potential of <i>ex situ</i> collections or confiscated material from known locations	2.4.1 Understand regulations and processes necessary for repatriation of seized plants to be returned to South Africa and determine feasibility.	DFFE	SANBI	LONG TERM	TBD
	2.4.2 Begin experimental field trails for re-introduction for some species to better understand best practice for reintroductions.	SANBI	MSBP	HIGH	TBD
	2.4.3 Develop protocol for reintroduction of confiscated material including registry for reintroductions required from local confiscations of international confiscations (if deemed feasible in 2.4.1) based on both desktop research, field trials and working in collaboration with horticulturists taking into account potential risks (hybridisation and disease).	SANBI	MSBP	LONG TERM	TBD
	2.4.4 If repatriation is deemed not feasible (in 2.4.1), explore options for international collaborations with trusted parties (e.g., reputable botanical gardens abroad) to expand the conservation network.	SANBI	RBG Kew	LONG TERM	TBD
	2.4.5 Explore isotope work for determining provenance of confiscated material for possible future reintroductions / augmenting impacted populations.	SANBI, RBG Kew	UCT	LONG TERM	TBD

2.3. Objective 3: Capacitate the compliance and enforcement sector to enable more effective action against illegal collection and trade of indigenous and endemic succulent flora

2.3.1. Rationale

Legislative and enforcement measures have an important role to play in addressing aspects of an illegal and unsustainable wildlife trade (Challender *et al.* 2015; UNEP 2019; Fukushima *et al.* 2021). South Africa generally possesses a progressive governance framework for the management of use and trade of wildlife and wildlife products, however, there are some gaps and misalignment between national and provincial policies that limits the ability of enforcement officials to sufficiently address the current succulent poaching crisis. In addition, the effective implementation and enforcement of existing policy and legislation on the ground is hampered by a number of challenges across national, provincial and local levels. These include budgetary and capacity constraints in compliance and enforcement departments, lack of awareness and understanding of biodiversity crimes (and particularly plant smuggling) among officials involved in the prosecution process as well as those mandated to check stocks at exporting nurseries and ports of exit. Some of these resource and capacity constraints are even more pronounced in the arid zone where areas are vast, population densities low, and number of compliance and enforcement officials limited. At present, the conviction rate of known perpetrators is low, particularly at higher levels of the trade chain, and there is little consistency with how these crimes are dealt with in terms of penalties imposed between the provinces. The capacity for experts writing statements for court cases (e.g., 212 or 213 statements) is also currently limited, often resulting in uncoordinated and inconsistent approaches. Monitoring of the trade in succulent plants (both legal and illegal) is inadequate and presents additional difficulties in curbing the problem, given that the trade is largely facilitated online.

Many of the processes that specifically relate to the illegal succulent trade need to be developed and standardised nationally. The aforementioned capacity and knowledge gaps need to be addressed in order to improve enforcement mechanisms. Implementation of these mechanisms also needs to be coupled with broader outreach programmes to educate role players at both the supply and consumer ends.

2.3.2. Anticipated outcomes

South Africa's compliance and enforcement sector particularly within the Arid Zone is well capacitated and effective in addressing the illegal trade in indigenous and endemic succulent flora. Likely impacts of compliance and enforcement actions are well understood and implemented in a careful and coordinated manner.

2.3.3. Key Actions

Table 3. Key Actions, lead agents and role players identified as necessary to achieve Objective 3.

KEY ACTIONS	SUB- ACTIONS	LEAD AGENT	SUPPORTING ROLE PLAYERS	PRIORITY	TIMELINE
3.1 Equip protected areas and agencies with resources to undertake enforcement within protected areas and in areas adjoining	3.1.1 Examine processes necessary to give SANParks the mandate to undertake enforcement in SANParks buffer zones and if this would require a legislative amendment. In particular around Richtersveld NP and Namaqua NP.	SANParks	DAERL, DFFE	HIGH	TBD
	3.2.1 Identify gaps in enforcement processes (SAPS, DFFE), promote recruitment of a local informer network and understand potential unintended consequences of current processes (e.g., sting operations that may potentially increase perceived demand for harvesting succulents locally).	NBIF	DFFE, SAPS, NPA, Provincial Conservation Agencies	HIGH	TBD
3.2 Effective enforcement processes are in place	3.2.2 Develop standardised approach for each arrest and flow of information (including comprehensive information collected at scene) to ensure centralised analysis of information and implementation of joint focused investigations	NBIF	EEFC	HIGH	TBD
	3.2.3 Work with law enforcement agencies in other countries implicated in the illegal succulent trade to initiate transnational investigations	DFFE, DPCI	EEFC, NPA	MEDIUM	TBD
	3.2.4 Identify single locality species only found in Protected Areas as a potential tool for enforcement as an interim measure until listed on ToPS.	SANBI		HIGH	TBD
	3.2.5 Develop templates for writing statements for court cases to ensure consistency and get clarity on which types of statements (212 or 213) are most appropriate.	DFFE	NPA, Provincial Conservation Agencies	HIGH	TBD
	3.2.6 Develop a Standard Operating Procedure for the treatment of plants once they are confiscated as well as once they arrive at relevant NBGs. This should include list of appropriate locations to which confiscated materials can/should be taken.	DFFE	SANBI, Provincial Conservation Agencies	HIGH	TBD
	3.2.7. Engage with protected area management authorities to understand their needs to protect range restricted and point endemics (e.g., Namaqua NP, Richtersveld NP, Knersvlakte NR) and what has/hasn't been working. Link to 3.2.4 .	WWF	SANParks, CapeNature	HIGH	TBD
	3.2.8 Pilot methods to protect range restricted and point endemics in areas that have been identified as being the next sites to be poached (e.g., temporary guards, communication equipment, licence plate recognition camera) using information from 3.2.7. and 1.1.6 .	DFFE	DAERL, SANParks, CapeNature, WWF, SANBI	HIGH	TBD
	3.2.9. Filling of vacant EMI posts in priority Succulent Karoo areas prioritised at national level.	CapeNature, DAERL, SAN		HIGH	TBD

KEY ACTIONS	SUB- ACTIONS	LEAD AGENT	SUPPORTING ROLE PLAYERS	PRIORITY	TIMELINE
3.3 Compliance and enforcement training needs are identified and gaps filled	3.3.1 Develop/upscale training for SAPS, EMI's, prosecutors and magistrates to increase awareness around the illegal succulent trade as well as how to understand the severity of the crimes linked to species biology, distribution, age, life strategy, ecological value, conservation status etc. (Link to development of Severity Index 3.4.2).	DFFE	EWT, WFA, TRAFFIC, SANBI, SAPS, NPA	MEDIUM	TBD
	3.3.2 Develop training for compliance officers who do nursery inspections – identification of species and distinguishing between wild and artificially propagated specimens. This could be through preparation of materials, or through Training programme "road show". e.g., have an expert do a training trip	DFFE	SANBI	HIGH	TBD
	3.3.3 Peace Officer training and/or training on treatment of succulents as evidence for provincial staff, EMI, CapeNature, DAERL, SANParks etc. in priority areas, as these are often first responders on the ground.	CapeNature, DAERL, SANParks	WWF	HIGH	TBD
	3.3.4 Increase training and awareness raising for relevant officials at airports, customs, post offices, couriers, ports etc including relevant contacts and procedures if they suspect illegal activities.	DFFE	EWT, TRAFFIC, SANBI, SAPS, CapeNature	HIGH	TBD
3.4 Consistency in statement writing and supporting evidence	3.4.1 Discussion on plant values to occur first in NBIF and then possibly Priority Committee on Wildlife Trafficking agenda. There needs to be a standardised way of dealing with monetary values in enforcement and prosecution and ensuring that these values are not presented in the media and are relevant to the level of the perpetrator i.e., differentiate between those collecting from field and middlemen etc.	NBIF		MEDIUM	TBD
	3.4.2 Severity Index development - allow comparison across species objectively (threat status, number, combined age, etc.) which draws the focus to the ecological impact, how unique and vulnerable the species are, and contextualising ecological loss, rather than relying solely on monetary value. Link to 3.2.5 . and 6.1 .	SANBI		MEDIUM	TBD
3.5 Lessons are learnt from other illegally traded wildlife species in South Africa applied to illegal trade in succulents	3.5.1 Engage with other sectors around lessons learned with regards to addressing illegal wildlife trade (including for example the concept of restorative justice). Sectors and potential partners to engage with: Rhino and other high-value game species, abalone, medicinal plants, cycads, pangolins.	WWF, TRAFFIC, EWT, WFA	SAHGCA DFFE, NBIF, UCT, EWT	HIGH	TBD
3.6 Monitoring of the trade internationally and locally	3.6.1 Use the FloraGuard tool (and/or other potential web applications) to monitor online trade and use results to develop publications that can inform decisions and can be used to leverage further funding.	RBG KEW, UK Scientific Authority	SANBI, DFFE, TRAFFIC	MEDIUM	TBD
	3.6.2 Develop a better understanding of the local trade dynamics and social-economic drivers of engaging in illegal plant harvesting and trade (at both ends of the supply chain) with strong links to 5.2	TRAFFIC, UCT	DFFE, SAPS, NBIF, CapeNature	MEDIUM	TBD

KEY ACTIONS	SUB- ACTIONS	LEAD AGENT	SUPPORTING ROLE PLAYERS	PRIORITY	TIMELINE
	3.6.3 Develop a better understanding of the international trade dynamics including mapping supply chains	TRAFFIC		MEDIUM	TBD
	3.6.4 Proactive engagement with online platforms internationally to monitor, flag and remove suspected wild-harvested South African succulents and perpetrator accounts (e.g., through Coalition to End Wildlife Trafficking Online).	TRAFFIC	WWF, IFAW	MEDIUM	TBD
	3.6.5 Start to engage with international conservation agencies, societies, collectors and buyers to encourage sharing of information on responsible plant purchasing and education about the illegal trade. Link to 6.1 .		WFA, TRAFFIC	MEDIUM	TBD

2.4. Objective 4: Ensure the policy and regulatory environment frameworks are streamlined to support improved compliance and enforcement, whilst also enhancing sustainable use and management of South African succulent flora within the Arid Zone

2.4.1. Rationale

The National Environmental Management: Biodiversity Act (10 of 2004) (NEMBA) governs the protection of indigenous biological resources by providing the framework, norms, and standards for the conservation, sustainable use, and equitable benefit-sharing of South Africa's biological resources. Relevant subordinate legislation, specifically in relation to the use and trade of biodiversity, include the Threatened or Protected Species (ToPS) Regulations of 2007 (as amended), the Publication of lists of critically endangered, endangered, vulnerable and protected species of 2007 (as amended) (the ToPS lists) and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) Regulations of 2010 (as amended). The national policy and legislative framework for biodiversity is deemed to be well developed and aligned with global conservation commitments, providing a strong basis for the conservation, management and sustainable use of the country's rich array of biodiversity. However, the concurrent legislative competencies given to national and provincial spheres of government in accordance with Schedule 4 of the Constitution of the Republic of South Africa, 1996, does present some challenges to effective implementation. In addition, there is concern that some of the bureaucratic processes' disincentivise compliance, for example, in the matter of legally acquiring, propagating and exporting stocks of rare and threatened plant species. There is thus a need for the alignment and co-ordination of appropriate legislative tools and practices across provincial and national spheres of government that uphold the principals of the NEMBA through conserving species but also in supporting the sustainable use and responsible management of biodiversity. The inclusion of species on the ToPS and/or CITES lists needs to be well thought out so that necessary and effective protection is afforded to at-risk species without hampering activities that would promote a legal and sustainable supply of in-demand plants.

2.4.2. Anticipated outcomes

South Africa has a policy and regulatory environmental framework, with regards to the trade in indigenous succulent flora, that supports effective compliance and enforcement, whilst also enabling well-regulated sustainable use and management of succulent flora from the arid zone.

2.4.3. Key Actions

Table 4. Key Actions, lead agents and role players identified as necessary to achieve Objective 4.

KEY ACTIONS	SUB- ACTIONS	LEAD AGENT	SUPPORTING ROLE PLAYERS	PRIORITY	TIMELINE
4.1 Ensure South Africa has effective ToPS listing of succulent flora at a national level.	4.1.1 Identify options for ToPS listing changes and potential implications for <i>in situ</i> conservation and formal economy.	SANBI	DFFE	HIGH	TBD
	4.1.2 Identify mechanisms for emergency listing as targeted species change rapidly and demand shifts.	SANBI	DFFE	MEDIUM	TBD
	4.1.3 Explore potential implications for genus level listing to make formal recommendations.	SANBI	DFFE	MEDIUM	TBD
4.2 Ensure South Africa has effective CITES listing of succulent flora	4.2.1 Identify options for CITES listing changes and potential implications for <i>in situ</i> conservation and formal economy. Exemptions must be considered so as not to hamper propagation activities.	SANBI	DFFE	MEDIUM	TBD
4.3 Ensure there is effective provincial listing of succulent flora	4.3.1 Identify any options for updating provincial legislation to close loopholes used in the illegal laundering of wild plants.	SANBI	DFFE	MEDIUM	TBD
4.4 Work towards harmonising provincial & national legislation with regards to succulent flora	4.4.1 Biodiversity alignment committee to eliminate challenges and inconsistencies in provincial and national legislation.	DFFE		MEDIUM	TBD

2.5. Objective 5: Reduce pressure on wild populations of South African succulent flora within the Arid Zone by engaging local communities and facilitating diversification of livelihoods (where applicable)

2.5.1. Rationale

South Africa is one of the most unequal countries in the world plagued by the injustices of the past, and with little to no progress having been made to adequately address the persistent inequalities (Futshane 2021). A recent United Nations Human Development Report found that about 18.9% of the country's population (one in every five South Africans) lives below the poverty line (Conceição 2020). The Northern Cape is the largest, yet most sparsely populated province in the country, with vast areas made up of desert or semi-desert. Limited economic activities exist and are centred primarily around mining and livestock farming, resulting in high unemployment rates (NCPG 2014), and although most people may have access to basic services, many households remain poor. Alternative sources of income, particularly in the Namakwa district, present in the form of illegal mining of mineral resources, or large-scale removals and illegal sale of succulent plants. It appears as though an increasing number of locals are being employed/solicited/exploited to harvest plants *en masse*, and without any understanding of the impact removals are having/may have on targeted species and the long-term health of sensitive ecosystems. The short-term financial incentives for plant poaching may be high, and poverty and unemployment amongst youth in particular is thought to play a big role in the commission of illegal activities. The socio-economic complexities that exist within the region make it challenging to tackle this 'wicked' problem. It is therefore necessary to better understand the socio-economic drivers of illegal plant trade if conservation headway is to be made (Challender and MacMillan 2013). This will require initial and ongoing engagements with local communities impacted by the trade and facilitating positive relationships between conservationists and local people. This will enable conservationists (whether from governments or NGOs) to think through their interventions in advance, use appropriate methods to understand existing behaviour and local perspectives on ways forward, and thereby design locally appropriate, participatory interventions that support co-defined, sustainable solutions (Milner-Gulland *et al.* 2020). Importantly, in order to encourage local communities to conserve rather than destroy valued species, incentives that help them meet their livelihood expectations need to be provided (Challender and MacMillan 2013; Cooney *et al.* 2016).

2.5.2. Anticipated outcomes

Through continued and meaningful engagement with local communities, a better understanding of the local drivers of illegal plant trade within the arid zone are realised and co-defined, well-balanced solutions are generated.

2.5.3. Key Actions

Table 5. Key Actions, lead agents and role players identified as necessary to achieve Objective 5.

KEY ACTIONS	SUB- ACTIONS	LEAD AGENT	SUPPORTING ROLE PLAYERS	PRIORITY	TIMELINE
5.1 Setting the scene for engaging local communities and facilitating diversification of livelihoods	5.1.1 Convene a workshop with relevant role-players (I.e., NGOs, government departments (national, provincial and local) including those relating to the environment and social issues, universities, and community forums, civil society organisation etc.) to understand the current scope and scale of work being undertaken in relation to community engagement and development across the region and improve/facilitate co-ordination of efforts between partners.	WWF	UCT, CSA	HIGH	Early 2022
	5.1.2 From the above workshop, identify organisations, individuals to form a task team to lead and further develop this body of work that have the necessary skills to understand the complexities of working with communities.	Task Team	WWF, SANBI, UCT, CSA, CapeNature	HIGH	Early 2022
	5.1.3 Once the landscape of work has been defined and all partners identified, highlight any gaps in current community engagement efforts and our research/understanding of existing issues particularly across hotspot areas in the Namakwa district using appropriately trained social scientists.	Task Team	UCT and other relevant universities	HIGH	TBD
5.2 Co-defining the vision for the landscape - with communities working together towards shared objectives and a sustainable future	5.2.1 Community engagement must be prioritised in hotspot areas with the aim being to understand challenges faced by locals and the co-defining of solutions to these challenges. This may entail conducting initial socio-economic (and wildlife trade) studies to determine the characteristics and situation of individuals engaged in these illegal wildlife activities (including a comprehensive understanding of livelihood options available), as this will play a key role in developing sustainable solutions. Links to 3.6.2	Task Team	TRAFFIC	HIGH	TBD
	5.2.2 Engage with other community groups (e.g., Rastafarian communities) to understand the dynamics of plant collecting from these communities and how to create more sustainable models especially for single site endemics and rare species.	Task Team		HIGH	TBD
5.3 Stimulate local economy in areas under threat from illegal trade in succulents	5.3.1 Explore economic options for the region including green enterprises (e.g., nature-based tourism development or alternative agriculture activities) in parallel to/guided by community engagement initiatives.	Task Team		MEDIUM	TBD
	5.3.2 Develop/promote long-term training and capacity building initiatives for youth to create sustainable opportunities.	Task Team		MEDIUM	TBD
5.4 Understand impacts of conservation action on communities	5.4.1 Unpack the Customary land use rights of local communities living on communal lands and how this relates to provincial and national biodiversity regulations	Task Team		HIGH	TBD

KEY ACTIONS	SUB- ACTIONS	LEAD AGENT	SUPPORTING ROLE PLAYERS	PRIORITY	TIMELINE
	5.4.2 Unpack social impacts of protected area expansion initiatives and seek to build on co-defined solutions that would benefit conservation whilst respecting the rights of communities.	Task Team		HIGH	TBD

2.6. Objective 6: Develop effective and consistent communication briefs about the impact of illegal plant collection and trade that foster biodiversity positive attitudes and do not lead to un-intended consequences

2.6.1. Rationale

The illegal trade in wild plants has received comparatively less scientific and policy attention than the illegal trade in wild animals (Margulies *et al.* 2019). The rise in incidents and unusual nature of plant ‘smuggling’, has recently brought growing media attention to the succulent plant poaching problem (see Hyman 2020; Dall 2021; CarteBlanche 2021; Nuwer 2021; Towey 2021). Whilst the media coverage may assist in creating awareness amongst unsuspecting consumers and spur governments to take action, the focus of journalists/outlets on catchy headlines and certain sensationalist storylines may often lead to simplistic or inaccurate (or false) narratives and furthermore result in unintended consequences that exacerbate the situation. There is thus a need to ensure that messages and statements around this topic are well coordinated, consistent, backed by evidence (based on research) wherever possible, with a focus on contributing to positive outcomes (such as to create awareness amongst target groups that leads to action or reformation). To this end, it will be necessary to undertake careful planning and tailor messages/campaigns to the specific aim and context to ensure that they engage the target audience effectively whilst fully considering all potential consequences of the information, drawing on existing evidence from other fields (Dean and Hinsley 2020). Most conservation issues stem from people’s actions and choices, and thus addressing biodiversity loss often depends on changing human behaviour (Schultz 2011). Although creating awareness does not always lead to behaviour change, focusing on positive biodiversity messages based on education, where people are provided information that encourages an understanding and appreciation of the natural world, could lead to voluntary behaviour change amongst some of the target groups (Rothschild 2000). Assuming pro-environmental values to be present, particularly amongst locals who have a deep connection with the land, as well as amongst consumer groups who may have a deep love for the plants, communication efforts aimed at educating, making aware and guiding towards better practice, may influence the choices of role-players (Park 2020) and contribute positively to reducing illegal plant collection and trade.

2.6.2. Anticipated outcomes

Carefully considered and targeted communication efforts, messages and outreach projects that contribute positively to the sustainable use and conservation of succulent plants.

2.6.3. Key Actions

Table 6. Key actions, lead agents and role players identified as necessary to achieve Objective 6:

KEY ACTIONS	SUB- ACTIONS	LEAD AGENT	SUPPORTING ROLE PLAYERS	PRIORITY	TIMELINE
6.1 Develop a comprehensive Communication Plan that promotes responsible and consistent messaging across local, regional and international platforms	6.1.1 Create an inter-institutional task team that will be responsible for developing a plan and coordinating communication and outreach programs. The plan must cover the identification of target audiences, key messages, resource needs, guidelines on dealing with sensitive information, as well as relevant and appropriate mechanisms for communication.	WWF and SANBI	WFA, CapeNature	HIGH	March 2022
	6.1.2 Ensure that communication messages and materials are coordinated, fact-based and themed - and have a strong focus on education and information sharing in a manner that is most relatable to target groups wherever possible (e.g., using livestock as a frame of reference when communicating with local farming communities by drawing parallels between plant harvesting and livestock management).	Task team	Local communities to be involved in developing messages where appropriate	HIGH	TBD
	6.1.3 Ensure that communication messages and materials do not mention locations of species, nor where confiscated materials are housed.	Task team		HIGH	TBD
	6.1.4 Identify potential sources of funding to support the development and implementation of the communication plan.	Task team		MEDIUM	TBD
	6.1.5 Develop channels to deal with immediate media requests so that responses are coordinated and take into account the possible unintended consequences of unplanned media attention.	Task team		HIGH	TBD

2.7. Objective 7: Explore options for the development of a formal economy around South African succulent flora that benefits the country, and contributes to socio-economic development and conservation within the Arid Zone

2.7.1. Rationale

It is hypothesised that a significant driver of the current explosion in illegal trade in succulent plants is owed to a growing demand, particularly across Asia, which has not yet been catered for through sufficient cultivated stocks (see Margulies 2020). Notably, it appears that South Africa plays an almost insignificant role in the legal global supply of succulent plants indigenous or endemic to the country. The continued illegal collection and trade in wild plants represents not only a loss of biological diversity and material that could be important for conservation initiatives, but also represents a loss in resources that could be of socio-economic benefit to citizens of the country. Case studies from Mexico have shown how developing sustainable supply chains within local communities close to biodiversity hotspots can help to decrease plant poaching and contribute to socio-economic development within remote areas (Pulido and Cuevas-Cardona 2013). As other countries continue to consume and profit from southern African resources, the question arises as to whether the country is capable of playing a more active and leading role in a sustainable international succulent trade. A regulated trade in succulent flora has the potential to differ from other trades in faunal wildlife products (e.g., rhinoceros horn or elephant ivory) in that the traded item is valued for being alive and there are many potential mechanisms through which the number of plants can be replicated at scale *ex situ* (e.g., propagation from seeds, cuttings or tissue culture).

Before any such trade may be established or encouraged it is vital to first evaluate the likely benefits and potential risks of such operations. In addition, South Africa would need to assess the production capacity currently existing within the country as well as the feasibility and willingness of existing nurseries to participate and contribute to making rare plants available through large, commercial scale artificial propagation.

2.7.2. Anticipated outcomes

A better understanding of the potential impacts of stimulating formal trade in succulent flora is developed. If found to be feasible, a roadmap for supporting the development of this sector is developed.

2.7.3. Key Actions

Table 7. Key actions, lead agents and role players identified as necessary to achieve Objective 7.

KEY ACTIONS	SUB- ACTIONS	LEAD AGENT	SUPPORTING ROLE PLAYERS	PRIORITY	TIMELINE
7.1 Conduct feasibility studies of different options to lower the threat to <i>in situ</i> populations through developing the formal economy in succulent flora in South Africa	7.1.1 Examine costs and benefits of different models for propagation locally - with either conservation or social goals. (e.g., community run, community beneficiation, Joint Ventures, commercial or links between NBGs and commercial enterprises).	WWF		HIGH	TBD
	7.1.2 Explore options for existing NBGs already housing confiscated stock to scale up propagation operations, where appropriate involve communities in growing of material.	SANBI & SANParks		HIGH	TBD
	7.1.3 Develop potential options for NBGs to legally offload/sell propagated materials for stock that isn't required for conservation collections.	SANBI		HIGH	TBD
	7.1.4 Explore options for SANBI to enter into MOUs with suitable and compliant succulent nurseries to use confiscated material as motherstock while ensuring flow of benefits back to the areas where succulents originate from.	SANBI	Provincial Conservation Agencies	HIGH	TBD
	7.1.5. Explore potential opportunities with overseas nurseries/sellers to grow succulents in South Africa to directly supply overseas markets (e.g., joint ventures).	SANBI	Provincial Conservation Agencies	HIGH	TBD
	7.1.6 Explore potential for legal propagation of succulents to help mitigate other development threats (e.g., using material from search and rescue prior to development and feeding into restoration efforts post development).	SANBI	Provincial Conservation Agencies	MEDIUM	TBD
	7.1.7 Explore explicit mechanisms to ensure economic benefit derived from South Africa's succulent flora accrue back to South Africa and particularly local communities. Local communities should be involved in the development of these mechanisms where appropriate.	SANBI		MEDIUM	TBD
7.2 Understanding and mapping regulatory burden/hindrances to cultivation, transfer and trade of South African succulents	7.2.1 Collate existing legislation relating to cultivation, transfer and trade of South African succulents and map how they relate to each other and identify areas that provide hindrances/opportunities.	SANBI	DFFE, CapeNature	MEDIUM	TBD
	7.2.2 Build on from feasibility study (7.1.1) to understand legislative burdens/hindrances and propose ways to navigating and resolving identified challenges to facilitate rather than obstruct development of a formal economy (e.g., through exemptions in ToPs listings – link to 4.1).	SANBI	WWF, CapeNature	MEDIUM	TBD

KEY ACTIONS	SUB- ACTIONS	LEAD AGENT	SUPPORTING ROLE PLAYERS	PRIORITY	TIMELINE
	7.2.3. Consider whether to include indigenous ornamental plants (including succulents) in horticulture as part of a finalised Biodiversity Economy Strategy (BES), which may allow opportunities to access international funding.	DFFE		HIGH	TBD

3. NEXT STEPS / IMPLEMENTATION

Given that this strategy has been created through engagement with multiple government and non-government stakeholders, the importance of continuing to encourage and facilitate communication as this National Response Strategy is implemented will be paramount.

The next steps in the implementation of this response strategy will be

1. To have this strategy approved through the existing formal (environmental) structures (Working group 1 and Working group 4, MINTECH and MINMEC).
2. To set up a formal oversight committee, to be chaired by SANBI/DFFE, with a representative from each lead implementing agency responsible for tracking the implementation of this response strategy.
3. To set up any task-teams or committees for each objective, chaired by the entity leading most of the initiatives in that objective, to complete the actions outlined in this document, and develop detailed plans that outline resources, timing, responsible persons and expectations.
4. To begin with high priority action items.
5. Oversight committee to meet every 6 months to report on progress, challenges and gaps. This opportunity will be taken to review the actions and make necessary changes and identify next steps based on updated information.
6. The oversight committee will also keep all Stakeholders informed – the attendees of the working sessions in June will form the basis of a Stakeholder List that is to be maintained and expanded.
7. Oversight committee to investigate options for sustainable funding streams to support the implementation of this strategy including setting up potential funds and/or fundraising if necessary.

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