Biodiversity Finance Initiative South Africa

Biodiversity Finance Needs Assessment

Final Report

December 2016

Acknowledgements

The Biodiversity Finance Needs Assessment involved may people and the writers would like to acknowledge the:

- Leadership and support from the Department of Environmental Affairs (DEA), the lead organisation of BIOFIN South Africa, Wilma Lutsch, Lucia Motuang and Ipeleng Machwisa.
- Leadership and support from the BIOFIN South Africa Project Leader, Tracey Cumming, and other SA BIOFIN team members, Hugo van Zyl, Juan Bester and Kamleshan Pillay. Hugo van Zyl is additionally thanked for his expert inputs and guidance.
- Support from the United Nations Development Programme (UNDP), specifically Maria Mbengashe and Aubrey Manamela at the UNDP Country Office, and David Meyers, Onno van den Heuvel, Fabiana Issler and Marlon Flores and Annabelle Trinidad of the UNDP Global BIOFIN Team.
- The BIOFIN South Africa Steering Committee, namely Ronette Engela of National Treasury, John Dini of South African National Biodiversity Institute (SANBI), Tertius Carinus of South African National Parks (SANParks), Joe De Beer and Robert Parry of Statistics South Africa (Stats SA) and Wilma Lutsch of DEA.
- Guidance, pragmatism and support from the technical reference group members, namely Tom Bouwer (SA Tourism), Deshni Pillay (SANBI), Saliem Fakir (WWF-SA), Ricardo Andrews (National Treasury), Pravin Pillay (EKZNW), and Wilma Lutsch (DEA).
- Many people who made themselves available for one-on-one meetings and gave comments on the draft Biodiversity Finance Needs Assessment.
- The BIOFIN donors, namely the European Union and Governments of Germany, Switzerland, Norway and Flanders.

Executive Summary

South Africa is one of the most biodiverse country in the world, recognised globally for its outstanding species diversity and endemism, as well as diversity of ecosystems. Nine terrestrial biomes are to be found within the country, namely thicket, desert, grassland, forest, fynbos, savanna the Indian Ocean Coastal Belt, Nama karoo and Succulent karoo, in addition to diverse wetland ecosystems, rivers, estuaries, marine and coastal ecosystems.

Biodiversity and well-functioning ecosystems make an important contribution to South Africa's socio-economic development. Well-management catchments deliver clean water to communities. Healthy soil, rangelands and plants support food security. Intact ecological infrastructure, such as wetlands and intact foredunes, help reduce the impact of disasters on built-infrastructure. The country's vast array of natural landscapes and indigenous species support the ecotourism industry, contributing to the GDP and creating jobs.

Many of South Africa's areas of high biodiversity are under increasing pressure, and three globally recognised hotspots have been identified in the country. The recent National Biodiversity Assessment (Driver, et al., 2012) shows that more than 18% of South Africa's natural terrestrial biomes have been lost. Over 40% of the country's ecosystem types are threatened, of which 9% is critically endangered (Government of South Africa, 2014). Loss and degradation of natural habitat is a primary pressure on biodiversity in terrestrial, freshwater and marine environments.

South Africa's revised National Biodiversity Strategy and Action Plan (NBSAP) was completed in 2015, setting out the prioritised programmes of work for the biodiversity sector from 2015 to 2025. The NBSAP was developed in a collaborative approach, drawing on input from NGOs, public sector entities and a number of relevant government departments. The 112 activities all aim to achieve the vision of the NBSAP, to *"Conserve, manage and sustainably use biodiversity to ensure equitable benefits to the people of South Africa, now and in the future"*. The NBSAP activities where prioritised into high, medium and low by stakeholders as part of the NBSAP process.

This report presents the results of a Finance Needs Assessment for the biodiversity sector. Two separate assessments were conducted, one attempting to determine a cost to implement the revised NBSAP, and the other to provide an estimate of the funding gap for the biodiversity sector as a whole. This study forms part of broader programme of work on biodiversity finance, implemented through the Biodiversity Finance Initiative, or BIOFIN.

BIOFIN is a global project implemented through the United Nations Development Programme (UNDP), currently being implemented at a national level in 30 countries around the world. In South Africa, BIOFIN is implemented by DEA with the UNDP. BIOFIN is designed to respond to the global challenge of addressing global biodiversity loss and change while attaining national sustainable development.

The aim of BIOFIN is to narrow the funding gap for biodiversity at a country level. Through this process, the project also aims to develop a globally-led methodology for better understanding biodiversity funding needs, expenditure on biodiversity, and identifying 'finance solutions' for closing the funding gap.

This document:

- Explains the BIOFIN Initiative and the approach, methodology and tools used in the Finance Needs Assessment (Section 1).

- Provides a short overview of South Africa's revised NBSAP, which covers a ten year period from 2015 to 2025, with a description of each of the NBSAP Strategic Objectives (Section 2).
- Summarises the findings of the costing assessment (by Strategic Objective, BIOFIN Taxonomy and lead institution) (Section 3)
- Presents and estimated gap analysis for the biodiversity sector (Section 4).
- Concludes with several key points recommendations (Section 5).

Of the NBSAP's 112 activities, it was possible to cost 76 activities. The total overall cost to implement these activities amounts to R86.88 billion (including inflation) and R62.98 billion (excluding inflation) over 10 years (2015/16 to 2024/25). The major cost drivers are associated with the restoration and maintenance of ecological infrastructure (around R57 billion over ten years), expanding the protected area estate and conservation area networks (around R10 billion based on the most cost effective scenario), improving the management effectives of state protected areas (around R13 billion). These activities full under Strategic Objectives 1 and 2 of the NBSAP (as shown in the upper portion of Figure A below). The NBSAP Strategic Objectives 3 – 6 are less costly (as shown in the lower portion of Figure A below).

The mechanism for protected area expansion greatly influences the overall cost. As the relative proportional use of different mechanisms for expansion in the future is not certain, three scenarios for protected area expansion are used to compare implementation costs and one scenario (Scenario 2) is selected for the purpose of analysis and summarizing projected implementation costs in the rest of the results (see section 3.1.1). Scenario 2 is a potential future scenario as deduced from the revised National Protected Area Expansion Strategy (NPAES), which estimates that 86% of new protected areas will be created through private protected areas, 8% through the declaration of state owned land, and the remaining 6% through land purchase by the state.

The year-on-year increases largely reflect the costs associated with meeting protected area expansion targets and upscaling of the ecological infrastructure restoration and maintenance. A slight decrease and levelling off of costs between 2019/20 and 2021/22 reflects the achievement of targets for many activities which have a 5 year timeframe linked to South Africa's Medium Term Strategic Framework (MTSF). The major drivers of the increased costs in Strategic Objective 3 in 2017/18 are two activities that have to be actioned across all municipalities in South Africa, namely the development of invasive species monitoring, control and eradication plans and integrating biodiversity priority areas into spatial development frameworks (SDFs), integrated development plans (IDPs) and land-use schemes (LUS).
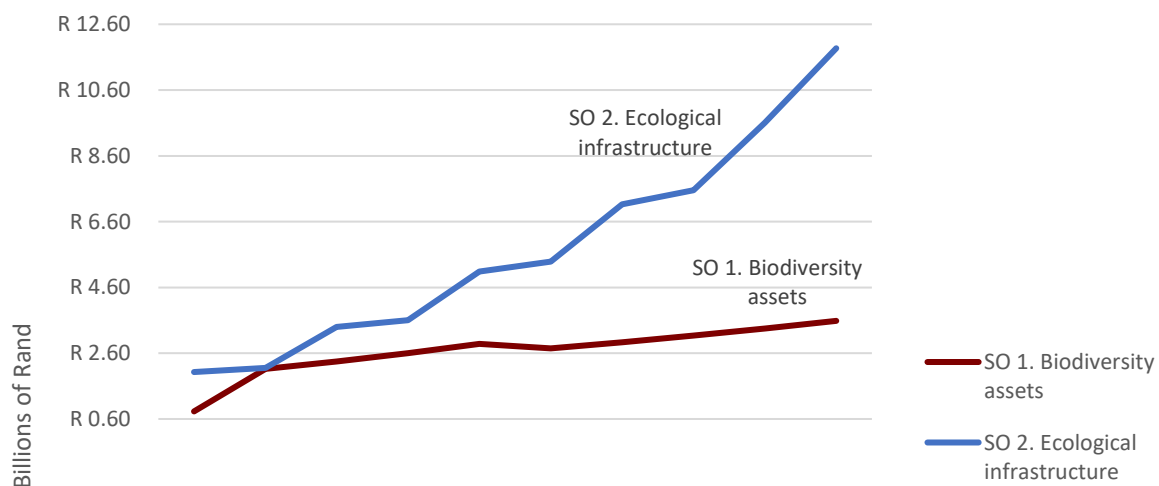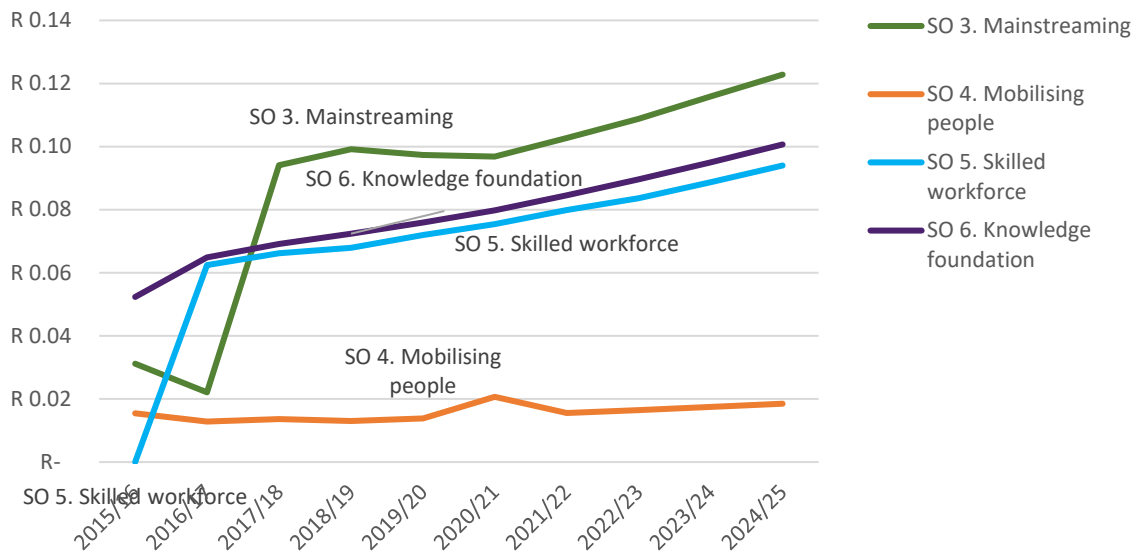
Figure A. Annual costs per NBSAP Strategic Objective in billions of Rand displayed over two y-axis because of the very large differential in costs for Strategic Objectives 1 and 2 (up to R12 billion in 2024/25), and Strategic Objectives 3 to 6 (<R0.13 billion or R130 million).

From an institutional perspective, the Department of Environmental Affairs (DEA), its public entities (primarily SANParks and SANBI), and other protected area authorities carry the majority of the costs of implementing the NBSAP. This is the case given the high costs associated with protected areas and restoration of ecosystems that are largely born by these institutions, and given the number of activities for which DEA and SANBI were named as lead implementation organisations in the NBSAP. Some of these costs, such as protected area expansion, will ultimately be borne by provincial protected area agencies, however, as DEA was listed as the lead agency for this activity in the NBSAP, the cost is attributed to DEA in this costing exercise.

As the costing exercise was able to cover 68% of the activities in the NBSAP, it does not provide an accurate reflection of the full cost of the implementing the entire NBSAP. The value of this costing exercise lies in identifying the major cost drivers, namely ecosystem restoration, protected area and conservation area expansion and protected area management. This will provide guidance for focussing efforts on developing finance solutions to these particular components of work in the sector. In addition, costing specific activities in the NBSAP should assist implementing agencies in further planning, budgeting for and implementing of these programmes of work.

Estimating the biodiversity finance gap for the sector as a whole took a case study approach, based on five separate assessments conducted between 2008 and 2016. Two of these case studies were institutional, analyzing the funding needs of key institutions within the biodiversity sector. One looked at Ezemvelo KZN Wildlife's costed mandate and the other was a business case for an Eastern Cape Parks and Tourism Agency. The remaining three case studies were more programmatic in their approach. One considered the funding gap for the effective management of 11 National Parks across the country, the other was a costing analysis done for the National Biodiversity Framework (2008), and one was based on a study of all protected areas (the DEA Protected Areas Rationalization Study). These case studies provided an indication of an estimated funding gap for the biodiversity sector. The percentage gap in these cases varies from 24% to 67% and is illustrative of the magnitude of the financial gap faced by biodiversity finance actors in the sector.

The current economic situation in South Africa is such that government budgets, including those for environmental and conservation entities, will be constrained going forward, at least for the short to medium term (DEA 2016c). All indicators point to a significant finance gap for the biodiversity sector, which will require focussed effort in order to be reduced. While all aspects of the biodiversity sector's mandate should be sufficiently funded, that most significant funding needs are expected to be for ecosystem rehabilitation and protected area establishment and management.

Reducing the funding gap for biodiversity can be addressed by increasing funding from existing sources, identifying new and innovative sources of funding, and improving the effectiveness with which resources are allocated and spent. The South African BIOFIN Biodiversity Finance Plan will draw on the findings of this Finance Needs Assessment, along with the Policy and Institutional Review and the Biodiversity Expenditure Review, to map out a suite of finance solutions for reducing the finance gap for biodiversity conservation and sustainable management in South Africa.

Finally, it is recommended that institutions look towards conducting results-based costing for fulfilling their mandates in the future, in order to integrate financial planning with their programmes of work, and motivate more accurately for their funding needs to be met. In addition, new policies, strategies and frameworks developed by the sector should be costed to support their implementation.

Contents

List of boxes

List of figures

List of tables

List of acronyms

Acronym	Description
BHCDS	Biodiversity Human Capital Development Strategy
BIOFIN	Biodiversity Finance Initiative
CBD	Convention on Biological Diversity
DAFF	Department of Agriculture, Forestry and Fisheries
DEA	Department of Environmental Affairs
DMR	Department of Mineral Resources
DRDLR	Department of Rural Development and Land Reform
DST	Department of Science and Technology
DWS	Department of Water and Sanitation
EKZNW	Ezemvelo KwaZulu-Natal Wildlife
ENE	Estimates of National Expenditure
HCDS	Human Capital Development Strategy
IDP	Integrated Development Plan
LUS	Land-Use Schemes
METT	Management Effectiveness Tracking Tool
NBSAP	National Biodiversity Strategy and Action Plan
NPAES	National Protected Area Expansion Strategy
NT	National Treasury
PA	Protected Area
SANBI	South African National Biodiversity Institute
SANParks	South African National Parks
SDF	Spatial Development Framework
SDG	Sustainable Development Goals
Stats SA	Statistics South Africa
UNDP	United Nations Development Programme
WWF-SA	World Wide Fund for Nature South Africa

1 Introduction

This document reports on the Biodiversity Finance Needs Assessment for the South African Biodiversity Finance Initiative (BIOFIN). BIOFIN is a global project managed by the United Nations Development Programme (UNDP), currently implemented in 30 countries, and is supported by the European Union and the Governments of Germany, Switzerland, Norway and Flanders. In South Africa, BIOFIN is led by the Department of Environmental Affairs (DEA), with strong support from the UNDP Country Office, and working closely with a range of stakeholders, including the national Treasury, the South African National Biodiversity Institute (SANBI), South African National Parks (SANParks) and Statistics South Africa (Stats SA).

1.1 The Biodiversity Finance Initiative (BIOFIN)

BIOFIN responds to the global challenge of addressing global biodiversity loss and change while attaining national sustainable development. This contributes towards the Sustainable Development Goals (SDGs), and directly to Target 15a which seeks to "mobilize and significantly increase financial resources from all sources to conserve and sustainably use biodiversity and ecosystems". It also contributes to Aichi Target 20 to develop a plan/strategy for mobilising financial resources to effectively implement the NBSAP and towards financial reporting to the Convention on Biological Diversity (CBD).

Responding to this challenge and the inter-related challenge of global climate change, is seen to require a fundamental change in the current trajectory of development – to create "a new development paradigm – attaining sustainable development through investments in biodiversity and ecosystems" (UNDP, 2014). There are two major tenets of this 'new sustainable development paradigm'. The first tenet is that there is a need to understand, calculate and incorporate the social and economic values of biodiversity into decision-making frameworks. The second is that there is a need to rapidly halt or reverse biodiversity losses, in order to safeguard human wellbeing.

Achieving these tenets requires scaling up investment in biodiversity and ecosystems and to fundamentally evaluate the cost-effectiveness of existing policies and practices. BIOFIN seeks to support and enable this at a national level. The aim of BIOFIN is to help countries in which it is implemented chart their own 'new development pathway' by assessing and mobilising the financial resources required to fully implement the strategies within their own National Biodiversity Strategy and Action Plans (NBSAPs), which should also contribute to attaining national sustainable development goals.

BIOFIN has developed a guiding Workbook and related tools to provide guidance from BIOFIN Global to countries on "how to assess existing biodiversity-related expenditures, gauge costs for implementing their NBSAP, and understand how to mobilize the financial resources required to fully implement their revised NBSAPs" (UNDP 2014). The BIOFIN Workbook has three parts:

> **Part I – Review of biodiversity finance context,** uses Workbook 1 which consists of three inter-related components, namely:

- **Workbook 1A** to review policy and practice drivers of biodiversity and ecosystem change;
- **Workbook 1B** to analyse the key actors and institutions, and their relationship to biodiversity drivers and biodiversity finance; and
- **Workbook 1C** to review public and private biodiversity expenditures.

Part II – Analysis of NBSAP costs, or the **Finance Needs Assessment**, uses Workbook 2 to assess the costs of implementing a country's NBSAP, through: a) an analysis of the costs for each set of strategies and actions; and b) a summary analysis of costs through 2025. *This document reports on this element of the South African BIOFIN project.*

Part III – Development of a finance plan, uses Workbook 3 to develop a resource mobilisation plan, including a) an analysis of potential finance mechanisms, actors and opportunities; and b) synthesis of the results into a comprehensive resource mobilisation plan.

1.2   The Finance Needs Assessment for South Africa's BIOFIN

1.2.1   BIOFIN methodology

BIOFIN uses a global methodology to undertake the Biodiversity Finance Needs Assessment. This involves running a methodical process to calculate the overall costs for implementing the strategies and actions emerging from the NBSAP and to assess the finance gap. The methodology is guided by the BIOFIN Workbook (UNDP 2014) and an Excel-based tool provided to structure data collection and management.

The methodology for the Financial Needs Assessment set out in the BIOFIN Workbook (UNDP, 2014) comprises the following broad steps (in more detail in Box 1):

a. Identify the strategies and actions (as per the NBSAP) that will be included in the analysis and translate these into costable units. This requires reviewing the results of Workbook 1A to ensure the strategies and actions counter negative drivers and support or enhance positive ones. Additional strategies may also be added.

b. The costable units are then prioritized and figures are entered into Workbook 2 which are automatically summarized. This provides information on the status quo financial scenario.

c. It is then possible to calculate the total financial gap for implementing the NBSAP and how to sequence actions in accordance with the development of a multi-year timeline for NBSAP strategies and actions.

Box 1. Steps to complete the Financial Needs Assessment – Workbook 2 (UNDP, 2014)

Detailed steps to complete Workbook 2:
✓   For each action to be included in the costing analysis, identify the costable action units.
✓   For each costable action unit, select the category and sub-category that best describes the action.
✓   For each costable action unit, identify each specific cost element required to complete the action.
✓   For each cost element, describe the unit that will be costed.
✓   For each cost element, describe the total number of units.
✓   For each cost element, describe the sensitivity range will be used in the costing.
✓   Mark the year/s in which the cost occurs (note one-time, episodic, recurring costs) from 2015-2025.

Based on these figures, the BIOFIN excel tool will automatically:
➤   *Summarise the costs of each action unit*
➤   *Calculate the total cost, factoring in an overall sensitivity range.*
➤   *Calculate rough finance gaps based on the categories and sub-categories used to describe both expenditures and future costs of implementing biodiversity strategies and actions, drawing on the figures on projected biodiversity expenditures (Workbook 1C).*

The completed Workbook 2 aims to provide a set of costable action units comprising strategies and actions from the NBSAP, the total cost implications for implementing each of these units and the year in which the costs will be incurred. In addition, by bringing in projected future expenditure from

Workbook 1C, the BIOFIN tool attempts to calculate the funding gap between future expenditure and resources needed to cover NBSAP costs.

BIOFIN provides further guidance for undertaking the Financial Needs Assessment which includes making a decision on the level and depth of resolution for the assessment. Coarse, medium and fine resolutions are defined, each of which require different levels of time, financial resources, data availability and stakeholder engagement. In a decision made with the South African BIOFIN Project Leader, it was agreed that the Financial Needs Assessment would be conducted at a medium level of depth and resolution.

A medium resolution analysis required drawing on best available information to inform the costing, together with input from sector and finance specialists where required as well as a steering committee[1], to identify estimated costs (including both once-off and recurring) for each strategy, based on an in-depth calculation of each action. As a medium resolution assessment, it was agreed that the Finance Needs Assessment focus primarily on costing high priority activities in the NBSAP, and secondarily on the NBSAP's medium priority activities. It was further agreed that a sensitivity analysis of 15% would be used to provide a low and high cost ranges for each action and strategy.

1.2.2   Approach to the Finance Needs Assessment

The approach to conducting the Finance Needs Assessment drew on experiences gained from the Policy and Institutional Review for BIOFIN in South Africa, and was structured according to the following phases:

Phase 1: Inception – This phase enabled a review of all relevant documentation and methodologies, as well as consultation with key stakeholders to scope and fine-tune the roll out of the assessment. Key to this phase was a review of the BIOFIN methodology, BIOFIN workbooks and the BIOFIN excel tool, South Africa's revised NBSAP, South Africa's 5th National Report to the CBD, the BIOFIN Policy and Institutional Review (including experience captured in the Lessons Learnt report from this process), approaches to result-based costing and understanding South Africa's public sector budgeting process.

This phase also included interrogating the scope of the NBSAP in the context of the Policy and Institutional Review to ensure that the NBSAP strategies and actions effectively address the drivers and sectoral practices affecting biodiversity change as identified in the Policy and Institutional Review. It was found that the NBSAP is sufficiently aligned with the drivers of biodiversity change identified in the Policy and Institutional Review.

In reviewing the BIOFIN methodology, workbooks and excel tool for the Finance Needs Assessment, certain adjustments were made under the guidance of the BIOFIN SA Project Leader and the BIOFIN Global Team. These adjustments are explained in detail in the Finance Needs Assessment Lessons Learnt report. The main adjustment being the approach used to calculate the finance gap (see section 4).

Phase 2: Research and consultation – This phase entailed undertaking the research and consultation needed to complete the costing using a step-by-step costing process. Inputs from the BIOFIN SA Team and the BIOFIN's Global Senior Technical Advisor were important in ensuring alignment between the BIOFIN components, as well as input from BIOFIN experience in other countries. It was agreed that a focused approach to stakeholder consultation was appropriate given the information captured during

---

[1] A Technical Reference Group comprising biodiversity sector and finance specialists was convened to provide input on the Expenditure Review, the Finance Needs Assessment and the Resource Mobilisation Plan.

the revision of South Africa's NBSAP which was drawn into the Finance Needs Assessment. More detail on stakeholder engagement is provided below. The output of this phase is a set of completed data sheets.

Phase 3: Draft Report – This phase entailed the analysis of costing information in the data sheets and the preparation of the Draft Report of the Finance Needs Assessment.

Phase 4: Final report – This phase allows for the review and finalization of the Biodiversity Finance Needs Assessment as well as documenting decisions and assumptions that were made and lessons learnt.

Phase 5: Final inputs – This phase allows for horizontal inputs into other components of BIOFIN, including feedback on the BIOFIN methodology and tools.

1.2.3 Stakeholder engagement

The approach to stakeholder engagement for the Financial Needs Assessment was informed by the extent of stakeholder involvement in the revision of South Africa's NBSAP and stakeholder engagement process undertaken during the BIOFIN Policy and Institutional Review. Based on this experience and the extent of costing information available in the NBSAP, it was agreed that the Finance Needs Assessment would be best informed by focused one-on-one engagements to address gaps once a preliminary costing had been developed.

Expertise within the South African BIOFIN Team as well as the BIOFIN Global Senior Technical Advisor was used to inform the approach, methodology and tools used in the Finance Needs Assessment. Thereafter a preliminary costing was developed drawing on information gathered during the development of the NBSAP. At this point consultation with sector experts was conducted to address gaps that remained. This included consultations on the approach to costing protected area expansion and protected area management as well as the implementation of biodiversity stewardship, the management and restoration of ecological infrastructure, the management of invasive species, the implementation of compliance and enforcement activities and several biodiversity mainstreaming activities. A list of stakeholder engagements is provided in Appendix 7.1.

In addition, the draft costing was presented to the BIOFIN South Africa Technical Reference Group and their inputs used to inform revisions as well as the approach to the gap analysis.

2 South Africa's revised NBSAP

This section provides a short overview of South Africa's revised NBSAP with a description of each of the NBSAP Strategic Objectives in order to inform the Financial Needs Assessment in the following section. A detailed costing of the NBSAP activities is included as Appendix 7.2.

2.1 Overview of South Africa's NBSAP

South Africa's recently revised NBSAP covers a ten year period from 2015 to 2025. The NBSAP has a vision which articulates the long-term goal for biodiversity in the country. The vision of the NBSAP is to *"Conserve, manage and sustainably use biodiversity to ensure equitable benefits to the people of South Africa, now and in the future"*.

Six strategic objectives[2] reflect the most pressing issues that the NBSAP seeks to address in support of the vision. These are:

1. Management of **biodiversity assets** and their contribution to the economy, rural development, job creation and social wellbeing is enhanced.
2. Investments in **ecological infrastructure** enhance resilience and ensure benefits to society
3. **Biodiversity considerations are mainstreamed** into policies, strategies and practices of a range of sectors.
4. **People are mobilized** to adopt practices that sustain the long-term benefits of biodiversity.
5. Conservation and management of biodiversity is improved through the **development of an equitable and suitably skilled workforce**.
6. **Effective knowledge foundations**, including indigenous knowledge and citizen science, support the management, conservation and sustainable use of biodiversity.

Figure 1 depicts the contribution of the Strategic Objectives to the vision, highlighting the importance and contribution of the enabling Strategic Objectives (4, 5 and 6) to the achievement of Strategy as a whole as well as the first three Strategic Objectives.

---

[2] The 'strategic objectives' in South Africa's NBSAP are sometimes called 'strategic goals' in other NBSAPs. They represent the most pressing issues to address to achieve the vision for biodiversity management in the country.

Vision:
Conserve, manage and sustainably use biodiversity to ensure equitable benefits to the people of South Africa, now and in the future.

1. Management of biodiversity assets and their contribution to the economy, rural development, job creation and social well-being is enhanced.

2. Investments in ecological infrastructure enhance resilience and ensure benefits to society.

3. Biodiversity considerations are mainstreamed into policies, strategies and practices of a range of sectors.

4. People are mobilised to adopt practices that sustain the long term benefits of biodiversity.

5. Conservation and management of biodiversity is improved through the development of an equitable and suitably skilled workforce.

6. Effective knowledge foundations, including indigenous knowledge and citizen science, support the management, conservation and sustainable use of biodiversity.

Figure 1. Structure of South Africa's revised National Biodiversity Strategy

Each strategic objective is supported by a set of outcomes, which are the priorities for that strategic objective. Each outcome is then addressed through a number of activities. The strategic objectives and outcomes, referred to as the core strategy of the NBSAP, are summarized in

Table 1.

Indicators and targets in the NBSAP have been identified at the outcome level, although not at an activity level. As far as possible, the indicators and targets have been drawn from existing national or organizational strategic plans in South Africa. This has served two functions. While providing a means to track progress towards implementing the NBSAP, the indicators and targets also ensure alignment and a direct contribution between the NBSAP and South Africa's development imperatives. This has resulted in the NBSAP being firmly integrated and aligned with the strategic priorities and plans of major role players in South Africa and therefore represents a common vision and plan for biodiversity management.

Table 1. Core strategy of the NBSAP

Vision: Conserve, manage and sustainably use biodiversity to ensure equitable benefits to the people of South Africa, now and in the future.					
Strategic objectives					
Management of **biodiversity assets** and their contribution to the economy, rural development, job creation and social wellbeing is enhanced.	Investments in **ecological infrastructure** enhance resilience and ensure benefits to society	Biodiversity considerations are **mainstreamed** into policies, strategies and practices of a range of sectors.	People are mobilised to **adopt practices** that sustain the long-term benefits of biodiversity.	Conservation and management of biodiversity is improved through the development of an **equitable and suitably skilled workforce**.	Effective **knowledge foundations**, including indigenous knowledge and citizen science, support the management, conservation and sustainable use of biodiversity.
Outcomes (number of activities per outcome)					
1.1 The network of protected areas and conservation areas includes a representative sample of ecosystems and species, and is coherent and effectively managed 1.2 Species of special concern are sustainably managed 1.3 The biodiversity economy is expanded, strengthened and transformed to be more inclusive of the rural poor 1.4 Biodiversity conservation supports the land reform agenda and socio-economic opportunities for communal land holders	2.1 Restore, maintain and secure important ecological infrastructure in a way that contributes to rural development, long-term job creation and livelihoods 2.2 Ecosystem-based adaptation (EbA) is shown to achieve multiple benefits in the context of sustainable development	3.1 Effective science-based biodiversity tools inform planning and decision-making 3.2 Embed biodiversity considerations into national, provincial and municipal development planning and monitoring 3.3 Strengthen and streamline development authorisations and decision-making 3.4 Compliance with authorisations and permits is monitored and enforced 3.5 Appropriate allocation of resources in key sectors and spheres of government facilitates effective management of biodiversity, especially in biodiversity priority areas 3.6 Biodiversity considerations are integrated into the development and implementation of policy, legislative and other tools	4.1 People's awareness of the value of biodiversity is enhanced through more effective coordination and messaging 4.2 People are mobilised to conserve and sustainably use biodiversity	5.1 Macro-level conditions enabled for skills planning, development and evaluation of the sector as a whole 5.2 An improved skills development system incorporates the needs of the biodiversity sector 5.3 Partnerships are developed and institutions are capacitated to deliver on their mandates towards improved service delivery	6.1 Relevant foundational data sets on species and ecosystems are in place and well-coordinated 6.2. The status of species and ecosystems is regularly monitored and assessed. 6.3 Geographic priority areas for the management, conservation and restoration of biodiversity assets and ecological infrastructure are identified based on best available science 6.4 Management-relevant and policy-relevant research and analysis is undertaken through collaboration between scientists and practitioners 6.5 Knowledge base is accessible and presented in a way that informs decision-making
(21 activities)	(8 activities)	(37 activities)	(7 activities)	(12 activities)	(29 activities)

2.2 Summary of NBSAP Strategies

This section offers a short description of each of the NBSAP Strategic Objectives in order to provide context to the activities costed in the Financial Needs Assessment.

SO 1 - Management of biodiversity assets and their contribution to the economy, rural development, job creation and social wellbeing is enhanced

The first NBSAP Strategic Objective addresses the management, conservation and sustainable use of biodiversity assets, including species, ecosystems and other biodiversity-related resources that generate ecosystem services, support livelihoods and provide a foundation for economic growth and human wellbeing. In addition to the effective management of these assets, an important focus of this strategy is that these assets contribute to the economy and social wellbeing, particularly through rural development and job creation.

The expansion and effective management of a network of protected areas and conservation areas is a key component of this strategy with different mechanisms for expansion and management translating into different financial scenarios. Species of special concern are those that have particular ecological, economic or cultural significance. Ensuring the sustainable management of these species through the development and implementation of management plans, *ex situ* conservation efforts, supporting sustainable use and effective oversight of species in trade is necessary to ensure the persistence of these species and the services they provide. South Africa has further prioritised the expansion, strengthening and transformation of the biodiversity economy in recognition of the contribution that biodiversity makes to economic growth and sustainable development, particularly in rural areas. Emphasis is placed on strengthening the natural products, wildlife, marine wildlife and biodiversity-based tourism sectors with a focus on supporting biodiversity economy nodes across the country. The NBSAP also aims to strengthen mechanisms that enable the management of biodiversity assets to support land reform and create socio-economic opportunities for communal land holders.

SO 2 - Investments in ecological infrastructure enhance resilience and ensure benefits to society

The second Strategic Objective of the NBSAP focuses on the management and restoration of parts of the landscape that deliver or generate valuable services to society, otherwise known as ecological infrastructure. Ecological infrastructure refers to naturally functioning ecosystems, such as wetlands, healthy mountain catchments and rivers that generate or deliver valuable services to people. These ecosystems play as important a role as built infrastructure in providing services and underpinning South Africa's socio-economic development.

Drivers of change, such as the spread of invasive alien species, land degradation and the impacts of climate change, impact on the ability of ecological infrastructure to provide essential services, which influences human health and welfare. Investments in the maintenance, restoration and protection of ecological infrastructure enhances the resilience of ecosystems to better withstand pressures, including from climate change, and to deliver basic services such as clean water. Investing in ecological infrastructure also protects and enhances built infrastructure, supports rural development and creates jobs.

The outcomes in this strategy involve scaling up restoration efforts, improving approaches to mapping and prioritising ecological infrastructure, how this information informs the implementation of

government led restoration programmes and securing priority ecological infrastructure through appropriate legislative mechanisms.

SO 3 - Biodiversity considerations are mainstreamed into policies, strategies and practices of a range of sectors

Biodiversity mainstreaming seeks to embed biodiversity considerations into policies, strategies and practices of key public and private actors, thus ensuring its conservation and sustainable use. This approach is central to South Africa's land- and seascape approach to managing biodiversity, addressing biodiversity loss and degradation outside protected areas, while strengthening protection of these areas through biodiversity compatible land/sea uses and land/sea use decisions. South Africa has a solid foundation of gains through biodiversity mainstreaming initiatives which this NBSAP builds upon.

The Strategic Objective ensures that science-based biodiversity tools are developed, maintained and then integrated into national, provincial and local planning processes, as well as into the strategies, plans and activities of the key production sectors. Key to this strategic objective is strengthening regulation, compliance and enforcement, as well as ensuring sufficient resources for biodiversity management where these resources are needed. This work also includes strengthening biodiversity considerations in the development and implementation of policy and other tools at national and international levels, in the biodiversity sector and beyond.

SO 4 - People are mobilised to adopt practices that sustain the long-term benefits of biodiversity

The need to improve public understanding and appreciation of the value of biodiversity, particularly in terms of its social and economic benefits, is addressed under the fourth Strategic Objective. This strategy includes building awareness of biodiversity values, as well as of the actions that people can take to conserve and sustainably use biodiversity.

A key focus within this Strategy includes the development, implementation and monitoring of a coordinated national biodiversity communications strategy, improving the integration of biodiversity into curricula and strengthening environmental literacy through citizen science programmes. Initiatives to promote biodiversity friendly actions include raising awareness around consumer choices, improved incentives to encourage voluntary behaviour change and improving awareness of and tools to protect environmental rights.

SO 5 - Conservation and management of biodiversity is improved through the development of an equitable and suitably skilled workforce

Building an equitable and skilled workforce of biodiversity professionals and technicians, including the strengthening and transformation of organisations involved in biodiversity conservation is addressed under the fifth Strategic Objective. This includes ensuring that all organisations whose work has a biodiversity mandate have capable and qualified staff at all levels and increasing the numbers of black South Africans particularly in leadership positions in the sector.

This strategic objective builds on the implementation of the Human Capital Development Strategy (HCDS) for the Biodiversity Sector (referred to as the BHCDS) with a focus on improving the enabling conditions for the growth and transformation of the capacity in the sector, incorporating the needs of the biodiversity sector into skills development and planning, and ensuring institutions are capacitated to deliver on their mandates.

SO 6 - Effective knowledge foundations, including indigenous knowledge and citizen science, support the management, conservation and sustainable use of biodiversity

The last Strategic Objective of the NBSAP is an enabling Strategic Objective that underpins the entire NBSAP. This Strategic Objective focuses on ensuring that strong knowledge foundations support the management, conservation and sustainable use of biodiversity, and in doing so, ensure the continued delivery of services to society.

The work in this Strategic Objective includes ensuring that foundational datasets on species and ecosystems exist, there is regular monitoring and assessments of biodiversity, which in turn inform the identification of geographic priority areas for biodiversity assets and ecological infrastructure, that research and analysis is management and policy relevant and that this knowledge base is accessible in order to improve the leverage of biodiversity data, including in decision-making.

2.3   Scope of the NBSAP and implications for costing

South Africa's NBSAP represents **the priority** strategies and actions for the conservation and management of biodiversity over a ten year period. As the NBSAP is a prioritised strategy, **it does not capture all activities that contribute towards biodiversity conservation**. Therefore, while the NBSAP provides an overview of the key strategies and actions for the management and conservation of South Africa's biodiversity, it does not provide the full picture. As **the Financial Needs Assessment provides a costing of the NBSAP, it does not reflect the full costs of biodiversity management.** This restricts its comparability with the outcomes of the Biodiversity Expenditure Review which includes all expenditure related to biodiversity management.

The fact that the NBSAP does not have targets that correspond to each of the activities is a challenge that the costing exercise addressed through the use of best available existing information and expert input. Existing information included drawing targets developed in subsequent and/or more detailed strategies on particular areas of biodiversity management and conservation. For example, from the National Protected Area Expansion Strategy (NPAES).

Activities in the NBSAP were further prioritised through stakeholder engagement as part of the NBSAP
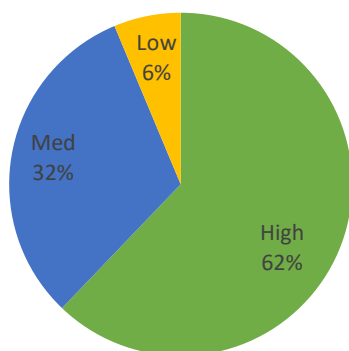
process as high, medium and low priority according to their importance in achieving the outcome and whether they were likely to receive funding, or were already funded. Sixty two percent of the activities were classified as high priority, 32% as medium, and only 6% as low priority. The proportion of high, medium and low priority activities in the NBSAP is illustrated in Figure 2. As a medium resolution assessment, it was agreed that the Finance Needs Assessment focus primarily on high priority activities, and secondarily on medium priority activities. All the NBSAP activities, and the costs for those activities costed, are shown in Appendices (6.2).

Figure 2. Proportion of high, medium and low priority NBSAP activities (n=112)

3   The Biodiversity Finance Needs and Gap Assessment

In the revision of the NBSAP, information about costable units (such as number and expertise of staff, capital assets, and land purchase) was gathered for high priority activities and some medium priority activities. The Finance Needs Assessment used this information as a basis for costing. Gaps in this information, where for instance, costable unit information was incomplete or unclear, or where it was not gathered during the NBSAP,[3] were filled through follow-ups with relevant stakeholders.

The majority of high priority activities (83%) and just over half the medium priority activities (51%) have been costed (Figure 3). Activities that were not costed[4] are those where the activity required further sector-based work before the cost of implementation could be determined. For example, activities that referred to the implementation of strategies that still needed to be developed, often in a prior activity. In the case of some medium priority activities, additional work was required to clarify the costable units before the activities can be costed.
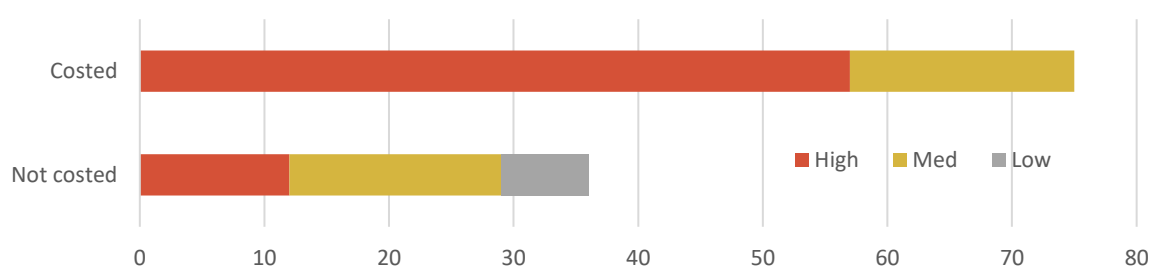
Figure 3. Number of NBSAP activities per priority that were costed and not costed.

The cost analysis used:

- The classification for cost elements drawn from the National Treasury Estimates of National Expenditure (ENE) Allocations Budget Breakdown. These were summarised into seven cost elements: human resources, administrative, equipment, land and building, professional services, travel and miscellaneous.
- Public sector salary levels from the Department of Public Service and Administration.
- A 12% overhead cost[5] on human resource cost elements for costs related to office and other overhead expenses.
- Both "once off" and recurrent implementation costs in respect of all the cost elements.

Costs were estimated for organisations that were identified during the NBSAP stakeholder workshops as lead organisations in implementing NBSAP activities. There is good alignment between these organisations and key finance actors identified in the Policy and Institutional Review and used in the Biodiversity Expenditure Review.

---

[3] Costable units information was only collected for some medium priority activities. Where possible, the Finance Needs Assessment sought to fill these gaps and cost the medium priority activities.

[4] Activities that were not costed may on occasion be referred to as 'uncosted' – both mean the same thing, referring to activities that were not currently costable due to insufficient information.

[5] The percentage of overheads was determined as an average of the overheads of four biodiversity actors in South Africa, namely South African National Biodiversity Institute, University of Cape Town, Endangered Wildlife Trust and the Adaptation Fund. The overheads ranged from 5% to 18%, with 12% being the average.

3.1 Summary of costs for all strategies

The total overall cost for costed activities across all Strategic Objectives amounts to R86.88 billion[6] (including inflation) and R62.98 billion (excluding inflation) over 10 years (2015/16 to 2024/25). The annual costs are reflected in Table 2, in which the costs are inflated at an annual rate of 6%[7].

The year-on-year cost increase from 2015/16 to 2016/2017 is largely as a result of when targets begin, particularly targets for protected area expansion provided in the NPAES beginning in 2016/17. This is a relatively artificial situation due to the revised NPAES being completed a year after the NBSAP.

Figure 4 reflects the costs of implementation over the 10 year period of the NBSAP and shows a 15% sensitivity range. The sensitivity range was agreed with SA BIOFIN team.

Table 2. NBSAP costing for period 2015-2024 (costs are inflated at 6% per annum).

Years	Including inflation (millions of Rand)	Excluding inflation (millions of Rand)
2015/16	R2 956	R 2 956
2016/17	R4 435	R 4 186
2017/18	R5 995	R 5 339
2018/19	R6 462	R 5 426
2019/20	R8 229	R 6 518
2020/21	R8 404	R 6 280
2021/22	R10 345	R 7 293
2022/23	R10 992	R 7 310
2023/24	R13 273	R 8 328
2024/25	R15 789	R 9 345
Total	**R86 879**	

A slight decrease and levelling off of costs between 2019/20 and 2021/22 reflects the achievement of targets for many activities which have a 5 year timeframe. Some of the activities that are currently not costed, for example the implementation of strategies that are under development, may come onto the budget by this period.

The cost of protected area expansion is a major cost driver of the overall cost of implementing the NBSAP. The mechanisms for expansion used (explained in the next section), greatly influence the overall cost of protected area expansion but the relative proportional use of these different mechanisms in the future is not certain. Consequently, the Finance Needs Assessment used three scenarios for protected area expansion to compare implementation costs. These are explained and described in section 3.1.1. However, for the purpose of analysis and summarizing projected implementation costs in the rest of this results section, one scenario was chosen (Scenario 2) and is reflected in results presented in sections that follow.

Another major cost driver is related to the management effectiveness of protected areas. The NBSAP activity speaks to strengthening management effectiveness, building on the baseline of existing capacity for management effectiveness. This difference is explained in section 3.1.2. It illustrates the distinction in what the Finance Needs Assessment costs (i.e. South Africa's *priority* strategies and actions for the conservation and management of biodiversity over a ten year period as reflected in the NBSAP) and the overall cost of biodiversity management and conservation in the country.

---

[6] Note that this is under a selected scenario for protected area expansion – see section 3.1.1.
[7] Inflation of 6% was determined as an average of CPI inflation figures for the period 2016-2019 reported in the South African National Treasury medium term budget policy statement for 2016 (National Treasury 2016).
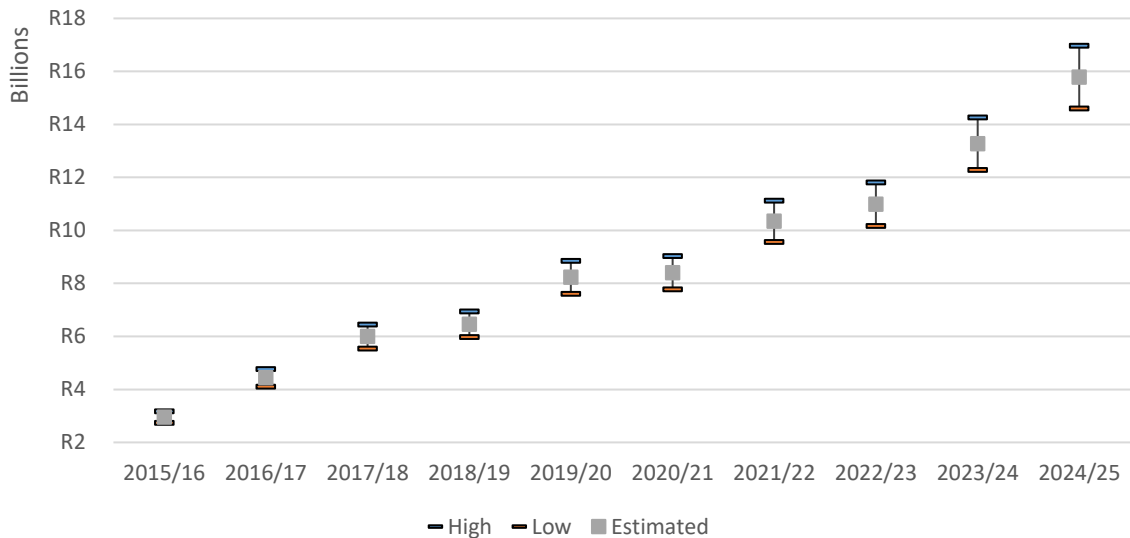
Figure 4. Annual cost of implementing the NBSAP activities costed in the BIOFIN Finance Needs Assessment

3.1.1 Scenarios for protected area expansion

There are varying cost implications for different mechanisms for expanding land-based protected areas, namely:

- **Acquisition**, the purchase of land and management by the state, which involves large upfront costs, and pertains predominantly to terrestrial ecosystems (land).

- **Private protected areas[8]**, including contract national parks and protected areas created through the biodiversity stewardship model, where landowners maintain ownership of their land, have their land declared a protected area, and enter into a contract with a protected area authority regarding the management of the land for biodiversity (SANBI 2015). Private protected areas are attractive because they cost protected area authorities substantially less than acquisition for the same degree of protection (SANBI 2015). The cost of acquiring land is avoided and the bulk of management costs are borne by the landowner. The appeal of this mechanism is also supported by systematic conservation planning - by far the largest proportion of land in the priority areas for protected area expansion lies in private or communal hands.

---

[8] In South Africa, the term 'private protected areas' refers to both privately owned protected areas as well as communal protected areas. While many existing private protected areas were created under older legislation (see Cumming and Daniels 2014), the majority of new private protected areas are established through biodiversity stewardship programmes led by conservation authorities, in which communal or private landowners enter into a voluntary contract agreement with conservation authorities. In some cases, these protected areas are referred to as 'contract protected areas, as in the NPAES. The recent Business Case for Biodiversity Stewardship (SANBI 2015) highlighted the cost effectiveness to the state of private protected areas vs state-owned protected areas. It also highlighted that biodiversity stewardship programmes in provincial conservation authorities are highly resource-constrained and provided an estimate of financial resources required per province for biodiversity stewardship. Protected area targets set out in the NPAES will not be achievable without additional resources for biodiversity stewardship.

- **Declaration of public or state land**, involves reassigning land to a protected area agency from another organ of state. It has limited applicability because only a small proportion of land in the priority areas for protected area expansion is public land.

The expansion of protected areas will happen through each of these mechanisms. The proportion of protected area expansion targets met through each mechanism will affect the overall cost of meeting targets and therefore implementing the NBSAP. To illustrate the cost implications, three scenarios for protected area expansion were explored (Table 3):

1. **Scenario 1:** The proportion of protected area expansion through acquisition, private protected areas or declaration of state owned land as it was during the first 'phase' of implementation of the NPAES, covering the period 2008 – 2014 (DEA 2010a). These figures were extracted from the revised NPAES (DEA 2016b) reporting figures for successfully implemented protected area expansion mechanisms[9] in phase 1.

2. **Scenario 2:** This scenario is a potential future scenario as deduced from the revised NPAES (DEA 2016b) which reported that "during the phase 1 review, protected area institutions reported that a further 1 100 000ha was still under some form of contractual negotiation with landowners for future declaration as protected areas". Accepting this addition through private protected areas changes the proportional contribution of this type of expansion (see Table 3). This was ultimately deemed to be the most likely Scenario, and was used in further analysis of the NBSAP costing.

3. **Scenario 3:** This scenario explores the implications of expansion where acquisition is the dominant mechanism for expansion.

Table 3. Proportion of protected area expansion targets met through different mechanisms of protected area expansion

PAE scenarios	Acquisition	Private protected areas	Declaration of state owned land
Scenario 1	13 % (1.22 million ha)	68 % (6.37 million ha)	19 % (1.78 million ha)
Scenario 2	6 % (0.56 million ha)	86 % (8.05 million ha)	8 % (0.75 million ha)
Scenario 3	90 % (8.43 million ha)	5 % (0.47 million ha)	5 % (0.47 million ha)

For further analysis of NBSAP costs, the proportion of mechanisms in Scenario 2 will be used. It is seen to most closely reflect current trends in which "the negotiation and conclusion of contractual agreements with landowners was the predominant protected area expansion mechanism adopted by most of the protected area agencies" (DEA 2016b). It is worth noting that current trends cannot be sustained without additional resources for biodiversity stewardship.

The cost implications of these scenarios are illustrated in

Cost (billions of Rand)	Scenario 1	Scenario 2	Scenario 3
Acquisition	19.78	9.13	136.94
Declaration of state owned land	0.21	0.09	0.05
Private protected areas	0.74	0.94	0.05
Grand Total	**20.73**	**10.16**	**137.05**

---

[9] These are for terrestrial protected areas only (See DEA 2016, page 12)

Figure 5 – the cost of private protected areas is shown by the thin black portion at the top of each bar. Scenario 3, which is predominantly acquisition, is the most expensive and an order of magnitude greater than Scenario 1 or 2. Increasing the proportion of protected area expansion through private protected areas is most cost effective for government. Because of the low cost to the state of private protected areas, even with 86% of protected areas expansion taking place through biodiversity stewardship programmes as in Scenario 2, the total cost of private protected areas remains low overall.
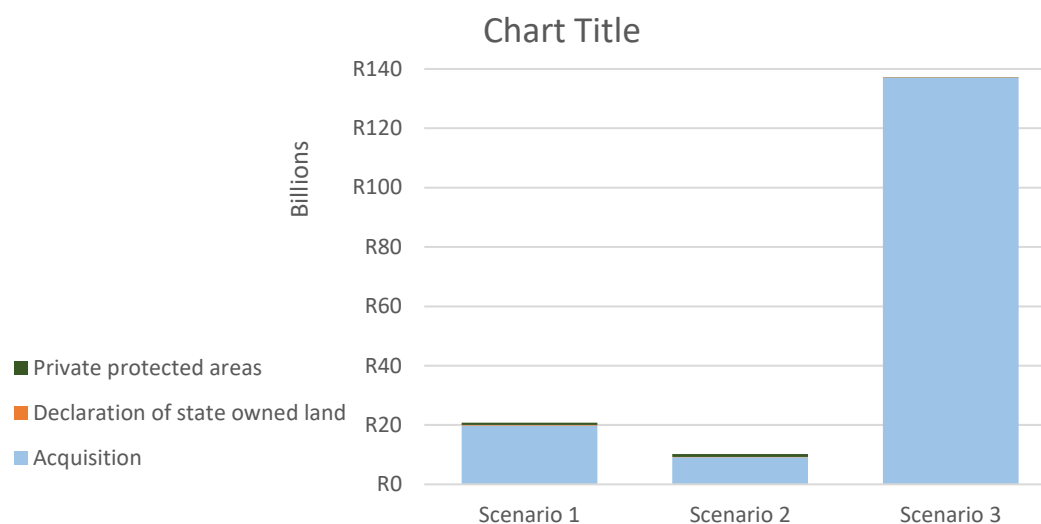
Cost (billions of Rand)	Scenario 1	Scenario 2	Scenario 3
Acquisition	19.78	9.13	136.94
Declaration of state owned land	0.21	0.09	0.05
Private protected areas	0.74	0.94	0.05
Grand Total	**20.73**	**10.16**	**137.05**

Figure 5. Cost implications of three scenarios for protected area expansion. Scenarios are made up of different proportions of three different mechanisms of expansion, namely acquisition, private protected areas or declaration of state owned land.

3.1.2 Costing NBSAP priority actions only

NBSAP Activity 1.1.4, is to *'Strengthen and monitor management effectiveness in protected areas and conservation areas, with an emphasis on biodiversity objectives, socio-economic benefits and climate change resilience'.* This activity focuses on **strengthening and monitoring** management effectiveness, but **does not include the baseline current costs of managing existing protected areas**. Consider the difference between the average cost of **managing effectively** in protected areas that maintained a Management Effectiveness (METT) Score of **more than 67%**[10] between 2014 and 2016, and the average cost per ha of **managing all protected areas** including those that were not effectively managed (i.e. that did not maintain a METT score of 67%). The cost per ha of 'effectively managed' areas (METT >67%) is R779.05/ha, while the cost per ha of all protected areas including less effectively managed areas is R644.74/ha, with the difference of R134.31/ha. The difference, which is a gap of

---

[10] The METT-SA involves self-assessment by conservation authorities and is intended to track progress over time rather than to compare protected areas or conservation authorities. Results of the baseline in 2010 were not satisfactory according to minimum METT score standards. Following the baseline, objectives were set to improve the scores so that at least 60% of protected areas have a METT score of >67% by 2014.

21%, is understood as what would be required to strengthen effective management in protected areas[11].

The cost of **strengthening management effectiveness** of the protected area network over the NBSAP period amounts to R13 billion. However the **full cost of effective management**, not just the additional amount needed to strengthen management, is estimated to be around R75 billion. This illustrates the gap between what is covered, and therefore costed, in the NBSAP activity and the full costs of biodiversity management and conservation in South Africa. The NBSAP activity emphasize improvements to the existing baseline of activities but does not include activities that speak to maintaining the effective management of protected areas. This is assumed as a fundamentally *underlying* aspect.

3.2   Summary of implementation costs per NBSAP Strategic Objective

The total overall cost per NBSAP Strategic Objective is reflected in Figure 6. Two Strategic Objectives are the main cost drivers, namely *Strategic Objective 1: Management of biodiversity assets* and *Strategic Objective 2: Investments in ecological infrastructure[12]*. Driving this are the costs associated with expanding the protected area and conservation area networks (Outcome 1.1) and the restoration and maintenance of ecological infrastructure (Outcome 2.1).

The projected implementation costs for Strategic Objectives 3 to 6 are comparatively much lower, illustrated on the second y-axis in Figure 6 as being <R1 billion over 10 years. Strategic Objective 3 has the third highest projected implementation costs, but of all the Strategic Objectives, it is the one with the highest number of activities not costed. This is because this Strategic Objective contains activities that refer to the development of strategies that need to first be developed before their implementation can be costed, as is the case for activities pertaining to compliance monitoring and enforcement (Outcome 3.4). Strategic Objective 6 is the effective knowledge foundation that underpins the entire NBSAP and Strategic Objective 5 underpins the NBSAP in terms of capacity for implementation.

---

[11] This assumes that the problem is in part financial resources. Additionally, these figures represent a national average, and are drawn only from state owned protected areas.

[12] Ecological infrastructure is naturally functioning ecosystems that generate or deliver valuable services to people. It is the nature-based equivalent of built infrastructure, and is just as important for providing services and underpinning economic development (SANBI 2016).

Figure 6. Total overall cost per NBSAP Strategic Objective in billions of Rand displayed over two y-axis because of the very large differential in costs for Strategic Objectives 1 and 2 (R20-R60 billion), and Strategic Objectives 3 to 6 (<R1 billion).

A detailed breakdown of the total overall cost per activity in the NBSAP is captured in Appendix 7.2 (This is also table 6). Figure 7 illustrates the annual costs per Strategic Objective. The steady increase in costs in Strategic Objective 2 is attributable to the scale up of efforts to restore and maintain degraded ecological infrastructure. This includes government led natural resource management programmes such as DEA's 'Working for' programmes. The major drivers of the increased costs in Strategic Objective 3 in 2017/18 are two activities that have to be actioned across all municipalities in South Africa, namely the development of invasive species monitoring, control and eradication plans (Activity 3.2.5) and integrating biodiversity priority areas into spatial development frameworks (SDFs), integrated development plans (IDPs) and land-use schemes (LUS) (Activity 3.2.6). The slight increase in costs in Strategic Objective 4 in 2015/16 and 2021/22 is as a result of equipment costs born twice during the 10-year period.
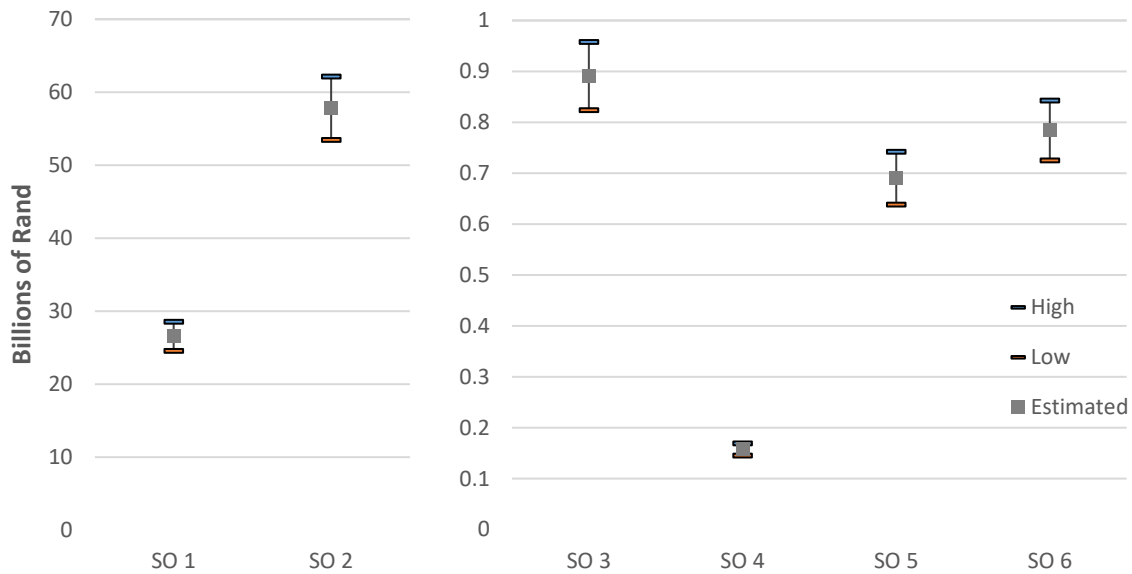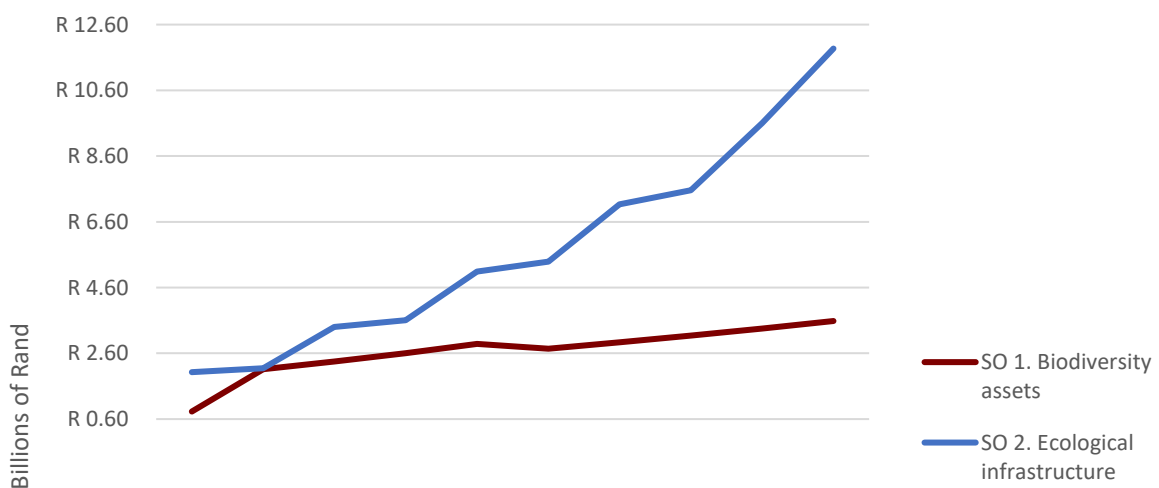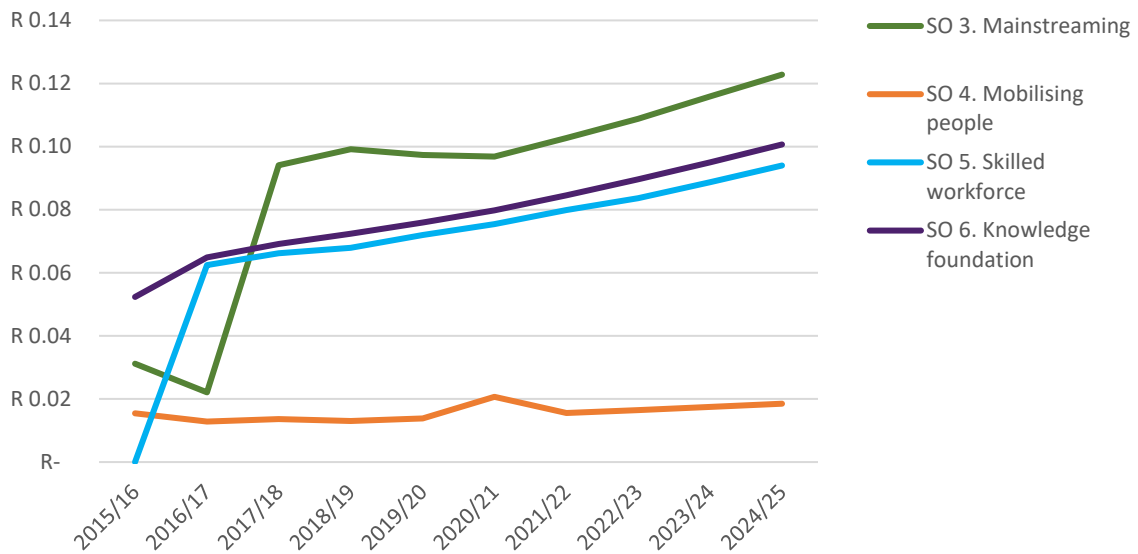
Figure 7. Annual costs per NBSAP Strategic Objective in billions of Rand displayed over two y-axis because of the very large differential in costs for Strategic Objectives 1 and 2 (up to R12 billion in 2024/25), and Strategic Objectives 3 to 6 (<R0.13 billion or R130 million).

3.3   Summary of implementation costs per BIOFIN taxonomy

Globally, BIOFIN uses a taxonomy/classification for categorising NBSAP activities. These are listed in Table 4. All NBSAP activities were categorized according to this taxonomy in the Finance Needs Assessment, with two exceptions. These two activities are in NBSAP Outcome 3.4 and relate to biodiversity mainstreaming into policy, legislative and other tools that cut across more than one BIOFIN category which, because it contributes significantly to all BIOFIN categories, cannot be assigned to one category. There were many other activities that were assigned to BIOFIN categories that were a 'best fit', but which do not necessarily preclude their contribution to other categories.

Table 4. BIOFIN taxonomy categories (level 1) described in terms of BIOFIN level 2 sub-categories.

BIOFIN Taxonomy Category	Includes activities that relate to:
Access and Benefit Sharing	Nagoya Protocol and Bioprospecting.
Biodiversity Knowledge	Biodiversity communication and education; biodiversity knowledge improved, shared and applied; evaluation, accounting and monitoring methods; indigenous and local community knowledge; and managerial and technical capacity increased.
Biosafety	Invasive Alien Species; living modified organisms and genetically modified organisms.
Climate Change Mitigation and Adaptation	Greenhouse gas mitigation, sustainable energy and Ecosystem-based Adaptation.
Conservation Areas	Expand landscape conservation; expand protected area systems; improve landscape conservation management; and improve protected area management.
Ecosystem management and restoration	Conservation of valuable ecosystem services; improve ecosystem connectivity; reduce or stop loss of valuable habitats; and restoration of ecosystems.
Pollution	Protection and remediation of soil, groundwater and surface water; protection of ambient air and climate; waste and wastewater management; and other pollution reduction.
Sustainable Business	Corporate sustainability; green supply chain; nature based tourism; responsible extractive industries; and sustainable consumption.
Sustainable Use	Sustainable agriculture, aquaculture, fisheries, forestry, marine and coastal management, sustainable land management, rangelands and wildlife; watershed management.
Targeted species and genetic conservation	Agrobiodiversity maintained; ex-situ conservation of endangered species; in-situ conservation of endangered species outside protected areas; and species extinction threat reduction.

Table 5 shows the number of NBSAP activities assigned to each of the BIOFIN taxonomy categories and the total finance needs associated with those activities. The highest projected costs in Table 5 are for ecosystem management and restoration, followed by conservation areas. These costs are significantly higher than costs in other categories, and for the same reasons that Strategic Objective 2 and 1 are the highest costs as described in the section 3.2. The majority of these costs relate to only two activities.

The third highest costs, and the highest number of activities in any one BIOFIN category, are for activities related to Biodiversity Knowledge. This also aligns with Strategic Objective 6 being the third highest cost, but there are also activities from three other Strategic Objectives that are categorised in this BIOFIN category. Activities in Strategic Objective 3 have to do with increasing managerial and technical capacity and integrating biodiversity into evaluation, accounting and monitoring methods, in Strategic Objective 4 and 5 the activities relate to biodiversity communication and education, and in Strategic Objective they are about improving, sharing and applying biodiversity knowledge.

Although there are two activities assigned to the Pollution category, these activities could not be costed at this time. Costing the NBSAP activity that relates to effective waste management and aerosol, marine and aquatic pollution control measures (Activity 3.4.7) requires further information from and costing of the Environmental Compliance and Enforcement Strategy.

Table 5. BIOFIN taxonomy categories (level 1) with the number of NBSAP activities (in total and per NBSAP Strategic Objective) and the total cost of activities

BIOFIN Taxonomy categories	Strategic Objectives						Total count	Total Rands
	1	2	3	4	5	6		
Access and Benefit Sharing	1		1				2	R1 327 607.24
Biodiversity Knowledge			15	5	12	29	61	R1 630 943 200.86
Biosafety			3				3	R304 100 273.86
Climate Change Mitigation and Adaptation		2	1				3	R4 284 319.77
Conservation Areas	7						7	R26 333 863 145.13
Ecosystem management and restoration		6					6	R57 813 156 210.15
Pollution			1				1	R-
Sustainable Business	1		1	2			4	R87 550 157.60
Sustainable Use	6		11				17	R490 308 690.05
Targeted species and genetic conservation	4		1				5	R191 439 362.14
(Not assigned a BIOFIN category)			2				2	R22 264 946.67

Appendix 7.3 summarises the projected cost of NBSAP activities aligned with the CBD Aichi Targets and aligned to SDGs. In almost all cases, NBSAP activities aligned to more than one Aichi Target or SDG. Therefore the cost of many NBSAP activities is counted as contributing to more than one Aichi Target or SDG (i.e. there is double accounting). As with the findings in section 3.2 and this section, the highest projected costs towards Aichi Targets or SDGs relate to NBSAP activities that expand and effectively manage the networks of protected areas and conservation areas and that restore and maintain ecological infrastructure. These activities ensure benefits to society from ecological infrastructure and contribute to the South African economy, rural development, job creation and social well-being (contributing to several of the SDGs).

3.4 Summary of implementation costs according to lead organisation

The Finance Needs Assessment indicates that the majority of implementation costs are carried by government (Figure 8), including national departments, provincial and local government. Costing placed an emphasis on *lead organisations* as identified in the NBSAP. DEA, and its public entities, carry the majority of these implementation costs (Figure 9). This is the case given the high costs associated with protected areas and restoration of ecosystems, and given the number of activities for which DEA and SANBI were named as lead organisations in implementing. **The approach taken to the NBSAP and the costing has resulted in the financial contribution by supporting organisations, which may carry a large amount of the actual implementation cost, being under-estimated.** NGOs, for example, contribute more in terms of costs than is illustrated in these findings but they are seldom lead organisations on NBSAP activities. The same is true for some other national departments, such as the Department of Rural Development and Land Reform in activities in Outcome 1.3.

■ Academic institution   ■ Government   ■ National Government Business Enterprises   ■ National/Local NGO
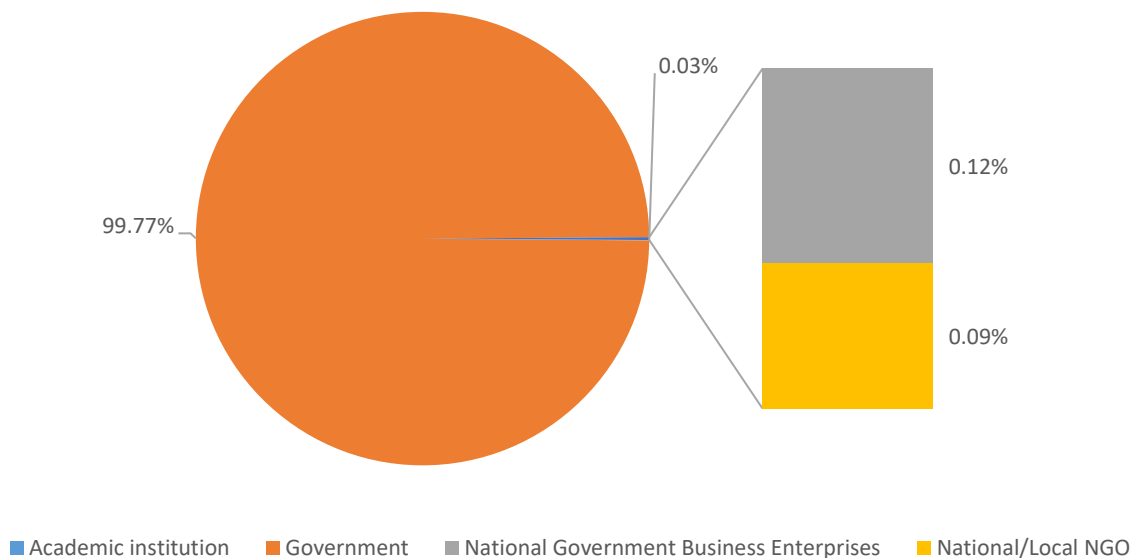
Figure 8. Lead organisations per actor type
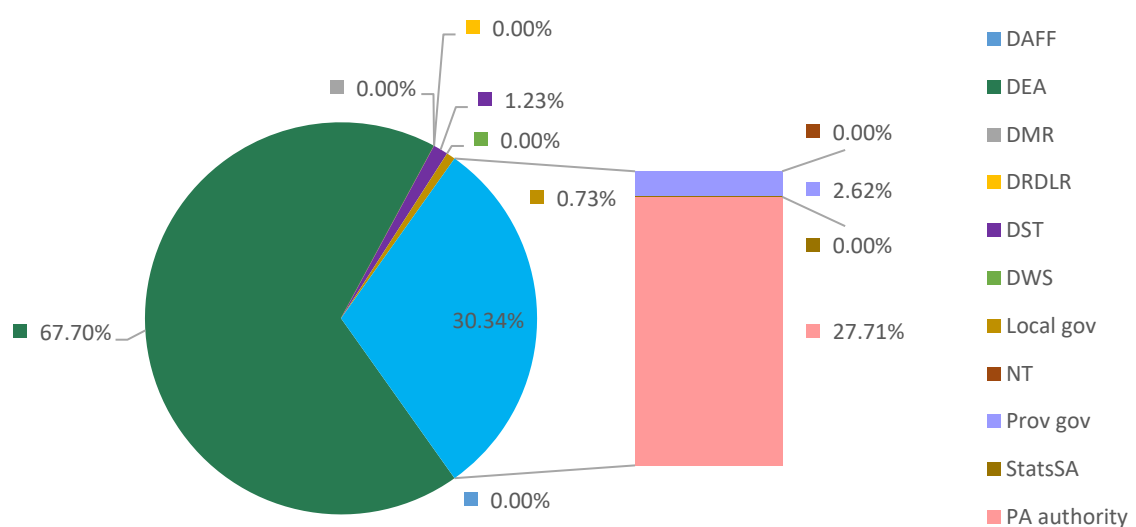
Figure 9. Breakdown of lead organisations in the government actor type (State PA authorities include all authorities involved in protected area management such as SANParks or provincial conservation authorities)

4   Gap Analysis

The Finance Needs Assessment aimed to estimate the funding gap for the biodiversity sector as a whole. Ideally, this would have been done by taking the cost for institutions to implement their full mandate, and compare this to their income, thus determining their shortfall, or 'funding gap'. In South Africa, government institutions do not conduct zero-based budgeting for their full mandate. Zero-based budgeting refers to where every function of that organisation is analysed for its full needs and cost. Zero-based budgeting would provide an indication of the cost to implement the full mandate for biodiversity conservation and sustainable management. Instead, the practice followed is incremental budgeting, where budgets are prepared based on the previous period's budget with incremental amounts added to allow for growth and inflation. As a result, it was not possible to undertake a comprehensive analysis of the biodiversity finance gap for the sector given the time frame of the project. Instead, the Finance Needs Assessment examines case studies to shed light on the biodiversity finance gap in South Africa. The Finance Needs Assessment used information on the costed mandates and budgets for key biodiversity actors and programmes between 2008 and 2016, with the intention of estimating the size of the funding gap for the biodiversity sector.

4.1.1   Case 1. South African National Parks
The average funding gap for 11 National Parks was calculated to be 47%. This was calculated as a cost per hectare from the budgets drawn from SANParks Management Plans for the 11 National Parks for which information was available. These budgets where all developed over a five year period (although the five year periods differ with the earliest spanning from 2012/13, the latest from 2014/15, and the majority beginning in 2013/14) and enable an analysis of the gap between budget and anticipated recurring and once-off operational costs per year. **The funding gap over the 11 parks varied from 23% to 76% of the required/allocated budget and the average funding gap across all 11 parks was 47%.**

4.1.2   Case 2. DEA Protected Areas Rationalisation Study
In 2010, DEA commissioned a review of the institutional arrangements for the management of protected areas in South Africa with a view to reforming the management of protected areas. This exercise included a review of conservation budgets to highlight cost drivers, expenditure trends and own revenue performance of protected area agencies. The study notes that the data limitations made it difficult to accurately assess the adequacy of funding for protected area management authorities. However an analysis of estimated minimum conservation costs for protected areas, compared with disclosed budgets, suggests an **aggregate of 30% underfunding**, with some provinces and agencies worse/better off than others (DEA, 2010b).

4.1.3   Case Study 3. The National Biodiversity Framework 2008
The National Biodiversity Framework of 2008 attempted to cost the implementation of the activities set out in the Framework. **The study estimated a shortfall of 47%, based on a** total budget of R7.6 billion required with a shortfall of R3.4 billion. **This study concludes that "regardless of the final figure, there appears to be ample evidence from a number of sources that conservation is seriously underfunded in aggregate, and that a comprehensive review of the funding requirements for conservation is required"** (DEA, 2010b).

4.1.4   Case 4. Ezemvelo KZN Wildlife

Ezemvelo KZN Wildlife undertook a zero based budget exercise in 2016. This was a once off exercise but provided an important example of this approach in a government entity. The total budget needed to execute their mandate was estimated to be R400 million over 2015/16 for operational costs only i.e. excluding the salary costs. Salary costs can be estimated using the existing employee related costs of Ezemvelo KZN Wildlife (R644,972 million) including a 6% increase in CPIX, and assuming that they are similar to the current staff and salary structure[13]. This amounts to a total requirement of R1,044,972,000/R1.045 billion. Comparing this to the total income reported in the Integrated Annual report 2015/16, which was R876,625 million, the gap is R207,045 million. The analysis indicated that **the funding need is 24% more than the current income.**

4.1.5   Case 5. Eastern Cape Parks and Tourism Agency

In 2009, the then Eastern Cape Parks Board developed a business case in which it explored four institutional options ranging from its current funded mandate and functions, as well options for various extended mandates and functions, including a potential merger with the provincial tourism agency. These scenarios explored different financial implications in terms of income and expenditure. The gap between income and expenditure ranged from 45% to 82% under the different scenarios, with an average gap of 66%. The scenario with the lowest gap was the merger with the provincial tourism board (but excluded taking on biodiversity stewardship functions). However, the route ultimately pursued – the merger with the tourism board and the uptake of biodiversity stewardship functions – **has a gap of 67%.**

The percentage gap in these cases varies from 24% to 67% and is illustrative of the magnitude of the financial gap faced by biodiversity finance actors under various scenarios. It can only point to an indication of an estimated funding gap for the biodiversity sector. The gap faced by other institutions, such as other provincial conservation authorities, should not be extrapolated from these examples as there is significant nuance per province, for instance, in the management costs of protected areas. This means that what has been calculated elsewhere may not be applicable equally to every province.

5   Conclusion

The Finance Needs Assessment was able to cost 76 of the 112 NBSAP activities. The total overall cost for these activities across all Strategic Objectives amounts to R86.88 billion (including inflation) and R62.98 billion (excluding inflation) over 10 years (2015/16 to 2024/25). The most substantial costs are for ecosystem rehabilitation, protected area and conservation area expansion, and protected area management.

A case study based estimation of the funding gap for the biodiversity sector is between 24% and 67%, indicating a significant funding need for the sector. Reducing the funding gap for biodiversity can be addressed by increasing funding from existing sources, identifying new and innovative sources of funding, and improving the effectiveness with which resources are allocated and spent. A recurring issue that has emerged is the need to improve abilities to make the case for funding and resources for biodiversity management in the context of an increasingly constrained economic climate and the perception of competing policy priorities.

---

[13] This is considered unlikely as a revised structure is being developed at the moment and all government departments are undergoing significant budget cuts that would affect the revised structure.

The South African BIOFIN Biodiversity Finance Plan, currently under development, will draw on the findings of this Finance Needs Assessment, along with the Policy and Institutional Review and the Biodiversity Expenditure Review, to map out a suite of finance solutions for reducing the finance gap for biodiversity conservation and sustainable management in South Africa.

Undertaking the Finance Needs Assessment revealed a substantial lack of results-based costing within the biodiversity sector. It is recommended that institutions look towards conducting results-based costing (or zero-based budgeting) for fulfilling their mandates in the future. This should help institutions to integrate financial planning into their programmes of work, and motivate more accurately for their funding needs to be met. While it may not be feasible for institutions to undertake this sort of exercise every year, building it into a five year strategic planning cycle could prove to be beneficial.

New policies, strategies and frameworks developed by the sector should be costed to support their implementation. This can be done as part of the development of these plans, through setting measurable targets linked to specific activities. By breaking down activities into 'costable units' such as personal requirements (e.g. amount of time needed, level of position) and operational needs for each activity, these can be fairly easily matched to an estimated cost.

6 References

Coetzee, I. and T. Bouwer, 2008. Report on the costing of the National Biodiversity Framework. Report to DEA, 12 December 2008.

Cumming, T.L. and Daniels, F. A Review of Private Protected Areas in South Africa. In Stolton, S. Redford, K.H. and Dudley, N. (2014). "The Futures of Privately Protected Areas". Gland, Switzerland: IUCN.

DEA (Department of Environmental Affairs). 2010a. National Protected Area Expansion Strategy 2008. Department of Environmental Affairs, Pretoria, South Africa.

DEA (Department of Environmental Affairs). 2010b. Review of Institutional Arrangements for Management of Protected Areas. Final report to DEA prepared by Linkd Environmental Services (Pty) Ltd.

DEA (Department of Environmental Affairs). 2016a. Biodiversity Finance Initiative South Africa: Policy and Institutional Review. Final Report, written by Aimee Ginsburg and Anthea Stephens. Department of Environmental Affairs, Pretoria.

DEA (Department of Environmental Affairs). 2016b. National Protected Areas Expansion Strategy for South Africa 2016. Department of Environmental Affairs, Pretoria, South Africa.

DEA (Department of Environmental Affairs). 2016c. Biodiversity Finance Initiative - South Africa: Biodiversity Expenditure Review. Final Report, written by Juan Bester. Department of Environmental Affairs, Pretoria.

DEDEA (Eastern Cape Department of Economic Development and Environmental Affairs). 2009. Eastern Cape Parks Board Business Case. Draft Version 3 dated 2 October 2009.

Giordano, T., J. Blignaut and C. Marais. 2012. Natural resource management — an employment catalyst: The case of South Africa. Development Planning Division Working Paper Series No. 33. Development Planning Division, Development Bank of Southern Africa, South Africa.

Government of South Africa, 2015. National Biodiversity Strategy and Action Plan, Department of Environmental Affairs, Pretoria.

National Treasury. 2016. Medium Term Budget Policy Statement 2016. 26 October 2016. National Treasury, Republic of South Africa. ISBN: 978-0-621-44971-6. Available at http://www.treasury.gov.za/documents/mtbps/2016/mtbps/MTBPS%202016%20Full%20Document.pdf

SANBI (South African National Biodiversity Institute). 2015. The business case for biodiversity stewardship. A report produced for the Department of Environmental Affairs. Developed by Cumming, T., Driver, A., Pillay, P., Martindale, G., Purnell, K., McCann, K. and Maree, K. South African National Biodiversity Institute, Pretoria.

SANBI (South African National Biodiversity Institute). 2016. Lexicon of Biodiversity Planning in South Africa. Beta Version, June 2016. South African National Biodiversity Institute, Pretoria. 72 pp.

UNDP. 2014. The BIOFIN Workbook: A Tool to Mobilize Financial Resources for Biodiversity and Development. New York: United Nations Development Programme. Retrieved from www.biodiversityfinance.net

7 Appendices

7.1 Stakeholder engagement

Table 6. Targeted stakeholder engagement list

Name	Organisation
Andries Wessels	DEA
Christo Marais	DEA
Frances Craigie	DEA
Geoff Cowan	DEA
John Ryan Peter	DEA
Mark Jardine	DEA
Sarah Polonsky	DEA
Siyabonga Dlulisa	DEA
Wilma Lutsch	DEA
Pravin Pillay	EKZNW
Ricardo Andrews	National Treasury
Deshni Pillay	SANBI
Jeffrey Manuel	SANBI
John Dini	SANBI
Phillip Ivy	SANBI
Tom Bouwer	SA Tourism
Saliem Fakir	WWF-SA

7.2 Projected cost of implementation per NBSAP activity

The total projected cost of implementation for lead organisations of each NBSAP activity is given in Table 7 per year and as a total. The value is given in R100 000's.

Table 7. Estimated implementation cost (in R100 000's) per NBSAP activity per year (from 2015/16 to 2024/25)

Activity	Priority	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	TOTAL
SO 1. Management of biodiversity assets and their contribution to the economy, rural development, job creation and social well-being is enhanced											R	**26 539 335 652.34**
1.1.1 Expand the protected area estate across all ecosystems (including marine, estuarine, freshwater and terrestrial), based on the Protected Area Expansion Strategies at national and provincial levels	High	0	11374	12056	12780	13546	14250	15105	16011	16972	17991	130086
1.1.2 Expand the network of conservation area through mechanisms under the Biodiversity Act, contract law and other informal agreements between the landowner and conservation authority.	High	2450	2598	2753	2919	3094	0	0	0	0	0	13814
1.1.3 Strengthen the institutional capacity of biodiversity stewardship programmes and the suite of incentives (such as access to technical expertise) to enhance their contribution to protected area and conservation area expansion, including through implementation of the Biodiversity Stewardship Business Case.	High	186	366	568	793	1042	1105	1171	1241	1316	1395	9183
1.1.4 Strengthen and monitor management effectiveness in protected areas and conservation areas, with an emphasis on biodiversity objectives, socio-economic benefits and climate change resilience.	Med	5504	6636	7914	9355	10975	11870	12831	13866	14979	16175	110105
1.1.5 Strengthen inter-agency cooperation in the management of protected and conservation areas, within South Africa and internationally in the context of Transfrontier Conservation Areas	Low	-	-	-	-	-	-	-	-	-	-	-
1.1.6 Strengthen access to and benefit sharing from protected areas, including assessing the potential for appropriate sustainable consumptive resource use in protected areas, and include this in protected area management plans	Low	-	-	-	-	-	-	-	-	-	-	-
1.1.7 Strengthen protection for Critically Endangered species occurring only at single sites	Med	3	9	4	4	4	0	0	0	0	0	24
1.2.1 Develop, implement and sustainably fund biodiversity management and/or recovery plans for prioritised species of special concern	Med	-	-	-	-	-	-	-	-	-	-	-
1.2.2 Ensure sufficient ex situ conservation of threatened and useful species to address impacts from climate change, habitat transformation and unsustainable use.	High	95	170	124	132	126	133	141	150	159	168	1398
1.2.3 Establish integrated programmes to support sustainable use of threatened species including medicinal species and horticultural plants, including propagation programmes, to relieve pressure on harvesting	Med	-	-	-	-	-	-	-	-	-	-	-
1.2.4 Maintain an effective Scientific Authority that provides scientific oversight for species in trade	High	37	40	42	44	47	50	53	56	59	63	492
1.3.1 Strengthen the contribution of the natural products sector, including biotrade and bioprospecting, to the national economy, based on the National Biodiversity Economy Strategy (NBES)	High	-	-	-	-	-	-	-	-	-	-	-

1.3.2 Strengthen the contribution of the wildlife sector to the national economy, based on the National Biodiversity Economy Strategy (NBES)	High	-	-	-	-	-	-	-	-	-	-	-
1.3.3 Develop a strategy to sustainably optimise the marine wildlife sector	Med	-	-	-	-	-	-	-	-	-	-	-
1.3.4 Develop a strategy to sustainably optimise the biodiversity-based tourism sector	Med	-	-	-	-	-	-	-	-	-	-	-
1.3.5 Pilot biodiversity economy transformation nodes, as a model for demonstrating multiple benefits from the biodiversity economy through partnerships	High	-	-	-	-	-	-	-	-	-	-	-
1.4.1 Strengthen the Land Reform Biodiversity Stewardship Initiative, including approval of guidelines, strategies and implementation plans developed through the DEA-DRDLR-SANBI alliance	High	6	12	7	7	14	8	8	16	10	10	98
1.4.2 Facilitate the settlement of land claims in protected areas and the conservation estate	High	4	4	5	5	5	5	6	6	6	7	53
1.4.3 Develop, enhance and maintain socio-economic opportunities for communal landowners from conservation initiatives in restituted land on biodiversity priority areas	Med	11	11	12	13	13	14	15	16	17	18	140
SO 2. Investments in ecological infrastructure enhance resilience and ensure benefits to society											R 57 817 189 320.32	
2.1.1 Support the implementation of chapter 5 (water resource protection) of the National Water Resource Strategy (NWRS)	High	8	19	21	3	2	0	0	0	0	0	53
2.1.2 Develop systematic approach, including methods, techniques, and expertise, for mapping and prioritising ecological infrastructure	High	0	7	8	0	0	0	0	0	0	0	15
2.1.3 Scale up and improve integration of efforts to restore degraded ecological infrastructure and maintain ecological infrastructure in good condition, including government led programmes such as DEA's Working for Water, Working for Wetlands and other, and DAFF's SoilCare, VeldCare, LandCare etc.	High	20000	21200	33708	35730	50499	53529	70926	75182	95631	118264	574668
2.1.4 Improve how biodiversity assets and ecological infrastructure is incorporated into the planning of DEA's Natural Resource Management programmes	High	257	273	289	306	325	344	365	387	410	434	3389
2.1.5 Secure ecological infrastructure that has been systematically prioritised through appropriate mechanisms, such as National Environmental Management Act, Protected Area Act, Biodiversity Act, National Water Act, National Forest Act, Conservation of Agriculture Resources Act (CARA), Minerals and Petroleum Resources Development Act, buffer zone policies, agricultural and municipal zoning, and contractual agreements	High	-	-	-	-	-	-	-	-	-	-	-
2.1.6 Support investments in ecological infrastructure through the implementation of the Water Research, Development and Innovation (RDI) Roadmap	Med	0	1	1	1	1	1	1	1	1	1	6
2.2.1 Develop an implementation plan for ecosystem-based adaptation (EbA) in the context of climate change adaptation and sustainable development	High	0	5	0	0	0	0	0	0	0	0	5
2.2.2 Capture lessons from National Implementing Entity (NIE) projects to illustrate the benefits of ecosystem-based adaptation	High	6	7	7	8	8	0	0	0	0	0	36
SO 3. Biodiversity considerations are mainstreamed into policies, strategies and practices of a range of sectors											R 890 965 502.38	

Activity	Priority											Total
3.1.1 Develop new science-based biodiversity tools to inform planning and decision-making	High	125	0	0	0	0	0	0	0	0	0	125
3.1.2 Maintain new and existing science-based biodiversity tools	High	7	12	16	22	28	29	31	33	35	37	250
3.1.3 Develop and publish bioregional plans and biodiversity management plans for ecosystems	Med	-	-	-	-	-	-	-	-	-	-	-
3.2.1 Integrate biodiversity considerations into the tools being implemented to support environmental decision-making for the Strategic Integrated Projects (SIPs) (i.e., SEAs, norms & standards, EIAs, EMPs, etc.)	High	18	31	33	35	0	0	0	0	0	0	117
3.2.2 Integrate biodiversity considerations into land capability and agricultural zoning for Preservation and Development of Agricultural Land Framework Bill and control measures in terms of Conservation of Agricultural Resources Act	High	4	4	4	4	4	5	5	5	6	6	47
3.2.3. Integrate biodiversity priority areas into integrated coastal management plans and off-shore plans	High	3	3	4	5	6	6	7	7	7	8	55
3.2.4 Develop and publish guidelines for invasive species monitoring, control and eradication plans and review these guidelines every five years.	High	8	0	0	4	4	0	0	0	5	5	25
3.2.5 Develop invasive species monitoring, control and eradication plans for protected area management plans, environmental plans for state land, and integrated development plans and review and submit progress on plans every three years	High	0	0	305	323	342	363	385	408	432	458	3016
3.2.6 Integrate biodiversity priority areas into spatial development frameworks (SDFs), integrated development plans (IDPs) and land-use schemes (LUS)	High	0	0	452	479	508	539	571	605	641	680	4475
3.2.7 Integrate biodiversity priorities into key production sector strategies and plans, including for agriculture, mariculture, aquaculture, mining, forestry, water, land reform and rural development, through cooperative approaches	Med	17	18	19	21	22	0	0	0	0	0	97
3.2.8 Integrate biodiversity into the management of natural resources through local-level structures such as Fire Protection Associations, Soil Conservation Committees, Water User Associations, and Communal Property Associations	Low	-	-	-	-	-	-	-	-	-	-	-
3.3.1 Harmonise the regulatory requirements across different regulatory processes for land- and sea-use activities to ensure consistency on biodiversity issues and improve compliance	High	1	2	1	1	2	2	2	2	2	2	17
3.3.2 Ensure regulatory requirements enable the impacts on biodiversity to be effectively assessed	Low	-	-	-	-	-	-	-	-	-	-	-
3.3.3 Identify areas of high sensitivity where certain types of development is prohibited, e.g. 'no-go' areas for mining	High	0	0	3	0	3	0	0	0	0	0	6
3.4.1 Strengthen the environmental regulatory and compliance frameworks to support the successful implementation of biodiversity management and conservation interventions by the private sector	High	1	4	1	0	0	0	0	0	0	0	6
3.4.2 Implement, maintain, monitor and improve the Environmental Compliance and Enforcement Strategy	High	-	-	-	-	-	-	-	-	-	-	-
3.4.3 Improved number, capacity and budget for Environmental Management Inspectors to enforce conditions of authorisation and to respond to environmental crimes	High	-	-	-	-	-	-	-	-	-	-	-
3.4.4 Improve the enforcement of trade regulations	High	-	-	-	-	-	-	-	-	-	-	-

3.4.5 Improved compliance of recreational activities with permits in coastal, marine and other ecosystems	High	-	-	-	-	-	-	-	-	-	-	-
3.4.6 Reduce invasions through interventions at ports of entry and coordinated species management programmes	High	-	-	-	-	-	-	-	-	-	-	-
3.4.7 Implement effective waste management and aerosol, marine and aquatic pollution control measures, with particular emphasis on aquatic ecosystems in biodiversity priority areas	High	-	-	-	-	-	-	-	-	-	-	-
3.5.1 Update the review of funded programmes under the environment portfolio in the public sector	High	-	-	-	-	-	-	-	-	-	-	-
3.5.2 Develop a resource mobilisation strategy for biodiversity, initially supported by the implementation of the UNDP/DEA BIOFIN project	High	40	42	0	0	0	0	0	0	0	0	82
3.5.3 Coordinate the integration of biodiversity considerations into the budgeting process of national, provincial and municipal budgets through intergovernmental structures	High	7	7	7	8	8	9	9	10	10	11	86
3.5.4 Review and develop innovative financial instruments beyond the fiscus to increase the pool of resources available for biodiversity	Med	12	13	14	15	16	17	18	19	20	21	164
3.5.5 Review and amend natural resource pricing to leverage finance for biodiversity management and conservation, such as the water pricing strategy	High	-	-	-	-	-	-	-	-	-	-	-
3.5.6 Develop and strengthen economic incentives to encourage appropriate investment by the private sector in biodiversity management and conservation, such as tax incentives, conservation agriculture incentives to farmers and others	Med	-	-	-	-	-	-	-	-	-	-	-
3.5.7 Review and remove perverse incentives that negatively impact biodiversity management and conservation, such as those related to municipal property rates	Med	-	-	-	-	-	-	-	-	-	-	-
3.5.8 Ensure biodiversity functions get an equitable allocation of budget by streamlining environment sector functions and responsibilities at national and provincial level, and developing appropriate monitoring and enforcement	Med	-	-	-	-	-	-	-	-	-	-	-
3.6.1 Develop, implement, review and update legislative and other tools that ensure the protection of species and ecosystems, such as the Biodiversity Act and its amendments as well as the norms and standards, regulations, and guidelines published and implemented in terms of the Biodiversity Act, the Protected Areas Act, the Integrated Coastal Management Act, a policy framework on biodiversity offsets, and legislation in regulating activities relating to emerging technologies	High	12	13	14	15	16	0	0	0	0	0	70
3.6.2 Integrate the value of biodiversity into national accounting and reporting systems	High	8	19	9	0	0	0	0	0	0	0	37
3.6.3 Integrate biodiversity considerations into sector policies and legislation, including land use planning (SPLUMA) and decision making tools for agriculture (includes PDALFA, Sustainable Use and Management of Natural Resources Policy and Bill, revision of CARA), climate change, waste management, renewable and non-renewable energy, invasive alien species and land degradation.	High	12	12	13	14	15	0	0	0	0	0	65
3.6.4 Integrate biodiversity considerations into production sector codes of conduct and best practice guidelines	Med	-	-	-	-	-	-	-	-	-	-	-
3.6.5 Proactively engage with the international community to influence regional, subregional and multilateral environmental agreements and ensure alignment of domestic legislation, implementation and strengthen monitoring and evaluation.	High	35	37	39	42	0	0	0	0	0	0	153

3.6.6 Ratify the Nagoya–Kuala Lumpur Supplementary Protocol on Liability and Redress to the Cartagena Protocol on Biosafety	High	3	3	3	5	0	0	0	0	0	0	13
3.6.7 Ensure that Ecosystem-based Adaptation (EbA) is reflected in South Africa's National Adaptation Plan (NAP)	Med	0	0	3	0	0	0	0	0	0	0	3
SO 4. People are mobilised to adopt practices that sustain the long term benefits of biodiversity											R	157 411 806.10
4.1.1 Develop and fund a coordinated national biodiversity communications, education and awareness strategy, implementation plan and monitoring framework	High	0	12	13	0	0	0	0	0	0	0	25
4.1.2 Implement the national biodiversity communications, education and awareness strategy, implementation plan and monitoring framework	High	-	-	-	-	-	-	-	-	-	-	-
4.1.3 Strengthen environmental literacy through citizen science programmes that promote learning and common knowledge about biodiversity	Med	88	46	48	51	54	118	61	65	69	73	673
4.1.4 Strengthen the integration and teaching of biodiversity content in relevant school curricula	Med	-	-	-	-	-	-	-	-	-	-	-
4.2.1 Promote awareness of biodiversity-friendly consumer choices, including in retail and tourism	Low	-	-	-	-	-	-	-	-	-	-	-
4.2.2 Expand the incentives available to encourage voluntary behaviour change towards more biodiversity-friendly choices	Med	66	70	75	79	84	89	94	100	106	112	876
4.2.3 Create awareness around environmental rights and appropriate tools that protect those rights	High	-	-	-	-	-	-	-	-	-	-	-
SO 5. Conservation and management of biodiversity is improved through the development of an equitable and suitably skilled workforce											R	690 143 172.60
5.1.1 Incorporate the Human Capital Development needs of the biodiversity sector into national skills development systems (e.g. NSDS, DHET and SETAs)	High	0	19	21	0	0	0	0	0	0	0	40
5.1.2 Develop an effective national mechanism for coordinating biodiversity and other green skills capacity development planning, initiatives and skills intelligence, within the sector and sectors impacting on biodiversity management.	High	0	7	8	8	9	0	0	0	0	0	32
5.1.3 Develop and/or integrate existing mechanisms for the monitoring and evaluation of BHCD initiatives	High	0	7	8	8	9	9	10	0	0	0	52
5.1.4 Ensure that national strategies receive adequate funding support	High	0	0	0	0	0	0	0	0	1	1	4
5.2.1 Develop and implement an updated Biodiversity Human Capital Development Plan in support of the BHCD Strategy	High	0	9	10	11	11	12	13	13	14	15	109
5.2.2 Improve the quality and relevance of skills produced for biodiversity conservation and management	High	0	7	8	8	9	9	10	10	11	12	85
5.2.3 Increase the number of black, talented South Africans attracted to the sector, based on the BHCDS	Med	-	-	-	-	-	-	-	-	-	-	-
5.2.4 Nurture a high end skills pipeline for biodiversity in SA, including bursaries, Centres of Excellence and Research Chairs	High	0	532	564	598	634	672	713	755	801	849	6119
5.3.1 Improve the retention and effective deployment of suitable individuals in the sector	Low	-	-	-	-	-	-	-	-	-	-	-
5.3.2 Build institutional capacity to implement scaled up labour intensive programmes of work in the sector	Med	-	-	-	-	-	-	-	-	-	-	-

5.3.3 Improve institutional cooperation and coordination at the operational level, including for cross-boundary management of biodiversity assets	Med	-	-	-	-	-	-	-	-	-	-	-
5.3.4 Influence and improve the capacity of key partners/departments across all sectors to improve service delivery and support effective biodiversity management, including improved understanding of mandates, rights and relevant legislation	High	0	40	43	45	48	51	54	57	60	64	461

SO 6. Effective knowledge foundations, including indigenous knowledge and citizen science, support management, conservation and sustainable use of biodiversity											R	784 192 459.73
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	High	0	48	55	28	20	21	22	24	25	27	270
6.1.2 Assess priority gaps in existing foundational data sets for indigenous species and relevant invasive alien species to enable decision-making	Med	-	-	-	-	-	-	-	-	-	-	-
6.1.3 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 mobilizing data from specimens in collections	Med	-	-	-	-	-	-	-	-	-	-	-
6.1.4 Compile consolidated species information, such as identification, biology, distribution, status, use / value to people, taxonomy, legislation, and other literature	Med	22	23	25	26	28	29	31	33	35	37	288
6.1.5 Maintain and formalise the National Ecosystem Classification System	High	3	3	3	3	4	4	4	4	5	5	38
6.1.6 Map national ecosystem types in terrestrial, freshwater and marine environments	High	13	18	19	20	16	17	18	19	20	21	180
6.1.7 Capture and safeguard indigenous knowledge linked to biodiversity through the National Recordal System	Med	-	-	-	-	-	-	-	-	-	-	-
6.1.8 Identify, develop and build on relevant long-term large-scale monitoring projects and data sets	High	355	337	343	411	435	461	489	519	550	583	4482
6.2.1 Review and expand Red Lists for priority taxa and assess all new species and species in areas targeted for development	High	22	23	24	26	27	29	31	32	34	37	285
6.2.2 Review lists for IAS, TOPS, CITES every five years, based on new data	Med	49	52	55	58	62	65	69	74	78	83	645
6.2.3 Develop and implement methods and approaches for assessing the status of ecological infrastructure	High	0	7	7	0	0	0	0	0	0	0	14
6.2.4 Identify, expand and monitor citizen science contributions to the status of species and ecosystems, ensuring appropriate data quality	High	13	14	15	16	17	18	19	20	21	23	177
6.2.5 Regularly map key pressures on biodiversity, including landcover change, pressures in the marine environments, such as fisheries, trawling, mining, and the density and distribution of invasive alien species	High	5	5	5	6	6	7	7	7	8	8	64
6.2.6 Monitor and report on the state of ecosystems and species, including the status and trends for priority harvested marine resources, impact of trade in wildlife and wild plants on biodiversity including change in status in TOPS and CITES listed species, invasive alien species, their impacts and the effectiveness of control measures, change in status of Red Listed species, the impacts of	High	15	16	17	18	19	20	22	23	24	26	201

Genetically Modified Organisms on biodiversity assets and ecological infrastructure, and the impacts of climate change on species and ecosystem

Action	Priority											Total
6.2.7 Revise and update the National Biodiversity Assessment at least every seven years	High	13	14	15	16	17	18	19	20	21	23	178
6.3.1 Set quantitative biodiversity targets for all national ecosystem types and for threatened, endemic, indicator, flagship and high-value useful species	High	2	2	2	2	2	2	2	2	3	3	21
6.3.2 Map species, ecological and socio-economic features that should inform spatial prioritisation, such as areas that are important for ecological infrastructure, ecosystem-based adaptation or climate change resilience, and areas where demand for ecosystem services is high.	High	5	5	5	6	6	7	7	7	8	8	64
6.3.3 Update the fruit salad map, provincial biodiversity plans, biodiversity sector plans and bioregional plans regularly, ideally at least every five to ten years	High	6	6	6	7	7	8	8	9	9	10	76
6.3.4 Identify priority areas for ecological infrastructure and other national biodiversity priority areas, such as national coastal biodiversity priority areas and updates of freshwater ecosystem priority areas	High	0	0	0	0	7	0	0	0	0	0	7
6.4.1 Develop the implementation plan for the National Biodiversity Research Strategy, including carrying out a gap analysis to identify priority research and data needs such as for the NBSAP	Med	0	0	4	0	0	0	0	0	0	0	4
6.4.2 Address priority research questions as identified in the National Biodiversity Research Strategy's gap analysis through network of researchers and institutions	Med	-	-	-	-	-	-	-	-	-	-	-
6.4.3 Engage with funding agencies and research community to align funding grants and allocations in support of priority projects	Med	0	0	2	2	3	3	3	3	3	3	23
6.4.4 Promote collaboration between practitioners and researchers through existing national forums, such as SAWMA, Fynbos Forum, Arid Zone, SASAqS, KZN Wildlife Symposium, Marine Science, Freshwater Ecosystem Network, Bioprospecting Forum, Biodiversity Planning Forum, WRC symposium, GSSA, Wetlands Indaba, Zoological Society of Southern Africa, South African Wildlife Management Association Symposium, Offshore Environment Forum	Med	-	-	-	-	-	-	-	-	-	-	-
6.4.5 Promote engagement in international policy development and decision-making platforms, such as IPBES, IOSEAs, GBIF, to support evidence-based policy and decision-making	Low	-	-	-	-	-	-	-	-	-	-	-
6.4.6 Establish a process for extracting and disseminating key policy and management relevant information and messages from research, planning and assessment for decision-makers	Med	0	0	8	8	9	9	10	10	11	12	76
6.5.1 Develop infrastructure that facilitates serving various forms of information and tools in an appropriate format for decision-making to as broad a group of users as possible	High	0	55	58	47	49	52	56	59	62	66	504
6.5.2 Develop an integrated information management system for accessing information about species and ecosystems for decision-making	Med	0	20	21	23	24	26	27	29	30	32	233
6.5.3 Ensure alignment between different data portals effectively serve biodiversity information to decision-makers and the public	Med	1	1	1	1	1	1	1	1	1	1	11
6.5.4 Develop tools that uses biodiversity data to provide more responsive analyses for science to policy purposes, such as an early warning system and/or predictive scenarios for issues such as climate change, land use impacts, or new and emerging technology	Med	-	-	-	-	-	-	-	-	-	-	-

7.3 Projected costs towards achieving Aichi Targets and Sustainable Development Goals

Each NBSAP activity was aligned with relevant Aichi targets and Sustainable Development Goals (SDGs). In almost all cases, NBSAP activities aligned to more than one Aichi Target or SDG. Therefore the cost of many NBSAP activities is counted as contributing to more than one Target or Goal and the values in the following tables cannot be summed.

The total projected cost of NBSAP activities that contribute to Aichi Targets is reported in Table 8. There is no cost associated with the Aichi Target 17 as the whole NBSAP relates to this target. The total projected cost of NBSAP activities that contribute to SDGs is reported in Table 9.

Table 8. Aichi targets, grouped by Strategic Goal, and the total projected cost of NBSAP activities aligned with each target

Strategic Goal A: Address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society		
Target 1	By 2020, at the latest, people are aware of the values of biodiversity and the steps they can take to conserve and use it sustainably.	R 1 452 256 871.82
Target 2	By 2020, at the latest, biodiversity values have been integrated into national and local development and poverty reduction strategies and planning processes and are being incorporated into national accounting, as appropriate, and reporting systems.	R 1 291 899 758.97
Target 3	By 2020, at the latest, incentives, including subsidies, harmful to biodiversity are eliminated, phased out or reformed in order to minimize or avoid negative impacts, and positive incentives for the conservation and sustainable use of biodiversity are developed and applied, consistent and in harmony with the Convention and other relevant international obligations, taking into account national socio economic conditions.	R 1 306 598 551.28
Target 4	By 2020, at the latest, Governments, business and stakeholders at all levels have taken steps to achieve or have implemented plans for sustainable production and consumption and have kept the impacts of use of natural resources well within safe ecological limits.	R 1 251 167 735.68
Strategic Goal B: Reduce the direct pressures on biodiversity and promote sustainable use		
Target 5	By 2020, the rate of loss of all natural habitats, including forests, is at least halved and where feasible brought close to zero, and degradation and fragmentation is significantly reduced.	R 2 017 999 482.53
Target 6	By 2020 all fish and invertebrate stocks and aquatic plants are managed and harvested sustainably, legally and applying ecosystem based approaches, so that overfishing is avoided, recovery plans and measures are in place for all depleted species, fisheries have no significant adverse impacts on threatened species and vulnerable ecosystems and the impacts of fisheries on stocks, species and ecosystems are within safe ecological limits.	R 2 047 121 010.54
Target 7	By 2020 areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity.	R 2 017 175 689.77
Target 8	By 2020, pollution, including from excess nutrients, has been brought to levels that are not detrimental to ecosystem function and biodiversity.	R 1 980 490 908.45
Target 9	By 2020, invasive alien species and pathways are identified and prioritized, priority species are controlled or eradicated, and measures are in place to manage pathways to prevent their introduction and establishment.	R60 102 031 712.23
Target 10	By 2015, the multiple anthropogenic pressures on coral reefs, and other vulnerable ecosystems impacted by climate change or ocean acidification are minimized, so as to maintain their integrity and functioning.	R 2 017 999 482.53
Strategic Goal C: To improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity		
Target 11	By 2020, at least 17 per cent of terrestrial and inland water, and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscapes and seascapes.	R86 444 492 669.01

Target 12	By 2020 the extinction of known threatened species has been prevented and their conservation status, particularly of those most in decline, has been improved and sustained.	R28 511 413 764.77
Target 13	By 2020, the genetic diversity of cultivated plants and farmed and domesticated animals and of wild relatives, including other socio-economically as well as culturally valuable species, is maintained, and strategies have been developed and implemented for minimizing genetic erosion and safeguarding their genetic diversity.	R 2 050 367 492.13
Strategic Goal D: Enhance the benefits to all from biodiversity and ecosystem services		
Target 14	By 2020, ecosystems that provide essential services, including services related to water, and contribute to health, livelihoods and well-being, are restored and safeguarded, taking into account the needs of women, indigenous and local communities, and the poor and vulnerable.	R59 824 159 772.53
Target 15	By 2020, ecosystem resilience and the contribution of biodiversity to carbon stocks has been enhanced, through conservation and restoration, including restoration of at least 15 per cent of degraded ecosystems, thereby contributing to climate change mitigation and adaptation and to combating desertification.	R59 818 640 170.36
Target 16	By 2015, the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization is in force and operational, consistent with national legislation.	R 2 002 527 247.67
Strategic Goal E: Enhance implementation through participatory planning, knowledge management and capacity building		
Target 17	By 2015 each Party has developed, adopted as a policy instrument, and has commenced implementing an effective, participatory and updated national biodiversity strategy and action plan.	R -
Target 18	By 2020, the traditional knowledge, innovations and practices of indigenous and local communities relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, are respected, subject to national legislation and relevant international obligations, and fully integrated and reflected in the implementation of the Convention with the full and effective participation of indigenous and local communities, at all relevant levels.	R 2 046 890 680.77
Target 19	By 2020, knowledge, the science base and technologies relating to biodiversity, its values, functioning, status and trends, and the consequences of its loss, are improved, widely shared and transferred, and applied.	R 2 294 410 493.22
Target 20	By 2020, at the latest, the mobilization of financial resources for effectively implementing the Strategic Plan for Biodiversity 2011-2020 from all sources, and in accordance with the consolidated and agreed process in the Strategy for Resource Mobilization, should increase substantially from the current levels. This target will be subject to changes contingent to resource needs assessments to be developed and reported by Parties.	R 1 198 854 240.64

Table 9. Sustainable Development Goals and the total projected cost of NBSAP activities aligned with each goal

Sustainable Development Goals		**Total**
Goal 1	End poverty in all its forms everywhere	R 59 326 498 449.40
Goal 2	End hunger, achieve food security and improved nutrition and promote sustainable agriculture	R 1 175 836 117.61
Goal 3	Ensure healthy lives and promote well-being for all at all ages	R 690 143 172.60
Goal 4	Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all	R 760 004 821.09
Goal 5	Achieve gender equality and empower all women and girls	R 58 818 197 751.77
Goal 6	Ensure availability and sustainable management of water and sanitation for all	R 86 582 914 089.94
Goal 7	Ensure access to affordable, reliable, sustainable and modern energy for all	R 708 346 995.04
Goal 8	Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all	R 59 421 002 260.58
Goal 9	Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation	R 59 037 738 875.19

Sustainable Development Goals		Total
Goal 10	Reduce inequality within and among countries	R 59 114 060 339.75
Goal 11	Make cities and human settlements inclusive, safe, resilient and sustainable	R 1 224 582 665.04
Goal 12	Ensure sustainable consumption and production patterns	R 899 870 016.04
Goal 13	Take urgent action to combat climate change and its impacts*	R 86 653 656 198.64
Goal 14	Conserve and sustainably use the oceans, seas and marine resources for sustainable development	R 86 875 544 696.02
Goal 15	Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss	R 86 875 544 696.02
Goal 16	Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels	R 1 250 962 133.43
Goal 17	Strengthen the means of implementation and revitalize the global partnership for sustainable development	R 715 022 072.93