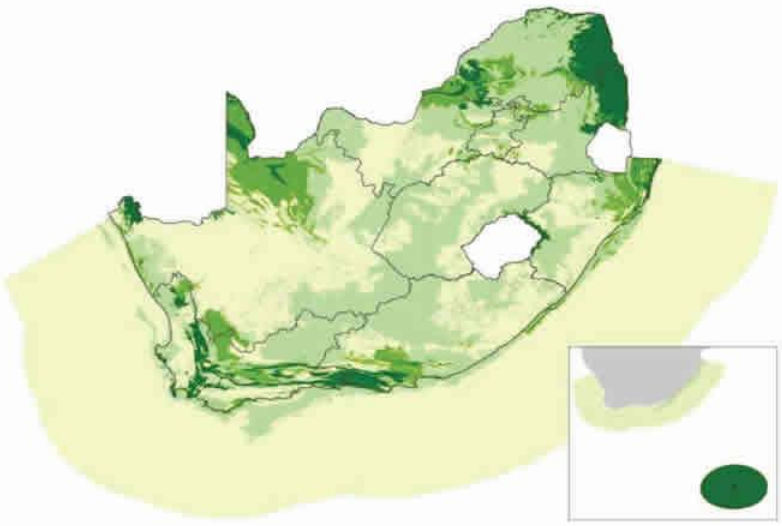
National Protected Area Expansion Strategy for South Africa

2018



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This update of the National Protected Area Expansion Strategy (NPAES) draws heavily on the original NPAES (2008). The authors of the original NPAES are acknowledged for their ongoing contribution to the current revision. Emily Botts and Aimee Ginsburg assisted with editing and formatting the document. The photographs on the cover page are courtesy of James Puttick, Gavin Fordham and Jane Ferraris.

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Version note:

This version of the *National Protected Areas Expansion Strategy for South Africa 2018* has been updated to include the Northern Cape Protected Area Expansion Strategy which was released in 2017. Analyses, maps, tables, discussion and spatial data were updated from the original version of the NPAES to reflect the updated Northern Cape data, but the remainder of the report has been retained.

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Acronyms

BIOFIN	Biodiversity Finance Initiative
CBD	Convention on Biological Diversity
DAFF	Department of Agriculture, Forestry and Fisheries
DEA	Department of Environmental Affairs
EEZ	Exclusive Economic Zone
EPWP	Extended Public Works Programme
FEPA	Freshwater Ecosystem Priority Area
IUCN	World Conservation Union
KZN	KwaZulu-Natal
MINMEC	A standing intergovernmental body consisting of the Minister of Environmental Affairs and provincial Members of the Executive Council (MECs)
MPA	Marine Protected Area
NBA	National Biodiversity Assessment
NFEPA	National Freshwater Ecosystem Priority Areas
NGO	Non-government organisation
NPAES	National Protected Area Expansion Strategy
SANBI	South African National Biodiversity Institute
SANParks	South African National Parks
UNESCO	United Nations Educational, Scientific and Cultural Organisation

Executive summary

The National Protected Area Expansion Strategy, first published in 2008 (NPAES 2008)[1], presents a 20-year strategy for the expansion of protected areas in South Africa.

Provision is made for the review and updating of the NPAES every 5 years. This document (NPAES 2018) represents the first full revision of the NPAES 2008, and the updated strategy for the next 5-years (2018 – 2022). Each new revision of the NPAES refers to a rolling 20-year period, so this revision sets out a future 20-year strategy.

The updated NPAES 2018 now includes:

- New biodiversity data and newly declared protected areas as well as updated provincial conservation plans and provincial protected area expansion strategies (PAES), to improve the setting of targets and the identification of priority areas for meeting these targets.
- A review of the performance of protected area institutions in protected area expansion for the first implementation phase of the NPAES (2008 – 2014)[2].
- A description of the priority activities, with explicit performance targets, for the second implementation phase (2018 – 2022) of the NPAES.

In order to maintain continuity of the NPAES over the 20 years of the strategy, the structure of this document has been maintained using similar formatting to the NPAES 2008. The document has similar sections, but the information has been revised and updated.

Why a National Protected Area Expansion Strategy?

South Africa's protected area network currently falls far short of representing all ecosystems and maintaining ecological processes. In this context, the goal of the National Protected Area Expansion Strategy (NPAES) is to achieve cost effective protected area expansion for improved ecosystem representation, ecological sustainability and resilience to climate change. The NPAES highlights how we can become more efficient and effective in allocating the scarce human and financial resources available for protected area expansion. It sets protected area targets, maps priority areas for protected area expansion, and makes recommendations on mechanisms to achieve this. The common set of targets and spatial priorities provided by the NPAES enable co-ordination between the many role players involved in protected area expansion.

The role of protected areas

Protected areas are areas of land or sea that are protected by law and managed mainly for biodiversity conservation. Protected areas recognised in the National Environmental Management: Protected Areas Act (Act 57 of 2003) are considered protected areas in the NPAES. The Protected Areas Act provides for several categories of protected areas, including special nature reserves, national parks, nature reserves, marine protected areas and protected environments.

The goal of the NPAES is to achieve cost effective protected area expansion for improved ecosystem representation, ecological sustainability and resilience to climate change. It sets protected area targets, maps priority areas for protected area expansion, and makes recommendations on mechanisms to achieve this.

Protected areas are vital for ecological sustainability and climate change adaptation.

[1] DEA., 2008.

[2] While the first implementation phase should have spanned the years 2008 to 2013, delays in initiating the review process mean that this review now covers the period 2008 to 2014.

They also serve as nodes in our ecological infrastructure network, protecting the ecosystems that deliver important ecosystem services to people. This natural infrastructure is largely free, so is often unnoticed or under-appreciated, but it is just as important for underpinning human livelihoods and well-being as our extensive built infrastructure network and our social infrastructure. South Africa has a unique opportunity to take a global lead in giving protected areas a central role in our climate change response strategy. To achieve this, the biases of the current protected area network are being addressed to ensure more effective inclusion of under-represented terrestrial ecosystems, river ecosystems, wetlands, estuaries and marine ecosystems in the national protected area estate.

Protected areas are vital for ecological sustainability and climate change adaptation, serving as nodes in our ecological infrastructure network. South Africa has an opportunity to take a global lead in giving protected areas a central role in our climate change response strategy.

Through the protection and management that protected areas provide for priority ecosystems and catchments, they help to secure the provision of important ecosystem services, such as production of clean water, flood moderation, prevention of erosion, carbon storage, and the aesthetic value of the landscape. Marine protected areas can play a particularly important role in keeping our fisheries sustainable, for example by protecting nursery grounds for commercially important fish species. In this way, protected areas form a valuable network of ecological infrastructure.

Protected areas can support rural livelihoods and local economic development. Especially in marginal agricultural areas, conservation-related industries have higher economic potential than agricultural activities such as stock farming.

Protected areas can support rural livelihoods and local economic development especially in marginal agricultural areas, conservation-related industries have higher economic potential than agricultural activities such as stock farming.

The relationship between protected areas and land reform has tended to be a controversial issue, with the focus usually on land claims in existing protected areas. Less attention has been paid to the opportunities for protected area expansion to actively support the land reform agenda and the diversification of rural livelihood options, especially in agriculturally marginal areas. Scope exists for protected area expansion to work in partnership with land reform for mutual benefit, for example through contract agreements that establish nature reserves or other forms of biodiversity stewardship agreement. In such cases, the land remains in the hands of its owners rather than being transferred to a protected area agency. The opportunity exists for local communities, as potentially major landholders through the land reform process, to have full access to the economic opportunities associated with ecotourism.

Protected areas are a powerful tool for biodiversity conservation and climate change adaptation, but not the only one. The National Environmental Management: Biodiversity Act (Act 10 of 2004) gives us a suite of legal tools, such as publishing bioregional plans and listing threatened ecosystems, for conserving the many biodiversity priority areas that lie outside the protected area network.

Comprehensive targets have now been set for wetlands, rivers, estuaries, specific marine ecosystems, as well as for the terrestrial and marine ecosystems of our Southern Oceans and Sub-Antarctic territories

Scope exists for protected area expansion to work in partnership with land reform for mutual benefit, actively supporting the land reform agenda and the diversification of rural livelihoods.

These tools complement the expansion and effective management of the protected area network in pursuit of the overall goals of biodiversity conservation and sustainable development.

Protected area targets

Protected area targets are action targets that indicate how much of each ecosystem should be included in protected areas. Targets help to focus protected area expansion on the least protected ecosystems and provide the basis for assessments of protection level and progress towards a more representative protected area network. The NPAES uses the established biodiversity targets for each ecosystem from the National Biodiversity Assessment (NBA)[3] as the long-term protected area targets. This ensures that targets are scientifically robust and have an ecological basis, such that no further ecosystems become Critically Endangered, and that targets and assessment results for the NBA and the NPAES align. The 20-year targets for protected area expansion were determined by proportionally allocating the total area committed to under the Convention on Biological Diversity (CBD) Aichi biodiversity targets to the individual ecosystems based on their long-term targets. The targets are set for individual ecosystem types.

The major improvements of this revised NPAES 2018 are that in addition to targets for terrestrial vegetation types and broad marine systems, comprehensive targets have now been set for wetlands, rivers, estuaries, specific marine ecosystems, as well as for the terrestrial and marine ecosystems of our Southern Oceans and Sub-Antarctic territories. These targets were set based on a new integrated ecosystem map.

Targets can only be met by secured intact habitat. This principle was established in the NPAES 2008 but was previously only partially implemented as only artificial waterbodies were excluded. In the NPAES 2018, we have excluded all poor condition habitats based on a new integrated ecosystem condition map.

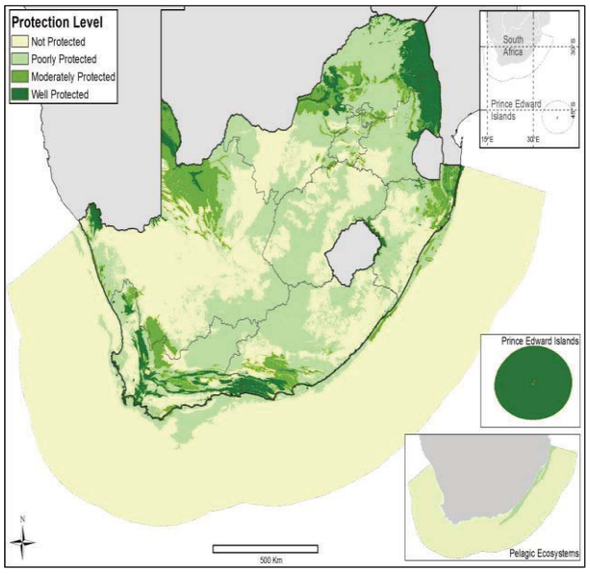

Figure 1: Protection levels for South African ecosystems

Targets are currently only evaluated in legally recognised protected areas. However, once other conservation areas are effectively secured, verified and monitored, they may also contribute to meeting targets.

The approach taken in the NPAES is that clear principles and a repeatable method are established for target setting. This ensures easy updates and allows provinces and agencies to calculate compatible targets if they are utilising different or finer scale ecosystem maps. South Africa has 969 distinct ecosystem types, across 26 biozones[4]. Of these, 201 (21%) are Well Protected, 122 (13%) are Moderately

[3] Driver et al., 2012.

[4] Biozones are major habitat units. In the terrestrial environment, they are the same as biomes, but the term biozone is used so that equivalent river, wetland and marine habitat units can be included.

Protected, 286 (30%) are Poorly Protected, and 360 (37%) are Not Protected[5].

Protection level varies among regions and biozones. Well Protected ecosystems include the Southern Oceans and Sub-Antarctic territories. The protected area targets for these areas are now fully met. Also reasonably protected are coastal and other shallow water systems, although key gaps exist on the West Coast and there are too few no-take areas. The offshore benthic and pelagic ecosystems are almost completely unprotected, although this should soon change with the implementation of Operation Phakisa[6]. Inland aquatic ecosystems (i.e. rivers, wetlands and estuaries) are extremely poorly represented in the current protected area network, and even many areas that are within reserves are in poor condition. Current protection of terrestrial ecosystems is still insufficient, though good coverage of Forest ecosystems has been achieved. Ecosystems of the Nama-Karoo, Grasslands and Succulent Karoo are not well represented in the current protected area network, while lowland Fynbos and central Savanna ecosystems are also very under-represented.

South Africa's current protected area network thus falls far short of representing all ecosystems. To meet the long-term protected area targets we need to add 413 163km^2 to the protected area network, of which 211 896km^2 are marine benthic and coastal ecosystems. In addition to this, 212 140km^2 of marine pelagic ecosystems needs to be secured, though some of this could be achieved at the same time as benthic and coastal ecosystems as these systems overlap.

To reach these long-term targets, 20-year targets have also been set. 255 877km^2 need to be added the protected area network over the next 20 years, of which 104 962km^2 are marine benthic and coastal ecosystems.

Of the 20-year total, 146 814km^2 is required for terrestrial ecosystems, 2 352km^2 for wetlands and 1 490km^2 for rivers. A separate 104 780km^2 is required to meet marine pelagic targets though this may overlap with some of the area required to meet the benthic target.

Priority areas for protected area expansion

Having set protected area targets, the next step is to determine which geographic areas are the highest priorities for protected area expansion to meet those targets. The NPAES takes the approach that the national role is not to undertake the spatial planning, but rather to set targets, identify key underlying planning principles, collate the provincial and sector priorities, and identify any remaining gaps.

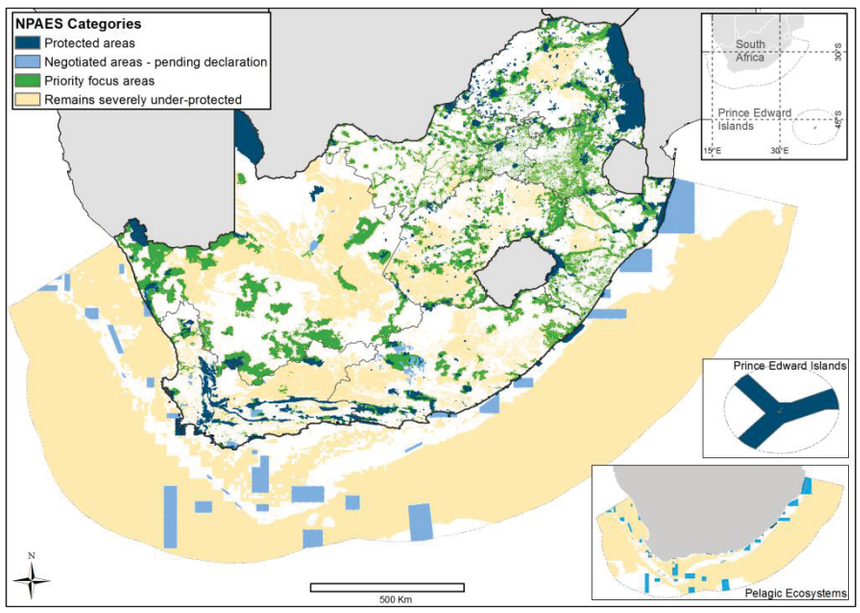

Figure 2: Priority areas for protected area expansion in South Africa.

5 See Table 8 for an explanation of these categories.

6 DEA, 2014b.

The previous NPAES 2008 was forced to establish the spatial priorities nationally as few provinces or agencies had conservation plans and even fewer had specific sets of protected area expansion priorities. This has changed sufficiently to allow a set of priority areas to be built-up from provincial and agency plans. This is an improvement, as detailed planning, scheduling and operational issues are all best dealt with at the provincial and agency level. The revised NPAES 2018 identifies additional priorities only where these do not exist, and also highlights ecosystems where, if fully implemented, the current set of priorities will not achieve targets. Provinces and agencies are likely to refine, revise and adapt their systematic spatial plans and protected area expansion priorities over time. For this reason, the NPAES highlights some overall principles that should be applied in protected area expansion planning and implementation. The requirement for a systematic, target-driven approach that is well integrated across ecosystems and between organisations is emphasised.

A comprehensive set of priority areas was compiled based on the priorities identified by provincial and other agencies in their protected area expansion strategies. The NPAES identified additional areas in the Northern Cape where there is a recently approved current protected area expansion strategy. The identified priority areas cover a total area of 190 109km^2, in addition to areas currently under negotiation covering 73 610km^2 of mostly marine areas.

Overall, the set of priorities is well aligned with requirements for improving the representation of most ecosystems over the next 20 years. The number of Well Protected ecosystems is anticipated to more than double, while Not Protected ecosystems will reduce by around 70%. An improvement in coverage is anticipated for 665 ecosystem types, with greatest progress likely in the Grasslands, Succulent Karoo, Savanna, wetlands, rivers and offshore benthic and pelagic ecosystems.

However, even if the priorities were to be implemented, no improvement in protection level is expected for 87 ecosystem types. The main areas with ecosystems where no improvement is anticipated are in the Nama Karoo and arid Savanna biozones.

Mechanisms for protected area expansion

There are three main mechanisms for expanding the land-based protected area network:

- **Acquisition of land**, the traditional way of establishing and expanding protected areas, which involves large upfront costs.
- **Contract agreements** are agreements in which landowners maintain ownership of their land but enter into a contract with a protected area agency in return for protected area status. Provisions in the Protected Areas Act facilitate these agreements. Contract agreements are attractive because they tend to cost protected area agencies less than acquisition, and because by far the largest proportion of land in the priority areas for protected area expansion lies in private hands. Biodiversity stewardship programmes should be strengthened so that more use can be made of contract agreements in the expansion of the protected area network. There are significant potential synergies between biodiversity stewardship programmes, land reform and rural development.
- **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.

Contract agreements are a key mechanism for expanding the protected area network. They are often much more cost effective than acquisition of land, and are used increasingly as part of biodiversity stewardship programmes.

Each one of these mechanisms has an important role to play, with contract agreements being used increasingly as part of biodiversity stewardship programmes.

Mechanisms for expanding the marine protected area network are more complex and require significant political negotiation processes and the accommodation of conflicting marine activities. Marine spatial planning processes and subsequent incorporation of agreed areas into marine protected areas nevertheless have potential to rapidly improve the representation of marine ecosystems when the process is successfully undertaken. South Africa's Operation Phakisa is proving to be international best practice in this regard.

Mechanisms for securing protected areas specifically focused on inland aquatic ecosystems remain poorly understood. The current process of securing rivers, wetlands and estuaries using the methods used for terrestrial ecosystems has proved largely ineffective. Even when the features are fully incorporated into protected areas, they are still subject to catchment related impacts. Much work remains to understand how to properly secure inland aquatic ecosystems and their associated processes.

Implementation of the NPAES.

The primary implementers of the NPAES are protected area agencies and institutions. These include provincial conservation authorities; South African National Parks (SANParks); the Department of Agriculture, Forestry and Fisheries (DAFF); and the Oceans and Coasts Branch of the Department of Environmental Affairs (DEA). Although most agencies have developed institution-specific protected area expansion plans, those that have not need to rapidly do so. Existing plans will require revision and greater alignment with the national strategy, which has been revised for the second phase of the NPAES.

DEA (through Working Group 1 of MINMEC) will ensure alignment of the efforts of the multiple agencies involved in protected area expansion. It will also provide a forum for discussing challenges and sharing lessons, and track progress towards meeting protected area targets. Establishing and strengthening provincial biodiversity stewardship programmes is an institutional priority for provincial conservation authorities and for DEA.

The NPAES 2018 provides a revised set of implementation targets for phase 2 (2018 – 2022), developed with consideration of the realistic resources available to implementing agencies.

Financing protected area expansion

Protected area expansion draws on several sources of finance, all of which have an important role to play given the size of the task of achieving protected area targets. These sources include funding from National Treasury and donors (particularly for land acquisition); revenues earned from protected areas; biodiversity-related fiscal reform to facilitate investment and expenditure by private landowners through contract agreements; and strategic implementation of the biodiversity offsets programme.

The purchase of land for protected area expansion could arguably be a good national investment in climate change adaptation but the cost is prohibitive for protected area agencies. For this reason, this strategy highlights the importance of expansion mechanisms other than land acquisition, particularly contract agreements through the biodiversity stewardship programmes.

Fiscal incentives contained in the Revenue Laws Amendment Act (Act 60 of 2008), have the potential to stimulate protected area expansion by making defined conservation management costs and land costs tax deductible for landowners who have entered into specified contractual agreements. Additional biodiversity-related fiscal reform options being explored include reducing the transaction costs associated with land acquisition for protected areas, removing perverse incentives in municipal property

rates, and using Expanded Public Works Programme funding as an incentive to encourage landowners to enter into contract agreements.

The strategic and efficient use of biodiversity offsets could potentially support the expansion of the protected area network. Priority areas for protected area expansion should be the major receiving sites for offsets, rather than *ad hoc* and individually identified sites. Careful planning will be necessary to ensure that offsets contribute optimally to protected area expansion and management, and do not place an undue burden on protected area agencies. A key issue is securing ongoing management costs.

Innovative financial mechanisms for protected area expansion that could be piloted include a conservation trust fund, and payments for ecosystem services in cases where protected areas contribute to, for example, catchment management and water supply.

Information gaps and research priorities

A number of information gaps identified in the first phase of the NPAES were filled in this revision. There remain further gaps that should be addressed in future revisions of the NPAES. These include an accurate and up-to-date mapping of protected areas and a national spatial data layer on land ownership and tenure.

Research priorities include further exploration of the role of protected areas in supporting ecosystem-based adaptation to climate change. Ecologically meaningful biodiversity targets for aquatic ecosystems need to be developed. Exploration of innovative ways to consider land price and opportunity costs in the identification of priority areas for protected area expansion are needed, as well as investigation of the likely costs of different mechanisms for protected area expansion into the future.

The strategic and efficient use of biodiversity offsets could potentially support the expansion of the protected area network. Priority areas for protected area expansion should be the major receiving sites for offsets.

Also useful would be additional research into the relative income and job creation potential of agriculture compared with protected areas and ecotourism. Finally, pilot projects are needed to evaluate the ways in which biodiversity stewardship agreements can used to support land reform and rural development.

1. Why a National Protected Area Expansion Strategy?

The goal of the National Protected Area Expansion Strategy (NPAES) is to achieve cost effective protected area expansion for improved ecosystem representation, ecological sustainability and resilience to climate change. It sets protected area targets, maps priority areas for protected area expansion, and makes recommendations on mechanisms to achieve this. This is particularly important in the context of South Africa's globally exceptional biodiversity richness on the one hand, and significant financial and human resource constraints on the other.

The NPAES is a 20-year strategy with 5-year implementation targets aligned with a 5-year revision cycle. Each new revision of the NPAES refers to a rolling 20-year period, so this revision sets out a future 20-year strategy. The NPAES 2018 reviews the first phase of the NPAES (2008 – 2014) and provides the strategy and implementation plan for the second phase (2018 – 2022).

This chapter outlines the importance of the NPAES in enabling co-ordination among many role-players towards more efficiently and effectively allocating the limited resources available for protected area expansion. It also sets out the scope of the NPAES and the structure of this strategy.

South Africa's protected area network remains insufficient to conserve biodiversity and ecological processes effectively, or to play its full potential role in providing resilience to the impacts of climate change. This is because of the *ad hoc* way the protected area network has developed over time, protecting some ecosystems well and others hardly at all. Historically, freshwater, estuarine and offshore marine ecosystems were especially poorly represented in the protected area network although significant steps have been taken recently to improve this situation.

The overall goal of the NPAES is to achieve cost effective protected area expansion for improved ecosystem representation, ecological sustainability and climate change adaptation. The NPAES highlights how we can become more efficient and effective in allocating limited resources available for protected area expansion.

South Africa's current protected area network in both the terrestrial and the marine environments remains insufficient to conserve biodiversity and ecological processes effectively, or to play its full potential role in providing resilience to the impacts of climate change.

It sets protected area targets, maps priority areas for protected area expansion, and makes recommendations on mechanisms to achieve this.

While the primary roles of the protected area network are representation of all ecosystems, ecological sustainability and climate change resilience, protected areas also deliver significant socio-economic benefits, especially in rural areas, thus contributing to South Africa's overall development goals.

Many role players, public and private, are involved in creating, expanding and managing protected areas in South Africa. The NPAES provides a common set of targets and spatial priorities to guide efforts and enable co-ordination. This is particularly important in the context of South Africa's globally exceptional biodiversity richness on the one hand, and significant financial and human resource constraints on the other.

The Department of Environmental Affairs (DEA) led the development of the NPAES, in consultation with the protected area agencies and other key stakeholders. The need for the development of the NPAES was established in the National Biodiversity Framework[7]. The NPAES is a 20-year strategy with 5-year implementation targets aligned with a 5-year revision cycle. Each new revision of the NPAES

[7] DEAT, 2008.

refers to a rolling 20-year period. The NPAES 2018 covers the implementation period 2018-2022 and sets out a future 20-year strategy.

The NPAES does not deal with site-scale planning or exactly which sites should be included in the protected area network, nor does it deal with detailed implementation planning for expanding protected areas. All of these are most appropriately done by protected area agencies and institutions, using the NPAES as a guide.

While the primary roles of the protected area network are representation of all ecosystems, ecological sustainability and climate change resilience, protected areas also deliver significant socio-economic benefits, especially in rural areas, thus contributing to South Africa's overall development goals.

Expansion of the protected area network should take place concurrently with efforts to improve biodiversity management effectiveness within existing and new protected areas. This need is not addressed in the NPAES, but requires attention alongside the implementation of the NPAES, particularly in some provincial protected area agencies as well as in the marine protected areas.

The NPAES is intended to be used by all those who play, or could play, a role in protected area expansion, including protected area institutions, agencies and managers, conservation non-governmental organisations (NGOs) and funding agencies, policymakers in relevant national departments, municipalities and the private sector.

Structure of this document

Chapter 2 outlines why protected areas are important and valuable.
Chapter 3 reviews progress in implementing the NPAES at the end of the initial phase of implementation.
Chapter 4 identifies the protected area targets that should guide the ongoing expansion of the protected area network. ***Chapter 5*** discusses priority areas for protected area expansion.
Chapter 6 reviews the main mechanisms available for protected area expansion.
Chapter 7 looks at some of the financial issues involved.
Chapter 8 describes the key actions and targets for the implementation of the NPAES for the period 2018 – 2022.
Chapter 9 highlights information gaps, research needs and identifies key legislative and policy issues that may need attention in order to support protected area expansion efforts.
Appendix 1 provides supporting information on the specific ecosystem targets.
Appendix 2 explains the technical approach to setting targets in more detail.
Appendix 3 provides a more detailed review of the first phase of the NPAES.

2. The role of protected areas

Protected areas are vital for ecological sustainability and climate change adaptation, serving as nodes in our ecological infrastructure network. South Africa has a strong legal context for protected areas and management of biodiversity. This chapter explains the role of protected areas in biodiversity conservation and ecological sustainability, in addition to the role they play in climate change adaptation, land reform and rural livelihoods, and socio-economic development. South Africa has an opportunity to be proactive in giving protected areas a central role in our climate change response strategy. To achieve this, the biases of the current protected area network are being addressed to ensure more effective inclusion of under-represented terrestrial ecosystems, river ecosystems, wetlands, estuaries and marine ecosystems in the national protected area estate.

Protected areas are vital nodes in South Africa's ecological infrastructure. Our ecological infrastructure consists of nodes and corridors of natural habitat that provide a range of ecosystem services as well as resilience to the impacts of climate change and natural disasters. This natural infrastructure is largely free, so is often unnoticed or under-appreciated, but it is just as important for underpinning human livelihoods and wellbeing as our extensive built infrastructure network and our social infrastructure.

Protected areas are vital nodes in South Africa's ecological infrastructure. They help to ensure functional landscapes that provide stable environments for the benefit of human well-being.

In this chapter, we highlight four of the most important contributions of protected areas, some of them only partially realised and all worthy of further attention:

- Biodiversity conservation and ecological sustainability
- Climate change adaptation
- Land reform and rural livelihoods
- Socio-economic development, including ecosystem services

Transfrontier conservation areas, of which there are six shared between South Africa and our neighbouring countries, provide opportunities for scaling up all of the above contributions of protected areas and for strengthening the links between ecological sustainability benefits and socio-economic benefits.

What are protected areas?

Protected areas are areas of land or sea that are protected by law and managed mainly for biodiversity conservation. Only protected areas recognised in the National Environmental Management: Protected Areas Act (Act 57 of 2003) are considered to be protected areas in the NPAES.

The Protected Areas Act distinguishes between several categories of protected area: special nature reserves, national parks, nature reserves, marine protected areas and protected environments. In addition, it also recognises world heritage sites, specially protected forest areas, and mountain catchment areas.

The NPAES uses a narrower definition of protected areas than the Convention on Biological Diversity (CBD) and IUCN, which acknowledge the role of other effective area-based conservation measures in protecting biodiversity. These areas could include conservation areas that are areas of land not formally protected by law but informally protected by the current owners and users and managed at least partly for biodiversity conservation. They can also include a range of other mechanisms such as the intact and conservation zoned areas of UNESCO biospheres, buffers zones on world heritage sites, areas protected by spatial planning laws (e.g. zoning for conservation use), areas protected by conservation servitudes, and in

the marine context may include specially zoned fishery management areas.

In the absence of legally binding measures that require effective management, these other area-based conservation measures may not provide sufficient protection. For this reason, the NPAES currently only evaluates protected areas. However, once other area-based conservation sites have been effectively secured (through legal measures other than the Protected Areas Act), are effectively managed, verified and monitored, then it is anticipated that intact conservation zoned areas under these other measures might also contribute to meeting targets.

The legal context

The Protected Areas Act is the central piece of legislation for the establishment and management of the protected area network in both the terrestrial and the marine environments. However, other legislation is also relevant, including the World Heritage Convention Act (Act 49 of 1999) for world heritage sites, the National Forests Act (Act 84 of 1998) for protected forests, and the Mountain Catchment Areas Act (Act 63 of 1970). In addition, several provinces have their own provincial legislation that deals with protected areas.

Protected areas are a powerful tool for conserving biodiversity and adapting to climate change, but not the only one. There are also several other legislative tools relevant to the management of biodiversity in South Africa, the primary among them being the National Environmental Management: Biodiversity Act (Act 10 of 2004).

The Biodiversity Act provides a suite of legal tools for conserving the many biodiversity priority areas that lie outside the protected area network and for various reasons are likely to remain outside of it. These tools include bioregional plans, biodiversity management plans, listing of threatened or protected ecosystems, listing of threatened or protected species, and regulations on alien and invasive species. In addition to regulatory tools provided by the Biodiversity Act, economic mechanisms such as environmental fiscal reform and payment for ecosystem services are currently being explored and developed in South Africa.

The Protected Areas Act is the central piece of legislation for the establishment and management of the protected area network in both the terrestrial and marine environments.

The Marine Living Resources Act (Act 18 of 1998) provides for additional mechanisms for biodiversity management over and above marine protected areas, and South Africa is in the process of implementing the ecosystem approach to fisheries management.

This wide range of biodiversity management tools complements the expansion and effective management of the protected area network in pursuit of the overall goals of biodiversity conservation and sustainable development.

Protected areas for biodiversity conservation and ecological sustainability

Protected areas are the most secure and effective mechanism for conserving a representative sample of all biodiversity including all ecosystems and species. This is especially important in South Africa because of our globally exceptional levels of biodiversity. Conserving a viable representative sample of biodiversity contributes to ecological resilience and is one of the cornerstones of ecological sustainability.

Historically, the protected area network has been biased towards some ecosystems, such as indigenous Forest, mountain Fynbos and lowveld Savanna, and has poorly covered other ecosystems such as Grasslands. Aquatic ecosystems, including rivers, wetlands, estuaries and offshore marine ecosystems, have been especially neglected. South Africa's protected area network needs to include a representative sample of all ecosystems. How this can be achieved is discussed further in ***Chapter 4*** on protected area targets.

The long-term persistence of biodiversity depends not only on conserving a representative sample of biodiversity but also on maintaining a complex set of ecological processes, such as the functioning of river corridors and movement of species between uplands and lowlands.

Ecological processes often occur across very large areas and over long periods of time, so they can be difficult to capture in the protected area network. Nevertheless, it is possible to take some ecological processes into account in the design of the protected area network.

For protected areas to achieve their full potential contribution to ecological sustainability, they need to include a representative sample of all ecosystems as well as key ecological processes. In recognition of this, the NPAES 2018 includes greater integration of the terrestrial and aquatic environments in the design calculations underpinning the spatial prioritisation of protected area expansion.

This is especially important in South Africa where water scarcity means that freshwater ecosystems are under even greater pressure than terrestrial ecosystems.

Estuaries can provide a focal point for integrating the design of terrestrial, freshwater and marine protected areas. Ideally, seamless integration is required between terrestrial, freshwater, estuarine, inshore and offshore marine protected areas, to maximise the ecological sustainability benefits of protected areas.

Protected areas for climate change adaptation

Healthy natural ecosystems can increase resilience to the impacts of climate change, by allowing species to adapt as naturally as possible to the changes. They also buffer human settlements and activities from the impacts of extreme climate events.

For protected areas to achieve their full potential contribution to ecological sustainability, they need to include a representative sample of all ecosystems as well as key ecological processes, in both aquatic and terrestrial environments. Ideally, seamless integration is required between terrestrial, freshwater, estuarine, inshore and offshore marine protected areas, to maximise the ecological sustainability benefits of protected areas.

A sufficient protected area network supports the persistence of biodiversity within the broader landscape and safeguards the long-term provision of ecosystem goods and services (such as sufficient clean water, pollination etc.) on which we all depend, especially in the face of stresses such as climate change. Intact ecosystems (i.e. ecosystems which are in a natural or near-natural state) withstand stresses better than highly modified and fragmented landscapes, and natural landscapes secured within protected areas are the anchor on which survival of broader ecological systems will depend. This role of protected areas is worthy of greater emphasis in the global debate on climate change adaptation. South Africa has a unique opportunity to take a global lead in giving protected areas a central role in our climate change response strategy.

An implication of this is that protected area expansion should prioritise protection of natural connected landscapes. Protected areas need to be expanded to incorporate altitudinal

Healthy natural ecosystems can increase resilience to the impacts of climate change, by allowing ecosystems and species to adapt as naturally as possible to the changes and by buffering human settlements and activities from the impacts of extreme climate events. South Africa has an opportunity to take a global lead in giving protected areas a central role in our climate change response strategy.

gradients and topographic range, intact river corridors, coastal dunes, and a greater range of microhabitats, in order to conserve the climatic gradients required to give us some leeway for climate change. The ability of species and systems to adapt to climate change will depend on landscapes that are sufficiently connected to allow species to move.

Freshwater ecosystems are likely to be particularly hard hit by rising temperatures and shifting rainfall patterns, and yet healthy, intact freshwater ecosystems are vital for maintaining resilience to climate change and mitigating its impact on human well-being. In the western part of South Africa, which is likely to become dryer, intact rivers and wetlands will help to maintain a consistent supply of water. In portions of the country that are likely to become wetter, intact rivers and wetlands will be important for reducing flood risk and mitigating the impacts of flash floods. This reinforces the importance of including freshwater ecosystems in land-based protected areas, and moving towards integrated aquatic and terrestrial design of the protected area network.

Protected areas for land reform and rural livelihoods

Historically, local communities have often been only minor recipients of benefits generated by protected areas, as in most cases they have not been owners of either the protected area land or the tourist facilities on that land. The opportunity now exists for local communities, as potentially major landholders through the land reform process, to have full access to the economic opportunities associated with ecotourism. Two good examples of this are Nambiti Private Game Reserve in KwaZulu-Natal and the !Ae!Hai Kalahari Heritage Park together with the !Xaus Lodge within the Kgalagadi Transfrontier Park.

Scope exists for protected area expansion to work in partnership with land reform for mutual benefit, actively supporting the land reform agenda and the diversification of rural livelihoods.

Contract agreements are used increasingly in expansion of the protected area network, and represent opportunities for mutual benefit between landowners, who receive incentives and assistance with management, and protected area agencies. It is important to note that biodiversity stewardship programmes allow for considerable flexibility in the nature of agreements concluded. For example, it is possible for part of the land involved to be formally proclaimed a protected area, and part not. The Richtersveld National Park, the Makuleke section of Kruger National Park and iSimangaliso Wetland Park provide good examples of community ownership of formal protected areas through contract agreements.

As discussed in the next section on socio-economic development, protected areas often represent the most promising option for economic development in rural regions, providing more jobs than commercial agriculture would.

Protected areas can be a cornerstone for local economic development, providing immediate socio-economic benefits to surrounding communities

Biodiversity stewardship programmes have now been developed, and are under implementation, in all nine provinces of the country, with the potential to contribute to land reform.

Protected areas for socio-economic development

Protected areas are important for socio-economic development in several ways. They can contribute to rural development and local economic development with immediate benefits to surrounding communities. Protected areas also contribute to the attractiveness of South Africa as a key destination for foreign and national tourists. By providing essential ecosystem services, protected areas safeguard the wellbeing of future generations.

Scope exists for protected area expansion to work in partnership with land reform for mutual benefit, actively supporting the land reform agenda and the diversification of rural livelihoods.

Protected areas can be a cornerstone for local economic development, providing immediate socio-economic benefits to surrounding communities, especially if this is an explicit aspect of the management goals of the protected area. Increasingly, there is sensitivity

The protected area network forms part of South Africa's competitive advantage, creating destinations for nature-based tourism, providing a draw card for international interest and attention, and acting as a unique selling point for Brand South Africa.

in the design and management of protected areas to the needs of local and regional communities, with protected areas seen not as isolated islands but as part of the socio-economic, as well as the ecological, environment. The DEA's People and Parks programme is significant in this regard.

In many rural regions, ecotourism based on protected areas provides a more viable option for economic development and livelihoods than agriculture, even though agriculture is currently often the main focus for rural socio-economic development. As mentioned in the previous section, land reform provides the opportunity for communities to become landholders in protected areas and to benefit directly from ownership of ecotourism ventures.

Especially in marginal agricultural areas, evidence suggests that conservation-related industries (protected areas, ecotourism on private reserves, game farming etc.) may have higher economic potential than agricultural activities such as stock farming. Further research and support for pilot initiatives is required to test this evidence formally and to determine whether these economic trends can be generalised across South Africa.

The protected area network forms part of South Africa's competitive advantage as a nation, creating destinations for nature-based tourism, providing a draw card for international interest and attention, and acting as a unique selling point for Brand South Africa. Our national identity includes the spectacular varied natural environment that is secured through our protected area network.

Through the protection and management, they provide for priority ecosystems and catchments, protected areas help to secure the ecological infrastructure which supports the provision of important ecosystem services, such as production of clean water, flood moderation, prevention of erosion, carbon storage, and the aesthetic value of the landscape. Mountain catchment areas, in particular, play an important role in safeguarding water supplies.

Marine protected areas are vital in sustaining commercial, recreational and subsistence fisheries resources. There is increasing evidence globally that the vast majority of fish stocks are fully exploited or overexploited. Fishing pressure continues to threaten marine ecosystems and the cultures and economies that depend on them.

Marine protected areas can help to address this by protecting spawning (breeding) stocks of fish species and allowing recovery of overexploited fish species.

This results in improved fishing yields outside of marine protected areas through a spill over effect. Often marine protected areas are the only areas in which viable numbers of reproductive fish are found. It is worth noting that no-take marine protected areas or no-take zones within marine protected areas, of which there are few in South Africa, play this role most effectively.

Finally, by contributing to climate change adaptation and protecting aquatic and terrestrial ecosystems and the services they provide, the protected area network safeguards the socio-economic well-being of future generations. The costs to future generations of not building and maintaining an effective protected area network are complex to quantify, but we can be sure they are substantial.

3. Progress in implementing the NPAES

Measurable progress across a range of indicators was made in implementing the first phase of the NPAES. This chapter highlights the new protected areas that were declared in both the marine and the terrestrial environments, which increased the spatial extent of a range of protected area types. Particularly notable were the expansion efforts in the marine environment, as well as expansion achieved as part of the biodiversity stewardship programme. Progress towards achieving specific ecosystem targets is presented. This chapter also provides a summary of improvements in administering the NPAES and the resources used to do so.

This review covers the progress in implementing phase 1 (2008 – 2014) of the NPAES. Area values are reported in hectares in this chapter to correspond with the targets set in NPAES 2008.

New protected areas declared.

Between 2008 and 2014, a total area of 18 943 336ha was added to South Africa's protected area system through 460 declarations of individual properties (see ***Table 1*** and ***Figure 3***).

The largest proportion (>95%) of the area added to the protected area estate was achieved through the declaration of three marine protected areas (MPAs), of which the Prince Edward Island MPA was by far the largest (18 085 137ha).

Of the 830 322ha of terrestrial protected areas declared in the first phase, 270 284ha was declared as National Parks, 348 515ha as Nature Reserves, 14 850ha as Forest Nature Reserves and 196 673ha as Protected Environments. Over 561 000ha (67%) of the properties declared as terrestrial protected areas were either privately owned (502 692ha) or under some form of communal tenure (59 175ha). This suggests that the negotiation of formal contractual agreements with landowners and communal rights holders has become the primary tool for protected area expansion efforts in the terrestrial environment.

Table 1: The number and extent of protected areas declared in phase 1, by protected area type.

Protected area type	Number of declarations	Area (ha)
Terrestrial		
National Park	325	270 284
Nature Reserve	112	348 515
Protected Environment	12	196 673
Forest Nature Reserve	8	14 850
Terrestrial total	457	830 322
Marine		
Marine Protected Area	3	18 113 015
Marine total	3	18 113 015
Total	460	18 943 336

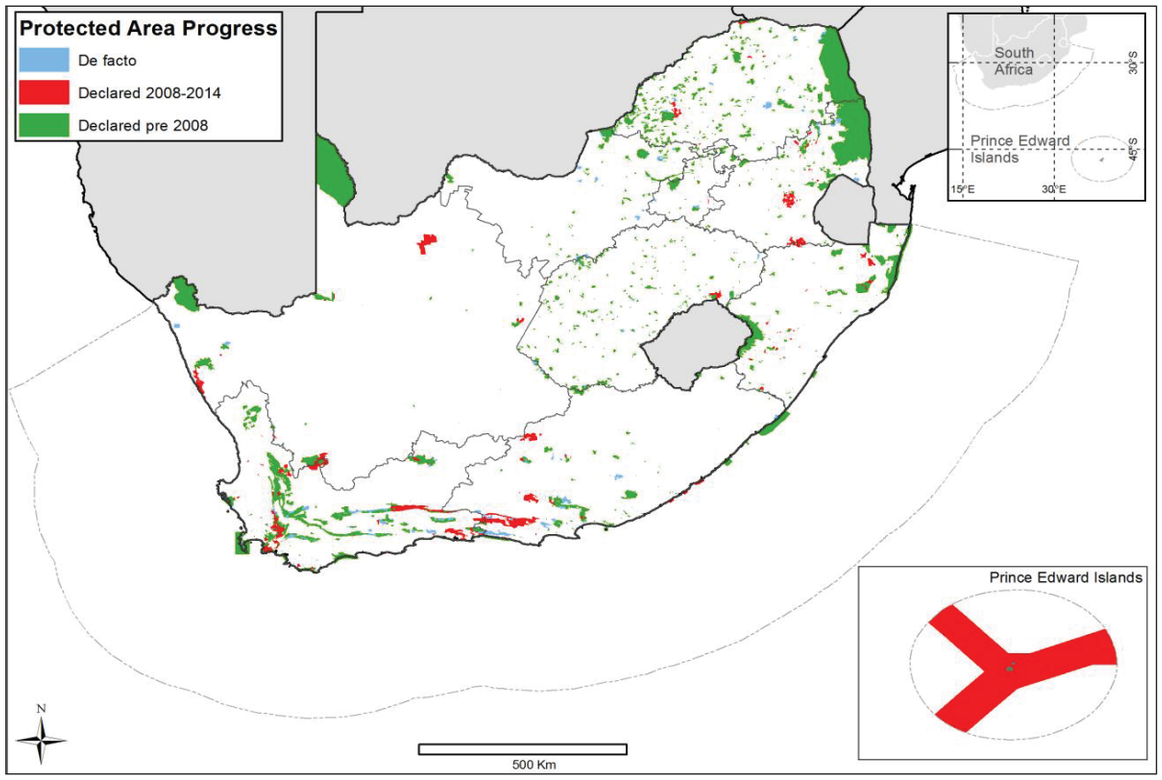

Figure 3: Protected Area status in South Africa and the Prince Edward Islands at the end of Phase 1[9].

Progress towards achieving protected area targets

The progress in achieving phase 1 representation targets[8] for terrestrial ecosystem types in the protected area system is summarised in ***Table 2***. When individual ecosystems are considered, the area contributing to meeting ecosystem targets improved from 3.6% to 3.9% of the total terrestrial area. This represents 18% of the phase 1 target. Biozones where good progress was made towards meeting underlying ecosystem representation targets in phase 1 include Forests (129% of the phase 1 target), water bodies (91%) and Albany Thicket (69%). No progress was made however in the Desert biozone and Indian Ocean Coastal Belt, while limited progress was made in the Nama-Karoo (9%), Savanna (14%) and Grassland (16%).

In the marine environment, the declaration of a single MPA in the Prince Edward Island Exclusive Economic Zone (EEZ) resulted in this area substantially exceeding the phase 1 target. In fact, the long-term target was exceeded by a factor of almost two and the no-take target nearly met (***Table 3***)

In mainland marine systems, two inshore MPAs (278km^2) were declared. As a result, the 5-year NPAES inshore target measured in terms of coast length for no-take areas was almost met, with 89% of the phase 1 target

[8] This target achievement is measured against the NPAES 2008. These targets are changed in the current NPAES revision.

[9] As in NPAES 2008, de facto protected areas are included. These are functioning as protected areas but are not formally declared. Formalising their status is critical to ensuring that they continue to contribute to the protected area network.

being achieved, while 163% of the phase 1 target for overall inshore protection was met.

This placed South Africa in a good position to achieve the full 20-year Marine Inshore targets. Little progress was made towards achieving the marine offshore area targets with the 278km^2 being under 1% of the phase 1 target of 52 182 km^2

Table 2: Current status (2014), and progress in phase 1, of representation of terrestrial ecosystem types in the protected area network. All targets are stated as a percentage of the total area.

Biozone	Total area (ha)	20-year target	Area in 2008	Effective area[10] in 2008	Area in 2014	Effective area 2014	% of phase 1 target met
Albany Thicket	2 912 754	10.3	6.2	6	8.7	6.7	69
Azonal vegetation	2 894 983	13.8	7.4	4.9	8.3	5.3	16
Desert	716 565	18.0	22.2	4.7	22.2	4.7	0
Forest	444 371	17.2	30.1	15.9	37.8	16.3	129
Fynbos	8 394 437	14.8	15.1	6.5	20.2	7.3	40
Grassland	31 987 116	13.2	2.8	2.3	3.2	2.7	16
Indian Ocean Coastal Belt	1 428 197	13.5	6.4	5.7	6.4	5.7	0
Nama-Karoo	24 827 996	11.0	0.8	0.8	1.0	1.0	9
Polar desert	10 825	10.8	100	10.8	100	10.8	N.A.
Savanna	39 966 563	10.1	11.4	5.2	11.9	5.4	14
Sub-Antarctic tundra	23 240	10.8	100	10.8	100	10.8	N.A.
Succulent Karoo	8 328 395	12.1	5.2	3.5	6.5	4.5	49
Water bodies	67 322	13.0	80.2	12.6	80.3	12.7	91
Total	14 333 600	12.0	6.7	3.6	7.6	3.9	18

Table 3: Current status (2014), and progress in phase 1, of representation of marine areas in the protected area network. All targets are stated as a percentage of the total extent.

Category	Total extent	Category	20-year target	Status in 2008	Status in 2014	% of phase 1 target met
Marine inshore (coastline)	3592km	No-take	15	7.9	9.5	89
		Total	25	20.6	22.4	163
Marine offshore (mainland EEZ)	1 065 660km^2	No-take	15	0.16	0.19	0.7
		Total	20	0.4	0.44	0.5
Marine offshore (Prince Edward Islands EEZ)	473 375km^2	No-take	15	0	14.4	385
		Total	20	0	38.2	764

[10] Effective area refers to the area that is contributing to meeting representation targets. This does not imply that these areas don't have value as there are valid reasons to have areas declared in excess of the minimum representation target. It merely indicates that these areas are in excess of the representation target.

Mechanisms of expansion.

All three available protected area expansion mechanisms for terrestrial protected areas (contractual agreement, land acquisition and declaration of state-owned land) were successfully implemented in phase 1. The breakdown of the extent of the area declared, by implementing agency, using each of the different expansion mechanisms is summarised in ***Table 4*** below. The negotiation and conclusion of contractual agreements with landowners was the predominant protected area expansion mechanism adopted by most of the protected area agencies. 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.

The negotiations and conclusion of contractual agreements with landowners was the predominant mechanism for protected area expansion in phase 1.

Implementation, resourcing and administration of the NPAES

The implementation of the NPAES is primarily the responsibility of the 12 protected area agencies[11]. By the end of phase 1, eight (up from only one in 2008) of the 12 protected area agencies had developed, adopted and were implementing an institutionally based Protected Area Expansion Strategy (PAES) that is closely aligned to the strategic objectives of the NPAES. The remaining agencies – with the exception of DAFF, which has no plans to develop an institutionally-based PAES – were well advanced in preparing these strategies.

Expansion plans for the marine environment are well developed and were recently published as part of Operation Phakisa[12].

Table 4: Terrestrial protected area declared (ha) in phase 1, per implementing institution and mechanism of expansion.

Institution/province	Contractual agreement	Donation	Purchase	Declaration of state owned land	Total
SANParks	74 012	-	106 663	89 608	270 283
DAFF	-	-	-	14 850	14 850
Eastern Cape	98 119	-	-	-	98 119
Free State	-	-	-	-	-
Gauteng	2 280	1 768	-	20 638	24 686
KwaZulu-Natal	61 068	-	-	-	61 068
Limpopo	-	-	-	-	-
Mpumalanga	102 066	-	-	-	102 066
Northern Cape	92 486	-	-	-	92 486
North West	-	200	-	32 647	32 847
Western Cape	133 916	-	-	-	133 916
Total	563 947	1 968	106 663	157 743	830 321

[11] The nine provincial agencies, SANParks, DAFF and DEA (Oceans and Coast Branch).
[12] DEA, 2014a.

The institutional capacity to implement the protected area expansion programme is limited, with an estimated total of 28 staff (that are unevenly distributed between institutions) contributing more than 60% of their time to protected area expansion.

The reported annual operational budgets for protected area expansion are also highly variable across institutions. It is estimated that a total of R61.75 million was available for protected area expansion efforts during the 2014/2015 financial year. Of this total amount, R34.5 million forms part of the South African National Parks (SANParks) budget and R12 million is set aside for marine protected area expansion, leaving approximately R15 million distributed across the remaining ten protected area institutions.

Phase 1 of the NPAES saw a number of legal and administrative developments that advanced protected area expansion. In this regard it is noted that:

- The Protected Areas Act was amended to include marine protected areas.
- The process of developing standardised Biodiversity Stewardship Guidelines[13] and a national Biodiversity Stewardship Policy was significantly advanced.
- Incentives for declaring privately owned and managed protected areas through tax rebates were piloted and further refined
- Levels of legislative compliance were improved through the development of the Protected Area Register.
- The development of a robust, spatial protected area database linked to the Protected Area Register.
- Guidelines for the declaration of different types of protected areas were published.

More information on the review of progress made in phase 1 of the NPAES is given in ***Appendix 3***.

Phase 1 of the NPAES saw a number of legal and administrative developments that have advanced protected area expansion.

[13] DEA., 2009

4. Protected area targets

Protected area targets are action targets that indicate how much of each ecosystem should be included in protected areas. They help to focus protected area expansion on the least protected ecosystems, and provide the basis for assessments. The NPAES uses the established biodiversity targets for each ecosystem from the National Biodiversity Assessment (NBA) as the long-term protected area targets. This ensures that targets are scientifically robust and have an ecological basis, while also ensuring that no further ecosystems become Critically Endangered, and that the NBA and the NPAES are aligned. The 20-year targets are designed to achieve overall CBD Aichi biodiversity targets, while optimally shifting the emphasis onto high biodiversity value ecosystems. Clear principles and a repeatable method are established for target setting, which will enable easy updates and allow provinces and agencies to calculate compatible targets.

This chapter presents several major improvements that have been made to the protected area targets in this revision of the NPAES. These include comprehensive targets for wetlands, rivers, estuaries and specific marine ecosystems, as well as terrestrial ecosystem types. A new integrated ecosystem map has been created and ecological condition has been included in the assessment.

South Africa's current protected area network still falls far short of sustaining biodiversity and ecological processes. The current achievement of targets has been evaluated, protection levels are mapped and the extent to which the current protected area network falls short of the targets is presented.

Protected area targets are action targets that indicate how much of each ecosystem should be included in protected areas, thus guiding protected area expansion to focus on ecosystems that are least protected.[14]

Protected area targets are action targets that indicate how much of each ecosystem should be included in protected areas, this guiding protected area expansion to focus on ecosystems that are least protected.

Internationally, the Convention on Biological Diversity (CBD) to which South Africa is a signatory, commits governments to a range of targets generally known as Aichi biodiversity targets[15]. Target 11 states that "by 2020, at least 17% of terrestrial and inland water areas, and 10% 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 landscape and seascape".

South Africa has a well-established system of systematic biodiversity planning which uses biodiversity targets[16] to determine which areas of the landscape and seascape are most important for conserving a representative sample of biodiversity pattern (ecosystems and species) and for keeping key ecological processes intact. These targets are used as the basis for national monitoring of Protection Level in the NBA.

The system and target values set out in the NBA 2011 are widely used and well-accepted across South Africa, including in the National Freshwater Ecosystem Priority Areas Assessment (NFEPA) project[17], prioritisation for marine protected areas in projects such as the Offshore Marine Protected Area (OMPA)

[14] More information about protected area targets can be found in Technical Note 1 of Appendix 2.
[15] CBD, 2010.
[16] Biodiversity targets are sometimes called biodiversity thresholds. See Driver et al., 2012 for explanations the systematic conservation planning approach used in South Africa and details on how biodiversity targets are determined and used in the evaluations of ecosystem protection level.
[17] Nel et al., 2011.

project[18], and the National Estuary Biodiversity Plan for South Africa 2012[19]. The same ecosystem targets are used in provincial conservation plans. Biodiversity targets for terrestrial ecosystems in South Africa range from 16% to 36% of the original extent of each ecosystem, with higher targets for more variable and species-rich ecosystems. In the absence of better data, a 20% biodiversity target is used for marine, river, wetland and estuarine systems.

The NPAES 2018 retains many core principles established for the NPAES 2008, including:

- Long-term protected area targets should align with established biodiversity targets. This means that, in principle, enough of each ecosystem will be protected to ensure that no further ecosystems can become Critically Endangered. It also allows for consistent reporting by the NBA and NPAES.
- Targets should be specifically set for each ecosystem. Although for convenience they can be reported for broader units such as a biozone, the actual target is set at the ecosystem level.
- Over a 20-year period, South Africa should aim to achieve its commitments under the CBD[20] even if the convention's timelines are not adhered to.
- The allocation of targets is optimised across ecosystems to reflect differing levels of biodiversity, i.e. increased targets for diverse ecosystems, but reduced targets in those with relatively low diversity, so that overall South Africa will achieve its CBD commitment.

Some additional elements have been added in the NPAES 2018. Firstly, and most importantly, targets have now been set for marine, wetland, river and estuarine features at the ecosystem level, in addition to the terrestrial targets. To do this, a new fully integrated ecosystem map was prepared, covering terrestrial, river, wetland, estuarine, coastal and marine ecosystems (***Figure 4***)[21]. Separate maps for each of these ecosystems were available, but overlaps between ecosystems (for example a terrestrial and river ecosystem) could result in double counting and inaccurate targets. A single integrated map was therefore developed that identified 969 distinct ecosystems in 26 biozones[22].

A new, fully integrated ecosystem map was prepared, covering terrestrial, river, wetland, estuarine, coastal and marine ecosystems.

[18] Sink et al., 2011.
[19] Turpie et al., 2012.
[20] The CBD targets have changed since NPAES 2008 (from 12%) to 17% for terrestrial areas and 10% for marine systems.
[21] More information about the integrated ecosystem map can be found in Technical Note 3 of Appendix 2.
[22] Biozones are major habitat units. In the terrestrial environment, they are the same as biomes, but the term biozone is used so that equivalent river, wetland and marine habitat units can be included.

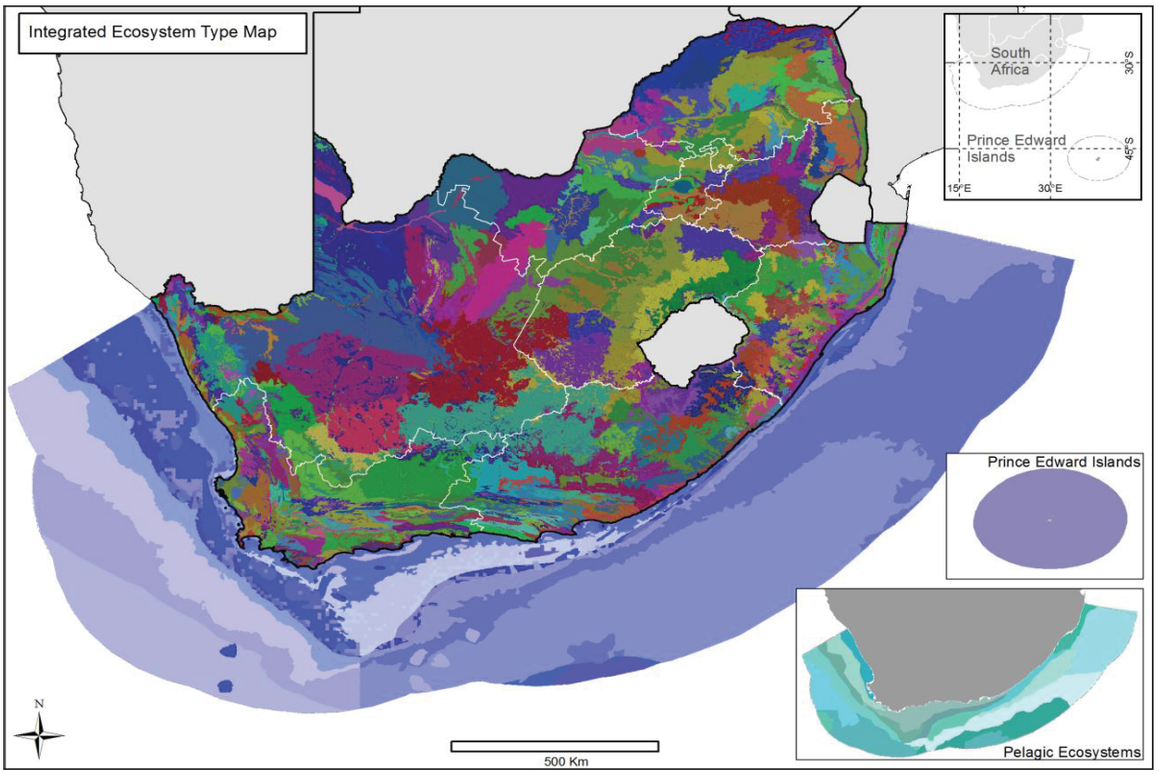

Figure 4: An integrated ecosystem map was created for South Africa. Inserts show the Prince Edward Islands and offshore pelagic ecosystems.

The second addition in the NPAES 2018 is that targets can only be met in intact habitat. This principle was established in the NPAES 2008 but was only partially implemented as only artificial waterbodies were excluded at that time. The underlying principle is that areas that are no longer intact (e.g. large dams, roads, rest camps, canalised sections of rivers and plantations of exotic trees) should not contribute to targets even if they are in protected areas. Hence, the preparation of a fully integrated ecosystem condition map was a key activity for the NPAES. This process produced the first ever integrated map of ecosystem condition for South Africa, which identified good, fair and poor condition areas of each ecosystem (***Figure 5***)[23].

Targets can only be met in intact habitat. Hence, the first ever integrated map of ecosystem condition was produced for South Africa.

Targets can be met in protected areas and other areas with effective area-based conservation measures. Currently, we only evaluate protected areas, as these are the only areas where biodiversity is currently legally secured. In the future, once other area-based conservation mechanisms have been secured effectively (e.g. through having intact natural areas of biospheres strictly zoned for conservation), subject to robust and effective land use controls, and have well-capacitated management authorities, it is anticipated that the intact and secure areas zoned for

[23] More information about the integrated condition map can be found in Technical Note 4 of Appendix 2.

conservation under these other measures will also contribute to meeting targets.

protected area targets for marine ecosystems are 50% of the long-term biodiversity targets,

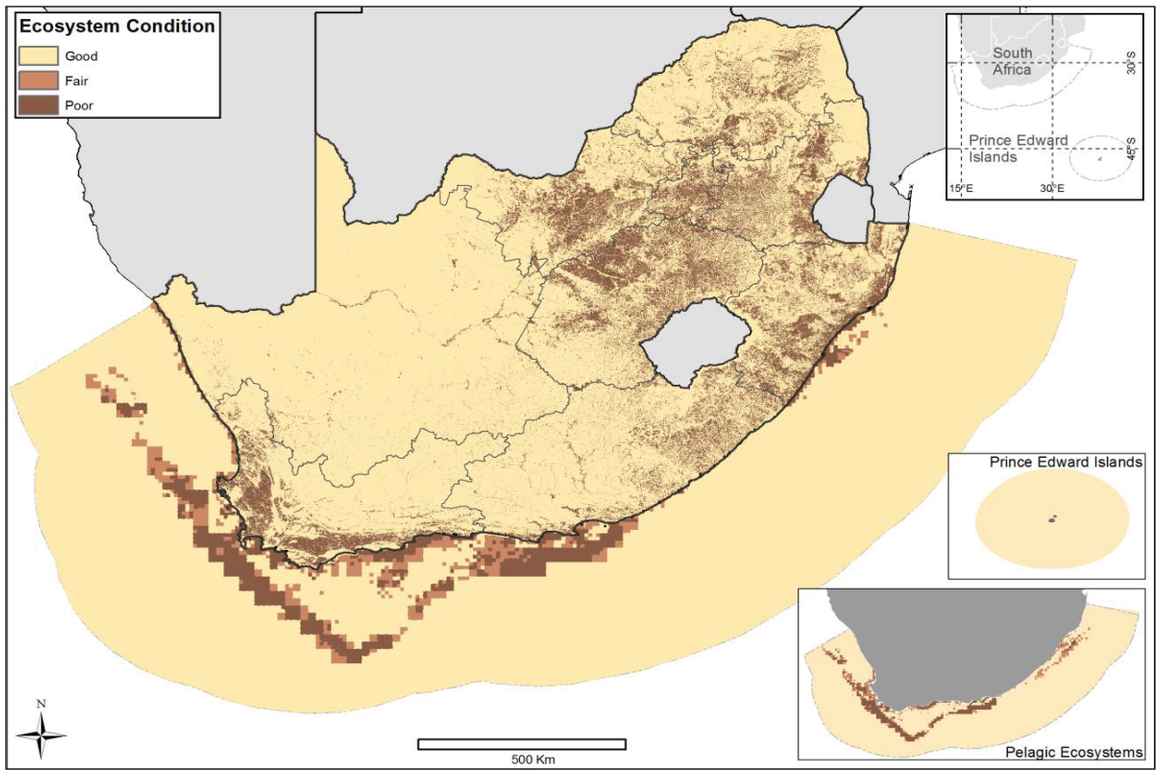

Figure 5: An integrated ecosystem condition map was created for South Africa. Inserts show the condition of the Prince Edward Islands and offshore pelagic ecosystems.

Calculating protected area targets

The NPAES has established a system that sets robust targets, but which can be quickly and easily updated when changes in any of the input elements occur[24]. In brief, the biodiversity targets for each ecosystem are identified from the NBA, and these are used as the long-term protected area targets. To calculate the 20-year targets, the ratio between the total area required to meet South Africa's CBD commitments and the total area needed to meet the long-term protected area target is then calculated[25].

This ratio is used to identify what proportion of the long-term target is required over the next 20 years. Based on current values, the 20-year

while those for terrestrial ecosystems are 78.63%. Shorter term protected area targets (e.g. 5-year target) are calculated as a portion of the 20-year target.

The target setting approach outlined here was applied using the integrated ecosystem map specially created for this strategy, which produced the values reflected in the tables, analyses and appendices of this report, but the same approach can be applied to any other ecosystem map. This allows provinces to use finer scale local ecosystem maps for their target setting and planning processes, while remaining fully compatible with the NPAES approach and required overall target.

[24] More information on how targets are calculated can be found in Technical Note 2 of Appendix 2.

[25] This was calculated separately for terrestrial and marine systems. Coastal ecosystems, which have a land component, were treated as terrestrial.

Summary of protected area targets.

The final target percentages for the NPAES 2018 are summarized in ***Table 5***. Importantly, the underlying targets are set at the ecosystem level, which are given in detail in ***Appendix 1***. The long-term protected area targets, which are the same as the biodiversity targets, range from 16% to 36% of original extent. The 20-year protected area targets range from 10% to 28.3%, with many systems such as coastal types, wetlands, estuaries and rivers having a target of 15.7%.

Table 6: summarizes the total areas required to meet the targets. A total of 574 735km^2, of which 363 392km^2 is the 20-year target, is required to meet long-term protected area targets for all ecosystems except marine pelagic ecosystems. The long-term target for marine pelagic ecosystems is 214 719 km^2, 107 359km^2 of which should be protected in the next 20-years. In many cases, targets for pelagic ecosystems and offshore benthic ecosystems could be met by the same protected area as these ecosystems overlap.

Fortunately, large areas required to meet many of these targets are already included in existing protected areas. The next section describes the current level of achievement of targets within the current protected area network.

Table 5: Summary of the percentages required for the long-term protected area targets, Aichi biodiversity targets, 20-year protected area targets and 5-year targets. Full targets for individual ecosystems are given in *Appendix 1*.

Category	Biozone	Long-term protected area target	Aichi target	20-year target**Error! Bookmark not defined.**	5-year target
Marine**Error! Bookmark not defined.**	Inner shelf, inshore, offshore benthic	20%	10%	10%	2.5%
	Marine pelagic**Error! Bookmark not defined.**	20%	10%	10%	2.5%
	Southern Oceans	20%	10%	10%	2.5%
	Coast types, island, lagoon	20%	17%	15.7%	3.92%
Terrestrial	All	16 – 36%	17%	12.6 – 28.3%	3.15 – 7.1%
Estuaries	All	20%	17%	15.7%	3.92%
Rivers	N.A.	20%	17%	15.7%	3.92%
Wetlands	N.A.	20%	17%	15.7%	3.92%

Table 6: Summary of the target areas for ecosystems. Full targets for each ecosystem are given in *Appendix 1*.

Category	Long-term protected area target (km^2)	Aichi target (km^2)	20-year target (km^2)	5-year target (km^2)
Estuary	**330**	**280**	**259**	**65**
Marine (Benthic and Coastal)	**215 281**	**107 911**	**107 862**	**26 966**
Coast types	322	273	253	63
Inner Shelf	573	286	286	72
Inshore	856	428	428	107
Island	441	375	347	87
Lagoon	11	9	9	2
Offshore Benthic	213 080	106 540	106 540	26 635
Marine Southern Oceans	**94 675**	**47 338**	**47 338**	**11 834**
Rivers	**2 670**	**2 270**	**2 100**	**525**
Sub-Antarctic	**69**	**58**	**54**	**13**
Sub-Antarctic Polar Desert	22	19	17	4
Sub-Antarctic Tundra	47	40	37	9
Terrestrial	**257 671**	**202 102**	**20 2604**	**50 651**
Albany Thicket	5 386	4 819	4 235	1 059
Azonal Vegetation	5 149	3 380	4 049	1 012
Desert	2 399	1 225	1 886	472
Forests	1 007	774	792	198
Fynbos	22 213	13 865	17 466	4 366
Grassland	78 270	54 586	61 543	15 386
Indian Ocean Coastal Belt	2 747	1 868	2 160	540
Nama-Karoo	50 069	41 811	39 369	9 842
Savanna	71 632	65 575	56 324	14 081
Succulent Karoo	18 800	14 198	14 782	3 696
Wetlands	**4 039**	**3 433**	**3 176**	**794**
Grand Total	**574 735**	**363 392**	**363 392**	**90 848**
Marine pelagic[26]	**214 719**	**107 359**	**107 359**	**26 840**

Current achievement of targets

With protected area targets determined for each ecosystem type, the next step is to evaluate how much of each ecosystem type is already effectively conserved in the protected area network. To do this, we need to combine the ecosystem map (***Figure 4***), ecosystem condition map (***Figure 5***) and protected area targets.

The ecosystem condition map is required to ensure that only intact areas are counted. ***Table 7*** gives a summary of the protected area targets for all ecosystems and evaluates the current protected area network in terms of its achievement of these targets.

[26]The targets for the marine pelagic systems cannot be added to the offshore benthic targets, as they will often be achieved in overlapping areas.

Table 7: Summary of the calculated shortfall between the current protected area (PA) extent and the long-term biodiversity target and the 20-year target.[27]

Category	Long-term protected area target (km^2)	20-year target (km^2)	Current PA extent (km^2)	Intact areas in PA (km^2)	Long-term target shortfall (km^2)	20-year target shortfall (km^2)
Estuary	**330**	**259**	**724**	**0.3**	**330**	**259**
Marine (Benthic and Coastal)	**215 281**	**107 862**	**4 665**	**4 001**	**211 896**	**104 962**
Coast types	322	253	282	273	91	47
Inner Shelf	573	286	239	173	400	114
Inshore	856	428	848	678	323	24
Island	441	347	178	117	323	229
Lagoon	11	9	6	6	5	3
Offshore Benthic	213 080	106 540	3 112	2 755	210 753	104 545
Marine Southern Oceans	**94 675**	**47 338**	**180 862**	**180 862**	**0**	**0**
Rivers	**2 670**	**2 100**	**1 092**	**871**	**2 009**	**1 490**
Sub-Antarctic	**69**	**54**	**343**	**343**	**0**	**0**
Sub-Antarctic Polar Desert	22	17	110	110	0	0
Sub-Antarctic Tundra	47	37	233	233	0	0
Terrestrial	**257 671**	**202 604**	**93 381**	**89 798**	**195 793**	**146 814**
Albany Thicket	5 386	4 235	2 533	2 446	2 939	1 971
Azonal Vegetation	5 149	4 049	2 054	1 699	3 720	2 735
Desert	2 399	1 886	1 601	1 596	1 818	1 419
Forests	1 007	792	1 692	1 622	100	50
Fynbos	22 213	17 466	17 031	16 776	12 843	9 658
Grassland	78 270	61 543	11 585	10 015	69 308	52 852
Indian Ocean Coastal Belt	2 747	2 160	619	605	2 141	1 554
Nama-Karoo	50 069	39 369	2 674	2 483	47 618	36 946
Savanna	71 632	56 324	48 123	47 105	41 147	29 248
Succulent Karoo	18 800	14 782	5 467	5 451	14 158	10 380
Wetlands	**4 039**	**3 176**	**1 413**	**1 139**	**3 135**	**2 352**
Grand Total	**574 735**	**363 392**	**282 479**	**277 016**	**413 163**	**255 877**
Marine pelagic	**214 719**	**107 359**	**3 082**	**2 579**	**212 140**	**104 780**

The shortfall in terms of achieving the long-term protected area targets shows that South Africa's current protected area network is still inadequate to sustain biodiversity and ecological processes. To meet the long-term protected area target we need to add 413 163km^2 to the protected area network, of which 211 896km^2 should be in protected areas securing marine benthic and coastal ecosystems. An additional amount of 212 140km^2 is needed to secure marine pelagic ecosystems.

To meet the 20-year targets, we need to add 255 877km^2 to the protected area network. This is made up of 104 962km^2 required for marine benthic and coastal ecosystems, 146 814km^2 for terrestrial ecosystems, 2 352km^2 for wetlands, 1 490km^2 for rivers and

[27] Importantly, the actual 20-year shortfall is larger than initial inspection of the targets and current protected areas would suggest because only the intact areas can meet targets and the current protected area extent includes areas which may be in excess of the minimum area required to meet targets for an individual ecosystem. See Appendix 2 for more detail.

259km^2 for estuaries. As discussed previously, pelagic ecosystems are dealt with separately and require 104 780km^2 to meet the 20-year targets.

It is important to remember that the aggregated protected area targets in ***Table 7*** are built up from more detailed ecosystem level targets, which are discussed in the sections that follow. These specific targets are crucial for ensuring that protected area expansion doesn't just provide more protection for already well-protected ecosystems.

The 'protection level' of an ecosystem provides a simple way to visualise and understand how well ecosystems are represented in the protected area network.

The ecosystem protection level is evaluated using the same methods and categories as the NBA (***Table 8***). These categories range from 'Not Protected', through intermediate categories to 'Well Protected'. The number of ecosystems in each of these categories are reported per biozone in ***Table 9*** and mapped in ***Figure 6***.

Of the 969 distinct ecosystem types, 201 (21%) are Well Protected, 122 (13%) types are Moderately Protected, 286 (30%) ecosystem types are Poorly Protected, while 360 (37%) ecosystem types are Not Protected. The following sections explore the ecosystem protection levels of marine, inland aquatic and terrestrial ecosystem groups in more detail.

Table 8: Categories used for evaluation of ecosystem protection levels. The categories are the same as those applied in the National Biodiversity Assessment.

Ecosystem protection level category	Definition
Not Protected	An ecosystem type of which no intact area, or only a very small area (less than 5% of the target), is located within the protected area network.
Poorly Protected	An ecosystem type in which less than half (but more than 5%) of the target is located within the protected area network.
Moderately Protected	An ecosystem type in which more than half of the target for an ecosystem type is located within the protected area network.
Well Protected	An ecosystem type in which the full target area falls within the protected area network.

Table 9: Summary of the current number of individual ecosystems within each protection level category, per biozone.

Category	Well Protected	Moderately Protected	Poorly Protected	Not Protected	Total
Estuary			**3**	**43**	**46**
Marine (Benthic and Coastal)	**23**	**26**	**14**	**46**	**109**
Coast types	12	14	3	3	32
Inner Shelf		1	2	1	4
Inshore	3	5	1	1	10
Island			2		2
Lagoon		1			1
Offshore Benthic	8	5	6	41	60
Marine pelagic			**2**	**14**	**16**
Marine Southern Oceans	**1**				**1**
Rivers	**37**	**26**	**79**	**69**	**211**
Sub-Antarctic	**5**				**5**
Sub-Antarctic Polar Desert	1				1
Sub-Antarctic Tundra	4				4
Terrestrial	**111**	**51**	**148**	**135**	**445**
Albany Thicket		5	7	2	14
Azonal Vegetation	8	5	11	12	36
Desert	6		1	8	15
Forests	9	3			12
Fynbos	43	8	41	30	122
Grassland	9	2	37	24	72
Indian Ocean Coastal Belt		2	1	3	6
Nama-Karoo	1		5	8	14
Savanna	25	17	30	18	90
Succulent Karoo	10	9	15	30	64
Wetlands	**24**	**19**	**40**	**53**	**136**
Grand Total	**201**	**122**	**286**	**360**	**969**

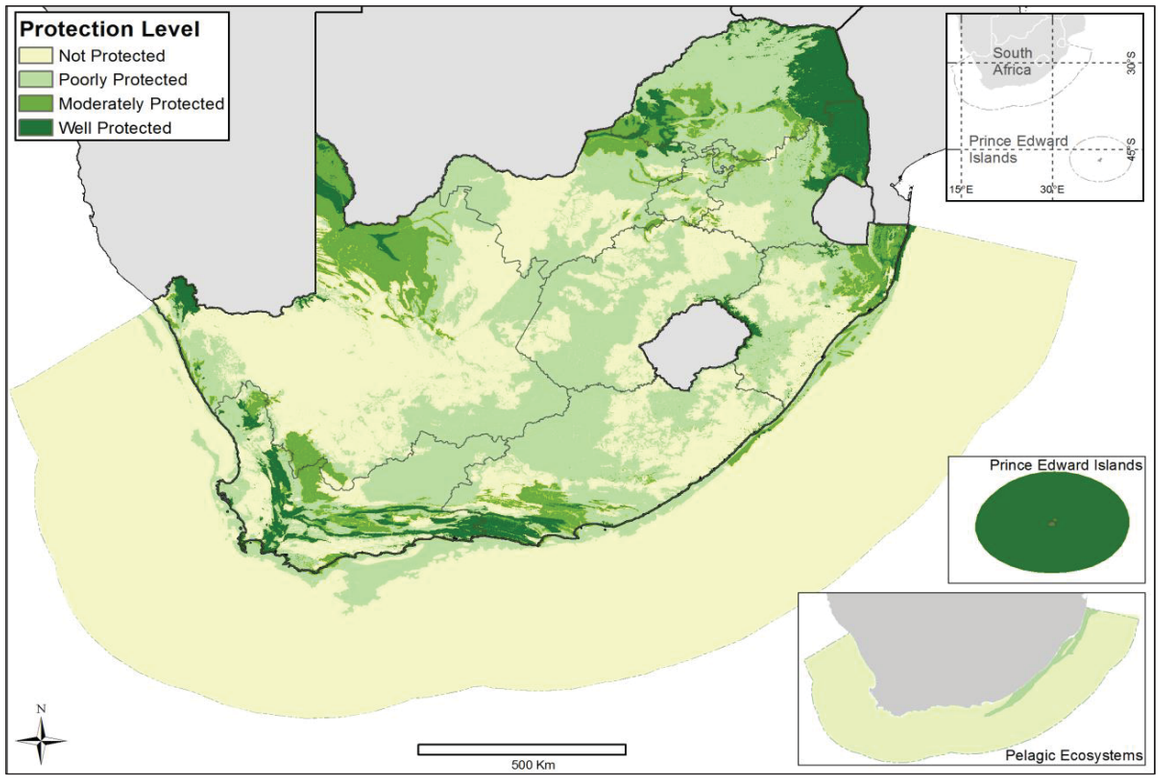

Figure 6: Current protection levels of South African terrestrial (including Sub-Antarctic ecosystems), river, wetland, estuarine, coastal and marine (including pelagic) ecosystems.

Achievement of marine targets

There are very distinct patterns of achievement of protected area targets for marine ecosystems (***Figure 7***). Coastal ecosystems are generally the best protected of the marine biozones. 273km^2 of coastal ecosystems, out of a target of 322km^2, has already been protected, with 91km^2 still being required to meet the full long-term target and 47km^2 to meet the 20-year target (***Table 7***). ***Figure 7*** shows that 12 coastal ecosystem types (38%) are Well Protected, 14 are Moderately Protected (44%), 3 are Poorly Protected (9%) and 3 are Not Protected (9%). Despite this relatively healthy situation, some important gaps remain.

Firstly, the West Coast is very under-protected, with 5 of the Poorly Protected and Not Protected ecosystem types being found here. Secondly, to properly secure marine ecosystems, at least 75% of each ecosystem's targets should be included into no-take zones. 'Controlled' or 'take' zones in marine protected areas can actually become nodes for increased exploitation by facilitating fishing access, rather than providing protection. Urgent attention should be given to reducing the impact of recreational fishing activities in the controlled zones within marine protected areas.

The current pressure to downgrade some long-standing marine protected areas from no-take to 'controlled' could undermine recent progress in marine protected area declaration.

The remaining shallow water systems (i.e. inner shelf, inshore, island, and lagoon) show variation in terms of current inclusion in the protected area network. Overall, 2 ecosystem types (12%) are Not Protected, 5 types (29%) are Poorly Protected, 7 types (41%) are Moderately Protected, and 3 types (18%) are Well Protected (***Figure 7***).

The largest gaps are in the inner shelf and island biozones, where significant additional areas are required, in particular along the West Coast where very few systems have any effective protection.

A number of inshore types along the East and South-East Coast have some level of protection, with most of the 3 Well Protected and 5 Moderately Protected Inshore types being found along this coast. The single lagoon ecosystem (Langebaan) is Moderately Protected. For all these ecosystems, a key issue is that even where there is some protection, few of these areas are declared no-take reserves.

The full target is met for the Southern Oceans, since declaration of the recent marine protected area. In contrast, mainland offshore benthic marine ecosystems currently have almost no protection, with 41 types (68%) categorised as Not Protected (***Figure 7***). Protection levels of marine pelagic ecosystems are even worse, with protected areas securing only 2% of the 20-year target.

This is reflected by the fact that 14 types (88%) are Not Protected with the remaining 2 types (12%) being Poorly Protected. Fortunately, this situation is currently changing with the declaration of marine protected areas through Operation Phakisa.

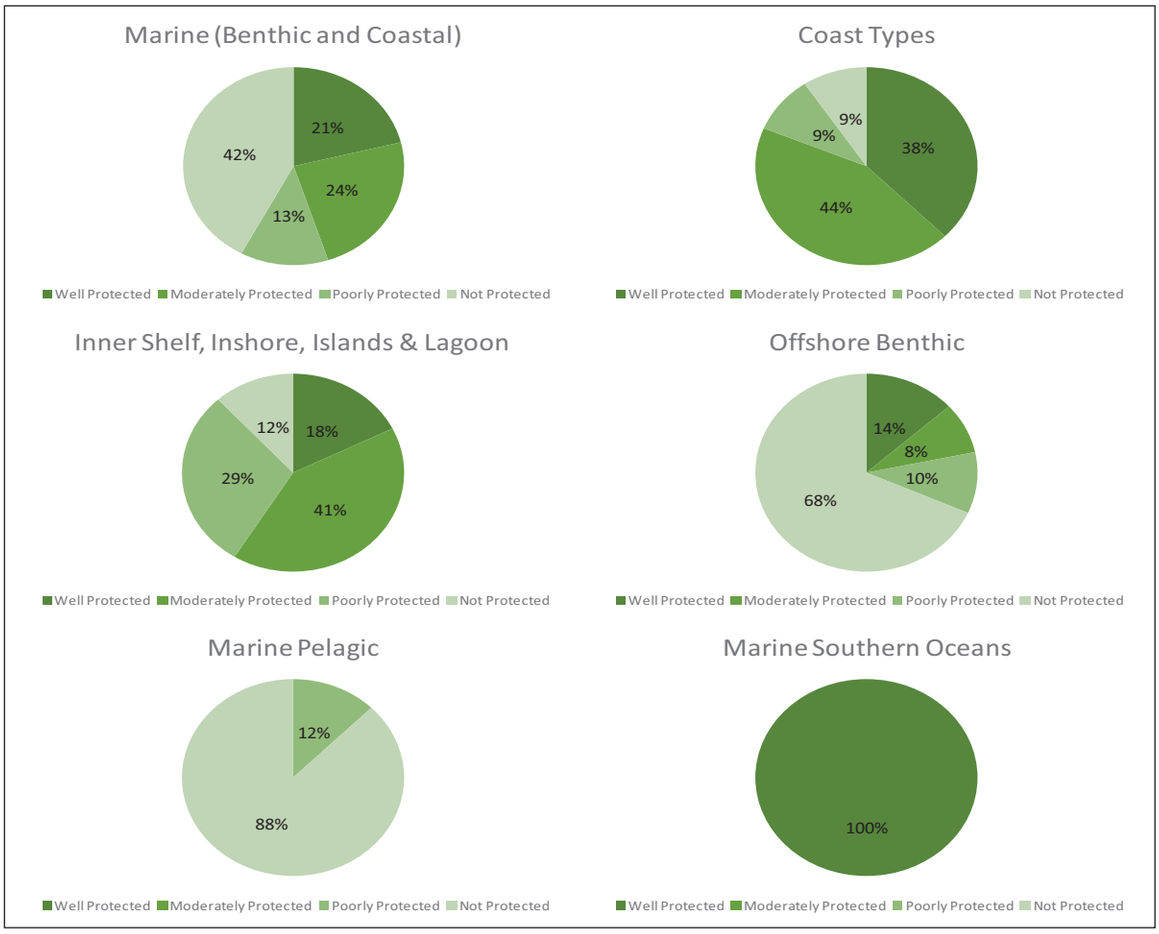

Figure 7: Current protection levels of marine ecosystems, divided according to biozone. The top left graph shows a summary of the marine (benthic and coastal) ecosystems.

To summarise, the focus for marine protected area expansion in the next five years should be securing the improved protection of marine ecosystems through Operation Phakisa. In addition, significant progress is needed in inshore regions and some coastal regions, particularly along the West Coast. A key issue is declaring sufficient no-take areas to ensure that marine ecosystems are effectively secured against fishing pressure. Otherwise, the benefits of declaring marine protected areas will be undermined.

The focus for marine protected area expansion should be on improved protection of marine ecosystems through Operation Phakisa, and on under-protected inshore and coastal regions, particularly along the West Coast. Sufficient no-take areas are needed to effectively secure marine ecosystems.

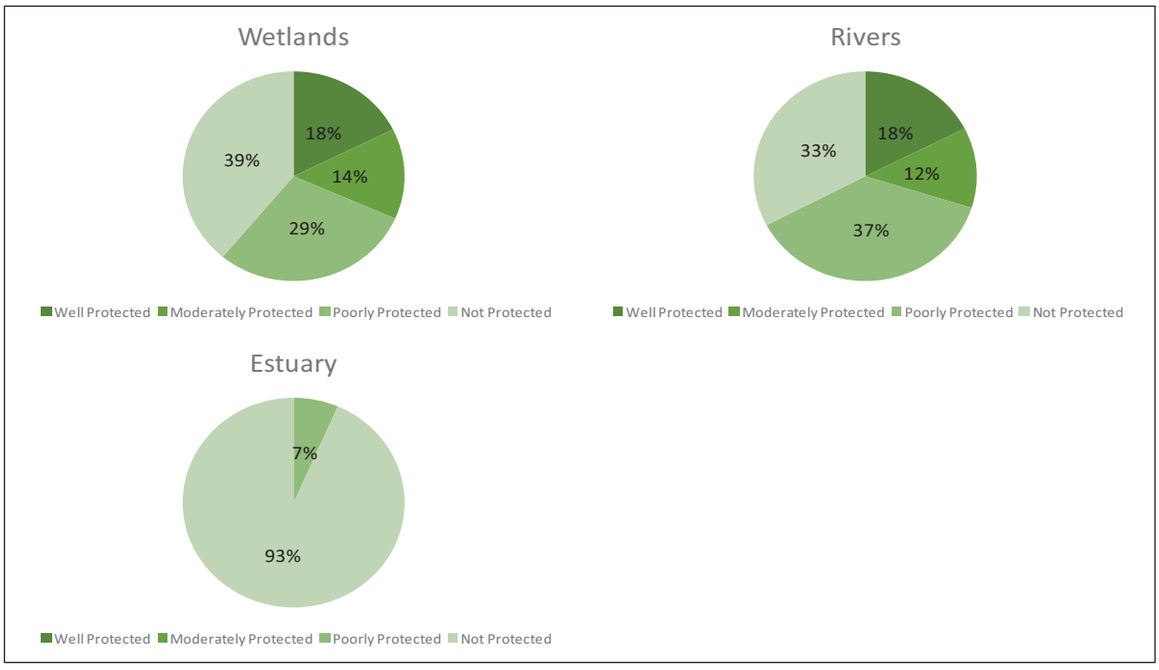

Figure 8: Current protection levels of inland aquatic ecosystems (rivers, wetlands and estuaries).

Achievement of targets for inland aquatic ecosystems

Unlike in the NPAES 2008, specific targets have now been set for inland aquatic ecosystems (rivers, wetlands and estuaries). All three-inland aquatic biozones are very poorly represented in the protected area network (***Figure 8***), which has a traditional bias towards terrestrial ecosystems. Further, many of the aquatic ecosystems that do occur within protected area boundaries are often in poor condition and are, therefore, not effectively secured.

This is most obvious in estuaries, where even though the current protected area network of 724km^2 exceeds the total required to meet targets, there is still a shortfall in actual target achievement (***Table 7***). This results from two issues. Firstly, although some large estuaries are conserved and targets are exceeded for those types, many ecosystems remain unprotected. Secondly, much of the estuary area within protected areas is in fact in a poor condition due to catchment related impacts and hence does not contribute to meeting targets.

Currently, 93% of the 43 estuary types are effectively Not Protected (***Figure 8***). Overall, 259km^2 of additional estuary protection is necessary over the next 20 years. Securing estuaries effectively in the protected area network is going to require both expansion into under-protected types and improved management of estuaries and their catchments.

Rivers are very poorly represented within the protected area network, with 69 ecosystem types (33%) being classified as Not Protected, and 79 (37%) as Poorly Protected. The remaining 63 types are fairly evenly spread between Moderately Protected (12%) and Well Protected types (18%). Currently, river ecosystems are well below targets, with only 871km^2 both protected and in acceptable condition. In order to secure full representation of rivers, an additional 2 009km^2 of river ecosystems is required in the long-term, of which 1 490km^2 is needed within 20 years (***Table 7***).

Protection of rivers is particularly important as they represent vital ecological infrastructure for the country, i.e. they are responsible for delivering important ecosystem services to people. As was the case for estuaries, protection of rivers is not ensured merely by including the river within a protected area, though this is a good starting point. Full protection requires that catchments are effectively managed, that important areas for generating runoff are secured (i.e. South Africa's Strategic Water Source Areas[28]), that abstraction is carefully controlled, and that riparian areas and floodplains are maintained.

Wetlands are even more poorly represented in the protected area network than river ecosystems. As many as 53 wetland ecosystem types (39%) are Not Protected, with an additional 40 types (29%) being Poorly Protected. Long-term targets are only met for the 24 types (18%) which are Well Protected, with another 19 types (14%) categorised as Moderately Protected.

The very poor protection of wetlands is illustrated by the fact that of the 4 039km^2 long-term and 3 176km^2 20-year targets required, only 1 139km^2 is met by wetlands that are both included acceptable condition and in a protected area (***Table 7***).

Consequently, a significant shortfall of 3 135km^2 exists in the long-term and 2 352km^2 is required over the next 20-years. It is clear that a far more targeted protection effort is required in order that South Africa sufficiently secures its wetlands. As was the case for rivers, wetlands represent key ecological infrastructure, and securing them can maintain important benefits in terms of the delivery of ecosystem services to people.

In summary, inland aquatic ecosystems (rivers, wetlands and estuaries) are very poorly represented in protected areas, and many of the areas that are included are in poor condition. There is a dual challenge to substantially improve the protected area coverage of inland aquatic systems and at the same time secure their functioning.

This requires careful management of catchments, securing effective management of key areas such as water source areas, floodplains and riparian areas, as well as improved management of wetlands within current protected areas. Although the challenge is great, the benefits are potentially far greater, as inland aquatic ecosystems are amongst South Africa's most important ecological infrastructure.

[28] Nel et al., 2011.

Achievement of terrestrial targets (mainland and Sub-Antarctic)

Overall, of the 445 mainland terrestrial ecosystem types, 25% are Well Protected, 12% are Moderately Protected, 33% are Poorly Protected and 30% are Not Protected (***Figure 9***). The overall low levels of protection are emphasised when one examines the actual targets (***Table 7***). Of the long-term target of 257 671km^2 and the 20-year target of 202 604km^2, only 93 381km^2 is currently included in the protected area network in acceptable condition. This leaves a long-term requirement for 195 793km^2, of which 146 814km^2 is required over 20-years.

Inland aquatic ecosystems are important ecological infrastructure, but are very poorly represented in protected areas, and many of the areas that are included are in poor condition. There is a dual challenge to substantially improve the protected area coverage of inland aquatic systems and at the same time secure their functioning.

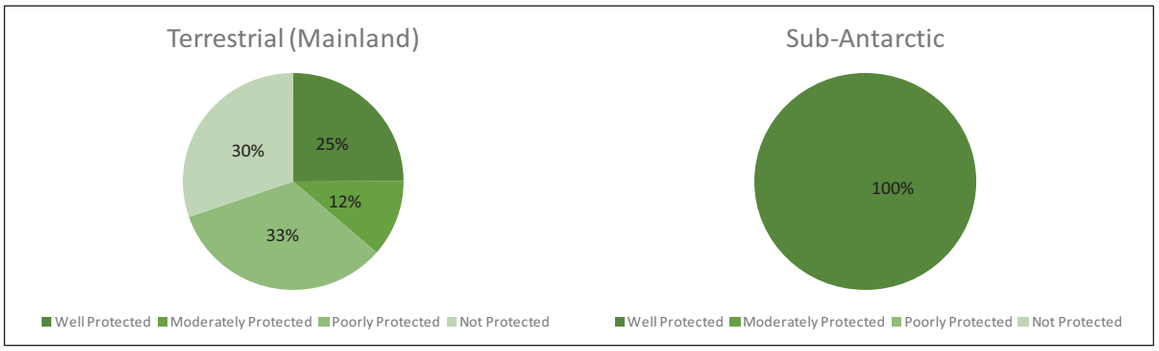

Figure 9: Current protection levels for all mainland terrestrial ecosystems and Sub-Antarctic ecosystems.

This equates to 36 703km^2 in 5-years or 7 340km^2 per year (i.e. 734 000ha a year). It is clear that South Africa is a long way from having a fully a protected area network that is fully representative of all mainland terrestrial ecosystems. In a welcome contrast to the mainland systems, all five Sub-Antarctic terrestrial ecosystem types are fully included in the protected area network.

If we examine the individual biozones, it is clear that there is much variation in protection (***Figure 10***). Forests are by far the best protected, with 9 ecosystem types (75%) being Well Protected and the remaining 3 types (25%) being Moderately Protected.

Sub-Antarctic ecosystems are fully protected, but the Nama-Karoo, Grassland and Succulent Karoo biozones remain significantly under-represented. Protected area expansion in these biozones is urgent, as competing land and resource uses continue to reduce opportunities for protection.

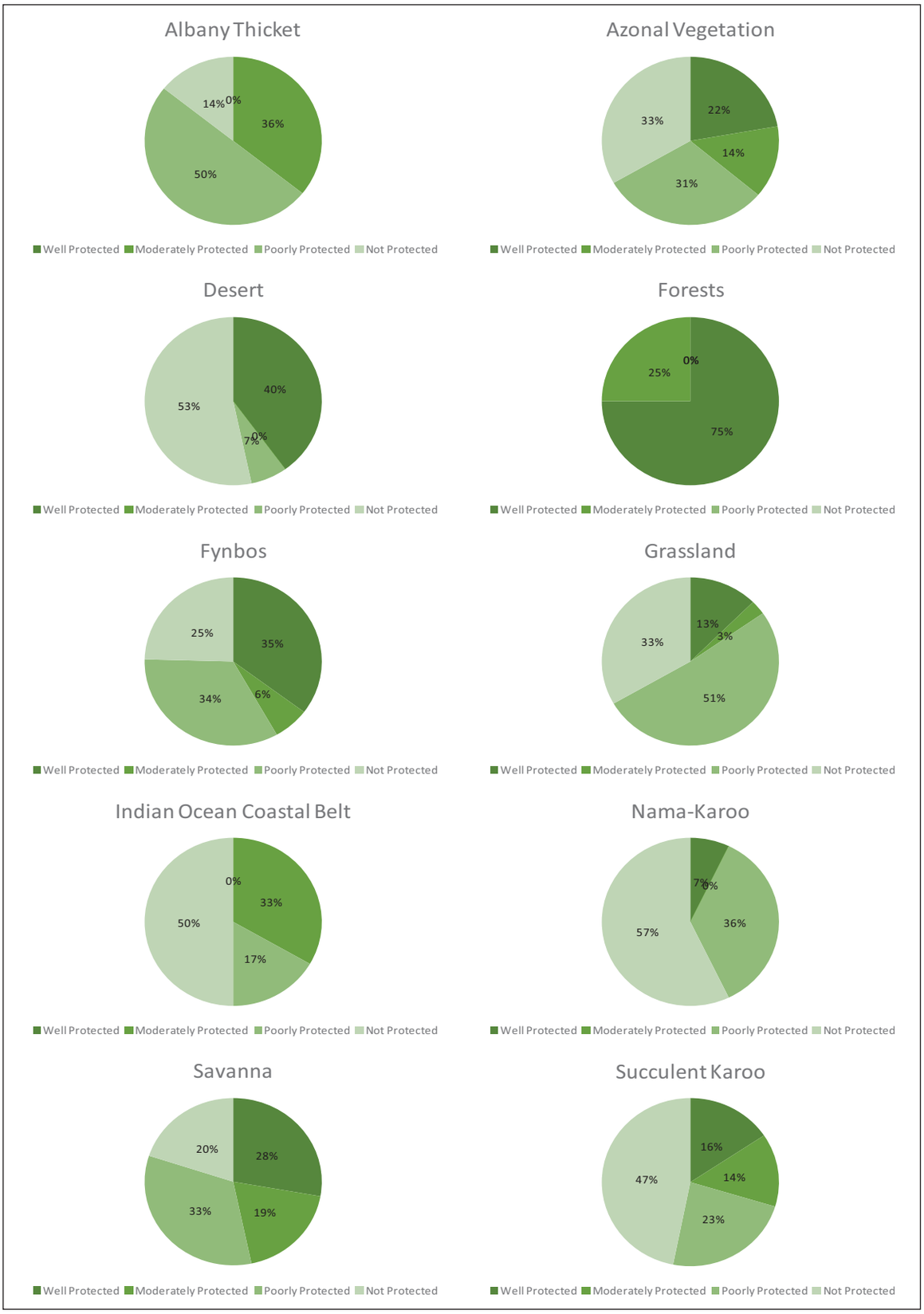

Figure 10: Current protection levels for terrestrial ecosystems, divided according to biozones.

None of the other terrestrial biozones have similar levels of protection. The Desert biozone has 6 types (40%) categorised as Well Protected, but 8 types (53%) are Not Protected. Effectively, Desert ecosystems in the west and east are well represented, but central types are not. There is a similar situation for Fynbos ecosystems, with 43 types (35%) being Well Protected, but 41 types (34%) remain Poorly Protected and 31 types (25%) are Not Protected. Many mountain and some coastal Fynbos ecosystems are well represented by the protected area network, but lowland and midland types remain very poorly conserved.

Savanna has a similar contrast, with 28% Well Protected ecosystem types, but 33% that remain Poorly Protected and 20% are Not Protected. Large Savanna focused protected areas secure the Lowveld and the arid Savannas, but much of the remaining mesic Savanna is very poorly protected. Hence, even in biozones that initially appear relatively well conserved thee is significant gaps in protection. These poorly represented ecosystems are just as deserving of protection as any other under-protected type, and the need to protect them is not reduced by good protection of other ecosystems in their biozone.

Overall, the Nama-Karoo is South Africa's least protected biozone, with 8 types (57%) categorised as Not Protected, and an additional 5 types (36%) remain Poorly Protected. In the past, protection of the Nama-Karoo was not seen as urgent because there were no imminent threats and it appeared that opportunities for protection would be available for the foreseeable future. However, shale gas exploration and production could now potentially foreclose protected area expansion opportunities across much of the Nama-Karoo.

This illustrates how protected area expansion efforts should be balanced between securing remaining fragments of already pressured ecosystems, with strategically securing areas before they become fragmented. It is clear that protected area expansion in the Nama-Karoo has suddenly become urgent and that opportunities for significant protection at low cost may have already been lost.

Grasslands are the second most under-represented terrestrial biozone, with 24 types (33%) being classified as Not Protected and 37 types (51%) as Poorly Protected. Few choices exist for meeting protected area targets in Grasslands because of many competing land and resource uses, and there is a need to act quickly to secure remaining options. The Succulent Karoo is in a very similar position to the Grasslands, 30 types (47%) are Not Protected and 15 types (23%) are Poorly Protected. Expansion of protected areas in the remaining under-represented types in the Succulent Karoo is also a priority.

In summary, terrestrial biozones show variable levels of protection. Sub-Antarctic ecosystem types are fully protected. Some ecosystems within Forests, Deserts and Savannas have good protection, but other ecosystems in these biozones remain under-protected. The most under-protected biozones are the Nama-Karoo, Grasslands and Succulent Karoo. In these biozones it is important to take all opportunities for further protection, as competing land and resource uses continue to expand.

5. Priority areas for protected area expansion

Having set protected area targets, the next step is to determine which geographic areas are the highest priorities for protected area expansion to meet those targets.

The NPAES takes the approach that the national role is not to undertake the spatial planning, but rather to set targets, identify key underlying planning principles, collate the provincial and sector priorities, and identify any remaining gaps. The strategy recognizes that detailed planning, scheduling and operational issues are all best dealt with at the provincial and agency level. In the NPAES 2008, spatial priorities had to be established nationally as few provinces or agencies had conservation plans and even fewer had specific sets of protected area expansion priorities. This has changed sufficiently for a set of priority areas to be collated directly from provincial and agency plans. The NPAES 2018 brings together these priorities, and highlights ecosystems where, if fully implemented, the current set of priorities will not achieve targets.

The identified priority areas cover a total area of 190 109km^2, in addition to areas currently under negotiation covering 73 610km^2 of mostly marine areas. The priority areas for each province, as well as for marine systems, are summarized. Overall, the set of priorities is well aligned with requirements for improving the representation of most ecosystems over the next 20 years. The number of Well Protected ecosystems is anticipated to more than double, while Not Protected ecosystems will reduce by around 70%. Assuming effective implementation the priority areas, greatest progress is anticipated in the Grasslands, Succulent Karoo, Savanna, wetlands, rivers and offshore benthic and pelagic ecosystems.

Chapter 4 addressed how much intact and functional area of each ecosystem type should be included in the protected area network if it is to be fully representative and play its role in ensuring that no further ecosystems become Critically Endangered. Once targets have been set, the next step is to determine which geographic areas are the highest priorities for protected area expansion to meet those targets.

Although the overall aim should be improving the representivity and efficiency of the protected area network, planning needs to take a far wider set of issues into account. These include detailed analysis of important areas for ecosystem processes (e.g. to secure areas against the impacts of climate change), and the identification of key areas of ecological infrastructure that will ensure that protected areas contribute to delivering key ecosystem services to people. Further, implementation prioritisation should reflect operational requirements (e.g. consolidation of protected areas to aid management) and the implementation mechanisms being used (e.g. the use of biodiversity stewardship programmes).

When the NPAES 2008 was developed, most provinces did not have systematic conservation plans and even fewer had specified sets of protected area expansion priorities. It was therefore necessary to prioritise at a national level. Little was known about inland aquatic and marine priorities. This situation has changed substantially, with most provinces, agencies and sectors having robust and systematically identified spatial priorities. All terrestrial, freshwater and marine areas now have functional protected area expansion strategies (PAES).

The national planning approach is therefore no longer necessary or appropriate, and instead the role of the NPAES 2018 is to set targets, review the collated spatial priorities and identify gaps, rather than undertaking its own spatial prioritisation. The NPAES 2018 is therefore collated from the protected area expansion priorities of the individual protected area agencies.

The strategy recognises that detailed protected area expansion planning is best dealt with at the provincial and agency level. Many planning issues (e.g. ecosystem service issues, identification of ecological infrastructure, protected area management issues, implementation negotiations, and practicalities of expansion in particular areas) are most effectively dealt with at a sub-national level. Hence, the NPAES focuses on the overall principles which should be applied during protected area expansion planning at the agency and provincial level.

In this chapter, the priority areas for each province, as well as for marine systems, are summarised in terms of how they were identified, their location, the key biodiversity features, and the key pressures on these priority areas. The anticipated situation in terms of protection levels of terrestrial, river, wetland, estuarine and marine ecosystems is evaluated assuming all the priority areas are successfully implemented. The ecosystems that are not fully addressed by the current set of priority areas are identified. Further, we evaluate the anticipated rate of implementation of priority areas in terms of the current implementation rates from the provinces and agencies.

Key principles for planning and implementation

It is anticipated that, over time, provinces and agencies will refine, revise and adapt their systematic conservation plans and PAES as implementation is rolled out, landscapes change (e.g. loss of intact habitat), knowledge is improved (e.g. revised ecosystem mapping) and planning processes are improved. The following key principles are intended to guide further protected area expansion planning and implementation, so that robust prioritisation is maintained:

Detailed planning is best dealt with at provincial and agency level. Protected area priorities are now available at this level for all terrestrial, freshwater and marine areas. The role of the NPAES 2018 is to collate these priorities and identify gaps, rather than undertaking national prioritisation.

Systematic approach: Protected area expansion planning should be closely linked to spatial priorities identified in provincial systematic conservation plans. In other cases, the planning may take place at a broader scale (e.g. for marine systems) or more locally (e.g. systematic expansion planning for a particular protected area). There should be strong alignment with identified Critical Biodiversity Areas and Ecological Support Areas (or equivalent categories). In most cases the identified protected area expansion priorities should be a subset of these categories in the applicable systematic conservation plan for an area.

Target driven: Prioritisation should focus on meeting targets for ecosystems. There should be a clear link between national targets and those used in local level planning. This issue is linked to the following two key points on representation and efficiency.

Improve representation of all ecosystems: Overall, planning for expansion of a protected area network should strive to improve representation of all ecosystems. It may not be possible, cost-effective or necessary to secure the full target for all ecosystem types through a protected area mechanism. Other effective conservation mechanisms may be more appropriate in some cases (e.g. appropriate zoning or development controls could be used in urban situations). Nevertheless, the starting point should be that all ecosystems should be represented in the protected area network to some extent, and that one should attempt to secure as much of the ecosystem targets in protected areas as is practically possible.

Improve efficiency: There are many valid reasons to have a greater portion of an ecosystem protected than the targets require. For example, a protected area may have a significant economic, social or tourism role; it may be necessary to protect some other biodiversity feature (e.g. a key threatened

species); or it may be necessary to secure a larger area to protect ecological infrastructure and ensure long-term climate change persistence. For ecosystem types with a limited extent, it may not be effective to only protect a portion of the system. In other instances, significant gains in management efficiency may override representation efficiency. However, the overall aim should be to improve the efficiency of meeting targets. This implies that where targets for an ecosystem have already been met, there needs to be a clear and rational reason for including more of that ecosystem before under-represented ecosystems are addressed.

Ecological persistence: Protected areas should secure areas critical for maintaining ecological process. This will ensure that protected areas themselves are able to adapt to climate change and that they contribute to society as a whole adapting to climate change impacts. Key areas include coastal and inland corridors, areas important for hydrological process (e.g. riparian areas), and areas with important altitudinal, climatic and ecological gradients.

Ecological infrastructure: Protected area planning should include issues related to the protection of natural areas that deliver critical ecosystem services to people. Ecological infrastructure linked to water-related ecosystem services are particularly critical, e.g. Strategic Water Source Areas.

Integrated planning across ecosystem types: Ideally planning should take place across terrestrial, river, wetland and marine systems to ensure that optimal areas are selected that will deliver a complete set of priority areas.

Integrated planning for threatened species: Priorities for threatened species should be fully incorporated into the analysis.

Alignment between provinces and agencies: Where ecosystems are shared between provinces, or where multiple agencies are active in a province, it is critical that clear communication lines exist and that planning processes are linked. This is necessary to ensure that priorities are aligned. For example, one should ensure that activities are not artificially focused in difficult to implement areas (e.g. where one province has a highly fragmented portion of an ecosystem that would be better protected in an adjacent province), that shared priority areas are consistently dealt with, and that boundary areas between biozones (e.g. coastal areas) are sensibly planned. Where a national agency is operating in a portion of a province it should take provincial priorities into account, and conversely, provinces should incorporate the national agency's priorities.

Address receding opportunities: Where limited opportunities exist to secure the last remaining portions of under-represented ecosystems, it is critical that these are prioritised. Although it may not be possible or cost-effective to secure all these areas through protected area expansion, it is important that this decision is made on a rational basis and that alternative mechanisms are used to secure these areas. At the other extreme, there may be some remaining large unfragmented landscapes where opportunities exist to secure protected areas where there are currently fewer competing land and resource uses. These areas should be secured before opportunities are lost.

Protected areas agencies should aim for a balanced portfolio of expansion activities, which contribute to biodiversity conservation and ecological sustainability. They should avoid reinforcing existing biases by not protecting more of the same. Priorities should be clearly defined through a robust systematic planning process.

Incorporate issues of opportunity cost: A key issue is that some areas may be very expensive for protected area expansion or difficult to secure, and can absorb a great deal of the protected area expansion effort for not much gain in terms of contributing to biodiversity targets. The balance between securing critical or irreplaceable sites and other sites that may contribute more effectively to meeting targets should be carefully considered.

In some cases, it may be better to secure these difficult areas through other conservation mechanisms such as development controls or zoning.

Other operational and economic issues: Protected areas need to be manageable, so operational issues need to be taken into account. Similarly, protected areas should contribute to the national, regional and local economy especially through tourism. These are all legitimate reasons for prioritising particular areas for expansion. However, care must be taken to ensure that these issues do not override all the above core principles aimed at securing a representative, ecologically sustainable and efficient reserve network.

Overall, protected area agencies should aim for a balanced portfolio of expansion activities which contribute to biodiversity conservation and ecological sustainability. They should avoid reinforcing existing biases in the protected area network by not protecting more of the same. Priorities should be clearly defined through a robust systematic planning process.

Priority areas for protected area expansion

The NPAES 2018 has collated protected area expansion priorities from the provincial and national agencies. These priorities reflect the spatial priorities from provincial and other PAES, or alternatively show the areas that are currently being incorporated into these provincial and agency strategies. Priorities were obtained from, and confirmed with, the various agencies and provinces.

An overall map of current protected areas, areas under negotiation and collated priorities from provinces and agencies is shown in ***Figure 11***.

The identified priority areas cover a total area of 184 190km^2, in addition to areas currently under negotiation covering 72 584km^2 of mostly marine areas. For comparison, the current protected area network covers a total of approximately 282 479km^2, the terrestrial protected areas are 96 610km^2 and the Prince Edward Islands marine protected area is 180 862km^2.

The following sections detail the priority areas for each province and summarise them as follows:

- How were the priority areas identified?
- Where are the main priority areas?
- What are the main biodiversity features?
- What are the key pressures on priority areas for protected area expansion?

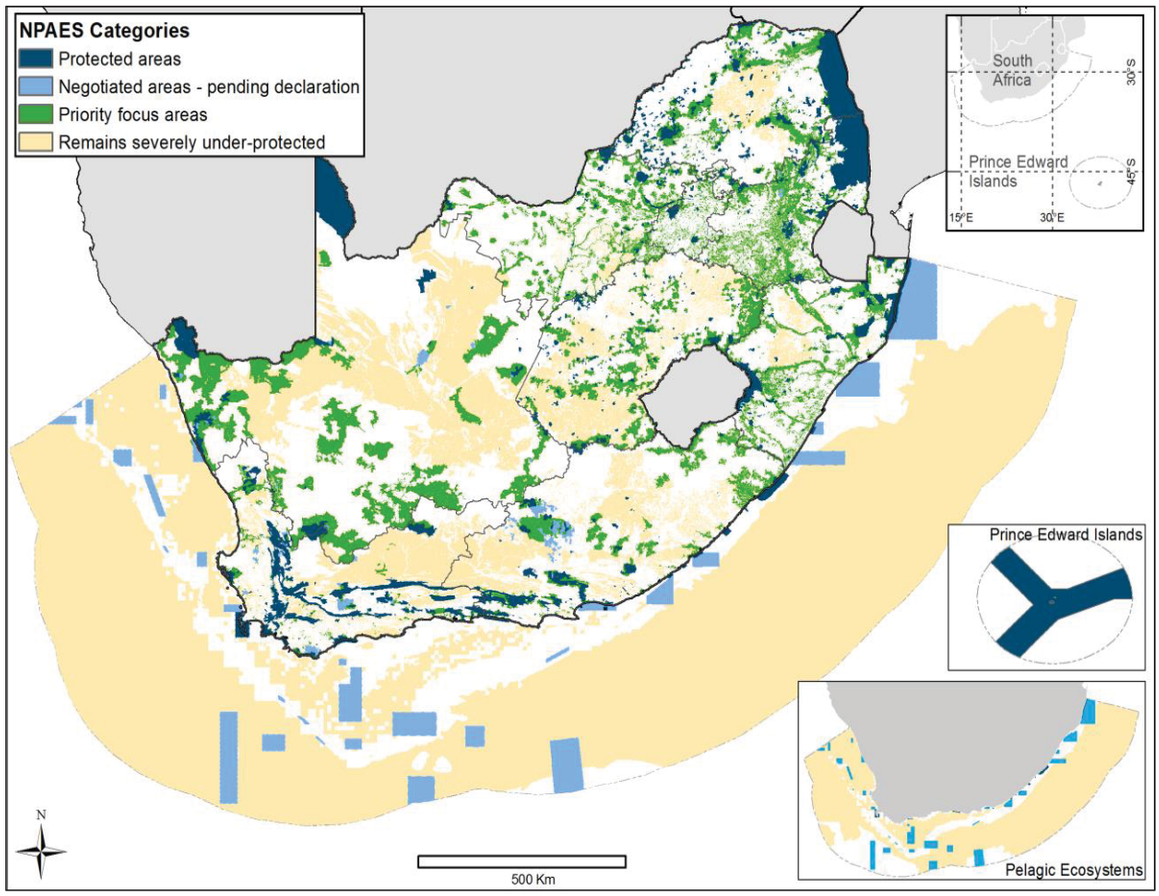

Figure 11: Current protected areas, areas under negotiation and collated priorities from provinces and protected area agencies. Intact areas of ecosystems which are likely to remain severely under-protected (i.e. Not or Poorly Protected) after implementation of the negotiated and priority areas are indicated.

Priority areas in the Eastern Cape

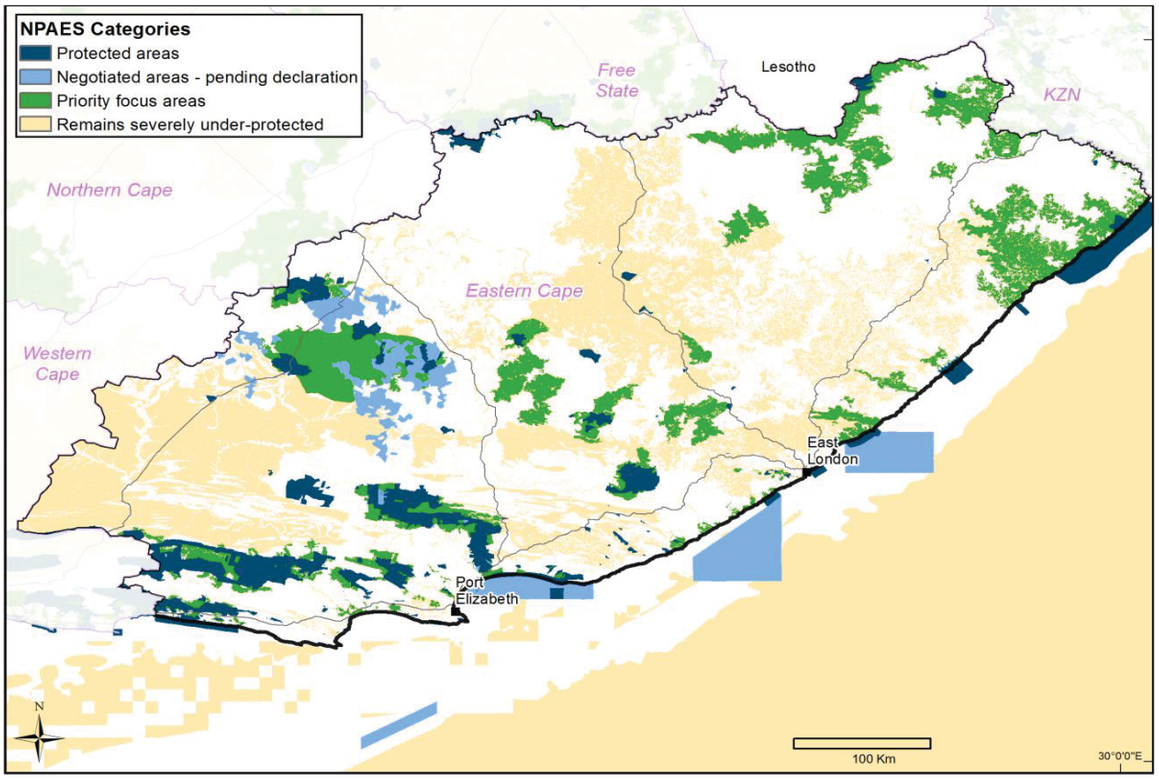

Figure 12: Priority areas for protected area expansion in the Eastern Cape.

How were the priority areas identified? The Eastern Cape has a provincial conservation plan[29], which had to be significantly updated when the provincial PAES was prepared[30]. The update included freshwater and estuarine priorities, climate change issues and key gaps in the representation of terrestrial ecosystems. The priority areas represent a finite set of implementation priorities rather than a comprehensive set of areas required to meet all targets. SANParks priorities were fully included into the provincial plan and hence were not added separately in the NPAES.

Where are the main priority areas? The main priorities are Pondoland, Qhorha-Manubi, Greater Baviaanskloof, Katberg-Amathole, the East London Coast, the Sunshine Coast, the St Francis region, Mountain Zebra to Camdeboo National Parks, around Addo National Park and the North Eastern Cape interior grasslands.

What are the main biodiversity features? Key biodiversity features targeted are the Pondoland Centre of Endemism, the high value montane grasslands and forest mosaics of the Katberg-Amathole, the wetland complexes of Matatiele, remaining pockets of coastal forest and grassland, corridor areas of the Sneeuberg region, and the under-protected and unique grasslands of the Southern Drakensberg.

What are the key pressures on priority areas? Agriculture (both commercial and subsistence) is an issue in many of the priority areas, new forestry programs are an issue in the east, while coastal urban expansion threatens coastal areas. Mining and infrastructure projects are issues in some areas such as the Pondoland.

[29] Berliner and Desmet, 2007.
[30] Skowno et al., 2012.

Priority areas in KwaZulu-Natal

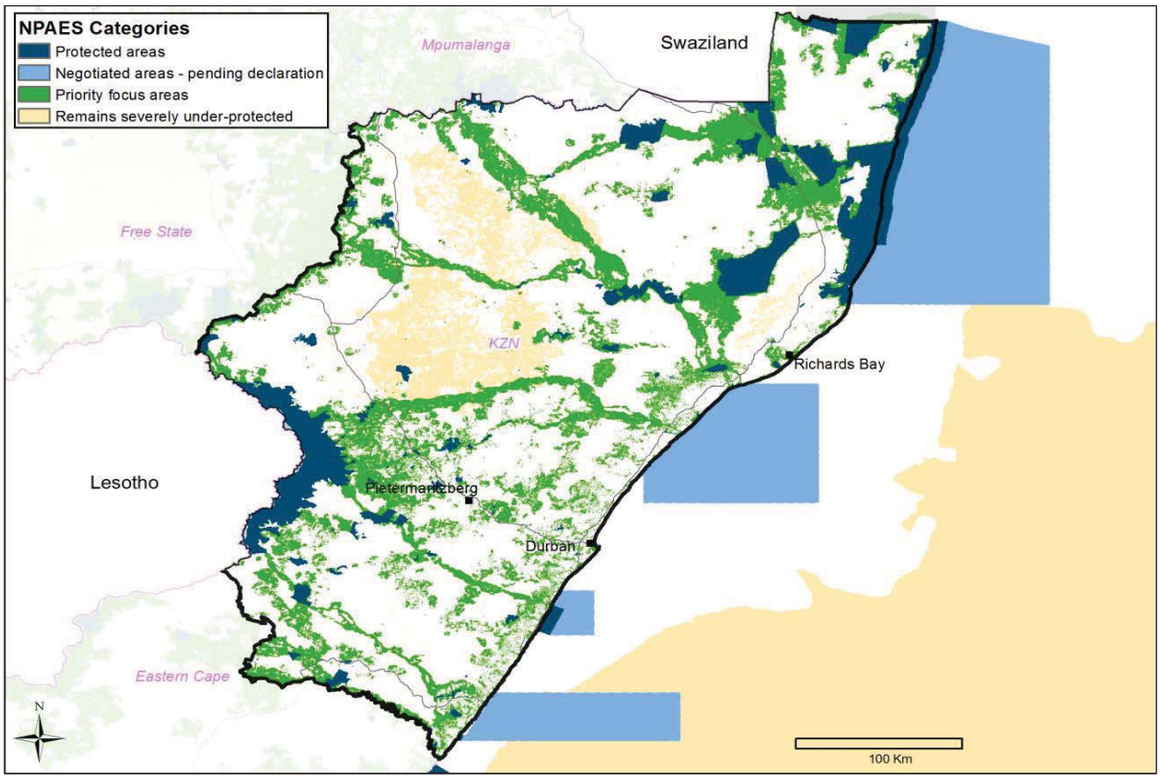

Figure 13: Priority areas for protected area expansion in KwaZulu-Natal.

How were the priority areas identified? Ezemvelo KZN Wildlife has a well-established and up to date systematic conservation planning system which identifies a comprehensive set of Critical Biodiversity Areas, within which protected area expansion priorities are identified[31]. Key issues include targeting irreplaceable and under-represented biodiversity features and important landscape corridors.

Where are the main priority areas? Most irreplaceable features are in the midland and coastal regions. In addition, there are critical landscape linkages including the Kokstad to Port Edward, Bulwer, Nottingham Road, Glencoe to Umtunzini, and Zululand/Maputaland corridors.

What are the main biodiversity features? Key features include the remaining areas of irreplaceable, highly threatened and under-represented Sub-escarpment Grassland, Sub-escarpment Savanna and Indian Ocean Coastal Belt. In addition, key landscape corridors are targeted. The planning process fully incorporates aquatic and species priorities.

What are the key pressures on priority areas? Urban residential and commercial expansion in the coastal areas are the key pressures, while commercial and subsistence agriculture are an issue inland.

[31] Ezemvelo KZN Wildlife, 2010.

Priority areas in Mpumalanga

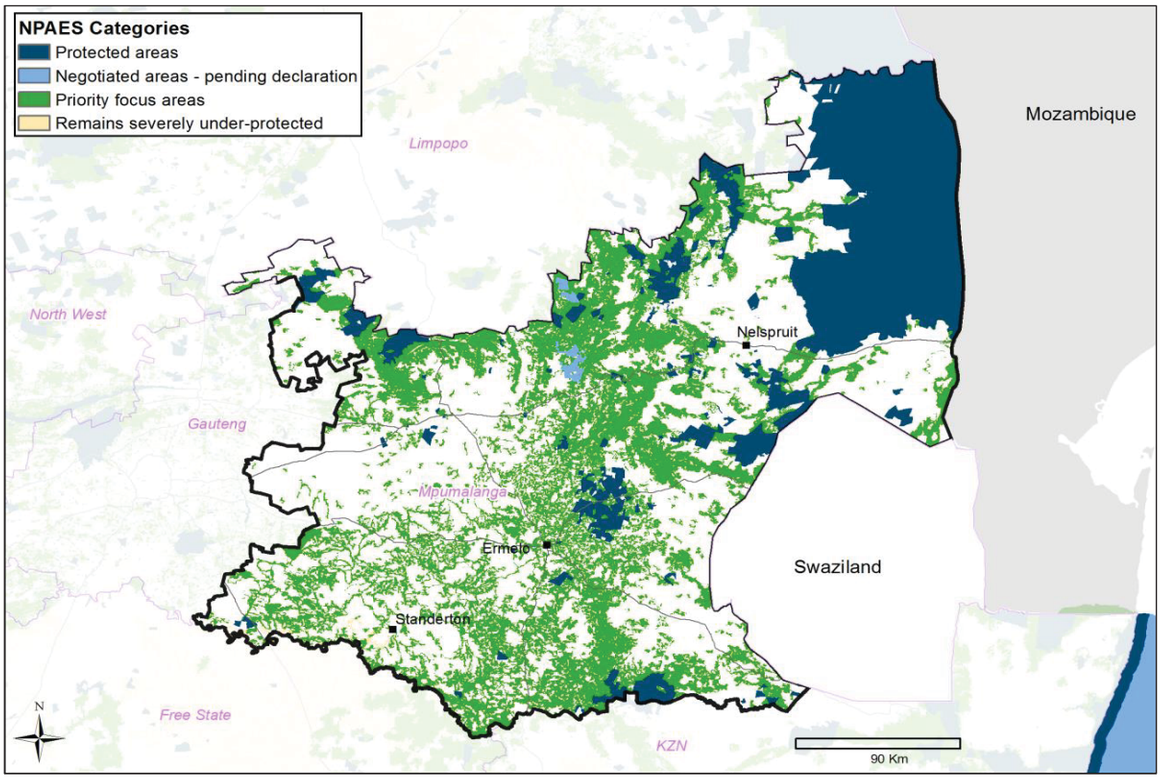

Figure 14: Priority areas for protected area expansion in Mpumalanga.

How were the priority areas identified? Mpumalanga has an up to date and comprehensive systematic conservation plan[32], from which a subset of areas was prioritised for the provincial PAES[33]. The prioritisation focused on meeting biodiversity targets for ecosystems, species and process areas. Key issues were landscape connectivity and securing threatened ecosystems.

Where are the main priority areas? Although a very comprehensive set of areas have been identified, the key priority areas are the Loskop-Middelburg region, the Steenkampsberg, Vaalhoek (near Blyde Canyon), Kaapsehoop and Schoemanskloof on the escarpment, the Slaaihoek and Badplaas region and around Wakkerstroom.

What are the main biodiversity features? The plan focuses on key corridors, priority intact grasslands, unprotected threatened species, threatened ecosystems and areas with remaining wilderness characteristics. Most priorities are in the Mesic Highveld Grasslands.

What are the key pressures on priority areas? Rapid expansion of mining (especially for coal) is the primary threat in the priority areas. In addition, significant pressures exist from commercial and subsistence arable agriculture, and to a lesser extent plantation forestry.

[32] Mpumalanga Tourism and Parks Agency (MTPA), 2014.
[33] Lotter, 2015.

Priority areas in Limpopo

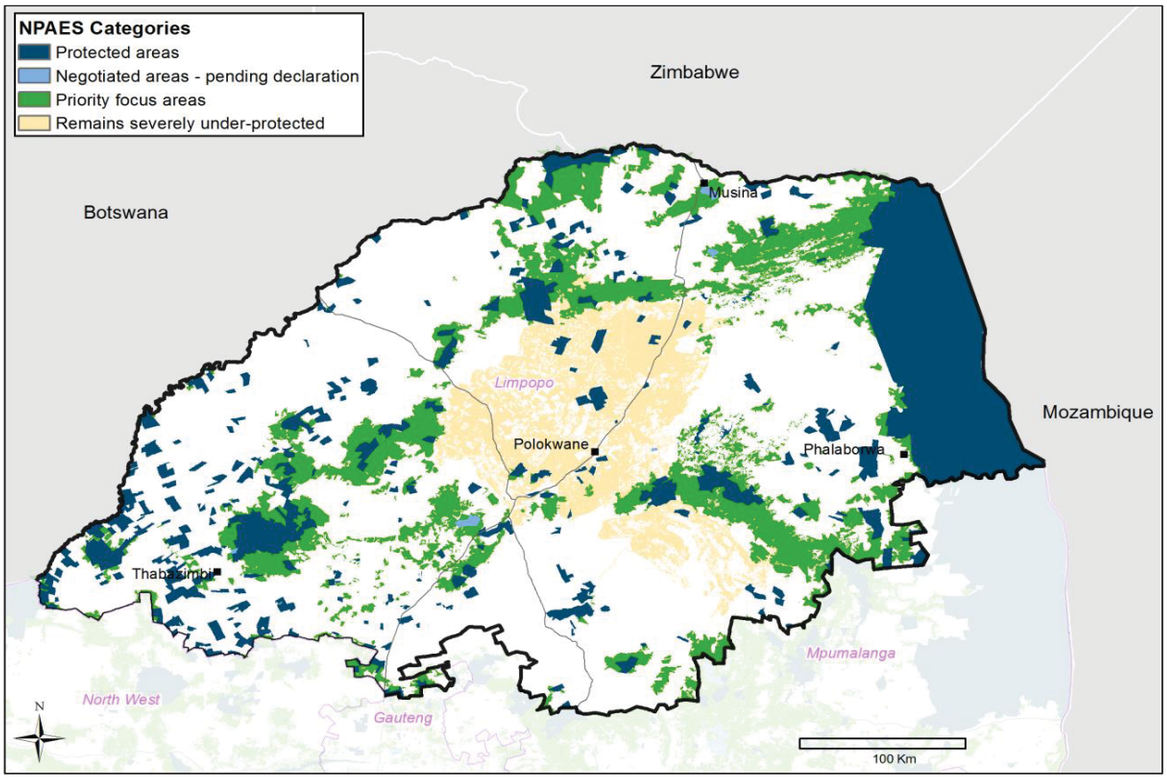

Figure 15: Priority areas for protected area expansion in Limpopo

How were the priority areas identified? The Limpopo Province has a relatively recent provincial systematic conservation plan[34] from which a spatially specific provincial protected areas expansion strategy was developed[35]. The spatial planning already includes SANParks priority areas and hence these were not separately added by the NPAES.

Where are the main priority areas? High value sites which are under threat are prioritised, particularly the Haenertsburg-Modjadji area, the Blouberg (and adjacent Makgabeng) and the Nyslvlei (and adjacent Makapan) areas. Further priority areas include the Makuya region, the area around the Wolkberg and the Drakensberg-Strydpoortberge region. In addition, areas with high land-owner willingness (e.g. Waterberg and Soutpansberg), and areas with committed champions for protected area expansion (e.g. Kruger to Canyons Biosphere and areas in the Waterberg Biosphere) are included.

What are the main biodiversity features? The priority areas comprehensively target the full range of biodiversity features in the province including under-protected terrestrial and freshwater ecosystems, landscape corridors and major areas important for threatened species.

What are the key pressures on priority areas? Cultivation and land degradation (often associated with former homeland areas) are consistent issues across many of the priority areas, while plantations and mining are locally very significant.

[34] Desmet et al., 2013.
[35] Desmet et al., 2014.

Priority areas in Gauteng

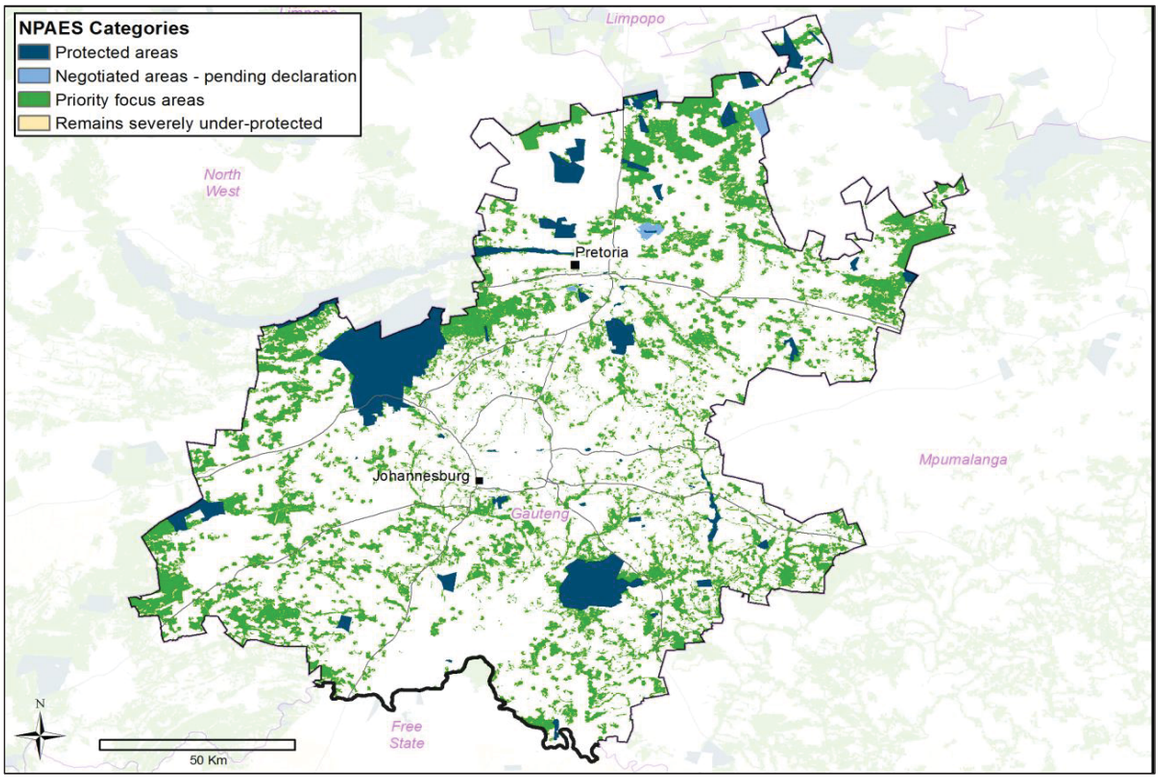

Figure 16: Priority areas for protected area expansion in Gauteng.

How were the priority areas identified? Gauteng province has a clearly delineated set of spatial priorities derived from its provincial systematic conservation plan. The Gauteng Protected Areas Expansion Strategy comprehensively includes the Critical Biodiversity Areas from the Gauteng C-Plan Version 3.3[36]

Where are the main priority areas? Key priority areas include the areas in and around the Cradle of Humankind in the West Rand, the Mesic Highveld Grasslands around Bronkhorstspruit, the Central Bushveld areas around Hammanskraal in the north of the province, and key connection across the south of the province linking Suikerbosrand and Sebokeng. Very few options remain in and around the highly urbanised City of Johannesburg and Ekurhuleni Metropolitan areas.

What are the main biodiversity features? The full range of important biodiversity features are targeted, including remain areas of threatened ecosystems, irreplaceable and important features. The priorities also include wetlands, rivers and their buffers, important ridges, dolomite areas and climate change corridors.

What are the key pressures on priority areas? The key pressure is the expansion of urban areas for a range of residential, commercial and industrial reasons. Mining is also an important pressure, though less so than urban pressures. Arable commercial agriculture and subsistence agriculture are important in particular areas such as the far north.

[36] GDARD, 2014.

Priority areas in the North West

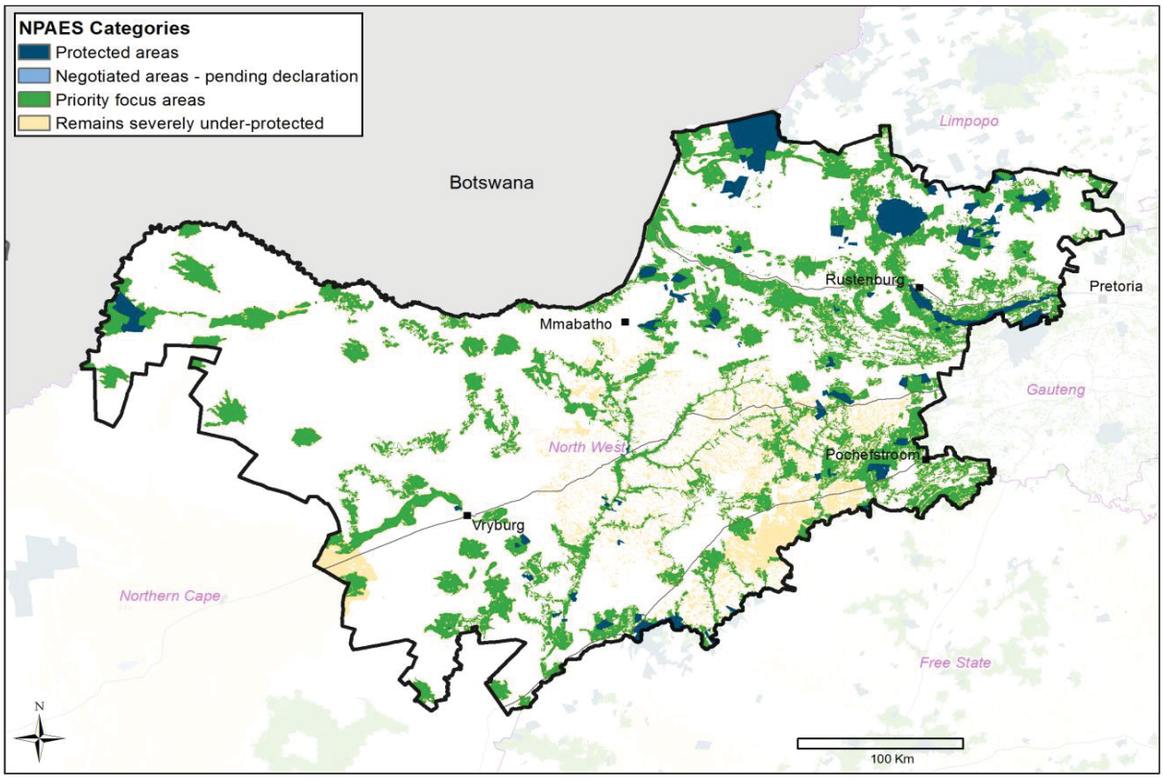

Figure 17: Priority areas for protected area expansion in the North West.

How were the priority areas identified? The North West is currently completing an update on its provincial conservation plan. Critical Biodiversity Areas from this plan, in particular priority areas (i.e. corridors and priority conservation nodes), were selected as the spatial priorities based on discussion with the conservation planners and provincial officials. These areas will be formalised into the revised provincial PAES.

Where are the main priority areas? The major spatial priorities areas are the Platinum Heritage Park in the north east of the province, the Highveld Park (around Potchefstroom to Boskop Dam Nature Reserve), the areas around the lower Vaal near SA Lombaard and Bloemhof Dam, Taung, Molemane to Mariko, and the Molopo area. In addition, some important finer scale corridors are prioritised through the few remaining intact linkages in the centre of the province.

What are the main biodiversity features? Under-protected ecosystem types, particularly in the Central Bushveld, Arid Highveld Grasslands and Eastern Kalahari Bushveld ecosystems are important biodiversity features. There is a strong focus on improving the landscape connectivity between reserves, with a particular focus on the major connections in the Bushveld areas of the Platinum Heritage Park and the more tenuous remaining river corridors through the Arid Highveld Grasslands.

What are the key pressures on priority areas? Commercial dryland agriculture (especially focused on maize production) is by far the dominant pressure in the province, though mining pressures and subsistence farming are an issue in the north east.

Priority areas in the Free State

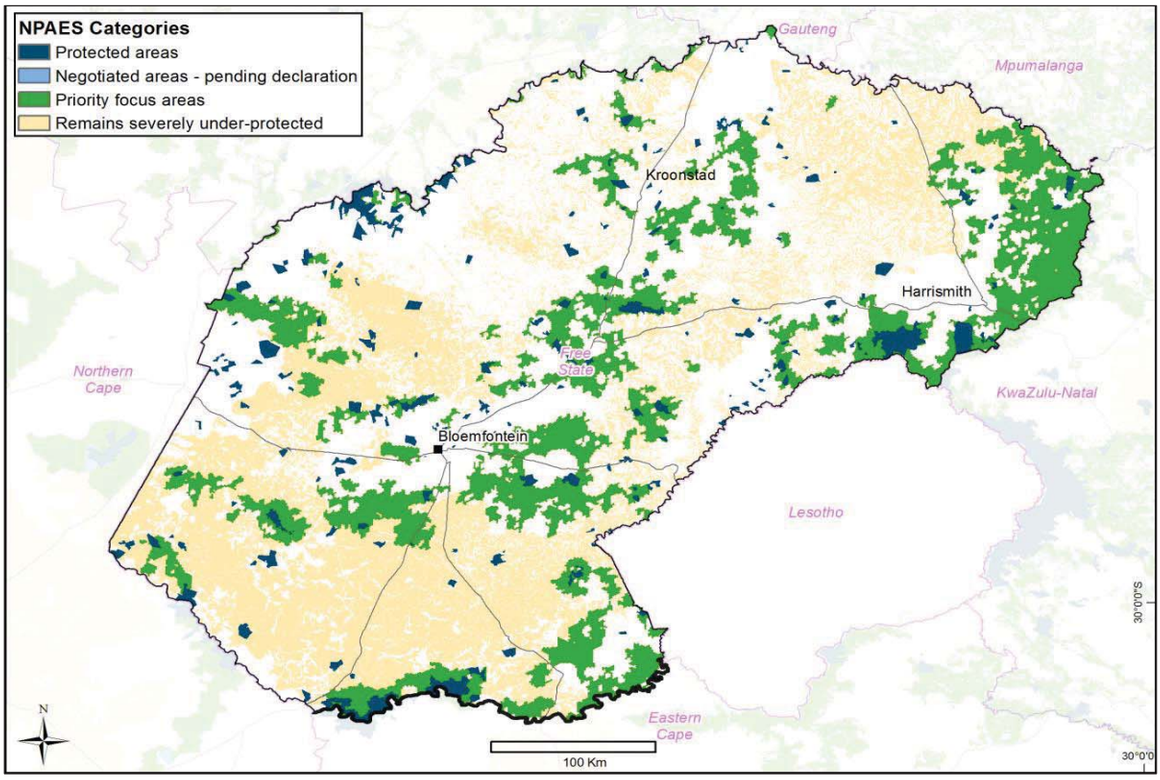

Figure 18: Priority areas for protected area expansion in the Free State.

How were the priority areas identified? The Free State is about to finalise its provincial conservation plan and protected areas expansion strategy. The plans are robust and systematic, with a clear focus on improving the representation of under-protected ecosystems. Initial priority areas from the draft provincial PAES were combined with SANParks expansion areas.

Where are the main priority areas? Three main geographic themes can be seen. The plan includes a large area of Mesic Highveld Grasslands and Drakensberg Grasslands in the eastern Free State which are important for ecosystem service delivery. There is a central and southern band of priority areas targeting very under-protected Dry Highveld Grasslands, and then a smaller set of areas in the west targeting the upper Nama-Karoo and Eastern Kalahari Bushveld.

What are the main biodiversity features? The plan strongly targets threatened and under-protected terrestrial ecosystems, particularly in the grasslands. The remaining intact areas of Endangered and Vulnerable ecosystem types are included in the plan. Freshwater priorities (i.e. FEPA[37] rivers and wetlands) are less directly targeted but are nevertheless built into the overall spatial planning process.

What are the key pressures on priority areas? The greatest pressure on Free State priority areas is agriculture. Most of this is commercial maize and sunflower production, though in some areas subsistence agriculture is also an issue. Large dams have also had an impact in the past.

[37] Freshwater Ecosystem Priority Areas, Nel et al., 2011.

Priority areas in the Western Cape

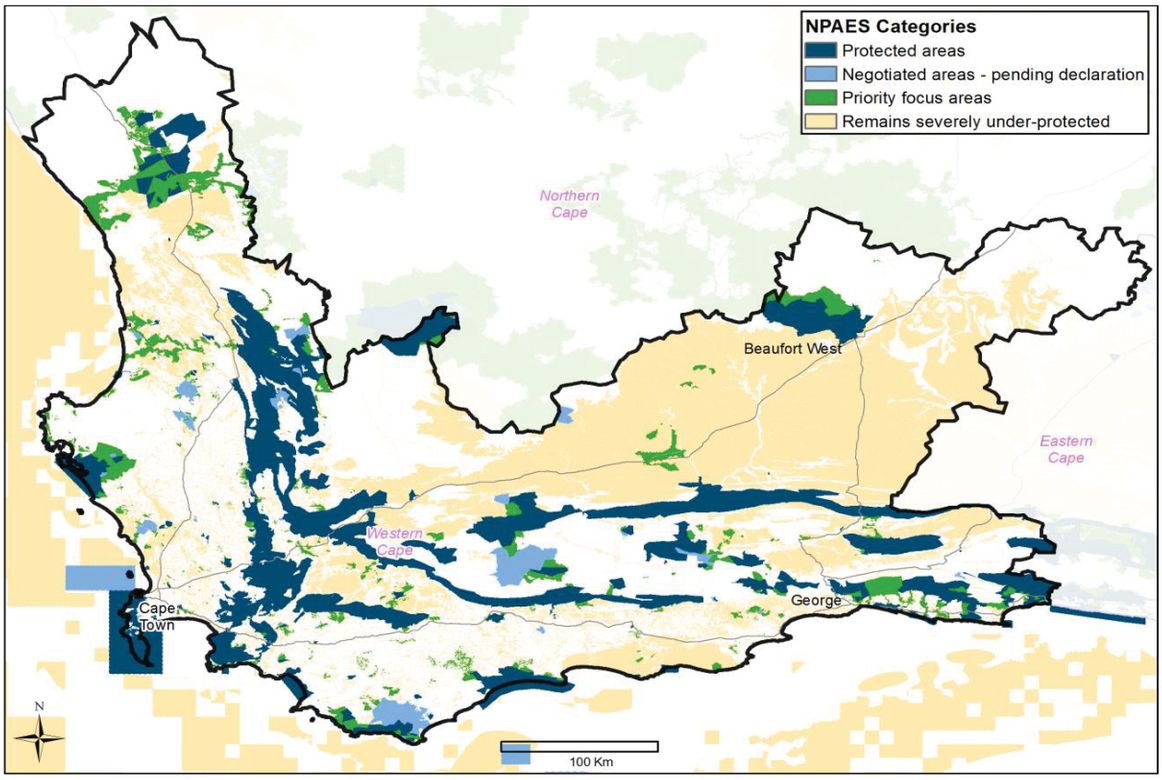

Figure 19: Priority areas for protected area expansion in the Western Cape.

How were the priority areas identified? CapeNature has a well-established and up to date systematic conservation planning system, which is used to identify Critical Biodiversity areas at a fine scale. Priorities from this planning process were put through a filter based on biodiversity features and operational requirements to identify a subset of priority areas for protected area expansion that are included in their PAES. SANParks priorities around existing national parks were also included.

Where are the main priority areas? The priority areas are widely distributed across the province. Key spatial priorities focus on remaining sites in threatened and under-protected lowland Fynbos systems, important climate change adaptation corridors, and consolidating areas around and between key reserves. The main geographical gap in the network is that the Nama-Karoo was largely excluded as it was of lower priority, but this is now changing with the emergence of shale gas exploration.

What are the main biodiversity features? The plan targets key gaps in the protected area network. It aims to secure at least one 'best remaining' site in each of the province's most poorly-protected Critically Endangered ecosystems, secure key sites for important species, secure special (unique, under-protected & threatened) freshwater ecosystems in each region and also targets marine, estuarine and coastal features.

What are the key pressures on priority areas? Lowland areas are under extreme pressure from urban and agricultural expansion. Agricultural expansion issues include expansion of potatoes, olives, rooibos and vineyards. Importantly, unmanaged Fynbos areas can be rapidly degraded through invasion by alien vegetation and poor fire management.

Priority areas in the Northern Cape

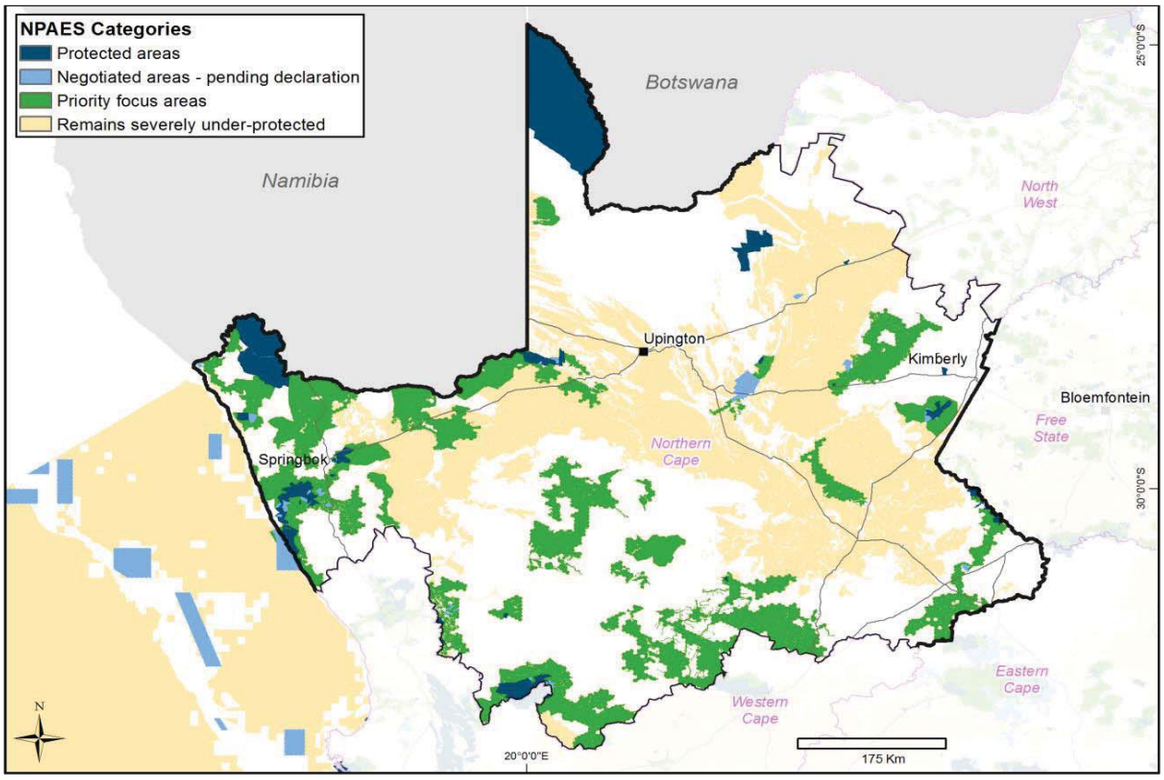

Figure 20: Priority areas for protected area expansion in the Northern Cape.

How were the priority areas identified? The Northern Cape now has a full Protected Area Expansion Strategy[38] developed by the Northern Cape Department of Environment and Nature Conservation with support from the Department of Environmental Affairs. This is based on an up to date systematic conservation plan for the province[39]. The PAES priorities, which are used directly, are largely a subset of the Critical Biodiversity Areas from the systematic conservation plan that were identified on implementation priority. SANParks priorities were fully included into the provincial PAES.

Where are the main priority areas? The priority areas are in the Succulent Karoo areas of the Namakwa District, Bushmanland, the southern Nama-Karoo as well as in the expansion areas of the existing national parks in the province.

What are the main biodiversity features? Succulent Karoo and southern Nama-Karoo priorities, as well as river and wetlands are included. Arid Savanna and some Desert ecosystems are currently not fully included in these of priorities, and these will need to be focussed on after existing priorities have been implemented.

What are the key pressures on priority areas? Areas of Bushmanland and Namakwa are under pressure from mining and rapid expansion of renewable energy facilities. Priorities along the Gariep River are under threat from expansion of irrigated agriculture. Climate change impacts are likely to be very significant in this region.

[38] Balfour and Holness, 2017.
[39] Holness and Oosthuysen, 2016.

Priority areas in marine ecosystems

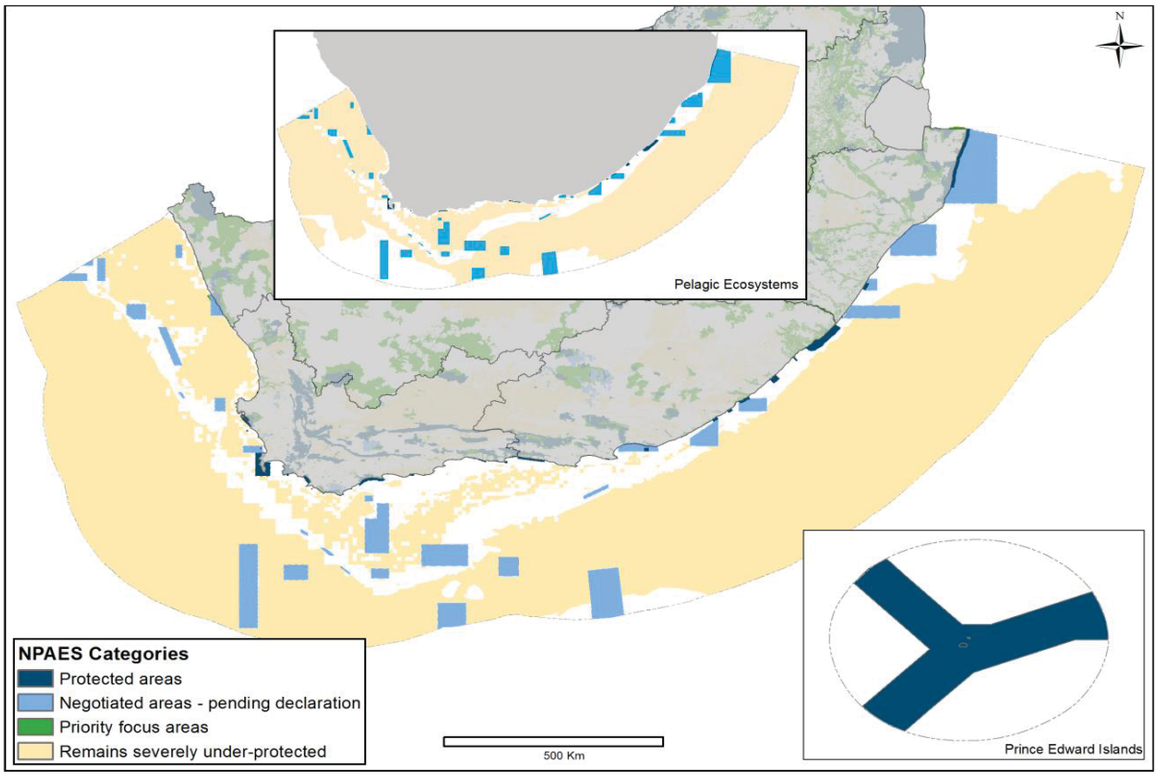

Figure 21: Priority areas for protected area expansion for marine ecosystems. These currently consist of areas under negotiation as part of Operation Phakisa and some other pending MPA declarations.

How were the priority areas identified? These are current areas under negotiation for Phase 1 of Operation Phakisa, which aims to proclaim a representative network of MPAs that protects at least 5% of mainland South Africa's EEZ. The systematically identified priorities were based on assessments for the Offshore Marine Protected Area Project 2011[40], the West Coast of South Africa[41] and assessments associated with the NBA 2011[42]. Further priorities to take the total to 10% will be identified by 2018.

Where are the main priority areas? These currently consist of the offshore areas under negotiation as part of Operation Phakisa, as well as MPAs in Algoa Bay, Namaqua, KwaZulu-Natal, and the Western Cape.

What are the main biodiversity features? Biodiversity features include under-protected ecosystems, sensitive habitats, and threatened ecosystems and species, as well as key nursery, spawning and feeding areas.

What are the key pressures on priority areas? The current priorities were deliberately designed to avoid major competing activities and pressures. Nevertheless, until they are declared the priority areas will still be vulnerable to fishery pressures as well as oil/gas exploration and potential phosphate mining.

[40] Sink et al., 2011.
[41] Majiedt et al., 2013.
[42] Sink et al., 2012.

Looking forward: Achievements if the priorities are implemented.

This section looks forward to the achievements that could be made in terms of representation of ecosystems if all the areas currently under negotiation and the priority areas are added to the protected area network.

Table 10 provides a summary of how the protection levels for all ecosystems could change in 20 years if the current areas under negotiation and the identified priority areas are implemented. If we assume that these areas are secured, the level of representation of South Africa's ecosystems will be significantly improved.

Table 10: Summary of the anticipated number of individual ecosystems within each protection level category in 20 years, should the identified priorities be implemented.

Category	Well Protected	Moderately Protected	Poorly Protected	Not Protected	Total
Estuary		**1**	**3**	**42**	**46**
Marine (Benthic and Coastal)	**58**	**22**	**20**	**9**	**109**
Coast types	22	6	3	1	32
Inner Shelf		2	1	1	4
Inshore	6	3		1	10
Island	1		1		2
Lagoon		1			1
Offshore Benthic	29	10	15	6	60
Marine pelagic	**1**	**3**	**9**	**3**	**16**
Marine Southern Oceans	**1**				**1**
Rivers	**119**	**33**	**36**	**23**	**211**
Sub-Antarctic	**5**				**5**
Subantarctic Polar Desert	1				1
Subantarctic Tundra	4				4
Terrestrial	**250**	**88**	**90**	**17**	**445**
Albany Thicket	5	6	3		14
Azonal Vegetation	17	9	7	3	36
Desert	14			1	15
Forests	12				12
Fynbos	59	20	38	5	122
Grassland	37	18	14	3	72
Indian Ocean Coastal Belt	3	3			6
Nama-Karoo	3	5	6		14
Savanna	59	18	10	3	90
Succulent Karoo	41	9	12	2	64
Wetlands	**72**	**22**	**26**	**16**	**136**
Grand Total	**506**	**169**	**184**	**110**	**969**

[43] More information can be found in Technical Note 5 of Appendix 2.

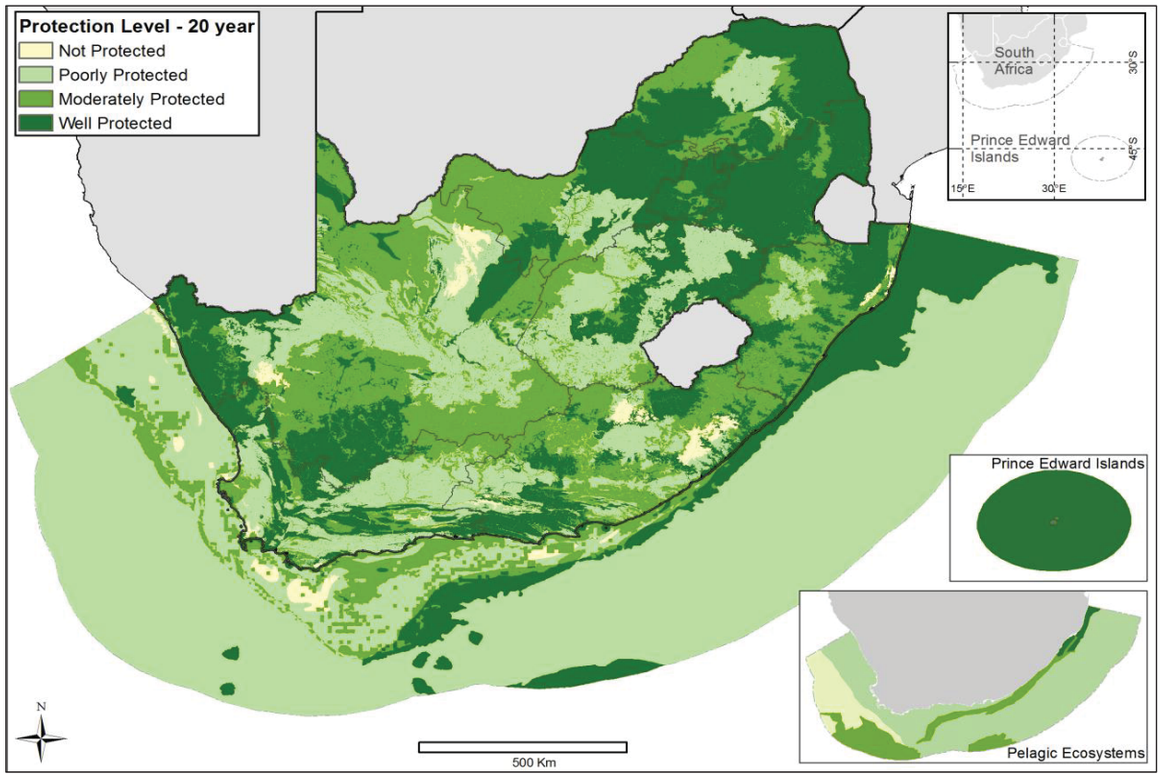

Figure 22: Anticipated protection levels for ecosystems in 20 years should all the priority areas be successfully implemented.

Should the priorities be implemented, of the 969 distinct ecosystem types, 506 or 52% (compared to the current 201 or 21%) will be Well Protected, and 169 or 17% (compared to the current 122 or 13%) will be Moderately Protected. For the lower categories of protection level, 184 or 19% (compared to the current 286 or 30%) of ecosystem types will be Poorly Protected, while only 110 or 11% (compared to the current 360 or 37%) of ecosystem types will remain Not Protected. The significant improvement in protection levels that is anticipated is evident in ***Figure 22***, which can be compared with the current situation shown in ***Figure 6***.

Under this scenario, an additional 305 ecosystem types would move to the Well Protected category, while 232 types improve in protection level by at least one category. A further 128 types would show some increase in protected area coverage but not enough to result in a category change. Based on the priority areas, greatest progress is anticipated in the Grasslands, Succulent Karoo, Savanna, wetlands, rivers and offshore benthic and pelagic ecosystems.

It is important to note that the full extent of priority areas is unlikely to be implemented, as these areas will generally include more of an ecosystem than is required to meet targets.

Some priority areas may include fine scale sites not suitable for inclusion into a protected area. In addition, when detailed planning takes place, the final implementation footprint may extend beyond the priority area. This is to be expected, and is an inevitable consequence of planning occurring at a broader scale than final implementation. Priority area boundaries should never be literally interpreted as future protected area boundaries.

Remaining gaps and revisions of spatial plans

Implementing the current areas under negotiation and priority areas would not improve the situation for 87 ecosystem types. Approximately half of the ecosystems that show no improvement are terrestrial, a quarter are rivers and the remaining types are spread between the other biozones (***Figure 22***).

It is important not to interpret the gap between what can be delivered by securing the spatial priorities and the requirements for fully meeting targets, as reflecting poor or incomplete planning. Different provinces and agencies have used slightly different, but equally valid, planning approaches. This results in some agencies placing a smaller basket of immediate priorities into the priority areas, while others prefer to put a far broader set of areas on the table.

This is clearly illustrated by the contrast between the Western Cape, where a very specific set of priority sites which are a small subset of their Critical Biodiversity Areas has been identified and the Free State where the priority areas essentially include the entire set of Critical Biodiversity Areas from the provincial conservation plan.

These approaches are different, but each have their advantages.

In the case of marine priorities, the gap between what is delivered by the current set of priorities (which have now moved into the 'negotiated' category as they have been gazetted) and the full area required to meet targets reflects an ongoing political process. It has been agreed that an additional set of priorities will be identified once the first set of Operation Phakisa priorities have been declared.

In time, it will be necessary to repeat the provincial and agency protected area expansion planning processes. This is necessary as implementation of protected area expansion programmes will result in the priority areas needing to be revised. In general, it should be sufficient to revise these plans every five years, but if significant progress is made in a region, then more frequent updates may be required.

In particular, it will be necessary to identify a second set of marine priorities once the initial Operation Phakisa priorities have been implemented. Where a number of agencies are active in a province (e.g. a provincial conservation agency and SANParks), it is particularly important that protected area plans are well-aligned.

6. Mechanisms for protected area expansion

There are three main mechanisms for expanding the land-based protected area network:

Acquisition of land is the traditional way of establishing and expanding protected areas, but involves large upfront costs.

Contract agreements are agreements in which landowners maintain ownership of their land but enter into a contract with a protected area agency. They are facilitated by provisions in the Protected Areas Act. They are being used increasingly as part of biodiversity stewardship programmes. Contract agreements are attractive because they tend to cost protected area agencies less than acquisition, and because by far the largest proportion of land in the priority areas is in private hands. Biodiversity stewardship programmes are increasingly recognized as an important mechanism in the expansion of the protected area network. There are significant potential synergies between biodiversity stewardship programmes, land reform and rural development.

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.

Expansion of the marine protected area network is more complex and mechanisms for securing protected areas specifically focused on inland aquatic ecosystems are poorly understood.

Once priority areas for protected area expansion have been identified, it is necessary to look at mechanisms for expanding the protected area network in those priority areas. There are three main mechanisms for expanding existing land-based protected areas or establishing new ones:

- Acquisition of land
- Contract agreements, including through biodiversity stewardship programmes
- Declaration of state or public land

Expansion of the marine protected area network is more complex. Marine protected areas are declared in terms of the Protected Areas Act as amended in June 2014. For offshore marine protected areas no private property rights are involved but there are mining rights, medium- and long-term fishing rights with annual quotas, and rights of access at sea that have to be modified, rescinded or expropriated in order to establish a marine protected area. Mechanisms for achieving this have been developed and are being implemented under Operation Phakisa.

Mechanisms for securing protected areas specifically focused on inland aquatic ecosystems are poorly understood. The current process of securing rivers, wetlands and estuaries using the methods used for terrestrial ecosystems has proved largely ineffective, as even when the features are fully incorporated into protected areas, they are still subject to catchment related impacts. Much work remains to understand how to properly secure inland aquatic ecosystems and their associated processes.

The focus in this chapter is on mechanisms for expanding the land-based protected area network. Contract agreements are increasingly used, and provincial biodiversity stewardship programmes have been strengthened and rolled out to all provinces. Nevertheless, acquisition of land and declaration of public land remain appropriate and important mechanisms for protected area expansion in some circumstances. Each of the three mechanisms is discussed briefly below.

Acquisition of land

Acquisition of land through purchase is the traditional mechanism for expanding the protected area network. Land is bought by protected area agencies, either for inclusion in existing protected areas or to establish a new protected area. Acquisition is the most secure option for protected area expansion, but also usually the costliest option.

Because acquisition is the mechanism that has been used most in the establishment of the land-based protected area network to date, it would be easy to continue to rely on it as the primary mechanism for expanding the protected area network. However, it will not be possible to meet protected area targets using acquisition alone – the cost would simply be too great.

Contract agreements, including biodiversity stewardship.

Contractual arrangements for expanding national parks were made possible by the National Parks Act (Act 57 of 1976) and have been used by SANParks especially from the late 1980s onwards. The Protected Areas Act has made it possible for contract agreements to be used in a wider range of contexts since 2003, including by provincial protected area agencies.

Acquisition of land through purchase is the traditional mechanism for expanding the protected area network. However, it is not possible to meet protected area targets using acquisition alone – the cost would simply be too great.

In this mechanism, the land concerned remains in private hands with a formal contract between the landowner and a protected area agency. The landowner agrees to restrictions on use of the land and the protected area agency commits to various forms of management assistance. In the most secure cases, restrictions on use of the land are written into the title deed and thus remain in place if the land changes hands. The landowner of such a contractual protected area is eligible for exclusion from property rates in terms of the Municipal Property Rates Act (Act 6 of 2004).

Contract agreements in terms of the Protected Areas Act are the most secure of a series of options for agreements with landowners that form part of biodiversity stewardship programmes. The less secure options require fewer restrictions on the part of landowners and come with less ongoing management assistance from the protected area agency. They are also not recognised in terms of the Protected Areas Act and thus do not constitute formal protected areas. These informal conservation areas can be useful as 'entry-level' biodiversity stewardship agreements, and may lead over time to more secure contract agreements. Existing conservation areas can also provide a useful starting point for pursuing contract agreements, as long as they fall within important areas for protected area expansion.

Following on from the pioneering work of CapeNature, all provincial protected area agencies now have a functional biodiversity stewardship programme. The national biodiversity stewardship policy document is in an advanced stage of development and is intended for publication during this phase of implementation (see ***Chapter 8***). More detail on biodiversity stewardship is available in the *Biodiversity Stewardship Guideline Document*[44].

It is important to note that contract agreements can be used where land is under communal ownership. As discussed in ***Chapter 2***, the Richtersveld National Park, the Makuleke section of Kruger National Park and iSimangaliso Wetland Park provide good examples of community ownership of formal protected areas through contract agreements.

[44] DEA, 2009.

Several biodiversity stewardship agreements are in negotiation with communities in other parts of the country. There are significant potential synergies between land reform, contract agreements for protected areas, and biodiversity stewardship programmes.

Contract agreements involve formal contracts between landowners and protected area agencies, in which the landowner agrees to restrictions on the use of the land and the protected area agency commits to various forms of management assistance. Contract agreements are often much more cost effective than acquisition of land and are used increasingly as part of biodiversity stewardship programmes.

Contractual protected areas can involve substantial costs in the process of negotiating the contract, and require ongoing resources from the protected area agency to support the landowner in managing and auditing the management of the property concerned. Nevertheless, the overall cost of contractual protected areas tends to be substantially less than the cost of acquisition. Thus, so long as there is adequate budget to cover the actual costs of contractual protected areas, they remain an attractive mechanism for protected area expansion in many circumstances, especially where land prices are prohibitive.

Protected area agencies should develop a basket of incentives that can be offered to landowners in return for entering into contract agreements, over and above the existing exclusion from municipal property rates and the income tax incentives that support the establishment of contractual protected areas (see ***Chapter 7***).

Additional incentives that can be combined to suit landowner preferences include, for example, technical and professional planning and operations support, fire management services, assistance with clearing invasive alien plants, advice on sustainable harvesting of natural resources, partnerships in nature-based commercial ventures, access to marketing resources, access to expensive game, fencing supply, and enforcement support.

Declaration of public or state land

Declaration of public or state land involves reassigning the management of public or state land from a national or provincial government department to a protected area agency. Where land in priority areas for protected area expansion is held by the state (for example, the Department of Public Works, DAFF, South African National Defence Force) or by parastatal agencies (for example, ESKOM), this should be identified and where possible management of the land should be assigned to a protected area agency.

It is worth noting that this mechanism has limited usefulness as a very small proportion (approximately 4%) of land in the protected area expansion priority areas is held by the state. However, where it is possible to use this mechanism it may be very cost effective

7. Financing protected area expansion

Protected area institutions can draw on several sources of funding for, and adopt more cost-effective approaches to, the expansion of protected areas. All funding sources will have an important role to play, given the size of the task of achieving the ambitious protected area targets.

The following complementary financing mechanisms and implementation approaches should be considered: funding from the national treasury; income from the use of protected areas; private voluntary donations; official donor assistance; biodiversity stewardship and biodiversity offsets.

The business case for a national conservation trust fund, with protected area institutions as the principal beneficiaries, needs to be investigated. This conservation trust fund could, through the investment of its capital, generate more stable and predictable income flows to finance protected area expansion and management efforts.

The Biodiversity Finance Initiative (BIOFIN), currently being piloted in South Africa, is intended to develop a more comprehensive national resource mobilisation strategy for biodiversity conservation and mainstreaming efforts across the country, and to improve cost-effectiveness. The outcomes from the BIOFIN project will therefore be extremely relevant to the ongoing pursuit of sustainable financing strategies for protected area expansion.

The *Sustainable Financing Framework for Management Authorities of State Managed Protected Areas*[45] highlights that all protected area institutions cite inadequate funding as a significant constraint to their ability to meet their targets for management effectiveness and protected area expansion. With slowing economic growth, and the rising costs of servicing debt, the current levels of national and provincial budget allocations to protected area institutions from the national fiscus are not likely to increase significantly. There is a need to further develop and diversify the sources of income to finance the ongoing costs of protected area expansion, and to continually improve the ability of protected area institutions to more cost-effectively administer the growing protected area estate.

Protected area institutions can draw on several sources of funding for, and adopt more cost-effective approaches to, the expansion of protected areas – all of which will have an important role to play, given the size of the task of achieving the ambitious protected area targets.

Funding is a significant constraint to the ability of protected area agencies to meet their targets for management effectiveness and protected area expansion. There is a need to develop and diversify the sources of funding to finance the ongoing costs of protected area expansion.

[45] DEA, 2015b.

The following complementary financing mechanisms and implementation approaches should be considered:

Funding from the National Treasury: Core public sector funding mechanisms for protected area expansion may include budget allocations, conditional grants, Expanded Public Works Programme (EPWP) funds[46], and grants from the Green Fund[47]. In order to maintain and expand on current levels of funding from the national treasury, protected area institutions will need to demonstrate more effectively the social and economic benefits of public investments in protected area expansion.

Income from the use of protected areas: Increasing the income from direct access to, and use of resources in, protected areas – including tourism charges, resource use fees, payment for ecosystem services, and bio-prospecting charges – may better enable protected area institutions to cross-subsidise the activities associated with the ongoing expansion of the protected area estate.

Private voluntary donations: Private sources of funding – including business and philanthropic foundations, non-governmental organisations (NGOs), conservation trust funds and private individuals – are an increasingly important source of financing for protected area expansion. There is a growing trend of close collaboration and pooling of resources between protected area agencies, the private sector and NGOs. Notably, this often occurs when linked to the socio-economic development of rural communities living in and around protected areas.

Official donor assistance: While donor investments are typically short- to medium-term and catalytic in nature, bilateral and multilateral donor agencies may provide financial and technical support to land acquisition and contractual negotiations with private and communal landowners. The Global Environment Facility (GEF) and the Critical Ecosystem Partnership Fund (CEPF) are particularly important sources of funding that can be mobilised for supporting protected area expansion efforts.

Biodiversity stewardship (contractual agreements): Biodiversity stewardship programmes represent a cost-effective strategy for expanding the protected area estate while avoiding the need for land purchases.

In order to make biodiversity stewardship more effective, a number of incentives can be used to support landowners and communities entering into contractual agreements. These include:

- Fiscal incentives – economic incentives based on government revenue or expenditure[48]
- Technical and professional advice and support
- Management assistance and support
- Partnerships in nature-based commercial ventures
- Access to marketing resources
- Public recognition

Biodiversity offsets[49]: South Africa has already implemented a number of biodiversity offsets projects and the DEA, along with some

[46] Through the Natural Resource Management programmes and Environmental Protection and Infrastructure Programme. Some of this funding is likely to be restricted to initial implementation costs associated with protected area expansion (e.g. fencing and management infrastructure) rather than land costs.

[47] Funding from EPWP and the Green Fund may be used as an incentive for the negotiation of contractual agreements or as a source of government co-financing for donor funds.

[48] For example, recent amendments to the Taxation Laws (March 2015) specifically deal with tax incentives for landowners who have entered into a contractual agreement to declare their land as a protected area.

[49] Biodiversity offsets are intended to address the residual environmental impacts of development that cannot be avoided or effectively mitigated, with the intention of ensuring that the net impact of a project on the environment is an environmental benefit, or at least not a net loss. DEA, 2015a.

provinces, are in the process of developing guidelines for environmental offsets. Biodiversity offsets hold the potential to shift some of the burden for financing the expansion of protected areas from the national fiscus to the private sector.

Biodiversity offsets provide a mechanism to compensate for residual negative impacts on biodiversity after all feasible and reasonable alternatives have been considered during the planning of a proposed development. The biodiversity offset mechanism enables land that was not previously designated as a protected area to be declared and for the management costs to be secured.

Priority areas for protected area expansion should be the major receiving sites for offsets, rather than *ad hoc* and individually identified sites. Careful planning will be necessary to ensure that offsets are efficiently implemented, that they contribute optimally to protected area expansion and management, and do not place an undue burden on protected area agencies. A key issue is securing ongoing management costs.

National conservation trust fund: The business case for a national conservation trust fund, with protected area institutions as the principal beneficiaries, needs to be investigated as a means of centralising the function of attracting grants and donations from bilateral and multilateral development agencies and private donors. This conservation trust fund could generate, through the investment of its capital, stable and predictable income flows to finance protected area expansion and management programmes.

The Biodiversity Finance Initiative

The Biodiversity Finance Initiative (BIOFIN), managed by the United Nations Development Programme (UNDP), in partnership with the European Commission and the Governments of Germany and Switzerland, is in the process of being piloted in South Africa (amongst 29 other countries) under the auspices of the DEA. BIOFIN is intended to provide a comprehensive analysis of the funding gap for the local implementation of the CBD's Aichi biodiversity targets – including the expansion of protected areas – and should provide much needed perspective on this issue. BIOFIN also aims to develop a comprehensive national resource mobilisation strategy, and improve cost effectiveness through the mainstreaming of biodiversity into national development and sector planning. The outcomes from the BIOFIN project will therefore be extremely pertinent to the ongoing pursuit of sustainable financing strategies by protected area institutions.

8. Implementation of the NPAES

Protected area agencies, including provincial conservation authorities, SANParks, DAFF and DEA, are the primary implementers of the NPAES. Most of these agencies have developed their own PAES and implementation plans, which are increasingly better aligned with the NPAES targets and priority areas.

DEA (through Working Group 1 of MINMEC) will work to ensure better alignment of the efforts of the multiple agencies involved in protected area expansion, will provide a forum for discussing challenges and sharing lessons, and track progress towards meeting protected area targets.

A detailed 5-year action plan with annual implementation targets, derived from the provincial plans, has been developed and is presented in this chapter.

Who implements the NPAES?

Protected area agencies are the primary implementers of the NPAES. These include the provincial conservation authorities (agencies and government departments), SANParks, and the Oceans and Coasts Branch of DEA. The Department of Agriculture, Forestry and Fisheries (DAFF) manages protected areas under the National Forest Act rather than the Protected Areas Act. Thus, although forest reserves contribute to the national efforts to expand protected areas, they do not fall under the same reporting and accountability regimes. Protected area agencies are supported in their implementation of the NPAES by a range of organisations including DEA, the South African National Biodiversity Institute (SANBI), National Treasury, provincial environment departments and conservation NGOs.

Many protected area agencies have developed, and are implementing, their own agency-specific protected area expansion strategies (PAES).

Protected area agencies are the primary implementers of the NPAES. These include provincial conservation authorities (agencies and government departments), SANParks, DAFF and the Oceans and Coasts Branch of DEA.

The NPAES and these agency-specific PAESs need to be closely aligned to ensure that the national targets are met through the collective efforts of the individual protected area agencies.

With multiple agencies implementing protected area expansion, it is also necessary to ensure a level of co-ordination in monitoring and reporting on the implementation of the strategy. Working Group 1 of MINMEC, is convened by DEA with representation from protected area agencies, SANBI, and relevant national NGOs, and is ideally suited to play a key role in this respect.

This will ensure that there is alignment of the efforts of the multiple agencies involved in protected area expansion, will provide a forum for discussing challenges and sharing lessons, and track annual progress towards meeting protected area expansion targets.

Phased implementation of the NPAES

The NPAES presents a long-term, 20-year and 5-year strategy for the expansion of protected areas in South Africa. The quantification of the spatial targets for individual ecosystems, and the identification of the priority areas for meeting these long-term, 20-year and 5-year targets, are fully described in ***Chapter 4*** and ***Chapter 5*** respectively.

The implementation of the NPAES is guided by 5-year targets. The implementation of the 20-year strategy for protected area expansion is thus structured into four implementation phases.

Phase 1 of the implementation of the NPAES, – covering the period 2008 – 2014, has now been completed and a brief review of the progress made in protected area expansion is described in ***Chapter 3***.

Action plan for phase 2 of the NPAES implementation

The implementation plan presented here covers the second phase (2018 – 2022) of the 20-year strategy of the NPAES[50]. At the national level, the priority activities and targets required to "support and align the efforts of protected area agencies in the ongoing expansion of protected areas, and track progress towards meeting long-term protected area system targets" have been collated into a 5-year action plan. The action plan is presented in ***Table 11***.

While the NPAES sets national level targets, the action plan does not deal with the detailed planning and implementation for expanding protected areas at the provincial and local levels.

This level of planning and implementation is most appropriately done by the responsible protected area agencies, using the NPAES as an overarching framework to guide local actions. Each protected area institution should continue to update, align and implement their institution-based PAESs to ensure that they will collectively contribute to meeting the national short- and medium-term targets contained in the NPAES.

[50] This action plan was developed at a workshop convened by DEA and to which representatives of all protected area agencies were invited.

Table 11: Implementation plan for the NPAES 2018, detailing 5-year actions and indicators.

Department of Environmental Affairs National Protected Areas Expansion Strategy (NPAES) 2018 5-year action plan						
Purpose: Support and align the efforts of protected area agencies in the ongoing expansion of protected areas, and track progress towards meeting long-term protected area system targets						
1. Protected area expansion planning						
Priority action	Performance indicator	Medium-term targets				
		Year 1	Year 2	Year 3	Year 4	Year 5
1.1 Facilitate the preparation, revision and alignment (strategic, spatial and phasing) of the protected area institution-based[51] protected area expansion strategies (PAES)	1.1.1 Number of approved institution-based protected area expansion strategies (of 12)	8	11	11	11	11
	1.1.2 Number of institution-based protected area expansion strategies that are fully aligned with the NPAES (of 12)	1	6	10	11	11

[51] Comprising 12 protected area agencies: SANParks; DAFF, DEA Oceans and Coasts Branch and 9 provincial Departments of Environmental Affairs (including Eastern Cape Parks Board, CapeNature, Ezemvelo-KZN Wildlife, North West Parks and Tourism Board and Mpumalanga Parks Board).

2. Implementation of the NPAES and institution-based PAES's						
Priority action	Performance indicator	Medium-term targets				
		Year 1	Year 2	Year 3	Year 4	Year 5
2.1 Formally declare new, or extend existing, protected areas as a means of improving the representation of terrestrial and marine ecosystem types	2.2.1 Extent (ha) of additional protected areas (by province) declared in the terrestrial 'spatial priority areas for protected area expansion':					
	Eastern Cape	15 000ha	25 013ha (13ha)[52]	10 000ha	20 597ha (597ha)	20 000ha (750ha)
	Free State	8 500ha	8 500ha	8 500ha	8 500ha	8 500ha
	Gauteng	0ha	0ha	5ha	0ha	0ha
	KwaZulu-Natal	18 870ha	18 870ha	18 870ha	0ha	18 870ha
	Limpopo	25 000ha (1 367ha)	25 000ha (4 110ha)	25 000ha	30 000ha	25 000ha
	Mpumalanga	20 000ha	22 000ha	25 000ha	25 000ha	28 000ha
	Northern Cape	63 415ha (3 791ha)	55 807ha	21 441ha (4 341ha)	27 000ha (3 000ha)	20 000ha (2 000ha)
	North West	10 000ha	10 000ha	10 000ha	20 000ha	20 000ha
	Western Cape	8 000ha	7 000ha	8 181ha (2 181ha)	7 053ha (2 053ha)	5 000ha
	Annual Total	**168 785ha**	**172 190ha**	**126 997ha**	**138 150ha**	**145 370ha**
	2.1.2 Extent (ha) of additional marine waters declared as marine protected areas[53]	0ha	0ha	0ha	193 317ha	5 359 415ha

[52] The portion of the protected areas expansion target within each province that is to be declared by SANParks or DAFF is shown in brackets.

[53] For the purposes of the action plan, *marine waters* means waters that *form part of the internal waters, territorial waters and the exclusive economic zone of the Republic of South Africa, respectively (refer to sections 3, 4 and 7 of the Maritime Zones Act)*. The proclamation and administration of marine protected areas fall under the mandate of the Oceans and Coast Branch of DEA.

2.2 Maintain a small core national team of professional staff to support, and build capacity in, under-resourced protected area institutions (in implementing the NPAES and institution-based PAES's)	2.2.1 Number of administrative, technical and professional staff available to support protected area institutions	8	8	8	8	8
2.3 Finalise and publish the National Biodiversity Stewardship Policy in order to provide guidance on its adoption by protected area institutions as a key mechanism for protected area expansion	2.3.1 Publishing of the National Biodiversity Stewardship Policy	Final draft of National Biodiversity Stewardship Policy	National Biodiversity Stewardship Policy published	-	-	-
2.4 Establish and administer a Conservation Trust Fund[54], or implement alternative financing mechanisms, in order to co-ordinate income from donations, grants and/or other sources of income (e.g. biodiversity offsets, mitigation credits, etc.) in support of the implementation of the national and institution-based protected area expansion strategies.	2.4.1 Annual income and expenditure of Conservation Trust Fund (or alternative financing mechanism/s)	Conservation Trust concept developed and agreed by stakeholders Income: 0	Registration of Conservation Trust: Income: 0	Organisational structure of Conservation Trust established Income: 0	Fund-raising started Income: R1-3 million Expenditure: up to R1 million	Income: R3-10 million Expenditure: >R1-5 million
		Conservation Trust concept developed, but not agreed by stakeholders	Review of alternative financing mechanisms	Implement alternative financing mechanism/s Income: 0	Implement alternative financing mechanism/s Income: R1-3 million Expenditure: up to R1 million	Implement alternative financing mechanism/s Income: R3-5 million Expenditure: >R1-2 million

[54] While the Conservation Trust Fund may, in future, include support for the costs of acquisition of land or land use rights, the priority of the fund would be to supplement the operating costs associated with the protected area expansion efforts of protected area institutions.

3. Co-operation and co-ordination in protected area expansion						
Priority action	Performance indicator	Medium-term targets				
		Year 1	Year 2	Year 3	Year 4	Year 5
3.1 Facilitate the co-ordination of, and co-operation between, protected area institutions in the implementation of the NPAES and institution-based PAESs.	3.1.1 Number of Protected Area Technical Task Team meetings (per annum)	2	2	2	2	2
4. Performance monitoring and reporting						
Priority action	Performance indicator	Medium-term targets				
		Year 1	Year 2	Year 3	Year 4	Year 5
4.1 Maintain and update the integrated protected area database	4.1.1 Confidence level in how reliable (number of months since complete update) the integrated protected area database is	6 months	3 months	3 months	3 months	3 months
4.2 Annually review and revise the short-term national and provincial targets for contributing to meeting the milestones under Presidential Outcome 10, Outputs 4.1.1 and 4.1.2[55]	4.2.1 Level of alignment of the annual national and provincial targets with the targets in Priority Action 2.1 of this Action Plan	Partially aligned	Fully aligned	Fully aligned	Fully aligned	Fully aligned
4.3 Annually report on the progress in the implementation of protected area institution-based PAESs	4.3.1 Number of Strategic Plans (SPs) and Annual Operational Plans (AOPs) - of the 12 protected area institutions - including explicit performance targets for protected area expansion	7	9	12	12	12
4.4 Review and update the National Protected Area Expansion Strategy	4.4.1 Progress in reviewing and updating the NPAES	-	-	-	-	Performance review of NPAES (Phase 2) First draft of updated NPAES (Phase 3)

[55] Refer to the Delivery Agreement for Presidential Outcome 10

9. Information gaps, research priorities and legislative reform priorities

Key information gaps for the NPAES include the ongoing development of an accurate spatial layer of existing protected areas and a national spatial data layer on land ownership and tenure. This chapter details a number of research priorities that would help to fill information gaps. Research priorities include further exploration of the role of protected areas in supporting ecosystem-based adaptation to climate change. Ecologically meaningful biodiversity targets for aquatic ecosystems need to be developed. Exploration of innovative ways to consider land price and opportunity costs in the identification of priority areas for protected area expansion are needed, as well as investigation of the likely costs of different mechanisms for protected area expansion into the future. Also useful would be additional research into the relative income and job creation potential of regular agriculture compared with protected areas and ecotourism. Finally, pilot projects are needed to evaluate the ways in which biodiversity stewardship agreements can used to support land reform and rural development.

Several information gaps, research needs and legislative reform priorities were adequately addressed during the implementation of phase 1 of the NPAES.

Outstanding information gaps that need to be addressed include:

- Continual updating and improving spatial information on the distribution of protected areas in the Protected Area Register. This includes verifying protected area boundaries, their proclamation status and management effectiveness. In particular, the privately owned protected areas included in the Protected Area Register but declared under pre-Protected Area Act legislation need to be verified.
- The potential inclusion of areas protected by 'other effective area-based measures' should be evaluated and potentially included in the assessment of target achievement. Robust criteria need to be set up to ensure that only intact, well-managed areas with long-term security of biodiversity are included.
- New biodiversity data is routinely being collected but does not always find its way into the planning data sets. More streamlined mechanisms for the inclusion of new biodiversity distribution data into the planning data sets are required.
- Mapping and classification of specific marine ecosystems at a finer scale is necessary, especially for vulnerable marine habitats e.g. reefs, sponge beds and kelp forests.
- Mapping marine ecological processes, for example spawning and nursery grounds and foraging areas for marine species.
- The identification of remaining focus areas (after implementation of Phase 1 of Operation Phakisa) required to meet marine targets is a priority.
- The specific biodiversity offset receiving areas which will optimally contribute to protected area expansion need to be identified and agreed on.
- Outstanding research priorities that still need to be addressed include:
- Further exploration of the role of protected areas in supporting ecosystem-based adaptation to climate change.
- Research on ecologically meaningful biodiversity targets for marine, estuarine and freshwater ecosystems.
- Innovative ways to consider land price and opportunity costs in the identification of priority areas for protected area expansion.
- Strategic use of biodiversity offsets to expand the protected area network and secure its ongoing management costs needs to be investigated.

Outstanding legislative reform priorities include:

- A need to properly secure the legal status and management of mountain catchment

areas. These were declared in terms of the Mountain Catchment Areas Act, which was forestry legislation at that stage falling under the DEA. There is no consensus on the administration of the Mountain Catchment Areas Act and the responsible regulating authority for mountain catchment areas. This is an important matter to resolve given the significant contribution that mountain catchment areas make to protected area targets and the vital role they play in providing ecosystem services.

- A need to explore legal and institutional mechanisms for implementing freshwater conservation areas. This will include potential links between the Biodiversity Act and mechanisms provided by the National Water Act (Act 36 of 1998), the National Water Resource Strategy and the National Water Resource Classification System.

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Appendix 1: Protection targets for ecosystems

Table A 1: All South African ecosystems, showing their biozones, original area, long-term protection targets (% and km²), current area protected (total area in protected areas (PAs) and intact area in protected areas), and current protection levels (based on full area included in protected areas and actual intact area protected). NP=Not Protected, PP = Poorly Protected, MP= Moderately Protected, WP= Well Protected. See Chapter 4 for category explanations.

Ecosystem number	Ecosystem name	Biozone	Area (km²)	Long-term target (%)	Long-term target (km²)	20-year target (km²)	Area in PA (km²)	Intact Area in PA (km²)	Protection level	Protection level (Intact)
1	Agulhas Boulder Shore	Coast types	18.5	20	3.7	2.9	5.5	5.5	WP	WP
2	Agulhas Canyon	Offshore Benthic	1119.6	20	223.9	112.0	0.0	0.0	NP	NP
3	Agulhas Dissipative-Intermediate Sandy Coast	Coast types	180.7	20	36.1	28.4	22.8	22.8	MP	MP
4	Agulhas Dissipative Sandy Coast	Coast types	63.2	20	12.6	9.9	14.6	14.6	WP	WP
5	Agulhas Estuarine Shore	Coast types	16.5	20	3.3	2.6	2.9	2.9	MP	MP
6	Agulhas Exposed Rocky Coast	Coast types	116.9	20	23.4	18.4	32.2	29.4	WP	WP
7	Agulhas Gravel Inner Shelf	Offshore Benthic	1323.9	20	264.8	132.4	58.6	58.6	PP	PP
8	Agulhas Gravel Outer Shelf	Offshore Benthic	1483.7	20	296.7	148.4	7.9	7.9	NP	NP
9	Agulhas Gravel Shelf Edge	Offshore Benthic	1787.4	20	357.5	178.7	0.0	0.0	NP	NP
10	Agulhas Hard Inner Shelf	Offshore Benthic	4309.5	20	861.9	431.0	120.4	116.7	PP	PP
11	Agulhas Hard Outer Shelf	Offshore Benthic	11581.5	20	2316.3	1158.2	0.0	0.0	NP	NP
12	Agulhas Hard Shelf Edge	Offshore Benthic	4177.0	20	835.4	417.7	0.0	0.0	NP	NP
13	Agulhas Inner Shelf Reef	Offshore Benthic	44.4	20	8.9	4.4	0.9	0.1	PP	NP
14	Agulhas Inshore Gravel	Inshore	46.5	20	9.3	4.6	9.2	9.2	MP	MP
15	Agulhas Inshore Hard Grounds	Inshore	757.0	20	151.4	75.7	123.6	119.2	MP	MP
16	Agulhas Inshore Reef	Inshore	43.2	20	8.6	4.3	14.6	5.9	WP	MP
17	Agulhas Intermediate Sandy Coast	Coast types	37.6	20	7.5	5.9	4.6	4.6	MP	MP
18	Agulhas Island	Island	869.8	20	174.0	136.8	84.2	73.0	PP	PP
19	Agulhas Mixed Sediment Inner Shelf	Offshore Benthic	628.5	20	125.7	62.9	0.0	0.0	NP	NP
20	Agulhas Mixed Sediment Outer Shelf	Offshore Benthic	1308.3	20	261.7	130.8	0.0	0.0	NP	NP
21	Agulhas Mixed Shore	Coast types	264.8	20	53.0	41.6	48.9	45.9	MP	MP
22	Agulhas Muddy Inner Shelf	Offshore Benthic	2698.6	20	539.7	269.9	0.0	0.0	NP	NP
23	Agulhas Muddy Outer Shelf	Offshore Benthic	1785.0	20	357.0	178.5	0.0	0.0	NP	NP
24	Agulhas Muddy Shelf Edge	Offshore Benthic	171.0	20	34.2	17.1	0.0	0.0	NP	NP
25	Agulhas Outer Shelf Reef	Offshore Benthic	6.5	20	1.3	0.7	0.0	0.0	NP	NP

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26	Agulhas Reflective Sandy Coast	Coast types	1.3	20	0.3	0.2	0.3	0.3	MP	MP
27	Agulhas Sandy Inner Shelf	Offshore Benthic	26280.9	20	5256.2	2628.1	657.3	558.1	PP	PP
28	Agulhas Sandy Inshore	Inshore	1714.8	20	343.0	171.5	308.5	205.7	MP	MP
29	Agulhas Sandy Outer Shelf	Offshore Benthic	32998.5	20	6599.7	3299.8	0.0	0.0	NP	NP
30	Agulhas Sandy Shelf Edge	Offshore Benthic	4073.5	20	814.7	407.4	0.0	0.0	NP	NP
31	Agulhas Shelf Edge Reef	Offshore Benthic	4.0	20	0.8	0.4	0.0	0.0	NP	NP
32	Agulhas Sheltered Rocky Coast	Coast types	16.5	20	3.3	2.6	2.1	2.1	MP	MP
33	Agulhas Very Exposed Rocky Coast	Coast types	18.5	20	3.7	2.9	2.3	2.2	MP	MP
34	Delagoa Sandy Shelf Edge	Offshore Benthic	646.0	20	129.2	64.6	189.8	189.8	WP	WP
35	Delagoa Canyon	Offshore Benthic	93.1	20	18.6	9.3	50.5	50.5	WP	WP
36	Delagoa Inshore Reef	Inshore	71.5	20	14.3	7.2	71.5	71.5	WP	WP
37	Delagoa Mixed Shore	Coast types	22.5	20	4.5	3.5	22.5	22.5	WP	WP
38	Delagoa Sandy Inshore	Inshore	105.1	20	21.0	10.5	105.1	105.1	WP	WP
39	Delagoa Sandy Shelf	Offshore Benthic	293.0	20	58.6	29.3	281.1	281.1	WP	WP
40	Delagoa Shelf Edge Reef	Offshore Benthic	2.6	20	0.5	0.3	1.1	1.1	WP	WP
41	Delagoa Shelf Reef	Offshore Benthic	75.5	20	15.1	7.6	75.5	75.5	WP	WP
42	Delagoa Very Exposed Rocky Coast	Coast types	0.1	20	0.0	0.0	0.1	0.1	WP	WP
43	Harbour	Harbour	14.7	0	0.0	0.0	0.2	0.2		
44	Natal-Delagoa Dissipative-Intermediate Sandy Coast	Coast types	86.7	20	17.3	13.6	21.7	21.7	WP	WP
45	Natal-Delagoa Dissipative Sandy Coast	Coast types	1.2	20	0.2	0.2	0.4	0.4	WP	WP
46	Natal-Delagoa Estuarine Shore	Coast types	13.1	20	2.6	2.1	2.3	2.3	MP	MP
47	Natal-Delagoa Intermediate Sandy Coast	Coast types	111.9	20	22.4	17.6	15.5	15.5	MP	MP
48	Natal-Delagoa Reflective Sandy Coast	Coast types	26.0	20	5.2	4.1	1.7	1.7	PP	PP
49	Natal Boulder Shore	Coast types	0.9	20	0.2	0.1	0.0	0.0	NP	NP
50	Natal Canyon	Offshore Benthic	484.6	20	96.9	48.5	66.3	66.3	MP	MP
51	Natal Estuarine Shore	Coast types	0.2	20	0.0	0.0	0.2	0.2	WP	WP
52	Natal Exposed Rocky Coast	Coast types	29.5	20	5.9	4.6	9.8	9.5	WP	WP
53	Natal Gravel Shelf	Offshore Benthic	1099.0	20	219.8	109.9	194.7	194.7	MP	MP
54	Natal Gravel Shelf Edge	Offshore Benthic	774.6	20	154.9	77.5	127.0	127.0	MP	MP
55	Natal Inshore Gravel	Inshore	0.2	20	0.0	0.0	0.0	0.0	NP	NP

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56	Natal Inshore Reef	Inshore	246.0	20	49.2	24.6	64.6	46.0	WP	MP
57	Natal Mixed Sediment Shelf	Offshore Benthic	1.8	20	0.4	0.2	1.8	1.8	WP	WP
58	Natal Mixed Sediment Shelf Edge	Offshore Benthic	29.2	20	5.8	2.9	29.2	29.2	WP	WP
59	Natal Mixed Shore	Coast types	67.5	20	13.5	10.6	11.9	10.9	MP	MP
60	Natal Muddy Inshore	Inshore	53.2	20	10.6	5.3	14.5	14.5	WP	WP
61	Natal Muddy Shelf	Offshore Benthic	503.6	20	100.7	50.4	90.9	90.9	MP	MP
62	Natal Muddy Shelf Edge	Offshore Benthic	61.8	20	12.4	6.2	40.2	40.2	WP	WP
63	Natal Sandy Inshore	Inshore	1241.1	20	248.2	124.1	136.1	100.5	MP	PP
64	Natal Sandy Shelf	Offshore Benthic	6370.7	20	1274.1	637.1	408.4	398.7	PP	PP
65	Natal Sandy Shelf Edge	Offshore Benthic	2422.7	20	484.5	242.3	33.4	33.4	PP	PP
66	Natal Shelf Edge Reef	Offshore Benthic	17.6	20	3.5	1.8	0.0	0.0	NP	NP
67	Natal Shelf Reef	Offshore Benthic	524.5	20	104.9	52.5	79.9	71.5	MP	MP
68	Natal Very Exposed Rocky Coast	Coast types	2.0	20	0.4	0.3	0.3	0.2	MP	MP
69	South Atlantic Abyss	Offshore Benthic	67817.6	20	13563.5	6781.8	0.0	0.0	NP	NP
70	South Atlantic Abyss With Ferro-Manganese Deposits	Offshore Benthic	77810.4	20	15562.1	7781.0	0.0	0.0	NP	NP
71	South Atlantic Lower Bathyal	Offshore Benthic	90341.7	20	18068.3	9034.2	0.0	0.0	NP	NP
72	South Atlantic Upper Bathyal	Offshore Benthic	38065.8	20	7613.2	3806.6	0.0	0.0	NP	NP
73	Southeast Atlantic Seamounts	Offshore Benthic	1602.3	20	320.5	160.2	0.0	0.0	NP	NP
74	Southern Benguela Boulder Shore	Coast types	11.4	20	2.3	1.8	4.1	2.9	WP	WP
75	Southern Benguela Canyon	Offshore Benthic	799.7	20	159.9	80.0	0.0	0.0	NP	NP
76	Southern Benguela Carbonate Mound	Offshore Benthic	1489.1	20	297.8	148.9	0.0	0.0	NP	NP
77	Southern Benguela Dissipative-Intermediate Sandy Coast	Coast types	69.5	20	13.9	10.9	15.9	15.9	WP	WP
78	Southern Benguela Dissipative Sandy Coast	Coast types	40.8	20	8.2	6.4	11.5	11.5	WP	WP
79	Southern Benguela Estuarine Shore	Coast types	3.0	20	0.6	0.5	0.4	0.4	MP	MP
80	Southern Benguela Exposed Rocky Coast	Coast types	110.0	20	22.0	17.3	13.2	12.3	MP	MP
81	Southern Benguela Gravel Outer Shelf	Offshore Benthic	436.4	20	87.3	43.6	0.0	0.0	NP	NP
82	Southern Benguela Gravel Shelf Edge	Offshore Benthic	30.1	20	6.0	3.0	0.0	0.0	NP	NP
83	Southern Benguela Hard Inner Shelf	Inner Shelf	670.6	20	134.1	67.1	59.0	45.0	PP	PP
84	Southern Benguela Hard Middle Shelf	Offshore Benthic	3667.5	20	733.5	366.8	133.7	4.1	PP	NP
85	Southern Benguela Hard Outer Shelf	Offshore Benthic	10813.4	20	2162.7	1081.3	48.7	0.0	NP	NP

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86	Southern Benguela Hard Shelf Edge	Offshore Benthic	4615.3	20	923.1	461.5	0.0	0.0	NP	NP
87	Southern Benguela Inner Shelf Reef	Inner Shelf	10.2	20	2.0	1.0	5.3	1.1	WP	MP
88	Southern Benguela Intermediate Sandy Coast	Coast types	68.8	20	13.8	10.8	0.5	0.5	NP	NP
89	Southern Benguela Island	Island	1333.8	20	266.8	209.8	93.4	44.4	PP	PP
90	Southern Benguela Lagoon	Lagoon	54.4	20	10.9	8.6	6.0	5.9	MP	MP
91	Southern Benguela Mixed Coast	Coast types	164.7	20	32.9	25.9	12.6	12.5	PP	PP
92	Southern Benguela Muddy Inner Shelf	Inner Shelf	291.0	20	58.2	29.1	2.2	2.2	NP	NP
93	Southern Benguela Muddy Organically Enriched Middle Shelf	Offshore Benthic	10332.7	20	2066.5	1033.3	0.0	0.0	NP	NP
94	Southern Benguela Muddy Outer Shelf	Offshore Benthic	6134.6	20	1226.9	613.5	0.0	0.0	NP	NP
95	Southern Benguela Muddy Riverine-Influenced Middle Shelf	Offshore Benthic	932.4	20	186.5	93.2	0.0	0.0	NP	NP
96	Southern Benguela Muddy Shelf Edge	Offshore Benthic	579.6	20	115.9	58.0	0.0	0.0	NP	NP
97	Southern Benguela Outer Shelf Reef	Offshore Benthic	1.6	20	0.3	0.2	0.0	0.0	NP	NP
98	Southern Benguela Reflective Sandy Coast	Coast types	29.6	20	5.9	4.7	0.1	0.1	NP	NP
99	Southern Benguela Sandy Inner Shelf	Inner Shelf	1891.1	20	378.2	189.1	172.8	124.3	PP	PP
100	Southern Benguela Sandy Middle Shelf	Offshore Benthic	6318.0	20	1263.6	631.8	222.9	166.3	PP	PP
101	Southern Benguela Sandy Outer Shelf	Offshore Benthic	57443.4	20	11488.7	5744.3	15.2	15.2	NP	NP
102	Southern Benguela Sandy Shelf Edge	Offshore Benthic	13542.2	20	2708.4	1354.2	0.0	0.0	NP	NP
103	Southern Benguela Sheltered Rocky Coast	Coast types	6.0	20	1.2	0.9	0.2	0.2	PP	PP
104	Southern Benguela Very exposed Rocky Coast	Coast types	8.7	20	1.7	1.4	1.1	1.1	MP	MP
105	Southwest Indian Abyss	Offshore Benthic	248718.9	20	49743.8	24871.9	0.0	0.0	NP	NP
106	Southwest Indian Abyss With Ferro-Manganese Deposits	Offshore Benthic	3416.5	20	683.3	341.7	0.0	0.0	NP	NP
107	Southwest Indian Lower Bathyal	Offshore Benthic	218001.3	20	43600.3	21800.1	0.0	0.0	NP	NP
108	Southwest Indian Lower Bathyal With Ferro-Manganese Deposits	Offshore Benthic	6902.1	20	1380.4	690.2	0.0	0.0	NP	NP
109	Southwest Indian Seamounts	Offshore Benthic	3724.9	20	745.0	372.5	0.0	0.0	NP	NP
110	Southwest Indian Upper Bathyal	Offshore Benthic	82678.1	20	16535.6	8267.8	176.3	176.3	NP	NP
112	Aggeneys Gravel Vygieveld	Succulent Karoo	62.1	18	11.2	8.8	0.0	0.0	NP	NP
113	Agter-Sederberg Shrubland	Succulent Karoo	932.3	19	177.1	139.3	22.8	22.8	PP	PP
114	Agulhas Limestone Fynbos	Fynbos	269.9	32	86.4	67.9	27.8	27.4	PP	PP
115	Agulhas Sand Fynbos	Fynbos	105.7	32	33.8	26.6	15.3	14.5	PP	PP

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116	Albany Alluvial Vegetation	Azonal Vegetation	488.2	31	151.4	119.0	35.5	27.2	PP	PP
117	Albany Broken Veld	Nama-Karoo	1599.8	16	256.0	201.3	114.1	113.5	PP	PP
118	Albany Coastal Belt	Albany Thicket	3202.9	19	608.5	478.5	50.3	40.7	PP	PP
119	Albany Dune Strandveld	Azonal Vegetation	165.2	20	33.0	26.0	55.3	54.1	WP	WP
120	Albertinia Sand Fynbos	Fynbos	698.9	32	223.6	175.9	37.4	35.3	PP	PP
121	Alexander Bay Coastal Duneveld	Desert	16.1	28	4.5	3.5	0.0	0.0	NP	NP
122	Algoa Dune Strandveld	Azonal Vegetation	276.9	20	55.4	43.5	19.4	18.8	PP	PP
123	Algoa Sandstone Fynbos	Fynbos	335.1	23	77.1	60.6	5.8	5.0	PP	PP
124	Aliwal North Dry Grassland	Grassland	6980.2	24	1675.2	1317.2	77.5	58.0	NP	NP
125	Amathole Mistbelt Grassland	Grassland	156.6	27	42.3	33.2	0.0	0.0	NP	NP
126	Amathole Montane Grassland	Grassland	4344.0	27	1172.9	922.2	116.6	113.3	PP	PP
127	Amersfoort Highveld Clay Grassland	Grassland	3794.9	27	1024.6	805.7	72.7	54.1	PP	PP
128	Andesite Mountain Bushveld	Savanna	1965.1	24	471.6	370.8	311.5	298.0	MP	MP
129	Anenous Plateau Shrubland	Succulent Karoo	237.0	28	66.4	52.2	0.0	0.0	NP	NP
130	Arid Estuarine Salt Marshes	Azonal Vegetation	4.3	24	1.0	0.8	0.5	0.5	PP	PP
131	Atlantis Sand Fynbos	Fynbos	691.9	30	207.6	163.2	15.4	15.4	PP	PP
132	Auob Duneveld	Savanna	2907.0	16	465.1	365.7	1695.2	1695.2	WP	WP
133	Barberton Montane Grassland	Grassland	1103.9	27	298.1	234.4	416.4	405.3	WP	WP
134	Barberton Serpentine Sourveld	Savanna	108.2	24	26.0	20.4	26.7	26.1	WP	WP
135	Basotho Montane Shrubland	Grassland	1763.3	28	493.7	388.2	166.5	162.3	PP	PP
136	Baviaanskloof Shale Renosterveld	Fynbos	118.8	29	34.5	27.1	75.1	75.1	WP	WP
137	Bedford Dry Grassland	Grassland	2025.2	23	465.8	366.3	0.0	0.0	NP	NP
138	Besemkaree Koppies Shrubland	Grassland	9557.9	28	2676.2	2104.3	612.9	506.5	PP	PP
139	Bhisho Thornveld	Savanna	7865.7	25	1966.4	1546.2	10.8	10.7	NP	NP
140	Bloemfontein Dry Grassland	Grassland	4849.7	24	1163.9	915.2	149.3	80.3	PP	PP
141	Bloemfontein Karroid Shrubland	Grassland	94.2	28	26.4	20.7	13.5	13.1	MP	PP
142	Blombos Strandveld	Fynbos	58.8	36	21.2	16.6	12.8	12.7	MP	MP
143	Blouputs Karroid Thornveld	Nama-Karoo	611.6	21	128.4	101.0	160.8	160.8	WP	WP
144	Bokkeveld Sandstone Fynbos	Fynbos	957.5	29	277.7	218.3	76.4	75.8	PP	PP
145	Boland Granite Fynbos	Fynbos	516.5	30	155.0	121.8	186.6	172.9	WP	WP
146	Breede Alluvium Fynbos	Fynbos	414.1	30	124.2	97.7	11.5	10.6	PP	PP

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147	Breede Alluvium Renosterveld	Fynbos	421.6	27	113.8	89.5	4.4	4.3	NP	NP
148	Breede Quartzite Fynbos	Fynbos	97.2	30	29.2	22.9	0.1	0.1	NP	NP
149	Breede Sand Fynbos	Fynbos	93.3	30	28.0	22.0	2.2	1.6	PP	PP
150	Breede Shale Fynbos	Fynbos	305.7	30	91.7	72.1	93.2	92.5	WP	WP
151	Breede Shale Renosterveld	Fynbos	1032.0	27	278.6	219.1	61.5	60.4	PP	PP
152	Buffels Thicket	Albany Thicket	1064.0	19	202.2	159.0	11.1	7.2	PP	NP
153	Bushmanland Arid Grassland	Nama-Karoo	45450.7	21	9544.7	7504.9	190.3	190.3	NP	NP
154	Bushmanland Basin Shrubland	Nama-Karoo	34169.4	21	7175.6	5642.1	0.0	0.0	NP	NP
155	Bushmanland Inselberg Shrubland	Succulent Karoo	645.5	34	219.5	172.6	0.0	0.0	NP	NP
156	Bushmanland Sandy Grassland	Nama-Karoo	2301.7	21	483.4	380.1	0.0	0.0	NP	NP
157	Bushmanland Vloere	Azonal Vegetation	1132.1	24	271.7	213.6	0.0	0.0	NP	NP
158	Camdebo Escarpment Thicket	Albany Thicket	1961.8	19	372.7	293.1	125.5	120.4	PP	PP
159	Canca Limestone Fynbos	Fynbos	1113.6	32	356.3	280.2	1.4	1.3	NP	NP
160	Cape Coastal Lagoons	Wetlands	0.4	24	0.1	0.1	0.0	0.0	PP	PP
161	Cape Estuarine Salt Marshes	Azonal Vegetation	6.9	24	1.7	1.3	0.6	0.5	PP	PP
162	Cape Flats Dune Strandveld	Fynbos	385.7	24	92.6	72.8	32.6	25.3	PP	PP
163	Cape Flats Sand Fynbos	Fynbos	554.9	30	166.5	130.9	1.2	0.8	NP	NP
164	Cape Inland Salt Pans	Azonal Vegetation	24.5	24	5.9	4.6	0.2	0.2	NP	NP
165	Cape Lowland Alluvial Vegetation	Azonal Vegetation	221.1	31	68.6	53.9	3.4	2.1	NP	NP
166	Cape Lowland Freshwater Wetlands	Azonal Vegetation	48.2	24	11.6	9.1	0.6	0.4	PP	NP
167	Cape Seashore Vegetation	Azonal Vegetation	226.0	20	45.2	35.5	128.3	126.7	WP	WP
168	Cape Vernal Pools	Azonal Vegetation	0.0	24	0.0	0.0	0.0	0.0	NP	NP
169	Cape Winelands Shale Fynbos	Fynbos	84.4	30	25.3	19.9	35.4	30.9	WP	WP
170	Carletonville Dolomite Grassland	Grassland	9011.0	24	2162.6	1700.5	575.9	539.8	PP	PP
171	Cathedral Mopane Bushveld	Savanna	273.6	19	52.0	40.9	273.6	273.5	WP	WP
172	Cederberg Sandstone Fynbos	Fynbos	2515.4	29	729.5	573.6	1411.7	1410.1	WP	WP
173	Central Coastal Shale Band Vegetation	Fynbos	64.3	27	17.4	13.6	42.9	42.6	WP	WP
174	Central Free State Grassland	Grassland	15566.5	24	3736.0	2937.5	463.6	355.7	PP	PP
175	Central Inland Shale Band Vegetation	Fynbos	97.7	27	26.4	20.7	88.7	88.7	WP	WP
176	Central Knersvlakte Vygieveld	Succulent Karoo	277.6	28	77.7	61.1	82.8	82.8	WP	WP
177	Central Mountain Shale Renosterveld	Fynbos	1235.8	27	333.7	262.4	0.0	0.0	NP	NP

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178	Central Richtersveld Mountain Shrubland	Succulent Karoo	1211.3	28	339.2	266.7	865.4	865.3	WP	WP
179	Central Ruens Shale Renosterveld	Fynbos	1864.7	27	503.5	395.9	3.1	1.4	NP	NP
180	Central Sandy Bushveld	Savanna	16927.4	19	3216.2	2528.9	1138.9	1046.1	PP	PP
181	Ceres Shale Renosterveld	Fynbos	484.6	27	130.8	102.9	4.4	4.0	NP	NP
182	Citrusdal Shale Renosterveld	Fynbos	36.6	28	10.2	8.1	0.0	0.0	NP	NP
183	Citrusdal Vygieveld	Succulent Karoo	146.6	28	41.1	32.3	4.4	4.3	PP	PP
184	Coega Bontveld	Albany Thicket	245.5	19	46.7	36.7	41.0	33.6	MP	MP
185	Crocodile Gorge Mountain Bushveld	Savanna	540.4	24	129.7	102.0	104.1	95.6	MP	MP
186	De Hoop Limestone Fynbos	Fynbos	663.1	32	212.2	166.9	193.2	193.2	MP	MP
187	Delagoa Lowveld	Savanna	773.2	19	146.9	115.5	479.2	478.9	WP	WP
188	Die Plate Succulent Shrubland	Succulent Karoo	128.7	28	36.0	28.3	0.0	0.0	NP	NP
189	Doringrivier Quartzite Karoo	Succulent Karoo	529.0	19	100.5	79.0	0.3	0.3	NP	NP
190	Drakensberg-Amathole Afromontane Fynbos	Grassland	17.3	27	4.7	3.7	13.3	13.3	WP	WP
191	Drakensberg Afroalpine Heathland	Grassland	78.3	27	21.1	16.6	54.7	54.7	WP	WP
192	Drakensberg Foothill Moist Grassland	Grassland	10638.3	23	2446.8	1923.9	305.2	284.4	PP	PP
193	Drakensberg Wetlands	Azonal Vegetation	16.8	24	4.0	3.2	8.0	7.6	WP	WP
194	Dry Coast Hinterland Grassland	Grassland	2934.6	25	733.6	576.9	19.6	19.6	NP	NP
195	Dwaalboom Thornveld	Savanna	9501.4	19	1805.3	1419.5	1488.7	1397.7	MP	MP
196	Dwarsberg-Swartruggens Mountain Bushveld	Savanna	2617.4	24	628.2	493.9	34.2	32.7	PP	PP
197	East Griqualand Grassland	Grassland	8246.2	23	1896.6	1491.3	63.0	61.1	NP	NP
198	Eastern Cape Escarpment Thicket	Albany Thicket	1277.6	19	242.7	190.9	51.3	50.6	PP	PP
199	Eastern Coastal Shale Band Vegetation	Fynbos	75.9	27	20.5	16.1	10.0	7.9	PP	PP
200	Eastern Free State Clay Grassland	Grassland	13663.4	24	3279.2	2578.4	255.9	148.3	PP	NP
201	Eastern Free State Sandy Grassland	Grassland	11012.3	24	2643.0	2078.1	455.6	336.6	PP	PP
202	Eastern Gariep Plains Desert	Desert	1586.8	34	539.5	424.2	0.0	0.0	NP	NP
203	Eastern Gariep Rocky Desert	Desert	2584.2	34	878.6	690.9	0.0	0.0	NP	NP
204	Eastern Highveld Grassland	Grassland	12483.4	24	2996.0	2355.7	674.4	481.8	PP	PP
205	Eastern Inland Shale Band Vegetation	Fynbos	107.6	27	29.1	22.8	46.2	46.2	WP	WP
206	Eastern Little Karoo	Succulent Karoo	1526.2	16	244.2	192.0	2.3	2.3	NP	NP
207	Eastern Lower Karoo	Nama-Karoo	8239.9	16	1318.4	1036.6	14.8	14.6	NP	NP
208	Eastern Ruens Shale Renosterveld	Fynbos	2621.2	27	707.7	556.5	7.4	7.2	NP	NP

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209	Eastern Temperate Freshwater Wetlands	Azonal Vegetation	295.8	24	71.0	55.8	41.0	40.3	MP	MP
210	Eastern Upper Karoo	Nama-Karoo	49164.9	21	10324.6	8118.2	757.9	589.9	PP	PP
211	Eastern Valley Bushveld	Savanna	9468.8	25	2367.2	1861.3	15.2	13.1	NP	NP
212	Eenriet Plains Succulent Shrubland	Succulent Karoo	264.8	28	74.1	58.3	0.0	0.0	NP	NP
213	Egoli Granite Grassland	Grassland	1069.7	24	256.7	201.9	47.9	38.6	PP	PP
214	Elgin Shale Fynbos	Fynbos	259.1	30	77.7	61.1	59.7	22.9	MP	PP
215	Elim Ferricrete Fynbos	Fynbos	585.5	30	175.6	138.1	20.4	15.9	PP	PP
216	Frankfort Highveld Grassland	Grassland	9594.5	24	2302.7	1810.6	44.7	26.1	NP	NP
217	Freshwater Lakes	Wetlands	14.6	24	3.5	2.8	13.7	0.6	WP	PP
218	Fynbos Riparian Vegetation	Azonal Vegetation	14.3	31	4.4	3.5	14.1	14.1	WP	WP
219	Gabbro Grassy Bushveld	Savanna	753.3	19	143.1	112.5	753.3	752.6	WP	WP
220	Gamka Karoo	Nama-Karoo	20194.5	16	3231.1	2540.6	440.7	440.2	PP	PP
221	Gamka Thicket	Albany Thicket	1456.7	19	276.8	217.6	179.9	179.0	MP	MP
222	Gamtoos Thicket	Albany Thicket	836.1	19	158.9	124.9	57.4	56.2	PP	PP
223	Garden Route Granite Fynbos	Fynbos	408.5	23	94.0	73.9	0.4	0.4	NP	NP
224	Garden Route Shale Fynbos	Fynbos	515.2	23	118.5	93.2	17.9	15.6	PP	PP
225	Gauteng Shale Mountain Bushveld	Savanna	1015.6	24	243.7	191.7	53.0	49.6	PP	PP
226	Ghaap Plateau Vaalbosveld	Savanna	15057.9	16	2409.3	1894.4	24.7	23.9	NP	NP
227	Goariep Mountain Succulent Shrubland	Succulent Karoo	173.6	28	48.6	38.2	173.6	173.6	WP	WP
228	Gold Reef Mountain Bushveld	Savanna	2007.4	24	481.8	378.8	423.2	413.9	MP	MP
229	Gordonia Duneveld	Savanna	36652.0	16	5864.3	4611.1	5493.0	5492.9	MP	MP
230	Gordonia Kameeldoring Bushveld	Savanna	2220.0	16	355.2	279.3	844.4	844.4	WP	WP
231	Gordonia Plains Shrubland	Savanna	7889.1	16	1262.3	992.5	1105.3	1105.3	MP	MP
232	Graafwater Sandstone Fynbos	Fynbos	1308.7	29	379.5	298.4	66.2	65.3	PP	PP
233	Granite Lowveld	Savanna	15545.1	19	2953.6	2322.4	4971.8	4945.7	WP	WP
234	Gravelotte Rocky Bushveld	Savanna	323.5	19	61.5	48.3	22.5	22.3	PP	PP
235	Great Fish Noorsveld	Albany Thicket	624.4	19	118.6	93.3	26.8	26.6	PP	PP
236	Great Fish Thicket	Albany Thicket	6553.7	19	1245.2	979.1	399.3	398.7	PP	PP
237	Greyton Shale Fynbos	Fynbos	251.7	30	75.5	59.4	15.5	14.1	PP	PP
238	Groot Brak Dune Strandveld	Fynbos	170.0	36	61.2	48.1	0.0	0.0	NP	NP
239	Groot Thicket	Albany Thicket	2424.3	19	460.6	362.2	290.4	288.0	MP	MP

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240	Grootrivier Quartzite Fynbos	Fynbos	563.8	23	129.7	102.0	0.0	0.0	NP	NP
241	Hangklip Sand Fynbos	Fynbos	62.2	30	18.7	14.7	18.3	14.9	MP	MP
242	Hantam Karoo	Succulent Karoo	7666.3	18	1379.9	1085.0	20.8	20.6	NP	NP
243	Hantam Plateau Dolerite Renosterveld	Fynbos	552.1	27	149.1	117.2	2.4	2.4	NP	NP
244	Hawequas Sandstone Fynbos	Fynbos	1037.1	30	311.1	244.6	922.7	919.5	WP	WP
245	Helskloof Canyon Desert	Desert	7.8	34	2.7	2.1	5.9	5.9	WP	WP
246	Highveld Alluvial Vegetation	Azonal Vegetation	4062.4	31	1259.4	990.2	421.8	183.4	PP	PP
247	Highveld Salt Pans	Azonal Vegetation	4.9	24	1.2	0.9	0.0	0.0	NP	NP
248	Hopefield Sand Fynbos	Fynbos	985.8	30	295.7	232.5	41.2	40.9	PP	PP
249	Humansdorp Shale Renosterveld	Fynbos	345.0	29	100.1	78.7	0.1	0.1	NP	NP
250	Income Sandy Grassland	Grassland	4271.1	23	982.4	772.4	0.0	0.0	NP	NP
251	Ironwood Dry Forest	Forests	45.7	36	16.4	12.9	45.5	45.5	WP	WP
252	Ithala Quartzite Sourveld	Grassland	1045.0	27	282.1	221.9	122.0	121.7	PP	PP
253	Kaalrug Mountain Bushveld	Savanna	474.0	24	113.8	89.5	107.3	105.9	MP	MP
254	Kahams Mountain Desert	Desert	593.3	34	201.7	158.6	571.9	571.9	WP	WP
255	Kalahari Karroid Shrubland	Nama-Karoo	8058.0	21	1692.2	1330.6	11.8	11.8	NP	NP
256	Kamiesberg Granite Fynbos	Fynbos	35.2	27	9.5	7.5	0.0	0.0	NP	NP
257	Kamiesberg Mountains Shrubland	Succulent Karoo	281.5	28	78.8	62.0	1.3	1.3	NP	NP
258	Kango Conglomerate Fynbos	Fynbos	403.1	27	108.8	85.6	48.1	47.9	PP	PP
259	Kango Limestone Renosterveld	Fynbos	497.9	29	144.4	113.5	15.5	15.5	PP	PP
260	KaNgwane Montane Grassland	Grassland	5904.1	24	1417.0	1114.2	127.1	87.0	PP	PP
261	Karoo Escarpment Grassland	Grassland	8303.6	24	1992.9	1567.0	320.5	320.2	PP	PP
262	Kathu Bushveld	Savanna	7397.3	16	1183.6	930.6	178.4	178.0	PP	PP
263	Kimberley Thornveld	Savanna	19256.3	16	3081.0	2422.6	898.2	752.3	PP	PP
264	Klawer Sandy Shrubland	Succulent Karoo	194.1	29	56.3	44.2	0.1	0.1	NP	NP
265	Klerksdorp Thornveld	Grassland	3868.1	24	928.3	729.9	107.3	106.0	PP	PP
266	Knersvlakte Dolomite Vygieveld	Succulent Karoo	50.5	28	14.1	11.1	0.0	0.0	NP	NP
267	Knersvlakte Quartz Vygieveld	Succulent Karoo	1194.4	28	334.4	263.0	335.9	334.7	WP	WP
268	Knersvlakte Shale Vygieveld	Succulent Karoo	954.0	28	267.1	210.0	60.9	60.9	PP	PP
269	Knysna Sand Fynbos	Fynbos	148.9	23	34.2	26.9	3.8	3.5	PP	PP
270	Kobee Succulent Shrubland	Succulent Karoo	138.5	29	40.2	31.6	0.3	0.3	NP	NP

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271	Koedoesberge-Moordenaars Karoo	Succulent Karoo	4691.2	19	891.3	700.8	13.7	13.5	NP	NP
272	Kogelberg Sandstone Fynbos	Fynbos	890.9	30	267.3	210.1	680.4	671.5	WP	WP
273	Koranna-Langeberg Mountain Bushveld	Savanna	1626.4	16	260.2	204.6	60.2	60.1	PP	PP
274	Kosiesberg Succulent Shrubland	Succulent Karoo	620.3	28	173.7	136.6	0.1	0.1	NP	NP
275	Kouebokkeveld Alluvium Fynbos	Fynbos	167.6	29	48.6	38.2	2.0	1.5	NP	NP
276	Kouebokkeveld Shale Fynbos	Fynbos	423.2	29	122.7	96.5	75.5	75.2	MP	MP
277	Kouga Grassy Sandstone Fynbos	Fynbos	4095.4	23	942.0	740.6	1035.1	1034.1	WP	WP
278	Kouga Sandstone Fynbos	Fynbos	2384.7	23	548.5	431.3	1069.2	1068.3	WP	WP
279	Kowie Thicket	Albany Thicket	2137.0	19	406.0	319.3	106.4	102.5	PP	PP
280	Kuruman Mountain Bushveld	Savanna	4356.2	16	697.0	548.0	0.0	0.0	NP	NP
281	Kuruman Thornveld	Savanna	5745.7	16	919.3	722.9	20.1	20.1	NP	NP
282	Kuruman Vaalbosveld	Savanna	3867.3	16	618.8	486.5	0.0	0.0	NP	NP
283	Kwaggarug Mountain Desert	Desert	108.8	34	37.0	29.1	108.8	108.6	WP	WP
284	KwaZulu-Natal Coastal Belt Grassland	Indian Ocean Coastal Belt	3988.9	25	997.2	784.1	37.1	36.4	NP	NP
285	KwaZulu-Natal Coastal Belt Thornveld	Indian Ocean Coastal Belt	1074.5	25	268.6	211.2	5.2	5.0	NP	NP
286	KwaZulu-Natal Highland Thornveld	Grassland	4920.3	23	1131.7	889.8	84.7	67.7	PP	PP
287	KwaZulu-Natal Hinterland Thornveld	Savanna	1476.4	25	369.1	290.2	8.2	6.3	NP	NP
288	KwaZulu-Natal Sandstone Sourveld	Savanna	1788.3	25	447.1	351.5	2.0	1.9	NP	NP
289	Lambert's Bay Strandveld	Fynbos	712.7	24	171.1	134.5	0.2	0.2	NP	NP
290	Langebaan Dune Strandveld	Fynbos	305.8	24	73.4	57.7	175.2	172.8	WP	WP
291	Langkloof Shale Renosterveld	Fynbos	196.2	29	56.9	44.7	1.2	0.9	NP	NP
292	Lebombo Summit Sourveld	Savanna	127.1	24	30.5	24.0	1.7	1.2	PP	NP
293	Legogote Sour Bushveld	Savanna	3460.7	19	657.5	517.0	189.1	120.1	PP	PP
294	Leipoldtville Sand Fynbos	Fynbos	1999.8	29	579.9	456.0	9.6	8.4	NP	NP
295	Lekkersing Succulent Shrubland	Succulent Karoo	820.3	28	229.7	180.6	88.5	88.5	PP	PP
296	Leolo Summit Sourveld	Grassland	20.4	24	4.9	3.8	0.0	0.0	NP	NP
297	Lesotho Highland Basalt Grassland	Grassland	3992.3	27	1077.9	847.5	188.9	188.9	PP	PP
298	Lesotho Mires	Azonal Vegetation	0.7	24	0.2	0.1	0.0	0.0	PP	PP
299	Limpopo Ridge Bushveld	Savanna	2727.6	19	518.2	407.5	705.0	703.4	WP	WP
300	Limpopo Sweet Bushveld	Savanna	11865.4	19	2254.4	1772.6	1083.0	1047.3	PP	PP

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301	Little Karoo Quartz Vygieveld	Succulent Karoo	238.5	16	38.2	30.0	9.8	9.8	PP	PP
302	Loerie Conglomerate Fynbos	Fynbos	217.1	23	49.9	39.3	31.8	31.7	MP	MP
303	Loskop Mountain Bushveld	Savanna	2024.5	24	485.9	382.0	370.5	357.7	MP	MP
304	Loskop Thornveld	Savanna	728.8	19	138.5	108.9	87.5	86.3	MP	MP
305	Lourensford Alluvium Fynbos	Fynbos	34.7	30	10.4	8.2	9.3	4.1	MP	PP
306	Low Escarpment Moist Grassland	Grassland	1714.1	23	394.2	310.0	53.6	50.2	PP	PP
307	Lower Gariep Alluvial Vegetation	Azonal Vegetation	459.2	31	142.3	111.9	23.7	21.4	PP	PP
308	Lower Gariep Broken Veld	Nama-Karoo	4510.7	21	947.2	744.8	154.8	154.7	PP	PP
309	Lower Karoo Gwarrieveld	Nama-Karoo	1556.2	16	249.0	195.8	2.7	2.7	NP	NP
310	Lowveld Riverine Forest	Forests	67.7	36	24.4	19.2	49.2	48.9	WP	WP
311	Lowveld Rugged Mopaneveld	Savanna	3083.6	19	585.9	460.7	1068.1	1067.5	WP	WP
312	Lydenburg Montane Grassland	Grassland	4793.6	24	1150.5	904.6	523.9	466.2	PP	PP
313	Lydenburg Thornveld	Grassland	1510.5	24	362.5	285.0	147.3	139.1	PP	PP
314	Mabela Sandy Grassland	Grassland	276.8	23	63.7	50.1	0.7	0.7	NP	NP
315	Madikwe Dolomite Bushveld	Savanna	969.6	19	184.2	144.9	244.0	243.5	WP	WP
316	Mafikeng Bushveld	Savanna	14127.3	16	2260.4	1777.3	16.5	6.0	NP	NP
317	Makatini Clay Thicket	Savanna	318.4	19	60.5	47.6	125.9	125.8	WP	WP
318	Makhado Sweet Bushveld	Savanna	10017.5	19	1903.3	1496.6	501.4	414.7	PP	PP
319	Makuleke Sandy Bushveld	Savanna	2040.3	19	387.7	304.8	731.4	730.7	WP	WP
320	Malelane Mountain Bushveld	Savanna	624.2	24	149.8	117.8	490.4	489.3	WP	WP
321	Mamabolo Mountain Bushveld	Savanna	679.8	24	163.1	128.3	65.6	65.0	PP	PP
322	Mangrove Forest	Forests	0.1	26	0.0	0.0	0.0	0.0	WP	MP
323	Maputaland Coastal Belt	Indian Ocean Coastal Belt	2069.8	25	517.4	406.9	308.8	300.9	MP	MP
324	Maputaland Pallid Sandy Bushveld	Savanna	594.5	25	148.6	116.9	91.8	91.6	MP	MP
325	Maputaland Wooded Grassland	Indian Ocean Coastal Belt	1048.9	25	262.2	206.2	165.6	161.4	MP	MP
326	Marikana Thornveld	Savanna	2483.2	19	471.8	371.0	27.7	22.5	PP	NP
327	Marine Saline Wetlands	Azonal Vegetation	2.4	24	0.6	0.5	0.4	0.4	MP	MP
328	Matjiesfontein Quartzite Fynbos	Fynbos	1273.6	27	343.9	270.4	74.3	74.3	PP	PP
329	Matjiesfontein Shale Fynbos	Fynbos	107.1	27	28.9	22.7	31.0	31.0	WP	WP
330	Matjiesfontein Shale Renosterveld	Fynbos	2080.9	27	561.8	441.8	199.3	199.0	PP	PP

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331	Midlands Mistbelt Grassland	Grassland	6751.6	23	1552.9	1221.0	148.1	82.2	PP	PP
332	Moist Coast Hinterland Grassland	Grassland	6165.1	25	1541.3	1211.9	8.4	7.8	NP	NP
333	Molopo Bushveld	Savanna	22575.2	16	3612.0	2840.1	227.0	226.9	PP	PP
334	Montagu Shale Fynbos	Fynbos	185.0	30	55.5	43.6	7.3	7.2	PP	PP
335	Montagu Shale Renosterveld	Fynbos	1583.3	27	427.5	336.1	55.8	55.2	PP	PP
336	Mooi River Highland Grassland	Grassland	2614.5	23	601.3	472.8	106.6	84.7	PP	PP
337	Moot Plains Bushveld	Savanna	2842.3	19	540.0	424.6	61.5	54.0	PP	PP
338	Mopane Basalt Shrubland	Savanna	2779.2	19	528.1	415.2	2779.2	2776.4	WP	WP
339	Mopane Gabbro Shrubland	Savanna	309.4	19	58.8	46.2	309.4	309.3	WP	WP
340	Mossel Bay Shale Renosterveld	Fynbos	747.0	27	201.7	158.6	1.1	1.1	NP	NP
341	Mthatha Moist Grassland	Grassland	5144.4	23	1183.2	930.4	1.7	1.6	NP	NP
342	Muscadel Riviere	Azonal Vegetation	347.4	16	55.6	43.7	0.6	0.5	NP	NP
343	Musina Mopane Bushveld	Savanna	8717.4	19	1656.3	1302.3	686.3	656.4	PP	PP
344	Muzi Palm Veld and Wooded Grassland	Savanna	492.2	25	123.1	96.8	34.8	34.8	PP	PP
345	Namaqualand Arid Grassland	Succulent Karoo	710.2	26	184.7	145.2	150.8	150.8	MP	MP
346	Namaqualand Blomveld	Succulent Karoo	3758.1	28	1052.3	827.4	46.9	45.5	NP	NP
347	Namaqualand Coastal Duneveld	Succulent Karoo	991.5	26	257.8	202.7	206.3	206.1	MP	MP
348	Namaqualand Granite Renosterveld	Fynbos	705.4	27	190.5	149.8	0.0	0.0	NP	NP
349	Namaqualand Heuweltjieveld	Succulent Karoo	2541.0	28	711.5	559.4	241.5	241.4	PP	PP
350	Namaqualand Inland Duneveld	Succulent Karoo	316.8	26	82.4	64.8	59.6	59.6	MP	MP
351	Namaqualand Klipkoppe Shrubland	Succulent Karoo	11019.9	28	3085.6	2426.2	445.8	442.0	PP	PP
352	Namaqualand Riviere	Azonal Vegetation	624.5	24	149.9	117.8	0.5	0.5	NP	NP
353	Namaqualand Salt Pans	Azonal Vegetation	83.2	24	20.0	15.7	0.0	0.0	NP	NP
354	Namaqualand Sand Fynbos	Fynbos	1142.1	29	331.2	260.4	23.2	23.2	PP	PP
355	Namaqualand Seashore Vegetation	Azonal Vegetation	64.4	26	16.8	13.2	0.2	0.2	NP	NP
356	Namaqualand Shale Shrubland	Succulent Karoo	674.5	24	161.9	127.3	0.0	0.0	NP	NP
357	Namaqualand Spinescent Grassland	Succulent Karoo	448.5	26	116.6	91.7	17.6	17.4	PP	PP
358	Namaqualand Strandveld	Succulent Karoo	4228.6	26	1099.4	864.5	252.6	252.5	PP	PP
359	Namib Lichen Fields	Desert	0.8	36	0.3	0.2	0.0	0.0	NP	NP
360	Namib Seashore Vegetation	Azonal Vegetation	11.7	26	3.0	2.4	0.0	0.0	NP	NP
361	Nardouw Sandstone Fynbos	Fynbos	549.9	29	159.5	125.4	0.0	0.0	NP	NP

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362	Ngongoni Veld	Savanna	794.9	25	198.7	156.3	0.0	0.0	NP	NP
363	Nieuwoudtville-Roggeveld Dolerite Renosterveld	Fynbos	214.8	27	58.0	45.6	7.0	7.0	PP	PP
364	Nieuwoudtville Shale Renosterveld	Fynbos	208.6	27	56.3	44.3	0.2	0.2	NP	NP
365	Noms Mountain Desert	Desert	341.2	34	116.0	91.2	341.2	341.1	WP	WP
366	Norite Koppies Bushveld	Savanna	256.1	24	61.5	48.3	9.8	9.7	PP	PP
367	North Hex Sandstone Fynbos	Fynbos	389.7	29	113.0	88.9	308.4	307.7	WP	WP
368	North Kammanassie Sandstone Fynbos	Fynbos	330.2	27	89.2	70.1	261.8	261.6	WP	WP
369	North Langeberg Sandstone Fynbos	Fynbos	1015.3	30	304.6	239.5	561.3	559.7	WP	WP
370	North Outeniqua Sandstone Fynbos	Fynbos	874.1	23	201.0	158.1	94.1	93.7	PP	PP
371	North Rooiberg Sandstone Fynbos	Fynbos	318.0	27	85.9	67.5	188.4	188.4	WP	WP
372	North Sonderend Sandstone Fynbos	Fynbos	529.3	30	158.8	124.9	370.8	369.2	WP	WP
373	North Swartberg Sandstone Fynbos	Fynbos	862.1	27	232.8	183.0	693.7	693.6	WP	WP
374	Northern Afrotemperate Forest	Forests	104.3	22	22.9	18.0	50.7	50.3	WP	WP
375	Northern Coastal Forest	Forests	614.8	18	110.7	87.0	333.3	308.7	WP	WP
376	Northern Drakensberg Highland Grassland	Grassland	1204.6	27	325.2	255.7	477.1	474.7	WP	WP
377	Northern Escarpment Afromontane Fynbos	Grassland	9.5	27	2.6	2.0	7.1	7.0	WP	WP
378	Northern Escarpment Dolomite Grassland	Grassland	928.5	27	250.7	197.1	24.5	22.2	PP	PP
379	Northern Escarpment Quartzite Sourveld	Grassland	1351.7	27	365.0	287.0	309.4	296.1	MP	MP
380	Northern Free State Shrubland	Grassland	29.2	28	8.2	6.4	0.5	0.5	PP	PP
381	Northern Inland Shale Band Vegetation	Fynbos	272.8	29	79.1	62.2	209.8	208.7	WP	WP
382	Northern Knersvlakte Vygieveld	Succulent Karoo	1518.1	28	425.1	334.2	304.3	304.2	MP	MP
383	Northern KwaZulu-Natal Moist Grassland	Grassland	6857.4	24	1645.8	1294.0	80.1	72.9	NP	NP
384	Northern Lebombo Bushveld	Savanna	1312.9	24	315.1	247.8	1305.7	1305.3	WP	WP
385	Northern Mistbelt Forest	Forests	596.2	22	131.2	103.1	232.5	220.6	WP	WP
386	Northern Nababiepsberge Mountain Desert	Desert	248.0	34	84.3	66.3	1.6	1.6	NP	NP
387	Northern Richtersveld Scorpionstailveld	Succulent Karoo	366.2	28	102.5	80.6	120.8	120.8	WP	WP
388	Northern Richtersveld Yellow Duneveld	Succulent Karoo	555.9	26	144.5	113.6	0.0	0.0	NP	NP
389	Northern Upper Karoo	Nama-Karoo	41345.9	21	8682.6	6827.1	228.4	207.5	NP	NP
390	Northern Zululand Mistbelt Grassland	Grassland	528.2	23	121.5	95.5	18.1	18.0	PP	PP
391	Northern Zululand Sourveld	Savanna	4660.9	19	885.6	696.3	347.4	346.0	PP	PP

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392	Nossob Bushveld	Savanna	745.5	16	119.3	93.8	745.5	745.5	WP	WP
393	Nwambyia-Pumbe Sandy Bushveld	Savanna	167.3	19	31.8	25.0	167.2	167.2	WP	WP
394	Ohrigstad Mountain Bushveld	Savanna	1958.2	24	470.0	369.5	274.8	268.4	MP	MP
395	Olifants Sandstone Fynbos	Fynbos	494.8	29	143.5	112.8	346.4	343.9	WP	WP
396	Olifantshoek Plains Thornveld	Savanna	8475.9	16	1356.1	1066.3	99.6	99.5	PP	PP
397	Oograbies Plains Sandy Grassland	Succulent Karoo	123.3	26	32.1	25.2	0.0	0.0	NP	NP
398	Overberg Dune Strandveld	Fynbos	382.2	36	137.6	108.2	143.1	142.6	WP	WP
399	Overberg Sandstone Fynbos	Fynbos	1115.4	30	334.6	263.1	111.8	111.0	PP	PP
400	Paulpietersburg Moist Grassland	Grassland	4076.9	24	978.5	769.4	202.6	166.5	PP	PP
401	Peninsula Granite Fynbos	Fynbos	91.7	30	27.5	21.6	44.0	31.1	WP	WP
402	Peninsula Sandstone Fynbos	Fynbos	213.6	30	64.1	50.4	202.6	196.3	WP	WP
403	Peninsula Shale Fynbos	Fynbos	12.5	30	3.8	3.0	7.9	6.5	WP	WP
404	Peninsula Shale Renosterveld	Fynbos	22.7	26	5.9	4.6	2.8	2.4	PP	PP
405	Phalaborwa-Timbavati Mopaneveld	Savanna	2207.6	19	419.5	329.8	1347.4	1345.3	WP	WP
406	Piketberg Quartz Succulent Shrubland	Succulent Karoo	2.8	26	0.7	0.6	0.0	0.0	NP	NP
407	Piketberg Sandstone Fynbos	Fynbos	418.2	29	121.3	95.4	0.5	0.5	NP	NP
408	Pilanesberg Mountain Bushveld	Savanna	431.4	24	103.5	81.4	415.3	412.0	WP	WP
409	Platbakkies Succulent Shrubland	Succulent Karoo	982.1	28	275.0	216.2	0.0	0.0	NP	NP
410	Polokwane Plateau Bushveld	Savanna	4411.3	19	838.1	659.0	116.5	110.7	PP	PP
411	Pondoland-Ugu Sandstone Coastal Sourveld	Indian Ocean Coastal Belt	1271.9	25	318.0	250.0	89.3	88.6	PP	PP
412	Postmasburg Thornveld	Savanna	920.0	16	147.2	115.7	0.0	0.0	NP	NP
413	Potberg Ferricrete Fynbos	Fynbos	38.7	30	11.6	9.1	2.2	2.1	PP	PP
414	Potberg Sandstone Fynbos	Fynbos	107.6	30	32.3	25.4	53.1	52.7	WP	WP
415	Poung Dolomite Mountain Bushveld	Savanna	870.9	24	209.0	164.3	105.9	105.8	MP	MP
416	Pretoriuskop Sour Bushveld	Savanna	920.5	19	174.9	137.5	402.1	395.2	WP	WP
417	Prince Albert Succulent Karoo	Succulent Karoo	2545.6	16	407.3	320.2	60.4	55.9	PP	PP
418	Queenstown Thornveld	Grassland	3511.3	23	807.6	635.0	28.6	28.0	NP	NP
419	Rand Highveld Grassland	Grassland	10088.2	24	2421.2	1903.7	169.4	149.6	PP	PP
421	Richtersberg Mountain Desert	Desert	363.3	34	123.5	97.1	363.3	363.3	WP	WP
422	Richtersveld Coastal Duneveld	Succulent Karoo	488.8	26	127.1	99.9	10.7	10.7	PP	PP

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423	Richtersveld Red Duneveld	Succulent Karoo	547.1	26	142.2	111.8	8.0	8.0	PP	PP
424	Richtersveld Sandy Coastal Scorpionstailveld	Succulent Karoo	385.4	26	100.2	78.8	0.0	0.0	NP	NP
425	Richtersveld Sheet Wash Desert	Desert	160.2	34	54.5	42.8	160.2	159.9	WP	WP
426	Riethuis-Wallekraal Quartz Vygieveld	Succulent Karoo	131.5	28	36.8	29.0	60.0	60.0	WP	WP
427	Robertson Granite Fynbos	Fynbos	16.7	30	5.0	3.9	7.0	7.0	WP	WP
428	Robertson Granite Renosterveld	Fynbos	18.9	27	5.1	4.0	5.6	5.6	WP	WP
429	Robertson Karoo	Succulent Karoo	651.7	16	104.3	82.0	19.1	18.3	PP	PP
430	Roggeveld Karoo	Succulent Karoo	5315.1	18	956.7	752.3	2.1	2.1	NP	NP
431	Roggeveld Shale Renosterveld	Fynbos	3210.1	27	866.7	681.5	55.7	55.1	PP	PP
432	Roodeberg Bushveld	Savanna	6442.9	19	1224.1	962.5	633.8	612.0	MP	PP
433	Rooiberg Quartz Vygieveld	Succulent Karoo	130.2	28	36.4	28.7	61.6	61.5	WP	WP
434	Rosyntjieberg Succulent Shrubland	Succulent Karoo	51.6	28	14.4	11.4	51.6	51.6	WP	WP
435	Ruens Silcrete Renosterveld	Fynbos	205.7	27	55.5	43.7	0.3	0.3	NP	NP
436	Saldanha Flats Strandveld	Fynbos	1598.1	24	383.5	301.6	82.4	81.7	PP	PP
437	Saldanha Granite Strandveld	Fynbos	280.9	24	67.4	53.0	30.7	29.8	PP	PP
438	Saldanha Limestone Strandveld	Fynbos	62.7	24	15.0	11.8	9.5	9.4	MP	MP
439	Sand Forest	Forests	271.4	36	97.7	76.8	118.0	117.8	WP	WP
440	Scarp Forest	Forests	744.5	22	163.8	128.8	204.6	203.6	WP	WP
441	Schmidtsdrif Thornveld	Savanna	4922.4	16	787.6	619.3	70.2	53.8	PP	PP
442	Schweizer-Reneke Bushveld	Savanna	1992.3	16	318.8	250.6	42.2	31.7	PP	PP
443	Sekhukhune Montane Grassland	Grassland	1335.1	24	320.4	251.9	9.6	7.6	NP	NP
444	Sekhukhune Mountain Bushveld	Savanna	2291.4	24	549.9	432.4	45.6	45.1	PP	PP
445	Sekhukhune Plains Bushveld	Savanna	2456.0	19	466.6	366.9	32.6	31.8	PP	PP
446	Senqu Montane Shrubland	Grassland	709.6	28	198.7	156.2	0.0	0.0	NP	NP
447	South Hex Sandstone Fynbos	Fynbos	317.2	29	92.0	72.3	288.3	288.0	WP	WP
448	South Kammanassie Sandstone Fynbos	Fynbos	304.3	27	82.2	64.6	216.4	214.9	WP	WP
449	South Langeberg Sandstone Fynbos	Fynbos	1191.3	30	357.4	281.0	909.7	909.3	WP	WP
450	South Outeniqua Sandstone Fynbos	Fynbos	1524.9	23	350.7	275.8	527.4	469.6	WP	WP
451	South Rooiberg Sandstone Fynbos	Fynbos	388.8	27	105.0	82.6	193.9	193.9	WP	WP
452	South Sonderend Sandstone Fynbos	Fynbos	349.2	30	104.8	82.4	270.5	269.7	WP	WP
453	South Swartberg Sandstone Fynbos	Fynbos	1081.2	27	291.9	229.5	881.2	881.1	WP	WP

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454	Southern Afrotemperate Forest	Forests	779.4	22	171.5	134.8	431.5	406.0	WP	WP
455	Southern Cape Dune Fynbos	Fynbos	175.0	36	63.0	49.5	42.6	38.3	MP	MP
456	Southern Cape Valley Thicket	Albany Thicket	141.2	19	26.8	21.1	1.0	1.0	NP	NP
457	Southern Coastal Forest	Forests	163.0	21	34.2	26.9	87.0	86.7	WP	WP
458	Southern Drakensberg Highland Grassland	Grassland	6519.8	27	1760.4	1384.2	606.4	605.9	PP	PP
459	Southern Kalahari Mekgacha	Azonal Vegetation	1824.3	24	437.8	344.3	313.8	313.3	MP	MP
460	Southern Kalahari Salt Pans	Azonal Vegetation	135.6	24	32.5	25.6	52.4	52.3	WP	WP
461	Southern Karoo Riviere	Azonal Vegetation	4676.4	24	1122.3	882.5	104.1	77.1	PP	PP
462	Southern KwaZulu-Natal Moist Grassland	Grassland	2243.9	23	516.1	405.8	95.0	69.3	PP	PP
463	Southern Lebombo Bushveld	Savanna	1290.1	24	309.6	243.5	118.7	116.9	PP	PP
464	Southern Mistbelt Forest	Forests	1163.9	20	232.8	183.0	138.8	132.8	MP	MP
465	Southern Nababiepsberge Mountain Desert	Desert	344.8	34	117.2	92.2	2.5	2.5	NP	NP
466	Southern Richtersveld Inselberg Shrubland	Succulent Karoo	371.6	28	104.0	81.8	0.0	0.0	NP	NP
467	Southern Richtersveld Scorpionstailveld	Succulent Karoo	726.3	28	203.4	159.9	0.0	0.0	NP	NP
468	Southern Richtersveld Yellow Duneveld	Succulent Karoo	340.2	26	88.5	69.5	78.7	78.7	MP	MP
469	Soutpansberg Mountain Bushveld	Savanna	4095.2	24	982.8	772.8	151.9	147.2	PP	PP
470	Soutpansberg Summit Sourveld	Grassland	86.2	24	20.7	16.3	23.2	23.1	WP	WP
471	Soweto Highveld Grassland	Grassland	14137.3	24	3392.9	2667.8	82.4	53.6	NP	NP
472	Springbokvlakte Thornveld	Savanna	8663.8	19	1646.1	1294.3	375.8	339.8	PP	PP
473	Stella Bushveld	Savanna	3150.8	16	504.1	396.4	0.0	0.0	NP	NP
474	Steytlerville Karoo	Succulent Karoo	774.9	16	124.0	97.5	0.0	0.0	NP	NP
475	Stinkfonteinberge Eastern Apron Shrubland	Succulent Karoo	65.9	28	18.4	14.5	65.6	65.6	WP	WP
476	Stinkfonteinberge Quartzite Fynbos	Fynbos	49.8	28	13.9	11.0	49.7	49.7	WP	WP
477	Stormberg Plateau Grassland	Grassland	2897.4	27	782.3	615.1	0.0	0.0	NP	NP
478	Strydpoort Summit Sourveld	Grassland	267.3	24	64.1	50.4	42.6	42.6	MP	MP
479	Subtropical Alluvial Vegetation	Azonal Vegetation	591.3	31	183.3	144.1	329.2	300.1	WP	WP
480	Subtropical Coastal Lagoons	Wetlands	0.3	24	0.1	0.0	0.0	0.0	NP	NP
481	Subtropical Dune Thicket	Azonal Vegetation	17.4	20	3.5	2.7	10.5	10.5	WP	WP
482	Subtropical Estuarine Salt Marshes	Azonal Vegetation	0.4	24	0.1	0.1	0.0	0.0	NP	NP
483	Subtropical Freshwater Wetlands	Azonal Vegetation	192.4	24	46.2	36.3	29.8	29.1	MP	MP
484	Subtropical Salt Pans	Azonal Vegetation	3.3	24	0.8	0.6	0.3	0.3	PP	PP

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485	Subtropical Seashore Vegetation	Azonal Vegetation	29.6	20	5.9	4.7	16.3	16.2	WP	WP
486	Sundays Noorsveld	Albany Thicket	1251.6	19	237.8	187.0	250.0	230.2	WP	MP
487	Sundays Thicket	Albany Thicket	5168.1	19	981.9	772.1	943.0	911.2	MP	MP
488	Suurberg Quartzite Fynbos	Fynbos	878.4	23	202.0	158.9	140.2	140.2	MP	MP
489	Suurberg Shale Fynbos	Fynbos	509.5	23	117.2	92.1	203.8	203.8	WP	WP
490	Swamp Forest	Forests	3.9	35	1.4	1.1	1.2	1.2	MP	MP
491	Swartberg Altimontane Sandstone Fynbos	Fynbos	51.0	29	14.8	11.6	51.0	51.0	WP	WP
492	Swartberg Shale Fynbos	Fynbos	75.1	27	20.3	15.9	8.3	8.2	PP	PP
493	Swartberg Shale Renosterveld	Fynbos	274.6	29	79.6	62.6	25.7	25.7	PP	PP
494	Swartland Alluvium Fynbos	Fynbos	452.6	30	135.8	106.8	41.9	40.1	PP	PP
495	Swartland Alluvium Renosterveld	Fynbos	53.3	26	13.9	10.9	0.0	0.0	NP	NP
496	Swartland Granite Renosterveld	Fynbos	952.9	26	247.8	194.8	5.4	5.3	NP	NP
497	Swartland Shale Renosterveld	Fynbos	4916.4	26	1278.3	1005.1	42.4	37.0	NP	NP
498	Swartland Silcrete Renosterveld	Fynbos	101.0	26	26.3	20.6	0.2	0.2	NP	NP
499	Swartruggens Quartzite Fynbos	Fynbos	1649.5	29	478.3	376.1	163.7	163.7	PP	PP
500	Swartruggens Quartzite Karoo	Succulent Karoo	547.4	19	104.0	81.8	39.5	39.5	PP	PP
501	Swaziland Sour Bushveld	Savanna	1289.6	19	245.0	192.7	405.0	390.6	WP	WP
502	Swellendam Silcrete Fynbos	Fynbos	816.1	30	244.8	192.5	42.3	40.4	PP	PP
503	Tanqua Escarpment Shrubland	Succulent Karoo	1321.4	19	251.1	197.4	172.3	172.3	MP	MP
504	Tanqua Karoo	Succulent Karoo	6968.1	19	1323.9	1041.0	779.0	778.6	MP	MP
505	Tanqua Wash Riviere	Azonal Vegetation	2037.3	19	387.1	304.4	365.4	353.5	MP	MP
506	Tarkastad Montane Shrubland	Grassland	4201.1	28	1176.3	924.9	81.1	80.2	PP	PP
507	Tatasberg Mountain Succulent Shrubland	Succulent Karoo	3.3	34	1.1	0.9	3.3	3.3	WP	WP
508	Tembe Sandy Bushveld	Savanna	1110.8	19	211.1	165.9	177.7	177.6	MP	MP
509	Temperate Alluvial Vegetation	Azonal Vegetation	297.2	31	92.1	72.4	36.1	13.0	PP	PP
510	Thukela Thornveld	Savanna	2126.5	25	531.6	418.0	21.5	21.4	NP	NP
511	Thukela Valley Bushveld	Savanna	2567.5	25	641.9	504.7	12.1	12.1	NP	NP
512	Transkei Coastal Belt	Indian Ocean Coastal Belt	1532.6	25	383.1	301.3	13.1	12.8	NP	NP
513	Tsakane Clay Grassland	Grassland	1257.6	24	301.8	237.3	58.6	44.4	PP	PP
514	Tsende Mopaneveld	Savanna	5266.1	19	1000.6	786.7	3681.0	3672.5	WP	WP

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515	Tshokwane-Hlane Basalt Lowveld	Savanna	2807.9	19	533.5	419.5	2223.0	2221.1	WP	WP
516	Tsitsikamma Sandstone Fynbos	Fynbos	2236.7	23	514.4	404.5	803.9	776.7	WP	WP
517	Tsomo Grassland	Grassland	5925.2	23	1362.8	1071.6	1.4	1.4	NP	NP
518	Tzaneen Sour Bushveld	Savanna	3384.0	19	643.0	505.6	131.8	106.2	PP	PP
519	uKhahlamba Basalt Grassland	Grassland	1329.5	27	359.0	282.3	1056.4	1056.2	WP	WP
520	Umdaus Mountains Succulent Shrubland	Succulent Karoo	437.8	28	122.6	96.4	0.0	0.0	NP	NP
521	Uniondale Shale Renosterveld	Fynbos	1325.3	29	384.3	302.2	33.3	32.4	PP	PP
522	Upper Annisvlakte Succulent Shrubland	Succulent Karoo	194.0	28	54.3	42.7	48.3	48.1	MP	MP
523	Upper Gariep Alluvial Vegetation	Azonal Vegetation	1495.5	31	463.6	364.5	42.3	34.3	PP	PP
524	Upper Karoo Hardeveld	Nama-Karoo	11710.7	21	2459.2	1933.7	583.7	583.0	PP	PP
525	Vaal-Vet Sandy Grassland	Grassland	22322.8	24	5357.5	4212.5	343.4	178.0	PP	NP
526	Vaal Reefs Dolomite Sinkhole Woodland	Grassland	334.1	24	80.2	63.1	0.3	0.2	NP	NP
527	Vaalbos Rocky Shrubland	Savanna	1435.8	16	229.7	180.6	81.5	81.3	PP	PP
528	Vanrhynsdorp Gannabosveld	Succulent Karoo	930.1	28	260.4	204.8	5.2	4.4	NP	NP
529	Vanrhynsdorp Shale Renosterveld	Fynbos	202.7	27	54.7	43.0	12.3	12.3	PP	PP
530	VhaVenda Miombo	Savanna	0.3	36	0.1	0.1	0.0	0.0	NP	NP
531	Vredefort Dome Granite Grassland	Grassland	905.2	24	217.3	170.8	3.3	3.3	NP	NP
532	Vyftienmyl se Berge Succulent Shrubland	Succulent Karoo	18.8	28	5.3	4.1	0.0	0.0	NP	NP
533	Wakkerstroom Montane Grassland	Grassland	3575.5	27	965.4	759.1	302.4	293.5	PP	PP
534	Waterberg-Magaliesberg Summit Sourveld	Grassland	522.9	24	125.5	98.7	129.9	129.6	WP	WP
535	Waterberg Mountain Bushveld	Savanna	8730.9	24	2095.4	1647.6	1302.6	1280.7	MP	MP
536	Western Altimontane Sandstone Fynbos	Fynbos	37.8	29	11.0	8.6	37.8	37.8	WP	WP
537	Western Bushmanland Klipveld	Succulent Karoo	2300.0	18	414.0	325.5	0.0	0.0	NP	NP
538	Western Coastal Shale Band Vegetation	Fynbos	131.9	30	39.6	31.1	96.6	96.5	WP	WP
539	Western Free State Clay Grassland	Grassland	6469.3	24	1552.6	1220.8	167.7	155.3	PP	PP
540	Western Gariep Hills Desert	Desert	417.0	28	116.8	91.8	45.2	41.3	PP	PP
541	Western Gariep Lowland Desert	Desert	242.5	28	67.9	53.4	0.4	0.4	NP	NP
542	Western Gariep Plains Desert	Desert	193.6	28	54.2	42.6	0.0	0.0	NP	NP
543	Western Gwarrieveld	Succulent Karoo	733.1	16	117.3	92.2	50.1	50.1	PP	PP
544	Western Highveld Sandy Grassland	Grassland	8435.2	24	2024.5	1591.8	25.8	12.3	NP	NP
546	Western Little Karoo	Succulent Karoo	4029.3	16	644.7	506.9	418.6	417.3	MP	MP

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547	Western Maputaland Clay Bushveld	Savanna	1466.8	19	278.7	219.1	294.0	184.5	WP	MP
548	Western Maputaland Sandy Bushveld	Savanna	151.3	19	28.8	22.6	28.1	27.8	MP	MP
549	Western Ruens Shale Renosterveld	Fynbos	1118.9	27	302.1	237.5	0.8	0.8	NP	NP
550	Western Sandy Bushveld	Savanna	6434.8	19	1222.6	961.3	1312.9	1283.0	WP	WP
551	Western Upper Karoo	Nama-Karoo	17030.9	21	3576.5	2812.2	14.0	14.0	NP	NP
552	Willowmore Gwarrieveld	Succulent Karoo	2288.4	16	366.1	287.9	3.5	3.5	NP	NP
553	Winburg Grassy Shrubland	Grassland	1549.7	28	433.9	341.2	67.9	65.9	PP	PP
554	Winterhoek Sandstone Fynbos	Fynbos	1134.9	29	329.1	258.8	923.1	920.6	WP	WP
555	Wolkberg Dolomite Grassland	Grassland	260.5	27	70.3	55.3	116.1	115.7	WP	WP
556	Woodbush Granite Grassland	Grassland	334.1	27	90.2	70.9	19.6	16.2	PP	PP
557	Xhariep Karroid Grassland	Grassland	13141.7	24	3154.0	2480.0	473.5	332.6	PP	PP
558	Zastron Moist Grassland	Grassland	3468.5	24	832.4	654.5	21.5	15.3	NP	NP
559	Zeerust Thornveld	Savanna	4044.3	19	768.4	604.2	131.2	119.5	PP	PP
560	Zululand Coastal Thornveld	Savanna	655.8	19	124.6	98.0	0.0	0.0	NP	NP
561	Zululand Lowveld	Savanna	6838.0	19	1299.2	1021.6	1071.1	1064.0	MP	MP
562	1_N_F	Rivers	0.2	20	0.0	0.0	0.2	0.0	WP	NP
563	1_N_L	Rivers	49.2	20	9.8	7.7	11.8	10.5	WP	WP
564	1_N_M	Rivers	0.4	20	0.1	0.1	0.3	0.3	WP	WP
565	1_N_U	Rivers	43.1	20	8.6	6.8	3.6	3.3	PP	PP
566	1_P_F	Rivers	38.5	20	7.7	6.0	9.8	9.4	WP	WP
567	1_P_L	Rivers	114.4	20	22.9	18.0	7.3	7.1	PP	PP
568	1_P_M	Rivers	0.3	20	0.1	0.0	0.2	0.2	WP	WP
569	1_P_U	Rivers	6.5	20	1.3	1.0	0.2	0.2	PP	PP
570	10_N_L	Rivers	0.1	20	0.0	0.0	0.0	0.0	NP	NP
571	10_N_M	Rivers	3.0	20	0.6	0.5	1.0	1.0	WP	WP
572	10_N_U	Rivers	7.7	20	1.5	1.2	0.4	0.4	PP	PP
573	10_P_L	Rivers	66.9	20	13.4	10.5	11.4	10.9	MP	MP
574	10_P_M	Rivers	9.0	20	1.8	1.4	2.8	2.3	WP	WP
575	10_P_U	Rivers	76.0	20	15.2	12.0	13.5	10.6	MP	MP
576	11_N_F	Rivers	3.7	20	0.7	0.6	2.5	0.1	WP	PP
577	11_N_L	Rivers	277.9	20	55.6	43.7	6.8	3.5	PP	PP

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578	11_N_M	Rivers	3.8	20	0.8	0.6	0.2	0.0	PP	PP
579	11_N_U	Rivers	194.9	20	39.0	30.7	5.1	3.6	PP	PP
580	11_P_F	Rivers	282.7	20	56.5	44.5	13.5	4.7	PP	PP
581	11_P_L	Rivers	692.4	20	138.5	108.9	26.3	11.8	PP	PP
582	11_P_M	Rivers	5.5	20	1.1	0.9	0.5	0.3	MP	PP
583	11_P_U	Rivers	172.0	20	34.4	27.1	5.3	3.5	PP	PP
585	12_N_L	Rivers	10.7	20	2.1	1.7	8.4	8.3	WP	WP
586	12_N_M	Rivers	1.3	20	0.3	0.2	0.1	0.1	PP	PP
587	12_N_U	Rivers	15.7	20	3.1	2.5	5.4	5.3	WP	WP
588	12_P_F	Rivers	0.1	20	0.0	0.0	0.0	0.0	PP	PP
589	12_P_L	Rivers	8.4	20	1.7	1.3	4.4	4.3	WP	WP
590	12_P_M	Rivers	0.1	20	0.0	0.0	0.0	0.0	NP	NP
591	12_P_U	Rivers	1.7	20	0.3	0.3	0.1	0.0	PP	PP
593	13_N_L	Rivers	2.2	20	0.4	0.4	0.6	0.6	WP	WP
594	13_N_U	Rivers	0.8	20	0.2	0.1	0.2	0.0	WP	NP
595	13_P_F	Rivers	0.8	20	0.2	0.1	0.1	0.1	MP	MP
596	13_P_L	Rivers	14.3	20	2.9	2.2	0.7	0.3	PP	PP
597	13_P_M	Rivers	0.3	20	0.1	0.0	0.0	0.0	NP	NP
598	13_P_U	Rivers	3.8	20	0.8	0.6	0.0	0.0	NP	NP
599	14_N_F	Rivers	0.3	20	0.1	0.1	0.0	0.0	NP	NP
600	14_N_L	Rivers	14.6	20	2.9	2.3	0.7	0.1	PP	NP
601	14_N_M	Rivers	3.2	20	0.6	0.5	0.0	0.0	NP	NP
602	14_N_U	Rivers	25.0	20	5.0	3.9	1.5	1.0	PP	PP
603	14_P_F	Rivers	15.9	20	3.2	2.5	2.4	0.1	MP	NP
604	14_P_L	Rivers	201.9	20	40.4	31.8	7.6	2.6	PP	PP
605	14_P_M	Rivers	18.5	20	3.7	2.9	1.0	0.8	PP	PP
606	14_P_U	Rivers	196.8	20	39.4	30.9	4.9	3.7	PP	PP
608	15_N_L	Rivers	26.8	20	5.4	4.2	0.4	0.0	PP	NP
609	15_N_M	Rivers	8.9	20	1.8	1.4	1.4	1.4	MP	MP
610	15_N_U	Rivers	50.0	20	10.0	7.9	0.3	0.2	NP	NP
611	15_P_F	Rivers	10.4	20	2.1	1.6	0.6	0.6	PP	PP

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612	15_P_L	Rivers	177.4	20	35.5	27.9	1.9	1.5	PP	NP
613	15_P_M	Rivers	39.6	20	7.9	6.2	14.6	14.1	WP	WP
614	15_P_U	Rivers	145.6	20	29.1	22.9	17.8	16.8	MP	MP
615	16_N_L	Rivers	1.7	20	0.3	0.3	0.0	0.0	NP	NP
616	16_N_M	Rivers	3.4	20	0.7	0.5	0.0	0.0	NP	NP
617	16_N_U	Rivers	10.8	20	2.2	1.7	0.0	0.0	NP	NP
618	16_P_F	Rivers	8.6	20	1.7	1.3	0.0	0.0	NP	NP
619	16_P_L	Rivers	379.1	20	75.8	59.6	3.4	1.6	NP	NP
620	16_P_M	Rivers	44.4	20	8.9	7.0	2.0	1.7	PP	PP
621	16_P_U	Rivers	472.6	20	94.5	74.3	4.7	4.2	PP	NP
622	17_N_M	Rivers	0.1	20	0.0	0.0	0.0	0.0	NP	NP
623	17_N_U	Rivers	0.1	20	0.0	0.0	0.0	0.0	NP	NP
624	17_P_F	Rivers	0.2	20	0.0	0.0	0.0	0.0	NP	NP
625	17_P_L	Rivers	157.5	20	31.5	24.8	2.0	1.4	PP	NP
626	17_P_M	Rivers	6.8	20	1.4	1.1	0.2	0.1	PP	PP
627	17_P_U	Rivers	163.4	20	32.7	25.7	3.5	3.1	PP	PP
628	18_N_F	Rivers	0.2	20	0.0	0.0	0.0	0.0	NP	NP
629	18_N_L	Rivers	156.7	20	31.3	24.6	2.0	1.3	PP	NP
630	18_N_M	Rivers	37.6	20	7.5	5.9	1.3	1.3	PP	PP
631	18_N_U	Rivers	382.7	20	76.5	60.2	9.2	7.4	PP	PP
632	18_P_F	Rivers	0.6	20	0.1	0.1	0.0	0.0	NP	NP
633	18_P_L	Rivers	414.0	20	82.8	65.1	24.0	20.7	PP	PP
634	18_P_M	Rivers	5.3	20	1.1	0.8	0.2	0.0	PP	NP
635	18_P_U	Rivers	107.0	20	21.4	16.8	2.0	1.7	PP	PP
636	19_N_F	Rivers	0.2	20	0.0	0.0	0.2	0.0	WP	NP
637	19_N_L	Rivers	88.6	20	17.7	13.9	4.7	4.4	PP	PP
638	19_N_M	Rivers	27.7	20	5.5	4.4	13.1	11.9	WP	WP
639	19_N_U	Rivers	223.8	20	44.8	35.2	24.0	22.4	MP	PP
640	19_P_F	Rivers	7.0	20	1.4	1.1	0.1	0.1	PP	PP
641	19_P_L	Rivers	301.3	20	60.3	47.4	49.4	39.2	MP	MP
642	19_P_M	Rivers	22.5	20	4.5	3.5	13.4	11.9	WP	WP

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643	19_P_U	Rivers	136.2	20	27.2	21.4	24.0	21.8	MP	MP
644	2_N_F	Rivers	0.3	20	0.1	0.0	0.0	0.0	NP	NP
645	2_N_L	Rivers	4.9	20	1.0	0.8	1.5	1.5	WP	WP
646	2_N_M	Rivers	2.6	20	0.5	0.4	0.0	0.0	PP	PP
647	2_N_U	Rivers	11.6	20	2.3	1.8	1.2	0.9	MP	PP
649	2_P_L	Rivers	35.6	20	7.1	5.6	7.4	7.3	WP	WP
650	2_P_M	Rivers	0.7	20	0.1	0.1	0.0	0.0	NP	NP
651	2_P_U	Rivers	9.8	20	2.0	1.5	0.4	0.4	PP	PP
653	20_N_L	Rivers	21.6	20	4.3	3.4	0.9	0.8	PP	PP
654	20_N_M	Rivers	2.0	20	0.4	0.3	0.2	0.2	MP	PP
655	20_N_U	Rivers	36.6	20	7.3	5.8	3.2	2.8	PP	PP
656	20_P_F	Rivers	4.0	20	0.8	0.6	0.0	0.0	NP	NP
657	20_P_L	Rivers	55.7	20	11.1	8.8	6.4	5.8	MP	MP
658	20_P_M	Rivers	7.7	20	1.5	1.2	4.6	3.5	WP	WP
659	20_P_U	Rivers	57.1	20	11.4	9.0	19.4	16.9	WP	WP
660	21_N_F	Rivers	0.0	20	0.0	0.0	0.0	0.0	NP	NP
661	21_N_L	Rivers	386.8	20	77.4	60.8	8.6	6.5	PP	PP
662	21_N_M	Rivers	28.9	20	5.8	4.5	1.6	1.1	PP	PP
663	21_N_U	Rivers	490.5	20	98.1	77.1	21.1	19.6	PP	PP
664	21_P_F	Rivers	0.3	20	0.1	0.1	0.1	0.0	MP	NP
665	21_P_L	Rivers	85.8	20	17.2	13.5	8.3	4.7	PP	PP
666	21_P_M	Rivers	0.3	20	0.1	0.0	0.0	0.0	MP	MP
667	21_P_U	Rivers	11.6	20	2.3	1.8	0.2	0.0	PP	NP
668	22_N_L	Rivers	8.2	20	1.6	1.3	0.0	0.0	NP	NP
669	22_N_M	Rivers	1.6	20	0.3	0.2	0.1	0.0	PP	NP
670	22_N_U	Rivers	12.6	20	2.5	2.0	0.1	0.1	NP	NP
671	22_P_F	Rivers	5.9	20	1.2	0.9	0.0	0.0	NP	NP
672	22_P_L	Rivers	43.0	20	8.6	6.8	1.9	1.3	PP	PP
673	22_P_M	Rivers	5.9	20	1.2	0.9	4.1	3.8	WP	WP
674	22_P_U	Rivers	15.6	20	3.1	2.4	2.7	2.5	MP	MP
676	23_N_L	Rivers	5.4	20	1.1	0.8	0.0	0.0	NP	NP

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677	23_N_M	Rivers	7.2	20	1.4	1.1	3.3	2.7	WP	WP
678	23_N_U	Rivers	23.9	20	4.8	3.8	1.6	1.5	PP	PP
679	23_P_F	Rivers	0.8	20	0.2	0.1	0.0	0.0	NP	NP
680	23_P_L	Rivers	66.8	20	13.4	10.5	3.5	3.4	PP	PP
681	23_P_M	Rivers	19.9	20	4.0	3.1	15.7	15.1	WP	WP
682	23_P_U	Rivers	69.2	20	13.8	10.9	24.7	23.8	WP	WP
684	24_N_L	Rivers	25.8	20	5.2	4.1	0.3	0.3	NP	NP
685	24_N_M	Rivers	4.8	20	1.0	0.8	0.8	0.8	MP	MP
686	24_N_U	Rivers	23.0	20	4.6	3.6	0.5	0.5	PP	PP
687	24_P_F	Rivers	6.2	20	1.2	1.0	0.2	0.0	PP	NP
688	24_P_L	Rivers	40.3	20	8.1	6.3	0.4	0.4	NP	NP
689	24_P_M	Rivers	4.6	20	0.9	0.7	1.7	1.6	WP	WP
690	24_P_U	Rivers	23.1	20	4.6	3.6	1.0	0.8	PP	PP
692	25_N_L	Rivers	74.4	20	14.9	11.7	8.7	8.7	MP	MP
693	25_N_M	Rivers	3.0	20	0.6	0.5	0.1	0.1	PP	PP
694	25_N_U	Rivers	75.3	20	15.1	11.8	5.3	5.3	PP	PP
695	25_P_F	Rivers	9.5	20	1.9	1.5	0.0	0.0	NP	NP
696	25_P_L	Rivers	30.7	20	6.1	4.8	2.5	2.4	PP	PP
697	26_N_F	Rivers	24.9	20	5.0	3.9	5.7	0.0	WP	NP
698	26_N_L	Rivers	941.8	20	188.4	148.1	5.1	2.6	NP	NP
699	26_N_M	Rivers	10.7	20	2.1	1.7	0.5	0.3	PP	PP
700	26_N_U	Rivers	571.1	20	114.2	89.8	5.6	5.1	NP	NP
701	26_P_F	Rivers	196.1	20	39.2	30.8	50.6	5.1	WP	PP
702	26_P_L	Rivers	303.6	20	60.7	47.7	8.6	4.5	PP	PP
703	26_P_M	Rivers	0.5	20	0.1	0.1	0.4	0.4	WP	WP
704	26_P_U	Rivers	17.5	20	3.5	2.8	0.2	0.2	PP	PP
706	27_N_L	Rivers	68.4	20	13.7	10.8	2.1	2.1	PP	PP
707	27_N_M	Rivers	11.8	20	2.4	1.9	2.9	2.9	WP	WP
708	27_N_U	Rivers	125.9	20	25.2	19.8	16.6	16.6	MP	MP
709	28_N_L	Rivers	16.3	20	3.3	2.6	2.5	2.5	MP	MP
710	28_N_M	Rivers	4.2	20	0.8	0.7	2.1	2.1	WP	WP

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711	28_N_U	Rivers	72.7	20	14.5	11.4	23.7	23.6	WP	WP
712	28_P_F	Rivers	48.3	20	9.7	7.6	10.0	9.8	WP	WP
713	28_P_L	Rivers	17.5	20	3.5	2.8	1.5	1.5	PP	PP
714	28_P_U	Rivers	3.0	20	0.6	0.5	1.3	1.3	WP	WP
715	29_N_F	Rivers	53.5	20	10.7	8.4	0.6	0.4	PP	NP
716	29_N_L	Rivers	249.9	20	50.0	39.3	0.2	0.0	NP	NP
717	29_N_M	Rivers	0.7	20	0.1	0.1	0.0	0.0	NP	NP
718	29_N_U	Rivers	80.7	20	16.1	12.7	0.0	0.0	NP	NP
719	29_P_F	Rivers	74.4	20	14.9	11.7	24.7	0.1	WP	NP
720	29_P_L	Rivers	45.9	20	9.2	7.2	1.5	1.5	PP	PP
721	29_P_U	Rivers	4.3	20	0.9	0.7	0.0	0.0	NP	NP
722	3_N_F	Rivers	0.8	20	0.2	0.1	0.4	0.0	WP	NP
723	3_N_L	Rivers	112.6	20	22.5	17.7	68.2	66.1	WP	WP
724	3_N_M	Rivers	5.6	20	1.1	0.9	1.9	1.8	WP	WP
725	3_N_U	Rivers	78.5	20	15.7	12.3	32.9	32.2	WP	WP
726	3_P_F	Rivers	14.0	20	2.8	2.2	8.7	1.1	WP	PP
727	3_P_L	Rivers	390.6	20	78.1	61.4	151.7	145.9	WP	WP
728	3_P_M	Rivers	5.0	20	1.0	0.8	1.0	0.9	WP	MP
729	3_P_U	Rivers	95.2	20	19.0	15.0	10.7	10.3	MP	MP
731	30_N_L	Rivers	48.5	20	9.7	7.6	0.4	0.4	NP	NP
732	30_N_M	Rivers	0.4	20	0.1	0.1	0.0	0.0	PP	PP
733	30_N_U	Rivers	42.6	20	8.5	6.7	0.2	0.2	NP	NP
734	31_N_M	Rivers	0.2	20	0.0	0.0	0.0	0.0	NP	NP
735	31_N_U	Rivers	2.2	20	0.4	0.4	0.0	0.0	NP	NP
736	31_P_F	Rivers	4.7	20	0.9	0.7	0.0	0.0	NP	NP
737	31_P_L	Rivers	214.5	20	42.9	33.7	5.3	4.9	PP	PP
738	31_P_M	Rivers	3.4	20	0.7	0.5	0.0	0.0	NP	NP
739	31_P_U	Rivers	171.9	20	34.4	27.0	0.4	0.2	NP	NP
741	4_N_L	Rivers	3.8	20	0.8	0.6	1.0	0.3	WP	PP
742	4_N_M	Rivers	2.1	20	0.4	0.3	0.1	0.1	PP	PP
743	4_N_U	Rivers	11.8	20	2.4	1.9	0.3	0.2	PP	PP

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745	4_P_L	Rivers	44.5	20	8.9	7.0	3.0	1.5	PP	PP
746	4_P_M	Rivers	5.3	20	1.1	0.8	0.7	0.7	MP	MP
747	4_P_U	Rivers	69.6	20	13.9	10.9	4.3	3.7	PP	PP
748	5_N_L	Rivers	9.6	20	1.9	1.5	0.1	0.1	NP	NP
749	5_N_M	Rivers	0.6	20	0.1	0.1	0.0	0.0	NP	NP
750	5_N_U	Rivers	17.6	20	3.5	2.8	1.1	1.1	PP	PP
751	5_P_L	Rivers	11.3	20	2.3	1.8	0.2	0.2	PP	PP
752	5_P_M	Rivers	0.2	20	0.0	0.0	0.0	0.0	NP	NP
753	5_P_U	Rivers	10.0	20	2.0	1.6	0.0	0.0	NP	NP
754	6_N_L	Rivers	4.5	20	0.9	0.7	0.3	0.3	PP	PP
755	6_N_M	Rivers	1.0	20	0.2	0.2	0.3	0.3	WP	WP
756	6_N_U	Rivers	15.8	20	3.2	2.5	2.3	2.3	MP	MP
757	6_P_F	Rivers	1.4	20	0.3	0.2	0.3	0.3	WP	MP
758	6_P_L	Rivers	36.8	20	7.4	5.8	5.7	2.7	MP	PP
759	6_P_M	Rivers	1.6	20	0.3	0.3	0.2	0.2	MP	MP
760	6_P_U	Rivers	39.9	20	8.0	6.3	4.9	4.8	MP	MP
761	7_N_F	Rivers	0.3	20	0.1	0.0	0.0	0.0	NP	NP
762	7_N_L	Rivers	13.9	20	2.8	2.2	2.3	2.2	MP	MP
763	7_N_M	Rivers	2.7	20	0.5	0.4	0.7	0.7	WP	WP
764	7_N_U	Rivers	34.8	20	7.0	5.5	4.3	3.9	MP	MP
765	7_P_F	Rivers	4.7	20	0.9	0.7	0.9	0.9	MP	MP
766	7_P_L	Rivers	72.8	20	14.6	11.5	1.2	0.7	PP	NP
767	7_P_M	Rivers	1.6	20	0.3	0.3	0.1	0.1	PP	PP
768	7_P_U	Rivers	53.3	20	10.7	8.4	3.9	3.3	PP	PP
769	8_N_F	Rivers	0.0	20	0.0	0.0	0.0	0.0	NP	NP
770	8_N_L	Rivers	78.1	20	15.6	12.3	3.6	2.3	PP	PP
771	8_N_M	Rivers	1.9	20	0.4	0.3	0.5	0.4	WP	WP
772	8_N_U	Rivers	47.0	20	9.4	7.4	3.2	3.1	PP	PP
773	8_P_F	Rivers	28.6	20	5.7	4.5	5.2	0.9	MP	PP
774	8_P_L	Rivers	164.3	20	32.9	25.8	15.7	9.6	PP	PP
775	8_P_M	Rivers	1.6	20	0.3	0.3	0.5	0.4	WP	WP

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776	8_P_U	Rivers	55.4	20	11.1	8.7	1.7	0.9	PP	PP
777	9_N_F	Rivers	0.4	20	0.1	0.1	0.4	0.1	WP	WP
778	9_N_L	Rivers	0.8	20	0.2	0.1	0.1	0.1	PP	PP
779	9_N_M	Rivers	7.2	20	1.4	1.1	0.8	0.8	MP	MP
780	9_N_U	Rivers	41.4	20	8.3	6.5	1.0	1.0	PP	PP
781	9_P_F	Rivers	1.8	20	0.4	0.3	0.0	0.0	NP	NP
782	9_P_L	Rivers	117.3	20	23.5	18.4	13.6	13.2	MP	MP
783	9_P_M	Rivers	8.6	20	1.7	1.4	1.0	0.6	MP	PP
784	9_P_U	Rivers	126.7	20	25.3	19.9	12.9	11.5	MP	PP
785	Unknown	Wetlands	16.3	20	3.3	2.5	2.5	2.5	MP	MP
786	Albany Thicket Bontveld	Wetlands	0.3	20	0.1	0.1	0.0	0.0	PP	PP
787	Albany Thicket Escarpment	Wetlands	1.7	20	0.3	0.3	0.1	0.1	PP	PP
788	Albany Thicket Valley	Wetlands	159.0	20	31.8	25.0	9.0	7.6	PP	PP
789	Central Bushveld Group 1	Wetlands	31.5	20	6.3	5.0	1.5	0.9	PP	PP
790	Central Bushveld Group 2	Wetlands	253.4	20	50.7	39.8	39.6	28.5	MP	MP
791	Central Bushveld Group 3	Wetlands	131.6	20	26.3	20.7	10.3	9.5	PP	PP
792	Central Bushveld Group 4	Wetlands	76.7	20	15.3	12.1	6.4	5.7	PP	PP
793	Central Bushveld Group 5	Wetlands	34.5	20	6.9	5.4	0.2	0.2	NP	NP
794	Central Bushveld Group 6	Wetlands	6.3	20	1.3	1.0	0.1	0.0	NP	NP
795	Central Bushveld Group 7	Wetlands	19.0	20	3.8	3.0	0.1	0.0	NP	NP
796	Central Bushveld Group 8	Wetlands	24.7	20	4.9	3.9	3.3	1.5	MP	PP
797	Central Bushveld Group 9	Wetlands	0.2	20	0.0	0.0	0.0	0.0	MP	MP
798	Drakensberg Grassland Group 1	Wetlands	26.4	20	5.3	4.2	0.0	0.0	NP	NP
799	Drakensberg Grassland Group 2	Wetlands	25.1	20	5.0	4.0	0.0	0.0	NP	NP
800	Drakensberg Grassland Group 3	Wetlands	13.7	20	2.7	2.2	0.5	0.5	PP	PP
801	Drakensberg Grassland Group 4	Wetlands	5.8	20	1.2	0.9	4.1	4.1	WP	WP
802	Drakensberg Grassland Group 5	Wetlands	5.1	20	1.0	0.8	1.8	1.7	WP	WP
803	Dry Highveld Grassland Group 1	Wetlands	39.5	20	7.9	6.2	0.3	0.2	NP	NP
804	Dry Highveld Grassland Group 2	Wetlands	181.6	20	36.3	28.6	16.6	0.9	PP	NP
805	Dry Highveld Grassland Group 3	Wetlands	1444.9	20	289.0	227.2	47.9	21.8	PP	PP
806	Dry Highveld Grassland Group 4	Wetlands	200.1	20	40.0	31.5	10.9	7.6	PP	PP

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807	Dry Highveld Grassland Group 5	Wetlands	357.9	20	71.6	56.3	4.1	2.6	PP	NP
808	East Coast Alluvium Renosterveld	Wetlands	9.1	20	1.8	1.4	0.6	0.6	PP	PP
810	East Coast Shale Renosterveld	Wetlands	826.2	20	165.2	129.9	56.3	53.5	PP	PP
811	East Coast Silcrete Renosterveld	Wetlands	1.9	20	0.4	0.3	0.0	0.0	NP	NP
812	Eastern Fynbos-Renosterveld Conglomerate Fynbos	Wetlands	0.2	20	0.0	0.0	0.0	0.0	NP	NP
813	Eastern Fynbos-Renosterveld Granite Fynbos	Wetlands	21.3	20	4.3	3.4	0.0	0.0	NP	NP
814	Eastern Fynbos-Renosterveld Quartzite Fynbos	Wetlands	0.2	20	0.0	0.0	0.0	0.0	MP	MP
815	Eastern Fynbos-Renosterveld Sand Fynbos	Wetlands	0.2	20	0.0	0.0	0.0	0.0	NP	NP
816	Eastern Fynbos-Renosterveld Sandstone Fynbos	Wetlands	91.8	20	18.4	14.4	14.5	14.4	MP	MP
817	Eastern Fynbos-Renosterveld Shale Band Vegetation	Wetlands	1.2	20	0.2	0.2	0.0	0.0	PP	PP
818	Eastern Fynbos-Renosterveld Shale Fynbos	Wetlands	26.3	20	5.3	4.1	0.5	0.5	PP	PP
819	Eastern Fynbos-Renosterveld Shale Renosterveld	Wetlands	24.3	20	4.9	3.8	0.0	0.0	NP	NP
820	Eastern Kalahari Bushveld Group 1	Wetlands	498.7	20	99.7	78.4	7.7	7.4	PP	PP
821	Eastern Kalahari Bushveld Group 2	Wetlands	87.5	20	17.5	13.8	0.8	0.5	NP	NP
822	Eastern Kalahari Bushveld Group 3	Wetlands	572.8	20	114.6	90.1	14.7	13.8	PP	PP
823	Eastern Kalahari Bushveld Group 4	Wetlands	7.9	20	1.6	1.2	0.0	0.0	NP	NP
824	Eastern Kalahari Bushveld Group 5	Wetlands	465.3	20	93.1	73.2	2.4	2.4	NP	NP
825	Eastern Kalahari Bushveld Group 6	Wetlands	49.9	20	10.0	7.8	2.7	2.7	PP	PP
826	Estuarine	Wetlands	71.9	20	14.4	11.3	64.9	0.1	WP	NP
828	Gariep Desert (Dg)	Wetlands	147.0	20	29.4	23.1	32.5	32.4	WP	WP
829	Indian Ocean Coastal Belt Group 1	Wetlands	1027.2	20	205.4	161.5	390.2	377.4	WP	WP
830	Indian Ocean Coastal Belt Group 2	Wetlands	38.6	20	7.7	6.1	0.8	0.6	PP	PP
831	Indian Ocean Coastal Belt Group 3	Wetlands	2.5	20	0.5	0.4	0.8	0.8	WP	WP
832	Indian Ocean Coastal Belt Group 4	Wetlands	3.3	20	0.7	0.5	0.0	0.0	NP	NP
833	Kalahari Duneveld	Wetlands	1212.1	20	242.4	190.6	110.7	110.7	PP	PP
834	Karoo Dolerite Renosterveld	Wetlands	6.1	20	1.2	1.0	0.0	0.0	NP	NP
835	Karoo Shale Renosterveld	Wetlands	19.1	20	3.8	3.0	0.3	0.3	PP	PP
836	Knersvlakte (Skk)	Wetlands	72.5	20	14.5	11.4	11.4	11.3	MP	MP

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837	Lower Nama Karoo	Wetlands	44.5	20	8.9	7.0	0.8	0.6	PP	PP
838	Lowveld Group 1	Wetlands	21.1	20	4.2	3.3	4.8	0.4	WP	PP
839	Lowveld Group 10	Wetlands	181.1	20	36.2	28.5	45.0	45.0	WP	WP
840	Lowveld Group 11	Wetlands	238.8	20	47.8	37.6	40.8	40.0	MP	MP
841	Lowveld Group 2	Wetlands	3.9	20	0.8	0.6	0.5	0.5	MP	MP
842	Lowveld Group 3	Wetlands	89.1	20	17.8	14.0	19.8	4.6	WP	PP
843	Lowveld Group 4	Wetlands	29.5	20	5.9	4.6	15.0	1.0	WP	PP
844	Lowveld Group 5	Wetlands	0.1	20	0.0	0.0	0.1	0.0	WP	MP
845	Lowveld Group 6	Wetlands	0.5	20	0.1	0.1	0.1	0.0	MP	NP
846	Lowveld Group 7	Wetlands	37.9	20	7.6	6.0	1.4	0.7	PP	PP
847	Lowveld Group 8	Wetlands	5.2	20	1.0	0.8	3.2	1.0	WP	MP
848	Lowveld Group 9	Wetlands	48.9	20	9.8	7.7	16.4	9.3	WP	MP
849	Mesic Highveld Grassland Group 1	Wetlands	115.9	20	23.2	18.2	4.3	3.7	PP	PP
850	Mesic Highveld Grassland Group 10	Wetlands	0.6	20	0.1	0.1	0.0	0.0	NP	NP
851	Mesic Highveld Grassland Group 11	Wetlands	0.7	20	0.1	0.1	0.0	0.0	NP	NP
852	Mesic Highveld Grassland Group 2	Wetlands	415.6	20	83.1	65.4	7.3	5.2	PP	PP
853	Mesic Highveld Grassland Group 3	Wetlands	155.5	20	31.1	24.5	1.8	0.4	PP	NP
854	Mesic Highveld Grassland Group 4	Wetlands	161.0	20	32.2	25.3	18.7	1.7	MP	PP
855	Mesic Highveld Grassland Group 5	Wetlands	208.3	20	41.7	32.8	2.7	2.3	PP	PP
856	Mesic Highveld Grassland Group 6	Wetlands	107.1	20	21.4	16.8	16.1	15.4	MP	MP
857	Mesic Highveld Grassland Group 7	Wetlands	55.2	20	11.0	8.7	1.8	1.5	PP	PP
858	Mesic Highveld Grassland Group 8	Wetlands	211.2	20	42.2	33.2	26.5	26.3	MP	MP
859	Mesic Highveld Grassland Group 9	Wetlands	12.5	20	2.5	2.0	7.1	6.8	WP	WP
860	Mopane Group 1	Wetlands	25.1	20	5.0	3.9	14.4	13.5	WP	WP
861	Mopane Group 2	Wetlands	33.4	20	6.7	5.3	13.2	7.9	WP	WP
862	Mopane Group 3	Wetlands	25.2	20	5.0	4.0	25.2	18.6	WP	WP
863	Mopane Group 4	Wetlands	41.6	20	8.3	6.5	21.4	3.9	WP	PP
864	Nama Karoo Bushmanland	Wetlands	4764.3	20	952.9	749.2	7.6	7.2	NP	NP
865	Namaqualand Cape Shrublands Granite Fynbos	Wetlands	0.1	20	0.0	0.0	0.0	0.0	NP	NP
866	Namaqualand Cape Shrublands Granite Renosterveld	Wetlands	3.4	20	0.7	0.5	0.0	0.0	NP	NP

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867	Namaqualand Cape Shrublands Quartzite Fynbos	Wetlands	0.0	20	0.0	0.0	0.0	0.0	WP	WP
868	Namaqualand Hardeveld (Skn)	Wetlands	153.2	20	30.6	24.1	11.8	11.8	PP	PP
869	Namaqualand Sandveld (Sks)	Wetlands	43.1	20	8.6	6.8	1.2	1.2	PP	PP
870	Northwest Alluvium Fynbos	Wetlands	12.6	20	2.5	2.0	0.0	0.0	NP	NP
871	Northwest Quartzite Fynbos	Wetlands	0.8	20	0.2	0.1	0.0	0.0	PP	PP
872	Northwest Sand Fynbos	Wetlands	140.2	20	28.0	22.0	3.5	0.1	PP	NP
873	Northwest Sandstone Fynbos	Wetlands	105.6	20	21.1	16.6	19.2	18.8	MP	MP
874	Northwest Shale Band Vegetation	Wetlands	2.2	20	0.4	0.3	1.8	1.8	WP	WP
875	Northwest Shale Fynbos	Wetlands	7.2	20	1.4	1.1	0.0	0.0	NP	NP
876	Rainshadow Valley Karoo (Skv)	Wetlands	98.2	20	19.6	15.4	10.0	9.6	MP	PP
877	Richtersveld (Skr)	Wetlands	2.8	20	0.6	0.4	0.0	0.0	NP	NP
878	South Coast Limestone Fynbos	Wetlands	56.0	20	11.2	8.8	7.4	7.0	MP	MP
879	South Coast Sand Fynbos	Wetlands	12.6	20	2.5	2.0	0.5	0.5	PP	PP
880	South Strandveld Sand Fynbos	Wetlands	0.8	20	0.2	0.1	0.3	0.3	WP	WP
881	South Strandveld Western Strandveld	Wetlands	24.5	20	4.9	3.9	0.7	0.7	PP	PP
882	Southern Namib Desert (Dn)	Wetlands	0.9	20	0.2	0.1	0.0	0.0	NP	NP
883	Southern Sandstone Fynbos	Wetlands	25.4	20	5.1	4.0	12.3	12.3	WP	WP
884	Southern Shale Band Vegetation	Wetlands	1.7	20	0.3	0.3	0.5	0.5	WP	WP
885	Southern Shale Fynbos	Wetlands	1.4	20	0.3	0.2	0.0	0.0	NP	NP
886	Southern Silcrete Fynbos	Wetlands	25.7	20	5.1	4.0	7.9	7.9	WP	WP
887	Southwest Alluvium Fynbos	Wetlands	40.4	20	8.1	6.3	9.7	9.3	WP	WP
888	Southwest Ferricrete Fynbos	Wetlands	213.1	20	42.6	33.5	37.7	37.1	MP	MP
889	Southwest Granite Fynbos	Wetlands	1.6	20	0.3	0.2	0.6	0.5	WP	WP
891	Southwest Sand Fynbos	Wetlands	54.5	20	10.9	8.6	6.6	6.4	MP	MP
892	Southwest Sandstone Fynbos	Wetlands	54.2	20	10.8	8.5	17.4	16.2	WP	WP
893	Southwest Shale Band Vegetation	Wetlands	0.4	20	0.1	0.1	0.3	0.3	WP	WP
894	Southwest Shale Fynbos	Wetlands	26.6	20	5.3	4.2	4.4	3.9	MP	MP
895	Soutwest Sand Fynbos	Wetlands	0.0	20	0.0	0.0	0.0	0.0	NP	NP
896	Sub-Escarpment Grassland Group 1	Wetlands	8.2	20	1.6	1.3	0.0	0.0	NP	NP
897	Sub-Escarpment Grassland Group 2	Wetlands	224.7	20	44.9	35.3	0.7	0.6	NP	NP

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898	Sub-Escarpment Grassland Group 3	Wetlands	171.4	20	34.3	27.0	1.9	1.5	PP	NP
899	Sub-Escarpment Grassland Group 4	Wetlands	758.0	20	151.6	119.2	7.5	4.6	NP	NP
900	Sub-Escarpment Grassland Group 5	Wetlands	384.9	20	77.0	60.5	28.3	26.6	PP	PP
901	Sub-Escarpment Grassland Group 6	Wetlands	463.5	20	92.7	72.9	0.8	0.1	NP	NP
902	Sub-Escarpment Grassland Group 7	Wetlands	82.0	20	16.4	12.9	0.0	0.0	NP	NP
903	Sub-Escarpment Grassland Group 8	Wetlands	11.3	20	2.3	1.8	0.0	0.0	NP	NP
904	Sub-Escarpment Grassland Group 9	Wetlands	2.5	20	0.5	0.4	0.0	0.0	NP	NP
905	Sub-Escarpment Savanna	Wetlands	360.0	20	72.0	56.6	0.5	0.4	NP	NP
906	Swamp Forest	Wetlands	0.7	20	0.1	0.1	0.6	0.6	WP	WP
907	Trans-Escarpment Succulent Karoo (Skt)	Wetlands	98.2	20	19.6	15.4	0.0	0.0	NP	NP
908	Upper Nama Karoo	Wetlands	981.6	20	196.3	154.4	5.1	4.3	NP	NP
909	West Coast Alluvium Renosterveld	Wetlands	5.3	20	1.1	0.8	0.0	0.0	NP	NP
910	West Coast Granite Renosterveld	Wetlands	6.7	20	1.3	1.0	0.0	0.0	NP	NP
911	West Coast Shale Renosterveld	Wetlands	70.0	20	14.0	11.0	0.0	0.0	NP	NP
912	West Coast Silcrete Renosterveld	Wetlands	0.5	20	0.1	0.1	0.0	0.0	NP	NP
913	Western Fynbos-Renosterveld Conglomerate Fynbos	Wetlands	0.1	20	0.0	0.0	0.0	0.0	NP	NP
914	Western Fynbos-Renosterveld Limestone Renosterveld	Wetlands	0.4	20	0.1	0.1	0.0	0.0	NP	NP
915	Western Fynbos-Renosterveld Quartzite Fynbos	Wetlands	0.2	20	0.0	0.0	0.0	0.0	NP	NP
916	Western Fynbos-Renosterveld Sandstone Fynbos	Wetlands	0.6	20	0.1	0.1	0.3	0.3	WP	WP
917	Western Fynbos-Renosterveld Shale Band Vegetation	Wetlands	0.1	20	0.0	0.0	0.1	0.1	WP	WP
918	Western Fynbos-Renosterveld Shale Fynbos	Wetlands	0.1	20	0.0	0.0	0.0	0.0	NP	NP
919	Western Fynbos-Renosterveld Shale Renosterveld	Wetlands	20.9	20	4.2	3.3	6.7	5.4	WP	WP
920	Western Strandveld	Wetlands	41.1	20	8.2	6.5	5.4	5.3	MP	MP
922	Cool Temp LargeClosedFreshTurbid	Estuary	24.7	20	4.9	3.9	0.0	0.0	NP	NP
923	Cool Temp LargeClosedMixedBlack	Estuary	59.9	20	12.0	9.4	7.3	0.0	MP	NP
924	Cool Temp LargeClosedMixedClear	Estuary	12.2	20	2.4	1.9	0.0	0.0	NP	NP
925	Cool Temp LargeOpenMixedClear	Estuary	121.9	20	24.4	19.2	0.0	0.0	NP	NP
926	Cool Temp MediumClosedFreshBlack	Estuary	21.6	20	4.3	3.4	0.0	0.0	NP	NP

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927	Cool Temp MediumClosedMixedBlack	Estuary	6.1	20	1.2	1.0	0.1	0.0	PP	NP
928	Cool Temp MediumClosedMixedClear	Estuary	11.7	20	2.3	1.8	0.2	0.0	PP	NP
929	Cool Temp MediumClosedMixedTurbid	Estuary	5.5	20	1.1	0.9	0.6	0.0	MP	NP
930	Cool Temp SmallClosedFreshBlack	Estuary	2.2	20	0.4	0.4	0.2	0.0	MP	NP
931	Cool Temp SmallClosedMixedBlack	Estuary	1.1	20	0.2	0.2	0.6	0.0	WP	NP
932	Cool Temp SmallOpenFreshBlack	Estuary	0.0	20	0.0	0.0	0.0	0.0	WP	NP
933	Cool Temp SmallOpenMixedBlack	Estuary	3.0	20	0.6	0.5	2.6	0.0	WP	NP
935	Subtropical LargeClosedFreshTurbid	Estuary	81.4	20	16.3	12.8	42.4	0.0	WP	NP
936	Subtropical LargeClosedMixedClear	Estuary	60.6	20	12.1	9.5	60.1	0.0	WP	NP
937	Subtropical LargeClosedMixedTurbid	Estuary	569.1	20	113.8	89.5	513.5	0.0	WP	NP
938	Subtropical LargeOpenMarineClear	Estuary	35.4	20	7.1	5.6	0.0	0.0	NP	NP
939	Subtropical LargeOpenMarineTurbid	Estuary	89.3	20	17.9	14.0	13.1	0.0	MP	NP
940	Subtropical LargeOpenMixedClear	Estuary	6.1	20	1.2	1.0	1.9	0.0	WP	NP
941	Subtropical LargeOpenMixedTurbid	Estuary	31.5	20	6.3	5.0	3.8	0.0	MP	NP
942	Subtropical MediumClosedFreshTurbid	Estuary	12.3	20	2.5	1.9	0.0	0.0	NP	NP
943	Subtropical MediumClosedMixedBlack	Estuary	1.8	20	0.4	0.3	0.0	0.0	NP	NP
944	Subtropical MediumClosedMixedClear	Estuary	33.8	20	6.8	5.3	4.9	0.0	MP	NP
945	Subtropical MediumClosedMixedTurbid	Estuary	16.8	20	3.4	2.6	0.4	0.0	PP	NP
946	Subtropical MediumOpenMarineClear	Estuary	6.1	20	1.2	1.0	0.0	0.0	NP	NP
947	Subtropical MediumOpenMixedTurbid	Estuary	7.1	20	1.4	1.1	1.2	0.0	MP	NP
948	Subtropical SmallClosedFreshBlack	Estuary	0.1	20	0.0	0.0	0.0	0.0	WP	NP
949	Subtropical SmallClosedMixedBlack	Estuary	1.9	20	0.4	0.3	0.1	0.0	PP	NP
950	Subtropical SmallClosedMixedClear	Estuary	1.7	20	0.3	0.3	0.3	0.0	WP	NP
951	WarmTemp LargeClosedMarineClear	Estuary	2.1	20	0.4	0.3	0.0	0.0	NP	NP
952	WarmTemp LargeClosedMixedBlack	Estuary	43.3	20	8.7	6.8	18.9	0.0	WP	NP
953	WarmTemp LargeClosedMixedClear	Estuary	7.1	20	1.4	1.1	0.3	0.0	PP	NP
954	WarmTemp LargeOpenMarineBlack	Estuary	25.1	20	5.0	3.9	0.0	0.0	NP	NP
955	WarmTemp LargeOpenMarineClear	Estuary	21.0	20	4.2	3.3	1.0	0.0	PP	NP
956	WarmTemp LargeOpenMixedBlack	Estuary	50.2	20	10.0	7.9	1.6	0.0	PP	NP
957	WarmTemp LargeOpenMixedClear	Estuary	142.5	20	28.5	22.4	25.6	0.0	MP	NP
958	WarmTemp LargeOpenMixedTurbid	Estuary	82.7	20	16.5	13.0	6.5	0.0	PP	NP

Ecosystem number	Ecosystem name	Biozone	Area (km²)	Long-term target (%)	Long-term target (km²)	20-year target (km²)	Area in PA (km²)	Intact Area in PA (km²)	Protection level	Protection level (Intact)
959	WarmTemp MediumClosedMixedBlack	Estuary	18.0	20	3.6	2.8	12.2	0.0	WP	NP
960	WarmTemp MediumClosedMixedClear	Estuary	21.4	20	4.3	3.4	2.9	0.0	MP	NP
961	WarmTemp MediumOpenMixedBlack	Estuary	0.2	20	0.0	0.0	0.0	0.0	NP	NP
962	WarmTemp MediumOpenMixedClear	Estuary	5.1	20	1.0	0.8	0.3	0.0	PP	NP
963	WarmTemp MediumOpenMixedTurbid	Estuary	2.5	20	0.5	0.4	0.0	0.0	NP	NP
964	WarmTemp SmallClosedFreshBlack	Estuary	0.2	20	0.0	0.0	0.0	0.0	NP	NP
965	WarmTemp SmallClosedMixedBlack	Estuary	0.8	20	0.2	0.1	0.4	0.0	WP	PP
966	WarmTemp SmallClosedMixedClear	Estuary	1.9	20	0.4	0.3	0.3	0.1	MP	PP
967	WarmTemp SmallOpenFreshBlack	Estuary	0.2	20	0.0	0.0	0.2	0.0	WP	PP
968	WarmTemp SmallOpenMixedBlack	Estuary	0.2	20	0.0	0.0	0.1	0.0	WP	NP
969	Southern Oceans	Southern Oceans	473375.0	20	94675.0	47337.5	180862.0	180862.0	WP	WP
970	Subantarctic Polar Desert	Subantarctic Polar Desert	109.9	20	22.0	17.3	109.9	109.9	WP	WP
971	Subantarctic Cinder Cones	Subantarctic Tundra	9.6	20	1.9	1.5	9.6	9.6	WP	WP
972	Subantarctic Coastal Vegetation	Subantarctic Tundra	12.1	20	2.4	1.9	12.1	12.1	WP	WP
973	Subantarctic Fellfield	Subantarctic Tundra	126.9	20	25.4	20.0	126.9	126.9	WP	WP
974	Subantarctic Mire-Slope Vegetation	Subantarctic Tundra	84.8	20	17.0	13.3	84.8	84.8	WP	WP
975	Pelagic Habitat 23	Pelagic	126993.0	20	25398.6	12699.3	0.0	0.0	NP	NP
976	Pelagic Habitat 7	Pelagic	9830.2	20	1966.0	983.0	0.0	0.0	NP	NP
977	Pelagic Habitat 10	Pelagic	65294.9	20	13059.0	6529.5	0.0	0.0	NP	NP
978	Pelagic Habitat 12	Pelagic	73695.5	20	14739.1	7369.6	0.0	0.0	NP	NP
979	Pelagic Habitat 11	Pelagic	97950.6	20	19590.1	9795.1	0.0	0.0	NP	NP
980	Pelagic Habitat 2	Pelagic	144107.0	20	28821.4	14410.7	0.0	0.0	NP	NP
981	Pelagic Habitat 1	Pelagic	68898.2	20	13779.6	6889.8	410.0	363.9	NP	NP
982	Pelagic Habitat 47	Pelagic	54965.9	20	10993.2	5496.6	578.9	206.3	PP	NP
983	Pelagic Habitat 9	Pelagic	55908.2	20	11181.6	5590.8	0.0	0.0	NP	NP
984	Pelagic Habitat 48	Pelagic	31412.1	20	6282.4	3141.2	95.4	34.1	NP	NP
985	Pelagic Habitat 21	Pelagic	59293.1	20	11858.6	5929.3	0.0	0.0	NP	NP
986	Pelagic Habitat 41	Pelagic	171579.0	20	34315.8	17157.9	0.0	0.0	NP	NP
987	Pelagic Habitat 38	Pelagic	28806.0	20	5761.2	2880.6	1389.8	1389.8	PP	PP
988	Pelagic Habitat 39	Pelagic	30790.3	20	6158.1	3079.0	0.0	0.0	NP	NP

Ecosystem number	Ecosystem name	Biozone	Area (km²)	Long-term target (%)	Long-term target (km²)	20-year target (km²)	Area in PA (km²)	Intact Area in PA (km²)	Protection level	Protection level (Intact)
989	Pelagic Habitat 40	Pelagic	22603.6	20	4520.7	2260.4	607.9	585.0	PP	PP
990	Pelagic Habitat 45	Pelagic	31467.3	20	6293.5	3146.7	0.0	0.0	NP	NP

Appendix 2: Supporting technical notes

This appendix provides more detailed background information beyond what could be included in the main document. The key sections covered in the appendix are:

- **Technical Note 1:** More detailed information on the approach and principles used to set targets.
- **Technical Note 2:** The detailed method for calculating targets.
- **Technical Note 3:** Supporting information on the creation of the integrated ecosystem map.
- **Technical Note 4:** Supporting information on the creation of the integrated ecosystem condition map.

Technical Note 1: Protected area targets

Protected area targets are action targets that indicate how much of each ecosystem should be included in protected areas, thus guiding protected area expansion to focus on ecosystems that are least protected. Internationally, the Convention on Biological Diversity (CBD) to which South Africa is a signatory, commits governments to a range of targets generally known as Aichi biodiversity targets. Target 11 states that "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". The key issues to highlight are that the CBD is very specific about the network needing to be ecologically representative and that the targets need to be met by intact habitat that is ecologically functional and is conserved in protected areas and other effective area-based conservation measures. Further, the flat targets of 17% and 10% are relatively arbitrary, and are politically decided rather than based on ecologically rationale.

South Africa has a well-established system of systematic biodiversity planning which uses biodiversity targets to determine which areas of the landscape and seascape are most important for conserving a representative sample of biodiversity pattern (ecosystems and species) and for keeping key ecological processes intact. These targets are used as the basis for national monitoring of Ecosystem Threat Status and Protection Levels in the National Biodiversity Assessment (NBA)[56]. The system, and specific values, of thresholds set out in the NBA is widely used and well-accepted across South Africa. These thresholds are widely used in national systematic biodiversity planning processes such as the National Freshwater Ecosystem Priority Areas Assessment (NFEPA)[57], prioritization for marine protected areas in projects such as the Offshore Marine Protected Area (OMPA) Project 2011[58], and the National Estuary Biodiversity Plan for South Africa 2012[59].

The same ecosystem targets are used in provincial conservation plans. Biodiversity targets for terrestrial ecosystems in South Africa range from 16% to 36% of the original extent of each ecosystem, with higher thresholds for more variable and species-rich ecosystems. In the absence of better data, a 20% biodiversity threshold is used for marine, river, wetland and estuarine systems.

[56] The targets are often called biodiversity thresholds. See Driver et al. 2012 for explanations of the thresholds, the systematic conservation planning approach used in South Africa and details on the biodiversity targets, how they are determined, and how they are used in the evaluations of ecosystem protection level.
[57] Nel et al. 2011
[58] Sink et al. 2011.
[59] Turpie et al. 2012.

The NPAES 2008 set long-term protected area targets equal to the biodiversity targets, so that protected area targets would have an underlying science-basis reflecting the ecological requirements for protecting ecosystems effectively.

The long-term goal was to incorporate into the protected area network at least that proportion of each ecosystem required to meet its biodiversity target. For the 20-year target, the biodiversity targets for individual ecosystems were adjusted so that they would cumulatively add up to the CBD target, which was 12% at that time for terrestrial areas. Specific habitat based protected area targets were set for each terrestrial habitat. More general targets, that were not habitat based, were set for marine (20% of which 15% should be no-take zones) and coastal systems (25% of the coast length of which 15% should be no-take zones). Although the need for these targets was emphasised in the NPAES 2008, no specific targets could be set for rivers, wetlands or estuaries, as suitable habitat maps were not yet available.

There are a number of issues relevant to protected area targets that have emerged since the NPAES 2008:

- The international CBD targets have increased to 17% of terrestrial and inland water, and 10% of coastal and marine areas, and the timelines have been adjusted. Further, there is a far stronger emphasis on the network needing to be ecologically representative and that the targets need to be met by intact habitat that is ecologically functional and is conserved in protected areas and other effective area-based conservation measures.
- The coast length target proved to be very difficult to monitor as the further you zoom into a coastline, the more detail you see and the longer the line is. Also it is important to recognize that natural ecosystems do not consist of a line, but rather consist of areas.
- In addition to the maps of terrestrial ecosystem types, we have how good maps of rivers, wetlands, estuaries and marine ecosystems. We need to set targets for these features. Unfortunately, these maps were separately created, with the consequence that one can have different habitat types overlapping (e.g. a terrestrial ecosystem, a specific river type and a wetland could all be mapped at the same site). This is clearly not the case on the ground, but rather is an issue related to our current fragmented approach to ecosystem mapping[60] . This means that if one just adds up the individual thresholds for these features that they will artificially inflate the target required[61].
- The terrestrial ecosystem map has been updated, with the consequence that areas of specific habitat types have changed. Similarly, both the wetland and marine ecosystem maps have had a series of spatial updates.

The NPAES has built on the principles and approach established for the NPAES 2008. The core elements of this approach, which we have retained, are:

- In the long term, South Africa's protected area targets should align with its established biodiversity thresholds. This ensures that, in principle, enough of each ecosystem will be protected to ensure that no further ecosystems can become Critically Endangered as sufficient intact habitat would be secured in the long term to avoid crossing this threshold. Further, alignment of the targets allows for consistent and aligned reporting.

[60] An integrated habitat map is a key priority for the National Biodiversity Assessment 2018.

[61] It has been argued that this does not matter as one would just add all the features together that are found at a site when one is calculating protection levels. However, this could result in falsely targeting sites for protection where the mapped features overlap. There would clearly be no rational ecological argument for this, as in reality only one ecosystem is found at a site.

- Targets should be specifically set for each ecosystem.
- Although overall the long term targets should meet the total CBD commitment, we optimize the allocation across habitats to reflect differing levels of biodiversity, i.e. we increase targets for diverse habitats, but reduce them in relatively low diversity habitats so that the overall commitment in terms of area remains the same. This ensures an optimal biodiversity outcome from our protected area expansion process.
- Over a 20-year period, South Africa's protected area targets should aim to achieve its commitments under the Convention on Biological Diversity even if the convention's timelines are not adhered to.
- Shorter term targets are calculated as a proportion of the 20-year target i.e. the 5 year target is a quarter of the 20 year target.

In addition, the following principles have been added:

- Targets should also be set for marine, wetland, river and estuarine features at the ecosystem level.
- Targets can be met only by intact habitat. This principle was established in the NPAES 2008 but was only partially implemented as only artificial waterbodies were excluded at that time.
- Targets can be met in protected areas and other areas with effective area-based conservation measures. Currently, we only evaluate protected areas, as these are the only areas where biodiversity is currently legally secured. In the future, once other area based conservation mechanisms have been secured effectively (e.g. through having intact natural areas of biospheres strictly zoned for conservation, subject to robust and effective land use controls, and have well-capacitated management authorities), it is anticipated that the intact and secure areas zoned for conservation under these other measures will also contribute to meeting targets.
- Targets for features should not be artificially inflated by having falsely overlapping habitat maps.
- The approach should be to set out clear principles for target setting, so that when habitat maps inevitably improve, biodiversity targets are refined (e.g. through more detailed biodiversity survey of aquatic habitats), or political commitments change (e.g. a revised CBD target), that it is a minor administrative and GIS task to recalculate the area required. A key element of this is that we need to move away from being fixated by the area measurement of target, which is in fact a secondary calculation, and rather realize that the area required is a function of the percentage of the habitat that is required and the mapped original extent of the feature.

Technical Note 2: Calculating targets

Targets are a fundamental building block guiding the design, implementation and evaluation of any protected area network that aims to be fully representative of all biodiversity. As discussed in the main body of the NPAES and in Technical Note One, targets for each ecosystem are a function of the original extent of that ecosystem; the proportion of the ecosystem that needs to be conserved to retain all its key biodiversity pattern and process (i.e. the biodiversity target); the political, administrative and practical considerations of how much to expand the protected area network; and finally, interim targets are influenced by timelines for implementation. All of these elements are however subject to change. For example, additional wetlands could be mapped which changes the original extent, new surveys could result in better biodiversity targets being set, the Aichi biodiversity targets related to CBD commitments could be altered, and finally a protected area expansion strategy may be implemented over a longer period. Therefore, the NPAES has established a system that sets robust targets, but which can be quickly and easily updated when changes in any of the input elements occurs. Ideally, it should be a minor GIS and administrative task to recalculate the required target.

The target calculation is undertaken for each ecosystem[62] using the following steps:

1. Identify the appropriate biodiversity target percentage to use for the ecosystem in question[63]. These currently range from 16 to 36% for terrestrial ecosystems, with a 20% target used for other ecosystems. The appropriate biodiversity threshold for each ecosystem is published in the latest National Biodiversity Assessment (NBA). Should the biodiversity thresholds, as published in the NBA change (e.g. as a result of research which improves our knowledge of the portion of a specific ecosystem which needs to be kept intact to conserve all its biodiversity elements), this change should also be applied to the NPAES. This percentage value should be used as the long-term protected area target. Securing this area in effectively managed protected areas will in theory ensure that no further ecosystems will become Critically Endangered, though obviously this opportunity has already been lost for many systems. Aligning the values also allows for robust and consistent assessment, and full alignment between the NPAES and the NBA.
2. Calculate the required area to secure the long-term protected area target. This is achieved by calculating the area of the ecosystem on an appropriate map, and multiplying this by the long-term protected area target percentage.
3. Establish the relationship between the total area required to meet long term protected area target for all ecosystems and the total area committed to politically or administratively. To do this we added up all the areas required to meet long-term protected area targets and divided it by the total area committed to under the CBD (i.e. 17% of inland and 10% for marine ecosystems). We did the calculation separately for terrestrial and marine systems. As they are mixed systems with terrestrial and marine elements, we treated coastal ecosystems which have a land component as terrestrial. This also ensures better alignment with current planning initiatives. Based on current

[62] The NPAES uses this target setting method on the integrated ecosystem map that was created for this project. However, if the method described above is applied to a different ecosystem map (e.g. a more detailed ecosystem map for a province), the overall outcome will still deliver the required total area to meet national targets. Hence, provinces can use their own maps, and still be confident that if this method is applied that they will be compatible with national requirements. Targets can even be calculated individually for ecosystem maps that are not integrated. The overall alignment with the NPAES will be retained so long as target achievement for individually mapped systems is also separately evaluated.

[63] So long as this method is applied in full, even if a province has set its own different biodiversity targets for ecosystem types, the final total requirement will still be compatible with the overall requirement for meeting national protected area targets.

values, 50% of the long-term biodiversity target is required for all non-coastal marine systems, while 78.63% of the long term biodiversity target is required for all other ecosystems[64].

4. Combined the long-term protected area target with the appropriate proportion from point 3 to calculate the 20-year protected area target.
5. Shorter term protected area targets (e.g. a 5-year target) are calculated as a portion of the 20-year target.

Technical Note 3: Integrated ecosystem map

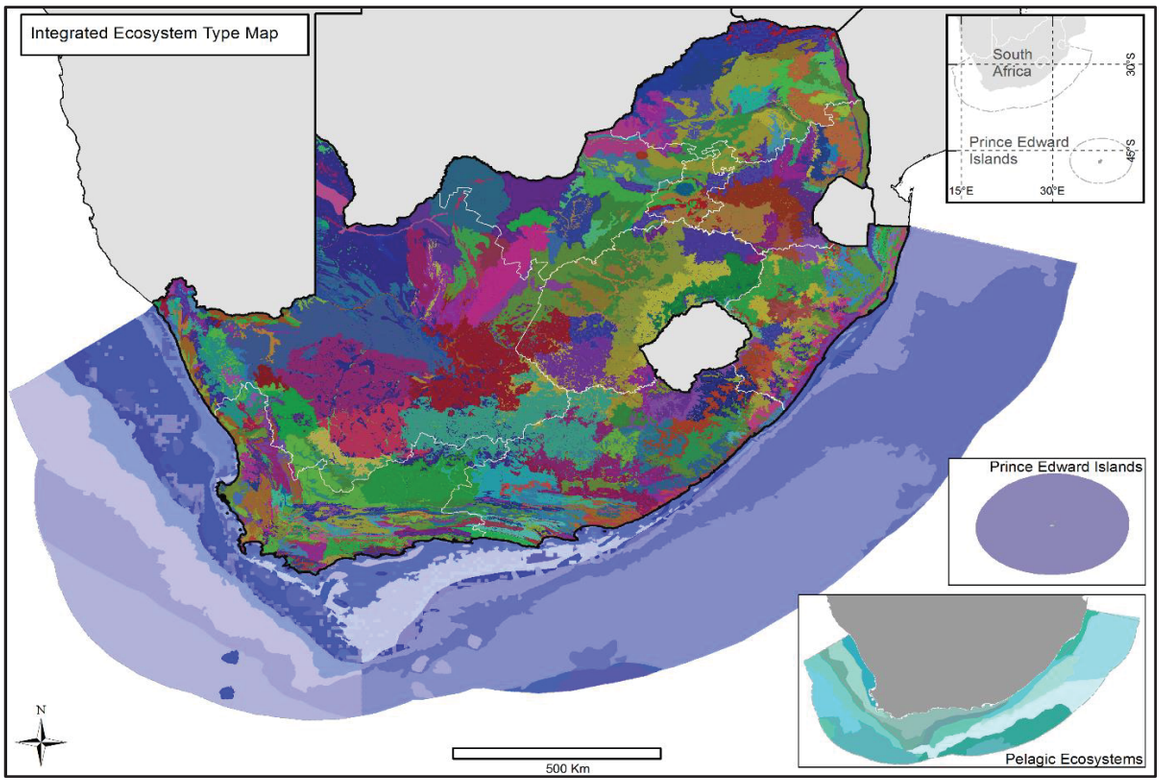

Figure A 1: An integrated ecosystem map was created for South Africa. The map includes 969 distinct terrestrial, river, wetland, estuarine, coastal and marine ecosystems and is mapped for the full extent of South African territory including its EEZ. The inset shows the Prince Edward Islands and their surrounding EEZ. Pelagic offshore ecosystems, which extend over the benthic offshore ecosystems are shown in the second insert. This is the first time an integrated ecosystem map is available for South Africa.

The preparation of a fully integrated ecosystem map covering terrestrial, river, wetland, estuarine, coastal and marine ecosystems was a key activity for the NPAES (***Figure A 1***). Without the map, accurate targets cannot be set and monitoring of achievement of targets is problematic. Although good maps of the individual ecosystem types now exist, these maps were separately created, with the consequence that one can have different habitat types overlapping. We therefore undertook a mapping process to develop an integrated map. We identified 26 biozones[65] (which are similar to

[64] These percentages can be directly applied to any ecosystem and its biodiversity target on any habitat map for South Africa, so long as the target for that ecosystem is aligned with the target from the NBA. There is no need to recalculate each step if there is no change to the CBD commitment. This allows rapid calculations to be made in provincial PAES assessments where more refined ecosystem maps are used.

[65] The term biozone is used as it is more compatible with the ecosystem classifications in marine and estuarine systems than a biome. For terrestrial systems the concept is identical to a biome, but the actual mapped extent of the terrestrial biozone will be different to its associated biome. This is caused by the fact that an area which

biomes but are not just applicable in terrestrial units) which include 969 distinct ecosystems. A map showing the biozones is provided in ***Figure A 2*** and a summary of biozones and ecosystems is given in ***Table A 2***.

The mapping used the following building blocks:

- **Terrestrial Ecosystems:** The revised 2012 National vegetation map[66]. There are 450 ecosystem types in 12 biozones. These biozones are very similar to the corresponding terrestrial biome, but will have a reduced area as some portions of the unit will now be mapped as wetlands or rivers.
- **Wetlands:** Natural wetlands included in the 2015 revised national wetland map (4a) were used[67]. Wetlands were included at the group level, which has 136 distinct ecosystem types. These are all included in 1 biozone as we do not currently have a reliable basis on which to divide these systems.
- **Coastal and marine types:** The integrated coastal and benthic ecosystem maps prepared for the National Biodiversity Assessment 2011 was used as the starting point[68]. An additional ecosystem was defined for all marine areas in the Southern Oceans which were not previously included in the national map. There are 109 benthic and coastal ecosystem types, 16 pelagic types and 1 Southern Ocean type distributed across 9 biozones.
- **Estuaries:** Estuary types were mapped based on the outlines in the National Estuary map 2012 and the classification in Whitfield (1992). There are 46 estuary ecosystem types in 3 biozones.
- **Rivers:** River ecosystems were based on the NFEPA classification and dataset (Nel et al., 2011). There are 126 distinct ecosystem types. As this map treats rivers as lines with no area, we approximated river areas by buffering rivers based on stream order, with the smallest rivers having a 30m buffer and largest ones 210m.

The individual components were integrated into a single map created at a 30m resolution using a simple rule based approach whereby wetlands and estuaries overrode all other layers; rivers overrode terrestrial ecosystems; and terrestrial ecosystems overrode marine and coastal systems. The approach is not ideal, but until the National Biodiversity Assessment 2018 when an integrated ecosystem map is anticipated to be a core product, this map developed for the NPAES is likely to be the best available.

was a single biome (e.g. Grasslands) was divided into terrestrial, river and wetland areas. This will clearly reduce the total mapped extent of the Grasslands.

[66] Based on the Mucina and Rutherford (2006) vegetation map with some revised units in KwaZulu-Natal, the Western Cape and Mpumalanga.

[67] This map is based on the NFEPA wetland dataset (Nel et al., 2011), but has not yet been formally released and does not have an updated reference.

[68] The mapping process is described in Sink et al. (2012). Some subsequent refinements of ecosystems near that Orange River mouth were also included.

Table A 2: Summary of the number of different ecosystem types in each category and biozone.

Category and biozone	Number of Ecosystems
Estuary	**46**
Marine	**109**
Coast types	32
Inner Shelf	4
Inshore	10
Island	2
Lagoon	1
Offshore Benthic	60
Marine Pelagic	**16**
Marine Southern Oceans	**1**
Rivers	**211**
Sub-Antarctic	**5**
Sub-Antarctic Polar Desert	1
Sub-Antarctic Tundra	4
Terrestrial	**445**
Albany Thicket	14
Azonal Vegetation	36
Desert	15
Forests	12
Fynbos	122
Grassland	72
Indian Ocean Coastal Belt	6
Nama-Karoo	14
Savanna	90
Succulent Karoo	64
Wetlands	**136**
Grand Total	**969**

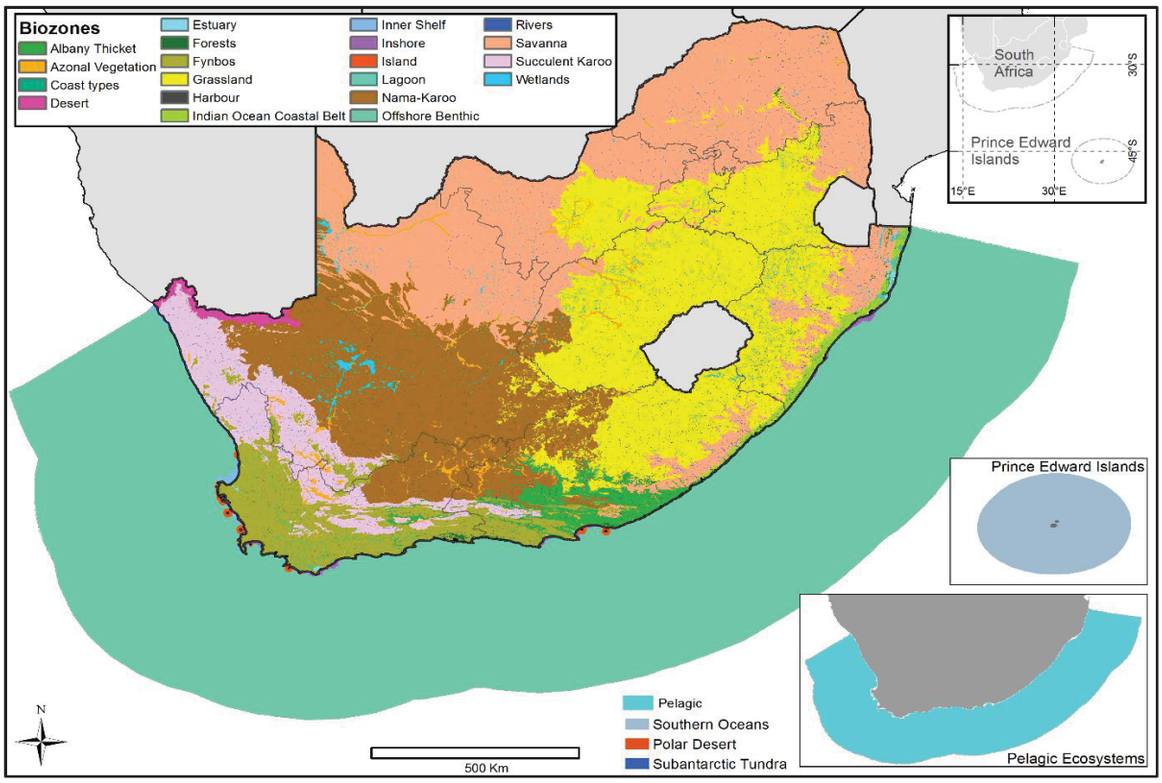

Figure A 2: The 969 ecosystem types mapped in the integrated ecosystem map are divided into 26 biozones.

Technical Note 4: Integrated ecosystem condition map

A second mapping input required for the evaluation of achievement of targets is an ecosystem condition map. The underlying principle is that areas that are no longer intact (e.g. large dams, roads, rest camps, canalized sections of rivers and plantations of exotic trees) should not contribute to targets even if they are in protected areas. Hence, the preparation of a fully integrated ecosystem condition map covering terrestrial, river, wetland, estuarine, coastal and marine ecosystems was a key activity for the NPAES. Although good maps of individual ecosystem condition now exist, these maps had not previously been integrated. A map was developed for the NPAES that identified good, fair and poor condition areas of each ecosystem (***Figure A 3***).

The mapping primarily used DEA's recently released National Land Cover (NLC 2013/2014)[69] for inland areas. The 72 land cover or land use classes were each classified as either good (for natural and semi-natural areas), fair (for degraded systems) or poor (for heavily modified systems such as mining, plantation, arable agriculture or urban land uses). For marine ecosystems, estuaries, rivers and wetlands the ecosystem condition maps developed for the respective components of the National Biodiversity Assessment 2011 were used. The layers were used to develop individual condition maps for the areas covered by each ecosystem type. These individual layers were then integrated based on the habitat type present at a site. Finally, if a site was mapped in the new National Land Cover as being in fair or poor condition, this value overrode any other input as it was likely to be more accurate. This process produced the first ever integrated ecosystem condition map for South Africa.

[69] DEA, 2014. This dataset is © Geoterraimage (2014).

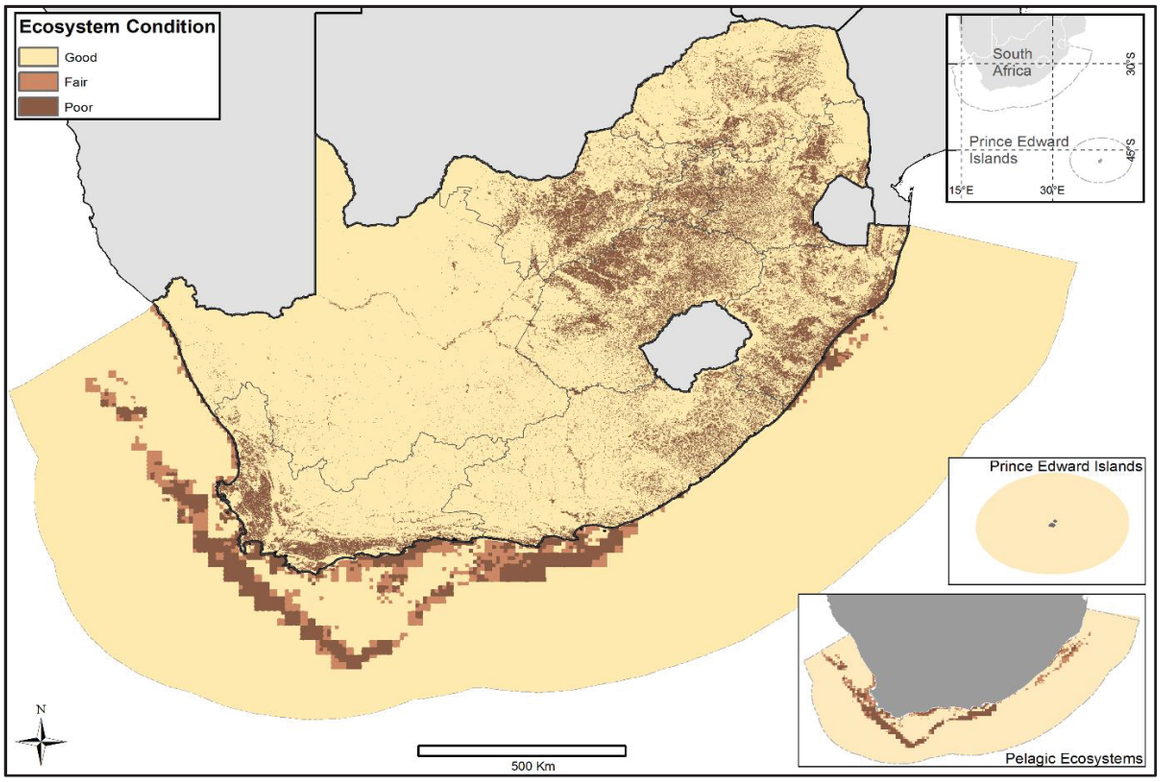

Figure A 3: An integrated ecosystem condition map was created for South Africa. This is the first time an integrated ecosystem condition map is available for South Africa for terrestrial, river, wetland, estuarine, coastal and marine ecosystems. The condition of Southern Ocean marine ecosystems and Sub-Antarctic terrestrial ecosystems is shown in the first insert, while offshore pelagic condition is shown in the second insert.

Appendix 3: Review of implementation of Phase 1 of the NPAES (2008 – 2014)

The first phase of the National Protected Area Expansion Strategy, covering the period 2008 – 2014, has been completed[70]. This appendix serves to review the progress made in implementing Phase 1 of the NPAES. This review reports on progress made in: (i) the formal declaration of new areas as protected areas; (ii) the negotiation (but not yet completed) of new areas for declaration as protected areas; (iii) the development of institutionally-based PAES's; (iv) the implementation of different protected area expansion mechanisms; (v) securing financial and human resources to support protected area expansion efforts; and (vi) the development of the enabling conditions (legal, policy, information management, incentives, cooperative governance) for protected area expansion. Based on the lessons learnt in the implementation of phase 1 of the NPAES, the review further identifies key challenges to protected area expansion that will need to be addressed in phase 2 of the NPAES in order to improve the efficiency and effectiveness of protected area expansion efforts.

1. New areas declared as protected areas

In Phase 1 of the NPAES, a total area of 189 433.36km^2 was added to the protected area system, through 460 formal declarations. Over 95% (180 851.37km^2) of this total is attributed to the declaration of a single protected area, the Prince Edward Island marine protected area (situated in the Prince Edward Island EEZ). ***Table A 3*** presents a breakdown of the new areas declared as protected areas during the period of review, by protected area type.

Table A 3: The number and extent of protected areas declared in Phase 1, by protected area type.

Protected area type	Number of declarations	Area (ha)
Terrestrial		
National Park	325	270 284
Nature Reserve	112	348 515
Protected Environment	12	196 673
Forest Nature Reserve	8	14 850
Terrestrial total	457	830 322
Marine		
Marine Protected Area	3	18 113 015
Marine total	3	18 113 015
Total	460	18 943 336

In the terrestrial environment, approximately 31% of the area originally targeted for expansion in phase 1 (i.e. 27 000.00km^2 or 2.2% of the country's surface area) was formally declared[71]. The spatial distribution of the new areas included into the terrestrial protected area system, for the period of review is shown in ***Figure A 4***.

[70] The actual timeframe for Phase 1 of the NPAES is 2008-2013. This review of progress was however only initiated at the end of 2014. It was thus considered prudent to include 2014 into the period of review.
[71] No specific targets were however set for different protected area types.

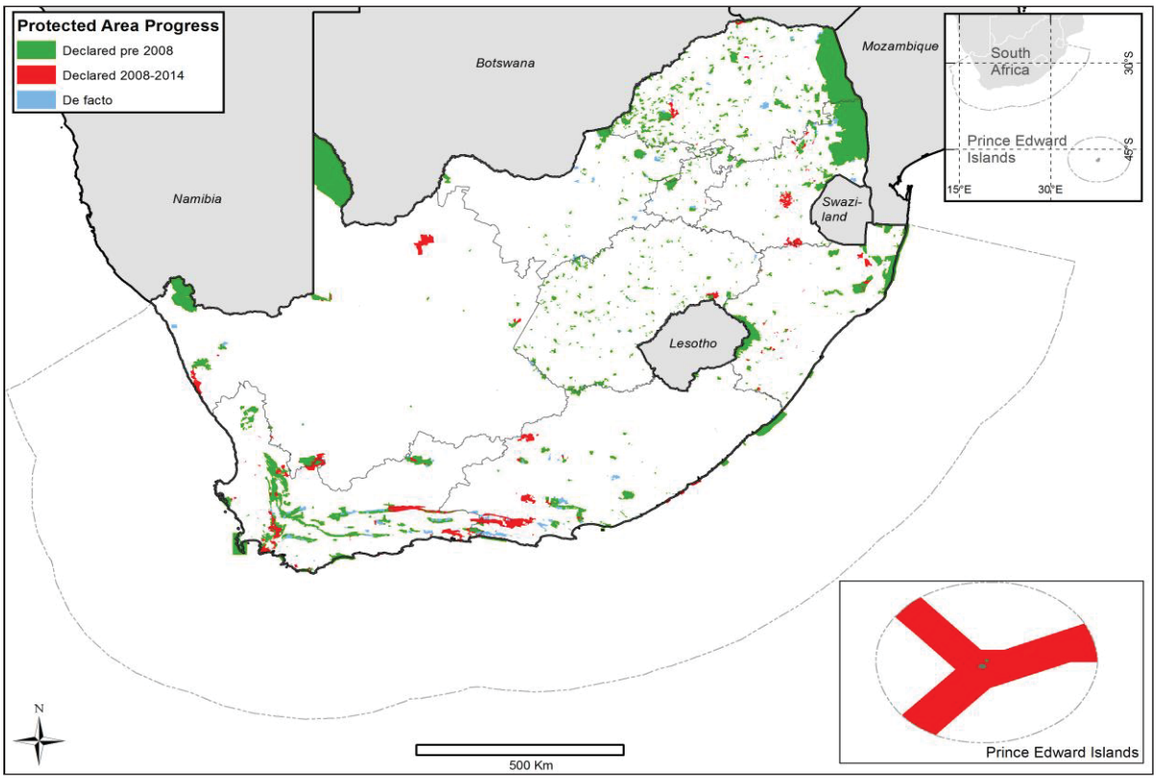

Figure A 4: Protected area status in South Africa and Prince the Edward Islands at the end of Phase 1.[72]

Of the 830 322ha added to the terrestrial protected area system, over 560 000ha of this was privately owned (502 692ha) or under some form of communal tenure (59 175ha), and declared under a contractual agreement without a change in ownership (***Table A 4***). This suggests that the negotiation of formal contractual agreements with people who have private or communal land tenure has become the primary tool for protected area expansion in terrestrial habitats (see discussion in section 2).

Most protected area agencies, with the exception of Limpopo and Free State, concluded new terrestrial protected area declarations in Phase 1 (see also ***Table A***).

Table A 4: Number and area of terrestrial protected areas declared in Phase 1.

Area ownership	Number of declarations	Area (ha)
State land	293	268 455
Communal tenure	2	59 175
Private property	162	502 692

[72] At the time that the NPAES (2008) was developed, there were many protected areas that were functioning as de facto protected areas but were not formally declared. These areas were included in national protected area calculations. Formalising their status by declaring them was identified as an important mechanism for protected area expansion – although this did not expand the actual area. De facto protected areas that have been proclaimed are recorded here.

The NPAES established the important principle of representing each habitat type within the protected area network, and set representation targets for each of South Africa's terrestrial habitat types[73]. ***Table A*** gives a summary of the NPAES targets for land-based protected areas, and summarizes progress towards meeting them[74,75]. As only intact areas contribute to meeting representation targets, the new DEA land-cover database was used to evaluate the actual contribution existing and expanded protected areas make by removing impacted areas such as dams, rest camps, roads and fields. For this reason[76], the total areas contributing to meeting representation targets for habitats are less than the full area of protected area added. This is particularly the case for Protected Environments which often consist of a mosaic of different land uses.

Table A shows that progress towards meeting the targets set in the NPAES has been mixed. When all habitats are considered, the areas effectively contributing to meeting targets improved from 3.6% to 3.9% (based on current protected areas), and will move to 4.2% if additional sites under negotiation are all completed[77]. Currently, this equates to 18% of the 5-year target and 4.5% of the 20-year target. Should all areas under negotiation be completed, 8.3% of the 20-year target will have been met. Clearly progress towards meeting targets has been slower than the NPAES proposed. Best progress (as measured by the % of the 5-year target met) has been made in the Forest biome, where the area declared exceeds the short term target with 129% of the target being achieved, while good progress was also made in the waterbodies biome and the Albany Thicket biome with 91% and 69% of the 5-year targets being met respectively.

No progress was made in the Desert biome and Indian Ocean coastal Belt, and little progress was made in the Nama-Karoo, Savanna and Grassland biomes with only 9%, 14% and 16% respectively of the 5-year targets being met. Two biomes which were not include in the NPAES (2008) (i.e. the Subantarctic Tundra biome and the Polar Desert biome) are both fully protected.

[73] Habitat specific representation targets could not be set for freshwater, marine and coastal types in the NPAES in 2008 as no suitable habitat maps existed at that time. These targets are set in NPAES 2018.

[74] Detailed data for each individual ecosystem type are given in the Appendix 1.

[75] Importantly, there are major differences between the NPAES 2008 spatial data, the current spatial data and the summaries of the areas declared that were submitted by the different protected area agencies. In addition to the landcover related issue, a fundamental issue is that many of the protected areas legally declared during the period 2008 to 2014 were already included as De facto protected areas in the NPAES 2008. We have hence developed a protected area layer specifically for the evaluation of habitat representation that examines the effective extent of protection. The figure in the habitat representation layer cannot be directly compared with the protected area declaration data.

[76] This, along with updates on the base protected area data layer, results in the protected area extent reported in the NPAES 2008 differing from the 2008 figures used in the current evaluation.

[77] These figures are far smaller than the full extent of the protected network as many Lowveld Savanna, Arid Savanna and Mountain Fynbos types are over-represented in terms of habitat targets. This does not imply that there are not excellent reasons to protect these extra areas (e.g. securing threatened species, protection of areas supplying water, securing habitat for wide-ranging species, protecting full functioning ecosystems, securing the country against climate change, and to support the tourism industry), but merely that these areas are beyond the **minimum** required habitat representation target.

Table A 5: Improvement in representation of terrestrial habitat types in protected areas.

	Target 20 year	Baseline (2008)	Baseline (2008) effective contribution to targets	Additional required to meet 5 year target	Additional required to meet 20 year target	Declared 2008 to 2014	Current (2014)	Current (2014) effective contribution to targets	% of 5 year target met	% of 20 year target met	Additional areas under negotiation	Current (2014) plus negotiated areas	Current (2014) plus negotiated areas effective contribution to targets	% of 20 year target met if all negotiated areas completed
Albany Thicket Biome (2912754 ha)	10.3% 298849 (ha)	Declared 4.8% (140669 ha) De facto 1.4% (40431 ha) Total 6.2% (181100 ha)	6% (173598 ha)	1.1% (31313 ha)	4.3% (125250 ha)	2.5% (73655 ha)	8.7% (254755 ha)	6.7% (195196 ha)	69%	17.2%	1.5% (45053 ha)	10.3% (299808 ha)	7.2% (208770 ha)	28.1%
Azonal Vegetation (2894983 ha)	13.8% 399352 (ha)	Declared 6.7% (195356 ha) De facto 0.6% (17822 ha) Total 7.4% (213178 ha)	4.9% (143204 ha)	2.2% (64037 ha)	8.8% (256148 ha)	1% (27861 ha)	8.3% (241040 ha)	5.3% (153376 ha)	15.9%	4%	0.8% (22789 ha)	9.1% (263828 ha)	5.9% (171176 ha)	10.9%
Desert Biome (716565 ha)	18% 128768 (ha)	Declared 22.2% (158891 ha) De facto 0% (0 ha) Total 22.2% (158891 ha)	4.7% (33354 ha)	3.3% (23854 ha)	13.3% (95414 ha)	0% (0 ha)	22.2% (158891 ha)	4.7% (33354 ha)	0%	0%	0% (0 ha)	22.2% (158891 ha)	4.7% (33354 ha)	0%
Forests (444371 ha)	17.2% 76434 (ha)	Declared 26.1% (115924 ha) De facto 4% (17859 ha) Total 30.1% (133782 ha)	15.9% (70789 ha)	0.3% (1411 ha)	1.3% (5646 ha)	7.7% (34208 ha)	37.8% (167990 ha)	16.3% (72603 ha)	128.6%	32.1%	0% (220 ha)	37.9% (168210 ha)	16.4% (72737 ha)	34.5%
Fynbos Biome (8394437 ha)	14.8% 1239260 (ha)	Declared 11.8% (994706 ha) De facto 3.3% (276125 ha) Total 15.1% (1270831 ha)	6.5% (541492 ha)	2.1% (174442 ha)	8.3% (697769 ha)	5.1% (428378 ha)	20.2% (1699209 ha)	7.3% (610721 ha)	39.7%	9.9%	1.2% (104070 ha)	21.5% (1803279 ha)	8.2% (684917 ha)	20.6%
Grassland Biome (31987116 ha)	13.2% 4209396 (ha)	Declared 2.5% (799194 ha) De facto 0.3% (91625 ha) Total 2.8% (890819 ha)	2.3% (720012 ha)	2.7% (872346 ha)	10.9% (3489384 ha)	0.5% (144873 ha)	3.2% (1035692 ha)	2.7% (858192 ha)	15.8%	4%	0.4% (129499 ha)	3.6% (1165192 ha)	3% (960957 ha)	6.9%
Indian Ocean Coastal Belt (1428197 ha)	13.5% 192807 (ha)	Declared 5.8% (83192 ha) De facto 0.6% (8394 ha) Total 6.4% (91586 ha)	5.7% (81977 ha)	1.9% (27707 ha)	7.8% (110830 ha)	0% (0 ha)	6.4% (91586 ha)	5.7% (81977 ha)	0%	0%	0% (346 ha)	6.4% (91932 ha)	5.8% (82220 ha)	0.2%
Nama-Karoo Biome (24827996 ha)	11% 2729463 (ha)	Declared 0.7% (162935 ha) De facto 0.1% (34810 ha) Total 0.8% (197745 ha)	0.8% (190333 ha)	2.6% (634783 ha)	10.2% (2539130 ha)	0.2% (56981 ha)	1% (254726 ha)	1% (245632 ha)	8.7%	2.2%	0.5% (127568 ha)	1.5% (382294 ha)	1.5% (373200 ha)	7.2%
Polar Desert Biome (10825 ha)	10.8% 1169 (ha)	Declared 100% (10825 ha) De facto 0% (0 ha) Total 100% (10825 ha)	10.8% (1169 ha)	0% (0 ha)	0% (0 ha)	0% (0 ha)	100% (10825 ha)	10.8% (1169 ha)	Fully met	Fully met	0% (0 ha)	100% (10825 ha)	10.8% (1169 ha)	Fully met
Savanna Biome (39966563 ha)	10.1% 4036554 (ha)	Declared 11% (4410017 ha) De facto 0.4% (151089 ha) Total 11.4% (4561106 ha)	5.2% (2092561 ha)	1.2% (485998 ha)	4.9% (1943994 ha)	0.5% (194223 ha)	11.9% (4755329 ha)	5.4% (2158897 ha)	13.6%	3.4%	0% (19564 ha)	11.9% (4774893 ha)	5.4% (2173070 ha)	4.1%
Subantarctic Tundra Biome (23240 ha)	10.8% 2510 (ha)	Declared 100% (23240 ha) De facto 0% (0 ha) Total 100% (23240 ha)	10.8% (2510 ha)	0% (0 ha)	0% (0 ha)	0% (0 ha)	100% (23240 ha)	10.8% (2510 ha)	Fully met	Fully met	0% (0 ha)	100% (23240 ha)	10.8% (2510 ha)	Fully met
Succulent Karoo Biome (8328395 ha)	12.1% 1010313 (ha)	Declared 4.9% (405814 ha) De facto 0.4% (31345 ha) Total 5.2% (437160 ha)	3.5% (288792 ha)	2.2% (180380 ha)	8.7% (721520 ha)	1.3% (107724 ha)	6.5% (544884 ha)	4.5% (376380 ha)	48.6%	12.1%	0.9% (75962 ha)	7.5% (620845 ha)	4.9% (407655 ha)	16.5%
Waterbodies (67322 ha)	13% 8725 (ha)	Declared 79.8% (53695 ha) De facto 0.5% (313 ha) Total 80.2% (54009 ha)	12.6% (8463 ha)	0.1% (65 ha)	0.4% (262 ha)	0.1% (59 ha)	80.3% (54068 ha)	12.7% (8522 ha)	90.8%	22.5%	1% (661 ha)	81.3% (54729 ha)	12.7% (8523 ha)	22.9%
Total (122002763 ha)	12% 14333600 (ha)	Declared 6.2% (7554459 ha) De facto 0.5% (669813 ha) Total 6.7% (8224272 ha)	3.6% (4348254 ha)	2.0% (2496337 ha)	8.2% (9985347 ha)	0.9% (1067962 ha)	7.6% (9292234 ha)	3.9% (4798529 ha)	18%	4.5%	0.4% (525732 ha)	8% (9817966 ha)	4.2% (5180260 ha)	8.3%

Table A and ***Table A*** show that although progress has been slower than anticipated, the expansion has largely been in areas which increase the efficiency and representivity of the protected area network. The NPAES identified 42 focus areas for land-based protected area expansion. Overall 59% (or 662 301ha) of the current expansion took place in these priority focus areas (***Figure A 5***). Of the current areas under negotiation, a far lower percentage (36% or 200 623ha) are within the priority focus areas. Importantly, as the priority focus areas identified in the NPAES examined only large intact priorities and not fragmented threatened habitats or finer scale provincial priorities, this does not imply that the current expansion outside of the focus areas is poorly located. Nor does it imply that the areas under negotiation are less of a priority.

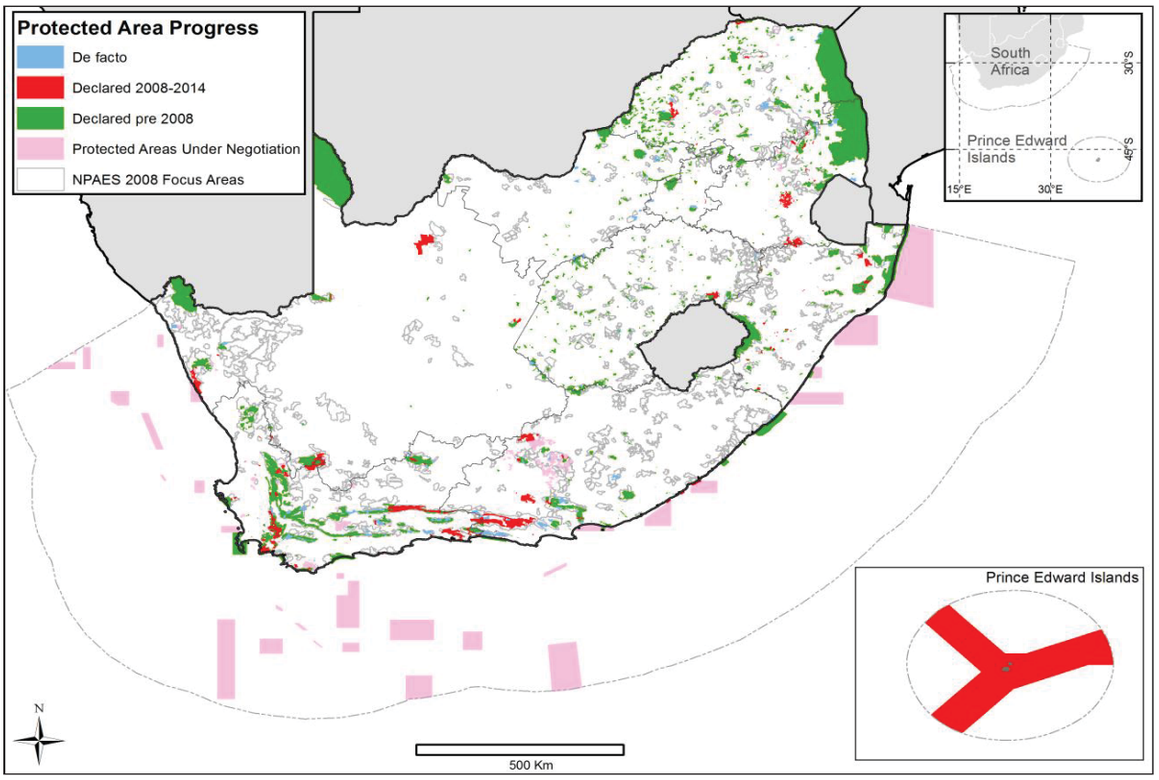

Figure A 5: Focus Areas for the establishment of large protected areas identified in the NPAES 2008. The red areas are those protected areas declared between 2008 – 2014; 59 % of the expansion took place within these focus areas.

Table A 6: Protected areas declared in Phase 1 and areas currently under negotiation, examined in terms of whether they are inside or outside the priority focus areas for land-based protected area expansion. Summarized by area.

	Declared 2008-2014 (ha)			Under negotiation (ha)		
Biome	Within Focus Areas	Outside of Focus Areas	Total	Within Focus Areas	Outside of Focus Areas	Total
Albany Thicket Biome	34 686	40 502	75 188	8 375	37 804	46 179
Azonal Vegetation	20 088	12 145	32 233	2 788	21 854	24 642
Forests	18 044	18 497	36 541	140	85	225
Fynbos Biome	392 946	46 667	439 613	29 950	95 134	125 084
Grassland Biome	59 678	115 343	175 021	93 019	39 091	132 109
Indian Ocean Coastal Belt					484	484
Nama-Karoo Biome	30 769	26 601	57 370	21 406	108 087	129 492
Savanna Biome	30 657	165 999	196 656	12 821	7 990	20 811
Succulent Karoo Biome	75 404	32 408	107 812	32 125	44 246	76 371
Waterbodies	29	30	59	0	663	663
All Biomes	662 301	458 192	1 120 493	200 623	355 437	556 060

Table A 7: Protected areas declared in Phase 1 and areas currently under negotiation, examined in terms of whether they are inside or outside the priority focus areas for land-based protected area expansion. Summarized by percentage.

	Declared 2008-2014 (%)		Under negotiation (%)	
Biome	Within Focus Areas	Outside of Focus Areas	Within Focus Areas	Outside of Focus Areas
Albany Thicket Biome	46	54	18	82
Azonal Vegetation	62	38	11	89
Forests	49	51	62	38
Fynbos Biome	89	11	24	76
Grassland Biome	34	66	70	30
Indian Ocean Coastal Belt				100
Nama-Karoo Biome	54	46	17	83
Savanna Biome	16	84	62	38
Succulent Karoo Biome	70	30	42	58
Waterbodies	49	51		100
All Biomes	59	41	36	64

In the marine environment, the declaration of the marine protected area (MPA) in the Prince Edward Island (PEI) EEZ resulted in marine protected areas far exceeding the short- and long-term NPAES targets (by a factor of 2) for the PEI EEZ. However, during the period of review no offshore MPAs were declared (against a short-term target of 52 500 km^2 in the NPAES) for the mainland EEZ and only 2 inshore MPAs (27 878 ha[78]) were declared, resulting in an under-representation of these habitats in meeting the overall targets for the marine protected area system. The spatial distribution of the new areas included into the marine protected area system for the period of review is shown in ***Figure A 4***.

Table A summarizes the progress towards achieving specific NPAES targets in the Marine Inshore and Marine Offshore environments. As no suitable habitat maps existed when the NPAES 2008 was undertaken no habitat specific representation targets were set at that time, and therefore we can only evaluate progress across these environments as a whole. Overall, better progress has been made in the marine environment than in terrestrial areas.

Table A 8: Progress towards achieving NPAES targets in the marine inshore and marine offshore environments.

	Target 20 year	Baseline (2008)	Additional required to meet 5 year target	Additional required to meet 20 year target	Declared 2008 to 2014	Current (2014)	% of 5 year target met	% of 20 year target met	Additional areas under negotiation	Current (2014) plus negotiated areas	% of 20 year target met if all negotiated areas completed
Marine Inshore (3592 km)	No-Take 15% (539 km)	7.9% (285 km)	1.8% (64 km)	7.1% (254 km)	1.6% (57 km)	9.5% (341 km)	89.4%	22.4%	0% * (0 km^2)	9.5% (341 km)	22.4%
	Total 25% (898 km)	20.6% (741 km)	1.1% (39 km)	4.3% (157 km)	1.8% (64 km)	22.4% (805 km)	163.4%	40.8%	7.8% (282 km)	30.3% (1087 km)	Fully met
Marine offshore: mainland EEZ (1 065 660 km^2)	No-Take 15% (159 849 km^2)	0.16% (1 755 km^2)	3.7% (39 524 km^2)	14.8% (158 094 km^2)	0.02% (266 km^2)	0.19% (2 021 km^2)	0.7%	0.16%	0% * (0 km^2)	0.19% (2 021 km^2)	0.16%
	Total 20% (213 132 km^2)	0.4% (4 404 km^2)	4.9% (52 182 km^2)	19.6% (208 728 km^2)	0.03% (278 km^2)	0.44% (4 682 km^2)	0.5%	0.13%	6.2% (66 473 km^2)	6.7% (71 155 km^2)	32.0%
Marine offshore: Prince Edward Islands EEZ (473 375 km^2)	No-Take 15% (71 006 km^2)	0% (0 km^2)	3.8% (17 751 km^2)	15% (71 006 km^2)	14.4% (68 364 km^2)	14.4% (68 364 km^2)	385.1%	96.3%	0% (0 km^2)	14.4% (68 364 km^2)	96.3%
	Total 20% (94 675 km^2)	0% (0 km^2)	5% (23 669 km^2)	20% (94 675 km^2)	38.2% (180 862 km^2)	38.2% (180 862 km^2)	764.1%	191.1%	0% (0 km^2)	38.2% (180 862 km^2)	Fully met

* Note that it is clear how much no-take area will be declared

In particular, good progress has been made in the marine offshore: Prince Edward Islands EEZ region, where the 20-year no-take target and the overall protected area target have effectively both been met through the declaration of the Prince Edward Islands Marine Protected Area. Progress in the marine inshore and marine offshore (mainland) EEZ environments has not matched that around the Prince Edward Islands. In the marine offshore (mainland) EEZ environment the protected area network was extremely limited in 2008 with only 0.4% of the area being protected (and only 0.16% being no-take). During phase 1 an additional 0.03% of the marine offshore (mainland) EEZ environment was declared of which 0.02% is no-take. This represents under 1% of the 5-year NPAES target. Progress in improving the current representation is likely to be better in phase 2 as significant areas in this

[78] The NPAES set a short-term target of 88km of coastline for inshore MPAs, but no area-based targets.

environment (representing 6.7% of the area and 32% of the 20-year target) are under negotiation through Operation Phakisa.

The 2008 baseline for the marine inshore environment, was 20.6% (741km) having some protection of which 7.9% (285km) was no-take. Eighty nine percent of the phase 1 target for no-take areas was met, while 163% of the 5-year target for overall inshore protection was met. Progress on no-take MPAs has been slower than required and will require specific attention in future phases of the NPAES.

2. Areas still under active negotiation for inclusion into the protected area network (2008 – 2014)

The areas still under active negotiation for future declaration as terrestrial protected areas – totaling some 1 180 997ha[79] – vary widely between protected area institutions (***Figure A 6***).

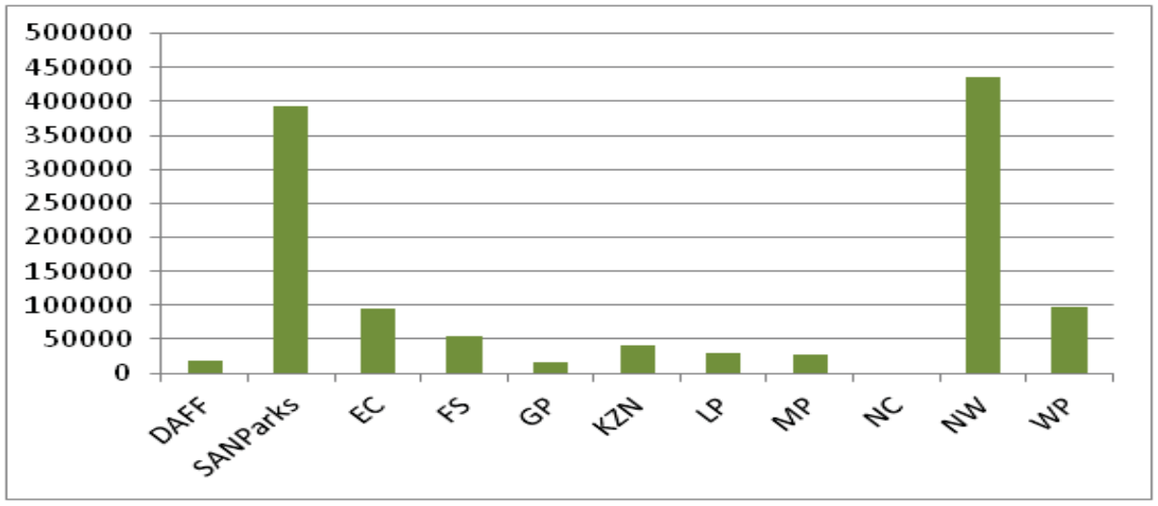

Figure A 6: Areas under negotiation for terrestrial protected area expansion, by protected area institution (ha).

[79] This total is indicative only- not all of this area will be successfully negotiated to the point of formal declaration.

The areas still under active negotiation for future declaration as terrestrial protected areas show a clear spatial bias towards private and communally owned land (***Figure A 7***).

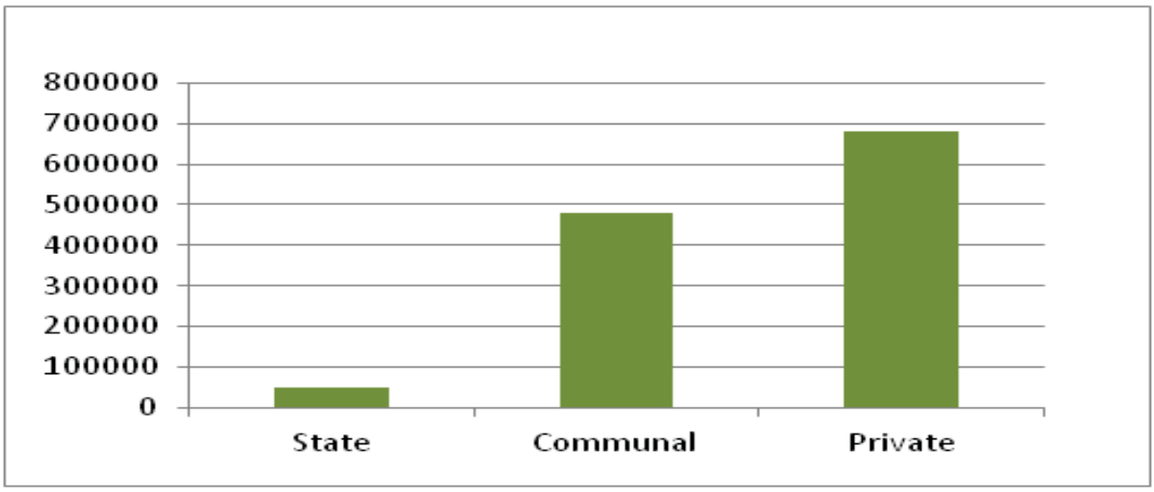

Figure A 7: Area under negotiation for terrestrial protected area expansion, by land tenure. (ha)

3. Mechanisms for expansion

In the terrestrial environment, the conclusion of a contractual agreement between the protected area institution and a landowner or land user (in the case of communal land) was the primary mechanism used to declare new terrestrial protected areas during phase 1 of the NPAES (***Table A***).

Of the total land incorporated into the terrestrial protected area system, contractual agreements accounted for 68% (563 947ha) of the extent of declared protected areas. Ninety three percent of the area under contractual agreements (522 128ha) was brokered on private and communal land through the biodiversity stewardship programmes.

Although the process of formally assigning and declaring state land accounted for 39% of the declarations, the extent of declared protected areas (157 743ha) comprised only 19% of the total expansion in phase 1.

SANParks is the only protected area institution which purchased land (106 663ha) for protected area expansion in phase 1.

Table A 9: Terrestrial protected area declared in phase 1, by mechanism of expansion.

Mechanism of expansion	Number of declarations	Area (ha)
Contractual agreement	164	563 947
Land acquisition (incl. donations)	117	108 631
Declaration of state land	176	157 743

Four protected area institutions formalised the declaration of state owned land that was already being managed as *de facto* protected areas (but not yet declared), while seven protected area institutions concluded contractual agreements for the declaration of protected areas (***Table A***). Of the land managed under contractual agreement, 29% (161 810ha) is managed by the state while the remainder is privately managed.

Table A 10: Terrestrial protected area declared (ha) in phase 1, by implementing institution and mechanism of expansion.

Institution/province	Contractual agreement	Donation	Purchase	Declaration of state owned land	Total
SANParks	74 012	-	106 663	89 608	270 283
DAFF	-	-	-	14 850	14 850
Eastern Cape	98 119	-	-	-	98 119
Free State	-	-	-	-	-
Gauteng	2 280	1 768	-	20 638	24 686
KwaZulu-Natal	61 068	-	-	-	61 068
Limpopo	-	-	-	-	-
Mpumalanga	102 066	-	-	-	102 066
Northern Cape	92 486	-	-	-	92 486
North West	-	200	-	32 647	32 847
Western Cape	133 916	-	-	-	133 916
Total	563 947	1 968	106 663	157 743	830 321

All three protected area mechanisms - contractual agreement, land acquisition and declaration of state owned land - were used in the expansion of National Parks and Nature Reserves. Contractual agreements were the only expansion mechanism used in the establishment of Protected Environments, while the declaration of state owned land was the only expansion mechanism used for Forest Nature Reserves (***Table A***).

Table A 11: Terrestrial protected area declared in phase 1, by protected area type and mechanism of expansion (ha).

Protected area type	Contractual agreement	Land acquisition[80]	Declaration of state owned land
National Park	74 012	106 663	89 608
Nature Reserve	293 262	1 968	53 285
Protected Environment	196 673	-	-
Forest Nature Reserve	-	-	14 850

In the marine environment, all 181 130.15km^2 of protected area expansion took place through the declaration of state territory.

[80] Including purchased and donated land.

4. The development of institutionally-based Protected Area Expansion Strategy's (PAES) (2008 – 2014)

In the terrestrial environment, only one protected area institution - CapeNature - had a PAES (in the form of a Biodiversity Stewardship Plan) in 2008. By the end of phase 1 however, eight of the twelve protected area institutions have now developed, adopted and are implementing an institutionally-based PAES. These institutionally-based PAES's are all closely aligned to the strategic objectives of the NPAES, although the implementation phases are not yet fully harmonised (***Table A***).

Three of the remaining protected area institutions (Free State, Limpopo and Northern Cape) are currently developing or have developed their own PAES's and are in the process of getting them adopted. Only one protected area institution – DAFF – currently has no plans to develop an institutionally-based PAES and is using the NPAES to guide its priorities for protected area expansion.

Table A 12: Status of protected area expansion strategy development, by each of the protected area institutions.

Institutional PAES	SANP	DAFF	DEA*[81]	EC	FS	GP	KZN	LP	MP	NC	NW	WC
Developing	-	N	-	-	Y	-	-	Y	-	Y	-	-
Adopted	Y	N	Y	Y	N	Y	Y	N	Y	N	Y	Y
Implementing	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

Expansion plans for the marine environment are well developed and were recently published as part of Operation Phakisa. The total area targeted for expansion of the MPA network is 64 807.10km^2 (covering 21 separate MPAs in the inshore and off-shore mainland EEZ).

5. Resource allocations to PAES (2014)

The institutional capacity to implement the protected area expansion programme is limited. An estimate of the human resources[82] available (as of end December 2014) for implementing the protected area expansion programme is presented in ***Table A*** .

Table A 13: Estimated human resources available for implementing the NPAES (as at Dec 2014), by protected area institution.

Number of staff	SANP	DAFF	DEA	EC	FS	GP	KZN	LP	MP	NC	NW	WC	Total
>60% of time[83]	2	0	6	1	0	5	0	2	3	0	3	6	**28**
<60% of time	5	0	14	5	0	11	6	0	2	4	0	18	**65**

[81] DEA are currently implementing the MPA expansion programme

[82] Human resource estimates are inclusive of relevant senior management, stewardship managers, negotiators and facilitators, planners, legal staff, ecologists, technicians and extension staff.

[83] Staff availability is broken down into those staff that spend more than 60% of their time on protected area expansion and those who have a role to play but spend less than 60% of their time on the function.

The estimated operational[84] budgets for protected area expansion are highly variable (***Table A 14***). The funding resources for protected area expansion, and the actual performance of the protected area agency in declaring new areas as protected areas, do not show a close correlation which suggests that some agencies are more efficient in expanding their protected areas.

Table A 14: Estimated annual budgets available for implementing the NPAES during phase 1.

Budget	SANP	DAFF	DEA	EC	FS	GP	KZN	LP	MP	NC	NW	WC
R ('000 000)	34.5	3.5	12.0	0.4	1.2	1.9	2.5	0.2	0.45	0.1	2.9	2.1

6. Legal and institutional developments (2008 – 2014)

Phase 1 of the NPAES (2008) saw a number of legal and administrative developments aimed at advancing protected area expansion. These include:

- The amendment of the Protected Areas Act to include marine protected areas.
- The process of developing standardised stewardship guidelines was advanced.
- Refinements in the incentives for declaring privately owned and managed protected areas through tax rebates.
- Improved levels of legislative compliance through the development of the Protected Area Register.
- The advanced development of a protected area database, linked to the Protected Area Register, which is populated with Stats SA-verified data only.
- The establishment of a national protected area co-ordination and standardisation forum (the Protected Area Technical Task Team; PATTT), which includes the mandate for protected area expansion.
- Publishing guidelines for the declaration of different types of protected areas.

7. Key protected area expansion issues and challenges (2008 – 2014)

The review process brought to light a number of key issues and concerns that warrant consideration in the development of an action plan for phase 2 of the NPAES. These include inter alia:

- **Inadequate funds to increase and sustain the biodiversity stewardship programme:** All protected area institutions involved in the biodiversity stewardship programme highlighted the concern that as more areas were being successfully contracted under the biodiversity stewardship programme, the need for maintenance engagements and auditing of these sites increases. This maintenance and auditing function thus requires a greater slice of the current budget as well as increased staff time. Attention needs to be paid to ways of covering the increasing maintenance costs of the biodiversity stewardship programme while maintaining adequate resources to continue with protected area expansion efforts.
- **Declining availability of funds for the SANParks land purchase fund:** The purchase by SANParks of key land for protected area expansion was possible through the land purchase fund. This fund is dependent on *ad hoc* grants from DEA to function and these grants have been cut substantially in recent years.
- **Staff numbers, staff turnover, staff capacity and institutional support:** Many protected area institutions raised the need for their agency to better align their staffing (both in terms of numbers and capacity) with the requirements of implementing their institutional PAESs. A range of skills and expertise is required to successfully declare new protected areas, from

[84] This includes budgets that institutions have for land purchase.

field-based negotiators to stewardship managers and from legal support to planners and ecologists. Mention was made of the negative effects of high staff turnover and the need for improving the career paths of individuals involved in protected area expansion efforts.

- **Data and data management:** The review has highlighted the widespread need for improved data and data management systems to ensure that the protected area expansion function is being based on reliable, updated and accessible information.
- **Alignment of the NPAES and institutional level plans:** Not all institutional PAES plans are aligned with the national plans. This may result in areas being added to the protected area system which contribute little towards target achievement. The need to promote better alignment between the NPAES and the institutionally-based PAESs has been highlighted.
- **Legal and administrative barriers:** All institutions indicated that administrative (including legal) barriers were one of the major bottlenecks in declaring new protected areas. The need for a task team to identify the major barriers and to seek ways to remove or reduce them was identified as important in taking the protected area expansion programme forward.