

Framework Strategy and Action Plan

for the control of

Invasive Alien Species



**EThekweni Municipality,
South Africa**

Environmental Planning and Climate Protection Department
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Acronyms and abbreviations

BSAP	Biodiversity Strategy and Action Plan
BMP	Best Management Practices
CA	Conservancies Association
CBD	Convention on Biological Diversity (Global)
CARA	Conservation of Agricultural Resources Act (Act 43 of 1983)
CSCM	Coastal Stormwater and Catchment Management
DAEARD	Department of Agriculture, Environmental Affairs and Rural Development (Provincial)
DAFF	Department of Agriculture, Forestry and Fisheries (National)
DEA	Department of Environmental Affairs (National)
D'MOSS	Durban Metropolitan Open Space System
DWA	Department of Water Affairs (National)
EDU	Economic Development Unit
EHS	Environmental Health Services
EM	EThekweni Municipality
EMA	EThekweni Municipal Area
EMIAS	EThekweni Municipality Invasive Alien Strategy
EPCPD	(EThekweni Municipality) Environmental Planning and Climate Protection Department
EKZNW	Ezemvelo KwaZulu-Natal Wildlife
GIS	Geographic Information Systems
IAA	Invasive Alien Animal
IAM	Invasive Alien Microbe
IAP	Invasive Alien Plant
IAS	Invasive Alien Species
IASP	Provincial Invasive Alien Species Programme
IDP	Integrated Development Plan
KZN	KwaZulu Natal
MOSS	Metropolitan Open Space System
NEMA	National Environmental Management Act (1998)
NEMBA	National Environmental Management: Biodiversity Act (Act 10 of 2004)
NHM	Provincial Natural History Museum in Pietermaritzburg
NSM	EThekweni Municipality Natural Sciences Museum
NRB	Natural Resources Branch (of the PLCD)
PLCD	(EThekweni Municipality) Parks, Leisure and Cemeteries Department
PMU	Project Management Unit
RABM	Rural Area Based Management
RSWM	Roads and Stormwater Maintenance
SANBI	South African National Biodiversity Institute (National)
WfWetlands	Working for Wetlands
WoF	Working on Fire
WESSA	Wildlife and Environment Society of South Africa

Executive Summary

Invasive Alien Species (IAS) are species not indigenous to a location, area, or region. They can include fauna, flora or microbes which have been either accidentally or intentionally introduced. Their ability to spread naturally (without the direct assistance of people) into natural or semi-natural habitats is greatly enhanced by the lack of competition or regulation in their new environment

IAS are problematic throughout the world, with detrimental impacts on natural resources, economies (e.g. agricultural pests, costs of control), public health (e.g. disease outbreaks, consumption of toxic plants), and biodiversity. The challenges relating to successful management of IAS are many and varied. This Strategy seeks to address various aspects of such management as a means successful control of these organisms within the boundaries of the eThekweni Municipality (EM).

In order to achieve successful management of IAS, a concise mission statement as well as a vision are provided, both of which are based on overarching objectives of the municipal IDP, the EM open space system, and relevant national legislation.

The Strategy outlines some of the general impacts of IAS, including notes and examples, and a more detailed discussion follows with a focus on two key areas of impact. Firstly, the negative impacts on ecosystem goods and services supplied by open spaces in the EM, and secondly, the human health risks and aesthetic impacts associated with IAS.

An overview of specific IAS challenges in the EM highlights the diversity and complexity of the IAS problem. The necessity for coordinated efforts is raised and sets the tone for the rest of the document. Collaboration not only within municipal departments, but also with external stakeholders and organisations is the only realistic way of dealing with IAS, if public funds are to be wisely spent in both initial and follow-up control operations.

A chapter outlining the context of the problem as well as guiding principles provides a closer analysis of how international, national, provincial and local influences will guide the strategic actions that must necessarily be undertaken. Following this is a chapter which expands on all the key elements of the Strategy. The importance and urgency of prioritizing these elements or activities, namely, **prevention and early intervention, management, maintenance, institutional arrangements, capacity building, funding, legislation, education and advocacy**, and **research** are all discussed. These elements reflect and conform to the structure of the Provincial Strategy for KwaZulu-Natal which guides work done at local level. Due to specific local conditions and/or objectives, the relative importance of each of these elements may differ from those of the Provincial Strategy.

Chapter 1. Introduction

1.1 Preamble and background

The complexity and difficulty of managing Invasive Alien Species (IAS) in the eThekweni Municipality (EM) requires that a strategic approach be adopted to boost and coordinate efforts to control such invasive species. Furthermore, the National Environmental Management: Biodiversity Act (Act 10 of 2004) requires that all government agencies develop and implement a strategy and management plan to control IAS.

IAS can be defined as a plant, animal, pathogen or any other organism that is not indigenous to a location, area, or region, has invader tendencies and may cause economic or environmental harm or adversely affect human health. In terms of NEMBA, IAS is a species whose establishment and spread is outside of their natural distribution range. They can include fauna, flora or microbes which have been either accidentally or intentionally introduced. Their ability to spread naturally (without the direct assistance of people) into natural or semi-natural habitats is often greatly enhanced by a lack of competition or regulation in their new environment, i.e. there is little or no natural disease and/or predation to limit population numbers. As such they often quickly become widespread. Such rapid establishment and proliferation in new environments not only damage human interests (health, lifestyles and economy), but severely impact on natural ecosystems and biodiversity. IAS are recognized as one of the greatest biological threats to the planet's environmental and economic well-being.

1.2 Mission

To establish a cooperative strategy for preventing the establishment of new IAS and the effective control of IAS already established in the eThekweni Municipal Area (EMA).

1.3 Vision

To prevent the establishment of new IAS, and to control established IAS populations. This, in order to reduce the negative impacts such IAS have on the ecosystem goods and services supplied by natural environments, which are considered essential for people, their livelihoods and the economic productivity of the EMA.

1.4 Impacts of Invasive Alien Species

1.4.1 Extent of IAS

IAS are problematic throughout the world, with detrimental impacts on natural resources, economies (e.g. agricultural pests, costs of control), public health (e.g. disease outbreaks, consumption of toxic plants), and biodiversity. The challenges relating to successful management of IAS are many and varied, due to the historical establishment of so many IAS within South Africa. However, significant efforts to manage these impacts and to raise awareness of IAS by the South African government are already yielding positive results.

The number of IAS known to science was recently estimated at 500,000, a figure that has doubled over the last 60 years. This escalation in numbers of IAS is most notably due to the increased mobility of people and goods, in the 'global village', where produce and other goods, as

well as billions of people are able to move about the globe in a matter of hours. Cargo ships, planes, and trucks all provide easy transport for biological organisms. Natural vectors such as migrating wildlife as well as wind and ocean currents can also spread and disperse invasive organisms.

In South Africa today, IAS occur over large parts of the country. An estimate of total area invaded by alien vegetation in South Africa in 1999 stood at just over 100 000 km², which is just over 8 percent of the country's total area. The extent of invasions by certain alien animals in South Africa is also well known, such as the density and distribution of certain alien bird, fish, mammal, and reptile populations. Currently less information is available invasive invertebrate and microbial invasive species.

1.4.2 Examples of the impacts of IAS

Some notable impacts of invasion by alien species include:

- (i) changes in natural ecosystem species composition throughout the food chain;
- (ii) loss of genetic integrity through cross-breeding by invasive species with local/indigenous species;
- (iii) a phenomenon known as an 'invasional meltdown', where interactions between invasive species promote further invasions, exacerbating their detrimental effects;
- (iv) devastation of crops, orchards, plantations, livestock populations as well as of food and related products already harvested, processed or stored;
- (v) damage to infrastructure, e.g. invasive rat species are known to damage optic fibre and other cables;
- (vi) direct impacts on human health and wellbeing, especially in the case of certain invasive microbes and/or pathogens;
- (vii) acting as vectors for pathogens that either affect humans (e.g. salmonella, bubonic plague) or indigenous fauna and/or flora.

The magnification of the impacts of plant invasions due to elements of global change (global warming, elevated atmospheric CO₂, nitrogen deposition, habitat fragmentation) are also known to occur. Specific examples include increased biomass production, greater leaf area and spininess, and enhanced pollen production.

1.4.3 Loss of biodiversity and ecosystem services

All ecosystems are known to suffer loss of biological diversity (biodiversity) due to invasions by alien species. This is because plants and animals that are introduced into new areas no longer face the natural enemies or competition found in their place of origin. They then tend to reproduce and spread prolifically. They impact on native species in a number of ways, such as through eating them, competing with them (for resources such as space, food, and/or nutrients), interbreeding with them, or introducing pathogens and parasites that sicken or kill them. IAS can also transform ecosystems by using excessive amounts of resources (notably water, light and oxygen), by adding resources (notably nitrogen), by promoting or suppressing fire, by enhancing or reducing the movement of

In the case of invasive alien plant species, all of the following impacts can occur:

- decreased water run off;
- reduced stream flow and available water;
- reduced grazing for livestock;
- increasing costs of fire protection;
- increased damage from wildfire.
- Decrease in soil stability and increase in soil erosion, and reduction of

sand or other substrates, by accumulating litter or by accumulating or redistributing salt.

Biodiversity encompasses a wide variety of resources including genes, populations, species, ecosystems and landscapes and is essential for healthy ecosystems. These ecosystems in turn provide a variety of goods and services vital for human well-being and economic sustainability. Impacts which directly affect local and national human interests:

- (i) loss of potentially productive land;
- (ii) increasing soil erosion following fires in heavily invaded areas;
- (iii) changing soil nutrient status;
- (iv) loss of biological diversity;
- (v) changing biomass of ecosystems;
- (vi) changing habitat suitability for native or agricultural species;
- (vii) reduce the amenity of recreation areas;
- (viii) direct human health impacts;
- (ix) increased costs to infrastructure maintenance.

Sustainable land use is therefore highly dependent on the retention of natural ecosystem functions to prevent natural resource degradation.

The EM's natural environment is highly profiled in its Integrated Development Plan (IDP). This stems from an understanding that the local populace derives significant benefits from the environmental goods and services supplied by open spaces and the biodiversity that they contain. Durban's first open space plan, the Metropolitan Open Space System (MOSS), was produced in 1979. This plan aimed at protecting conservation-worthy areas of the EM, but has since become a means to ensure the protection of the EM's natural resource base which will continue to supply environmental goods and services in the long-term (Figure 1).

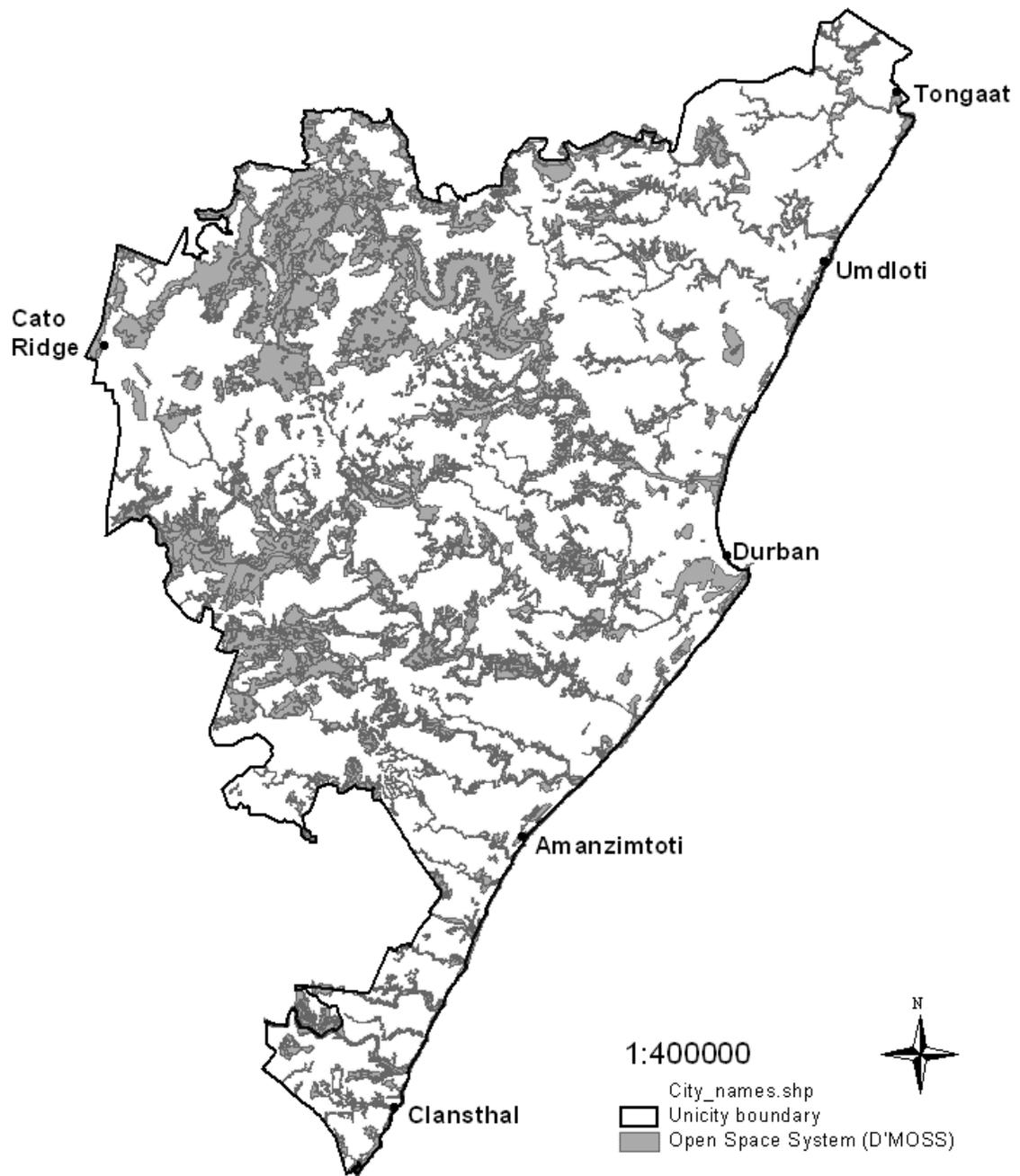


Figure 1. The extent of DMOSS in the EMA

1.4.4 Health risks and aesthetic degradation

The impacts of IAS on biodiversity and ecosystem services can seriously impact human well-being by contributing to lower food security, harsher living conditions, and declining health. Low income groups are particularly susceptible to the impacts of IAS, as they are often directly dependent on biodiversity-based goods and the associated ecosystem services for their livelihoods. Alien fauna such as rats (and possibly also House Crows and the Common Myna) pose health risks to society. Many invasive alien plants are toxic and several are lethal (e.g. *Nerium oleander*). It is likely that the current problems will continue to grow if significant interventions are not forthcoming.

Aesthetic degradation can be due to several reasons, including: increased siltation of dams, damage to natural areas from wildfires, and general degradation of natural areas due to dense infestations of invasive alien plants. Bird species such as the Common Myna and House Crows have significant nuisance value.

1.5 The challenge of IAS management in the EMA

The challenges of managing IAS invasions in the EMA are likely as many as they are diverse. This area, as is the case for the rest of South Africa, has been subject to a long history of invasions which continue to present difficult management scenarios. Fortunately, efforts to combat such invasions do exist on national, provincial and local levels. These include, amongst others, the raising of awareness, building of capacity, and drafting of relevant legislation.

The warm, moist, temperate conditions present in the EMA have created ideal conditions for many invasive alien plant species (IAPs) in particular. Such species threaten the ecological functioning of many of the local habitat types such as Coastal Lowland and Scarp Forests, Sourveld Grasslands and Valley Bushveld. Invasive Alien Animals (IAAs) such as the Common Myna and House Crow have also established populations. Their impacts have varied from minor nuisance to probable impacts on indigenous bird populations, due to their highly competitive behaviour.

Managing IAS in the EM is a complex task that must include a wide range of stakeholders, including the general public. Whilst numerous efforts have been made in the past to deal with IAS, most such efforts have been done on a fairly *ad hoc* and opportunistic basis. Although well-meant and perhaps even sometimes successful, such efforts can be wasteful, because IAS are usually able to re-infest areas if ongoing and thorough follow-up control is not maintained.

This Strategy aims to ensure that all future IAS control is coordinated in a way that results in faster, more efficient operations being implemented, along with realistic targets that can be measured and assessed. IAS control also needs to become a far more integral part of the ongoing sustainable management practices that the EM is engaged in. This should ultimately ensure that public funds are not wasted, and that the EMA becomes a more liveable city, where the well-being and health of its citizens can benefit from a healthy environment.

The Strategy further serves to clarify how various departments of the EM will deal with, and coordinate their efforts, with respect to IAS control. Sustainable IAS management requires a focussed approach that targets areas of high priority and seeks maximum benefit to the EM. As such, the Strategy will dictate a system of close collaboration and consolidation of efforts within the EM's jurisdiction, which will be implemented and maintained on a sustainable basis.

The Strategic Action Plan provides an immediate operational and practical outline of how the Strategy is to be implemented, and will be updated as necessary. The actions under the Strategy

shall continuously seek integration with National, Provincial and local role-players.

Chapter 2. Context and guiding principles

2.1 Preamble

IAS management can be considered an evolving science, due to ongoing research and increased understanding of how and why IAS spread and how and why they impact on the areas they invade. IAS may also adapt or evolve, and display different behaviours and qualities in areas that they invade, particularly if compared to the same species living in their natural environments. It is essential that best practices, be consulted and adapted for any given situation. A successful IAS Strategy must embrace the concept of adaptive management, i.e. learning by doing, such that all actions are monitored and evaluated and that the Strategy is adapted based on the results of such evaluations.

South African legislation which influences IAS control by the EM is examined in more detail in Chapter 3 of this document. It is essential that the principles embodied in this legislation be maintained and adhered to while recognising the EM's priorities and resource limitations.

This Strategy has been developed in consideration of the local, national and international developments that influence IAS management in the EM. Effective local implementation will rely as much on these as it will on the principles set forth by the various legal, institutional and operational structures that have guided the development of this document

2.1 International guiding principles

The Convention on Biological Diversity (CBD), which entered into force in 1993, as a product of the UN Conference on Environment and Development held in Rio in 1992, and was ratified by South Africa in 2003. Parties to the Convention must "prevent the introduction of, control or eradicate those alien species which threaten ecosystems, habitats, or species" (Article 8h). As party to the Convention, South Africa has agreed to undertake this goal, as part of its biodiversity conservation objectives.

Following this, the "Guiding principles for the prevention, introduction and mitigation of impacts of alien species that threaten ecosystems, habitats or species" were developed. Furthermore, the Global Invasive Species Programme (GISP) was developed to support these aims of the CBD and seek international implementation of the guiding principles. The principles are to be maintained as far as possible throughout the implementation of this Strategy.

GISP has produced a Global Invasive Species Strategy, and a "toolkit" of best management practices. These practices are to be promoted for all management activities arising from the roll-out of the Strategic Action Plan.

2.2 National legislation

In terms of national legislation, the EM is required to protect biodiversity and control IAS on land under its ownership. Further details of this Strategy's alignment with national legislation are

provided in Chapter 3 of this framework document.

2.3 Local alignment

The approach to control of IAS in the EM must at all times attempt to align with the appropriate local structures. This will encourage the necessary collaborations between role-players, and will enhance the efficacy of implementation measures. Such synergies which align the aims and objectives of the various departments of the EM must also work in close partnership with the likes of the National Working for Water (WFW) campaign, the National Department of Environmental Affairs (DEA), National Department of Agriculture, Forestry and Fisheries (DAFF), the provincial conservation authority, Ezemvelo KZN Wildlife (EKZNW), the provincial Department of Agriculture, Environmental Affairs and Rural Development (DAEARD), the Working for Wetlands (WfWetlands) campaign, Working on Fire (WoF), and also the likes of Non-Government Organisations such as the Wildlife and Environment Society of South Africa (WESSA), the Duzi Umgeni Conservation Trust (DUCT), and the Conservancies Association (CA).

Chapter 3. Elements of the Strategy

The control of IAS in EM will require prioritization of several key elements or activities, namely: **prevention and early intervention, management, maintenance, institutional arrangements, capacity building, funding, legislation, education and advocacy, and research**. These elements reflect and conform to the structure of the Provincial Strategy for KwaZulu-Natal which guides the work done at municipal level. It is, however, expected that the relative importance of each of these elements will differ from those of the Provincial Strategy.

3.1 Prevention and early intervention

Preventing the introduction and early spread of new IAS is key due to the significant savings that can be effected. IAS tend to follow what is referred to as a “long fuse big bang” population growth curve. This means they persist at relatively low numbers for many years, slowly increasing and then suddenly their population explodes. The EM must work closely with provincial and national government to identify and report IAS that are new to the area. The provincial Invasive Alien Species Programme (IASP) has dedicated rapid-response teams that are tasked with eliminating new populations of IAS, before they are able to fully establish. The nursery and pet industries, as well as other industries, could make significant contributions to reducing the introduction and spread of IAS through adoption of codes of practice dictated by national, provincial, or local regulations.

Many IAS not yet present in the EMA, but which pose serious potential threats must be identified. Stakeholders need to be aware of IAS, the means by which they may be introduced, and how the risk of introduction can be reduced. Education and advocacy activities can concentrate on informing stakeholders, including the general public, of the potential impact of emerging species. A watchdog approach should also be encouraged (see item 3.8). The ability to detect new IAS is critical to reducing major infestations, and where an incursion is recognised, an early response control capability is recommended. However, the EM needs to prioritise and manage IAS at site specific level. Prevention and early detection should ideally include controls at the harbour, airports, and major roadways, but this responsibility sits with agencies such as the IASP. The EM

must work with these organisations within the realm of its mandate.

For many IAS the means for distribution and invasion is assisted inadvertently through human activities. Minimising this spread is the most effective way to limit the continued spread of IAS and their future impacts. If isolated infestations occur, these centres for potential future spread need to be eradicated. For optimum results, strategic management of IAS is to be done at catchment level. Close collaboration, and a detailed partnership agreement, should be established with the IASP rapid-response teams. This is to ensure that responsibilities are clearly defined, and in instances where the IASP do not have capacity to implement the management objectives from the Strategic Action Plan, possible delegation of responsibilities, together with funding, can be made to the EM or other appointed agencies.

3.2 Effective management

Effective integration of various IAS management programmes will allow for better and wider implementation at lower costs. Several IAS management strategies and policies have recently been developed in South Africa. Two key documents which this Strategy needs to integrate with are the KZN DAEARD IASP strategy, and the EKZNW strategic management plan. As these do not fully address issues faced at local EMA levels, the current Strategy needs to identify and fill any important gaps. Ongoing potential also exists for research to deliver new or improved practices.

There is also a clear need to align IAS control with local and provincial Systematic Conservation Plans (SCP). Areas of critical biodiversity value should be prioritised for urgent interventions where required, and buffer zones surrounding such areas should be established. Management plans will need to be cognisant of areas which hold no biodiversity value. However, plans must factor in the potential of such areas to act as conduits for IAS propagules, and the ongoing threat that they may harbour thriving populations of IAS.

Management practices can include various combinations of chemical, physical, mechanical and biological control methods. Such IAS best practice management principles (BMPs) are the subject of ongoing investigation at several research and development (R&D) institutions in South Africa. The EM should therefore seek to ensure that local management plans incorporate these BMPs. Differences of opinion, as well as feedback relating to efficacy of such methods, are to be communicated back to the relevant research institutions.

Land managers must ultimately accept responsibility for acquiring and implementing new management technologies through awareness campaigns and in partnership with other land-users. However, in certain instances, it would be appropriate for local government agencies to provide assistance through the likes of BMP awareness campaigns or incentives (e.g. herbicide assistance). BMPs to be communicated could include the likes of tried and tested control and rehabilitation methods. Importantly, it should be communicated that active restoration is seldom required, particularly in natural areas, if regular follow-up controls are undertaken. This is due to the inherent ability of ecosystems to recover once the IAS are removed. Natural ecosystem recovery is also preferred due to cost effectiveness, and the risks of introducing non-native species during restoration.

State-assisted clearing of IAS is to be encouraged, but should be used to boost the development of a coordinated IAS management programme within the EMA. New projects should be aligned with existing projects to enhance control programmes already underway (particularly with regard to IAPs). This will result in progressively more contiguous projects over larger areas where control is effective.

Commercial opportunities for utilising IAS should align with existing programmes. Guidelines must be provided to contractors that harvest IAS resources for commercial purposes, and contractors must be made accountable for containing those IAS populations. Workers (including supervisors) employed in such undertakings are to meet training requirements stipulated by the EM. Commercial use of IAS in the EM must be monitored to ensure that lobbies which actively prevent the effective IAS control do not develop. This is known to occur when IAS that are seen as an income source, and when such income would decline if effective IAS controls are implemented.

3.3 Maintenance and monitoring

The long term success of IAS control is highly reliant on follow-up maintenance to ensure that re-invasions of eradicated IAS do not occur. Information regarding effective long-term IAS control is available from various R&D institutions and should form the basis of any well-planned, adaptive management plan. While it is unlikely that the EM will engage in any in-depth IAS research programmes, provision should be made for activities within the EMA to be informed by or guided by such research. Regular monitoring is required for comprehensive assessment of affected areas, and planning for future actions. Partnerships with R&D institutions should be explored with regard to analysis of relevant data.

Data capture methodologies should be carefully planned and evaluated to avoid the unnecessary waste of scarce resources and time. Baseline surveys to guiding planning on a broad scale are useful and can incorporate existing IAS distribution and abundance data. In many instances, rapid temporal changes in IAS distribution can make previous assessments or mapping exercises redundant. For example, bird populations which spread rapidly and easily make detailed distribution mapping unhelpful; effective reporting frameworks which rapidly identify new populations for eradication are more useful.

Databases for capturing abundance and distribution data of target IAS are useful if accessible and regularly updated. Such data, if analysed appropriately, will prove useful for guiding management activities, particularly follow-up work, in a cost-effective manner. Successful data analysis requires efficient data collection, and appropriate collation, storage, and regular updates. The database should preferably be linked to an electronic mapping system (e.g. GIS) to allow for spatial representation. Data analysis can also be used to determine financial and environmental impacts of specific IAS.

3.4 Institutional arrangements

Coordinated planning and actions together with agreed priorities, responsibilities and resourcing are key to ensuring effective IAS management. Allocation of responsibilities with regard to who coordinates which actions is vital, as it will guide all goal setting, action plans, and monitoring and evaluation activities. This approach will result in the most effective use of resources and should maximize cooperative efforts of interested and affected parties.

Where different government departments and/or different organisations are involved, responsibilities must be clearly designated to minimise confusion with regard to any perceived overlaps. Community leadership and industry involvement in the planning and development of strategies must be promoted, in order to ensure widespread benefits.

Policies need to be understood, adopted and implemented by the general public, and should be consistent with the needs of stakeholders. Awareness programmes can to some extent address responsibilities that lie with communities, industries and the public with regards to IAS management. Once management plans have been formulated by local government, land managers can be informed of the targets and objectives relating to areas under their jurisdiction. Input and feedback from such land managers is also essential if enforcement of policies is to be realised.

Enforcement measures need to be adopted to deal with transgressions or refusals to adopt responsibilities. Enforcement should be seen as an action that supports the majority, who act with due diligence, to mitigate the threat created by a minority. Enforcement should be used after other approaches to gain cooperation have failed.

3.5 Capacity building

A structured capacity-building programme needs to be developed within the municipality in order to address the current shortage of capacity and skills. This programme must be developed in close collaboration with other major role-players in the province, i.e. the DAEARD IASP and EKZNW, as well as other stakeholders or industry sectors.

Capacity building for effective management of IAS should focus on communication and liaison, human resources requirements in all sectors, IAS identification and monitoring (early warning and rapid response teams), implementation (control teams), and biocontrol. Capacity building should also address the issue of language barrier by translating relevant documents, terminologies and products such as posters, into a language that is understood by the target audience (land-owners, communities etc.).

Sustainable development or poverty alleviation IAS management programmes which involve poor or disadvantaged communities can help to ensure these groups benefit from employment, development, and skills improvement opportunities. Such communities are often situated close to important biodiversity or open space assets, and programmes should be geared to communicate the benefits of ecosystem goods and services that open spaces provide.

The formation of close partnerships with land-owners and communities will help to foster a greater degree of ownership with regard to dealing with IAS issues at grass roots level. This will also significantly depend on how effective the means of communication applied is and stresses the need to translate available material into isiZulu.

3.6 Funding

This Strategy and the related Strategic Action Plan require not only the support of a broad range of partners and stakeholders, which are implicated in its approach to IAS management, but also the necessary funding to ensure success. The extent of funding is beyond that which the EM can solely provide, and the Strategy must recognise various other channels through which funding can be secured. These include:

- (i) Internal support

- Municipal funds from the various relevant departments to be directed at supporting IAS management activities;
- (ii) External support
 - Funding for IAS projects which are aligned with strategic objectives that are obtained from either private or government institutions;
- (iii) Partnerships and In-Kind support
 - This includes the sharing of technical, management, and logistic capacities of collaborative projects that allow for shared financial responsibilities within the partnership network.

Internal support of departmental budgets is largely controlled by the municipal Treasury, though the various departments may be required to gather sufficient information to motivate for realistic budgets.

Incentives and disincentives linked to rates or levies, and incorporated into municipal bylaws, are one way of directing resources towards control of IAS. To this end, the EM will need to engage in understanding how best to apply such incentives and disincentives in highly diverse communities, i.e. communities with varying economic standings or cultural backgrounds, as these may respond very differently to different incentives and disincentives.

Examples of incentives and disincentives:

- (i) Rates discounts or penalties for landowner compliance or non-compliance with regard to IAS management.
- (ii) Rates discounts for landowners that manage conservation significant areas according to best practice guidelines.
- (iii) A requirement for "IAS free" certificates to be presented prior to or on transfer of property

An initial assessment of the approximate extent of IAS within the EMA, particularly on land owned by the EM, may be required in order that feasible budget targets and associated interventions can be planned. Once such budget targets are set a mechanism to ensure due provision of funds needs to be implemented. Monitoring the success of control methods and correct use of budgets is required to ensure adequate and ongoing funding of appropriate follow-up control measures.

3.7 Legislation

Various laws govern the control of IAS in South Africa, and some of the relevant Acts are listed further below. However, legislation can change from year to year, and it is the responsibility of the EM to continuously engage with new legislation to ensure that activities taking place are in line with current laws.

Existing IAS legislation cannot be considered comprehensive particularly with regard to: i.) the introduction of new and potential IAS; ii) the requirement for ongoing and appropriate follow-up control of previously eradicated IAS. As such, the requirement for IAS control and follow-up control should be integrated into EM bylaws (for both urban and rural landscapes).

3.7.1 National legislation

Applicable Acts that have a bearing on IAS control in South Africa are listed below:

- (i) The Agricultural Resources Act, 1983 (Act No. 36 of 1983), administered by the National Department of Agriculture, Forestry and Fisheries (DAFF), provides for measures to control agricultural pests.
- (ii) The Conservation of Agricultural Resources Act (CARA; Act 43 of 1983) deals specifically with management of already established IAPs, but does not cover the importation or accidental introduction of new alien species.
- (iii) The Fertilizers, Farm Feeds, Agricultural Remedies and Stock Remedies Act, 1947 (Act No. 36 of 1947) as amended controls the registration of herbicides that may be used for the control of certain IAPs in South Africa
- (iv) The National Environment Management: Biodiversity Act (NEMBA; Act 10 of 2004) requires government organisations to have an IAP strategy in place.

The above list is not exhaustive and will need to be re-assessed and updated periodically to ensure the Strategy is current.

3.7.2 Provincial guidelines

The KwaZulu-Natal Biodiversity Conservation Management Bill (2006), is currently still in draft format. This provincial legislation provides for various biodiversity management and conservation objectives. It includes a chapter on IAS and hybrids, the purpose of which is to:

- (i) Prevent the unauthorised introduction and spread of alien or hybrid species to ecosystems and habitats where they do not naturally occur; and
- (ii) Manage and control alien or hybrid species and invasive species to prevent or minimise harm to the environment and to biodiversity in particular.

The above speaks clearly to the various IAS impacts and/or threats posed to indigenous biodiversity. As such this Strategy and the related Strategic Action Plan need to stipulate that any interventions targeting IAS must be sensitive to natural ecosystems and indigenous biodiversity.

The Strategy for the Management of Invasive Alien Plants in KwaZulu-Natal (prepared by the DAEARD IASP), and the Invasive Alien Species Strategic Management Plan (prepared by EKZNW), are the other two key provincial documents with which this Strategy needs to align. This will ensure that the EM does not take on IAS control tasks that are beyond its mandate, and that actions are aligned with provincial strategic guidelines.

3.7.3 Implementation at municipal level

NEMBA is the most recent Act which legislates for control of IAS. It is prescriptive about several responsibilities that municipalities are required to shoulder. Some of these requirements, which are applicable to the EM, are listed as follows:

- (i) The EM is required, as are all organs of state in all spheres of government, to prepare an invasive species monitoring, control and eradication plan for land under its control.
- (ii) The EM is required to take steps to control and eradicate invasive species on land

- under its ownership.
- (iii) Monitoring, control and eradication plans are to be part of the EM integrated development plans (IDP).
- (iv) As the manager of various protected areas, the EM is required to ensure that an invasive species control and eradication strategy is incorporated into management plans for such areas.
- (v) As a management authority of protected areas, the EM is required to, at regular intervals, prepare and submit to the Minister or the MEC for Environmental Affairs in the province a report on the status of any listed invasive species that occurs in that protected area.

IAS control at local level will also need to align closely with all appropriate stakeholders to ensure effective impact and to encourage collaborative action. The implementation of this Strategy must seek to maximise synergies within the various departments of the EM, as well as between partner organisations such as DAEARD, DEA, DWA, EKZNW, DAFF, SANBI, WoF, WFW, and WfWetlands.

Development of municipal bylaws which support the various aspects and interventions outlined in this Strategy must be a priority.

3.8 Education and advocacy

Raising public awareness of the causes of, and appropriate responses to IAS, is key to the management of the IAS problem. People are often unaware of the impacts that IAS have on the natural environment and primary production or that they may be contributing to the problem through their own actions. They are also often unaware of the economic and social costs. Control and eradication of IAS will also be more successful if supported by informed and co-operating interested and affected parties. Understanding the dynamics of human attitudes towards IAS is crucial in that correct attitudes are key to successful management practices.

While the EM and other institutions are making progress in this field, a lack of awareness has and will continue to result in insufficient resources being made available, and in ineffective systems being used to deal with the problem. It is important to understand the strengths and weaknesses of each organisation or stakeholders in order to develop strategies that maximise outreach. Where capacity already exists it should not be duplicated. The EM should rather seek to support and facilitate work that can be done by other organisations. For example, where an organisation has expertise and capacity to promote awareness, it could be out-sourced. Close collaboration would be essential to ensure that work undertaken is in line with this Strategy.

The availability of clear, concise information about IAS and the promotion and adoption of best management practices will increase public awareness, knowledge, advocacy, and skills. Information availability can be improved through the use of modern communication technologies and a diversity of providers and information packaging techniques.

3.9 Research

Any research undertaken by the EM should be done in collaboration with R&D institutions. Careful planning should be undertaken to assess needs and available resources and no unnecessary duplication of research should occur. Partnerships with R&D institutions should be explored with regard to analysis of relevant data that may be collected as part of ongoing management and maintenance. The task of actively seeking such partnerships should be delegated, along with an

appropriate mandate and resources to the appropriate department or individual.

Good partnerships with R&D institutions will ensure that up-to-date knowledge regarding IAS control is received. Procedures, along with budgets and responsibilities are to be assigned to ensure that such information be disseminated appropriately as part of the management, education, and advocacy components of this Strategy.

Appendix 1: Strategic Action Plan

Several municipal departments will contribute to ensuring the successful implementation of the Strategy. Specific inputs from the following departments have been listed in the Strategic Action Plan. However, IAP control is not exclusively the core function of these departments, and the exclusion of other municipal does not imply such departments are without responsibilities with regard to IAP control.

Municipal departments listed in the Strategic Action Plan:

- Environmental Planning and Climate Protection Department (EPCPD)
- Parks Leisure and Cemeteries Department (PLCD)
- Rural Area Based Management (RABM)
- Roads and Stormwater Maintenance (RSWM) includes Zibambele and Sihlanzimvelo
- Natural Science Museum (NSM)
- Coastal Stormwater and Catchment Management (CSCM)
- Environmental Health Services (EHS)
- Project Management Unit (PMU)
- Economic Development Unit (EDU)
- Housing and human settlements (HS)

1.1 Prevention and Early Intervention

1.1.1 Prevention of introduction

Objective: To prevent the introduction of emerging IAS to the EMA

Notes: Responsibilities for this component of the Strategic Action Plan lie primarily with national (and to a lesser extent, provincial) government.

	Strategic action	Action by:
1.1.1.1	Pressurise the IASP and WfW KZN to alert selected industries, government departments and other organisations about the dangers of introducing new IAS into the EMA	EPCPD. 2009/2010 and ongoing
1.1.1.2	Use a public awareness campaign to discourage the use of new species, cultivars and genetically modified species which have not been subjected to full assessment by a suitably qualified agency. This can be outsourced if necessary	EPCPD, PLCD. Ongoing
1.1.1.3	Increase public awareness regarding the potential dangers of introducing new IAS from other regions/countries	EPCPD, PLCD, NSM. Ongoing
1.1.1.4	Prepare a list of high priority potential IAS in the EMA	EPCPD, PLCD, NSM. 2009/2010 and ongoing
1.1.1.5	Collaborate with staff from other municipalities, provincial government, and other government agencies on strategies to prevent the introduction of new IAS across the EMA borders	EPCPD, 2008/2009 and ongoing
1.1.1.6	Promulgate a by-law prohibiting the dumping of garden refuse into adjacent vacant lots. The use of heavy fines to regulate this practice, along with effective enforcement is essential. This will be EM's key	EPCPD, 2012/2013.

	Strategic action	Action by:
	contribution to stopping new IAS in RSA (IAPs as well as a host of IAAs and IAMs get spread in this way).	

1.1.2 Early detection and eradication

Objective: Detect and eradicate new IAS

	Strategic action	Action by:
1.1.2.1	Promote mechanisms, established by the IASP, whereby municipal departments, research organisations, and the public can report the presence of new and unusual species to the IASP and the relevant municipal department. This to be in line with the IASP strategy.	EPCPD, NSM. 2010/2011 and ongoing.
1.1.2.2	Support the DAFF and/or SANBI and/or the IASP to investigate/initiate an accreditation process whereby individuals skilled and willing to do IAS identification can have their services enlisted.	EPCPD, 2011/2012 and ongoing.
1.1.2.3	Collaborate in the IASP's – and the SANBI EDRR's systems for reporting new IAS infestations	EPCPD, PLCD, RSWM, RABM, NSM, CSCM, EHS, PMU, EDU. 2012/2013
1.1.2.4	Provide support and input to the SANBI EDRR's rapid response teams for the eradication of new infestations of target IAS.	EPCPD, PLCD. 2008/2009.
1.1.2.5	Monitor new IAS invasions and management interventions at both property and catchment levels.	EPCPD, PLCD, RSWM, RABM, NSM, CSCM, EHS, PMU, EDU 2012/2013, Ongoing.
1.1.2.6	Provide support and input into the development of best management practices and responses for control of new IAS.	EPCPD, PLCD, NHM. 2011/2012
1.1.2.7	Commission baseline taxonomic inventories of lesser known groups (fauna, flora and microbe) in significant biodiversity areas to find out what indigenous and alien species are present.	EPCPD, NSM. Ongoing.
1.1.2.8	Initiate and/or support the routine re-surveying of significant biodiversity areas for lesser known groups of fauna, flora and microbes to improve chances of detecting new IAS before they have become too well established to allow their eradication.	EPCPD, NSM, Ongoing.

1.1.3 Prevention of spread

Objective: Minimise the spread of IAS in new areas

Notes: Responsibilities for this component of the Strategic Action Plan lie primarily with national (and to a lesser extent, provincial and local) government. The EM to support and assist where possible.

	Strategic action	Action by:
1.1.3.1	Disseminate to managers of open spaces, as well as to the public at	EPCPD, PLCD, RSWM,

	Strategic action	Action by:
	large, up-to-date information (via printed or electronic media) detailing best practices for limiting the spread of IAS.	RABM, NSM, CSCM, EHS, PMU, EDU. 2011/2012
1.1.3.2	Promote protocols established by the ARC, SANBI and the IASP that assist industries, communities and government departments to meet the duty of care	EPCPD. 2011/2012
1.1.3.3	Assist the IASP in the development of protocols for containing emerging IAS in their core areas while management actions are being implemented.	EPCPD, PLCD. 2011/2012
1.1.3.4	Provide input and support to the IASP for development of programmes aimed at assisting industries, communities and government departments to improve the practices relating to IAS. Promote the local roll-out of such.	EPCPD. 2014/2015 and ongoing.
1.1.3.5	Provide input and support to the IASP for development of programmes aimed at assisting nursery, aquarium, pet store, farming, industry and community groups to take responsible action regarding the sale, distribution and control of IAS. Promote local roll-out of such.	EPCPD, 2014/2015 and ongoing
1.1.3.6	Ensure transport corridors are given high priority in IAS management programmes in close collaboration with provincial and national authorities.	EPCPD, PLCD, RSWM, RABM, NSM, CSCM, EHS, PMU, EDU. 2010/2011 and ongoing

1.2 Effective Management

1.2.1 Development of IAS best management practices

Objective: To develop new or improved IAS management practices

	Strategic action	Action by:
1.2.1.1	Gap analyses should identify the need for BMPs that are lacking, Negotiations with external institutions better-equipped to develop BMPs should then be initiated.	EPCPD, PLCD, NSM. 2012/2013 and ongoing
1.2.1.2	Investigate the need for an integrated management system for the control of different IAS	EPCPD. 2011/2012
1.2.1.3	Publish IAS management plans for protected areas in the EMA	PLCD, EPCPD, RABM. 2012/2013
1.2.1.4	Initiate/support meetings that stimulate collaboration between national, provincial and local government. These should be regular planned meetings, with committed individuals representing (at high level) each of the relevant tiers of government and their relevant departments/agencies.	EPCPD, PLCD. 2008/2009 ongoing
1.2.1.5	Develop, publish and implement guidelines for minimising environmental impacts related to eradication of IAS	EPCPD, PLCD. 2013/2014

	Strategic action	Action by:
1.2.1.6	Investigate ways of using IAS within the EMA productively, and monitor the implementation of such methods, in support of reducing negative impacts	PLCD, EPCPD. 2012/2013

1.2.2 Adoption of IAS best management practices

Objective: To promote and adopt best practice IAS management

	Strategic action	Action by:
1.2.2.1	Collate, document and publicise existing BMPs for all IAS known to exist in or near the EMA, and synthesise these in terms of their relevancy to the EMA.	EPCPD, PLCD, NSM. 2012/2013 and ongoing
1.2.2.2	Integrate IAS management into the management of reserves and the DMOSS.	EPCPD, PLCD, RSWM, RABM, CSCM, EHS, PMU, EDU. 2008/2009 and ongoing.
1.2.2.3	Adopt and implement IAS BMPs for land under management by the EM.	PLCD. 2010/2011 and ongoing
1.2.2.4	Collaborate with SANBI, WfE and the IASP to ensure integrated IAS management, including use of biocontrol and cultural practices. Identify the best management approach for each situation, e.g. large, established populations would be better controlled using biological approaches whereas small, isolated infestations can be eliminated using other means. The use of herbicides/pesticides and tillage to be minimized where possible.	PLCD, EPCPD. ongoing
1.2.2.5	Implement control programmes that are consistent with strategy guidelines and best practice.	EPCPD, PLCD, RABM, RSWM, NSM, CSCM, EHS, PMU, EDU. 2011/2012 and ongoing
1.2.2.6	Adopt restoration/rehabilitation practices in conjunction with IAS control activities and in line with BMPs	PLCD, EPCPD, EDU, RSWM, RABM. ongoing
1.2.2.7	Develop close relationships with the relevant biocontrol agencies	EPCPD, PLCD, EDU. 2010/2011 and ongoing
1.2.2.8	Actively support the relevant biocontrol programmes for critical IAS which are otherwise uncontrollable	EPCPD, PLCD. 2010/2011 and ongoing

1.2.3 Landholder incentives

Objective: To use IAS management incentives that enhance public benefit

	Strategic action	Action by:
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	Strategic action	Action by:
1.2.3.1	Review the availability and effectiveness of existing incentives	EPCPD. 2011/2012
1.2.3.2	Identify, evaluate and minimise the impacts of disincentives	EPCPD. 2012/2013
1.2.3.3	Develop and promote new and revised incentives	EPCPD. 2013/2014

1.2.4 Environmentally significant areas

Objective: To protect environmentally significant areas from IAS impacts

	Strategic action	Action by:
1.2.4.1	Identify and prioritise environmentally significant areas and associated IAS threats.	EPCPD, PLCD. 2010/2011 and ongoing
1.2.4.2	Establish strategic site-based management programmes for on-ground, long-term management of priority IAS. The best approach is to consolidate control/management areas and then to work towards linking these areas.	PLCD, EPCPD. 2012/2013
1.2.4.3	Encourage direct local community involvement of IAS in environmentally significant areas.	EPCPD, PLCD, RSWM, RABM, EDU, PMU, CSCM. 2007/2008 and ongoing

1.3 Awareness and Education

1.3.1 Awareness and communication of information

Objective: To make relevant information relating to IAS available to all stakeholders. To increase awareness and knowledge about IAS and their impact

	Strategic action	Action by:
1.3.1.1	Identify municipal and other stakeholders, as well as associated roles and responsibilities.	EPCPD. July 2008/2009 and ongoing
1.3.1.2	Review the merits of out-sourcing selected awareness and education activities, or working in close liaison with other agencies, e.g. WESSA, SANBI EDRR etc.	EPCPD, PLCD. 2010/2011 and ongoing
1.3.1.3	Establish/support working groups to discuss ideas/develop resources and work-plans. Ensure information is shared between stakeholders.	EPCPD, PLCD and others. 2008/2009 and ongoing
1.3.1.4	Development awareness strategies for various target groups, e.g. community-based awareness	EPCPD, PLCD, RSWM, RABM, NHM, CSCM. 2011/2012

	Strategic action	Action by:
1.3.1.5	Work with SANBI EDRR, WfW and the IASP to establish information networks at all levels to improve understanding of how introduced IAS, e.g. exotic garden plants can become weeds. Promote the use of locally native species.	EPCPD, PLCD, NHM. Ongoing
1.3.1.6	Develop and disseminate information packages as well as relevant education programmes to the various interest groups/target audiences identified.	EPCPD, CSCM, PLCD, RSWM, RABM, EDU, NHM. Ongoing
1.3.1.7	Identify key people in each important stakeholder/partner group who act as information disseminators to their group's members, and then target them with the best information available	EPCPD, PLCD, CSCM, NHM. Ongoing
1.3.1.8	Improve public signage for IAS risk areas, and cooperative control programmes	PLCD, EPCPD. 2011/2012
1.3.1.9	Develop and promote a balanced perspective on controversial IAS-related issues. Newspaper articles, forum meetings, radio talks.	EPCPD, PLCD, CSCM. 2008/2009 and ongoing.
1.3.1.10	Establish points of contact such as websites, list servers or newsletters at all levels for access to information	EPCPD. 2012/2013
1.3.1.11	Review the availability and applicability of existing information and the extent to which it is accessed	EPCPD. 2010/2011
1.3.1.12	Maximise use of communication technologies.	EPCPD, PLCD, NHM. Ongoing

1.3.2 Capacity building

Objective: To build capacity and enhance stakeholder knowledge and skills through various education and training activities

	Strategic action	Action by:
1.3.2.1	Increase capacity of relevant municipal staff at all levels w.r.t. IAS management in reserves, parks, nurseries, gardens etc.	EPCPD, PLCD, RSWM, RABM, NSM, CSCM, EHS, PMU, EDU. 2007/2008 and ongoing
1.3.2.2	Develop suitable training based on competencies that meet local government and organisational requirements	PLCD. 2010/2011
1.3.2.3	Ensure staff attend suitable, quality training that meet local government and organisational requirements, as well as national and international standards	EPCPD, PLCD, RSWM, RABM, NSM, CSCM, EHS, PMU, EDU. 2011/12
1.3.2.4	Identify knowledge areas that are lacking and encourage research into such by the various relevant R&D institutions	EPCPD, NSM. 2010/2011 and ongoing.
1.3.2.5	Pressurise national and/or provincial education authorities to develop and incorporate IAS management content into a format for use by	EPCPD. 2012/2013

	Strategic action	Action by:
	schools	
1.3.2.6	Encourage other organizations and municipal departments to build the capacity of their staff w.r.t. IAS management	EPCPD. 2012/2013

1.4 Planning, Responsibility and Resourcing

1.4.1 Strategic planning

Objective: To develop, collate and streamline management plans for control of IAS in the EMA in conjunction with community, industry and government planning processes. This to ensure optimal and realistic implementation.

	Strategic action	Action by:
1.4.1.1	Integrate IAS management issues into the municipal IDP as well as the relevant land management plans (e.g. DMOSS) and engage stakeholders (through forums) for their input.	EPCPD. Start 2011/2012 and ongoing.
1.4.1.2	Prioritise council owned properties for management/control of IAS. Relevant departments to implement these IAS plans on their land. The principle of consolidating the control of selected areas and working towards linking these areas should be applied.	EPCPD. 2009/2010 and ongoing.
1.4.1.3	Partner with DAFF, DAEARD, WESSA, SANBI, BOTSOC and WfW to develop guidelines for dissemination to private land owners about IAS management on private property. Include information on the legal responsibilities of landowners.	EPCPD, PLCD, NSM, CSCM. 2010/2011
1.4.1.4	Ensure all stakeholders agree on and/or are aware of priorities. Develop plans to tackle key species and issues, e.g. emerging weeds. Ensure areas already addressed in previous years do not simply get re-invaded	EPCPD, PLCD, RSWM, RABM, NSM, CSCM, EHS, PMU, EDU. 2008/2009 and ongoing.
1.4.1.5	Develop and implement a standard monitoring programme that can be used on all municipal land. The technique should be reliable and repeatable to ensure consistency, and must ensure that achievements in IAS control can be demonstrated.	EPCPD, PLCD. 2011/2012 and ongoing.
1.4.1.6	Develop an easy to use web-based data capture system for all departments and external agencies to use when reporting on IAP control efforts	EPCPD. Start 2011/2012
1.4.1.7	Relevant departments to monitor the extent of control operations and report on as part of an annual audit for properties under their management. Reporting to ultimately be done via a web-based data-capture system.	EPCPD, PLCD, RSWM, RABM, NSM, CSCM, EHS, PMU, EDU. Start 2009/2010 and ongoing.
1.4.1.8	Incorporate IAS management ideologies into the environmental planning and development assessment processes.	EPCPD. Ongoing

1.4.2 Management

Objective: Implement effective IAS management within the municipality by means of an integrated approach with community, industry and the various tiers of government.

	Strategic action	Action by:
1.4.2.1	Prioritise IAS management: i.e. within DMOSS, on municipal owned properties, in protected areas, nurseries, parks and gardens. Initiate communication with, and ensure buy-in from, other municipal departments who control large tracts of land.	EPCPD, PLCD, RSWM, RABM, CSCM, EHS, PMU, EDU. 2008/2009
1.4.2.2	Use existing biodiversity forums and other mechanisms to ensure stakeholders adopt best practice with regards to control of IAS and rehabilitation on degraded sites. Identify and maintain links between stakeholders for management planning activities that relate to IAS.	EPCPD. 2010/2011
1.4.2.3	Review and compile (in partnership with DAEARD, SANBI and DAFF) a summary of legislated IAS control requirements for dissemination to partners and managers involved in IAS management Ensure all management plans conform to the legislation.	EPCPD, CSCM, NSM. 2011/2012

1.4.3 Roles and responsibilities

Objective: Identify and achieve acceptance of roles and responsibilities across all stakeholders: to be consistent with legislation, regulations and bylaws, as well as this strategy.

	Strategic action	Action by:
1.4.3.1	The EM, in partnership with DAFF, to support mechanisms for advising land owners of problem species on their properties. This responsibility currently sits with national government (DAFF).	EPCPD, PLCD. 2010/2011 and ongoing.
1.4.3.2	Clarify and agree on roles/responsibilities between the EPCPD, PLCD, RSWM, RABM, NSM, CSCM, EHS, PMU, and EDU.	EPCPD, PLCD, RSWM, RABM, NSM, CSCM, EHS, PMU, EDU. 2011/2012 and ongoing
1.4.3.3	Incorporate role and responsibility messages in ongoing planning and networking activities	EPCPD. Ongoing

1.4.4 Long-term commitment

Objective: Achieve long-term stakeholder commitment to management of IAS.

	Strategic action	Action by:
1.4.4.1	Provide realistic budgets for alien plant control to EM Treasury. Motivate for realistic, sustained funding of IAS control as part of the medium-	EPCPD, PLCD. 2010/2011 and

	Strategic action	Action by:
	term expenditure framework, as well as inclusion in long term plans. Ensure that IAS management programmes do not waste public funds.	ongoing.
1.4.4.2	Encourage land managers and government employees to adopt a 'good neighbor' approach to IAS management.	EPCPD, PLCD, RSWM, RABM, NSM, CSCM, EHS, PMU, EDU. Ongoing
1.4.4.3	Establish 'ownership' of management programmes through long-term partnerships between community, industry and government.	EPCPD, PLCD, RSWM, RABM, NSM, CSCM, EHS, PMU, EDU. 2010/2011
1.4.4.4	Where feasible, use rewards and recognition mechanisms to stimulate responsible IAS management programmes.	EPCPD, PLCD. 2012/2013

1.4.5 Legislation, policy and compliance

Objective: The implementation of clear, concise and workable legislation and policy in support of IAS management.

	Strategic action	Action by:
1.4.5.1	Use national and provincial legislative guidelines to develop bylaws for enforcing IAS management and control, in collaboration with national and provincial authorities.	EPCPD. 2012/2013
1.4.5.2	Provide guidelines and training to law enforcement officers.	EPCPD, PLCD. 2008/2009 and ongoing.
1.4.5.3	Support the DAFF and/or DAE in their roles as enforcers of existing and/or new regulations. This to ensure that stakeholders meet their duties with regards to IAS management.	EPCPD, PLCD. 2008/2009 and ongoing.
1.4.5.4	Establish a support network for enforcement officers.	EPCPD, PLCD. 2007/2008 and ongoing.

1.4.6 Coordination

Objective: Coordinate the implementation, evaluation and review of IAS management.

	Strategic action	Action by:
1.4.6.1	Establish a management coordination committee to represent stakeholders that ensures the strategy is communicated and implemented. This task is of highest priority	EPCPD, 2011/2012 and ongoing.

	Strategic action	Action by:
1.4.6.2	The management committee to address issues of liaison between government agencies.	EPCPD, PLCD, NHM. 2011/2012
1.4.6.3	Ensure the management committee agrees on coordination mechanisms for the implementation of the Strategy.	EPCPD, PLCD, NHM. 2011/2012
1.4.6.4	The management committee to promote collaboration between community groups and government agencies.	EPCPD, PLCD, NHM. 2011/2012

1.4.7 Resourcing

Objective: Acquisition and management of the required resources for effective IAS control in the EMA.

	Strategic action	Action by:
1.4.7.1	Build an economic case for the allocation of financial and manpower resources for the implementation of the IAS Strategy. Present this case to your EM Council at a high level. Ensure the above is coupled with sustainable development/poverty alleviation and EPWP programmes in order to highlight the important green job opportunities.	EPCPD, CSCM, RSWM, PLCD, NHM. 2008/2009 and ongoing
1.4.7.2	Assess the resource needs of all stakeholders and identify common objectives and opportunities for sharing of resources for IAS control	EPCPD, PLCD, NHM. 2012/2013 and ongoing.
1.4.7.3	Explore how to use existing resources to provide 'seed' funds for establishing long-term community and industry commitment to better resourcing of IAS management.	EPCPD, PLCD. Ongoing.
1.4.7.4	Identify and capitalise on opportunities for obtaining resources from sponsors, government programmes and the corporate sector.	EPCPD, PLCD. Ongoing
1.4.7.5	Investigate mechanisms for ensuring that beneficiaries of the programmes are also contributors.	EPCPD, 2010/2011
1.4.7.6	Promote IAS management as a long-term investment for land owners/managers in improving the economic and ecological viability of their properties.	EPCPD, PLCD, NHM. Ongoing
1.4.7.7	Establish mechanisms to attract, direct and acknowledge the efforts of community volunteers to specific tasks most suited to them.	EPCPD, PLCD, NHM. 2011/2012 and ongoing
1.4.7.8	Motivate and support the allocation of realistic resources to departments involved in IAS management.	EPCPD, PLCD, NHM. 2009/2010 and ongoing

1.5 Assessment

1.5.1 Data collection

Objective: To acquire data on the distribution, abundance and current management status of IAS in the EMA. Such data should be made accessible to relevant stakeholders.

	Strategic action	Action by:
1.5.1.1	Develop, together with the DAEARD, ARC, SANBI, and WfW, a data collection programme that links with existing databases and mapping exercises. Data for distribution, abundance, impact and management status of IAS in the EMA to be captured. Feed data into existing databases where possible (e.g. National Database housed at the ARC).	EPCPD, PLCD, NHM. 2012/2013. Ongoing.
1.5.1.2	Establish mechanisms for storage, analysis and retrieval of IAS distribution and abundance data. Data on management input to be reported on annually. Larger trend reports to be generated at 5 year intervals.	EPCPD, PLCD, NHM. 2009/2010 and ongoing.
1.5.1.3	Improve public access to IAS information systems. Collaborate with national and provincial government as well as other organizations.	EPCPD and PLCD. 2008/2009 and ongoing
1.5.1.4	Ensure standardised protocols for data collection, validation, dissemination, and access.	EPCPD. 2012/2013 and ongoing.
1.5.1.5	Integrate data collection of IAS population dynamics with ongoing spatial mapping, with an emphasis on relevant actions rather than mapping for no purpose. Incorporate surrogate measures from management programmes where applicable.	EPCPD. 2009/2010 and ongoing.

1.5.2 Assessment and data analysis

Objective: To plan for future management of IAS, based on areas prioritised within the EMA. Knowledge and BMPs generated at provincial and national level to be used where possible.

	Strategic action	Action by:
1.5.2.1	Provide assistance to the SANBI EDRR and IASP teams for the development of an assessment process for emerging IAS.	EPCPD, PLCD. 2008 and ongoing
1.5.2.2	Undertake ongoing assessments in key biodiversity areas to determine the potential impact of all IAS in the EMA.	EPCPD, PLCD, NHM. Ongoing
1.5.2.3	List criteria to be used for assessing IAS as a basis for management/control. Key criteria for would include: the ability to keep areas clean, the biodiversity value of selected sites, etc. Prioritize reserves accordingly	EPCPD, PLCD. Start 2009/2010.
1.5.2.4	Review/assess the effectiveness of current management programs, strategies and practices for individual IAS.	PLCD, EPCPD. 2010/2011 and

	Strategic action	Action by:
		ongoing.
1.5.2.5	Develop policies, programmes and priorities for management and research based on data analysis.	EPCPD. Ongoing.
1.5.2.6	Draw on national or provincial decision-support systems for the management of IAS in designated areas/zones/properties.	EPCPD, PLCD, RSWM, RABM, NSM, CSCM, EHS, PMU, EDU. Ongoing.

1.5.4 Social assessment

Objective: To better understand current attitudes of the general public, industries and government departments with regard to IAS control.

	Strategic action	Action by:
1.5.4.1	Investigate and delegate this responsibility or outsource if necessary. Provide support to national and/or provincial government agencies that may undertake this work.	EPCPD, RSWM, PLCD. Ongoing
1.5.4.2	Assess community, government and individual attitudes to IAS.	EPCPD, RSWM. 2012/2013 and ongoing
1.5.4.3	Adopt best procedures to change incorrect practices relating to IAS.	EPCPD, RSWM, PLCD. 2012/2013 and ongoing
1.5.4.4	Use proven and established methodologies to raise awareness and commitment, and to improve current management practices.	EPCPD, RSWM, PLCD. 2012/2013 and ongoing