South Africa's
Strategy for
Plant Conservation

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Editor: D. Raimondo

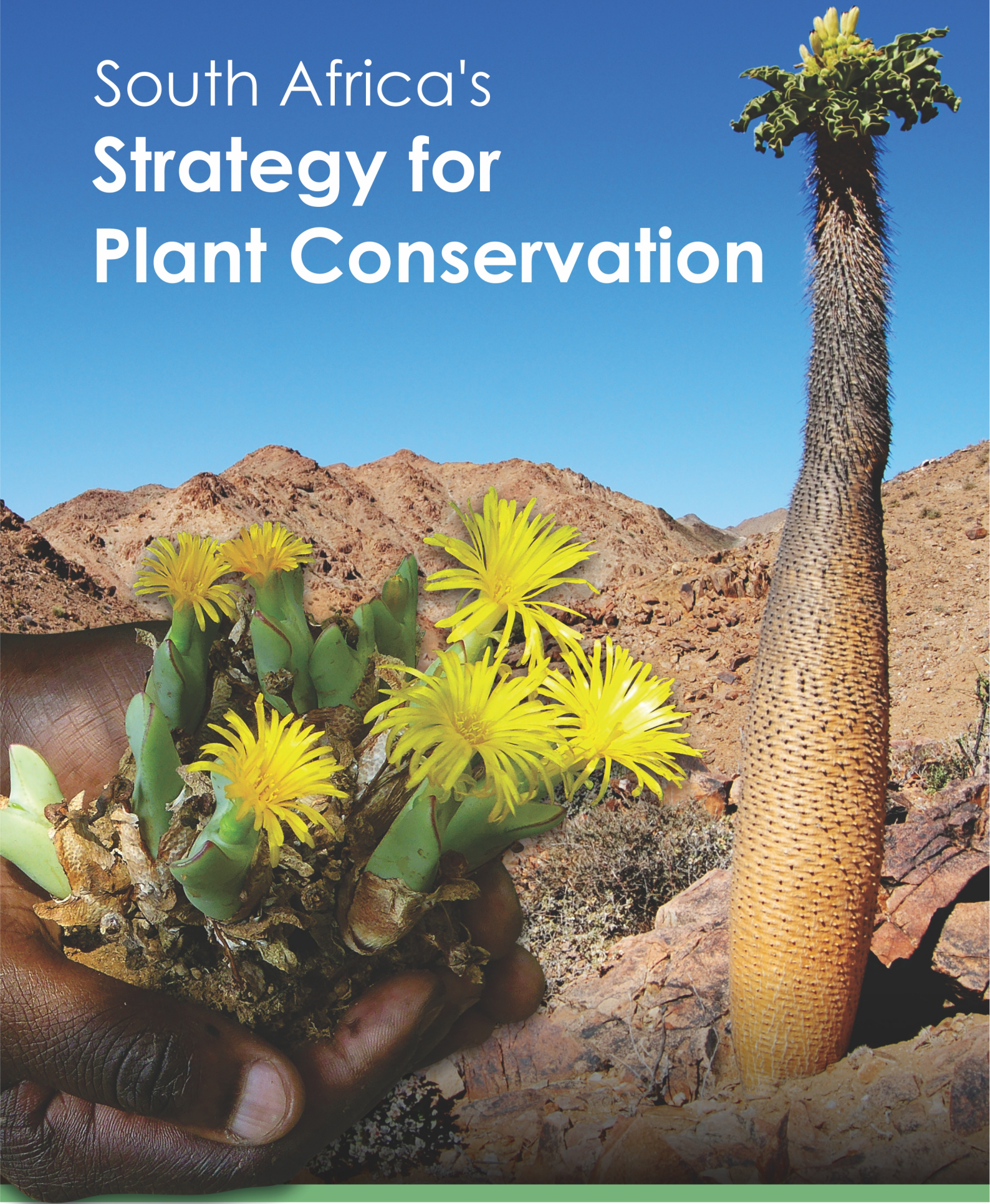Prepared by the South African National Biodiversity Institute and the Botanical Society of South Africa in collaboration with a network of South African botanists and conservationists

environmental affairs

Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

SANBI
Biodiversity for Life
South African National Biodiversity Institute

South Africa's Strategy for Plant Conservation

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Prepared by the South African National Biodiversity Institute and the Botanical Society of South Africa in collaboration with a network of South African botanists and conservationists.

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Acknowledgements

Foreword

Plants are universally recognised as a vital component of the world's biological diversity and an essential resource for ecosystem functioning – goods and services. Additionally, plants have great economic and cultural importance. Plants play a key role in maintaining the planet's basic environmental balance, ensuring ecosystem stability, and they form an irreplaceable component of the habitats for the world's animal life.

Of urgent concern is the fact that many plant species, communities and their ecological interactions, including the many relationships between plant species and human communities and cultures, are in danger of extinction, threatened by such human-induced factors as, *inter alia*, habitat loss and transformation, over-exploitation, pollution, clearing for development activities, alien invasive species and climate change. If this loss is not stemmed, countless opportunities to develop new solutions to pressing economic, social, health and industrial problems will be equally lost. Furthermore, plant diversity is of special concern to indigenous and local communities, and these communities have a vital role to play in addressing the loss of plant diversity.

South Africa is proud to honour its commitment to the Convention on Biological Diversity (CBD) by developing this Strategy for Plant Conservation, which aligns with the CBD-endorsed Global Strategy for Plant Conservation (GSPC).

In 2010, South Africa, along with all Parties to the CBD, endorsed an updated version of the Global Strategy for Plant Conservation and the adoption of Decision X/17 committed Parties to:

'develop or update national and regional targets relevant to the Global Strategy for Plant Conservation, and, where appropriate, to incorporate them into relevant plans, programmes and initiatives, including national biodiversity strategies and action plans, and to align the further implementation of the Strategy with national and/or regional efforts to implement the Strategic Plan for Biodiversity 2011–2020.'

This strategy, while aligning closely with the Global Strategy for Plant Conservation, is also appropriate to the Megadiverse context in which conservation takes place in South Africa. It has been developed simultaneously with the review of South Africa's National Biodiversity Strategy and Action Plan, and all activities in South Africa's Strategy for Plant Conservation nest under activities within the National Biodiversity Strategy and Action Plan.

This strategy responds to the priorities of the South African government, such as job creation through research projects on how to grow medicinal plants on a national scale and promoting a healthy environment for all of South Africa's people, one of the fundamental rights outlined in South Africa's constitution. With 85% of South Africans using medicinal plants harvested from the wild, without the availability of these plants the government would need to significant increase fiscal spending on health care. Maintaining ecological infrastructure through protection and restoration of threatened ecosystems is also addressed here and is a crucial intervention required to safeguard water provision services to South Africa's people.

I would like to thank stakeholders involved in the development of this strategy, that is, under the leadership of the South African National Biodiversity institute (SANBI) as the focal point for the implementation of the GSPC nationally, and with support from the National Department of Environmental Affairs (DEA), the Botanical Society of South Africa (BotSoc), a network of botanists and conservationists which has been developed to includes conservation agencies, Non-Governmental Organisations (NGOs) and academic institutions.

With 6% of the world's plant diversity and strong botanical and conservation capacity, South Africa is well placed to make a significant contribution to plant conservation globally. I trust that the extensive network institutions and conservationists that have been pulled together through the development of this strategy will ensure its effective implementation. This is one of the examples that show that through working together we can achieve more!

Mrs B.E.E. Molewa
Minister of Environmental Affairs

Introduction

South Africa is signatory to the Convention on Biological Diversity (CBD) and is committed to the implementation of a national strategy to conserve plants that aligns with the Global Strategy for Plant Conservation (GSPC). With 6% of the world's plant diversity and strong botanical and conservation capacity, South Africa is well placed to make a significant contribution to plant conservation globally. This document presents South Africa's Strategy for Plant Conservation. It includes 16 outcome-oriented targets, each of which, if implemented well, will help lead to improved conservation of plants. The targets range from work to document, describe and assess the conservation status of plants; through to targets to conserve plants *in situ* and *ex situ*. There are targets tackling the threat of invasive alien plants and a host of targets that address the sustainable utilisation of South Africa's plant species. The strategy ends with three targets on expanding plant conservation awareness through education programmes and building individuals' skills and institutional capacity to implement plant conservation effectively. The targets are nationally relevant and align with activities identified in South Africa's updated National Biodiversity Strategy and Action Plan (NBSAP).

South Africa has, since 2002, done extensive work to conserve plants, aligned with the GSPC. In 2006, the publication: *A South African response to the Global Strategy for Plant Conservation* was produced, which outlined, for each of the 16 targets, work that was taking place in South Africa and what future priorities were. This publication guided work by South African conservationists until 2010. In 2010 the CBD adopted an updated version of the GSPC, which included many changes to the 16 outcome oriented targets; these new targets now form the basis of this strategy. As a result, South Africa has undergone a process to ensure alignment of national plant conservation work to the updated global strategy.

In March 2013, the South African National Biodiversity Institute (SANBI) hosted a workshop to develop this Strategy for Plant Conservation. The majority of South Africa's active botanists and conservationists gathered at this workshop specifically to discuss the GSPC and its implementation nationally. Much work in smaller task teams followed the workshop and has resulted in nationally relevant and achievable targets being developed that align with the 16 global targets. Achievable outcomes and activities have been identified, and responsible stakeholders and timeframes have been agreed to. The very clear activities and outcomes identified in this strategy will allow South Africa to evaluate and monitor progress with the implementation of the strategy over the next five years. Task teams of between five and ten individuals have been constituted to take the implementation of each target forward.

During the process of developing this strategy, global targets were modified to ensure that they are achievable in the megadiverse flora context in which plant conservation work takes place. Much of South Africa's conservation work is done in an integrated fashion with plant and animal conservation combined with the conservation of ecosystems and habitats. Plant conservation is not done in isolation of other work to conserve biodiversity. South Africa's biodiversity sector bases its work on priorities identified through systematic biodiversity plans that identify Critical Biodiversity Areas (CBAs), which represent ecological viable networks of ecosystems and species for conservation. The targets to conserve plant diversity in production lands (Target 6) and the conservation of ecosystems (Target 4) in particular, have been guided by systematic biodiversity planning work. The difference between South Africa's national targets and those from the GSPC are presented in Table 2. The Strategy for Plant Conservation, presented here, also aligns with South Africa's updated NBSAP. Each of the outcomes in this plant strategy is either directly represented or nested under one of the activities of the NBSAP. How this strategy links to the NBSAP is shown in Table 1. Under the leadership of SANBI, the focal point for the implementation of the GSPC nationally, and with support from the Botanical Society of South Africa (BotSoc), a network of botanists and conservationists has been developed that includes conservation agencies, non-governmental organisations (NGOs) and academic institutions. It is this strong network who will ensure that South Africa's Strategy for Plant Conservation is well implemented by 2020.

Table 1: How South Africa's Strategy for Plant Conservation links to the South African National Biodiversity Strategy and Action Plan

NSPC Target	NSPC Outcome	NBSAP Outcome	NBSAP Activity
Target 1: An online Flora of all known plants.	1.1. e-Flora produced that includes descriptions, distribution information and images for taxa.	6.1 Relevant foundational datasets on species and ecosystems are in place and well coordinated.	6.1.1.Design, establish and maintain accessible biodiversity data system/network that links data sets from various institutions (including academic and citizen science projects) for indigenous and invasive alien species, including occurrence records and coordinated information on species.
	1.2. Identification keys to genus level and where possible to species level included in e-Flora.		
Target 2: An up-to-date assessment of the conservation status of all South African species.	2.1. Red List maintained and updated with all newly described species assessed.	6.2 The statuses of species and ecosystems are regularly monitored and assessed.	6.2.1. Review and expand Red Lists for priority taxa and assess all new species and species in areas targeted for development.
	2.2. Species from priority areas under imminent threat reassessed.		
Target 3: Information, research and associated outputs, and methods necessary to implement the Strategy, developed and shared.	3.1. Information on plant occurrences from herbaria, provincial conservation agencies and atlasing projects centralised, quality checked where feasible, and made available via a single portal.	6.1 Relevant foundational datasets on species and ecosystems are in place and well coordinated.	6.1.1. Design, establish and maintain accessible biodiversity data system/network that links data sets from various institutions (including academic and citizen science projects) for indigenous and invasive alien species, including occurrence records and coordinated information on species.
	3.2. Plant taxa of conservation concern monitored.	6.2 The status of species and ecosystems is regularly monitored and assessed.	6.2.6. Finalise and implement the National Monitoring Framework.
	3.3. Under-sampled areas targeted for surveys.	6.1 Relevant foundational datasets on species and ecosystems are in place and well coordinated.	6.1.2. Address priority gaps in foundational data for indigenous species and relevant invasive alien species, including documenting the distribution and abundance of priority groups (surveys/inventories), and mobilisation of data from specimens in collections.
	3.4. Taxonomic revisions of priority genera produced.	6.4 Management-relevant and policy-relevant research and analyses are undertaken through collaboration between scientists and practitioners.	6.4.2. Address priority research questions as identified in the National Biodiversity Research Strategy's gap analysis through involving networks of researchers and institutions.
Target 4: Biodiversity targets for terrestrial eco-systems secured through effective management.	4.1. The protection levels of the 35 terrestrial ecosystems that were assessed in 2011 to be Critically Endangered or Endangered and also unprotected or poorly protected are substantially increased.	1.1 The network of protected areas and conservation areas includes a representative sample of ecosystems and species, and is coherent and effectively managed.	1.1.1. Expand the protected area (conservation area) estate through the declaration of state-owned protected areas, Marine Protected Areas (MPAs) and biodiversity stewardship sites, based on the National Protected Area Expansion Strategy.
	4.2. The rate of loss of habitat in threatened ecosystems reduced with no further loss taking place in Critically Endangered ecosystems.	3.4 Compliance with authorisations and permits is monitored and enforced.	3.4.1.Green and Blue Scorpions develop a framework and cooperate for compliance and enforcement in biodiversity priority areas.

Table 1: How South Africa's Strategy for Plant Conservation links to the South African National Biodiversity Strategy and Action Plan (cont.)

NSPC Target	NSPC Outcome	NBSAP Outcome	NBSAP Activity
Target 5: Important areas for plant diversity identified and incorporated into conservation processes.	5.1. Important areas for plant diversity in South Africa identified based on botanical richness and endemism patterns.	6.3. Geographic priority areas for the management, conservation and restoration of biodiversity assets and ecological infrastructure are identified based on best available science.	6.3.3. Biodiversity sector plans and bioregional plans regularly updated, ideally at least every five to ten years.
	5.2. Important areas for plant diversity incorporated into biodiversity planning processes and protected area expansion strategies.		
Target 6: Initiatives in place to ensure the sustainable management of production lands, consistent with the conservation of plant diversity.	6.1. Mainstream plant diversity into agricultural planning and implementation within priority catchments.	3.2. Embed biodiversity considerations into national, provincial and municipal development planning and monitoring.	3.2.2. Integrate biodiversity considerations into the development of management plans at regional or provincial levels (coastal, water resource classification, invasive management plans etc.).
		3.6. Biodiversity considerations are integrated into the development and implementation of policy and legislative tools.	3.6.4. Integrate biodiversity considerations into sector codes of conduct and best practice guidelines.
	6.2. Capacity of agricultural extension services strengthened and enforcement capacity improved	5.3 Institutions are capacitated to deliver on their mandates in terms of biodiversity management and conservation.	5.3.4. Improve the capacity of key departments (e.g. Department of Agriculture, Forestry & Fisheries; Department of Water Affairs; Department of Mineral Resources; Department of Rural Development & Land Reform; Department of Economic Development; Department of Science & Technology; and local government) to support biodiversity conservation and management.
Target 7: At least 75% of known threatened plant species conserved in situ.	7.1. Protected area expansion strategies to incorporate layer of high priority unprotected threatened species sites.	6.3. Geographic priority areas for the management, conservation and restoration of biodiversity assets and ecological infrastructure are identified based on best available science.	6.3.3. Update biodiversity sector plans and bioregional plans regularly updated, ideally at least every five to ten years.
	7.2. Biodiversity Stewardship programmes focused on areas with high concentrations of unprotected threatened species.	1.1 The network of protected areas and conservation areas includes a representative sample of ecosystems and species, and is coherent and effectively managed.	1.1.1. Expand the protected area (conservation area) estate through the declaration of state-owned protected areas, Marine Protected Areas and biodiversity stewardship sites, based on the National Protected Area Expansion Strategy.
	7.3. Legal protection of Critically Endangered plant species occurring at one site only, achieved.	1.1 The network of protected areas and conservation areas includes a representative sample of ecosystems and species, and is coherent and effectively managed.	1.1.9. Strengthen protection for Critically Endangered species occurring only at single sites.
		3.6. Biodiversity considerations are integrated into the development and implementation of policy and legislative tools.	3.6.1. Develop, implement and update legislative tools that ensure the protection of species and ecosystems.

Table 1: How South Africa's Strategy for Plant Conservation links to the South African National Biodiversity Strategy and Action Plan (cont.)

NSPC Target	NSPC Outcome	NBSAP Outcome	NBSAP Activity
Target 8: At least 60% of threatened plants in ex situ collections, preferably in the country of origin, and available for recovery (restoration) programmes, with 1% in active reintroduction programmes.	8.1. 60% of threatened plants conserved ex situ.	1.2. Species of special concern are sustainably managed.	1.2.3. Ensure sufficient ex situ conservation of threatened and useful species to address impacts from climate change, habitat transformation and unsustainable use.
	8.2. 1% of species with ex situ collections active in restoration programmes.		
Target 9: The genetic diversity of crops, including their wild relatives, and indigenous edible plant species conserved while respecting, preserving and maintaining associated indigenous and local knowledge.	9.1. Genetic diversity of 400 indigenous edible plant species and crop traditional varieties conserved in gene banks.	1.2. Species of special concern are sustainably managed.	1.2.3. Ensure sufficient ex situ conservation of threatened and useful species to address impacts from climate change, habitat transformation and unsustainable use.
	9.2. Priority crop wild relatives conserved in situ and ex situ.	1.1 The network of protected areas includes a representative sample of ecosystems and species, and is coherent and effectively managed.	1.1.1. Expand the protected area (conservation area) estate through the declaration of state-owned protected areas, Marine Protected Areas and biodiversity stewardship sites, based on the National Protected Area Expansion Strategy.
		1.2. Species of special concern are sustainably managed.	1.2.3. Ensure sufficient ex situ conservation of threatened and useful species to address impacts from climate change, habitat transformation and unsustainable use.
Target 10: Effective management plans in place to prevent new biological invasions and to manage important areas for plant diversity that are invaded.	10.1. Invasive Species Programme effectively detecting and documenting new invasions, providing reliable post-border risk assessments and coordinating implementation of national eradication plans.	3.7 Effective management of pressures to biodiversity.	3.4.7. Reduce invasions through interventions at ports of entry and coordinated species management programmes.
	10.2. Important areas for plant diversity receiving priority attention by invasive alien clearing programmes.	2.1. Restore, maintain and secure important ecological infrastructure in a way that contributes to rural development, long-term job creation and livelihoods.	2.1.4. Improve how biodiversity assets and ecological infrastructure is incorporated into the planning of the Department of Environmental Affairs' Natural Resource Management programmes.

Table 1: How South Africa's Strategy for Plant Conservation links to the South African National Biodiversity Strategy and Action Plan (cont.)

NSPC Target	NSPC Outcome	NBSAP Outcome	NBSAP Activity
Target 11: No species of wild flora endangered by international trade.	11.1. Non–Detriment Findings for all cycad species conducted.	1.2 Species of special concern are sustainably managed and contribute to livelihoods.	1.2.1. Develop, implement and sustainably fund biodiversity management and/or recovery plans for prioritised species of special concern.
	11.2. Biodiversity Management Plan for Critically Endangered and Endangered cycads implemented.		
	11.3. Listing proposals for species threatened by international trade, but not yet included on one of the CITES appendices, completed.		1.2.2. Develop, implement, review and amend regulations that deal with the management and protection of species and activities that impact on species.
	11.4. Early warning system to flag new species potentially threatened by international trade implemented.		1.2.5. Maintain an effective Scientific Authority that provides scientific oversight for species in trade.
Target 12: All wild harvested plant-based products sourced sustainably.	12.1. A landscape approach to the conservation of medicinal plants developed and implemented.	6.3. Geographic priority areas for the management, conservation and restoration of biodiversity assets and ecological infrastructure are identified based on best available science.	6.3.3. Ensure that spatial biodiversity plans, biodiversity sector plans and bioregional plans are regularly updated, ideally at least every five to ten years.
	12.2. The option of substituting wild-sourced medicinal plants with cultivated plants investigated.	1.2 Species of special concern are sustainably managed and contribute to livelihoods.	1.2.4. Establish integrated programmes to support sustainable use of threatened species (including medicinal species) and horticultural plants, including propagation programmes to relieve pressure on harvesting.
	12.3. The demand for wild-sourced plants in the horticultural collectors' trade diminished as a result of cultivated material being made available.		
	12.4. Species harvested from the wild for bio-trade managed sustainably.		1.2.1. Develop, implement and sustainably fund biodiversity management and/or recovery plans for prioritised species of special concern.

Table 1: How South Africa's Strategy for Plant Conservation links to the South African National Biodiversity Strategy and Action Plan (cont.)

NSPC Target	NSPC Outcome	NBSAP Outcome	NBSAP Activity
Target 13: Indigenous and local knowledge innovations and practices associated with plant resources maintained or increased as appropriate to support customary use, sustainable livelihoods, local food security and healthcare.	13.1. The National Recordal System capturing and safeguarding Indigenous Knowledge.	6.1. Relevant foundational datasets on species and ecosystems are in place and well coordinated.	6.1.7. Capture and safeguard indigenous knowledge linked to biodiversity through the National Recordal System.
	13.2. Studies conducted to capture Indigenous Knowledge related to plant use by ethnic groups in regions not yet definitively researched.	6.4. Management- and policy-relevant research and analysis are undertaken through collaboration between scientists and practitioners.	6.4.2. Address priority research questions as identified in the National Biodiversity Research Strategy's gap analysis through involving networks of researchers and institutions.
	13.3. A national database on indigenous plant use knowledge available online.	6.1. Relevant foundational datasets on species and ecosystems are in place and well coordinated.	6.1.1. Design, establish and maintain accessible biodiversity data system/network that links data sets from various institutions (including academic and citizen science projects) for indigenous and invasive alien species, including occurrence records and coordinated information on species.
Target 14: The importance of plant diversity and the need for its conservation incorporated into communication, education and public awareness programmes.	14.1. Plant conservation included in the life science curriculum across South Africa.	4.1 People's awareness of the value of biodiversity is enhanced through more effective coordination and messaging.	4.1.4. Strengthen the integration and teaching of biodiversity content in relevant school curricula.
	14.2. Plant conservation awareness expanded by exposure to botanical gardens and by involving the public in citizen science projects.		4.1.3. Strengthen environmental literacy through citizen science programmes that promote learning and common knowledge about biodiversity.
	14.3. Plant conservation is promoted in relevant media.		4.1.1. Develop and fund a coordinated national biodiversity communications, education and awareness strategy, implementation plan and monitoring framework.
Target 15: The number of trained people working with appropriate facilities sufficient according to national needs, to achieve the targets of this Strategy.	15.1. Conservation courses offered in South Africa's universities aligned with skills needed in the field of plant conservation.	5.2. An improved skills development system incorporates the needs of the biodiversity sector.	5.2.1. Improve the quality and relevance of skills produced for biodiversity conservation and management.
	15.2. Work place mentorship opportunities available in plant conservation programmes.		5.2.3. Strengthen and support existing Biodiversity Centres of Excellence that enhance research excellence and capacity development for biodiversity conservation and management.
	15.3. Postgraduate research studies required to ensure the conservation of South Africa's plant species promoted.		
Target 16: Institutions, networks and partnerships for plant conservation established or strengthened at national, regional and international levels to achieve the targets of this Strategy.	16.1. A South African network for plant conservation effectively implementing and updating the Strategy for Plant Conservation.	5.3. Partnerships are developed and institutions are capacitated to deliver on their mandates towards improved service delivery.	5.3.3. Improve institutional cooperation and coordination at the operational level, including for cross-boundary management of biodiversity assets.
	16.2. Working groups for each target ensuring that specified outputs are being achieved.		

Figure 1: *Aristea teretifolia* Endangered. Photograph: A. Harrower

Table 2: The changes South Africa has made to targets as compared with the targets of the Global Strategy for Plant Conservation

Target for South Africa	Global Strategy for Plant Conservation target	Reason for change
Target 1: An online Flora of all known plants.	Target 1: An online Flora of all known plants.	No change required.
Target 2: An up-to-date assessment of the conservation status of all South African species.	Target 2: An assessment of the conservation status of all known plant species, as far as possible, to guide conservation action.	No change required.
Target 3: Information, research and associated outputs, and methods necessary to implement the Strategy developed and shared.	Target 3: Information, research and associated outputs, and methods necessary to implement the Strategy developed and shared.	No change required.
Target 4: Biodiversity targets for terrestrial eco-systems secured through effective management.	Target 4: At least 15% of each ecological region or vegetation type secured through effective management and/or restoration.	South Africa's ecosystem targets are scientifically set and based on diversity estimates. The percentage of each ecosystem required for its effective conservation varies between different ecosystems.
Target 5: Important areas for plant diversity identified and incorporated into conservation processes.	Target 5: At least 75% of the most important areas for plant diversity of each ecological region protected with effective management in place for conserving plants and their genetic diversity.	South Africa has adopted a systematic conservation planning approach to identify important areas for the persistence of the full spectrum of biodiversity, conservation of important plant areas needs to be integrated into systematic planning processes to ensure these areas are protected.
Target 6: Initiatives in place to ensure the sustainable management of production lands, consistent with the conservation of plant diversity.	Target 6: At least 75% of production lands in each sector managed sustainably, consistent with the conservation of plant diversity.	Engagement with private sector work in production lands is highly intensive and experience working in this area in South Africa has resulted in an understanding of how many partners and institutions are required for effective engagement. In this target South Africa aims to ensure that priority biodiversity areas subject to production land uses are managed sustainably.
Target 7: At least 75% of known threatened plant species conserved in situ.	Target 7: At least 75% of known threatened plant species conserved in situ.	No change required.
Target 8: At least 60% of threatened plants in ex situ collections, preferably in the country of origin, and available for recovery (restoration) programmes, with 1% in active reintroduction programmes.	Target 8: At least 75% of threatened plant species in ex situ collections, preferably in the country of origin, and at least 20% available for recovery and restoration programmes.	To date (2015) South Africa has conserved 43% of threaetned plants in ex situ collections. Due to active work in this area over the past decade, the rate of collection of new species for ex situ conservation is well established. By 2020 it will only be possible to conserve 60% of threatened plants. A number of Critically Endangered plant species require active restoration programmes, these constitute 1% of threatened species.
Target 9: The genetic diversity of crops including their wild relatives and indigenous edible plant species conserved while respecting, preserving and maintaining associated indigenous and local knowledge.	Target 9: The genetic diversity of crops including their wild relatives and indigenous edible plant species conserved while respecting, preserving and maintaining associated indigenous and local knowledge.	No change required.

Table 2: The changes South Africa has made to targets as compared with the targets of the Global Strategy for Plant Conservation (cont.)

Target for South Africa	Global Strategy for Plant Conservation target	Reason for change
Target 10: Effective management plans in place to prevent new biological invasions and to manage important areas for plant diversity that are invaded.	Target 10: Effective management plans in place to prevent new biological invasions and to manage important areas for plant diversity that are invaded.	No change required.
Target 11: No species of wild flora endangered by international trade.	Target 11: No species of wild flora endangered by international trade.	No change required. No change required.
Target 12: All wild-harvested plant-based products sourced sustainably.	Target 12: All wild-harvested plant-based products sourced sustainably.	No change required. No change required.
Target 13: Indigenous and local knowledge innovations and practices associated with plant resources maintained or increased as appropriate to support customary use, sustainable livelihoods, local food security and healthcare.	Target 13: Indigenous and local knowledge innovations and practices associated with plant resources maintained or increased as appropriate to support customary use, sustainable livelihoods, local food security and healthcare.	No change required. No change required.
Target 14: The importance of plant diversity and the need for its conservation incorporated into communication, education and public awareness programmes.	Target 14: The importance of plant diversity and the need for its conservation incorporated into communication, education and public awareness programmes.	No change required. No change required.
Target 15: The number of trained people working with appropriate facilities sufficient according to national needs, to achieve the targets of this Strategy.	Target 15: The number of trained people working with appropriate facilities sufficient according to national needs, to achieve the targets of this Strategy.	No change required.
Target 16: Institutions, networks and partnerships for plant conservation established or strengthened at national, regional and international levels to achieve the targets of this Strategy.	Target 16: Institutions, networks and partnerships for plant conservation established or strengthened at national, regional and international levels to achieve the targets of this Strategy.	No change required.

OBJECTIVE 1

Objective I:

Plant diversity is well understood, documented and recognised

Target 1: An online Flora of all known plants

Contributors: M. le Roux, B. Bytebier, J. Victor, E. van Wyk & D. Raimondo

Background

In 2006, South Africa produced a checklist of its entire flora achieving at that time Target 1: A widely accessible working list of known plant species, as a step towards a complete world Flora. The updated version of this checklist is available online at www.posa.sanbi.org.

Since 1997, South Africa has embarked on producing regional floras that contain short descriptions for plants found within South Africa's biomes. The South African flora consists of ± 20 500 taxa and is well known for its species richness. In order to compile a national flora for all taxa by 2020, contributions (entire familial or generic treatments) from taxonomists will be incorporated. Thereafter gaps in the flora will be identified. In those cases where no taxonomist or recent taxonomic revision is available, information will be taken from the seven provincial and biome-focussed regional floras. These will be combined to produce a national flora that will be served on the World Wide Web by 2020 (Victor et al. 2013).
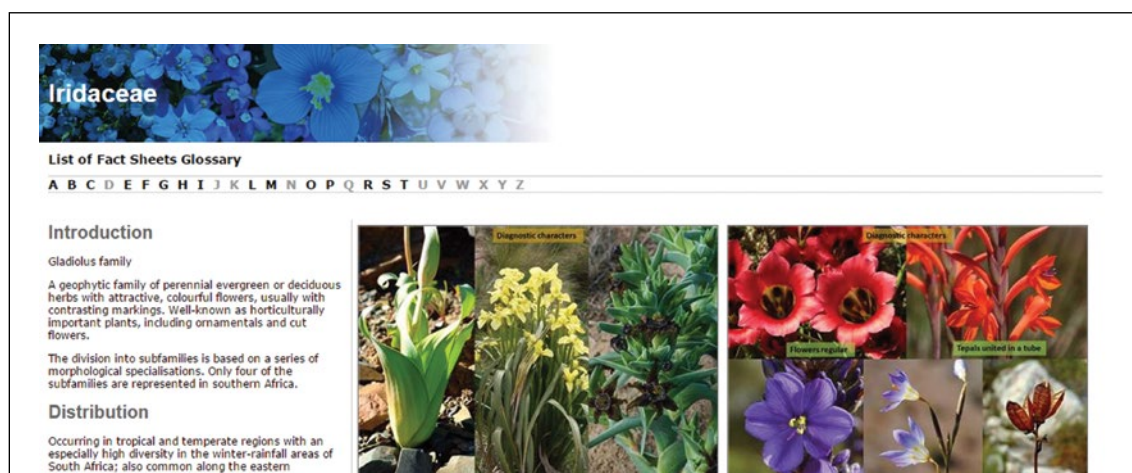
Figure 2: An example of a plant family description taken from the 'South African Plant Families' website; http://keys.lucidcentral.org/keys/v3/South_African_Plant_Families.

TARGET 1

Figure 3: Two examples of regional floras that contain short descriptions for plants found within South Africa's biomes.

Figure 4: An example of a species description taken from the 'Helichrysums of southern Africa' website; http://keys.lucidcentral.org/keys/v3/helichrysum.

Figure 5: Three *Helichrysum* taxa are shown below: a, *H. aureum* subsp. *argenteum*; b, *H. saxicola*; and c, *H. lesliei*. Photographs: a,c, J.E. Burrows; b, J.H. Vlok.

OBJECTIVE 1
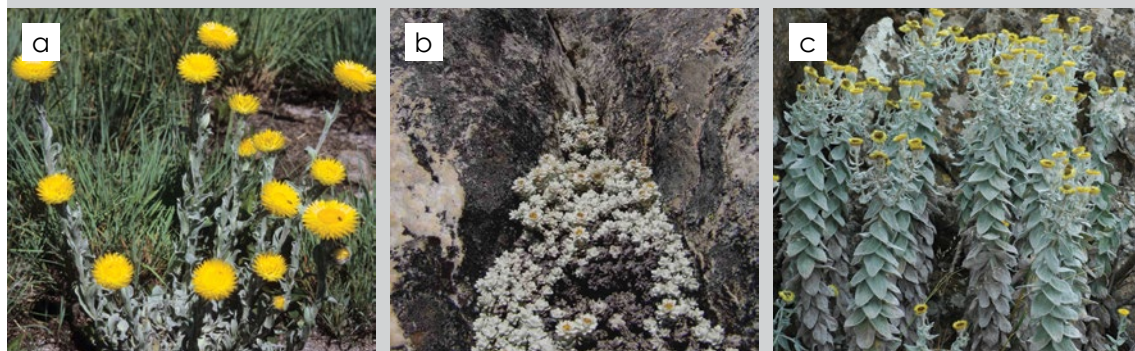
Target 1 outcomes for 2020

1.1.   e-Flora produced that includes descriptions, distribution information and images for taxa.

During the development of information for the online Flora, taxonomic information will be stored in the Botanical Research and Herbarium Management System (BRAHMS) database (http://herbaria.plants.ox.ac.uk/bol/) from where it will be exported onto the e-Flora of South Africa website. Electronically available specimen data from the National Herbarium (PRE), the Compton Herbarium (NBG), the KwaZulu-Natal Herbarium (NH), taken from BRAHMS, will be used to produce distribution maps. Additional specimen data from any other South African herbarium that uses the BRAHMS database will be included. Images will be sourced for each family and genus from professional and amateur botanists. Where no images are available scans of herbarium specimens will be included.

1.2.   Identification keys to genus level and where possible to species level included in e-Flora.

Identification keys to genera and where possible species level will be compiled from available taxonomic literature.

Figure 6: An interactive Conophytum key website; http://rpowell2.wix.com/conophytum-delta-key.

Figure 7: a, *Conophytum khamiesbergense*; b, *C. auriflorum*; c, *C. burgeri*; d, *C. piluliforme* (Photographs: a, N.A. Helme; b & c, C. Paterson-Jones; d, J.H. Vlok).

TARGET 1

Target 1: An online Flora of all known plants

Outcomes	Activities	Responsible stakeholders	Timeframe
1.1. e-Flora produced that includes descriptions, distribution information and images for taxa.	1.1.1. National checklist updated that includes: · Up-to-date names with authorships. · Protologue citations. · Synonyms listed.	1.1.1. SANBI – Biosystematics Research and Biodiversity Collections.	Checklist updated on an ongoing basis and available as an electronic download.
	1.1.2. Database with the following floristic information populated: · 5 000 species descriptions per annum. · National geographic distribution ranges accompanied by maps. · Residency status. · Endemism status. · Literature references ensuring that credit is provided to authors and suppliers of resources.	1.1.2. SANBI – e-Flora co-ordinator and taxonomists (SANBI and non-SANBI).	5 000 species per annum; 100% completed by 2019.
	1.1.3. Herbarium specimens and associated database records verified (to improve the accuracy of distribution information).	1.1.3. SANBI – Biosystematics Research and Biodiversity Collections as well as non-SANBI taxonomists.	Verify the accuracy of 10 000 specimens and records per annum.
	1.1.4. Images for 350 genera sourced per annum.	1.1.4. Taxonomists (SANBI and non-SANBI), citizen scientists.	350 genera per annum.
1.2. Identification keys to genus level and where possible to species level included in e-Flora.	1.2.1. Available dichotomous keys converted to electronic format, dependant on availability of time and resources.	1.2.1. SANBI – e-Flora co-ordinator and taxonomists (SANBI and non-SANBI).	1.2.1. & 1.2.2. Selected keys from available sources served by 2020.
	1.2.2. Links to interactive keys for selected genera provided.	1.2.2. Taxonomists (SANBI and non-SANBI).	

OBJECTIVE 1

TARGET 1

OBJECTIVE 1

Target 2: An up-to-date assessment of the conservation status of all South African species

Contributors: L. von Staden & D. Raimondo

Background

South Africa achieved Target 2 in 2009 with the completion of a comprehensive national plant Red List (Raimondo et al. 2009), a global first for a mega-diverse country (Raimondo et al. 2013). The International Union for the Conservation of Nature (IUCN) Red List Categories and Criteria version 3.1 were used in the assessment www.iucnredlist.org.

In South Africa, the conservation statuses of plant species guide a wide range of conservation interventions, such as land-use decision-making and conservation, and protected area expansion plans. It is therefore a national priority to ensure that the Red List remains up to date. The national Red List is maintained by the South African National Biodiversity Institute (SANBI), and updates are published annually on the national Red List website (redlist.sanbi.org).

Conservation assessments are updated annually based on data received from a network of botanists including ± 40 professional botanists and ± 500 citizen scientists involved in the Custodians of Rare and Endangered Wildflowers (CREW) programme. Updated assessments are available on the National Red List Website: redlist.sanbi.org.
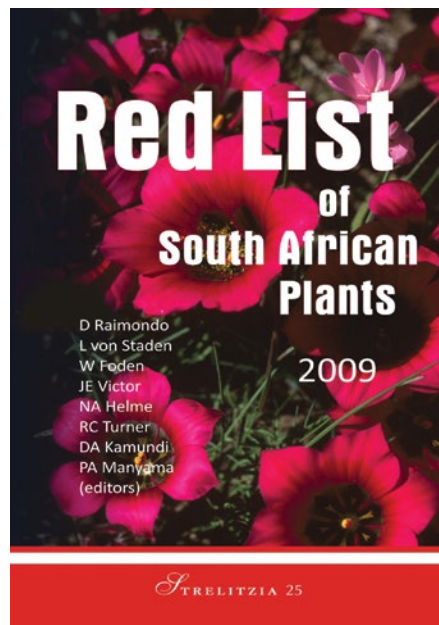
Figure 8: The *Red List of South African Plants*, published in 2009.

Figure 9: *Erica recurvata*, a Critically Endangered species known from only 28 individuals. Photograph: C. Paterson-Jones.

TARGET 2

Figure 10: *Hessea cinnamomea*, an Endangered species from the Amaryllidaceae family. Photograph: C. Paterson-Jones.

Figure 11: *Serruria meisneriana*, an Endangered species from the Proteaceae family. Photograph: C. Paterson-Jones.

OBJECTIVE 1

TARGET 2

OBJECTIVE 1

Target 2 outcomes for 2020

2.1.   Red List maintained and updated with all newly described species assessed.

Figure 12: An example from the Red List of South African Plants Website, www.redlist.sanbi.org. The site is updated annually.

2.2.   Species from priority areas under imminent threat reassessed.

The first comprehensive Red List completed between 2004 and 2009 was achieved with funding from the Norwegian Ministry, which allowed five full-time scientists to be employed by SANBI to work in collaboration with South Africa's 150 botanists. Since 2009 South Africa's Department of Environmental Affairs (DEA) continues to support one full-time Red List Scientist to keep the Red List updated. As there are too many plant species in South Africa for one individual to keep the list updated, species for reassessment are prioritised. Priority species for Red List assessments are: newly described species, species with new field information and species concentrated in areas under imminent threat.

TARGET 2

Figure 13: *Brachystelma modestum*, a Near Threatened species from the Apocynaceae family. Photograph: D. Styles.

OBJECTIVE 1

TARGET 2

Target 2: An up-to-date assessment of the conservation status of all South African species

Outcomes	Activities	Responsible stakeholders	Timeframe
2.1. Red List maintained and updated with all newly described species assessed.	2.1.1. Species with new field monitoring information from the CREW programme and independent botanical consultants re-assessed.	2.1. SANBI's Threatened Species Programme Red List Scientists.	Annual update of the Red List produced on-line.
	2.1.2. All newly described species assessed within two years of description.		
2.2. Species from priority areas under immi-nent threat reassessed.	2.2. Areas of country to reassess based on emerging threats prioritised.	2.2. SANBI's Threatened Species Programme Red List Scientists.	Species from one area under imminent threat reassessed annually.

Target 3: Information, research and associated outputs, and methods necessary to implement the strategy developed and shared

Contributors: D. Raimondo, E. van Wyk, H. Steyn, B. Bytebier, A.P. Dold, T. Trinder-Smith & J.E. Victor.

Background

South Africa is fortunate among megadiverse countries to have a disproportionably high level of capacity in terms of taxonomic expertise and field botanists. The majority of the flora has received taxonomic treatment with 62% of plant taxa having been revised since 1970 (Von Staden et al. 2013). In addition, a network of 20 local herbaria across the country house a representative sample of plant specimens, with the majority of specimens (90% of the country's ± 3 263 200 plant specimens) concentrated in only six herbaria: the Bolus Herbarium (BOL); the Selmar Schönland Herbarium (GRA); the Compton Herbarium (NBG); the KwaZulu-Natal Herbarium (NH); the BEWS herbarium (NU); and the National Herbarium (PRE) (National Research Foundation [NRF] 2011).

Good electronic data in the form of digitised herbarium specimens and spatial layers for vegetation classification and national land use exist (Mucina & Rutherford 2006) and 44% of South Africa's plant specimens have been electronically encoded (NRF 2011). Most of these specimens are georeferenced to at least a quarter-degree square grid. This richness of taxonomic literature, electronic specimen and land-use data, combined with expert knowledge, has enabled South Africa to make good progress towards achieving a number of the targets included in this strategy. Despite this situation, a number of information gaps remain. Botanists involved in the development of this strategy have identified four key information needs; these are detailed below. In addition, a number of other research priorities have been identified during the development of this strategy. These have been included under the relevant targets and are not repeated here.

3.1.   Centralising plant occurrence data

Electronic occurrence data underpin conservation assessment and planning work in South Africa. Currently records are scattered amongst different institutions. For example herbarium specimen records that have been encoded and georeferenced are managed by individual herbaria. Only 44% of South Africa's specimens have been encoded (National Research Foundation [NRF] 2011), with important regional collections not yet digitised. Each of South Africa's provincial conservation agencies manages independent species occurrence datasets with a number having good records for plants. Atlasing programmes, such as the Protea Atlas Project and the Custodians of Rare and Endangered Wildflowers (CREW) programme, have, through the contribution of citizen scientists, provided thousands of recent and accurate plant occurrence records. Centralising these datasets is a priority both to improve conservation assessments (Target 2) and conservation planning (Target 7), and to facilitate effective species monitoring. The South African National Biodiversity Institute (SANBI) has the mandate to manage and serve biodiversity information and will collaborate with herbaria and provincial authorities to facilitate this information sharing.

3.2.   Monitoring plant taxa of conservation concern

One in every four plants in South Africa is of conservation concern (plants that are either rare, range-restricted taxa or taxa that qualify as Threatened or Near Threatened under the International Union for the Conservation of Nature (IUCN) Red List Criteria). Many of these taxa, particularly those under threat, require monitoring; this work is undertaken by a network of citizen scientists working under the supervision of SANBI and the Botanical Society of South Africa (BotSoc), as part of the Custodians of Rare and Endangered Wildflowers (CREW) programme. Additional monitoring work, especially within protected areas, is undertaken by the South African National Parks (SANParks) and the provincial conservation agencies. Ongoing field monitoring of populations of taxa of conservation concern is required in order to accurately assess their conservation status as well as to report on trends in plant species status. Between 2015 and 2020, provincial conservation authorities and South Africa's Scientific Authority will focus on developing processes to monitor plant species listed on South Africa's Threatened and Protected Species List of the National Environmental Management: Biodiversity Act (NEMBA), Act No. 10 of 2004.

3.3.   Under-sampled areas the focus for plant collecting

A number of areas in South Africa remain poorly explored botanically. These areas (see Figure 11) are concentrated in the western interior of the country within the Nama Karoo biome; quarter-degree square areas within this biome that have never been sampled need to be surveyed. Other priority areas are deep rural regions in the

eastern parts of the country, particularly areas formally designated as homelands. The former Transkei and Ciskei regions of the Eastern Cape are particularly poorly explored and are top priority for future botanical collecting. The escarpment edge, including the southern Drakensberg foothills, is also of collection priority.

3.4.   Taxonomic revisions of priority genera produced

Taxonomic revisions, monographs and floras are the most important, and often the only, source of data for assessing the conservation status of plants (Target 2). Conservation assessments form the basis upon which much of the rest of this plant strategy is based. A study conducted by Von Staden et al. (2013) identified taxonomic research priorities for the conservation of South Africa's plants. Priorities were identified at the genus level based on an analysis combining time since last revision, level of endemism, collecting effort, proportion of taxa included in revisions, and specimen identification confidence. Results indicate that only 62% of the flora has been recently revised. The family Aizoaceae is the top priority for taxonomic research with 55% of taxa in need of revision, followed by Hyacinthaceae with 34% of taxa not yet revised. Ericaceae, Euphorbiaceae, Rutaceae, Malvaceae, Asteraceae and Acanthaceae are priorities with over 30% of taxa last revised prior to 1970. An earlier study by Victor & Smith (2011) that identified priority families for taxonomic attention also identified the family Aizoaceae as being the highest priority for revisionary work. A strategy for biosystematics research led by SANBI has further prioritised genera identified by Von Staden et al. (2013) and a priority list of genera in need of revision is produced and annually updated. This list, available on SANBI's website (www.sanbi.org), includes information on which taxonomists are working on revisions of priority genera.

Figure 14: Bews herbarium technician and data logger, Prudence Magwaza, digitising specimen data. Photograph: B. Bytebier.

Figure 15: Bews herbarium researcher, Brian Schrire, and data logger, Kevin Thompson, working with herbarium specimens. Photograph: B. Bytebier.

Figure 16: *Monsonia*. Photograph: S.P. Bester.

OBJECTIVE 1

TARGET 3

OBJECTIVE 1

Target 3 outcomes for 2020

3.1.   Information on plant occurrences from herbaria, provincial conservation agencies and atlasing projects centralised, quality checked were feasible, and made available via a single portal.

3.2.   Plant taxa of conservation concern monitored.

3.3.   Under-sampled areas targeted for surveys.

3.4.   Taxonomic revisions of priority genera produced.
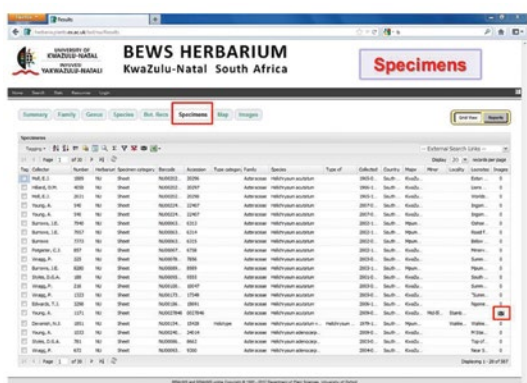
Figure 17: An example of specimen data captured into the BRAHMS database. South African herbaria are standardising specimen data to all utilise the BRAHMS system (example from the BEWS herbarium database).
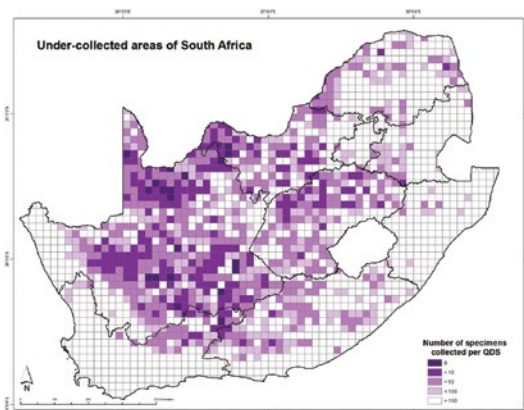
Figure 18: Areas of South Africa that are poorly collected.

Figure 19: Conducting surveys in poorly sampled areas of the country is a priority. Photograph: L. von Staden.

TARGET 3

Target 3: Information, research and associated outputs, and methods necessary to implement the strategy, developed and shared

Outcomes	Activities	Responsible stakeholders	Timeframe
3.1. Information on plant occurrences from herbaria, provincial conservation agencies and atlasing projects, centralised, quality checked were feasible and made available via a single portal.	3.1.1. 50% of specimens from South Africa's six largest herbaria (PRE, NBG, NH, NU, GRA, BOL) encoded, using the BRAHMS database.	3.1.1. Herbarium staff at PRE, NBG,NH,NU,GRA and BOL.	3.1.1. 2020
	3.1.2. Data-sharing agreements in place with provincial conservation agencies and non-SANBI herbaria.	3.1.2. SANBI Monitoring and Assessment group.	3.1.2. 2016
	3.1.3. Data quality checked where feasible and errors reported to responsible institution.	3.1.3. SANBI.	3.1.3. 2015–2020
	3.1.4. All occurrence records centralised and served as part of South Africa's e-Flora.	3.1.4. SANBI's Biodiversity Information Management.	3.1.4. 2020
3.2. Plant taxa of conservation concern monitored.	3.2.1. Populations of taxa of conservation concern monitored throughout South Africa, focusing on areas of high concentration of threatened taxa.	3.2.1. CREW network, provincial conservation agencies.	3.2.1. 2015–2020
	3.2.2. Species listed on the Threatened and Protected Species List of NEMBA monitored.	3.2.2. Scientific Authority and provincial conservation agencies.	3.2.2. 2015–2020
	3.2.3. Trends in the status of plant species reported in the National Biodiversity Assessment.	3.2.3. SANBI.	3.2.3. 2018
3.3. Under-sampled areas targeted for surveys.	3.3.1. All under-collected quarter degree squares in the Nama Karoo have been botanically sampled.	3.3.1. SANBI Biosystematics & Collections.	3.3.1. 2015–2020
	3.3.2. Botanical surveys conducted in the former Ciskei and Transkei regions of the Eastern Cape.	3.3.2. CREW Eastern Cape node, and SANBI Biosystematics & Collections.	3.3.2. 2015–2020
	3.3.3. Botanical surveys conducted along the escarpment edge including the southern Drakensberg foothills.	3.3.3. CREW Eastern Cape node, and SANBI Biosystematics & Collections.	3.3.3. 2015–2020
3.4. Taxonomic revisions of priority genera produced.	3.4. Revisions are conducted on genera identified as priorities by the National Biosystematics Research Strategy and Von Staden et al. (2013).	3.4. Biosystematics researchers based at universities or in South Africa's herbaria.	3.4. 2015–2020

Objective II:
Plant diversity is urgently and effectively conserved

Target 4: Biodiversity targets for terrestrial ecosystems secured through effective management

Contributors: A. Driver, F. Daniels, N. Helme, M. Lotter & D. Raimondo

Background

4.1   Mapping of terrestrial ecosystems

South Africa is fortunate to have a long history of vegetation mapping, and currently a detailed map of vegetation types exists, *The Vegetation of South Africa, Lesotho and Swaziland,* Mucina & Rutherford (2006). It describes 438 national vegetation types in nine biomes. These provide the basis for delineating terrestrial ecosystems types.

4.2   Determining biodiversity targets for each ecosystem

South Africa recognises that different ecosystems have different species compositions and to effectively conserve all biodiversity, the country has set different targets for each ecosystem. The biodiversity target is the minimum proportion of each ecosystem type that needs to be kept in a natural or near-natural state in the long term to maintain viable representative samples of all ecosystem types and the majority of species associated with those ecosystems. The biodiversity target is calculated based on species richness, using species–area relationship, and varies between 16% and 36% of the original extent of each ecosystem type (Desmet & Cowling 2004).

4.3   Assessing ecosystem threat status

The ecological condition or integrity of ecosystems, including loss or degradation of natural habitat, is used to determine ecosystem threat status. Spatial data on land cover is used as a proxy or surrogate for ecological condition.

Figure 20: Saldanah Limestone Strandveld, threatened by housing development in Jacobsbaai, Western Cape. Photograph: N. Helme.

In all environments, the proportion of each ecosystem type that remains in good ecological condition is evaluated against a series of thresholds, as shown in Figure 14, to determine ecosystem threat status.

4.4   Assessing ecosystem protection level

The proportion of each ecosystem type that falls within a protected area is calculated and compared with the biodiversity target for that ecosystem type, to determine ecosystem protection level. If the full biodiversity target has been met in a protected area, the ecosystem type is considered well protected. If the ecosystem type has more than 50% of the area required for the biodiversity target, it is moderately protected; 5–49% is poorly protected; and if it does not occur in any protected area at all, or if less than 5% of the biodiversity target has been met in a protected area, the ecosystem is considered not protected (Driver et al. 2012).
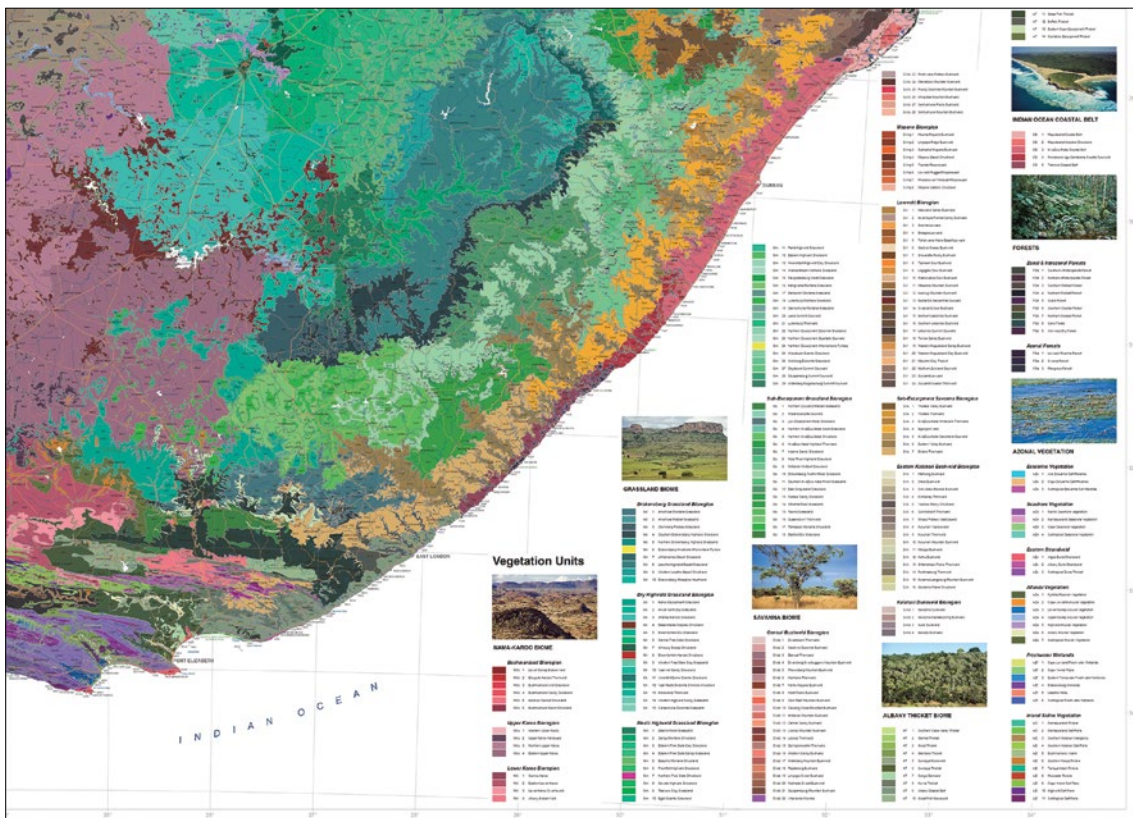
Figure 21: Detail from the vegetation map of South Africa (Mucina & Rutherford 2006).

An ecosystem type, e.g. vegetation type, river type, estuary type, marine habitat type

CR   EN   VU   LT

Biodiversity target*   Biodiversity target + 15%   Ecological function threshold**
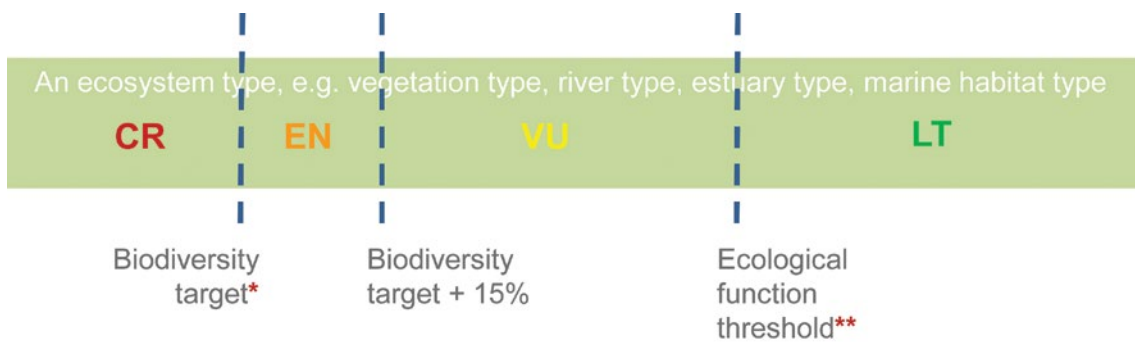
* This is a threshold for **representation** of biodiversity pattern. Set at 20% if insufficient data to determine ecologically differentiated biodiversity targets per ecosystem type.

** This is a **persistence** threshold. Usually 60%.

Figure 22: The process of evaluating an ecosystem as Threatened.

OBJECTIVE 2

Target 4 outcomes for 2020

4.1.   The protection levels of the 35 terrestrial ecosystems that were as-
        sessed in 2011 to be Critically Endangered or Endangered, and also
        unprotected or poorly protected, are substantially increased.

4.2.   The rate of loss of habitat in threatened ecosystems reduced, with
        no further loss taking place in Critically Endangered Ecosystems.

Of South Africa's terrestrial ecosystem types, 40% are threatened, with 9% Critically Endangered, 11% Endangered and 19% Vulnerable. Nearly a quarter of terrestrial ecosystem types are well protected, while 35% have no protection (Driver et al. 2012). Threatened ecosystems with little or no protection are a priority to conserve.

Biodiversity stewardship programmes, which facilitate the protection of private and communal land through contractual agreements between conservation authorities and landowners, have been successfully established in the last decade in most of South Africa's nine provinces. In addition to stewardship programmes, outright land acquisition for protection is also conducted by South African National Parks (SANParks) and by the World Wide Fund for Nature (WWF)'s Land Trust. Alongside mechanisms for formal protection, interventions to minimise loss of habitat in threatened ecosystems have also been put in place. Since 2010, the listing of threatened ecosystems in terms of the National Environmental Management: Biodiversity Act (NEMBA), Act No. 10 of 2004, and the inclusion of threatened ecosystems and Critical Biodiversity Areas (CBAs) in the Environmental Impact Assessment regulations, have meant that threatened ecosystems and CBAs are taken into account in environmental authorisations and municipal land-use planning processes.
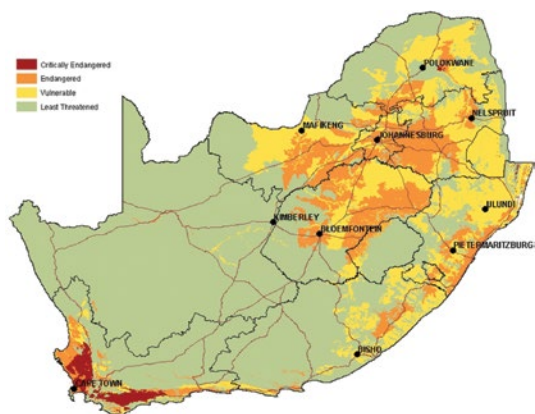
Figure 23: Spatial distribution of Critically Endangered, Endangered, Vulnerable and Least Threatened terrestrial ecosystems.
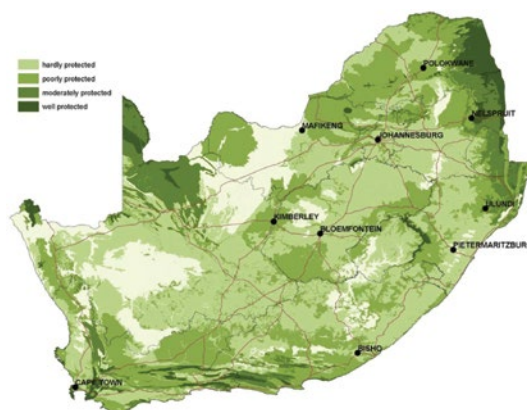
Figure 24: Protection status of South African terrestrial ecosystems based on the percentage target met in formal protected areas.

Figure 25: Bokkeveld Sandstone Fynbos, threatened by crop cultivation for Rooibos tea. Photograph: N. Helme.

TARGET 4

Target 4: Biodiversity targets for terrestrial eco-systems secured through effective management

Outcomes	Activities	Responsible stakeholders	Timeframe
4.1. The protection levels of the 35 terrestrial eco-systems that were assessed in 2011 to be Critically Endangered or Endangered and also unprotected or poorly protected are substantially increased.	4.1.1. The National Protected Areas Expansion Strategy and Provincial Protected Area Expansion Strategies updated to include targets for poorly protected or unprotected Critically Endangered and Endangered Ecosystems.	4.1.1. National and Provincial Biodiversity Planners.	4.1.1. 2014–2020
	4.1.2. Provincial biodiversity stewardship work prioritised to take place in threatened and poorly protected or unprotected ecosystems.	4.1.2. Existing conservation officials including bio-diversity stewardship officials.	4.1.2. 2014–2020
	4.1.3. A fund for land acquisition and manage-ment of remaining intact areas of natural habitat in threatened ecosystems set up.	4.1.3. World Wide Fund for Nature (WWF) Land Trust; provinces special applications to Treasury.	4.1.3. 2015–2020
4.2. The rate of loss of habitat in threatened eco-systems reduced with no further loss taking place in Critically Endangered Ecosystems.	4.2.1. All Critically Endangered Ecosystems iden-tified as Critical Biodiversity Areas (CBAs) in pro-vincial biodiversity plans, biodiversity sector plans (municipal) and bioregional plans.	4.2.1. Provincial biodiversity planners and SANBI's Biodiversity Planning and Policy Advice team.	4.2.1. 2014–2020
	4.2.2. Land-use guidelines restrictive enough to ensure persistence of remaining natural areas of Critically Endangered Ecosystems.	4.2.2. Provincial biodiversity planners and SANBI's Biodiversity Planning and Policy Advice team.	4.2.2. 2014–2020
	4.2.3. Law enforcement processes improved to discourage illegal removal of indigenous vegeta-tion in Critically Endangered Ecosystems (further detailed in South Africa's updated National Biodi-versity Strategy and Action Plan, underway at time of writing).	4.2.3. Department of Agriculture, Forestry and Fisheries (DAFF).	4.2.3. 2015–2020

OBJECTIVE 2

TARGET 5

Target 5: Important areas for plant diversity identified and incorporated into conservation processes

Contributors: L. von Staden & M. Lotter

Background

South Africa has the richest temperate flora globally. Three regions of high plant diversity and endemism: the Cape Floristic Region, the Succulent Karoo Region and the Maputaland–Pondoland Region, and 15 centres of plant endemism have been recognised by Van Wyk & Smith (2001) for South Africa (Figure 17). Van Wyk and Smith's system defines broad areas important for plant diversity based on expert opinion. There is currently a need for a more fine-scale, objective analysis of floristic patterns for the identification of important plant areas that can be integrated into existing conservation processes.

In 2004, the South African National Biodiversity Institute (SANBI) tried to identify important plant areas based on the Important Plant Area criteria developed by PlantLife International. However, insufficient fine-scale plant distribution data available at the time prevented the application of the criteria in a practical manner, and the Important Plant Areas (IPAs) concept was not implemented in South Africa.

In the meantime, systematic conservation planning was adopted as the standard approach to identify important areas for the persistence of the full spectrum of biodiversity. Major advances in methodology as well as recently available datasets have allowed systematic conservation plans to be developed at ever finer scales, and these plans are now key instruments guiding site-level land-use decisions and protected area expansion priorities.

With the amalgamation of the Important Plant Areas concept with other site-based conservation-prioritisation programmes into a global standard, Key Biodiversity Areas (KBAs), it is necessary to revisit our approach to the identification and conservation of areas important for plant diversity, to ensure alignment with this new standard in our reporting on Target 5. KBA criteria emphasise globally threatened species and ecosystems, geographically restricted species and ecosystems, centres of endemism, and areas of high ecological integrity. Whereas there is agreement with KBA principles for the identification of important areas, the KBA criteria are out of step with well-established practices of biodiversity target-setting within the South African conservation planning community, and preliminary testing showed the criteria to be too land-hungry within a megadiverse country context. For consistency and integration with current conservation practices within South Africa, it is therefore necessary to align the identification of areas important for plant diversity with established conservation planning methods, but it must be ensured that all important elements emphasised by the global standard are represented.

Systematic conservation plans typically set targets for ecosystems, threatened species, and areas important for ecosystem services and landscape-level functional processes – a concept analogous to areas of ecological integrity highlighted in KBA criteria. The missing key elements are centres of endemism and geographically restricted, but not threatened species. The objective for Target 5 is therefore to use the fine-scale plant occurrence datasets that have become available over the past decade to objectively define centres of endemism and areas of high species diversity at a scale that can be used as a biodiversity feature, together with existing datasets on ecosystems and threatened species, in systematic conservation plans.

Progress on this target will be measured in terms of how well important areas for plant diversity are represented in:

* Formal protected area networks.
* Critical Biodiversity Areas (CBAs) identified through systematic conservation plans and taken up legislatively via bioregional and biodiversity sector plans.
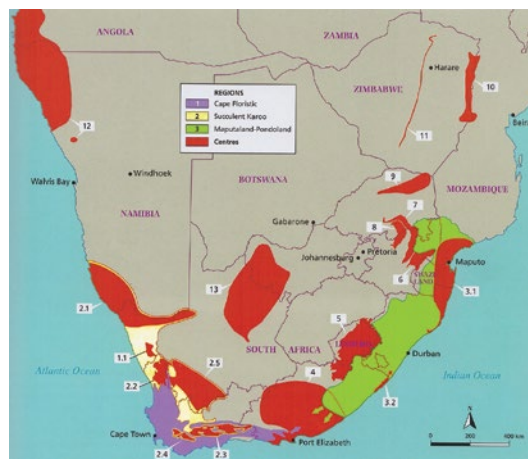
Figure 26: Regions and centres of floristic endemism identified by Van Wyk & Smith (2001).

Figure 27: Examples of important plant areas from the Little Karoo and the Swartberg Mountain Range. Photographs: J. Vlok.

OBJECTIVE 2

TARGET 5

Target 5 outcomes for 2020

5.1. Important areas for plant diversity in South Africa identified based on botanical richness and endemism patterns.

5.2. Important areas for plant diversity incorporated into biodiversity planning processes and protected area expansion strategies.

Figure 28: Many important plant areas occur in low-lying areas and are under significant threat from urban development and agricultural expansion. Shown here are the last remaining fragment of the Critically Endangered Lourensford Alluvial Fynbos near Somerset West in the Western Cape. Photographs: R. Koopman.

Target 5: Important areas for plant diversity identified and incorporated into conservation processes

Outcomes	Activities	Responsible stakeholders	Timeframe
5.1. Important areas for plant diversity in South Africa identified based on botanical richness and endemism patterns.	5.1.1. All fine-scale plant occurrence data collated from herbarium specimens, atlasing projects and from relevé data collected for vegetation mapping and/or other ecological or conservation projects.	5.1.1. SANBI's Threatened Species Programme.	5.1.1. 2015
	5.1.2. Data analysed to identify areas of high plant richness and endemism.	5.1.2. SANBI's Threatened Species Programme and biodiversity planners from Mpumalanga Parks and Tourism Agency (MTPA).	5.1.2. 2016
	5.1.3. Publication produced on the areas of importance for plant diversity, which includes information on endemic species.	5.1.3. SANBI's Threatened Species Programme and biodiversity planners from Mpumalanga Parks and Tourism Agency (MTPA).	5.1.3. 2016
5.2. Important areas for plant diversity incorporated into biodiversity planning processes and protected area expansion strategies.	5.2.1. A spatial layer of important areas for plant diversity produced and provided to provincial biodiversity planners.	5.2.1. SANBI's Threatened Species Programme.	5.2.1. 2017
	5.2.2. Important areas for plant diversity provided as features for inclusion in biodiversity planning and protected area expansion processes.	5.2.2. Biodiversity planners from the nine provincial conservation authorities.	5.2.2. 2017

OBJECTIVE 2

Target 6: Initiatives in place to ensure the sustainable management of production lands consistent with the conservation of plant diversity

Contributors: D. Raimondo, R. Stanway & K. Maze

Background

Working with the production sector through mainstreaming projects has been a major focus of biodiversity conservation work in South Africa over the last 10 years. While there is still much work to do, significant successes have been achieved. Agriculture, specifically crop cultivation, is the most severe threat to plant diversity in South Africa threatening over 1 400 plant species. Much work has been done since 2004 to work within the agricultural sector with Biodiversity and Business Initiatives (BBIs) set up for wine, potatoes, rooibos tea, sugar, indigenous cut flowers and fruit producers. Overgrazing by livestock also poses a significant threat to plant diversity and a number of non-governmental organisations (NGOs) and biome-based mainstreaming projects have worked on initiatives with the red meat industry.

All of these agriculture-based initiatives involve developing and implementing best-practice farming guidelines to minimise the impact of faming on biodiversity, as well as providing training on a range of land management techniques (e.g. monitoring veld condition, grazing and burning plans, annual farm assessments etc.). Within several of these initiatives, and driven by the broader conservation sector, incentives are provided to farm owners of high biodiversity land to formally conserve land via biodiversity stewardship programmes. Many of these initiatives allow farms to become members of the initiative. By so doing they sign up to industry standards developed to safeguard biodiversity and are then subject to forms of auditing. Members may also receive incentives in the form of market access, marketing materials and improved consumer awareness. In addition, dedicated extension services are provided that assist with assessing conservation values of land and in the development of environmental management plans.

In addition to the BBI approach, provincial conservation agencies have facilitated biodiversity mainstreaming into production landscapes through a formal stewardship approach. In this case, through a spatial prioritisation process, parcels of land with intact vegetation of high biodiversity value have been identified, and formal stewardship agreements negotiated. In some cases, this mainstreaming has taken a 'corridor' approach, with a patchwork of agricultural land and high biodiversity natural land falling under one large landscape-level conservancy or corridor, administered by the provincial nature conservation agency, but with close collaboration with provincial agriculture and industry bodies.

Much progress has been made by these initiatives, for example the Biodiversity and Wine Initiative has ensured that over 140 000 hectares of natural area has been conserved since the projects inception in 2004. This means that the South African wine industry's conservation footprint is well in excess of its current vineyard footprint of 101 568 hectares. Another excellent initiative has been the promotion of sustainable wildflower harvesting in the Western Cape. About 60% of total fynbos flower retail in the Western Cape originates from natural populations. In the main area where flower harvesting takes place, the Agulhas Plain, a Sustainable Harvesting Programme has been established by stakeholders involved in fynbos harvesting, including Flower Valley Conservation Trust, CapeNature and the fynbos industry. This includes a Code of Best Practice for Wild Harvesters, for landowners and harvesters to follow, with guidance on how to sustainably harvest different species of Fynbos. A vulnerability index identifies which indigenous plant species have restricted distributions and life history characteristics that make them vulnerable to over-harvesting. Species that score high on the vulnerability index should not be picked. Landowners and harvesters who are part of the Sustainable Harvesting Programme receive extension support from the NGO, Flower Valley Conservation Trust, as they

Figure 29: Harvesting fynbos as part of the sustainable harvesting programme on the Agulhas Plain in the Western Cape. Photograph: Flower Valley Conservation Trust, Dreampix Photography.

TARGET 6

Figure 30: The forestry sector is the second largest land user after agriculture in South Africa's Grasslands Biome. The total area under timber plantations is approximately 1.27 million hectares and 45 000 ha of natural habitat on forestry land have been prioritised for conservation through work done by the Grasslands Programme in partnership with Forestry South Africa. Photographs: Mondi Forestry.

undertake a journey to become sustainable by acting responsibly in the environment, and by meeting social and labour best practise standards. The programme provides a baseline assessment of the landowner or harvesting team's fynbos practices and provides capacity building to meet those best practice standards set out in the code. Support to monitor and collect information on harvesting is also provided through the programme. The aim is to prepare the operation to be audit ready, for when the market demands such an audit. Much of the product is exported to high-end supermarkets in the UK.

Within the plantation forestry sector, a number of mainstreaming tools have been developed by the biome-based Grasslands Programme. These enable improved decision-making over where future afforestation occurs and how open (natural) areas are managed within the forestry production landscape. The tools include 'Guidelines for Grasslands Management in the Forestry Sector', 'Environmental Guidelines for Commercial Forestry in South Africa', a 'Biodiversity Screening Tool' and a 'Conservation Planning Tool'.

Despite the progress made over the past 10 years, a number of challenges remain. The Green Choice Alliance, a communications network of various BBIs led by Conservation South Africa, put in place a monitoring framework to assess the effectiveness of BBIs. An audit conducted in 2013, comparing natural areas in 2006 and 2010 within the footprint of the various initiatives, found that extensive transformation of natural habitat was still occurring with much of this taking place within Critically Endangered ecosystems and in areas identified in biodiversity plans as Critical Biodiversity Areas. In addition, not enough progress has been achieved in securing threatened ecosystems for conservation. Areas secured for conservation after 10 years of work represent a very small fraction of the potential land available for conservation within the footprint of properties owned by BBI members.

Figure 31: The majority of agricultural land in South Africa is used for livestock production. South Africa's Grassland Programme has produced grazing and burning guidelines to promote sustainable management of grasslands under livestock production.

Figure 32: WWF's Biodiversity and Wine Initiative has ensured that over 140 000 hectares of natural area has been conserved since the project's inception in 2004. Photograph: Vergelegen Farm.
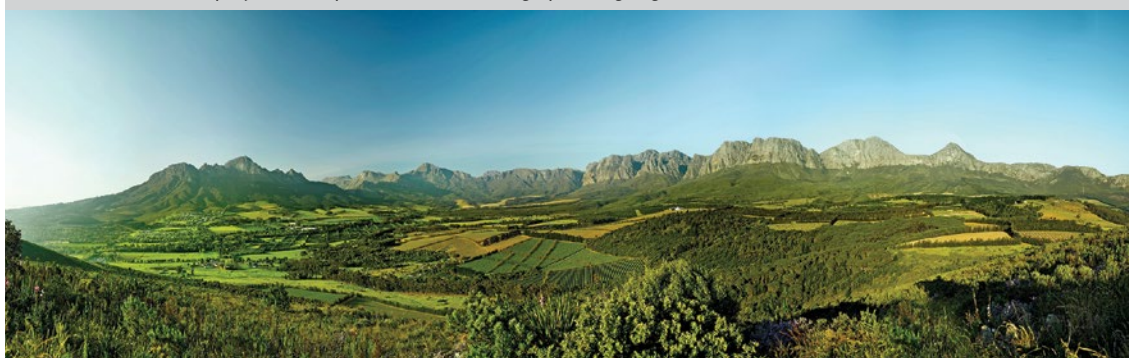
Target 6 outcomes for 2020

6.1.   Mainstream biodiversity into agricultural legislation, planning and implementation.

The main factors impeding biodiversity conservation within production lands focusing on the agricultural sector were identified through a participatory workshop undertaken in 2014, which involved key agricultural partners (Agri SA and the Department of Agriculture, Forestry and Fisheres (DAFF)); and partners with experience working with the agricultural production sector (the United National Development Programme (UNDP), the South African National Biodiversity Institute (SANBI), Conservation South Africa (CSA), the Endangered Wildlife Trust (EWT) and the World Wide Fund for Nature – South Africa branch (WWF-SA)). The major barriers identified included un-streamlined regulatory compliance, and limited institutional capacity for extension services and enforcement. Particularly problematic is a misalignment between requirements for permits under the Conservation of Agricultural Resources Act (CARA, Act No. 43 of 1983) and for environmental authorisations under the National Environmental Management Act (NEMA, Act No. 107 of 1998) for listed agricultural activities. The listed activities and timeframes of these regulatory frameworks differ, resulting in challenges to implementation, as well as high non-compliance and poor enforcement. These issues need to be addressed over the next five years.

6.2.   Capacity of agricultural extension services strengthened and enforcement capacity improved.

A number of large government initiatives exist to support agriculture in South Africa, including Soil Conservation Schemes, the Comprehensive Agricultural Support Programme, LandCare Area-Wide Planning and Natural Resource Management programmes. These programmes tend to be implemented without taking biodiversity conservation considerations into account. As a water-scarce country, the use of water is a high priority for government. Irrigated agriculture is the largest single user of water in South Africa, consuming 60% of available supply (DWA 2013). In a country where 98% of our water supply is already being used, where a substantial proportion of our globally unique biodiversity essentially falls within the custodianship of agricultural landowners and where food security is an ongoing issue, there is a critical need for the integrated management of water and biodiversity in agricultural practises.

6.3.   Private sector leadership mainstreams biodiversity conservation and environmental sustainability through international and national standard frameworks.

Private sector–led self-regulation is implemented through the Consumer Goods Council of South Africa (CGCSA), with more than 12 000 member companies, of which approximately 80% have agriculturally related activities in food and beverage production. This implementation will be enabled by the recently developed Environmental Sustainability Compliance Programme, which was co-developed by the conservation sector and provides a locally relevant, but globally benchmarked standard for environmental compliance across 11 performance areas. One of these performance areas is land-use and biodiversity, whereby companies are required as a minimum to comply with the legal instruments of the country, and as best practice to set ambitious performance targets with regards to land-use and biodiversity.

Locally, Fruit South Africa and WWF have developed a Sustainability Initiative of South Africa (SIZA) environmental management system; a best practice standard aligned to the same global benchmark as the CGCSA framework, with in-depth emphasis on the environmental aspects of sustainability on farms.

6.4   Existing Business and Biodiversity Initiatives (BBIs) supported to mainstream biodiversity into production landscapes.

It remains a priority to continue work with existing BBIs in South Africa. Both the Green Choice Alliance and SANBI provide overarching communications and governance support to existing BBIs in South Africa and will ensure that this work continues.

Target 6: Initiatives in place to ensure the sustainable management of production lands, consistent with the conservation of plant diversity

Outcome	Activities	Responsible stakeholders	Timeframe
6.1. Mainstream biodiversity into agricultural planning and implementation within priority catchments.	6.1.1. Biodiversity mainstreamed into the agricultural practices within in eight priority catchments where strategic water resources and high plant diversity overlap.	SANBI, Department of Agriculture, Forestry and Fisheries (DAFF); Endangered Wildlife Trust (EWT); Conservation South Africa (CSA); AGRI SA, WWF-SA.	2020
	6.1.2. Integrated land-use planning projects developed and implemented at catchment scale through multi-stakeholder partnerships.	SANBI, DAFF; EWT; CSA; AGRI SA, WWF-SA.	2020
	6.1.3. Large-scale government programmes coordinated by the departments of Environmental Affairs (DEA), Water & Sanitation (DWS) and Agriculture, Forestry and Fisheries (DAFF) are aligned to support sustainable agriculture practices.	SANBI, DAFF; EWT; CSA; AGRI SA, WWF-SA.	2020
6.2. Capacity of agricultural extension services strengthened and enforcement capacity improved.	6.2.1. Capacity of agricultural extension services strengthened within priority catchment areas through working directly with extension officials and focussing on enforcement requirements.	SANBI, DAFF; EWT; CSA; AGRI SA, WWF-SA.	2020
	6.2.2. Agricultural skills development at tertiary level addresses integration of relevant biodiversity, including basic legislative issues.	SANBI, DAFF; EWT; CSA; AGRI SA, WWF-SA.	2020
6.3. Private sector leadership mainstreams biodiversity conservation and environmental sustainability through international and national standard frameworks.	6.3. Biodiversity mainstreamed into 10% of the South African private sector agricultural component through implementation of relevant national and international frameworks.	Consumer Goods Council of South Africa (CGCSA); CSA; Cambridge Program for Sustainability Leadership; private sector agricultural stakeholders; WWF-SA; Sustainability Initiative of South Africa (SIZA); Fruit SA.	2020
6.4 Existing Business and Biodiversity Initiatives supported to mainstream biodiversity into production landscapes.	6.4. Continue to work with business and industry in production landscapes, focussing on: 1) Integrating biodiversity into production and service standards and guidelines. 2) Incorporating biodiversity and environmental management objectives in area-wide plans and farm planning processes. 3) Deepening relationships between conservation and national and provincial departments of Agriculture, including collaborative efforts to strengthen capacity for extension and enforcement functions. 4) Mainstream existing biodiversity and production tools.	CapeNature; WWF; CSA; Flower Valley Conservation Trust; SANBI; industry bodies (Red Meat Producers Organization; Wines of South Africa; Fruit SA; Grassfed SA; Mohair SA; SA Ostrich Business Chamber).	2020

OBJECTIVE 2

TARGET 6

OBJECTIVE 2

Target 7: At least 75% of known threatened plant species conserved *in situ*

Contributors: L. von Staden & D. Raimondo

Background

South Africa currently has 2 576 plant species that are threatened with extinction. Since 2005, the South African National Biodiversity Institute (SANBI) Threatened Species Programme (TSP) has worked towards getting accurate distribution data for known locations of threatened species. Over 57 000 herbarium records have been en- coded and georeferenced. In addition a network of volunteers has been monitoring populations of threatened plants in the field as part of the Custodians of Rare and Endangered Wildflowers (CREW) pro- gramme (www.sanbi.org). Twelve other threatened plant data sources, which come from national and provincial conservation authorities, re- gional herbaria, and atlas and citizen science programmes, have been included. Spatial data are now available for 2 345 threatened species in South Africa. Of these, 1 554 (66%) species have at least one record within a formally protected area (Von Staden et al., in prep).

Since 2005 South Africa has expanded protection of terrestrial ecosystems through the establishment of Biodiversity Stewardship programmes in several provinces. As part of these programmes, contractual protected areas are declared on private or communal land. Conservation authorities enter into contract agreements with landowners who retain title to the land and are recognised as the management authority of the protected area. The cost to the state

Figure 33: The 2008 Protected Area Ex- pansion strategy that prioritised areas of the country for conservation, but did not take into account threatened plant occurrences as data was not available at that stage.
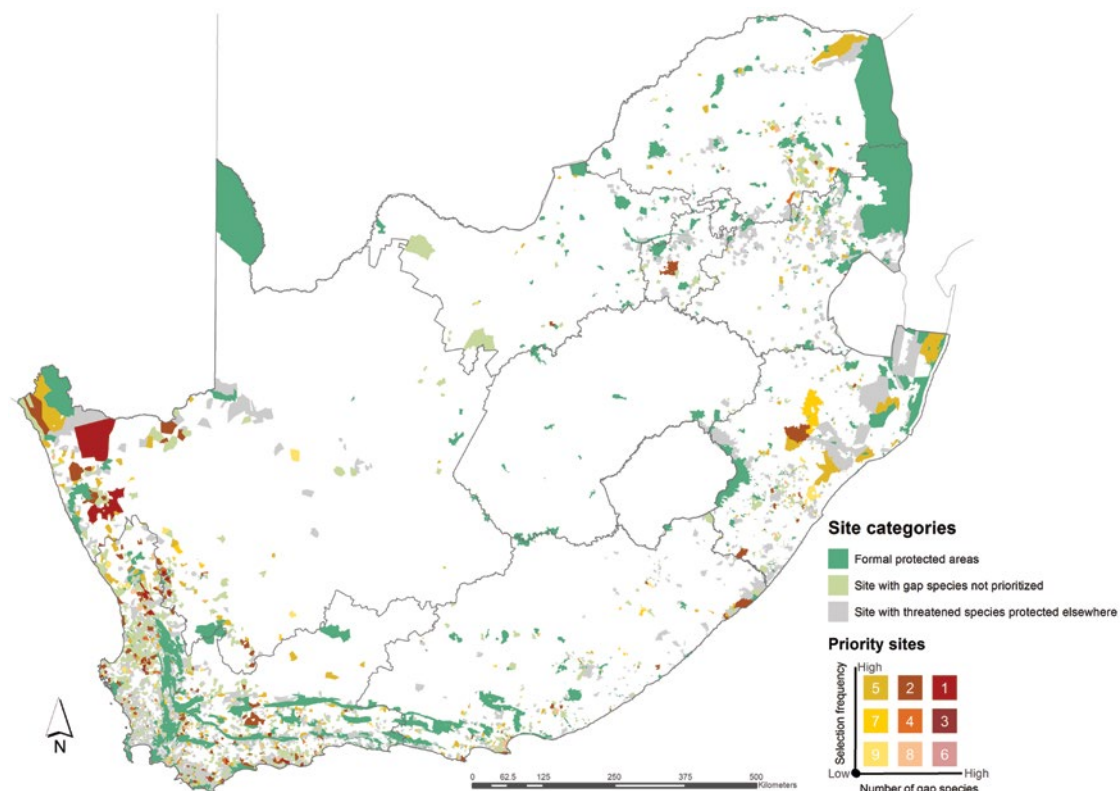
Figure 34: Results of the systematic biodiversity planning exercise done to identify optimal sites to conserve the highest numbers of unprotected species (Von Staden et al. 2015). These priority sites will be targeted by provincial conservation authorities in their protected area expansion work.

TARGET 7

is a fraction of the cost of acquiring and managing land, making biodiversity stewardship a highly cost effective approach to expanding the protected area network. Twenty-four contract protected areas have been declared through Biodiversity Stewardship programmes totalling over 75 000 ha, with approximately 360 000 ha of additional contract protected areas awaiting proclamation or are in negotiation.

Areas of high concentrations of threatened plant species

High

Low
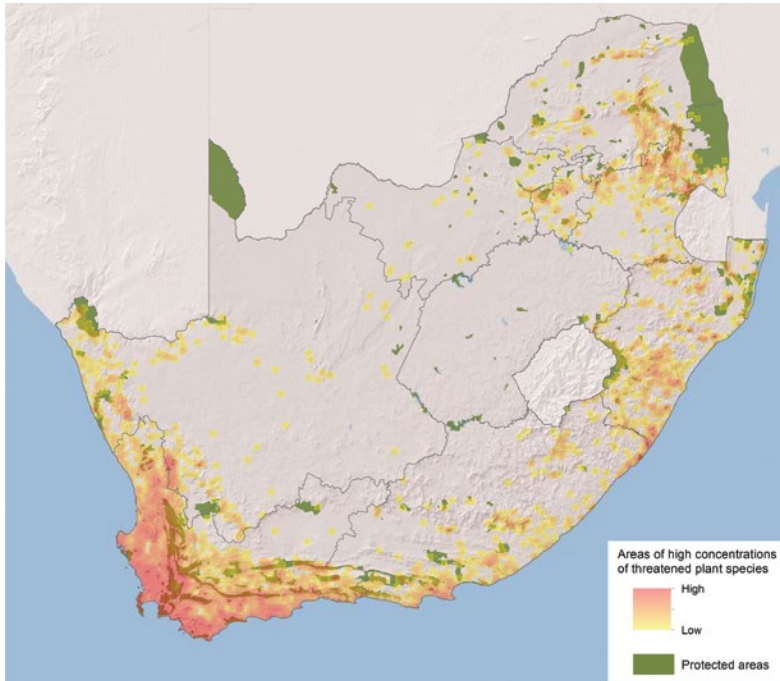
Protected areas

Figure 35: High concentrations of populations of threatened plant species shown in relation to South Africa's Protected Area Network.
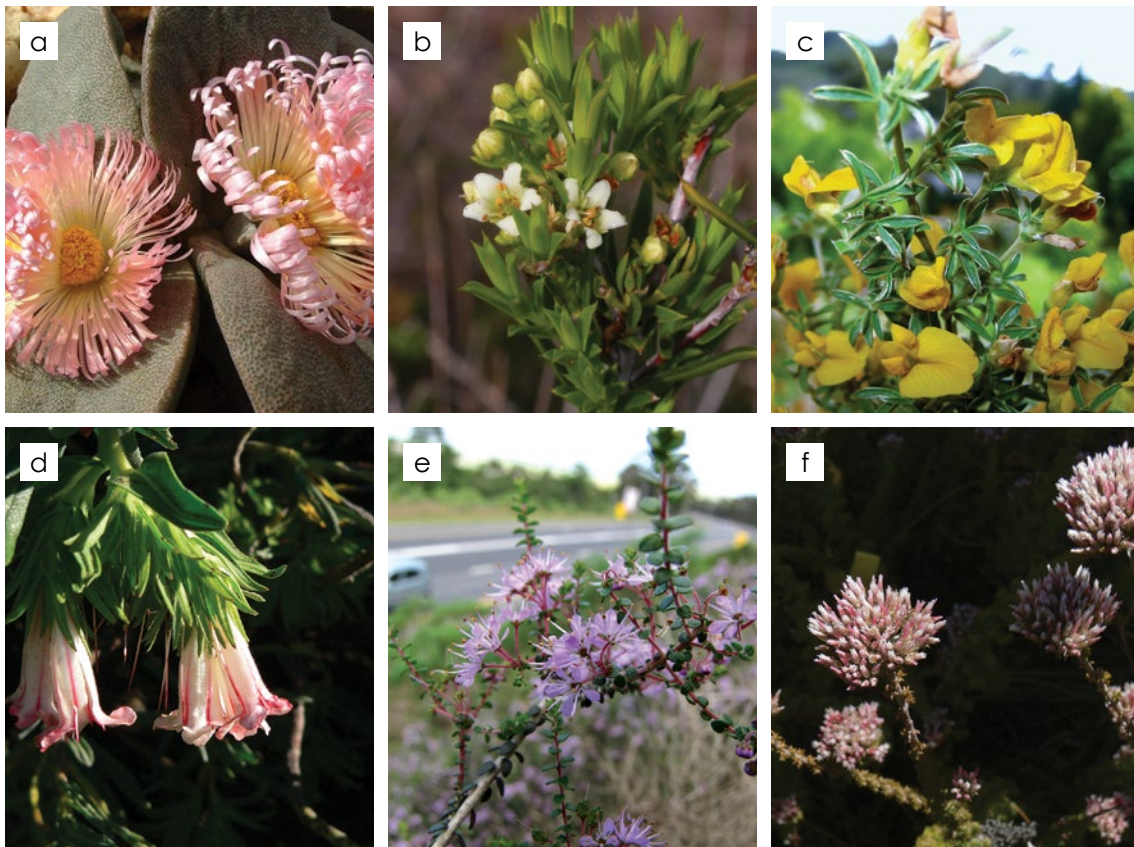
Figure 36: Critically Endangered species all known from only a single site: a, *Pleiospilos simuans*; b, *Diosma aristata*; c, *Polhillia brevicalyx*; d, *Lobostemon belliformis*; e, *Agathosma orbicularis*; f, *Planea schlechteri*. Photographers: a, E. Van Jaarsveld; b, A. Schuttel Vlok; c, unknown; d, D. Osbourne; e, N. Helme; f, Keith Breetzke.

OBJECTIVE 2

TARGET 7

Target 7 outcomes for 2020

7.1. Protected area expansion strategies (provincial and national) include priority sites for conserving unprotected threatened species.

South Africa has a National Protected Area Expansion Strategy (NPAES), produced in 2008, which identifies spatial focus areas for further expansion of the land-based protected area network (available at www.environment. gov.za). The NPAES sets targets that maximise the representation of ecosystems in South Africa's protected areas network. It identifies 42 focus areas for land-based protected area expansion. These are large, intact and unfragmented areas, suitable for the creation or expansion of large protected areas. These areas, if protected, have the potential to conserve an additional 8% of South Africa's threatened species. Unfortunately species data were not available in 2008 to include in the identification of priority areas for conservation. These will be included in the next protected area expansion strategy, which is due to be undertaken. SANBI's TSP identified areas of the country to optimise the conservation of unprotected threatened plant species (Von Staden et al., in prep); these areas are being taken up both in the national protected area expansion strategy as well as in provincial protected area conservation strategies.

7.2. Biodiversity Stewardship programmes focused on areas with high concentrations of unprotected threatened species.

One of the most effective current forms of expanding protected areas is through Biodiversity Stewardship programmes; these programmes are implemented by provincial conservation agencies and are guided by provincial conservation protected area strategies. Provincial Biodiversity Stewardship programmes will target sites identified within their protected area expansion strategies to house unprotected threatened species. Through targeting the best sites for protecting the highest number of unprotected species, it should be possible to reach the target of 75% of threatened species protected *in situ* by 2020. The conservation of only 30 additional sites is required in order to achieve this target (Von Staden et al., in prep).

7.3. Legal protection of Critically Endangered plant species occurring at one site only, achieved.

The above discussed expansion of protected areas to conserve plants caters for plant species that occur in large, intact areas of natural vegetation. Unfortunately, South Africa also has many Critically Endangered plant species that have lost most of their former habitat and now remain only on remnant small patches of vegetation within urban and agricultural landscapes or along road verges. These species are highly vulnerable to extinction as a result of development.

Although South Africa has environmental authorisation legislation under the National Environmental Management Act (NEMA; Act No. 107 of 1998) in terms of the EIA regulations, which requires an environmental impact assessment to be undertaken for a wide range of development activities (82 in total), minimum thresholds exist for each activity. A significant gap exists in this legislative framework arising from the fact that a 300 m² threshold is provided for the clearance of indigenous vegetation in the most sensitive geographical areas and a 1 ha threshold for the clearance of vegetation within ecologically sensitive areas. Any clearance of vegetation below these thresholds does not require Environmental Authorisations. Where a Critically Endangered species threatened by habitat loss is characterised by an extremely limited geographic range / area of occupancy, or an extremely small and declining population, the clearance of between 300 m² and 1 ha of indigenous vegetation may impact on the last remaining population or individuals of the species, immediately resulting in the extinction of that species.

There is currently no legislation in South Africa that would effectively prevent the destruction through land use change of the last remaining population or individuals of Critically Endangered plant species. There is an urgent need to develop legislation to protect such species from extinction. There is also a need to identify accurately the exact areas where these species occur and promote awareness of these sites.

Figure 37: Critically Endangered species all known from only a single site: a, *Circandra serrata*; b, *Erica jasminiflora*; c, *Moraea loubseri*. Photographers: a, R. Koopman; b, unknown; c, G. Duncan.

Target 7: At least 75% of known threatened plant species conserved *in situ*

Outcomes	Activities	Responsible stakeholders	Timeframe
7.1. Protected area expansion strategies to incorporate layer of high priority unprotected threatened species sites.	7.1.1. A conservation plan that prioritises optimal sites for conserving the highest number of unprotected threatened species published.	7.1.1. SANBI TSP Red List Scientist.	7.1.1. 2015
	7.1.2. Priority sites for threatened species shared with conservation agencies.	7.1.2. SANBI TSP	7.1.2. 2015
	7.1.3. Priority sites for threatened species incorporated into protected area expansion strategies by Mpumalanga Parks and Tourism Agency (MPTA), Ezemvelo KwaZulu-Natal Wildlife (EKZNW), Cape Nature and the DEA.	7.1.3. MPTA, EKZNW, Cape Nature and DEA conservation planners.	7.1.3. 2016
7.2. Biodiversity Stewardship programmes focused on areas with high concentrations of unprotected threatened species.	7.2. Stewardship officials in Mpumalanga, KwaZulu-Natal and the Western Cape focus on negotiating contracts for properties with high concentrations of unprotected threatened species.	7.2. MPTA, EKZNW and Cape Nature stewardship officials.	7.2. Ongoing
7.3. Legal protection of Critically Endangered plant species occurring at one site only, achieved.	7.3.1. Accurately identify sites where Critically Endangered species with a highly restricted geographic range occur.	7.3.1. SANBI's Threatened Species Programme.	7.3.1. 2016
	7.3.2. Identify the appropriate legislative tool and develop regulations to protect highly restricted Critically Endangered plant species.	7.3.2. DEA and SANBI's Threatened Species Programme.	7.3.2. 2019
	7.3.3. Promote awareness of sites where Critically Endangered species occur (sites for zero extinction) with relevant government departments whose work impacts these sites, e.g. the South African National Roads Agency (SANRAL), provincial departments of transport, and provincial departments responsible for Environmental Authorisations.	7.3.3. Botanical Society of South Africa, provincial conservation authorities.	7.3.3. 2016–2020.

Target 8: At least 60% of threatened plants in ex situ collections, preferably in the country of origin, and available for recovery (restoration) programmes, with 1% in active reintroduction programmes

Contributors: L. Nkuna, A. Hitchcock, A. Rebelo, E. van Wyk, I. Johnson & D. Raimondo

Background

South Africa has very high numbers of threatened plants (2 576 taxa). To achieve Target 8, 1 545 species need to be included in *ex situ* collections. However, this number is too high. Insufficient space exists within horticultural facilities in South Africa's ten national botanical gardens to include adequate genetic representation of each species. In addition, living collections are very costly and insufficient funding and man power are available. Banking seeds is a more efficient and secure conservation option. South Africa been working, since 2000, as part of the Millennium Seed Bank Partnership (MSBP), a programme that includes 50 countries, with the aim to bank 35% of the world's plants by 2020. To date, 13% or 340 of South Africa's threatened plant species have been banked. An updated agreement between the South African National Biodiversity Institute (SANBI) and Kew Gardens, the implementing agents of the MSBP, was signed in 2010, which will ensure that seed banking will continue in South Africa at least until 2015, with South Africa continuing the commitment of banking seeds until 2020.

The seed collections and related data are split into two: the original seed collections are stored at the National Plant Genetic Resources Centre (NPGRC) of the Department of Agriculture, Forestry and Fisheries (DAFF) at Roodeplaat, Pretoria and the herbaria maintained by SANBI. Duplicate material (seed collections, herbarium material and data) are stored at the Kew herbarium and in the Millennium Seed Bank at Wakehurst Place.

Living collections of threatened species are kept in pot collections in the national botanical gardens. Certain highly threatened species are maintained in stock beds, which serve to preserve as wide a genetic pool per species as possible. These are used as stock material for restoration programs.

Figure 38: Millennium Seed Bank Partnership staff collecting seeds of restricted endemic species from the Blouberg Mountain, Limpopo Province, South Africa. Photograph: D. Raimondo.

Figure 39: Volunteers and staff of SANParks working to restore Critically Endangered Lowland Sand Fynbos in Tokai on the Cape Peninsula. Photograph: T. Rebelo.

Figure 40a&b: Critically Endangered species from the Proteaceae family propagated at Kirstenbosch National Botanical Gardens (a, *Leucadendron levisanus*; b, *Mimetes stokoei*; c, *Serruria furcellata*). Photographs: A. Hitchcock.

OBJECTIVE 2

TARGET 8

Target 8 outcomes for 2020

8.1.   60% of threatened plants conserved *ex situ*.

The Millennium Seed Bank Partnership in South Africa focusses seed collecting in areas with high concentrations of threatened species; another focus is collecting species that are useful to people. Between 2000 and 2010, the MSBP in South Africa did not have a strict focus on collecting threatened species, but collected a range of different endemic and utilised species. Since 2010 the focus of the MSBP has shifted to prioritising collection of seeds from threatened species. The MSBP in South Africa aims to collect and conserve seeds of additional 1 000 (39%) threatened species by the year 2020.

8.2.   1% of species with *ex situ* collections active in restoration programmes.

Twenty-six threatened plant species in South Africa are currently being used in re-introduction programmes (1% of threatened plants). Work on these plants has indicated that re-introductions are resource intensive, from both a financial and human capacity aspects. However, South Africa has 21 Critically Endangered ecosystems, 86% of which occur in the Fynbos Biome. Researching re-introduction techniques for threatened plants endemic to these ecosystems is vital for their long term survival. Horticulturalists based at SANBI will continue to pilot and document re-introduction programmes in the form of restoration protocols for at least 1% of South Africa's threatened plants.

Figure 41: Reintroducing highly threatened fynbos species into the Critically Endangered Cape Flat Sand Fynbos ecosystem.

Target 8: At least 60% of threatened plants in ex *situ* collections, preferably in the country of origin, and available for recovery (restoration) programmes, with 1% in active re-introduction programmes

Outcomes	Activities	Responsible stakeholders	Timeframe
8.1. 60% of threatened plants conserved ex *situ*.	8.1.1. MSBP effort for seed collection focused 90% on threatened species.	MSBP staff based at SANBI to coordinate seed collection both by staff within the MSBP team and with partners, including the Botanical Society and volunteers who are part of the CREW programme.	Annual workshop to evaluate ex *situ* collections progress, both seed banking and living collections, conducted.
	8.1.2. Seed collecting capacity increased by identifying and capacitating non-SANBI botanical gardens and nature reserves.		MSBP collect and bank seed of 100 threatened species, not yet represented in ex *situ* collections, per annum.
	8.1.3. Threatened species with recalcitrant seeds grown in living collections.	Specialist horticulturists in SANBI's Conservation Gardens and Tourism Directorate to co-ordinate further collections and manage living collections.	Audit of species represented in living collections conducted by end of 2015, and repeated in 2017 and 2020.
	8.1.4. Existing gardens ex *situ* living collections maintained and increased through providing training, resources, direction and monitoring of progress.		
8.2. 1% of species with ex *situ* collections active in restoration programmes.	8.2.1. Threatened species included in restoration programmes in Critically Endangered ecosystems.	8.2.1. SANBI TSP research and garden staff.	8.2.1. Ongoing
	8.2.2. Protocol for documenting restoration work developed.	8.2.2. SANBI TSP research staff.	8.2.2. 2016
	8.2.3. Any restoration programmes involving threatened species, those implemented by government or private landscaping companies, documented to build up knowledge base.	8.2.3. Provincial conservation authorities to identify private companies doing restoration. SANBI TSP research and garden staff to manage and serve online information on restoration.	8.2.3. Ongoing

Target 9: The genetic diversity of crops, including their wild relatives and indigenous edible plant species, conserved while respecting, preserving and maintaining associated indigenous and local knowledge

Contributors: L. Nkuna, E. van Wyk, N. Maluleke, T. Tjikana, W. Jansen van Rensburg, E. Dulloo, I. Thormann & D. Raimondo

Background

The genetic resources of crops and other indigenous edible plant species are the biological base for food security. South Africa is fortunate in that traditional farming is still practised in many parts of the country; thereby allowing a number of African crop species to be grown and many different landraces of crops to exist. Furthermore, a wide variety of indigenous plant species are collected directly from the wild and used for food. Over the last few decades there has been increasing concern about the loss of crop genetic diversity internationally. Over this same time period in South Africa, there has been an ongoing trend of urbanisation and an associated loss of traditional landraces as well as traditional farming practices.

Conserving traditional landraces of crops, their wild relatives and indigenous edible species is a priority for the following reasons:

- Traditional landraces constitute 'within-species' diversity and provide resilience and local adaptation in traditional farming systems.
- Crop wild relatives – i.e. species that are related to crops and can potentially donate genes to them in breeding and improvement programmes – provide beneficial traits to crops, such as pest and disease resistance, and drought tolerance.
- Indigenous edible plant species constitute important components of a diversified diet and provide a food security safety net.

Protecting plant genetic resources of traditional landraces and indigenous edible plants has been a priority for the South African Government for the past two decades, with South Africa becoming a member of the Southern

Figure 42: Collecting traditional knowledge on indigenous crops in rural parts of South Africa, Limpopo Province – Sekhukhuneland. Photograph: D. Raimondo.

African Develoment Community (SADC) Plant Genetic Resources Centre (SPGRC) in 1995 and the National Plant Genetic Resource Centre of South Africa (NPGRC) established by the then Department of Agriculture in 1998. The NPGRC coordinates activities related to the conservation and sustainable use of plant genetic resources in South Africa, which includes the collection, multiplication, characterisation, evaluation, rejuvenation and documentation of seed, as well as gene bank management. The process of collecting plant genetic resources in South Africa is done in such a way so as to ensure that the indigenous knowledge associated with the use of each species is captured at the same time as seed is collected.

Figure 43: *Cleome gynandra*, an indigenous vegetable used as spinach by many rural South Africans. Photograph: B.E. van Wyk.

Figure 44: *Vigna unguiculata*, cowpea, traditional landrace grown in Sekhukhuneland, South Africa. Photograph: B. van Wyk.

Figure 45: Banked seeds of *Vigna radiata*, mungbean, stored at the National Genebank managed by the NPGRC of South Africa. Photograph: N. Maluleke.

Figure 46: Acacia seed pod. Photograph: S.P. Bester.

OBJECTIVE 2

TARGET 9

OBJECTIVE 2

TARGET 9

Target 9 outcomes for 2020

9.1. Genetic diversity of 250 indigenous, edible species and traditional crop landraces conserved in the South African gene bank and duplicated in either the SADC region gene bank or in the Millennium Seed Bank.

South Africa's national gene bank established by the NPGRC in 1998 includes mostly agricultural crops focusing on traditional landraces; the bank also includes fodder species, ornamentals, industrial crops (crops used in industry for fibre, hemp, oils etc.), indigenous vegetables and fruits, and selected medicinal species. A total of 324 species have been banked by the national gene bank by the end of 2014, however only 44 are crops or other edible South African species. A further 103 edible indigenous species have been collected by the Millennium Seed Bank project coordinated by SANBI in partnership with the Royal Botanic Gardens Kew.

9.2. Priority crop wild relatives conserved both in situ and ex situ.

South Africa has 2 260 crop wild relative species within its border; 66 of these have been selected as priority species based on their conservation status, level of endemism, current economic value, their use as food and their breeding potential. These species will be the focus of the African, Caribbean and Pacific Group of States–European Union's (ACP-EU's) *in situ* conservation project, called the 'Crops Wild Relatives (CWR) project', in the SADC region. South Africa has been selected as one of three SADC countries to take part in a three-year CWR project coordinated by Bioversity International and the University of Birmingham (UoB) and funded by the ACP-EU Science and Technology Programme. This project aims to enhance links between conservation and the use of CWR as a means of underpinning regional food security and mitigating the predicted adverse impact of climate change. This project runs from 2014 to 2016 (http://www.cropwildrelatives.org/sadc-cwr-project/).

The specific objectives of the SADC CWR project are to enhance the scientific capacities within each participating country to conserve crop wild relatives and to identify useful potential traits for use to adapt to climate change. The project also aims to develop National Strategic Action Plans for the conservation and use of crop wild relatives.

Figure 47: Traditional landrace for Cucumis melo growing in Sekhukhuneland, Limpopo Province. Photograph: B.E. van Wyk.

Target 9: The genetic diversity of crops, including their wild relatives and indigenous edible plant species, conserved while respecting, preserving and maintaining associated indigenous and local knowledge

Outcomes	Activities	Responsible stakeholders	Timeframe
9.1. Genetic diversity of 400 indigenous edible plant species and crop traditional varieties conserved in gene banks.	9.1.1. Information collected as part of Target 13 (collection of indigenous knowledge) used to guide which indigenous edible plants require gene banking.	9.1.1. SANBI's Millennium Seed Bank Programme	9.1.1. Ongoing.
	9.1.2. Capacity developed with officials from the NPGRC to spatially map all collections of traditional crop varieties made to date and identify gap areas for further collecting.	9.1.2. DAFF NPGRC and SANBI.	9.1.2. 2016
	9.1.3. Seed collections made of indigenous edible species not previously banked.	9.1.3. SANBI's Millennium Seed Bank programme.	9.1.3. Seeds of 20 previously not collected edible indigenous plants collected annually.
	9.1.4. Collection of seeds of traditional crop varieties made in areas identified as gaps in activity 9.1.2., while ensuring ongoing collection of associated indigenous knowledge.	9.1.4. DAFF NPGRC collections staff.	9.1.4. Two areas targeted annually.
9.2. Priority crop wild relatives conserved in situ and ex situ.	9.2.1. Occurrence records obtained for priority crop wild relatives through georeferencing herbarium specimen data and conducting fieldtrips to obtain new occurrence records.	9.2.1. SANBI Biosystematics Division and Millennium Seed Bank Partnership (with mentorship from Bioversity and UoB, under the SADC CWR project).	9.2.1. 2015
	9.2.2. In situ CWR hotspots and priority sites for in situ conservation identified.	9.2.2. SANBI and DAFF NPGRC (with mentorship from Bioversity and UoB, under SADC CWR project).	9.2.2. 2015–2016
	9.2.3. Priority CWR for ex situ conservation collected and banked.	9.2.3. SANBI's Millennium Seed Bank Project.	9.2.3. 2015–2016
	9.2.4. In situ conservation areas included in provincial conservation plans, protected areas expansion strategies and the NBSAP.	9.2.4. SANBI's Strategy for Plant Conservation Focal Point in collaboration with DAFF under SADC CWR project.	9.2.4. 2016–2017

OBJECTIVE 2

Target 10: Effective management plans in place to prevent new biological invasions and to manage important areas for plant diversity that are invaded

Contributors: P. Ivey & D. Raimondo

Background

As of 2010 South Africa had 8 750 introduced plant taxa; 660 of which are recorded as naturalised and 198 that are included in invasive species legislation (revised regulations still to be passed into law list 381 plant species as invasive), but only 60 of these are subject to regular control. Biological invasions are a major threat to biodiversity and economic livelihoods in South Africa. Nationally it was estimated (2008 prices) that losses to the following values occur as a result of invasive alien plants:

- Loss of available water – ± R8 billion.
- Loss of grazing – ± R450 million.

The management of widely established invasive plants has been led by the Working for Water Programme (WfW) since its establishment in 1995. South Africa also has a long history of controlling invasive species through introductions of biological control agents. Biocontrol agents are established for 48 invasive alien plant species.

In 2008 an Invasive Species Programme was established at the South African National Biodiversity Institute (SANBI), funded by the Working for Water Programme, to specifically tackle early detection of new alien invaders, conduct risk assessments for post-border introductions and to work on eradication of alien species that have just started to expand their ranges.
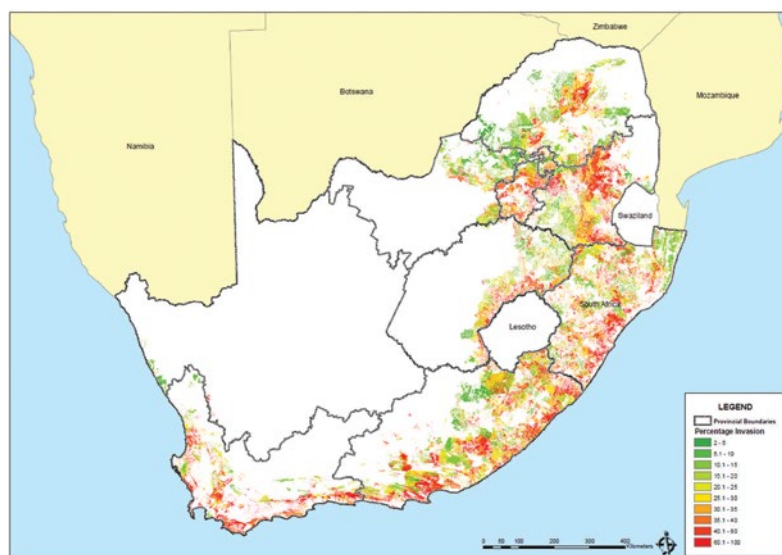
Figure 48: The proportion of a quaternary catchment infested, data from the National Invasive Alien Species Survey (Kotze et al. 2010).

TARGET 10
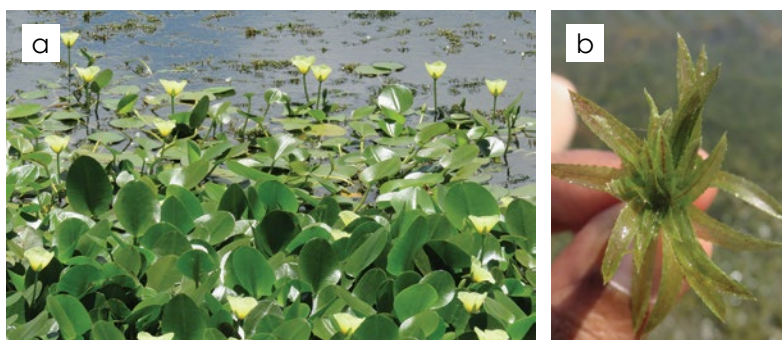
Figure 49: a, *Hydrocleys nymphoides*; b, *Hydrilla verticillata*.
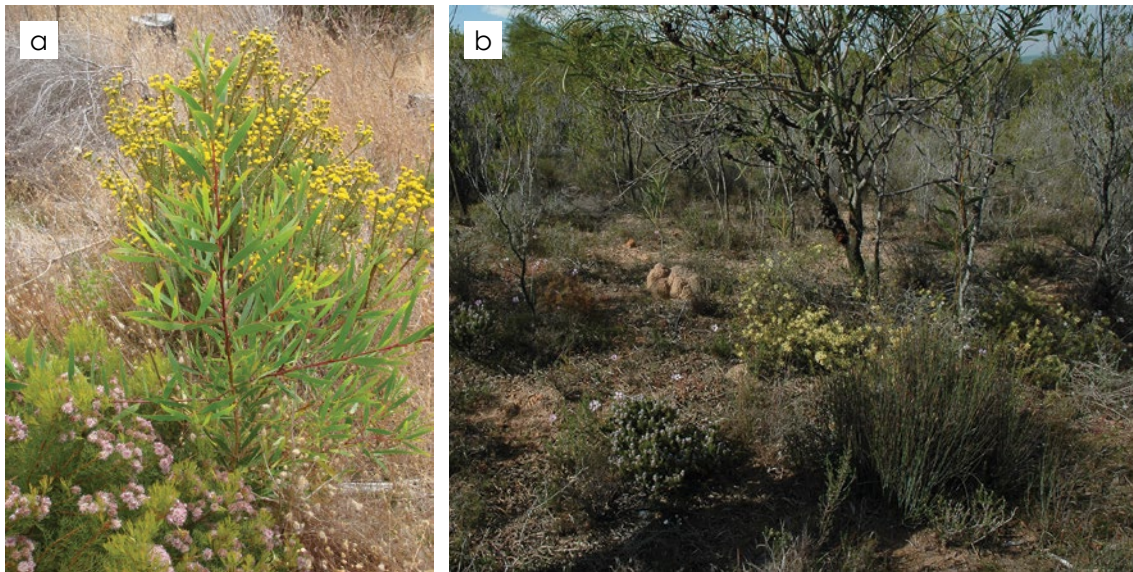
Figure 50a&b: Schoongezicht, an area with high concentrations of endemic and threatened indigenous plants, threatened by invasive acacias. Photographs: R. Koopman.
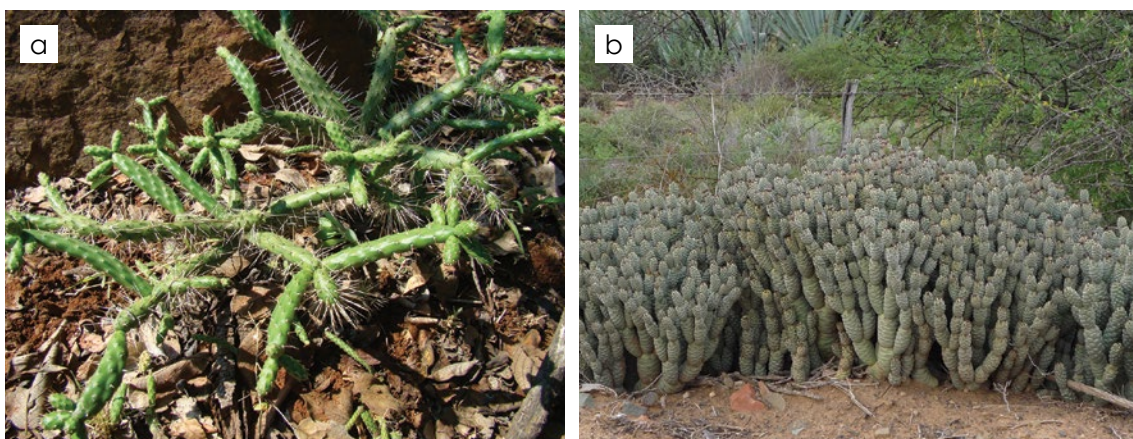
Figure 51a&b: Two species of Cactaceae that are starting to expand their ranges: *Opuntia pubescens* (right); *Tephrocactus articulates* (left). Photographs: Invasive Species Programme, SANBI.

Figure 52: Clearing of the new invasive, *Furcraea foetida*. Photograph: Invasive Species Programme, SANBI.

OBJECTIVE 2

Target 10 outcomes for 2020

10.1. Invasive Species Programme effectively detecting and documenting new invasions, providing reliable post-border risk assessments and coordinating implementation of national eradication plans.

10.2. Important areas for plant diversity receiving priority attention by invasive alien clearing programmes.

As part of this Strategy for Plant Conservation, South Africa's network of botanists is committed to assist with invasive species management by focusing on two areas:

10.1.   Supporting the development of capacity of the SANBI Invasive Species Programme to facilitate detection and monitoring of invasive alien plants, to support information gathering for more accurate risk assessments of the majority of naturalised species, and to be actively working on eradicating species that have just started to expand their range. The programme will continue to work with the Department of Environmental Affairs (DEA) to strengthen pre-border biosecurity to prevent legal, illegal, intentional and unintentional introductions of potentially invasive species from other countries into South Africa (Wilson et al. 2013).

10.2.   Identify important areas for plant diversity (Target 5) that are currently most threatened by invasive alien plants. Prioritise these areas of the country as those that most need invasive species management through government-supported management programmes. Assist with the development and implementation of Invasive Species Monitoring, Eradication and Control plans of these high priority areas.
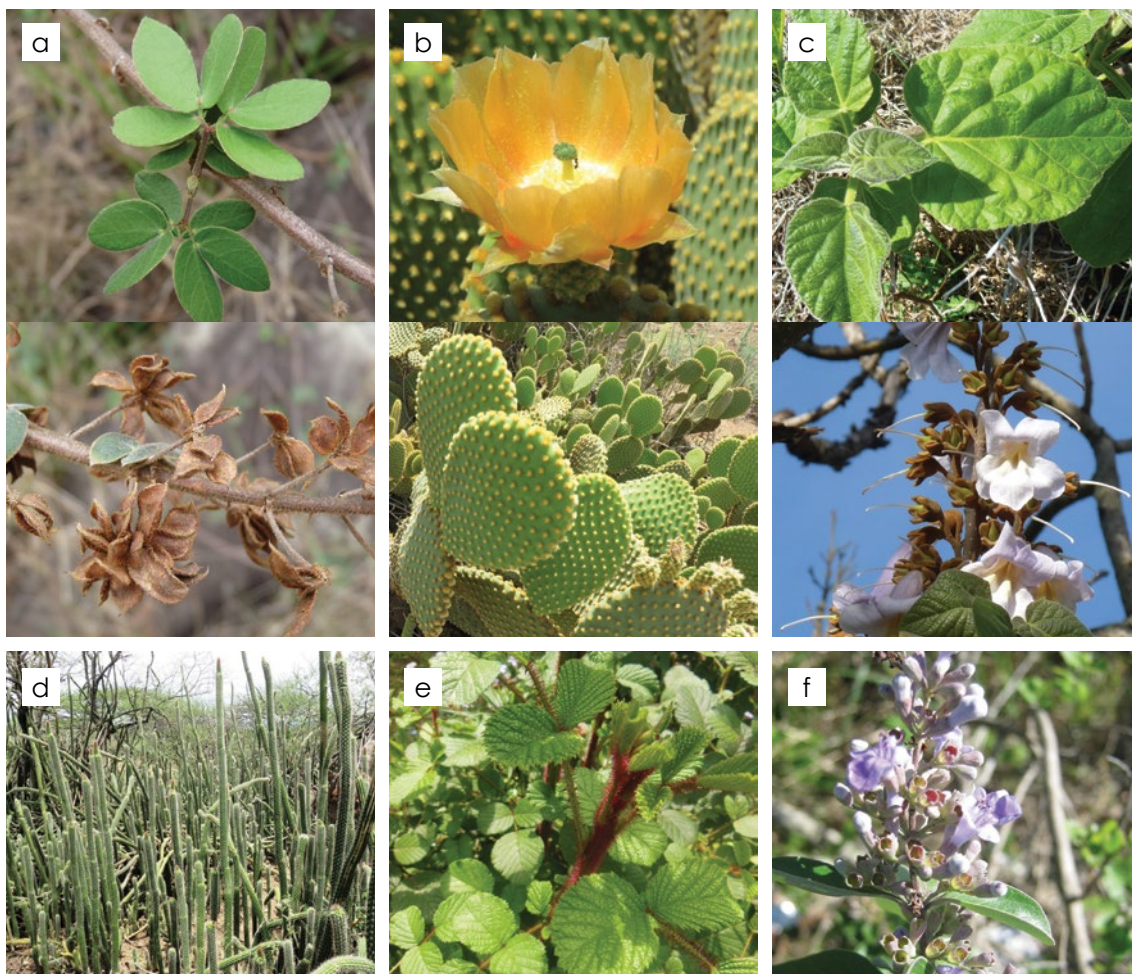
Figure 53: Recently emerging invasive alien plant species currently known from fewer than five localities in South Africa. a, *Mimosa albida*; b, *Opuntia microdasys*; c, *Paulownia tomentosa*; d, *Peniocereus serpentinus*; e, *Rubus ellipticus*; f, *Vitex trifolia*.

TARGET 10

Target 10: Effective management plans in place to prevent new biological invasions and to manage important areas for plant diversity that are invaded

Outcomes	Activities	Responsible Stakeholders	Timeframe
10.1. Invasive Species Programme effectively detecting and documenting new invasions, providing reliable post-border risk assessments and coordinating implementation of national eradication plans.	10.1.1. Status of invasive species with limited distribution monitored.	10.1.1. SANBI and partners.	10.1.1. Ongoing
	10.1.2. Clearly understood process to prevent legal introductions developed and implemented.	10.1.2. Biosecurity Division within the DEA.	10.1.2. 2017
	10.1.3. 125 initial risk assessments conducted.	10.1.3. SANBI Invasive Species Programme.	10.1.3. 2016
	10.1.4. Management plans developed for species requiring compulsory control to ensure eradication, with overt goals and timelines included.	10.1.4. SANBI Invasive Species Programme.	10.1.4. Ongoing
10.2. Important areas for plant diversity receiving priority attention by invasive alien clearing programmes.	10.2.1. Areas important for plant diversity based on concentrations of range-restricted, endemic and threatened taxa identified (Target 5).	10.2.1. SANBI Threatened Species Programme	10.2.1. 2016
	10.2.2. Areas of alien infestation identified by Kotze et al. (2010) overlaid with areas important for plant diversity and priority catchments for alien clearing identified.	10.2.2. Postgraduate Conservation Biology Student	10.2.2. 2016–2017
	10.2.3. Invasive Species Monitoring, Eradication and Control plans for these high priority areas developed and being implemented.	10.2.3. SANBI Invasive Species Programme in partnership with Working for Water Programme	10.2.3. 2017–2020

OBJECTIVE 2

TARGET 10

Objective III:

Plant diversity is used in a sustainable and equitable manner

Target 11: No species of wild flora endangered by international trade

Contributors: M. Pfab & D. Raimondo

Background

South Africa is party to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). International trade of CITES-listed plants is managed via CITES regulations that were promulgated in March 2011 in terms of section 97 of the National Environmental Management: Biodiversity Act (NEMBA), Act No. 10 of 2004.

South Africa has established a Scientific Authority (Section 60 of NEMBA) to monitor the legal and illegal trade in wildlife and make Non-Detriment Findings (NDFs) on the impacts of international trade. The Scientific Authority is a committee of experts comprised of a scientist from each of the nine provincial conservation authorities of South Africa, together with representatives from the Department of Environmental Affairs (DEA), the South African National Parks (SANParks), the National Zoological Gardens, and one member to represent museums. The South African National Biodiversity Institute (SANBI) coordinates and chairs the Scientific Authority. South Africa's Management Authority, which regulates the trade via a system of permits, is coordinated by the DEA and is implemented through the nine provincial conservation authorities.

Figure 54: South Africa's most threatened group of plants is cycads; despite being on CITES, they continue to decline due to ongoing illegal harvesting for the specialist collectors trade. Photographs: J. Donaldson.

Figure 55: Examples of plant species threatened by international trade, such as species in the genus *Haworthia* (Asphodelaceae); haworthias are not yet included on the CITES appendices. Photographs: J. Vlok.

Target 11 Outcomes for 2020:

11.1. Non-Detriment Findings for all cycad species conducted.

11.2. Biodiversity Management Plan for Critically Endangered and Endangered cycads implemented.

11.3. Listing proposals for species threatened by international trade but not yet included on one of the CITES appendices completed.

11.4. Early warning system to flag new species potentially threatened by international trade implemented.

There are 852 South African plant taxa listed on the appendices to CITES. Forty-four of these are listed on Appendix I, meaning that commercial trade is not allowed. The majority of Appendix I species are cycads (91%). Despite being listed on CITES Appendix I, wild plants are still being illegally harvested. Two species of cycad have gone extinct in South Africa since 2005 and a further four are on the brink of extinction. Cycads are South Africa's most threatened group of plants and ensuring their protection is an urgent priority.

Of the 808 plant species included on Appendix II, 245 are in trade, while the rest are listed for look-alike reasons. Between 2012 and 2014, the Scientific Authority revised the plant species to be included on the list of Threatened or Protected Species (TOPS) (Section 56 of NEMBA). A total of 172 plant species are listed on TOPS as they are threatened by unsustainable use, however, only some are affected by international trade, with many being impacted by traditional medicinal plant trade or local horticultural trade. Some of the TOPS species threatened by international trade are not yet included on CITES. It is necessary that risk assessments are conducted for these taxa and that those at risk to the impacts of international trade are nominated for listing on CITES.

The majority of plants threatened by international trade are traded as specialist horticultural collectors' items. The fashion of plants included in specialist collections changes constantly. To protect many of South Africa's narrow endemics from being threatened in future by international trade, an early warning system must be developed.

OBJECTIVE 3

TARGET 11

Target 11: No species of wild flora endangered by international trade

Outcomes	Activities	Responsible Stakeholders	Timeframe
11.1. Non-Detriment Findings for all cycad species conducted.	11.1.1. NDFs for all cycads listed as Critically Endangered, conducted.	11.1.1. Scientific Authority.	11.1.1. 2015
	11.1.2. NDFs for all cycads listed as Endangered, Vulnerable, Near Threatened and Least Concern conducted.	11.1.2. Scientific Authority.	11.1.2. 2016
11.2. Biodiversity Management Plan for Critically Endangered and Endangered Cycads implemented.	11.2.1. Biodiversity Management Plan for the Critically Endangered and Endangered cycads published.	11.2.1. SANBI's Scientific Authority coordinating body and the Department of Environmental Affairs.	11.2.1. 2015
	11.2.2. Biodiversity Management Plans for the Critically Endangered and Endangered cycads implemented.	11.2.2.Provincial Conservation Authorities and the Department of Environmental Affairs.	11.2.2. Ongoing from 2015
11.3. Listing proposals for species threatened by international trade but not yet included on one of the CITES appendices, completed.	11.3.1. Species listed as Threatened or Protected in terms of NEMBA and traded internationally, identified.	11.3.1. SANBI's Scientific Authority coordinating body.	11.3.1.2015
	11.3.2. CITES listing proposals prepared for priority species threatened by international trade.	11.3.2. Scientific Authority.	11.3.2. 2016
	11.3.3. NDFs for species newly included on the CITES appendices conducted.	11.3.3. Scientific Authority.	11.3.3. 2020
11.4. Early warning system to flag new species potentially threatened by international trade implemented.	11.4.1. A process for the Internet monitoring of South African plant species developed.	11.4.1. SANBI's Scientific Authority coordinating body.	11.4.1. Annual
	11.4.2. Risk assessments for new species identified in trade conducted and appropriate conservation interventions proposed.	11.4.2. SANBI's Scientific Authority coordinating body.	11.4.2. Annual

Target 12: All wild-harvested plant-based products sourced sustainably

Contributors: N. Crouch, M. Pfab, V. Williams, A. Cunningham & D. Raimondo

Background

South Africa has well over 2 000 plant species that are recorded as used locally for medicinal purposes – more than a tenth of the total flora. In addition to medicine, many more species are used by rural communities for food, fuel, building materials and rituals. The total number of utilised plant species has not been determined. Between 2011 and 2014, the South African National Biodiversity Institute (SANBI) ran a process to determine which species are threatened or declining due to utilisation, and therefore requiring listing as threatened or protected in terms of South Africa's National Environmental Management: Biodiversity Act (NEMBA), Act No. 10 of 2004.

A total of 172 plant taxa were nominated for listing on the Threatened or Protected Species (TOPS) List. The four main utilisation pressures leading to species qualifying for listing are, in order of impact: collecting for the specialist horticultural trade (52% of species on TOPS); medicinal plant collecting for trade in local *muthi* markets (30%); cut flower harvesting (7%); and harvesting for formal biotrade (6%).

This target will focus on developing interventions to promote sustainability for plant-based products sourced for the specialist horticultural trade, the medicinal plant trade and for harvesting for formal commercial trade. Cut flower harvesting is dealt with under Target 6 of this strategy.

Specialist horticultural trade

Many of South Africa's unusual plants are in demand by local and international plant collectors. Illegal collection from wild populations takes place to supply this demand. Particularly vulnerable to illegal harvesting are slow growing species such as cycads, euphorbias and haworthias. Those species with restricted distributions are most at risk of becoming highly threatened or going extinct in the wild.

Local medicinal trade

About a third of all species known to be utilised for medicine (656 species) are traded in local *muthi* markets. Trade in traditional medicines was estimated at R2.9 billion per year in 2007, with at least 133 000 people employed in the trade – many of whom are rural-based women. Wild harvesting and trade in medicinal species is an important livelihood for low income communities in South Africa. The majority of medicinal plants occur and are utilised in the eastern parts of South Africa. The Red List of South African Plants (Target 2) shows that of the 656 medicinal plant species that are traded, 134 are not being sustainably sourced and subpopulations are undergoing rapid declines, with 56 of these already listed as threatened with extinction.

Due to the ongoing trend of urbanisation, most of the demand for medicinal plants comes from South Africa's urban centres. In order to service this demand, extensive unsustainable harvesting is taking place with whole subpopulations of important species already extirpated. Due to high levels of unemployment in South Africa, many individuals are opportunistically becoming involved in this trade. High levels of wastage of plant materials in the markets have been reported. Of concern is that South Africans who live in rural communal areas and who depend on ac-

Figure 56: *Siphonochilus aethiopicus*, wild ginger, a Critically Endangered medicinal plant. Photograph: C. Paterson-Jones.

cess to wild plants for their healthcare and general well-being, are having their plants stolen by opportunist *muthi* harvesters and traders. Urgent action is required to ensure the conservation of the 134 species in decline due to harvesting. Without a coordinated approach to this conservation issue, Target 12 of the GSPC is unattainable. There is evidently a need to establish systems to help protect medicinal plant species from unregulated harvesting for urban markets.

Formal biotrade

At least eight South African plants are harvested in very high volumes and sold commercially for medicine, teas or cosmetics. These species include *Pelargonium sidoides, P. reniforme, Harpagophytum procumbens and Aloe ferox*, which are used in the pharmaceutical industry and four species from the genus *Cyclopia*, used to produce honeybush tea. The high volumes involved are currently sourced from wild populations of these species, with offtake presenting a potential threat. The management of the trade of these taxa is regulated under Chapter 6 on Bioprospecting Access and Benefit Sharing (BABS) of the National Environmental Management: Biodiversity Act (NEMBA), Act No. 10 of 2004. Baseline resource assessments against which the impact of future harvesting can be measured have been undertaken thus far only for *P. sidoides* and *A. ferox*. Resource assessments are required for all of the remaining taxa in the biotrade category. Ongoing monitoring of the impacts of extraction for biotrade is required for these species, as are autecological studies to inform harvesting guidelines.

Figure 57: Mpondo diviner at Port St Johns in the Eastern Cape collecting plants. Photograph: T. Dold.

Figure 58: Trade in traditional medicinal is a significant industry in South Africa. Photographs: K. Sink and D. Raimondo.

OBJECTIVE 3

Target 12 outcomes for 2020

12.1. A landscape approach to the conservation of medicinal plants developed and implemented.

12.2. The option of substituting wild sourced medicinal plants with cultivated plants investigated.

12.3. The demand for wild sourced plants in the horticultural collector's trade diminished through increased availability of cultivated material.

12.4. Species harvested from the wild for the formal biotrade managed sustainably.

Figure 59: *Hoodia gordonii*. Photographs: C. Paterson-Jones.

TARGET 12

Target 12: All wild-harvested plant-based products sourced sustainably

Outcomes	Activities	Responsible stakeholders	Timeframe
12.1. A landscape approach to the conservation of medicinal plants developed and implemented.	12.1.1 Comprehensive baseline data for 134 medicinal species of conservation concern obtained by collating and georeferencing all herbarium specimens; by conducting targeted fieldwork across the eastern parts of the country and running a Medicinal Plant Atlas on iSpot.	12.1.1. SANBI, contracted independent botanists and iSpot users.	12.1.1. 2015–2016
	12.1.2. Priority areas for the conservation of medicinal plants identified through conducting a spatial biodiversity planning exercise. Priority areas identified in the plan categorised as: i) Resource conservation sites that require strict protection where no harvesting is allowed (preferentially located in protected areas and privately owned land). ii) Culturally significant resource use areas; those areas with a high diversity of plants used medicinally and for rituals (located in communal areas or on state land surrounding urban areas).	12.1.2. SANBI's Scientific Authority and contracted conservation planner.	12.1.2. 2016–2017
	12.1.3. Projects to establish sustainable utilisation programmes for three culturally significant resource use areas piloted.	12.1.3. SANBI to contract service provider using GEF 5 funding.	12.1.3. 2017–2020
12.2. The option of substituting wild sourced medicinal plants with cultivated plants investigated.	12.2.1. A systematic review to evaluate the social context of the demand, and related trends (historic, current and future) in medicinal plant markets undertaken.	12.2.1. Anthropologist commissioned by Wildlife Economy section SANBI	12.2.1. 2015–2016
	12.2.2. A systematic review of the economics of the trade and use of medicinal plants in South Africa and its contribution to the healthcare of its citizens undertaken.	12.2.2. Resource economist commissioned by Wildlife Economy section of Biodiverstiy Research, Assesment and Monitoring Division (BRAM) in SANBI.	12.2.2. 2015–2016
	12.2.3 Based on the results of the systematic reviews (12.2.1. & 12.2.2.), the feasibility of state-subsidised cultivation of 50 species to replace wild sourced material investigated.	12.2.3. Wildlife Economy section of BRAM in SANBI.	12.2.3. 2018

Target 12: All wild-harvested plant-based products sourced sustainably (cont.)

Outcomes	Activities	Responsible stakeholders	Timeframe
12.3. The demand for wild sourced plants in the horticultural collector's trade diminished as a result of cultivated material being made available.	12.3.1. A strategy devised to secure mother stock for ex situ propagation to supply the specialist horticulture market.	12.3.1. SANBI (Scientific Authority) and SANBI Gardens).	12.3.1. 2018
	12.3.2. Economic incentives for the conservation of wild cycad populations developed, involving the propagation of wild-harvested seeds for augmentation of wild populations and for trade purposes in accordance with CITES Resolution Conf. 11.11 (Rev. CoP15).	12.3.2. SANBI (Scientific Authority).	12.3.2. 2018
	12.3.3. Taxonomists encouraged to facilitate the provision of mother stock to specialist growers for long-lived, slow-growing species as soon as possible after the discovery of the species.	12.3.3. SANBI (Threatened Species Programme).	12.3.3. 2018
12.4. Species harvested from the wild for biotrade managed sustainably.	12.4.1. Resources assessments commissioned for five commercially harvested species.	12.4.1. DEA Bioprospecting, Access and Benefit-Sharing (BABS) unit.	12.4.1. 2020
	12.4.2. Harvesting permits ensuring sustainable extraction of resource in accordance with findings of resource assessments.	12.4.2. Provincial conservation agencies.	12.4.2. Annual
	12.4.3. Resource assessment data centralised in a single database to be used as a baseline for future monitoring.	12.4.3. SANBI Scientific Authority.	12.4.3. 2017
	12.4.4. Autecological studies conducted and harvesting guidelines produced that also take social and cultural factors into account.	12.4.4. Ecology students with funding from SANBI's Scientific Authority.	12.4.4. 2016–2020
	12.4.5. Monitoring conducted of status of populations for priority bio-traded species.	12.4.5. SANBI Scientific Authority.	12.4.5. 2020

Figure 60: *Clivia miniata* from the Amaryllidaceae family is threatened by collecting for the local medicinal trade in South Africa.
    Photograph: C. Paterson-Jones.

OBJECTIVE 3

TARGET 12

OBJECTIVE 3

Target 13: Indigenous and local knowledge innovations and practices associated with plant resources maintained or increased as appropriate to support customary use, sustainable livelihoods, local food security and healthcare

Contributors: N. Crouch, B-E. van Wyk & D. Raimondo

Background

South Africa has rich ethnic and cultural diversity, and its biodiversity is of global significance. There is a strong link between cultural and biological diversity (bio-cultural diversity) with large numbers of indigenous species, particularly plants (well over 2 000 taxa), used for traditional medicine and in rituals by local ethnic groups. Indigenous Knowledge (IK) practices are being researched to document the cultural and spiritual value of plants to different South African ethnic groups. For over a century, ethnobotanical studies have been undertaken reflecting the knowledge of the Zulu, Khoikhoi, Xhosa and the Sotho, amongst other groups. Much work on documenting indigenous knowledge remains to be done in South Africa. There has been little research and documentation of certain ethnic groups who have rich bio-cultural practices such as the Venda, the Pedi and the Pondo. Particularly urgent is the need to further document and conserve indigenous plant knowledge of the Khoikhoi and San people, who are endemic to southern Africa and represent the most ancient cultural traditions in the world. In addition, research is required that explores plant usage patterns linking different ethnic groups.

Figure 61: A diviner-in-training preparing dream root (*isilawu*, *Silene undulata*). Photograph: T. Dold.

With an ever-increasing number of South Africans entering into the formal economy and moving from rural to urban lifestyles, there is ongoing erosion and profound loss of indigenous knowledge. This forfeiture of knowledge is particularly evident amongst the younger generation. A high priority for South Africa is capturing the insights and traditions of elderly indigenous knowledge holders before it is lost. Based on South Africa's rich bio-cultural diversity, there is ongoing interest in bioprospecting, a value-adding process informed in part by traditional practices.

In order to protect Indigenous Knowledge Systems (IKS) an IKS Policy was adopted by Cabinet in 2004. This policy identifies the need to establish a recordal system; one in which communities, guilds and individual IK holders can record their knowledge to advance future economic benefits and social good. In response, the National Indigenous Knowledge Systems Office (NIKSO), established by the Department of Science and Technology (DST), set up the National Recordal System (NRS) in 2013. The NRS works with communities throughout South Africa to capture indigenous knowledge, starting with knowledge relating to African traditional medicine and indigenous foods, and will be developed at a later stage to include arts, crafts and farming practices. This system is unique in that it records African IK in its original oral format, links it to a complex metadata scheme, and provides the necessary mechanisms for both positive and defensive protection. The first objective of this strategy is the full roll-out of the NRS in recording IK on traditional medicine and indigenous foods.

Given the rapid loss of IK in South Africa, an urgent need remains to continue with academic research in collaboration with previously understudied ethnic groups to ensure that their indigenous knowledge is fully documented. The dual strategy of conducting academic research and promoting a NRS is financially supported by the Department of Science and Technology (DST), with the academic research component supported through the National Research Foundation (NRF). There is a need to ensure that published information on indigenous knowledge is centralised, as currently this information is scattered across the scientific and popular literature. There has been some progress made over the past decade towards centralising information, for example, the South African

TARGET 13

National Biodiversity Institute (SANBI) has put together the National Medicinal Plants Database for South Africa (MEDBASE), which holds data on the 300 most important traditional medicinal plants of southern Africa. This database needs to be linked to the checklist of South African plants, served online and expanded over the next five years.

Figure 62: Diviners at the graduation ceremony of a trainee diviner (wearing a crown of dream root – *Behnia reticulata*). Photograph: T. Dold.
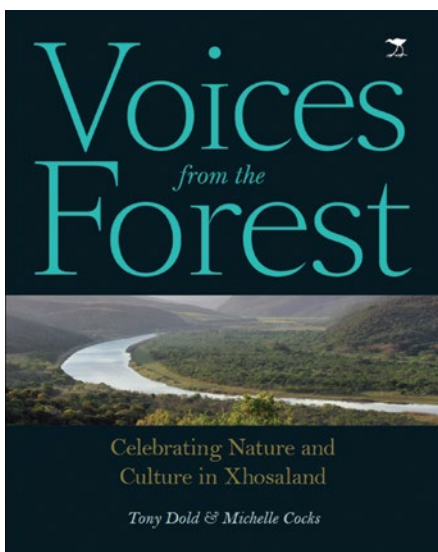
Figure 63: *Voices from the forest*, a publication on the indigenous knowledge of the Xhosa people written by T. Dold & M. Cocks.

Figure 64: *Isiqhobo*, *Eriosemopsis subanisophylla*, roots being prepared in Pondoland. Photograph: S. Zukulu.

OBJECTIVE 3

TARGET 13

Target 13 outcomes for 2020

13.1. The National Recordal System capturing and safeguarding indigenous knowledge.

13.2. Studies conducted to capture indigenous knowledge related to plant use by ethnic groups in regions not yet definitively researched.

13.3. A national database on indigenous plant use knowledge available online.

Figure 65: Indigenous knowledge being shared by local Pondo knowledge holder, Umnumzana Shezi, at a plant conservation workshop held at Umtamvuma Nature Reserve, KwaZulu-Natal. Photograph: I. Nanni.

Figure 66: Extensive harvesting of plants from the wild takes place in South Africa particularly for supporting healthcare needs of rural South Africans. Photograph. V. Williams.

Target 13: Indigenous and local knowledge innovations and practices associated with plant resources maintained or increased as appropriate to support customary use, sustainable livelihoods, local food security and healthcare

Outcomes	Activities	Responsible stakeholders	Timeframe
13.1. The National Recordal System capturing and safeguarding indigenous knowledge.	13.1.1. At least one NRS node established in each of South Africa's nine provinces.	13.1.1. DST National Indigenous Knowledge Systems Office (NIKSO).	13.1.1. 2020
	13.1.2 Plant IK held by selected communities of diverse ethnicity in each province recorded.	13.1.2. DST NIKSO.	13.1.2. 2015–2020
	13.1.3. IK captured and vouchered with herbarium specimens that have been lodged at a registered herbaria.	13.1.3. DST NIKSO.	13.1.3. 2015–2020
13.2. Studies conducted to capture indigenous knowledge related to plant use by ethnic groups in regions not yet definitively researched.	13.2.1. Surveys conducted with communities not yet definitively researched using quantitative methods that allow for comparisons of knowledge between ethnic groups.	Universities in South Africa. A few examples of work currently underway include: Indigenous knowledge of the Xhosa – Rhodes University. Indigenous knowledge of the Pedi from Sekhukhuneland – University of Johannesburg and Botanical Society of South Africa. Indigenous knowledge of the Venda – universities of Johannesburg and Pretoria.	2015–2020
	13.2.2. Surveys conducted according to internationally accepted standards of ethics, ensuring that the principle of educated prior informed consent is adhered to.		
	13.2.3. Knowledge documented in a manner that incorporates as many different knowledge holders from within a specific community as feasible to facilitate comparison between individual knowledge holders, different cohorts within a community, and to identify differences between communities.		
	13.2.4. Knowledge providers properly acknowledged in publications and appropriate feedback provided.		
13.3. A national database on indigenous plant use knowledge available online.	13.3.1. Existing SANBI plant use databases augmented with additional utilised species data, ensuring that for all species the scientific name, common name in local languages, and main medicinal uses are provided, together with references.	13.3.1. SANBI.	13.3.1. 2020
	13.3.2. Information from the database linked to the South Africa's plant checklist and served online.	13.3.2. SANBI.	13.3.2. 2020

OBJECTIVE 3

TARGET 13

Objective IV:

Education and awareness about plant diversity, its role in sustainable livelihoods and importance to all life on earth is promoted

Target 14: The importance of plant diversity and the need for its conservation incorporated into communication, education and public awareness programmes

Contributors: C. Browne, M. Cocks, A. Hitchcock & D. Raimondo

Background

South Africa has a long history of running public awareness programmes for plant diversity and conservation, such as through the South African National Biodiversity Institute (SANBI) linked to the ten botanical gardens across the country. SANBI has a strong synergistic association with the Botanical Society of South Africa (BotSoc), and both run public awareness programmes such as the Custodians of Rare and Endangered Wildflowers (CREW).

The formal education system in South Africa includes sections on biodiversity in the high school curriculum, and specifically deals with plant diversity and human influences on ecosystems. Beyond high school, many tertiary institutions have courses focusing on plant diversity and conservation, ranging from being strictly botany focused to courses in nature conservation/management.

Figure 67: Bio-cultural lessons as part of the Inkcubeko Nendalo project, Grahamstown in the Eastern Cape. Photograph: T. Dold.

Apart from the formal education curriculum, South Africa has set aside several days each year to commemorate issues relevant to this target, such as Arbor Day, and commemorate pertinent international days, such as International Biodiversity Day, World Environment Day etc. There are also many initiatives that bring together government and non-governmental organisations (NGOs) in achieving public awareness and action towards plant conservation.

Challenges

Although issues of plant diversity and conservation are included in the school curriculum, the majority of schools are not equipped with either the teachers or facilities to effectively achieve the goals of the curriculum. Furthermore, analysis of the examinations done at the end of high school (National Senior Certificate) show that students fare particularly poorly in environmental studies (National Senior Certificate 2013: Diagnostic report, Department of Basic Education).

Figure 68: Learners from Lwandle township near Somerset West in the Western Cape taking part in monitoring plants as part of Arbor Day celebrations. Photograph: I. Ebrahim.

Figure 69: Learning about plants on a school heritage outing to Woody Cape in the Eastern Cape. Photograph: M. Cocks.

Figure 70: Volunteers from the CREW programme in the field helping City of Cape Town staff with biodiversity assessments. Photograph: I. Ebrahim.

OBJECTIVE 4

Target 14 outcomes for 2020

14.1. Plant conservation included in the life science curriculum across South Africa.

Education: plant conservation needs to be incorporated into the school curriculum at provincial level to ensure that the curriculum is relevant to local language(s)/culture(s) and biome(s). A blanket curriculum intervention for South Africa will lose an enormous opportunity to engage at a local level. Currently plant conservation is poorly supported mainly due to lack of locally relevant material available to educators. One way to gain support and understanding is to introduce the concept of bio-cultural diversity at schools. The Grade 10 Life Science curriculum provides a perfect platform for this. An excellent pilot of such an intervention is the Inkcubeko Nendalo Bio-Cultural Diversity Conservation Programme, http://www.bioculturaldiversity.co.za run by Rhodes University in the Eastern Cape. This programme gets learners interested in plant diversity and conservation by studying how plants form an integral part of their culture. These types of education interventions need to be replicated in other provinces.

14.2. Plant conservation awareness expanded by exposure to botanical gardens and by involving the public in citizen science projects.

Creating awareness by involving the public in citizen science projects: engaging the public in monitoring plant diversity helps raise awareness of plant conservation issues and a sense of community responsibility for caring for the environment. Examples of popular and ever-growing citizen-science interventions include the CREW programme and the iSpot virtual museum. CREW involves volunteers from the public, mostly from rural areas, in the monitoring and conservation of rare and threatened plants, http://www.sanbi.org/programmes/threats/crew, while iSpot is an exciting and interesting website that allows anyone with an interest in nature to share their observations and passion with a network of like-minded enthusiasts by posting digital photographs of plants observations online. This makes it a virtual museum of plant information. In addition to being a virtual museum, it is a social hub for nature enthusiasts and an increasingly valuable database on species occurrences, see www.ispot.org.za.

14.3. Plant conservation promoted in relevant media.

Media: currently there is very little-media coverage for plant conservation and better coverage on social media platforms is required. Key persons from within the Plant Conservation Network need to be identified as designated 'Talking Heads' and to foster relationships with media outlets. Members of the Plant Conservation Network active on Social Media platforms such as blogging, Facebook, Twitter etc. need to promote plant conservation information on their platforms.

Figure 71: Bio-cultural learners taking part in the Inkcubeko Nendalo project; observing nature in an undisturbed forest patch near Grahamstown in the Eastern Cape. Photograph: T. Dold.

TARGET 14

Target 14: The importance of plant diversity and the need for its conservation incorporated into communication, education and public awareness programmes

Outcomes	Activities	Responsible stakeholders	Timeframe
14.1. Plant conservation included in the life science curriculum across South Africa.	14.1.1. Educational materials developed for teaching Grade 10s relevant to each of South Africa's nine provinces. A curriculum-aligned module designed and trialled with a pilot school in each province.	14.1.1. Education consultant (funded by BotSoc).	14.1.1. 2015–2020
	14.1.2. The network of botanists involved in this strategy assisting in the development of appropriate educational material.	14.1.2. Education consultant (funded by BotSoc).	14.1.2. 2015–2016
	14.1.3. SANBI National Botanical Gardens are outdoor classrooms for learners, with curriculum-linked educational activities being offered.	14.1.3. SANBI education department developing resources in collaboration with garden's horticulturists.	14.1.3. 2015–2020
	14.1.4. Groups of botanists taking school learners on field excursions, especially on days such as Arbor Day.	14.1.4. Volunteers from across the country involved in the CREW programme.	14.1.4. 2015–2020
14.2. Plant conservation awareness expanded by exposure to botanical gardens and by involving the public in citizen science projects.	14.2.1. Plant conservation promoted in SANBI National Botanical Gardens through labelled and interpreted living plant displays, talks and demonstration gardens to educate and create awareness about the importance of plant diversity and conservation.	14.2.1. SANBI Gardens & Education.	14.2.1. 2015–2020
	14.2.2. The number of individuals able to participate in iSpot expanded by developing apps compatible with android cell phones.	14.2.2. Open University from the United Kingdom responsible for the development of iSpot.	14.2.2. 2015
	14.2.3. Educational activity developed for learning about plants using the iSpot website, ensuring this activity is available as part of the iSpot website and being used in schools.	14.2.3. iSpot team SANBI and education consultant.	14.2.3. 2017
	14.2.4. The number of volunteers involved in the CREW programme expanded to ensure that CREW works in all areas where threatened plants are concentrated.	14.2.4. CREW programme implemented by SANBI and BotSoc.	14.2.4. 2020
14.3. Plant conservation is promoted in relevant media.	14.3.1. Newspaper, magazine articles, and popular books on plant conservation produced.	14.3.1. Plant Conservation Network.	14.3.1. 2015–2020
	14.3.2. Plant conservation stories, especially those linked to the 16 targets of this strategy, are featured on television and social media platforms.	14.3.2. Plant Conservation Network, SANBI Marketing and BotSoc.	14.3.2. 2015–2020

OBJECTIVE 5

Objective V:

The capacities and public engagement necessary to implement the Strategy have been developed

Target 15: The number of trained people working with appropriate facilities sufficient according to national needs, to achieve the targets of this Strategy

Contributors: J. Kioko, C. Browne & D. Raimondo

Background

Within the tertiary education sector, a wide variety of courses are offered in fields that contribute to training in plant conservation. All 23 public universities offer environment-related courses at various levels (from short courses to post-graduate programmes).

Although there are courses, infrastructure and capacity to support plant conservation in South African higher education institutions, access to higher education is particularly low in the country (only about 16% of young people who should be at university, actually are), and the graduation rates are undesirably low (on average, only about 40% of those enrolled for undergraduate degrees or diplomas complete their courses). Furthermore, many of the successful graduates do not find employment, with students from previously disadvantaged backgrounds being grossly over-represented among the unemployed. This level of unemployment is in spite of a demonstrated shortage of appropriately skilled graduates for the biodiversity sector. Thus, there seems to be a persistent mismatch between the supply of trained graduates and the skills required. The plant conservation field is not exempt from this mismatch. In response to this challenge in 2009, South Africa produced the Biodiversity Human Capital Development Strategy. This strategy aims to address South Africa's shortage of skills to manage its biodiversity and improve historical inequalities in the sector.

One valuable intervention catalysed by the Biodiversity Human Capital Development has been the Groen Sebenza programme for developing young conservation practitioners across South Africa. The programme is a partnership between SANBI and 33 organisations from all tiers of government, non-governmental organisations (NGOs) and the private sector. Groen Sebenza is based on an 'incubator model' giving the 800 participating youth workplace experience through a structured mentoring programme, together with skills development and training opportunities for a period of two-and-a-half years from April 2013 to December 2016. Five hundred graduates and 300 school leavers (matriculants) referred to as 'pioneers' are placed within one of the 33 partner organisations for the duration of the project. Funding for this programme comes from National Treasury's Jobs Fund, and is being channelled into the conservation sector by the Development Bank of South Africa (DBSA). As part of each placement, training is provided. This training includes general job place training such a project management skills, conflict resolutions skills etc. It also includes specific training relevant to the specialist field of the plant conservation project that the intern is in. For example, Groen Sebenza pioneers placed with the Botanical Society and working on threatened plants, receive intensive training on how to conduct Red List Assessments and also how to conduct monitoring of threatened plants in the field. It is highly likely that there will be a second phase of the Groen Sebenza programme implemented between 2016 and 2019.

A second valuable mentorship opportunity is offered by the National Research Foundation (NRF) of the Department of Science and Technology (DST). Through the DST–NRF internship programme, unemployed science graduates and postgraduates are afforded an opportunity to acquire practical work experience and improve their competencies through exposure to a research environment. Graduates are placed for one year in various in South African scientific research institutions. Many receive placements in conservation projects within biodiversity research institutions. The DST–NRF internship programme is a long-term programme implemented on an annual basis.

TARGET 15

Figure 72: Red List training for Groen Sebenza pioneers. Photograph: D. Raimondo.

Figure 73: Students from the University of KwaZulu-Natal & Durban University of Technology taking part in fieldtrips to monitor threatened plants. Photograph: B. Bytebier & S. Parbhoo.

OBJECTIVE 5

TARGET 15

Target 15 outcomes for 2020

15.1. Conservation courses offered in South Africa's universities aligned with skills needed in the field of plant conservation.

15.2. Work place mentorship opportunities available in plant conservation programmes.

South Africa has a strong history of botanical research, however, despite this there a still a number of areas of plant conservation where there is lack of appropriate skills. These areas were identified in 2013 as part of a workshop to develop this National Plant Conservation Strategy. The three most urgent skills development interventions required include:

1) Promoting applied ecology and ethnobotanical studies in universities to ensure skills exist to sustainably manage the over-utilisation of South Africa's plant species. This intervention will help South Africa achieve Target 11, Target 12 and Target 13.
2) Developing skills amongst conservation graduates to assess the quality of Environmental Impact Assessments and to conduct law enforcement processes linked to land-use rights. This intervention will allow South Africa to achieve Target 5 and Target 7.
3) Reversing the declining trend in the foundational science of plant taxonomy. This declining trend is affecting South Africa's ability to achieve Target 1, Target 2 and Target 3 of this strategy.

Figure 74: The CREW Programme, jointly implemented by BotSoc and SANBI, has organised for fifteen Groen Sebenza pioneers to take part in monitoring plants in rural areas. Groen Sebenza pioneers working with CREW are recruited from rural communities to help conduct taxonomic and ecological research in the areas that they live in. They collect specimens of plants in their respective areas, which are all under-collected parts of South Africa. In addition they conduct interviews within their respective communities to document traditional uses of local plants. Photographs: G. Grieve and T. Dold.

Target 15: The number of trained people working with appropriate facilities sufficient according to national needs, to achieve the targets of this Strategy

Outcomes	Activities	Responsible stakeholders	Timeframe
15.1. Conservation courses offered in South Africa's universities aligned with skills needed in the field of plant conservation.	15.1.1. GreenMatter partnership, responsible for the implementation of the Biodiversity Human Capital Development Strategy aware of critical skills required for plant conservation and appropriate interventions being made.	15.1.1. BotSoc.	15.1.1. 2015
	15.1.2. Workshops hosted that bring together conservation practitioners and staff from South Africa's Universities of Technology that offer Nature Conservation and Horticultural Diplomas to identify skills required for improved environmental management, law enforcement and *ex situ* conservation.	15.1.2. BotSoc.	15.1.2. 2016
	15.1.3. Course convenors of postgraduate university courses in conservation at the University of Cape Town (UCT), University of Witwatersrand (Wits) and University of Stellenbosch aware of and teaching students about the conservation priorities as identified in this strategy and the NBSAP.	15.1.3. Postgraduate course convenors at UCT, Stellenbosch and Wits, Strategy for Plant Conservation coordinator (SANBI).	15.1.3. 2015–2017
15.2. Work place mentorship opportunities available in plant conservation programmes.	15.2.1. Plant conservation research programmes continue to host interns supported by the DST–NRF Internship programme.	15.2.1. Plant Conservation Network.	15.2.1. Ongoing
	15.2.2. Internship opportunities as part of the Groen Sebenza Programme available in plant conservation programmes.	15.2.2. Plant Conservation Network.	15.2.2. Ongoing
15.3. Promote postgraduate research studies required to ensure the conservation of South Africa's plant species.	15.3.1. Bursaries provided for taxonomic revisions of priority genera identified in the paper: 'Taxonomic research priorities for the conservation of the South African flora', Von Staden et al. 2013.	15.3.1. SANBI and DST–NRF.	15.3.1. Ongoing
	15.3.2. Bursaries provided for applied ecology and ethno-botanical studies to research sustainable harvesting requirements of South Africa's most highly utilised plant species.	15.3.2. Scientific Authority of South Africa and DST–NRF	15.3.2. Ongoing

OBJECTIVE 5

Target 16: Institutions, networks and partnerships for plant conservation established or strengthened at national, regional and international levels to achieve the targets of this Strategy

Contributor: D. Raimondo

Background

South Africa has strong institutional capacity and a rich history of creating networks to promote plant conservation. The South African National Biodiversity Institute (SANBI), formerly the National Botanical Institute, is a branch of the Department of Environmental Affairs (DEA), and monitors and reports on the status of species and ecosystems and provides planning and policy advice to help safeguard all of South Africa's biodiversity. SANBI is the focal point for the implementation of the National Plant Conservation Strategy.

Nine provincial conservation authorities and the South African National Parks (SANParks) manage protected areas and implement conservation of plant diversity outside of reserves.

The Botanical Society of South Africa (BotSoc), established in 1913, has been promoting the conservation and wise-use of South Africa's rich flora for over 100 years. The society now has over 20 000 members spread across the world.

Research institutions and collaborations are also strong. The South African Association of Botanists (SAAB) meets annually and represents a wide range of academic botanical disciplines, with members located at different South African universities, and academic and research institutions.

To protect South Africa's unique biomes and to promote applied conservation research for these areas, specific biome-based research and conservation forums have been established; these include the Fynbos Forum, the Arid Zone, the Thicket Forum, and the Grassland Society of South Africa.

Research into indigenous knowledge of plants and their sustainable use is promoted by the Indigenous Plant Use Forum.

Figure 75: South Africa has strong networks in place for plant conservation; shown hear are stakeholders including conservation officials, citizen scientists and local indigenous knowledge holders at a threatened plants workshop held at Umtamvuna Nature Reserve, KwaZulu-Natal, South Africa. Photograph: G. Grieve.

TARGET 16

Since 2003 the capacity to conserve and monitor South Africa's unique flora has been expanded by enabling members of the public to work as citizen scientists. The Custodians of Rare and Endangered Wildflowers (CREW) programme is a vehicle through which conservation-minded citizens can participate in national plant conservation work. A powerful network has been established over the past decade by linking professional botanists and citizen scientists via the CREW programme. CREW members monitor and conserve threatened plants.
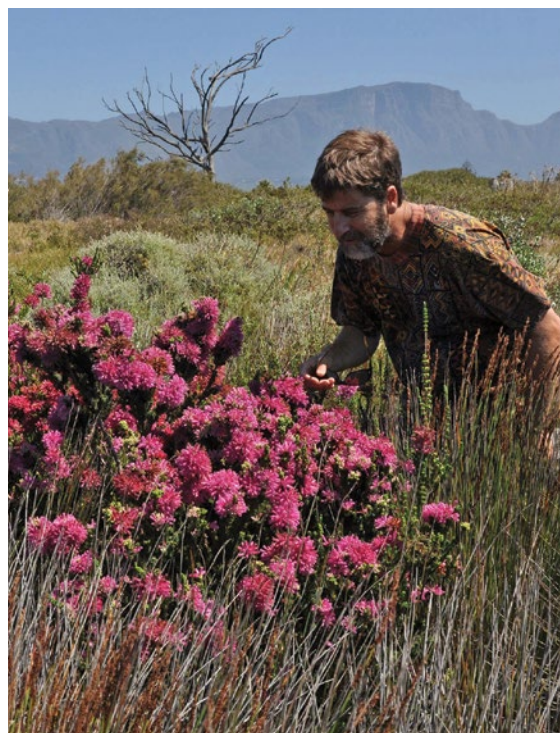

Figure 76: Citizen scientists from the CREW programme working with field rangers to monitor and protect threatened plants in the Western Cape.

OBJECTIVE 5

TARGET 16

Target 16 outcomes for 2020

16.1. A South African network for plant conservation effectively implementing and updating the Strategy for Plant Conservation.

16.2. Working groups for each target ensuring that specified outputs are being achieved.

Given South Africa's strong conservation and research capacity, the only necessary intervention to help promote plant conservation is coordination around specific areas of work. In March 2013, 46 conservationists and botanists representing a wide range institutions and organisations met to develop South Africa's Strategy for Plant Conservation. Working groups for each of the 16 targets were established and these groups are now responsible for ensuring that progress is made towards achieving each of the outputs listed under the targets. The organisations that took part in developing this plant conservation strategy and are actively involved in its implementation are listed on page iv. Many independent botanists are also involved and committed to the implementation of this strategy.

Target 16: Institutions, networks and partnerships for plant conservation established or strengthened at national, regional and international levels to achieve the targets of this Strategy.

Outcomes	Activities	Responsible stakeholders	Timeframe
16.1. A South African network for plant conservation effectively implementing and updating the Strategy for Plant Conservation.	16.1.1. A workshop for all botanists and conservationists involved in plant conservation strategy organised to monitor progress of the strategy.	16.1.1. BotSoc and SANBI to organise.	16.1.1. Biannually (2016, 2018, 2020)
	16.1.2. Outputs for each target and individuals responsible updated as needs are identified.	16.1.2. Focal point for South Africa's National Plant Conservation Strategy.	16.1.2. Biannually (2015, 2017, 2019)
16.2. Working groups for each target ensuring that specified outputs are being achieved.	16.2.2. Annual update reports written on work progress and posted online.	16.2.2. Working group coordinators.	16.2.2. Annual
	16.2.3. Case studies, scientific papers, images and video links of work being done posted online.	16.2.3. Working Group coordinators and all stakeholders working to help achieve this strategy.	16.2.3. Annual

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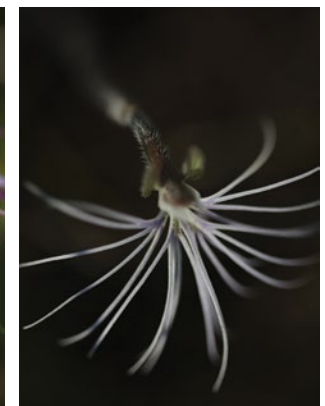
Photographs (top and left): D. Kirkwood

Photographs: D. Kirkwood

South Africa is signatory to the
Convention on Biological Diversity and is
committed to the implementation of a
national strategy to conserve plants that
aligns with the Global Strategy for Plant
Conservation (GSPC). With 6% of the
world's plant diversity and strong
botanical and conservation capacity,
South Africa is well placed to make a
significant contribution to plant
conservation globally. This document
presents South Africa's Strategy for Plant
Conservation. It includes 16 outcome
oriented targets, each of which, if
implemented well, will help lead to
improved conservation of South Africa's
plants. The targets include work that
ranges from the description, assessment
and conservation (*in situ* and *ex situ*) of
South Africa's plants; to work on the
sustainable utilisation of plant species. In
South Africa, plant conservation is not
done in isolation of other biodiversity
conservation work. This Strategy for Plant
Conservation aligns with South Africa's
updated National Biodiversity Strategy
and Action Plan. Each of the outcomes in
this plant strategy is either directly
represented or nested under one of the
activities of the NBSAP. Under the
leadership of the South African National
Biodiversity Institute (the focal point for
the implementation of the GSPC
nationally), and with support from the
Botanical Society of South Africa, a
network of botanists and conservationists
has been developed that includes
conservation agencies, NGOs and
academic institutions. It is this strong
network that will ensure that South
Africa's Strategy for Plant Conservation is
implemented by 2020.