



## Capacity strengthening for management of invasive alien species in South Africa to enhance sustainable biodiversity conservation and livelihoods improvement

### Part I: Project Information

#### GEF ID

10524

#### Project Type

FSP

#### Type of Trust Fund

GET

#### CBIT/NGI

☐ CBIT

☐ NGI

#### Project Title

Capacity strengthening for management of invasive alien species in South Africa to enhance sustainable biodiversity conservation and livelihoods improvement

#### Countries

South Africa

#### Agency(ies)

UNEP

**Other Executing Partner(s)**

Department of Environment, Forestry and Fisheries (DEFF)

**Executing Partner Type**

Government

**GEF Focal Area**

Biodiversity

**Taxonomy**

Influencing models, Strengthen institutional capacity and decision-making, Demonstrate innovative approach, Stakeholders, Private Sector, Large corporations, SMEs, Individuals/Entrepreneurs, Financial intermediaries and market facilitators, Communications, Education, Behavior change, Awareness Raising, Public Campaigns, Type of Engagement, Consultation, Participation, Partnership, Information Dissemination, Local Communities, Beneficiaries, Civil Society, Non-Governmental Organization, Academia, Community Based Organization, Gender Equality, Gender Mainstreaming, Sex-disaggregated indicators, Women groups, Gender-sensitive indicators, Gender results areas, Participation and leadership, Knowledge Generation and Exchange, Capacity Development, Capacity, Knowledge and Research, Learning, Indicators to measure change, Innovation, Knowledge Exchange, Enabling Activities, Targeted Research, Knowledge Generation, Seminar, Master Classes, Workshop, Course, Professional Development, Training

**Rio Markers****Climate Change Mitigation**

Climate Change Mitigation 1

**Climate Change Adaptation**

Climate Change Adaptation 1

**Duration**

60 In Months

**Agency Fee(\$)**

324,106

**Submission Date**

4/9/2020

A. Indicative Focal/Non-Focal Area Elements

Programming Directions	Trust Fund	GEF Amount(\$)	Co-Fin Amount(\$)
BD-2-6	GET	3,411,644	22,583,294
	Total Project Cost (\$)	3,411,644	22,583,294

**B. Indicative Project description summary**

**Project Objective**

The efficient and effective management of high-risk invasive alien species (IAS) directly mitigates their negative impacts on South Africa’s biodiversity assets, and indirectly contributes to the improvement of rural food security and livelihoods.

Project Component	Financing Type	Project Outcomes	Project Outputs	Trust Fund	GEF Amount(\$)	Co-Fin Amount(\$)
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Project Component	Financing Type	Project Outcomes	Project Outputs	Trust Fund	GEF Amount(\$)	Co-Fin Amount(\$)
1. Strengthened IAS detection and surveillance capacities at key national ports of entry	Technical Assistance	<p><u>Outcome 1</u> South African authorities adopt new tools and methods of high-risk IAS surveillance at key national ports:</p> <ul style="list-style-type: none"> <li>- The number of high-risk invasive taxa introduced to South Africa decreases or remains constant at national ports of entry;</li> <li>- More introduction pathways at national ports of entry in South Africa are effectively managed; and</li> <li>- Affected state border agencies actively participate in biosecurity risk assessment and management at national ports of entry.</li> </ul>	<p><u>Output 1.1</u> An inter-agency 'Biosecurity Risk Assessment/ Targeting Centre (BRA/TC) is established and operational</p> <p><u>Output 1.2</u> A sea container and break-bulk cargo biosecurity risk management system is piloted</p> <p><u>Output 1.3</u> A small team of biosecurity detection dogs and their handlers are operational at key ports of entry</p> <p><u>Output 1.4:</u> New and emerging invasive species identified monitored and controlled</p>	GET	1,519,861	10,100,000

Project Component	Financing Type	Project Outcomes	Project Outputs	Trust Fund	GEF Amount(\$)	Co-Fin Amount(\$)
2. Enhanced biosecurity communications and information flows	Investment	<p><u>Outcome 2</u> Stakeholders partner with and support state biosecurity agencies in pre-border and post border risk analysis, surveillance, detection, reporting and control of high-risk IAS:</p> <ul style="list-style-type: none"> <li>- Awareness levels in, and active involvement of, the private sector, disadvantaged local communities and environmental community groups in pre- and post-border biosecurity increases;</li> <li>- The proportion of biosecurity data derived from volunteer monitoring sources increases.</li> </ul>	<p><u>Output 2.1</u> A 'biosecurity awareness and involvement campaign' is developed and implemented as a leverage point through which to engage the community about the importance of pre- and post-border biosecurity and influence public perception about biosecurity</p> <p><u>Output 2.2</u> A centralized Biosecurity Information and Risk Analysis System is operational and freely accessible to all responsible public biosecurity institutions.</p>	GET	529,324	3,500,000

Project Component	Financing Type	Project Outcomes	Project Outputs	Trust Fund	GEF Amount(\$)	Co-Fin Amount(\$)
3. Improved effectiveness of control measures for high risk IAS	Technical Assistance	<p><u>Outcome 3:</u> South Africa eradicates house mouse from Marion Island and contains the spread of high-risk invasive plant species:</p> <p>- Number of islands in South Africa where house mice have been eradicated; and</p> <p>- Number of species under an effective control regime as a result of project.</p>	<p><u>Output 3.1</u> The spread of the house mouse on Marion Island is eradicated and protocols are developed to prevent future introductions in Marion Island and Prince Edward Island.</p> <p><u>Output 3.2</u> Biocontrol agents for priority invasive plant species are developed and released.</p>	GET	1,200,000	7,800,000
Sub Total (\$)					3,249,185	21,400,000
Project Management Cost (PMC)						
GET					162,459	1,183,294
Sub Total(\$)					162,459	1,183,294
Total Project Cost(\$)					3,411,644	22,583,294

**C. Indicative sources of Co-financing for the Project by name and by type**

<b>Sources of Co-financing</b>	<b>Name of Co-financier</b>	<b>Type of Co-financing</b>	<b>Investment Mobilized</b>	<b>Amount(\$)</b>
Government	Department of Environment, Forestry and Fisheries (DEFF)	Public Investment	Investment mobilized	3,300,000
Government	Department of Environment, Forestry and Fisheries (DEFF)	In-kind	Recurrent expenditures	2,000,000
Government	Department of Agriculture, Land Reform and Rural Development (DALRRD)	Public Investment	Investment mobilized	883,294
Government	Department of Agriculture, Land Reform and Rural Development (DALRRD)	In-kind	Recurrent expenditures	2,500,000
Government	Agricultural Research Institute (ARC)	Public Investment	Investment mobilized	100,000
Government	Agricultural Research Institute (ARC)	In-kind	Recurrent expenditures	2,000,000
Government	South African National Biodiversity Institute (SANBI)	Public Investment	Investment mobilized	1,000,000
Government	South African National Biodiversity Institute (SANBI)	In-kind	Recurrent expenditures	3,000,000
Government	Department of Human Settlements, Water and Sanitation (DHSWS)	Public Investment	Investment mobilized	200,000
Government	Department of Human Settlements, Water and Sanitation (DHSWS)	In-kind	Recurrent expenditures	1,000,000
Government	South African National Parks (SANParks)	In-kind	Recurrent expenditures	1,000,000
Government	Department of Transport	Public Investment	Investment mobilized	500,000
Government	Department of Transport	In-kind	Recurrent expenditures	2,000,000



Sources of Co-financing	Name of Co-financier	Type of Co-financing	Investment Mobilized	Amount(\$)
Government	Provincial Government	Public Investment	Investment mobilized	400,000
Government	Provincial Government	In-kind	Recurrent expenditures	1,600,000
Government	Council for Scientific and Industrial Research (CSIR)	Public Investment	Investment mobilized	100,000
Government	Council for Scientific and Industrial Research (CSIR)	In-kind	Recurrent expenditures	1,000,000

**Total Project Cost(\$)**    **22,583,294**

**Describe how any "Investment Mobilized" was identified**

The Government of South Africa investments mobilized are extrapolated from the MTEF project/programme-based budget allocations for the contributing Departments and Public Institutions.

D. Indicative Trust Fund Resources Requested by Agency(ies), Country(ies), Focal Area and the Programming of Funds

Agency	Trust Fund	Country	Focal Area	Programming of Funds	Amount(\$)	Fee(\$)	Total(\$)
UNEP	GET	South Africa	Biodiversity	BD STAR Allocation	3,411,644	324,106	3,735,750
Total GEF Resources(\$)					3,411,644	324,106	3,735,750

E. Project Preparation Grant (PPG)

PPG Required

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PPG Amount (\$)

150,000

PPG Agency Fee (\$)

14,250

Agency	Trust Fund	Country	Focal Area	Programming of Funds	Amount(\$)	Fee(\$)	Total(\$)
UNEP	GET	South Africa	Biodiversity	BD STAR Allocation	150,000	14,250	164,250
Total Project Costs(\$)					150,000	14,250	164,250

**Core Indicators**

**Indicator 1 Terrestrial protected areas created or under improved management for conservation and sustainable use**

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)
33,400.00	0.00	0.00	0.00

**Indicator 1.1 Terrestrial Protected Areas Newly created**

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Total Ha (Achieved at MTR)	Total Ha (Achieved at TE)
0.00	0.00	0.00	0.00

Name of the Protected Area	WDPA ID	IUCN Category	Total Ha (Expected at PIF)	Total Ha (Expected at CEO Endorsement)	Total Ha (Achieved at MTR)	Total Ha (Achieved at TE)
Akula National Park	125689	Select				<input type="checkbox"/>

**Indicator 1.2 Terrestrial Protected Areas Under improved Management effectiveness**

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Total Ha (Achieved at MTR)	Total Ha (Achieved at TE)
33,400.00	0.00	0.00	0.00

Name of the Protected Area	WDPA ID	IUCN Category	Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Total Ha (Achieved at MTR)	Total Ha (Achieved at TE)	METT score (Baseline at CEO Endorsement)	METT score (Achieved at MTR)	METT score (Achieved at TE)
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Name of the Protected Area	WDPA ID	IUCN Category	Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Total Ha (Achieved at MTR)	Total Ha (Achieved at TE)	METT score (Baseline at CEO Endorsement)	METT score (Achieved at MTR)	METT score (Achieved at TE)
Akula National Park Prince Edward Island Special Nature Reserve	125689555563456	SelectStrict Nature Reserve	33,400.00						

Indicator 4 Area of landscapes under improved practices (hectares; excluding protected areas)

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)
300000.00	0.00	0.00	0.00

Indicator 4.1 Area of landscapes under improved management to benefit biodiversity (hectares, qualitative assessment, non-certified)

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)
300,000.00			

Indicator 4.2 Area of landscapes that meets national or international third party certification that incorporates biodiversity considerations (hectares)

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)

Type/Name of Third Party Certification

Indicator 4.3 Area of landscapes under sustainable land management in production systems

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)

Indicator 4.4 Area of High Conservation Value Forest (HCVF) loss avoided

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)

Documents (Please upload document(s) that justifies the HCVF)

Title	Submitted		
Indicator 5 Area of marine habitat under improved practices to benefit biodiversity (excluding protected areas)			
Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)

Indicator 5.1 Number of fisheries that meet national or international third party certification that incorporates biodiversity considerations

Number (Expected at PIF)	Number (Expected at CEO Endorsement)	Number (Achieved at MTR)	Number (Achieved at TE)

Type/name of the third-party certification

Indicator 5.2 Number of Large Marine Ecosystems (LMEs) with reduced pollutions and hypoxia

Number (Expected at PIF)	Number (Expected at CEO Endorsement)	Number (achieved at MTR)	Number (achieved at TE)
0	0	0	0

LME at PIF	LME at CEO Endorsement	LME at MTR	LME at TE
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Indicator 5.3 Amount of Marine Litter Avoided

Metric Tons (expected at PIF)	Metric Tons (expected at CEO Endorsement)	Metric Tons (Achieved at MTR)	Metric Tons (Achieved at TE)
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	Metric Tons (expected at PIF)	Metric Tons (expected at CEO Endorsement)	Metric Tons (Achieved at MTR)	Metric Tons (Achieved at TE)
Indicator 11 Number of direct beneficiaries disaggregated by gender as co-benefit of GEF investment				
	Number (Expected at PIF)	Number (Expected at CEO Endorsement)	Number (Achieved at MTR)	Number (Achieved at TE)
Female	420			
Male	200			
Total	620	0	0	0

Provide additional explanation on targets, other methodologies used, and other focal area specifics (i.e., Aichi targets in BD) including justification where core indicator targets are not provided

The project will improve the management of Prince Edward Islands Special Nature Reserve (33,400 ha) by supporting the eradication of the house mouse (*Mus musculus*) from Marion Island and implementing biosecurity protocols to prevent future introductions of the house mouse to Marion Island and Prince Edward Island. The project will seek to reduce the impact of eight Category 1b plant invasive species over a total area of at least 300,000 ha. The project will contribute to achieving Aichi Target 9 ('By 2020, invasive species and their pathways should be identified and prioritised') under Strategic Goal B ('Reduce the direct pressures on biodiversity') of the CBD's Strategic plan for Biodiversity 2011-2020. The project will further contribute to meeting Target 15.8 ('By 2020, introduce measures to prevent the introduction and significantly reduce the impact of invasive alien species on land and water ecosystems and control or eradicate the priority species') of Goal 15 ('Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss') of the UN Sustainable Development Goals (SDGs) under the strategic framework of The 2030 Agenda for Sustainable Development. The project will contribute to achieving Aichi Target 9 ('By 2020, invasive species and their pathways should be identified and prioritised') under Strategic Goal B ('Reduce the direct pressures on biodiversity') of the CBD's Strategic plan for Biodiversity 2011-2020. The project will further contribute to meeting Target 15.8 ('By 2020, introduce measures to prevent the introduction and significantly reduce the impact of invasive alien species on land and water ecosystems and control or eradicate the priority species') of Goal 15 ('Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss') of the UN Sustainable Development Goals (SDGs) under the strategic framework of The 2030 Agenda for Sustainable Development.

## Part II. Project Justification

### 1a. Project Description

#### 1.1) the global environmental and/or adaptation problems, root causes and barriers that need to be addressed (systems description);

##### *Biodiversity significance*

South Africa occupies only 2% of the world's land surface area and yet is home to 10% of the world's plant species and 7% of the reptile, bird and mammal species. It is home to over 23 000 plant species, more than half of which are endemic. The country hosts three globally recognised biodiversity hotspots: Cape Floristic Region; Succulent Karoo (shared with Namibia) and Maputaland-Pondoland-Albany hotspot (shared with Mozambique and Swaziland). South Africa is also home to an entire floral kingdom, the smallest, richest and most threatened of the world's six floral kingdoms - the Cape Floral Kingdom (CFK) - which occurs nowhere else in the world.

##### *Invasive species (IAS)*

Biological invasions are a growing environmental problem worldwide, and South Africa in particular is home to a large and growing number of invasive species. Of the 2033 alien species recorded (or assumed to be present) outside of cultivation or captivity in the country, *775 are known to be invasive*, 388 are known to be naturalised but not invasive, and 355 are present, but not naturalised.[\[1\]](#)<sup>1</sup>

##### *Impacts of IAS*

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The impacts of invasive alien species vary widely in type and magnitude and are dependent on the species, their invasive potential, the extent to which they have invaded, the nature of the invaded environment, socio-economic contexts and the likely interaction with other global changes such as climate change, land degradation, pollution, etc.

A systematic and comprehensive evaluation of the impacts of individual invasive alien species in South Africa has not yet been conducted. However, 25 species were recently assessed by experts (see Zengeya *et al.*, 2017)<sup>[2]</sup> as having a severe impact, and 82 as having a major impact. Of these 107 species, most (80) are terrestrial or freshwater plants, eight are mammals, five each are freshwater fish, freshwater invertebrates and terrestrial invertebrates, two are amphibians, and there is one bird and one marine plant species.

The greatest impacts associated with invasive alien species in terrestrial habitats are due to invading plants. Depending on the species, they can:

- (i) *Reduce rangeland condition and carrying capacity.* Invasive alien plant infestations are estimated to have reduced the potential for South Africa to support grazing stock by just over 1%, though this varies between biomes. If no remedial action is taken, however, impacts are projected to become much larger (up to a 71% loss of grazing in some biomes);
- (ii) *Reduce surface water runoff and groundwater recharge.* At a national scale, the combined impacts of invasive alien plants on surface water runoff have been estimated at between 1 444 to 2 444 million m<sup>3</sup> per year. Primary catchments most affected (i.e. > 5% reduction in mean annual runoff) are in the Western and Eastern Cape, and KwaZulu-Natal. If no remedial action is taken, reductions in water resources could rise to between 2 589 and 3 153 million m<sup>3</sup> per year, about 50% higher than estimated current reductions;
- (iii) *Increase fire hazards.* Invasion of natural ecosystems by alien plants can change the structure and biomass of vegetation, adding fuel and supporting fires of higher intensity. Increased fire intensity can, in turn, increase the damage done by fires, as well as the difficulty of controlling fires; and
- (iv) *Erode biodiversity.* Reductions in biodiversity intactness as a result of biological invasions in South Africa's terrestrial biomes were highest (3%) in the fynbos biome. Under a scenario where invasive alien plants are allowed to reach their full potential, biodiversity intactness is predicted to decline dramatically, by around 70% for the Savanna, Fynbos and Grassland biomes, and even more (by 87% and 96%) for the two Karoo biomes.

Island ecosystems in South Africa are particularly vulnerable to biological invasions<sup>[3]</sup>. This is especially true for remote and isolated islands, which often lack the diversity of species found on continents, and whose indigenous species often lack defences against newly introduced predators or competitors. It has, for example, been estimated that about

5% of the Prince Edward Islands is covered by invasive plants, which have established around the coastal periphery on both Marion and Prince Edward Islands, and from where they are spreading inland.

Although well-documented cases are rare, in freshwater ecosystems, invasive fish and crustaceans, as well as the diseases they carry, are known to have large impacts on indigenous freshwater biota. This includes predation of indigenous biota (e.g. a depletion in the abundance of endemic Cape Floristic Region fishes through size-selective predation by *Oncorhynchus mykiss*), competition, habitat alteration, disease transfer and hybridisation.

As the most widespread and abundant marine invaders (*Mytilus galloprovincialis*, *Semimytilus algosus* and *Balanus glandula*) occur on rocky shores of the west and south coasts of South Africa, this habitat is considered to be the most highly impacted in South Africa. Because of the impacts associated with *Ficopomatus enigmaticus* (estuarine tubeworm) in estuaries, this habitat is considered to be moderately impacted, while harbour environments typically experience lower impacts.

The past decade has seen a significant increase in the number of insect pests and plant pathogens (pests) of tree species in South Africa<sup>[4]</sup>. In the last five years the Myrtaceae rust pathogen, *Puccinia psidii*, the Cycad Asian Scale (CAS), *Aulacaspis yasumatsui*, and several damaging insect pests of plantation forestry species (such as *Euwallacea fornicates*, the Polyphagous Shot Hole Borer,) appeared in the country. The previously recorded non-native pathogens, *Phytophthora cinnamomi* and *Armillaria mellea* has spread into natural environments, threatening native ecosystems.

Estimates of the monetary value of impacts generated by invasive species in South Africa indicate substantial negative effects in economic terms. For example, one study estimated that, at levels of infestation in 2010, invasive alien plants caused economic losses amounting to over ZAR 6 500 million every year, mostly for losses of water runoff, but also for loss of livestock production from invaded rangelands, and income from biodiversity-related goods and services. Given the large and growing impacts of invasive species, attempts to contain or reduce these impacts would be economically justifiable if the control measures were effective and efficient. The best available evidence for this comes from the field of biological control. By comparing the costs of biological control research and implementation to the benefits of restored ecosystem services, or avoided costs, and avoided ongoing control costs, biological control has been shown to be extremely beneficial in economic terms: estimated benefit: cost ratios ranged from 8:1 up to 3 726:1. This essentially means that for every one rand invested into control, losses of between ZAR 8–3 700 were prevented.

### *Extent of biological invasions*

Large numbers of invasive alien species have relatively restricted distributions (at the scale of quarter degree grid cells [QDGC]) across the country, and only in the case of plants and birds are there widespread species found. At least one alien reptile (*Python natalensis x molurus*,) and two alien terrestrial invertebrate species (*Cornu aspersum* and *Vanessa cardui*) are relatively widespread<sup>[5]</sup>. Alien species in other taxa (amphibians, freshwater invertebrates and mammals) appear to be less widespread. There are however no reliable data to illustrate the distribution of freshwater fish, fungi and microbial species at the scale of the QDGC.

### *National regulatory framework for IAS management*

The main legislative instrument that guides the management of invasive alien species in South Africa is the *National Environmental Management: Biodiversity Act* (NEM:BA, Act 10 of 2004) and the Alien Invasive Species regulations relating to this Act. The NEM:BA requires the Minister to ensure the coordination and implementation of programmes for the prevention, control or eradication of invasive species. The Act also empowers the Minister to establish a public entity to coordinate and implement programmes for the prevention, control or eradication of invasive species.

South Africa is one of the few countries that has comprehensive regulations in place to manage biological invasions, and many parts of the regulations are innovative. The regulations deal with most aspects of biological invasions (pathways, species, areas and the effectiveness of interventions) and most mechanisms to implement, update, review, and appeal the regulations are clear.

The NEM:BA *Alien and Invasive Species Regulations* (A&IS, 2014 as amended<sup>[6]</sup>) list a total of 559 alien species as invasive<sup>[7]</sup>, across four different categories: Category 1a – emerging invasive species that require early detection and a rapid control response; Category 1b – established, destructive invasive species that need to be actively managed; Category 2 – destructive invasive species that have socio-economic ‘value’ and whose spread must be controlled; and Category 3 – invasive species that have the potential to be serious invasives, and whose spread must be contained.

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The Regulations specify the way in which listed alien and invasive species in South Africa are to be managed. The intent of the regulations is to reduce the risk of importing alien species that could become invasive and harmful, reduce the number of alien species becoming invasive, limit the extent of invasions, and reduce the impacts caused by these invasions. This is to be achieved, in particular, by assigning responsibilities for the control of listed invasive species, and where appropriate to prescribe the conditions under which species that are both invasive and beneficial can be owned, cultivated, transported and traded, as well as assign the responsibility to owners to prevent the spread of such species.

The A&IS Regulations state that “if an Invasive Species Management Programme has been developed in terms of section 75(4) of the Act, a person must control the listed invasive species in accordance with such programme”. Management programmes have been developed for a small number of established invasive species. To date, two species-specific strategies (*Parthenium hysterophorus* and *Campuloclinium macrocephalum*), two genus-level (*Acacia* and *Prosopis*) strategies and one family-level strategy (Cactaceae) have been developed.

Control measures aimed at reducing the combined impacts of several co-occurring invasive species in a given area can also be implemented in any land parcel. Management authorities of protected areas, and all other organs of state in all spheres of government are required to prepare area management plans (termed “Invasive Species Monitoring, Control and Eradication Plans” in the regulations), and to submit those plans to the Minister and to the South African National Biodiversity Institute (SANBI). To date, twenty-nine area management plans, covering about 4% of the land-surface of the country, have been submitted.

Although the A&IS Regulations make allowance for the Minister to issue emergency interventions and enforcement actions involving listed invasive species, no such interventions have been issued by the Minister to date.

There are also several other Acts in South Africa that are relevant to the management of biological invasions, the most important of which (e.g. *Agricultural Pests Act*, *Plant Health Policy for South Africa*, *Animal Diseases Act*, *Animal Health Act*, *Conservation of Agricultural Resources Act*) are under the jurisdiction of the Department of Agriculture, Land Reform and Rural Development (DALRRD). The Conservation and Agricultural Resources Act (CARA), through the Conservation of Agricultural Resources Act Regulations, deals with several issues relating to the control of weeds and invasive plants. Regulations 15A, 15B and 15C which deal with the control of category 1, 2 and 3 plants, set out the permitted activities which may be undertaken with each category of plants. Regulation 15 furthermore provides for the measures applicable to each of the categories of plants as identified. An important provision in regulation 15E is the requirement that any action taken to control category 1, 2 and 3 plants shall be executed with

caution and in a manner that will cause the least possible damage to the environment. The Agricultural Pests Act (APA), which has as its main aim the prevention and combating of agricultural pests, contains several provisions relating to the importation of controlled goods into the country. Although not making direct reference to IAS, the APA regulates the importation of alien and potentially invasive plants, pathogens and insects. The Plant Health Policy (PHP) harmonises the national phytosanitary legislative, regulatory and institutional frameworks with the appropriate international standards. The PHP is specifically focused on preventing, controlling and mitigating the introduction, spread and establishment of quarantine pests and limiting the economic impact of regulated non-quarantine pests of plants in new areas.

The DEFF are currently in the process of drafting and finalising a *National Policy for Biological Invasions* and a *National Invasive Species Strategy and Action Plan* (NISSAP).

#### *Surveillance and detection of IAS*

Intentional alien species introduction pathways are currently managed through a permitting system administered by Department of Environment, Forestry and Fisheries (DEFF). Species require import permits that are based on a risk assessment conducted by a qualified risk assessor. These assessments are then sent by the DEFF to the SANBI's coordinated Alien Species Risk Analysis Review Panel (ASRRAP) who provide scientific oversight on risk assessments and make recommendations to DEA for import of invasive alien species. DEFF then makes a decision to approve or, should the risks be too high, reject an application for an import permit.

There are 11 pathways involved in the accidental introduction of alien species as stowaways on transport vectors. Cargo and passengers entering South Africa are searched for alien organisms. Legislation to prevent the introduction of species through the release of ballast water by ships has recently been drafted. For air traffic, inspections by the DEFF are currently only carried out at O.R. Tambo International Airport where compliance with the permit and permit conditions is checked, illegal imports are intercepted, and the luggage of tourists and cargo is searched for alien organisms that may have been unintentionally transported as stowaways. Occasional and infrequent joint operations are also carried out by DEFF - in conjunction with other departments - at a limited number of other ports of entry/exit points. While other control measures are in place to manage additional pathways of introduction, these focus on potential agricultural pests (e.g. phytosanitary inspections at border posts and treatment of wood packaging to prevent the spread of timber pests) or threats to human health (e.g. spraying the interior of aircrafts to kill insect disease vectors).

In line with international obligations under the International Plant Protection Convention (IPPC) and its role as the National Plant Protection Organization (NPPO), the Department of Agriculture, Land Reform and Rural Development (DALRRD) further regulates and monitors the importation of agricultural goods.

### *Management and control of IAS*

Approximately 126 plant taxa are currently being targeted for mechanical (and chemical) clearing by the DEFF's Natural Resource Management (NRM) programmes. Most of this clearing effort is being directed towards eight taxa - *Solanum mauritianum*, *Acacia mearnsii*, *Prosopis* spp., *Acacia dealbata*, *Pinus* species, *Cereus jamacaru*, *Lantana camara*, and *Eucalyptus* species (albeit with limited success in containing their spread or reducing their rate of invasion).

To date, 42 eradication projects have been initiated<sup>[8]</sup>, or are under consideration, in South Africa. Most of these (32) are aimed at terrestrial or freshwater plants. Of these projects, 23 are under consideration, pending the outcome of a risk analysis or the development of a detailed plan, and 10 are ongoing [eight against plants, one targeting a bird species (*Corvus splendens*), and one targeting a mammal (*Hemitragus jemlahicus*)].

Biological control agents have been established on 60 invasive alien plant species in South Africa. Of these, 15 species (eight succulent cacti, four aquatic plants, two herbs and one shrub species) are currently under complete control; 19 species (nine tree or shrub species, eight succulent cacti, one aquatic plant and one herb) are under a substantial degree of control; a negligible degree of control has been achieved on 15 species (11 tree or shrub species, two herbs and two climbers); while the degree of control has not been determined for the remainder (three tree and shrub species, four succulent cacti, two herbs and two climbers). This success is further aided by mass-rearing programs<sup>[9]</sup>.

The NEM:BA empowers competent authorities to issue notices and directives to landowners, to ensure their compliance with the requirements of the Act and its regulations. There are three types of notifications – pre-compliance notices, compliance notices and warning letters. As at 2017: (i) notices regarding invasive plant species have been served to the owners of 85 properties across South Africa; 59 of these notices went to private landowners, and 26 to plant traders; and (ii) notices regarding invasive animal species have been served to the owners of 119 properties across South Africa; 78 of these properties (66%) were pet shops, 19 were game farms (16%), 12 were other private landowners (10%) and 10 were sanctuaries or zoological gardens (8%). The regulations further require that the sellers of any immovable property must, prior to the conclusion of the relevant sale agreement, notify the purchaser of that property, in writing, of the presence of listed invasive species on that property.

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### *Barriers to surveillance and detection of IAS*

Despite significant efforts being made to manage biological invasions in South Africa, the following barriers are comprising the effectiveness of IAS surveillance and detection measures along high-risk introduction pathways and the cost-effective control of established high-risk IAS:

#### *(i) Weaknesses in the capacities and inter-agency coordination in biosecurity measures at key national ports of entry:*

There are 72 official ports of entry through which people, goods and transport vessels can enter the country. Eight of these are maritime ports, ten are airports and 54 are land border posts. Unfortunately, control measures are still not in place for many of these pathways. Only one of the ports of entry – OR Tambo International Airport – has adequate biosecurity measures in place, while the remaining ports of entry have limited, or sporadic deployment, of biosecurity capacity. The import of goods such as live plants and food to the country is increasing, and although some control measures are in place to prevent the accidental introduction of commodity contaminants, the rate at which alien taxa are being introduced through these pathways is growing. In South Africa, the accidental introduction of alien taxa as stowaways on transport vessels (and their containers) is playing an important role that is likely to increase in the future. The mandate to manage several aspects of biosecurity at national ports of entry is currently fragmented across several government departments and their agencies. It is not yet clear the degree to which the approach among the various departments is co-ordinated to avoid duplication of effort and increase efficiency. The detection and surveillance skills, expertise and knowledge (across numerous disciplines such as natural and social sciences, legal and law enforcement) of biosecurity officials to ensure compliance with the A&IS regulations at these ports of entry remains very limited.

*(ii) Key knowledge gaps in, and low levels of awareness and involvement of the broader society in, pre-and post-border biosecurity:* Biosecurity in South Africa tends to be thought of as the domain of governments and industry agencies, with its importance less well recognized among the broader society, especially those rural communities who are vulnerable to the threats posed by invasive species. Biosecurity information also exists in several different databases that are often dispersed and not easily accessible. In addition, these databases were created for different purposes and vary in completeness and information content. Further, there are some key gaps in the available information on pathways of introduction and dispersal.

*(iii) Inefficient and expensive IAS control measures:* Only 136 out of 556 listed invasive alien taxa (24.3%) are subjected to regular management. This management also reaches only a small proportion (~1% per year) of the populations of each managed invasive species. Besides a small proportion (6.4%) of species that have either been eradicated or brought under biological control, populations of most species continue to grow, indicating that interventions are ineffective at a broad scale. Only 0.36% of invaded land is subjected to active management. Based on a limited number of studies, 8% of this area is effectively managed, 58% is partially effectively managed, and 34% is ineffectively

managed. Mechanical and chemical control measures have largely failed to check plant invasions[10]<sup>10</sup>. Despite considerable investments, and some localised or technique-specific successes, control measures have by-and-large failed to reverse the spread of invasive species. By comparing the costs of biological control research and implementation to the benefits of restored ecosystem services, or avoided costs, and avoided ongoing control costs, biological control has been shown to be extremely beneficial in economic terms: estimated benefit:cost ratios ranged from 8:1 up to 3 726:1 (Le Maitre *et al*, 2011). This essentially means that for every one rand invested into control, losses of between ZAR 8–3 700 were prevented.

## **1.2) the baseline scenario and any associated baseline projects,**

### *Surveillance and detection of IAS*

In the DEFF: (i) the Biosecurity Directorate regulates the introduction, establishment and spread of IAS through a national permitting system; (ii) the Biodiversity Compliance Directorate undertakes surveillance at national ports of entry and conducts nation-wide inspections to ensure compliance with permit conditions and IAS regulations; and (iii) the Biodiversity Risk Management Directorate conducts IAS risk assessment and response planning to identify and address the emerging threats to biodiversity from IAS. These three directorates collectively have an annual operational budget[11]<sup>11</sup> allocation of approximately USD 2,3 million (conservatively estimated at ~USD 11,5 million over the five years of project implementation).

The Agricultural Production, Health and Food Safety Branch in DALRRD administers the Agricultural Pests Act (APA) at the national ports of entry through its Plant and Veterinary Health Inspection Services. The Directorate: Land Use and Soil Management (D:LUSM) in DALRRD administers and enforces compliance with the CARA through its 'Resource Auditors' and delegated 'Municipal Weed Inspectors'. The Directorate: Animal Health in DALRRD reduces sanitary risks in the import and export of animals and animal products and renders epidemiological services for early warning and monitoring of animal diseases. The DALRRD biosecurity inspection services collectively have an annual operational budget[12]<sup>12</sup> allocation of approximately USD 4.1 million (conservatively estimated at ~USD 20,5 million over the five years of project implementation).

The South African National Biodiversity Institute's (SANBI) Biological Invasions Directorate (BID) aims to detect emerging invasive species, assess and document risk profiles of all listed invasive species in South Africa and attempt eradication of high-risk species with limited distribution (in particular Category 1a listed species). The BID is working

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towards full risk profiles of all NEMBA listed invasive species, has developed species-specific eradication plans for 42 species, and is helping to implement these plans. The SANBI BID has an annual budget of USD 3,6 million (USD 18 million over the five years of project implementation) , employs 33 staff working across all nine provinces, supports 10 postgraduate students and hosts 35 interns (including those as part of a drive to collect DNA barcodes for all invasive taxa). In support of SANBI's BID, the South African Plant Invaders Atlas (SAPIA) catalogues localities, abundances and habitats of alien plant species growing outside of cultivation. The SAPIA database currently contains about 78 000 records (covering more than 720 species) in 1 500 QGDCs.

### *Management and control of IAS*

The Natural Resource Management (NRM) Programmes in the DEFF seek to address the threats of established terrestrial IAS's by using labour-intensive mechanical and chemical IAS control methods which target unemployed, youth, women, people with disabilities and small to medium size enterprises (SMMEs). The relevant NRM programmes<sup>[13]</sup> of the DEFF collectively have an annual operational budget allocation of more than USD 75 million, (>USD 375 million over the five years of project implementation) and create more than 25,000 work opportunities across at least 300 NRM-funded IAS control projects nation-wide.

The annual budget for additional mechanical and chemical control of invasive alien plant species being independently funded by the Department of Human Settlements, Water and Sanitation (DHSWS) (e.g. the adopt-a-river programme), South African National Parks (SANParks), provincial conservation agencies (e.g. the Invasive Alien Species Programme administered by Ezemvelo KZN-Wildlife), municipalities (e.g. the Invasive Species Programme administered by the City of Cape Town) and private landowners (e.g. invasive alien control work undertaken on private land) is conservatively estimated at USD 10.7 million (>USD 53.5 million over the five years of project implementation).

Employing some 40 staff members (mainly entomologists, plant pathologists, plant ecologists, technicians and support staff), the ARC's 'Weeds Research Programme' of the Plant Protection Research (PPR) facility is responsible for research on the ecology and chemical and biological control of invasive alien plants in South Africa, with an emphasis on non-native problem plants in conservation and pasture situations, as well as non-native aquatic weeds. It has an annual budget allocation exceeding USD 1.95 million (>USD 9.75 million over the five years of project implementation).

The newly established Centre for Biological Control (CBC) at Rhodes University<sup>[14]</sup><sup>14</sup> has been awarded a USD 4,7 million contract (until March 2021) by the DEFF. The research focus of the CBC is the sustainable control of 54 species of invasive alien plants through biological control using insects. The centre is also involved in the development of these agents in its DAFF-approved quarantine facility, and the mass-rearing and implementation of the insects once they have been cleared for release. Its five programmes (each programme focuses on a different target area or number of species, as well as different aspects of biological control) are managed by a total staff complement of 19 research staff, 9 support staff and 2 mass-rearing facility staff.

#### *IAS Research and development*

The Centre for Invasion Biology (CIB) at Stellenbosch University (SU) undertakes research on the biodiversity consequences of biological invasions, largely through post-graduate student training. The CIB comprises a network of senior researchers and their associated postdoctoral associates and graduate students throughout South Africa. The CIB is co-funded principally by the Department Higher Education, Science and Technology (DHEST), through the National Research Foundation (NRF), and by SU. It has a core staff complement of 2 management staff and 15 research staff (1 of whom is based at the University of Pretoria). The South African Institute for Aquatic Biodiversity (SAIAB), a National Research Facility of the National Research Foundation (NRF) and an internationally recognised centre for the study of aquatic biodiversity, conducts research on invasive aquatic organisms. The Natural Resources and the Environment programme of the Council for Scientific and Industrial Research (CSIR) has produced a substantial body of research on invasive species, mainly in terrestrial environments. Most of the research on alien microorganisms is conducted at the Forestry and Agricultural Biotechnology Institute (FABI) at the University of Pretoria. The South African Medical Research Council (MRC) conducts research on many human diseases involving alien species under the auspices of the Department of Health. Onderstepoort Biological Products SOC Ltd (OBP) is a South African state-owned animal vaccine manufacturing company whose mandate is to prevent and control animal diseases that impact food security, human health and livelihood. Collectively this effort equates to an annual national budget commitment to invasive species research and development of at least USD 9.2 million (>USD 46 million over the five years of project implementation).

### **1.3) the proposed alternative scenario with a brief description of expected outcomes and components of the project.**

In the proposed alternative scenario, the project will contribute to strengthening the national capacity to implement South Africa's (draft) *National Invasive Species Strategy and Action Plan* (NISSAP). The project will focus GEF investments on addressing some of the key gaps in managing the first three stages of invasion (introduction, establishment and expansion) through a combination of species-based, area-based and pathway-based approaches. It will however emphasise the strengthening of biosecurity along high risk

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introduction pathways and specifically target activities that result in the protection of globally significant terrestrial, aquatic, coastal and marine biodiversity (species, habitats and ecosystems) from the impacts of biological invasions.

The project will, wherever practicable, direct its efforts to the management and control of those invasive species that also impact on food security, human health and the livelihoods of rural communities (notably in the fishing, forestry and agriculture sectors), particularly in the areas where the poorest people may be dependent on biodiversity-based products for food, fuel and construction material.

The overall project objective is that *‘The efficient and effective management of invasive alien species mitigates their negative impacts on South Africa’s biodiversity assets and contributes to the improvement of livelihoods’*.

The project’s objective is to improve efficiency and effective management of high-risk invasive alien species (IAS) in South Africa. This project is important since it will directly mitigate the resultant negative impacts of AIS on South Africa’s biodiversity assets, and indirectly contributes to the improvement of rural food security and livelihoods.

South Africa has extensive transport networks that facilitate the movement of goods and people around the country and also connecting the Southern African Development Community region with world through road and air transportation). In line with the international trade patterns, the volume of goods and the number of people moving around the country is expected to increase. For instance, the number of domestic airline passengers has increased over time such that in the 2015/2016 financial year, there were over 13 million trips made by over 140 000 flights thus making South Africa more prone to alien invasion. As in the PIF, over 2000 alien species have established populations outside of captivity or cultivation in South Africa to date. About one third of these have become invasive. Experts are of the opinion that more than 100 invasive species already cause major impacts. Both number of species causing major impacts, and the magnitude of the impacts themselves, are set to grow as further species become invasive, and as others enter a phase of exponential spread.

The enabling frameworks, and the respective mandates of the different state institutions (directly and indirectly) responsible for the prevention and early detection of IAS, are more comprehensively described in Chapter 7 of the report ‘The status of biological invasions and their management in South Africa (2017).

The enabling frameworks, and the respective mandates of the different state institutions (directly and indirectly) responsible for the prevention and early detection of IAS, are more comprehensively described in Chapter 7 of the report ‘The status of biological invasions and their management in South Africa (2017) and are summarised below:

Department of Forestry, Fisheries and the Environment: They are the National Focal Point of the Convention on Biological Diversity and responsible for administering the National Environment Biodiversity Act and the Alien and Invasive Species Regulations. The implementation of the Act is mainly supported by number of environmental programmes that are presented in detail on the PIF such include the Natural Resource management (Working for Water).

Department of Agriculture, land reform and Rural Development is responsible for the combating weeds and invader plants for the maintenance of the agricultural production potential and conservation of natural agricultural resources in terms of the Conservation of Agricultural Resource Act, Act 43 of 1983 and also the national Focal point of the International Plant Protection Convention which is implemented through the Agricultural Pest Act .

Agricultural Research Council: they have a dedicated unit called Plant Protection Research Institute dedicated on conducting biological control research in South Africa.

South African National Biodiversity Institute I: their legal mandate in terms of the NEMBA is on monitoring and reporting on invasive alien species. They are also responsible for Early Detection and Rapid Response programme to control and manage emerging invasive and alien plants in South Africa. The programme aims to reduce plant invasions through the following four key implementation areas:

- Early detection
- Identification and verification
- Risk assessment and response planning
- Rapid response.

South African National PARKS: their mandate is to oversee the conservation of South Africa's biodiversity, landscapes and associated heritage assets through a system of national parks.

Natural Resources and the environment: their mandate as relates to IAS is conduct research, vegetation mapping, impact assessment, cost benefit analysis and capacity building.

Department of Human Settlement, Water and Sanitation promotes effective and efficient water resources management to ensure sustainable economic and social development. They also empower communities through sustainable partnerships to support the water and sanitation development agenda.

Department of Transport: they are responsible for the implementation of Ballast Water Bill and maritime issues. They are also the focal point for the International Maritime Organisation and the International Civil Aviation Organization.

Provincial government are responsible for implementing their Provincial ordinances on conservation which include permitting and control of invasive alien species.

The project is structured into three components, with each component comprising a complementary suite of two to three outputs:

**Component 1** is focussed on improving the operational management of high-risk introduction pathways for the *priority alien invasive species* considered to have a detrimental impact on South Africa's globally significant biodiversity, and that also constitute a significant risk to rural livelihoods. The outputs and activities under this component will collectively contribute to strengthening the country's surveillance capacity at key entry points (i.e. points of import) in the form of border controls, monitoring, early detection and quarantine measures.

In South Africa there is currently no intervention to prevent introduction through hull fouling. Over 60 alien taxa are believed to have been introduced in South Africa through hulls of visiting ships. The rate of introductions that have occurred so far has increased over time. To address the increasing demand, all of South Africa's major ports, except the Mossel Bay, will be upgraded and expanded in the future. This action could lead to an increase in the number of visiting ships, and unless additional biosecurity measures are put in place, the increased shipping intensity could result in an increase in the introduction of marine organisms through hull fouling.

Currently the Durban harbour is more threatened by this pathway due to the number of visiting ships, and trade routes from Asia in particular.

The Department of Forestry, Fisheries and the Environment is more visible at the OR Tambo international airport. The latter is the busiest airport that connects the rest of the cities across the country. The Beitbridge border post which connects South Africa to the rest of continent is one of the priority border posts for this project. However, occasional joint operations are carried out at other entry points in conjunction with other departments in particular Agriculture, Land Reform and Rural Development (DALRRD) which is visible at most of the ports (air, harbour and land borders).

It is initially envisaged that Output 1.1 be piloted at 2 primary ports of entry - OR Tambo International Airport and Durban maritime port. During the PPG, the feasibility of including a key land border post (such as Beit Bridge) as an additional pilot will be assessed.

Under Output 1.1 the project will pilot the establishment and operations of a small, inter-agency ‘Biosecurity Risk Assessment/Targeting Centre (BRA/TC)’<sup>[15]</sup><sup>15</sup> for the surveillance of the priority invasive alien species at key national ports of entry. It is anticipated that this BRA/TC will then enable a more coordinated approach in the coherent and consistent implementation of protocols and procedures related to IAS biosecurity monitoring, prevention, early detection and emergency response at national ports of entry. The BRA/TC will also provide an increased ability and capacity to better manage and integrate multiple information and intelligence flows on pre-border IAS introductions. It will further facilitate closer linkages between intelligence and front-line operational activities (such as Biosecurity Inspection and Compliance and Plant and Veterinary Health Inspection). GEF financing will be used to: (i) support the development of an operational model for the RA/TC; (ii) facilitate invitations to other border agencies to voluntarily join and work in the BRA/TC<sup>[16]</sup><sup>16</sup>; (iii) procure the requisite infrastructure and equipment for the BRA/TC; (iv) install a networked IT systems hub in the BRA/TC to coordinate information exchange on biosecurity risk related issues (see also Output 2.2 below); (iv) develop automated biosecurity risk profiling capabilities for incoming aircraft, ships, cargo and passengers; and (v) co-finance the running and operating costs of the BRA/TC.

Under Output 1.2 the project will strengthen capacities of DEFF, DALRRD and the Department of Transport (Maritime Transport Branch) to implement the minimum treatment requirements for sea containers and break-bulk cargo at key ports of entry in order to mitigate the unintentional risks of introductions of the priority invasive species. GEF funding will be used to develop, and test the implementation of, a sea container and break-bulk cargo biosecurity risk management system at Durban harbor (Durban has been identified as the South African port with the highest invasion probability). The project will support the following suite of activities: (i) maintain a national watch list of invasive species

associated with high risk shipping routes; (ii) draft a national sea container and break-bulk cargo biosecurity risk policy; (iii) generate risk profiles for all incoming sea containers and break-bulk cargo (see also Output 2.2 below); (iv) conduct visual inspections of medium and high risk sea containers and break-bulk cargo at Durban harbor; (v) quarantine sea containers failing visual inspections at Durban harbor; (vi) install and operate an automated high-pressure container cleaning facility at Durban harbor for sea containers failing visual (or automated) inspections; (vii) conduct washing and fumigation<sup>[17]</sup> of the interior of sea containers and/or break-bulk cargo failing visual (or automated) inspections at Durban harbor; and (viii) develop and implement a cost recovery system for the expenses associated with the ongoing cleaning and fumigation of quarantined sea containers and/or break-bulk cargo at Durban harbor.

In Output 1.2, GEF resources will only be used to support the roll out of a sea container and break-bulk cargo and biosecurity risk management system at the Durban maritime port. The lessons learnt in this roll out will be used for guiding the future scaling up, on a prioritised basis, of the risk management system at each of the other ports. Please refer to Australia's Department of Agriculture, Water and Environment Sea Container Risk Management Policy (SCRMP) - developed to manage the detection and intervention of biosecurity risk material on the external surfaces of sea cargo containers entering Australia - as an example of a biosecurity risk management system for containers in ports of entry (<https://www.agriculture.gov.au/import/before/prepare/sea-container-cleaning-standards/frequently-asked-questions#what-is-this-policy>).

Under Output 1.3 the project will support the establishment of a small professional team of biosecurity detection dogs (targeting high-risk invasive alien plant and animal species) and their handlers to be deployed at national ports of entry (in support of existing measures to detect high risk invasive species at national ports of entry). GEF financing will be used to: (i) develop certification standards and standard operating procedures (SOP<sup>[18]</sup>) for biosecurity detection dogs and their handlers; (ii) select, train and certify dog handlers; (iii) select, acquire and train suitable dogs; (iv) deploy dogs and their handlers to selected ports of entry; (v) provide ongoing operational support to dogs and their handlers; (vi) ensure that dog health requirements and dog veterinary needs are met; and (vii) develop additional surveillance skills for dogs and their handlers (e.g. for pre-voyage biosecurity inspections of vessels and facilities to prevent the re-introduction of mice to offshore islands after the implementation of the house mouse eradication project – see Output 3.1 below).

Currently, the DALRRD has 11 detection dogs that are trained to detect plants and plant products. The detector dogs are a fast, versatile and mobile detection technology that can screen across a range of environments. Therefore, the project will also look into upscaling capacity for interception and prevention of import of potentially damaging invasive

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species. This will be done through the deployment of detection dogs that might offset the cost of vigilance, and an increase in this capacity to deliver positive returns on investment. The dogs will be trained to detect broad spectrum of alien species and animal products to strengthen our biosecurity system. In Output 1.3, GEF resources will be used to train and operationalise a number of biosecurity dogs and their handlers (not only one). Each dog/handler team will specialise in targeted groups of invasive species assessed to have high risk and high impact. It is anticipated that these teams will be mobile, moving to identified port of entry 'hotspots', rather than deployed to specific ports of entry. The specificities of the activities under this output will be further developed during the PPG phase.

**Component 2** is focused on strengthening the role of *the broader community* in biosecurity activities, particularly in pre-border and post-border risk analysis, surveillance, detection and reporting.

In Output 2.1 the project will assist in raising the profile of biosecurity by improving communications and awareness at all levels. It will develop and launch – using a range of media, web and new technologies<sup>[19]</sup><sup>19</sup> - a 'biosecurity awareness campaign' as a leverage point through which to engage the community about the importance of pre- and post-border biosecurity and influence public perception about biosecurity. GEF financing will also be used under this output to initiate a more focused engagement programme with select stakeholders, principally targeting: (a) the private sector; (b) disadvantaged local communities; and (c) environmental community groups. This will specifically entail: (i) encouraging the integration of biosecurity issues into relevant private sector codes of practice, corporate social responsibility (CSR) programmes and corporate communications; (ii) facilitating the active involvement (through the adopt-a-river approach administered by the DHSWS) of poor local communities in controlling the spread of invasive plants species along rivers and river courses with high biodiversity and ecosystem service value (local communities living in the following sub-catchments have been preliminary targeted for project support – Buffalo, Mzimvubu, Mbhashe, Nahoon and Pienaars/Crocodile); and (iii) strengthening the capabilities of environmental groups to become more involved in biosecurity monitoring, through surveillance, detection and reporting activities (e.g. notification of new and emerging IAS through citizen science smartphone applications).

In Output 2.2 the project will support the design, scoping and phased development of a centralised national Biosecurity Information and Risk Analysis System (BIRAS). It is envisaged that the BIRAS will act as central access point for biosecurity-related information, facilitate improved information flows and provide for better data access, sharing and analysis. GEF financing will be used to: (i) design, and scope the requirements for, a BIRAS that will allow for the collection, collation and analysis of information to support biosecurity activities; (ii) standardize electronic data forms and work flows for recording details of surveys, inspections and control measures; (iii) develop an analytics capability to improve the identification and management of pre-border and border risks; (iv) implement the first phase of the development of the BIRAS (including data management centre,



shared database, management console, wireless data service, mobile device software and data entry forms. automated data aggregating and IT support) servicing both field and office-based parts of the management workflow.

**Component 3** is focused on supporting efforts to improve the effectiveness of control measures that address individual species, with an emphasis on the eradication and biological control of *targeted invasive alien species* considered a high risk to South Africa's global biodiversity values and food security.

Under Output 3.1 the project will support the eradication of the house mouse (*Mus musculus*) from Marion Island[20]<sup>20</sup>. Marion Island is a South African territory in the Southern Ocean[21]<sup>21</sup> and is home to several threatened seabird species, including nearly half of the world's Wandering Albatrosses. These seabirds are threatened by an unlikely, but voracious predator, the house mouse. Mouse attacks on 18 species of burrow-nesting and surface-breeding seabirds at Marion Island are pervasive and increasing. Left uncontrolled, it is feared that these burrow nesting and surface-breeding seabirds may be vulnerable to local extirpation should the mice not be eradicated. Aside from the seabirds, the entire ecology of Marion Island has suffered severely from the negative impacts from mice – disrupting nutrient cycles and energy flows, and adversely impacting the native invertebrate and plant communities. GEF financing will thus be used to: (i) co-finance the seasonal deployment (during the optimal time of year for baiting<sup>22</sup>) and daily running costs of a mouse eradication team (including helicopter team) at the Marion Island research base; (ii) procure rodenticide (for administration in the form of cereal bait pellets) and specially modified agriculture fertiliser spreaders (to spread the bait from a helicopter); (iii) co-finance the seasonal helicopter costs for the seasonal island-wide application of bait (in the specially modified agriculture fertiliser spreaders); (iv) monitor the impact of the eradication efforts on mouse and seabird populations; and (v) develop and implement biosecurity protocols to prevent future introductions of the house mouse to Marion Island and the nearby Prince Edward Island.

The Marion island and Prince Edward Islands are also a Ramsar sites and are already recognized as a Special Nature Reserve, which affords the highest degree of protection under South African environmental legislation. The Marion Island's terrestrial ecosystem has been radically transformed by introduced mice, which are now threatening the island's globally important seabird. The project eradication efforts[22]<sup>22</sup> will start during early winter, when mouse numbers are falling due to lack of food and cold conditions, increasing the likelihood of all animals consuming bait. These Mice also cease breeding on Marion from late May to August, reducing the chances of semi-independent young in the den failing to encounter bait. Winter also coincides with the period of lowest numbers of brown skuas and giant petrels (*Macronectes* spp.) present on the island, which might be killed accidentally by either primary or secondary poisoning. This is a cost-effective method to eradicate mice in the island which will be done by helicopter bait spraying to achieve

wide application of bait. The method has also been tested and proven effective in the eradication of house mice from South Georgia. A preliminary expert assessment (Birdlife South Africa) has confirmed that eradication of mice from Marion Island is entirely feasible, with minimal and manageable risks to non-target species.

Under [Output 3.2](#) the project will support the development and controlled release of biocontrol agents (number to be determined during PPG when costs are more accurately estimated) for targeted Category 1b (established, destructive invasive species that need to be actively managed) invasive plant species known to have a significant impact on native biodiversity and rural economies (see Table 2 below).

Table 2. Prospective Category 1b alien invasive plants being targeted for biocontrol

Category 1b alien invasive plants targeted for biocontrol	Invasiveness	Biodiversity impacts <a href="#">[23]</a> <sup>23</sup>	Current biocontrol status
<i>Tecoma Stans</i> (Bignoniaceae) Yellow bells	A leafy evergreen shrub or small tree up to 4m high. <i>T. stans</i> is one of the fastest spreading invasive tree in South Africa and the neighbouring countries. It competes with, and has the potential to replace, indigenous species. Invades hot and dry savanna where it reduces grazing for wildlife and livestock.	1 Critically Endangered Ecosystem 5 Endangered Ecosystems	The two biocontrol agents released are not yet adequate to curb the spread of the weed. There is a need to search for flower-attacking agents in countries outside of Mexico

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<i>Cestrum laevigatum</i> and <i>C. parque</i> (Solanaceae)  Inkberry	An evergreen shrub or tree growing 1-2m high (but reaching 15m or more along the coastal regions). Highly invasive along the KZN and Eastern Cape Coast. It is a habitat transformer and competes against indigenous plants and crops. The whole plant is poisonous for livestock and wildlife.	11 Critically Endangered Ecosystems  3 Endangered Ecosystems	None. Surveys and search of potential agents in South America still to be conducted.
<i>Xanthium strumarium</i> (Asteraceae)  Large cocklebur	An herbaceous shrub growing up to 1,2m high. Distributed throughout all provinces in South Africa, particularly the eastern regions. Competes with crop plants and indigenous species along riverbanks. Its spiny burs adhere to the wool of sheep wool and becomes entwined in tails, manes and coats of domestic livestock, causing the animals much discomfort. The seedlings are particularly toxic to domestic livestock. It readily invades overgrazed pastures and spreads at the expense of the indigenous species.	1 Critically Endangered Ecosystem  3 Endangered Ecosystems	Biocontrol has been attempted in Australia, and some biocontrol agents have been identified.
<i>Biancaea decapetala</i> (Syn. <i>Caesalpinia decapetala</i> ) (Fabaceae)  Mauritius thorn	A thorny evergreen shrub which grows from 2-4 m high (or climbs to 10 m or higher). It often forms dense thickets. A widespread, highly invasive weed, sprawls over and outcompetes indigenous vegetation and crops in KwaZulu Natal, Mpumalanga, and Gauteng. Mechanical and chemical control alternatives are impractical for all but the smallest infestations.	7 Critically Endangered Ecosystems  2 Endangered Ecosystems	One seed-feeding agent released but its establishment and impact is poor. New agents are required.
<i>Anredera cordifolia</i> (Basellaceae)  Madeira vine	A long-lived (perennial), twining or climbing plant growing over taller plants. Madeira vine is capable of smothering and even replacing indigenous vegetation across the Eastern Cape, Western Cape, KwaZulu-Natal, Mpumalanga and Gauteng. Being a vine, it is difficult to control with herbicides and manual clearing and biological control is the only long term, sustainable option.	9 Critically Endangered Ecosystems  3 Endangered Ecosystems	A leaf-feeding beetle was released in 2016. Poor establishment may improve with mass-rearing, but an additional subterranean and aerial tuber feeder is required to manage the spread of the weed along river systems and coastal areas.
<i>Lythrum salicaria</i> (Lythraceae)  Purple loosestrife	A perennial herb, 2 m tall. Contained in distribution to wetlands across the Western Cape. However, as happened in North America, it poses a serious threat to wetland biodiversity if allowed to spread beyond the province. At high densities, purple loosestrife can create near-monocultures, smothering indigenous wetland vegetation.	2 Critically Endangered Ecosystems	Classical biocontrol of <i>Lythrum salicaria</i> was a success in the US, so those effective agents should be introduced to South Africa for host-specific tests and possibly be released.

<i>Schinus terebinthifolius</i> (Anacardiaceae),  Brazilian Pepper tree	An evergreen shrub or tree growing up to 6m high with wide-spreading, horizontal branches. It is invasive in the Eastern Cape, Mpumalanga and Limpopo, and along the KZN coast. Competes with and has the potential to replace indigenous species. Poisonous and irritant. Indigenous birds tend to neglect the dispersal of indigenous plants as a consequence of their preference for the fruits of the Brazilian Pepper tree.	9 Critically Endangered Ecosystems  5 Threatened Ecosystems	It has an advanced biocontrol programme on it in Florida and Hawaii, which would make it an easier target in South Africa.
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GEF financing will be used (for each targeted IAS) to: (i) identify prospective biocontrol agents in the native range, and assess their level of specialization (host-specificity testing multi-level screening process) in quarantine; (ii) apply for permission to release suitable agents from quarantine and undertake safety testing of candidate biocontrol agent/s for formal approval and importation/quarantine clearance; (iii) develop a species-based biocontrol release programme; (iv) implement mass-rearing and release of biocontrol agent/s on their target species at selected experimental sites for monitoring; (v) prepare guidelines for full biocontrol agent release; (vi) implement a full release at selected release sites, and monitor the efficacy of the biocontrol agents; and/or (vii) initiate further mass-rearing of biocontrol agent/s to enhance their dispersal and distribution. As part of the implementation modalities for this output, senior researchers from the Agricultural Research Institute's (ARC) Plant Protection Research (PPR) Unit. will mentor three post-graduate students who will work on some aspects of foreign exploration and biocontrol agent screening (host-specificity testing) in quarantine.

#### **1.4) alignment with GEF focal area and/or Impact Program strategies.**

The proposed project is fully aligned with the Goal of the GEF-7 BD Strategy 'to maintain globally significant biodiversity in landscapes and seascapes. It will directly contribute to meeting Objective 2 of the GEF-7 BD Strategy 'Address direct drivers to protect habitats and species' through Programme 4 'Prevent and control invasive species'. The project targets a sub-selection of high priority alien invasive species considered to have a severe detrimental impact on South Africa's globally significant biodiversity, and that also constitute a significant risk to rural livelihoods.

#### **1.5) incremental/additional cost reasoning and expected contributions from baseline, GEFTF and co-financing**

Summary of current situation	Summary of GEF alternative scenario	GEF increment by project end
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<ul style="list-style-type: none"> <li>- The country has a comprehensive suite of legal instruments to regulate the introduction and management of IAS, but there is still a widespread public ignorance of the legal requirements, and limited institutional capacity to ensure compliance;</li> <li>- Several government institutions are mandated to administer the different acts and regulations governing the management of IAS, but the weak coordination and collaboration between these institution's is compromising the overall effectiveness of IAS surveillance, detection and management efforts;</li> <li>- Biosecurity control measures are being undertaken at some high priority national ports of entry/exit by DEFF, DALRRD and the DoH, but there are still no/limited biosecurity controls being undertaken at most of the other national ports of entry/exit;</li> <li>- There are rich datasets of IAS information across the country, but this information is still located in a plethora of different databases that are widely dispersed and not easily accessible;</li> <li>- South Africa has invested significant resources in large-scale mechanical and chemical management control programmes for well-established invasive alien plants, but these programmes still have limited coverage and are by-and-large failing to effectively check their spread and impacts;</li> <li>- South Africa is a global leader in the development of biological control agents, but resource constraints to finance the development of new biocontrol agents and inefficient mass-rearing is compromising the further release of biocontrol agents; and</li> <li>- Eradication plans have been developed for a suite of high priority species, but the high upfront resources required for implementing these plans is a significant limiting factor.</li> </ul>	<ul style="list-style-type: none"> <li>i) strengthening biosecurity capacities, and improving inter-agency cooperation in biosecurity surveillance, along high-risk introduction pathways at national ports of entry;</li> <li>(ii) establishing a centralized biosecurity information system to harmonize information flows and provide for better data access, sharing and risk analysis;</li> <li>(iii) broadening the awareness and involvement of the wider community in biosecurity activities along high risk introduction and post-introduction pathways;</li> <li>(iv) eradicating high risk invasive animal species with limited distribution; and</li> <li>(v) furthering the development and controlled release of biocontrol agents for high risk invasive plant species</li> </ul>	<ul style="list-style-type: none"> <li>- Enhanced surveillance capacity at key national ports of entry leads to improvements in the prevention, early detection, quarantine and treatment of high-risk IAS</li> <li>- Improved biosecurity communications and information flows engender broader community awareness of biosecurity issues, and strengthens pre-border and post-border risk analyses of high-risk IAS</li> <li>- High risk invasive plant and animal species are eradicated, or their impacts on biodiversity and livelihoods contained by biocontrol agents</li> </ul>
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#### 1.6) global environmental benefits (GEFTF) and/or adaptation benefits (LDCF/SCCF);

Action on IAS is prioritised under the GEF-7 Biodiversity Strategy as a key means of addressing biodiversity loss in areas of global biodiversity significance. The project will contribute to a reduction in the loss of this globally important biodiversity and in countering the negative impacts and costs of IAS on livelihoods and economic development. By mitigating the impacts of IAS, the project will help to sustain the populations of critically endangered, threatened and endemic species in at least 12 listed Critically Endangered Ecosystems, 6 Endangered Ecosystems in South Africa (see Government Notice 34809 of 2011, *Threatened Ecosystems in South Africa*[24]<sup>24</sup>) and in one global biodiversity hotspot (Maputaland-Pondoland-Albany hotspot); protect the resilience of natural ecosystems to the impacts of climate change; and contribute to natural disaster risk reduction. It will contribute to containing the threats to about 10 million ha of land already being impacted by IAS across the country. It will specifically target a reduction in the impact of seven Category 1b plant invasive species over a total area of at least 300,000 ha. It will also contribute to improving the conservation status of a number of threatened seabird species in the Southern Ocean (Sooty Albatross EN, Light-mantled Albatross NT, Grey-headed Albatross EN, Grey Petrel NT, White chinned Petrel VU and Kerguelen Tern NT), including nearly half of the world's population of Wandering Albatrosses (VU).

### 1.7) innovation, sustainability and potential for scaling up.

**Innovation:** The current operations are disintegrated and very inefficient making it difficult to effectively manage AIS in South Africa. The current project is aimed at addressing these major issues by introducing a number of innovative measures including:

- (i) Establishing and operationalising an inter-agency operations centre to improve coordination and cooperation in the surveillance of IAS at key national ports of entry (Output 1.1). It has not been attempted in South Africa and is a cost-effective way of preventing entry of IAS into South Africa.
- (ii) Developing a biosecurity risk management capacity at South Africa's main harbours, and implementing a self-financing cleaning and fumigation system for sea containers and break-bulk cargo at Durban harbour (Output 1.2). Such a cleaning and fumigation system is new to South Africa.
- (iii) Establishing a centralised national biosecurity information system, with dedicated biosecurity risk-analytic capabilities (Output 2.2); and
- (iv) Introducing a smartphone application, linked to the national biosecurity information system and to national IAS databases, to enable the IAS fraternity and civil society to identify IAS for a wide range of purposes and to report sightings of them being introduced via entry ports and in the wild (Output 2.1). Using this new technology for conservation purposes will result in better reporting and results.

These activities are innovative because they aim to change business-as-usual management of IAS styles by creating efficiency and effectiveness.

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**Sustainability** is premised on improving the efficiencies and cost-effectiveness of the responsible public institutions (DEFF, DALRRD, SANBI, etc.) in implementing the invasive species regulations along high risk introduction and post-introduction pathways. It is anticipated that, by project end, the responsible institutions will be able to significantly improve their biosecurity surveillance capabilities using the existing budget allocations and staff capacities. The project has thus been designed to: (i) pilot mechanisms to demonstrate the cost-effectiveness of inter-agency collaboration using existing institutional capacities; (ii) improve the efficiencies of access to, and sharing of, the biosecurity information that is already being collected, collated and maintained by different institutions; (iii) promote the voluntary collection of additional biosecurity-related information by other stakeholder groups in order to improve the existing biosecurity risk profiling capacities of institutions; (iv) test the efficacy of a (in part or full) cost-recovery system for expenses associated with implementing a biosecurity risk management system at key national harbors; (v) expand the corps of biosecurity detection dogs in order to improve existing IAS detection efficiencies; (vi) contribute to addressing the initial high costs of finding suitable candidate biocontrol agents, testing them for safety in quarantine, and complying with regulations around release in order to significantly reduce the overall cost of the full release costs of a biocontrol agent; and (viii) invest significant funding over a short period to eradicate an island invasive in order to reduce the ongoing prevention costs beyond the project term.

**Potential for national upscaling** post-project is high in the following areas: (i) establishing biosecurity capabilities (including BRA/TCs, biosecurity detection dogs and/or sea container and bulk-cargo inspections and treatment) at all ports of entry (initially it may only be possible to prioritize the main air and sea ports); (ii) upscaling the full release, and mass rearing, of the project-developed biocontrol agents; (iii) upscaling the integration of biosecurity issues into the private sector; (iv) broadening the scope and reach of the involvement of civil society in contributing to building the knowledge on IAS; and (v) rolling out the adopt-a-river programme nation-wide.

The scope and potential for replicating the experiences gained and lessons learned from this project to other countries within the SADC region is substantial and will be actively pursued throughout the project implementation phase. By demonstrating an integrated national approach to IAS management and control, the project will showcase a *modus operandi* for other countries in the SADC region and provide a model for adoption by other IAS programmes across sub-Saharan Africa.

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[1] For the remainder (516 species), there is insufficient information to assign them to an introduction status category.

[2] The scores in Zengeya *et al.* (2017) were grouped into five categories that correspond in spirit to the five categories of the EICAT and SEICAT schemes [1–2 is negligible impact ~ Minimal Concern (MC) under EICAT; 3–4 are a few impacts ~ Minor (MI); 5–6 is some impact ~ Moderate (MO); 7–8 are major impacts ~ Major (MR); and 9–10 are severe impacts ~ Massive (MV)], with each taxon assigned to a category according to the maximum impact scored (i.e. the higher of either the environmental or socio-economic impacts).

- [3] Besides many islands that are close to the South African coast, the country also governs the Prince Edward Islands (PEIs, comprising Marion and Prince Edward Island) in the sub-Antarctic Indian Ocean.
- [4] The unregulated trade in non-native ornamental plants is a major contributor to the local spread of pests in South Africa
- [5] Although the data coverage is poor, so there is a low level of confidence in these estimates.
- [6] The Minister of Environmental Affairs has subsequently published proposed amendments to the Regulations ('Draft 2018 Alien and Invasive Species Regulations) on 16 February 2018 for public comments.
- [7] The listing of the 556 alien taxa in a number of categories in the NEM:BA A&IS Regulations was initially based on expert opinion, and not on formal risk assessments. The DEFF, through SANBI, has however embarked on a retrospective exercise aimed at completing risk analyses for all listed alien species, as well as for species that are candidates for listing in the future.
- [8] Of the completed historical projects, three were successful (one being the eradication of *Felis catus* from Marion Island, and the other two against terrestrial invertebrates). Six projects were deemed to have failed, three against plants, one against an amphibian, one against a freshwater invertebrate and one against a terrestrial invertebrate.
- [9] In some cases biological control agents do not disperse quickly or it takes time for populations to build up. In order to expedite control, agents are mass-reared. Mass-rearing involves the establishment of a breeding facility, and a programme of targeted distribution of agents to field-sites.
- [10] Some of the contributing factors that were identified included the absence of effective prioritisation, goal-setting and planning; monitoring of inputs rather than of outcomes; multiple goals that lead to confusion over priorities; the fact that the actual costs of control far exceed the estimated costs; a failure to adhere to accepted best practices and standards; complex contracting and employment models; and conflicts over species that have commercial or other value, but also cause significant environmental damage
- [11] Including permanent and contract staff costs.
- [12] Including permanent and contract staff costs.
- [13] The NRM portfolio includes *inter alia* the following relevant environmental public works programmes addressing IAS management: Working for Water, Working on Fire, Working for Ecosystems , Working for the Coast, Working for Land, Working for Wetlands and Working for Forests.
- [14] In a partnership with the University of Cape Town, the University of KwaZulu-Natal and the University of the Witwatersrand.
- [15] It is envisaged that the BRA/TC will be a physical facility or mobile unit for the colocation of the relevant border agencies (e.g. DEFF, DAFF, Border Management Authority[15], SANBI, SAPS).
- [16] Even though DEFF will physically host the centre, each participating organization will keep its agency-specific mission, role and identity.



[17] The project will facilitate the adoption of non-toxic fumigation measures, wherever practicable.

[18] See example in <https://www.doc.govt.nz/globalassets/documents/science-and-technical/sops/dog-handlers/sop-conservation-doghandler-team.pdf>.

[19] Key message areas for the biosecurity awareness campaign will include: (i) the benefits of biosecurity; (ii) the importance (in terms of market access and maintaining biodiversity) of keeping pests, weeds and diseases out of the country; and (iii) the consequences of pest, weed and disease outbreaks for the country's economy, food security, sustainability, environment, biodiversity and lifestyle.

[20] Refer to annexed report *South Africa works towards eradicating introduced house mice from sub-Antarctic Marion Island: the largest island yet attempted for mice* (2019)

[21] South Africa's Exclusive Economic Zone (EEZ) covers parts of the Atlantic, Indian and Southern Oceans and includes the areas surrounding the sub-Antarctic islands that form part of the country's territories.

22 There is a short three-month window in early winter during which the baiting operation can be carried out. This is the only time during the year that mice on Marion do not breed, and an indication of food stress.

[22] The project will follow accepted global practices on eradication of AIS with regards to humane treatment and disposal of the deceased.

[23] The biodiversity impacts are shown at the critically endangered and threatened ecosystem level (see Government Notice 34809 of 2011, *Threatened Ecosystems in South Africa*). The identification of the impacted ecosystem was assessed by overlapping maps of the known distribution range of the IAS with the listed threatened ecosystem maps.

[24] Each listed terrestrial ecosystem has a description of the known species of special concern (Red Data and endemic plant species) in the ecosystem.

#### **1b. Project Map and Coordinates**

**Please provide geo-referenced information and map where the project interventions will take place.**

Please refer to the project maps in Annex A.

#### **2. Stakeholders**

**Select the stakeholders that have participated in consultations during the project identification phase:**

**Indigenous Peoples and Local Communities**

**Civil Society Organizations** Yes

**Private Sector Entities** Yes

**If none of the above, please explain why:**

N/A

**In addition, provide indicative information on how stakeholders, including civil society and indigenous peoples, will be engaged in the project preparation, and their respective roles and means of engagement.**

A small technical working group – with representation of the DEFF, UNEP, DALRRD, ARC, DHSWS and SANBI – was constituted to guide and oversee the project preparation activities, including all stakeholder communications and consultations.

The table below briefly profiles the stakeholder groups that have been actively involved throughout the project identification phase, that will be consulted during the PPG phase and/or that will be involved in the project implementation phase.

The involvement of stakeholders during this project identification phase was solicited through the following approaches: (i) active participation in three inter-disciplinary consultative workshops moderated by the DEFF to iteratively guide the development of the PIF; (ii) consultations via electronic media (Skype, e-mail, whatsapp), through a series of DEFF-moderated communications, to obtain inputs into, and solicit comments on, the draft versions of the PIF documentation; and (iii) involvement in focussed bilateral meetings with the project proponents to further discuss and clarify proposed project outputs and activities and project-specific institutional roles and responsibilities.

Department/ Institution/ Statutory body	Directorate/ Branch/ Unit/ Programme	Key roles and responsibilities in IAS management	Level of involvement in development of PIF	Prospective role/s in project implementation[1]
Department of Environment, Forestry and Fisheries (DEFF)	Biosecurity Directorate	Administers, and ensures compliance with, the AIS regulations	<u>Project proponent</u>  (i) Participation in consultative workshops  (ii) Consultations via electronic media  (iii) Involvement in bilateral meetings	Project oversight
	Biodiversity Compliance Directorate	Undertakes surveillance at national ports of entry		Chair of the Project Steering Committee (PSC)
	Biodiversity Risk Management Directorate	Conducts IAS risk assessment and response planning		Day-to-day project management
	Natural Resource Management (NRM) programmes	Regulates and monitors the importation of alien species  Plan, finance and implement integrated invasive species eradication and management (mechanical, chemical and biocontrol) activities		Directly responsible for the implementation of Outputs 1.1, 1.2, 1.3, 2.1, 2.2 and 3.1

Department of Agriculture, Land Reform and Rural Development (DALRRD)	Plant and Veterinary Health Inspection Services	Administers and enforces the Agricultural Pests Act, Animal Diseases Act, Animal Health Act and Conservation of Agricultural Resources Act	(i) Participation in consultative workshops (ii) Consultations via electronic media (iii) Involvement in bilateral meetings	Member of the PSC  Main collaborating partner in the implementation of Outputs 1.1, 1.2, 1.3, 2.1, 2.2 and 3.2
	Animal Health Directorate	Undertakes surveillance at national ports of entry		
	Land Use and Soil Management Directorate	Conducts IAS risk assessment and response planning  Regulates and monitors the importation of agricultural goods		
Agricultural Research Institute (ARC)	Plant Protection Research (PPR) Unit	Research on the ecology and chemical and biological control of invasive alien plants	(i) Participation in consultative workshops (ii) Consultations via electronic media (iii) Involvement in bilateral meetings	Member of the PSC  Directly responsible for the implementation of Output 3.2
South African National Biodiversity Institute's (SANBI)	Biological Invasions Directorate (BID)	Detect and undertake risk assessments of IAS  Develop eradication plans for selected IAS  Collect DNA barcodes for all invasive taxa  Maintain data on the distribution of invasive alien plant species in the SAPIA	(i) Participation in consultative workshops (ii) Consultations via electronic media (iii) Involvement in bilateral meetings	Member of PSC  Collaborating partner in the implementation of Outputs 1.1, 1.2, 2.1 and 2.2
South African National Parks	Conservation Services	Plan, finance and implement integrated invasive species eradication and management (mechanical, chemical and biocontrol) activities in National Parks	Limited to information-sharing	Collaborating partner in the implementation of Outputs 2.1, 3.1 and 3.2 (release sites for biocontrol agents)

Department of Human Settlements, Water and Sanitation (DHSWS)	Integrated Water Resource Planning Directorate	Plan, finance and implement integrated invasive species management (mechanical, chemical and biocontrol) activities along rivers	(i) Participation in consultative workshops (ii) Consultations via electronic media (iii) Involvement in bilateral meetings	Collaborating partner in the implementation of Outputs 2.1, 2.2 and 3.2 (release sites for biocontrol agents)
Department of Health (DoH)	Medical Research Council (MRC)	Conducts research on human diseases involving alien species	Limited to information-sharing	Collaborating partner in the implementation of Outputs 1.1, 1.2, 1.3, 2.1 and 2.2
Department of Trade, Industry and Competition (DTIC)	International Trade Administration Commission (ITAC)	Establishing an efficient and effective system for the administration of international trade (including import and export control)	None	Support to identifying and engaging private sector biosecurity stakeholders in Output 2.1
Department of Transport	Maritime Transport Branch	Implementation of the National Ports Act	None	Collaborating partner in the implementation of Output 1.2
Provincial governments	Environmental Departments (e.g. Limpopo Department of Economic Development Environment and Tourism) and Provincial Public Institutions (e.g. CapeNature)	Issue IAS notices and directives to landowners  Plan, finance and implement integrated invasive species eradication and management (mechanical, chemical and biocontrol) activities in provincial protected areas and in KBAs	Limited to information-sharing	Collaborating partner in the implementation of Output 2.1, 2.2, 3.1 and 3.2 (release sites for biocontrol agents)
Municipalities (local, district and metropolitan)	Environmental management departments	Issue IAS notices and directives to landowners  Plan, finance and implement integrated invasive management (mechanical, chemical and biocontrol) activities in local protected areas and in KBAs	Limited to information-sharing	Collaborating partner in the implementation of Output 2.1, 2.2 and 3.2 (release sites for biocontrol agents)
South African Institute for Aquatic Biodiversity (SAIAB)		Conducts research on invasive aquatic organisms.	Limited to information-sharing	Collaborating partner in the implementation of Outputs 2.1, 2.2 and 3.2

Stellenbosch University (SU)	Centre for Invasion Biology (CIB)	Undertakes research on the biodiversity consequences of biological invasions	Limited to information-sharing	Collaborating partner in the implementation of Outputs 2.1, 2.2 and 3.2
Rhodes University	Centre for Biological Control (CBC)	Identifying, developing and mass rearing of insect biocontrol agents for IAS	Limited to information-sharing	Collaborating partner in the implementation of Outputs 2.1, 2.2 and 3.2
Council for Scientific and Industrial Research (CSIR)	The Natural Resources and the Environment programme	Undertakes research on invasive species, mainly in terrestrial environments	Limited to information-sharing	Collaborating partner in the implementation of Outputs 2.1 and 2.2
University of Pretoria	Forestry and Agricultural Biotechnology Institute (FABI)	Conducts research on alien microorganisms	Limited to information-sharing	Collaborating partner in the implementation of Output 2.1 and 2.2
Environmental and rural livelihood NPOs and Schedule 3 (c)/(d) Public Entities	e.g. WWF-SA, Birdlife SA, Casidra, ECRDA, etc.	Facilitates and promotes mutually beneficial linkages between communities and IAS control and eradication activities  Plan, finance and/or implement integrated invasive management (mechanical, chemical and biocontrol) activities  Provides 'citizen science' input data on IAS	None	Collaborating partner in the implementation of Outputs 2.1 and 3.2
Private and communal landowners	Individuals, corporations, trusts, Community Property Associations, etc.	Plan, finance and implement integrated invasive management (mechanical, chemical and biocontrol) activities on private land	None	Collaborating partner in the implementation of Output 2.1 and 3.2 (release sites for biocontrol agents)
UN Environment (UNEP)	UNEP Regional Office for Africa, UNEP Office in South Africa	Assist DEFF to develop, implement and execute the project	<u>Project advocate</u>  (i) Participation in consultative workshops  (ii) Consultations via electronic media  (iii) Involvement in bilateral meetings	GEF Agency

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[1] To be finalised at the PPG phase. A stakeholder consultation plan will be developed to guide consultations with these key stakeholders during the PPG phase

### 3. Gender Equality and Women's Empowerment

**Briefly include below any gender dimensions relevant to the project, and any plans to address gender in project design (e.g. gender analysis).**

Twenty-five years into democracy, South Africa has made great strides in reforming laws and policies that prohibited women's full participation in all social, economic and political spheres. These range from the development of a constitution which articulates equality for all persons, to the establishment of Chapter Nine institutions which serve to guard against historical injustices and promote human rights for all in the country. South Africa is also a signatory to a number of international conventions, declarations, regional charters and protocols which aim to address inequalities and ultimately achieve gender equality, and which the state is obliged to implement. Notwithstanding the plethora of legislation, women have still not advanced as rapidly in terms of socio-economic empowerment and gender equality. The National Development Plan (NDP, 2030) identifies women as still the most affected by inequality, poverty and unemployment.

The 2018 World Economic Forum Global Gender Report ranked South Africa at 19th when it comes to gender equality (South Africa is however ranked 117th in the global ranking of 149 countries on wage equality).

The project will apply the relevant GEF and UNEP policies to promote and enhance roles and capacities for women in biosecurity and IAS management. Gender disaggregated target and baseline data will also be collected where appropriate, as part of the project results framework and monitoring plan. Implementation of specific activities will pay particular attention to identifying and minimising the gender-differentiated consequences of negative environmental and social impacts of invasive alien species.

Preliminary opportunities for improving gender equality and strengthening economic empowerment of women may include *inter alia*:

- Optimising opportunities for the employment, training and equipping of women as project management staff (project management), BRA/TC managers, (Output 1.1), control environmental officers/plant and veterinary health inspectors/IAS border inspectors (Output 1.2), dog handlers (Output 1.3), invasive alien clearing laborer's (Output 2.1); BIRAS administrators (Output 2.2), mouse eradication team members (Output 3.1) and biocontrol technicians (Output 3.2);
- Ensuring that women-owned and/or managed businesses participate equitably in the procurement of project-funded equipment, infrastructure and technical services (all outputs);
- Collaborating with project-contracted businesses to continually develop and implement mechanisms which may further strengthen the capacities of women (all outputs);
- Ensuring that the reach of project-funded education/awareness-raising (Output 2.1), mechanical and chemical (Output 2.1), invasive clearing skills development (all outputs) and mentoring (Output 3.2) programmes will target women and/or women-headed households;
- Contributing positively to rural women and low-income households by reducing the risks posed by IAS (many of which impact negatively on health, food security and livelihoods) addressing the significant IAS knowledge constraints (project);
- Advocating for an increase in the number of women involved in the collection of baseline and end-of-project data (project management); and
- Ensuring equitable representation of women in the project's decision-making structures, including the Project Steering Committee (project management).

These opportunities will be further elaborated in a *Gender Strategy and Action Plan* to be prepared during the PPG, in consultation with the relevant interest groups, to guide the funding and operationalisation of gender equality and empowerment activities in the project implementation.

The project has a high-level gender indicator of 'at least 420 women directly benefit from project activities as a result of GEF investment'.

**Does the project expect to include any gender-responsive measures to address gender gaps or promote gender equality and women empowerment? Yes**

**closing gender gaps in access to and control over natural resources;**

**improving women's participation and decision-making; and/or Yes**

generating socio-economic benefits or services for women. Yes

Will the project’s results framework or logical framework include gender-sensitive indicators?

Yes

4. Private sector engagement

Will there be private sector engagement in the project?

Yes

Please briefly explain the rationale behind your answer.

An effective biosecurity regime for both imports and exports depend on a strong partnership with the private sector and is key to the development of the country’s domestic and export base, especially when it comes to agriculture. The project will thus, with the active support of the Department of Trade, Industry and Competition (DTIC), explore opportunities to create networks for business and government to work together to address sanitary and phytosanitary risks in trade. Under Output 2.1, the project will specifically work with large businesses to support the process of integrating biosecurity issues into their respective codes of practice, business plans, CSR programmes and corporate communications. The project will also seek to facilitate the funding of, and technical support for, adopt-a-river initiatives from private sector CSR programmes.

5. Risks

Indicate risks, including climate change, potential social and environmental risks that might prevent the Project objectives from being achieved, and, if possible, propose measures that address these risks to be further developed during the Project design (table format acceptable)

Risks	Rating	Mitigation
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<p>An ongoing lack of cooperation and coordination between different public institutions in the management of IAS leads to inefficiencies in project implementation</p>	<p>Medium</p>	<p>A key constraint for public institutions involved in IAS management and control is available human resources. While the project has limited opportunities to meaningfully increase the staffing complement of these public institutions, it has however explored ways to address this constraint through improved collaboration, cooperation and information sharing. By example, the project will pilot the establishment and operations of a small inter-agency Biosecurity Risk Assessment/Targeting Centre (Output 1.1) in order to demonstrate the cost-benefits of improved inter-agency collaboration in the surveillance of IAS at key national ports of entry. Similarly, the project will support the establishment of a centralised biosecurity information system (Output 2.2) as a means of improving inter-agency information flows and provide for better data access, sharing and analysis. By broadening the involvement of the broader community in biosecurity activities, (Output 2.1) the project also seeks to supplement the limited monitoring capacities of the responsible public institutions. The project envisaged that the training of dogs and dog handlers (Output 1.3) will further improve the efficiencies of the biosecurity control staff of the public institutions at national ports of entry. The piloting of a cost-recovery system for expenses associated with the cleaning and fumigation of quarantined sea containers and break-bulk cargo at Durban harbour (Output 1.2) will also test the feasibility of alternative funding mechanisms for the biosecurity control functions of the different agencies. Finally, the development of a suite of biocontrol agents for selected IAS (Output 3.2) may assist in reducing the exceptionally high costs of public institution staff undertaking mechanical and chemical control programmes.</p> <p>It is envisaged that these project-supported interventions would collectively provide sufficient incentive for the public institutions to cooperate with, and actively collaborate in, the project implementation.</p> <p>All affected public institutions will however continue to be actively consulted in the project design and development phase, and opportunities for their involvement in project implementation will be optimised wherever practicable. These public institutions will also be coopted to be represented on, and participate in, the Project Steering Committee.</p>
<p>Climate change creates new opportunities for the introduction of new, and further spread of existing, IAS</p>	<p>Medium-Low</p>	<p>The project will strengthen biosecurity measures to prevent the introduction of new IAS (or strains of IAS) as a result of climate change and develop rapid response capacities to monitor and eradicate alien species that may become more invasive due to climate change. These improved approaches biosecurity measures and rapid response capacities will include: implementing a more coordinated approach to biosecurity monitoring, prevention, early detection and emergency responses (Output 1.1); strengthening the biosecurity capacities (e.g. risk management system, inspection staff, sniffer dogs, cleaning equipment, quarantine facilities) to manage priority pathways of introduction (harbours and airports) to the country (Outputs 1.2 and 1.3); establishing and maintaining a central access point for improved biosecurity-related information and risk analysis (Output 2.2); and broadening the active involvement of the wider community in biosecurity activities along high risk introduction and post-introduction pathways (Output 2.1).</p>

Conflicts between stakeholders over the regulation and management of IAS with perceived benefits undermines the efficacy of IAS control measures	Low-Medium	The project will seek to promote an approach in which parties with different value systems agree on a win-win solution where invasive species can still deliver benefits, but adverse impacts are reduced. This will require open dialogue among stakeholders, trade-offs and compromises. Where the impacts outweigh perceived benefits, the project will negotiate trade-offs and compromises that minimise the impact of the invasive species but retain a large proportion of their amenity values. In some cases, such as the use of biological agents to control invasive plants species (see Output 3.2), the project will employ strategies to try and effectively communicate the risks through open dialogue among stakeholders (see Output 2.1). Conflicts will, wherever possible, be resolved by avoiding biocontrol agents that have the ability of causing damage to the useful part of the plant, and instead using only seed-reducing agents (these reduce the reproductive potential of the plants, curb their dispersal and reduce the follow-up work needed after clearing, while still allowing for the continued utilisation of the plant).
Bio-control agents may spread and become invasive	Low	South Africa has practiced biological control for nearly a hundred years, has an exemplary safety and success record, and is a leader in this field internationally. Once biocontrol agents have been collected in the country of origin, they are imported directly into quarantine. Host specificity testing will be carried out ensure that the proposed biological control agent is specific to the target species (a host specificity test list is a list of plants/insects closely related to the target weed or insect pest that is developed by a biological control researcher. The species on the list are exposed to the proposed biological control agent in a quarantine containment facility). Once the agent is considered to be host specific, and safe for release, only then is permission sought from the DEFF for its release.

## 6. Coordination

**Outline the institutional structure of the project including monitoring and evaluation coordination at the project level. Describe possible coordination with other relevant GEF-financed projects and other initiatives.**

The project will be implemented by UN Environment, and nationally executed by the national Department of Environment, Forestry and Fisheries (DEFF).

UNEP – through its GEF Task Manager (TM) and Funds Management Officer (FMO) - will monitor the implementation of the project, review progress in the realization of the project outputs, and ensure the proper use of GEF funds. The UNEP TM will be directly responsible for: (i) providing consistent and regular project oversight to ensure the achievement of project objectives; (ii) liaising between the project and the GEF Secretariat; (iii) ensuring that both GEF and UN Environment policy requirements and standards are applied and met (i.e. reporting obligations, technical, fiduciary, M&E); (iv) approving budget revisions, certifying fund availability and transferring funds; (v) organizing mid- and end-term evaluations and reviewing project audits; (vi) providing technical, legal and administrative guidance if requested; and (vii) certifying project operational completion.

The DEFF will be accountable to UN Environment for the disbursement of funds and the achievement of the project objective and outcomes, according to the approved overall project work plan. The DEFF will designate a senior staff member to act as a National Project Director (NPD). This NPD will provide the strategic oversight and guidance to project implementation by the Project Implementation Unit (see below).

The DEFF will establish a small Project Implementation Unit (PIU), in partnership with the Department of Agriculture, Land Reform and Rural Development (DALRRD), to provide the strategic oversight and guidance to project implementation. Reporting directly to the NPD, the PIU will be responsible for: (i) preparing the overall project work plan; (ii) preparing annual budgets and work plans; (iii) managing project expenditure in line with these annual budgets and work-plans; (iv) recruiting specialist support services<sup>[1]</sup>, and procuring equipment and materials for the project; (v) coordinating and implementing technical project activities; (vi) ensuring technical quality of products, outputs and deliverables; (vii) producing quarterly expenditure and six-months cash advance requests; (viii) reporting to the Project Steering Committee (PSC) on project delivery and impact; and (ix) liaising and working closely with all partner institutions to link the project with complementary national, regional and local programs and initiatives

A Project Steering Committee (PSC) will be constituted to serve as the project oversight, advisory and support body for the project. The final composition of the PSC will be determined at the Project Inception Workshop, but will include representatives of DEFF, DALRRD, SANBI, DHSWS, ARC and UNEP. The PSC will ensure that the project remains on course to deliver the desired outcomes of the required quality. The PSC provides overall guidance and policy direction to the implementation of the project and provides advice on appropriate strategies for project sustainability. The PSC will play a critical role in project monitoring and evaluation by quality assuring the project processes and products. It also advises on any conflicts within the project or to any problems with external bodies.

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<sup>[1]</sup> This will include concluding an MOU with the ARC to implement Output 3.2.

## **7. Consistency with National Priorities**

### **Is the Project consistent with the National Strategies and plans or reports and assessments under relevant conventions**

Yes

**If yes, which ones and how: NAPAs, NAPs, ASGM NAPs, MIAs, NBSAPs, NCs, TNAs, NCSAs, NIPs, PRSPs, NPFE, BURs, INDCs, etc**

- National Action Plan for Adaptation (NAPA) under LDCF/UNFCCC yes

- National Action Program (NAP) under UNCCD yes
- National Biodiversity Strategies and Action Plan (NBSAP) under UNCBD yes

The project is fully consistent with Action 1.1.6 ('Monitor and control the spread of alien invasive species that benefit from climate change') of Outcome 1.1 ('Increased resilience and adaptive capacity achieved in human, economic, environment, physical and ecological infrastructure vulnerability') under Strategic Intervention 1 ('Reduce human and economic vulnerability, ensure resilience of physical capital and ecological infrastructure and build adaptive capacity') of the *Draft National Climate Change Adaptation Strategy* (May, 2019).

The project is well aligned with the 'programmatic approach to intervention projects' (refer to Appendix D for the 'Indicative programme of intervention projects') that is advocated by the *National Action Programme (NAP): combatting land degradation to alleviate rural poverty* (2004), notably through the Natural Resource Management (NRM) Programmes being administered by DEFF (e.g. Working for Water, LandCare, Working for Wetlands).

The project will support the implementation of the IAS management strategies and activities identified in the *National Biodiversity Strategy and Action Plan* (2015-2020).

The project will further contribute to the implementation of Strategy 8(b) of the *SADC Regional Biodiversity Strategy* ('Improve the region's capacity to prevent, eradicate and control IAS') and paragraph 5 of Article 8 (wherein States [Parties] are called upon to 'take measures to 'eradicate, control and prevent the introduction of invasive species') of the *SADC Protocol on Environmental Management for Sustainable Development*.

## **8. Knowledge Management**

**Outline the Knowledge management approach for the Project, including, if any, plans for the Project to learn from other relevant Projects and initiatives, to assess and document in a user-friendly form, and share these experiences and expertise with relevant stakeholders.**

The Biosecurity Information and Risk Analysis System (BIRAS) envisaged under Output 2.2 will be developed as a national, centralised access point for biosecurity-related knowledge. Once functional, the BIRAS will strengthen the capacity of the Biosecurity Risk Assessment/Targeting Centre (BRA/TC) – established under Output 1.1 - to better manage and integrate multiple information and intelligence data sources related to monitoring, prevention, early detection and emergency response at national ports of entry. The

BIRAS will also provide an analytics functionality for intelligence and front-line biosecurity institutions in the maintenance of watch lists for IAS associated with high risk shipping routes and the generation of risk profiles for incoming sea containers and break-bulk cargo at South Africa's main shipping harbours (Output 1.2).

An integral part of the stakeholder engagement programme envisaged under Output 2.1 is broadening the involvement of civil society in biosecurity monitoring, through surveillance, detection and reporting activities. The project will develop suitable technologies and systems to seamlessly integrate this additional biosecurity knowledge into BIRAS and other national IAS databases (e.g. SAPIA).

The project will facilitate the exchange of IAS information with the broader community by supporting the maintenance of the [www.invasives.org.za](http://www.invasives.org.za) website (and linked Facebook, Instagram, Pinterest, e-newsletter and YouTube media) as a centralised focal point for the invasive species awareness campaign under Output 2.1. The website will continue to be developed as a repository for IAS legislation, academic papers, technical reports, fact sheets, pamphlets, news bulletins, event information, contact information, etc.

Each project output will include the documentation of lessons learnt from the implementation of activities under that output, and a collection of the tools and templates (and any other materials) developed during implementation of that output. Project information will be collated and presented annually at the *National Symposium on Biological Invasions*.

The best practices established, and lessons learned from this project will have significant benefits for the southern Africa region through the transfer of expertise and knowledge, as well as peer learning between countries. They will guide the ongoing development of a Regional Invasive Species Strategy and Action Plan (RISSAP) for the SADC region. Project resources will be committed to ensure the ongoing involvement in, and information sharing with, regional counterpart countries on IAS management and control, through the SADC Directorate: Food, Agriculture and Natural Resources.

Special care will be taken to avoid duplicating past and present efforts, and to enhance existing methods of managing knowledge, using for example existing Clearing House Mechanisms such as the Global Invasive Species Database.



**Part III: Approval/Endorsement By GEF Operational Focal Point(S) And Gef Agency(ies)**

**A. RECORD OF ENDORSEMENT OF GEF OPERATIONAL FOCAL POINT (S) ON BEHALF OF THE GOVERNMENT(S): (Please attach the Operational Focal Point endorsement letter with this template).**

<b>Name</b>	<b>Position</b>	<b>Ministry</b>	<b>Date</b>
MR ZAHEER FAKIR	Director/ GEF Operational Focal Point	DEPARTMENT OF ENVIRONMENTAL AFFAIRS	3/2/2020

#### ANNEX A: Project Map and Geographic Coordinates

Please provide geo-referenced information and map where the project intervention takes place

Map 1: South Africa (Project) and the 72 official ports of entry (Component 1)



Map 2 (a) - (g). Distribution maps for: (a) *Tecoma stans*; (b) *Cestrum laevigatum*; (c) *Xanthium strumarium*; (d) *Caesalpinia decapetala*; (e) *Anredera cordifolia*; and (f) *Schinus terebinthifolius*; (no distribution map is currently available for *Lythrum salicaria*) (Output 3.1)



Map 3: Marion Island management zones (Output 3.1)

