UGANDA WILDLIFE AUTHORITY

Strategy and Action Plan

for Invasive Plant Species Management in Six Wildlife Protected Areas 2025-2035

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Acronyms and Abbreviations

CBD	Convention on Biological Diversity
GoU	Government of Uganda
IAS	Invasive Alien Species
KVNP	Kidepo Valley National Park
LMNP	Lake Mburo National Park
MBWR	Matheniko-Bokora Wildlife Reserve
MENP	Mt Elgon National Park
MTWA	Ministry of Tourism, Wildlife and Antiquities
NARO	National Agricultural Organisation
NBSAP II	National Biodiversity Strategy and Action Plan (second edition)
NEMA	National Environment Management Authority
NFA	National Forestry Authority
PA	Protected Area
PUWR	Pian Upe Wildlife Reserve
QENP	Queen Elizabeth National Park
UWA	Uganda Wildlife Authority

Foreword

Uganda Wildlife Authority (UWA) is a premier conservation agency with the statutory mandate to conserve, economically develop and sustainably manage the wildlife and wildlife protected areas of Uganda in partnership with the neighboring communities and other stakeholders for the benefit of the people of Uganda and the global community. Ecosystem degradation and loss of critical wildlife habitats and biodiversity loss are, however, a growing threat to the management of these ecosystems. The emergence and rapid escalation of invasive plant species, exacerbated by climate change, threatens to undermine the realization of conservation goals and objectives. Concerted effort is, therefore, required to address the challenge in order to restore the integrity of ecosystems and sustainably manage wildlife, and biodiversity in general, in line with the national vision and international commitments.

The main drivers of biological invasions are well known within the conservation fraternity, as are the difficulties of controlling them and their negative impacts. However, the magnitude of the damage to the affected ecosystems, including the multiple social, economic and environmental services, and impact on human, animal and plant health, have not been fully evaluated in all their dimensions. It needs to be appreciated that the biological invasions are one of the main causes of biodiversity loss across all ecosystems in the world. In the case of UWA's protected areas, there are also Problematic Native Species. These become problematic due to changes in the ecosystem conditions that alter their growth cycles.

Together with the wildlife and tourism fraternity, the Board of Trustees is delighted that a comprehensive plan of action is now in place to guide our efforts in managing the invasive plant species menace in the next medium-term period (2025-2035). While appreciating that intensifying climate change and population pressure make the next few years extremely challenging for wildlife management, we commend the UWA Management for the vision and proactive leadership that have put together this plan. We look forward to successful implementation of this strategy and action plan.

The Board pledges to be at the forefront of mobilizing stakeholders and resources to raise capacity within UWA and among its partners and neighboring communities, to restore and preserve the ecological integrity of our protected areas, and, as a natural consequence, the social and economic benefits derived therefrom.

This Strategy and Action Plan is an important framework for institutional coordination and leadership in dealing with invasive species in Protected Areas. The Board is committed to the implementation of this strategy, and calls upon all partners and stakeholders to support its implementation process. We are optimistic that this strategy will guide UWA and partner institutions to develop, acquire and efficiently deploy the requisite tools, systems, practices and resources for prevention, detection and timely response to mitigate, control and eradicate invasive plant species.

I am sincerely hopeful that, by 2035, Uganda's PA system will have effectively suppressed the problem of invasive plant species and will have sufficient capacity to contain the challenge in order to fulfil its mandate of sustainably managing Uganda's wildlife heritage and the integrity of their ecosystems.

Professor James Kalema
Chairperson, Board of Trustees

Message from the Executive Director

The emergence and spread of Invasive plant species is **adversely affecting Uganda's wildlife and** Protected Areas system, as well as the tourism economy and socio-cultural systems that depend on them. In particular, Protected Areas (PAs) are the most pristine ecosystems that provide stable habitats for threatened wildlife species in Uganda, which are now threatened by invasive species. Every day, indigenous species and habitats are exposed to risks of degradation from invasion by native and non- native flora and fauna species. These invaders, in new ecosystems, rapidly become aggressive predators, competitors and parasites, and cause diseases to native and domesticated flora and fauna. The resultant impacts of these invasions on our ecosystems, habitats and species are severe and often irreversible. This has significant costs to **communities'** health and livelihoods, economy and the environment with consequences far beyond our borders.

The threats posed by invasive plant species is growing at a worrying rate, across all Wildlife Protected Areas in Uganda. The main drivers are linked to the degradation of biodiversity outside Protected Areas, expansion in the trade of goods and services, the increased mobility of people into and outside PAs, and declining availability of resources (including water, grazing resources) in and outside PAs triggering cross-boundary movement of people and animals in and outside the PAs. The escalating climate change effects are also causing disruptions in the ecological structure and flow of ecosystem services, causing nonnative or naturalized species not known to be invasive to become invasive. Indeed, the recent inventory studies have found the invasive species incidences and their negative effects to be profoundly severe, calling for urgent, decisive and comprehensive action against invasive species.

Uganda Wildlife Authority (UWA) is committed to addressing all threats to wildlife and ecosystems in and around all Protected Areas under it's mandate of Conserving for Generations. UWA will take lead role in implementing radical measures to address the problems of invasive species, protect and conserve **Uganda's** natural resources and associated industries. UWA pledges to work with the local communities and other stakeholders to prevent invasions through different areas.

Towards this, UWA, in collaboration with sister agencies, partners and stakeholders, has developed a specific and comprehensive strategy and action plan to effectively respond to the invasive species challenge. The strategy is a culmination of intense consultations and on-ground biophysical assessment undertaken since September 2023, and has been formulated to guide the efforts to manage Invasive plant species in selected Wildlife PAs in Uganda.

Conserving for Generations.

Dr. James Musinguzi, PhD
EXECUTIVE DIRECTOR

Acknowledgment

The comprehensive baseline studies that informed this strategy and action plan, and the preparation of this plan were undertaken with support of consultants from the Centre for Resource Analysis Limited (CRA). The Uganda Wildlife Authority (UWA) gratefully acknowledges the professional time, expertise and commitment that enabled the successful preparation of this strategy. The UWA Team, led by Mr. Aggrey Rwetsiba, Senior Manager Wildlife Monitoring and Research, is strongly acknowledged for their dedication to review documents and provide on-going guidance to the team. the Senior Conservation Managers and staff of the Six Protected Areas where field visits were undertaken are highly appreciated for their facilitation. In equal measure, UWA acknowledges the support and information provided by Local Government authorities and community members, for supporting the exercise and argues them to actively participate in the implementation of this strategy. Sister Agencies, partner institutions in the private sector, civil society and development cooperation, are acknowledged for their invaluable inputs into the process. The steadfast leadership of the Executive Director, Mr Samuel John Mwandha and the entire Top Management in keeping the issue of invasive plant species management a matter of urgent priority, merits special mention. The Board of Trustees who reviewed the drafts, provided invaluable advice on the Plan and approved the final version for implementation, are specially acknowledged.

Executive Summary

Invasive plants are native or alien species which when introduced into an ecosystem, trigger or cause changes in the ecological structure and functioning of species, habitats and the entire ecosystem. The change in behaviour of species consequently results in environmental, social and/or economic damage within the ecosystem. Biological invasions occur across all living organisms, animals, plants, micro-organisms, and across all terrestrial and aquatic ecosystems. Invasive species typically lack natural predators and can successfully colonize and thrive beyond their natural ranges, often out-competing other species thereby contributing to the decline in extent, distribution and diversity of other species. Key features that enable these species to invade habitats and suppress existing species are competitive adaptations, aggressive reproductive strategies and efficient dispersal methods.

Uganda's wildlife and biodiversity are threatened by invasive species, that now occupy large parts of the protected areas (PAs). Most PAs have, over the last decade, experienced significant expansion of invasive woody species at the expense of grasslands, while many water bodies in PAs are increasingly being covered by invasive aquatic plants. This altered terrestrial vegetation cover has particularly affected grazers, resulting in the tendency to move outside PAs for feeding, which exposes them to dangers of predation and poaching. The changing movement and distribution of wildlife, has consequently affected tourism in all PAs as the presence of big cats most coveted by tourists usually depends on abundance of herbivores. The baseline inventory in six PAs identified 22 invasive plant species and revealed that most invasive plant species are native or naturalized and that they did not have invasive tendencies 60 years ago when the first Uganda Vegetation map was produced. This underscores the escalating drivers notably climate change and human pressures.

This Strategy and Action Plan aims to control the introduction and spread of invasive plant species within Uganda's Wildlife Protected Areas and their vicinity through a combination of sustainable management approaches. The plan will achieve 5 strategic objectives: i) Eliminate invasive species and restore ecosystems to reduce the impacts of invasion; ii) Prevent new invasions and manage established ones; iii) Strengthen institutional capacity to manage woody species encroachment and invasion by other species; iv) Collaborate with other agencies and stakeholders to do research and manage invasive plant species; and v) Leverage funding for control and management of invasive plant species in the PAs.

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Dichrostachys cinerea in Kidepo Valley National Park

1.0 Introduction

1.1 Background

Invasive plants are native or alien species whose introduction or change in ecological behavior within an area causes or results in environmental, social or economic damage within the ecosystem. Invasive plants often lack natural predators and can successfully colonize and thrive beyond their natural ranges, often out-competing other plants thereby contributing to the decline in extent, distribution and diversity of other species. A key characteristic of these species is that they tend to have competitive adaptations, aggressive reproductive strategies, efficient dispersal methods.

By the year 2010, many of the protected areas in Uganda had registered cases of expansion of woody vegetation cover at the expense of the grasslands. This had a direct effect of altering the vegetation cover and reducing the area coverage for grazing. As a result, the grazers have tended to move beyond the boundaries of the PAs in search of more favorable grazing ground. Consequently, this has affected the tourist arrivals, as the presence of the big cats usually coveted by tourists often depends on abundance of herbivores. From the baseline surveys, it was established that the plants that are invading the ecosystems in the PAs are either native or naturalized (with a few alien), but did not have invasive tendencies 60 years ago when the first vegetation map for Uganda was made.

UWA commissioned a study to establish the baseline status of the invasive species distribution and extent, as well as the implications for ecological and social management of Uganda's Protected area ecosystems. Although the baseline survey covered only six PAs, it informed this strategy and action plan for invasive plant species management, which could apply to the rest of the PA system because the unsurveyed PAs also majorly suffer the same issue of encroachment by native woody invaders, and face the same management challenges particularly insufficient financial and human resources.

1.2 Invasive Plant Species Management in the Context of UWA Medium-term Strategy

The UWA Strategic plan for 2020-2025 highlights the infestation of invasive plant species as a big driver of natural resources and ecosystem degradation, among other pressures notably climate change, wildlife trafficking and economic development activities (mostly extractives and energy infrastructure). These threaten the survival of wildlife and the ecosystem services derived therefrom, including tourism. The strategy, now in mid-term, set out to restore ecosystem resilience and resistance to withstand invasive plant species, support community livelihoods and ultimately generate financial resources to enable effective management of the natural ecosystems.

The invasive plant species management and control will directly contribute to realization of at least 4 of the 7 key results of the UWA Strategic plan, viz. i) enhanced Quality of wildlife habitats in PAs; ii) improved species diversity and viability in and outside PAs; iii) mitigation of human-wildlife conflicts; iv) increased and diversified wildlife utilization benefits to communities and other stakeholders.

1.3 Problem Statement and Justification

1.3.1 The Problem

Invasive plant species are a growing challenge to biodiversity and wildlife management, in part due to intensifying climate change and human induced mobility and land use change. Given the relationship between nature, biodiversity and Uganda's economy and socio-cultural systems, Invasive plant species pose a serious danger to human health and socioeconomic well-being. From tourism to agriculture and food systems,

to health and culture, biodiversity plays a key role in sustainable livelihoods and the future of Uganda as a global genetic databank. There is inadequate knowledge of the extent of coverage of invasive species implying that the magnitude of the consequences might be much higher than is currently known. Invasive plant species are colonizing large parts of protected areas, some of which are unique habitats to a variety of species. Within UWA and the entire public sector, there remains limited capacity – both technically and financially, to address the invasive challenge. Yet it is widely recognized that the spread of invasive species is complicated and controlling them is equally difficult. Building a strong knowledge base to identify which species are invasive, their morphology and favourable conditions for their spread, is the critical first step in effective management of these species.

1.3.2 Justification

The high costs associated with invasive plant species require proactive and effective high-level response to address the invasive species challenge from a long-term ecological perspective. Although species are typically left to colonise habitats as part of natural ecological processes, some biological invasions can be a threat to ecosystem stability as they are induced by undesired changes that can negatively alter ecological processes, resulting in serious consequences for wildlife and biodiversity, human health, wellbeing and economy. Effective management of invasive species will contribute to ecosystem, rehabilitation and enhance biodiversity conservation in line with the country's vision of conserving for generations.

1.4 Scope of the Strategy and Action Plan

UWA is responsible for the management of 10 National Parks, 12 Wildlife Reserves and seven Wildlife Sanctuaries and provides guidance over the management of five Community Wildlife Areas. This Strategy and Action Plan is, however, based on the comprehensive inventory in six PAs across four different landscapes i.e. Kidepo Valley National Park (KVNP), Pian Upe Wildlife Reserve, Matheniko-Bokora Wildlife Reserve, Mt Elgon National Park (MENP), Lake Mburo National Park (LMNP) and Kabwoya Wildlife Reserve. The plan, therefore, covers these six PAs. It includes general and area-specific actions for management of invasive species in those locations. However, there will be scope to cover the entire PA system when the data from other PAs is included.

It focuses on the management of invasive plants; native, naturalized and alien, that have the potential to pose undesirable or/and detrimental impacts on wildlife, ecosystems and the economy. It is intended to guide the country, and particularly Wildlife conservation managers, to understand and respond to the invasive species threat through research, information generation and dissemination, education and advocacy, as well as regulatory and physical on-ground actions as appropriate. The strategy adopts area-based approach where the extent of threats by particular species and the conditions of the PAs will guide national level decisions in terms of priority species to be managed and techniques to be used, taking into consideration resource and ecological compatibility. The Strategy will be implemented over a period of ten (10) years during 2025- 2035.

1.5 Guiding Principles

Responding to biological invasions require delicate balance as all available methods of control have potential adverse implications for the integrity of ecosystems if not well handled. Consistent with international best practices, the Strategy will adopt the ecosystem approach principle (as defined by the CBD COP 6, 2002). The principle is based on the application of appropriate scientific methodologies focused on levels of biological organization which encompass the essential processes, functions and interactions among organisms and their environment. Accordingly, adoption of the ecosystem approach entails consideration of the following guidelines or processes:

i) Maintenance of healthy ecosystems because they are more resilient to invasive species;

ii) Prevention or minimization of disturbances in any and use activities

iii) Rehabilitation of disturbed areas and degraded ecosystems and landscapes

iv) Handle ecosystems and landscapes as individual entities and determine the appropriate control and management approaches, with priority actions based on the knowledge of target invasive species

v) Other ecosystem and landscape values shall be considered when managing invasive species. Such values include water quality, nesting and breeding sites, and even invertebrate food sources including potential disruption of food webs

Besides the ecosystem management principles, this strategy embraces other principles in ensuring effective and ecologically responsive management of invasive plant species, as follows:

a) Priority to safety consideration

b) Improved internal coordination, integration and efficiency

c) Engagement and communication with a wide variety of stakeholders to increase collaboration across ecosystems and landscapes

d) Operating adaptively and at multiple scales and levels, both internally and externally.

1.6 Strategy Formulation Process

The formulation of this strategy and action plan was undertaken through a combination of scientific survey and stakeholder consultations and expert analysis in iterative process summarized in Figure 1.

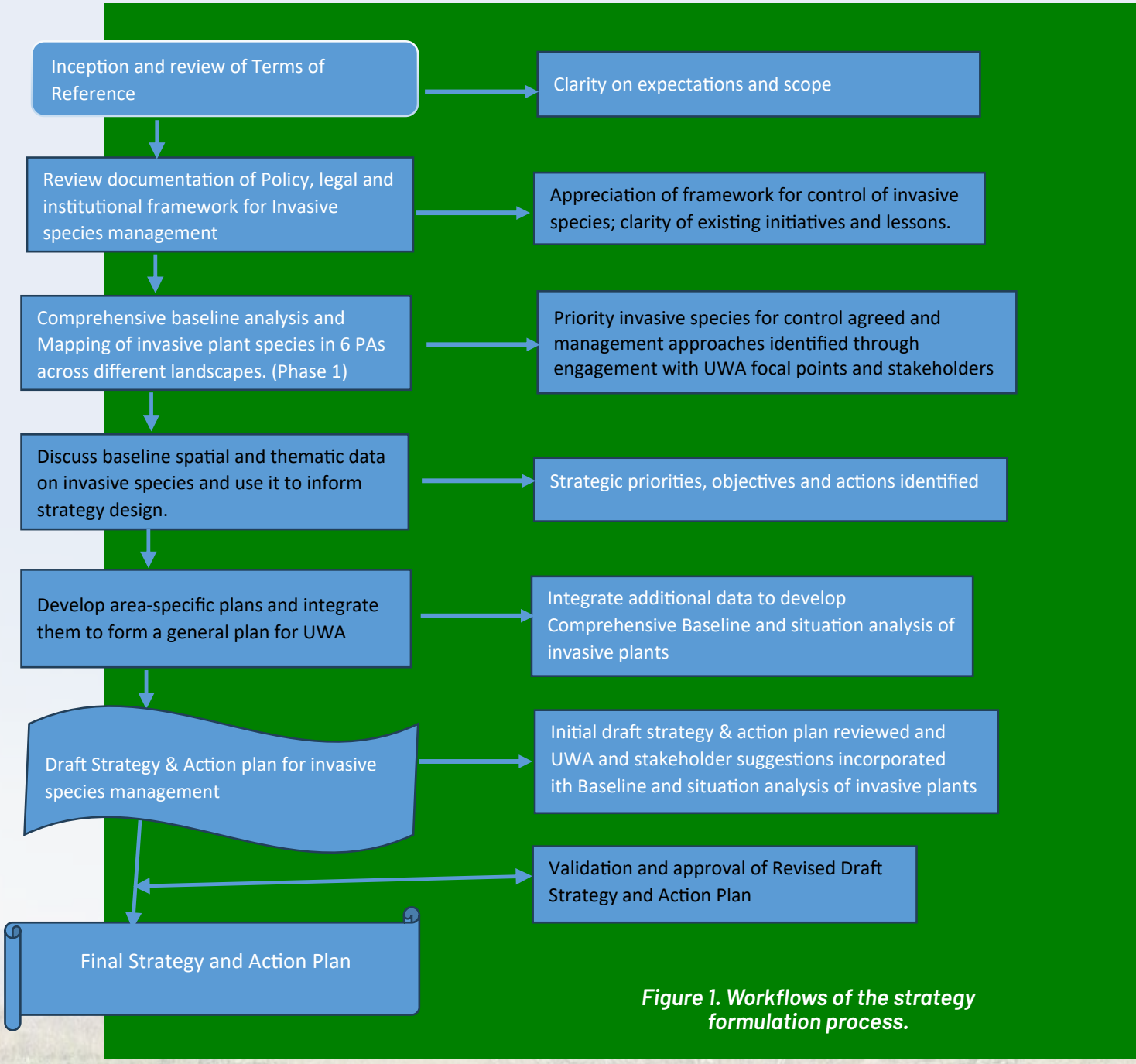

Figure 1. Workflows of the strategy formulation process.

Dichrostachys cinerea invaded woodland in Matheniko-Bokora Wildlife Reserve

2.0 Situation Analysis and Baseline Inventory of Invasive Species in Uganda's Protected Area System

2.1 Major Invasive Plant Species Found in PAs and Extent of Coverage

Twenty-two (22) invasive plant species were identified in a detailed survey of six Protected Areas (Kidepo Valley National Park, Matheniko-Bokora Wildlife Reserve, Pian Upe Wildlife Reserve, Mt Elgon National Park; Lake Mburo National Park and Kabwoya Wildlife Reserve). The species include ten woody types: *Acacia drepanolobium, A. hockii, A. mearnsii, A. mellifera, A. polyacantha, A. senegal, A. seyal var. fistula, Dichrostachys cinerea, Harrisonia abyssinica and Lantana camara.* There are six shrubs: *Hibiscus cannabinus, Indigofera arrecta, Senna alata, Senna occidentalis, Solanum campylacanthum and Tithonia diversifolia.* In addition there also are six herbaceous species: *Cuscuta sp., Crotalaria incana, Imperata cylindrica, Parthenium hysterophorus, Sporobolus pyramidalis and Tagetes minuta* (Plate 1). With the exception of *Acacia mearnsii,* which is alien and naturalized, all species encountered are native to the country and the PAs where they are located. Though native, 15 of the species have become invasive in being prolific woody invaders and thicket formers, and seven are sub shrubs and herbaceous colonizers.

The highest number of invasive species were found in Lake Mburo National Park (LMNP) and Pian Upe Wildlife Reserve (PUWR) with 10 and 8 species respectively. Mount Elgon National Park was recorded with four species, Kidepo Valley National Park with three and Matheniko-Bokora Wildlife Reserve had only two. The most common species was *Dichrostachys cinerea,* occurring in four PAs (KVNP, MBWR, PUWR, LMNP) and *Lantana camara* occurring in three PAs (PUWR, MENP, LMNP). Ten species were recorded as invasive only once, i.e. each from only one PA, and four species occurred as invasive each from two PAs. Table 2.1 presents a summary of the encountered species and their distribution in Uganda.

Within the particular PAs, the most vulnerable areas to these invasive plant species are grasslands through which *Harrisonia abyssinica, Acacia drepanolobium, Dichrostachys cinerea* and *Lantana camara* occupy about 16.22 %, 9.78 %, 9.41 % and 0.85 % of grasslands respectively in Pian Upe Wildlife Reserve (Fig. 2.1). In Kidepo Valley National Park, the areas mostly vulnerable to *Dichrostachys cinerea* and *Harrisonia abyssinica* are the savannah grasslands by which they occupy 5.02% and 4.6% of the grasslands respectively (Fig. 2.2). In Lake Mburo National Park, areas mostly vulnerable to these invasive plant species are woodlands whereby *Acacia hockii, Dichrostachys cinerea, Lantana camara* and *Acacia polyacantha* occupy about 19.68 %, 16.63 %, 6.34 % and 0.44 % of the woodlands respectively (Fig. 2.3). In Matheniko-Bokora Wildlife Reserve, the most vulnerable areas to *Acacia mellifera* and *Dichrostachys cinerea* are grasslands within the Wildlife Reserve whereby *Acacia mellifera* and *Dichrostachys cinerea* occupy about 20.96 % and 17.05 % of the grasslands respectively (Fig. 2.4). In Kabwoya Wildlife Reserve, the most vulnerable areas to these invasive plant species are grasslands through which *Solanum campylacanthum, Harrisonia abyssinica, Acacia senegalensis, Dichrostachys cinerea* and *Hibiscus cannabinus* respectively cover about 68.41 %, 25.83 %, 25.83 %, 25.20 % and 2.21 % of grasslands (Fig. 2.5). This highlights the need for specific attention to these areas in all plans to eradicate these invasive species before they invade other parts of the PAs. In the mountain ecosystems (mostly Mt. Elgon National Park), the most vulnerable areas are forested areas in which both *Lantana camara* and *Cuscuta sp.* occupy about 0.58 % and 0.58 % of the forests respectively (Fig. 2.6). Thus, the need to develop a management strategy to control the invasion of the above invasive species before they expand.

Table 2.1: Invasive species, their location in the PA System and extent of the problem in Uganda

Species	Common names	Description and Distribution in Uganda	Protected Area Affected	Observed & potential impact
Acacia drepanolobium New name: ***Vachellia drepanolobium*** (Harms ex Y.Sjöstedt) P.J.H.Hurter	Whistling thorn, Ant-galled acacia	Shrub or tree, 1-5 m high Karamoja, Mbale, Teso, Acholi, Madi, West Nile, Bunyoro	PUWR	Thicket forming
Acacia hockii New name: ***Vachellia hockii*** (De Wild.) Seigler & Ebinger	White thorn acacia Ekisim (Ateso), Kasaana (Luganda), Ali (Lugbara), Besabako (Lugwe), Musiono (Lugwere), Achiru (Luo), Oli (Madi), Rugando (Runyankore), Mugando (Rutoro), Delya (Sebei)	Shrub or tree, 2-6 m high Drier areas of Mbarara and Luwero Districts and in North Eastern region, usually associated with Combretum, other Acacia and Commiphora species. Widespread.	LMNP	Thicket forming
Acacia mearnsii De Wild.	Black wattle	Tree, 2-15 m high Ankole, Kigezi: Mt. Mgahinga	MENP, PUWR	Habitat degradation - too much litter, in MENP; Thicket forming in PUWR (saplings seen).
Acacia mellifera New name: ***Senegalia mellifera*** (Vahl) Seigler & Ebinger	Hook-thorn acacia, Wait-a-bit thorn Eregai/Ebenyo (Ateso), Magokwe (Lugishu)	Shrub or tree, 1-6 m high Found in Karamoja, Mbale and Acholi.	MBWR, PUWR	Thicket forming
Acacia polyacantha New name: ***Senegalia polyacantha*** (Willd.) Seigler & Ebinger	Falcon's claw acacia	Tree, up to 21 m high Widespread	LMNP	Creating woodland
Acacia Senegal New name: ***Senegalia senegal*** (L.) Britton (Acacia senegal)	Sudan gum arabic, three-thorned acacia Ekodokodwo/Ekonoit (Ateso), Bina (Lugbara), Lakido/Achika/Alal/ Okutokech	Shrub or tree, up to 12 m high Widespread	KWR	Thicket forming
Acacia seyal var. *fistula* New name: ***Vachellia seyal*** var. ***fistula*** (Schweinf.) Kyal. & Boatwr.	White thorn, White-galled acacia, White whistling thorn	Small tree, up to 9 m high Karamoja, Teso, Mengo	PUWR	Thicket forming
Cuscuta sp.	Doddler	Twining rootless herb with yellow leafless stems Becoming widespread in urban areas but the current distribution is not documented	MENP	Parasitic
Crotalaria incana L.	Akasambandege (Luganda), Ekijegajege (Rutoro), Nyakijugo/ Ekijugo (Runyankore)	Branched woody herb, up to 1.2 m high Widespread	LMNP	Colonising

Species	Common names	Description and Distribution in Uganda	Protected Area Affected	Observed & potential impact
Dichrostachys cinerea (L.) Wight & Arn.	Sickle bush	Shrub or tree, 1-8 m high Widespread	KVNP, MBWR, PUWR, LMNP	Thicket forming
Harrisonia abyssinica Oliv.		Shrub or tree, 1-13 m high Widespread	KVNP, PUWR	Thicket forming
Hibiscus cannabinus L.	Lubeera (Luganda), Eteke (Rutoro), Malakwang (Langi), Emalakwang (Ateso), Orubeeru (Runyankore), Orugwena (Rukiga)	Woody herb, up to 1.5 m high Widespread	KWR	Colonising
Imperata cylindrica (L.) Raeusch.	Spear grass, sword grass Ebiat (Ateso), Lusenke (Luganda), Lubembe (Lusoga), Omushojwa (Rukiga), Omushojwe (Runyankore)	Grass Widespread	PUWR, MENP	Colonising
Indigofera arrecta Hochst.	African indigo Kabamba maliba (Luganda), Omusororo (Rutooro, Runyoro), Omusoorooza (Runyankore, Rukiga)	Herb or small shrub up to 2 m high Widespread	LMNP	Bush forming
Lantana camara L.	Lantana, Curse of India Akayuukiyuuki (Luganda), Abelwinyo (Lango, Acholi), Omuhuuki (Runyankore, Rukiga), Omushekyera (Runyankore)	Shrub, up to 2.4 m high Widespread	PUWR, MENP, LMNP	Thicket forming
Parthenium hysterophorus L.	Congress weed, Carrot weed, Bitter weed, Santa Maria	Annual herb, up to 1 m high Becoming widespread but the current distribution is not documented	LMNP	Colonising
Senna alata (L.) Roxb.	Candle bush	Shrub, 3-4 m high Widespread	KWR	(Need monitoring)
Senna occidentalis (L.) Link	Coffee sena, Septic weed	Shrub, 1-2 m high Widespread	KWR	(Need monitoring)
Solanum campylacanthum Hochst. ex A. Rich.	Bitter apple, Sodom apple Entengotengo (Luganda), Orugusuru (Rutoro, Runyoro), Ocokocok (Langi, Acholi), Etulel (Ateso), Ekitobotobo (Runyankore, Rukiga), Ekikokwa (Runyankore)	Shrub, up to 1.8 m high Widespread	KVNP, PUWR, LMNP	(Need monitoring)
Sporobolus pyramidalis P. Beauv.	Pyramidal spore grass Egromoit (Ateso), Nakaselye (Lusoga), Kasibante (Luganda)	Tough tussocky perennial grass, 60 cm – 1 m high Widespread	LMNP	Colonising
Tagetes minuta L.	Mexican marigold Omubazi gwemhazi (Rukiga), Kawunyira (Luganda)	Stiff herb, up to 45 cm high Widespread	LMNP	Colonising
Tithonia diversifolia (Hemsl.) A. Gray	Mexican sunflower, Japanese sunflower, Tree marigold	Woody shrub, 2-3 m high Widespread	MENP	Colonising

Source: Field Reports, 2024.

Plate 1. Photo-illustration of the invasive species that were encountered in the six PAs.

Vachellia drepanolobium (Acacia drepanolobium)

Vachellia hockii (Acacia hockii)

Acacia mearnsii

Senegalia polyacantha (Acacia polyacantha)

Senegalia mellifera (Acacia mellifera)

Senegalia senegal (Acacia senegal)

Vachellia seyal var. fistula (Acacia seyal var. fistula)

Crotalaria incana

Cuscuta sp.

Imperata cylindrica

Dichrostachys cinerea

Harrisonia abyssinica

Indigofera arrecta

Tithonia diversifolia

Lantana camara

Solanum campylacanthum

Hibiscus cannabinus

Parthenium hysterophorus

Senna alata

Sporobolus pyramidalis

Tagetes minuta

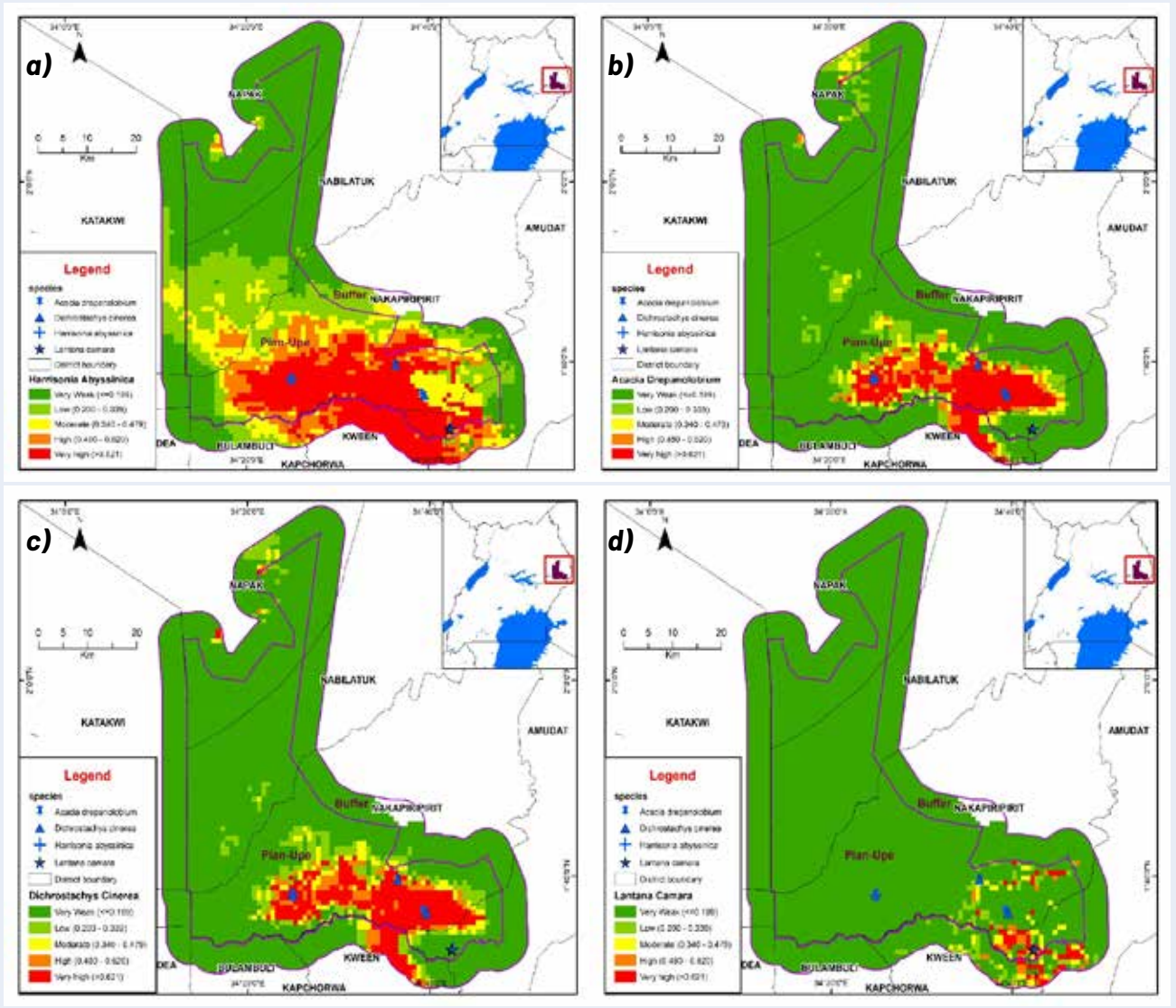

Figure 2.1 Current distribution of *Harrisonia abyssinica (a), Acacia drepanolobium (b), Dichrostachys cinerea (c),* and *Lantana camara (d)* in Pian Upe Wildlife Reserve

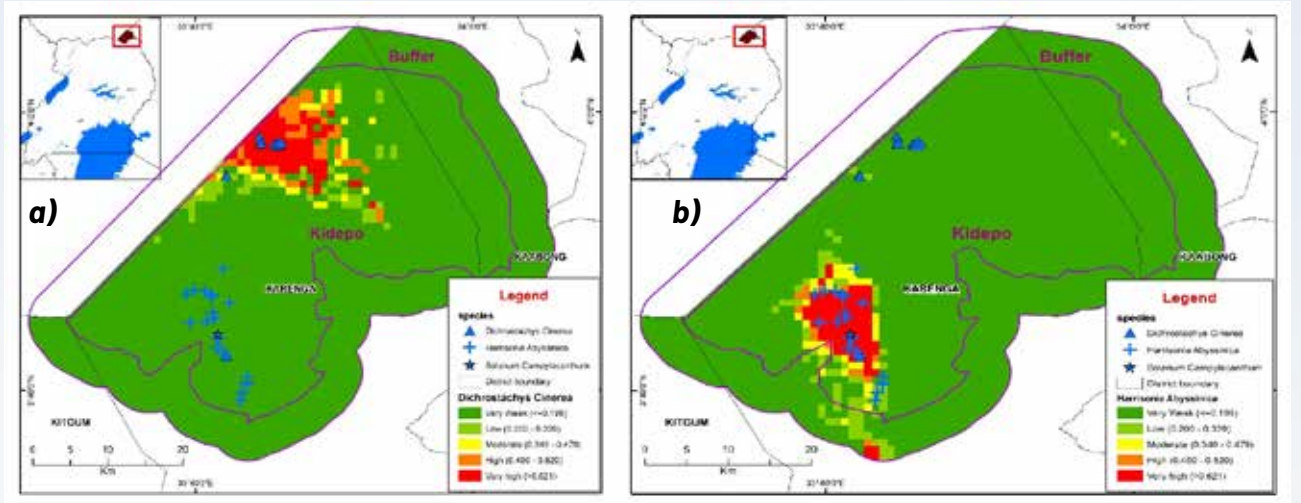

Figure 2.2 Current distribution of *Dichrostachys cinerea (a)* and *Harrisonia abyssinica* (b) in Kidepo National Park

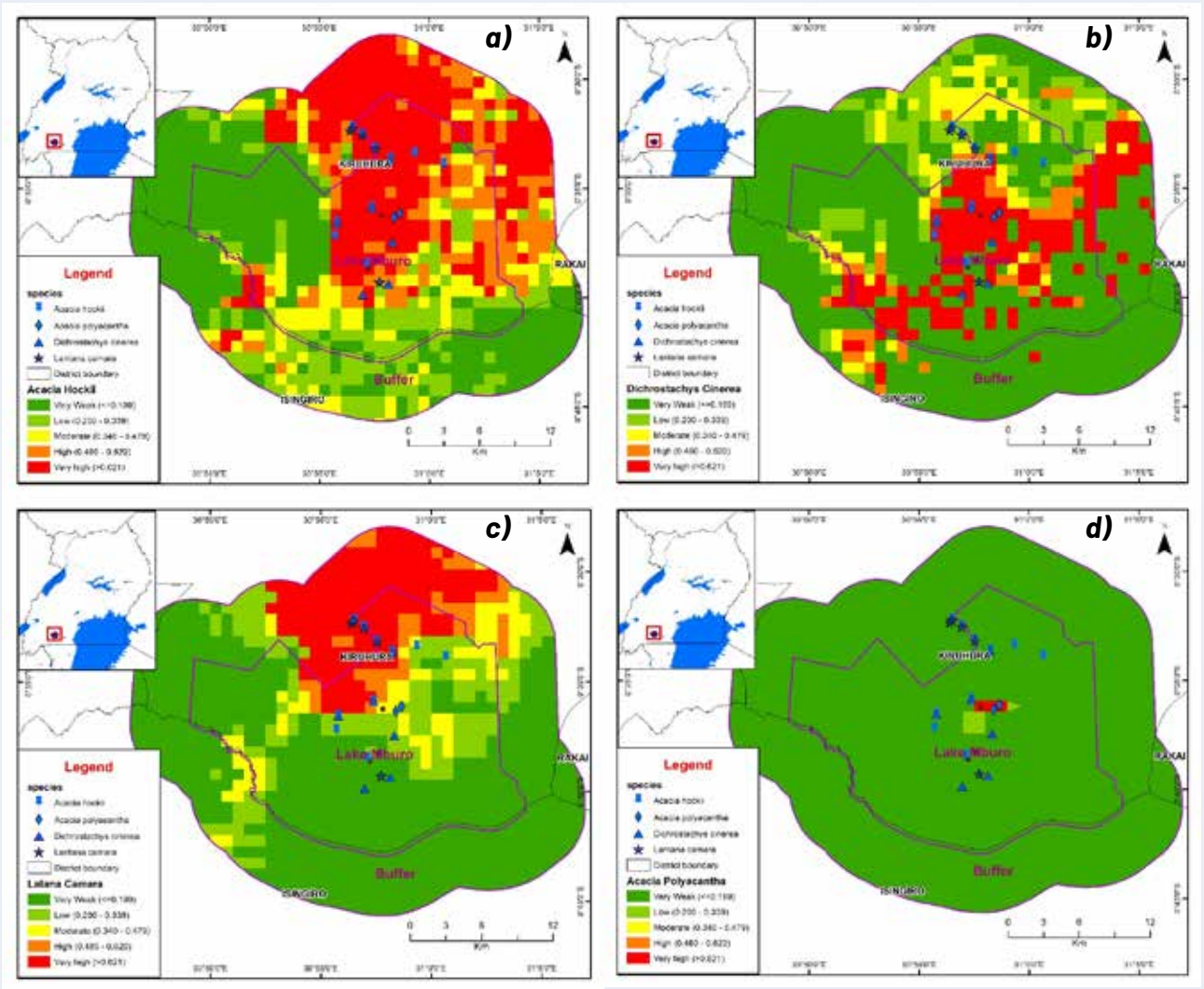

Figure 2.3 Current distribution of *Acacia hockii (a), Dichrostachys cinerea (b), Lantana camara (c)* and *Acacia polyacantha (d)* in Lake Mburo National Park

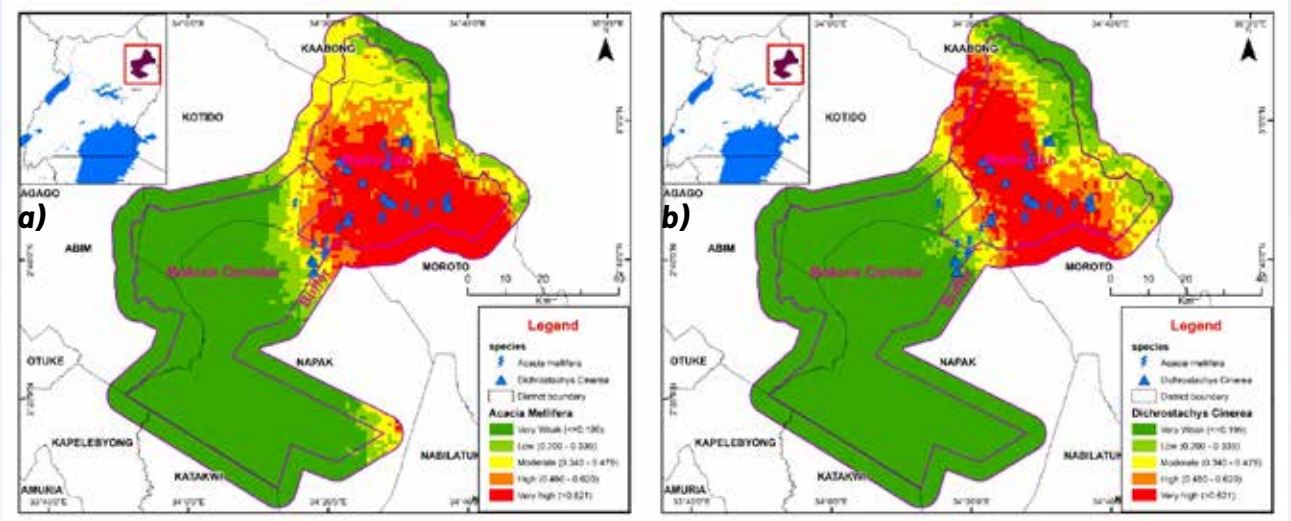

Figure 2.4 Current distribution of *Acacia mellifera (a) and Dichrostachys cinerea (b)* in Matheniko-Bokora Wildlife Reserve

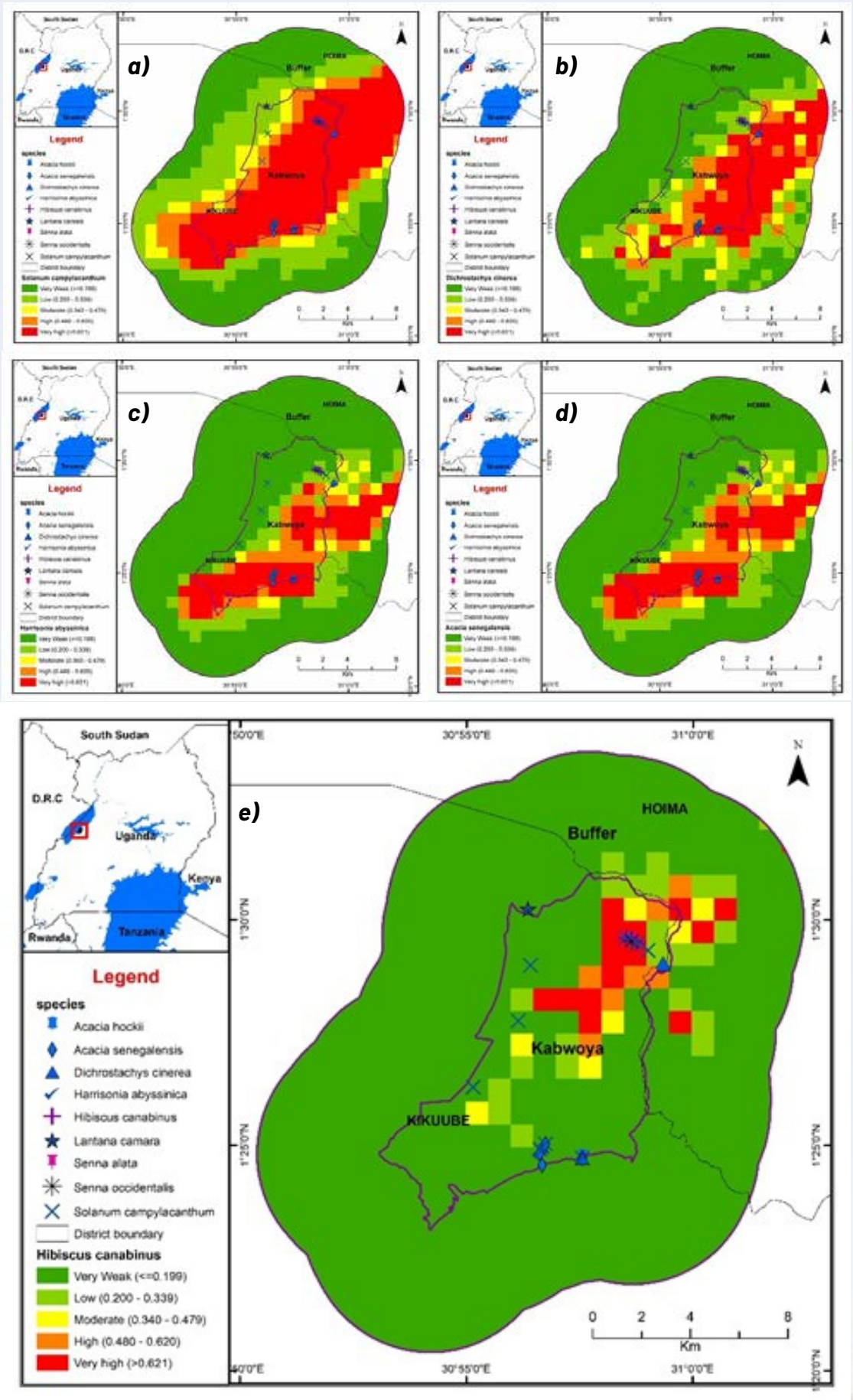

Figure 2.5 Current distribution of *Solanum campylacanthum (a), Dichrostachys cinerea (b), Harrisonia abyssinica (c), Acacia senegalensis (d)* and *Hibiscus canabinus (e)* in Kabwoya Wildlife Reserve

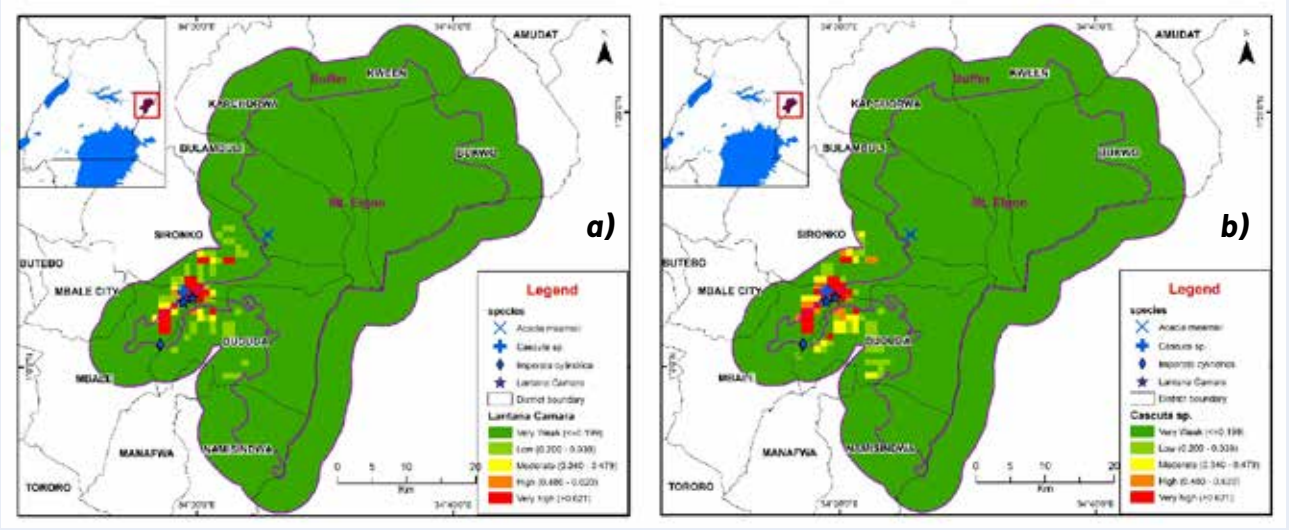

Figure 2.6 Current distribution of *Lantana Camara (a)* and *Cuscuta sp. (b)* in Mt. Elgon National Park

2.2 Drivers of Invasive Species in Selected Protected Areas

According to the DPSIR framework (Driving Forces-Pressures-State-Impacts-Responses), a driver is defined as the social, demographic, and economic developments which influence the human activities that have a direct impact on the environment. The main drivers of biological invasions in Uganda's protected area systems, particularly invasive plant species, are mostly human induced and similar, only varying in extent in different PAs. These are:

1. ***Wildfires***: While fire is an important ecological management tool and an instrument for controlling invasives, wildfires in many PAs have been a major cause of emergence and scalation of invasive plant species. While wild fires are caused by external illegal activities such as by illegal hunters, there are legal fires used as ecological management instruments that often may go out of hand. Fire suppression and over grazing is known to degrade grasslands by promoting invasion by woody species (Auken, 2009; Archer et. al. 2017), and fires have been known to enhance the spread of I. Cylindrica. This threat raises the need to revisit existing management procedures, especially in the wake of intensifying climate change threats which has changed the conditions for protected ecosystems management. Field findings reveal that fires are often It underscores the need for prescribed fires to be planned more effectively to manage and preserve the grasslands in PAs as a way of preventing such invasions and sustaining forage and habitats. It was observed, for instance, that burning of mature D. cinerea plants kills the shoots only and regeneration occurs from the roots. Therefore, effective fire management would be before the plants reach maturity, but the frequency of the fires should be determined after experimental research.

2. ***Grazing Livestock***: Uncontrolled livestock grazing in PAs is a common phenomenon all PAs especially in the Karamoja region. Pastoralists not only bring in herds that alter the ecological balance by overgrazing (and browsing on specific species) but also help to disperse seeds of invasive species. Pastoralists invasion of PAs also come with other human activities such as illegal hunting, cutting down trees and even mining. These further create conditions for invasives to colonise the area.

3. ***Wind dispersals***: Strong winds in PAs like Matheniko-Bokora Wildlife Reserve, were found to be a key dispersal agent of invasives with light seeds such as A. mellifera.

4. ***Climate change***: the changing climate conditions has resulted in alternation of ecological dynamics, and a surge in invasives, with more aggressive species taking the space of others, with subsequent change in species composition and distribution.

Changes in temperature and precipitation has also catalysed other drivers such as increased incidence and extent of wildfires, increased human and domestic livestock improvements into the protected areas, which have further escalated dispersal of species known to be invasive. Indeed, across all PAs, invasion/encroachment by woody species is largely attributable to the changing climatic conditions, which tends to be compounded by fire suppression and over grazing.

5. ***Unregulated human movements within the PAs***: This is especially the case with humans that frequently collect resources from the park. In the Karamoja region (KVNP, MBWR and PUWR), warriors frequently move through the park (hiding in the thickets) as they plan raids. Through this process, they disperse seeds of invasive plants.

6. ***Water***: Flood water carry seeds of invasive plant species from some areas. This explains the persistent invasive species in PA water bodies (such as they Water hyacinth in Lake Mburo National Park (LMNP). Erosion caused by run-off water exposes roots which then sprout.

7. ***Presence of invasive species in neighbouring communities***: Some species were found to spread from park boundaries, often as a result of human activities in riparian communities. Some species are deliberately introduced by local communities which then find their way into the protected areas. The risk is exacerbated by absence of functioning buffer zones which would protect sensitive ecosystems from potentially dangerous biological invasions.

8. ***Tourism and Recreation***: Increased tourism and recreation activities in protected areas can lead to the introduction of invasive species through human movement, vehicles, and equipment.

9. ***Lack of effective management and regulation***: Inadequate management and regulation of protected areas, including insufficient resources, capacity, and enforcement, can contribute to the introduction and spread of invasive species. This was the case in MBWR and LMNP.

2.3 Implications of Biological Invasive on Conservation and Management of Uganda's Protected Area Ecosystems

The nature of invasions is such that external and local drivers tend to reinforce each other i.e. species that are evolve to be invasive by climate change or are transported from elsewhere by humans, tend to spread within the new territory by animal dispersals. It is also observed that whereas some PAs have uniform stands of invasive species (e.g. KVNP, MBWR), others have mixed communities of invasive/encroaching species (e.g. PUWR, LMNP). Management of these species is harder where communities are mixed because these species respond differently to disturbance (deliberate management actions) and they also have different regeneration rates. Therefore, species focused management would yield better results in such habitats and is therefore recommended.

Invasive plant species have varied but significant impacts on biodiversity, wildlife and protected areas systems. For Uganda's PA systems, invasive plant species are particularly problematic because of the following the following are particularly outstanding and need serious attention:

i) ***Loss of habitat and feed resources for wildlife, which affects wildlife populations and dependent systems. Declining availability of feed for grazers and browsers has particularly affected wildlife tourism as this also makes sights of carnivores (especially the big cats) rare and the parks unattractive.***

ii) ***Reduced level of aesthetic value***: invasive plant species tend to create crowns of bushes and uniform pure stands of woody biomass or shrub that alter species and structural diversity which disfigures the aesthetic views and, consequently, the value of the landscape. This affects landscape tourism.

iii) ***Biodiversity loss and threats to ecosystem services***: invasive species displace exiting species, and disrupt ecosystem equilibrium, resulting in reduced species diversity in the affected habitats and the landscape. **and prevent recruitment of native species due to competition for light, nutrients, and/or moisture.**

iv) Reduced ecosystem services, particularly regulating functions of nutrient recycling, hydrology moderation, pollination, carbon sequestration and micro-climate moderation.

2.4 Policy, Legal and Institutional Framework

The policy context of invasive species management spans international and national policy frameworks. The *international framework* for invasive plant species management is defined by the 1992 Convention on Biological Diversity (CBD) to which Uganda is a signatory and has been is still committed to. Article 8(h) obliges parties to "prevent the introduction of, control or eradicate those alien species which threaten ecosystems, habitats or species." Aichi Biodiversity target 9 of the revised global Strategic Plan for Biodiversity (2010-2020) requires that 'by 2020, invasive alien species and pathways are identified and prioritized, priority species are controlled or eradicated, and measures are in place to manage pathways to prevent their introduction and establishment' (CBD, 2020). Towards this end, the GoU has undertaken a number of actions, including formulation of Management strategies and action plans to control most threatening invasive alien species. Uganda has implemented National Biodiversity Strategy and Action Plans since 1996, and invasive species have been given prominence in NBSAP II (2015-2025). Nonetheless, little has been done even as NBSAP II comes to an end due to inadequate financing.

At *national level*, the control invasive alien species is one of the 10 priority areas of the National Biodiversity Strategy and Action Plan (NBSAP), a 10-year plan (2015-2025) implemented to restore and sustainably manage ecosystems and biodiversity resources therein. Indeed, according to NEMA (2019), Uganda developed a National Invasive Species Strategy and Action Plan (NISSAP) between 2008 and 2012. Uganda's NISSAP aims to minimize the impact of invasive species on aquatic and terrestrial ecosystems, and for improved livelihoods, poverty reduction and sustainable economic development. Its specific objectives are: (i) to increase awareness about IAS as a major issue affecting Uganda's socioeconomic development; (ii) introduce strategies to prevent the introduction of IAS a priority issue requiring national action; (iii) ensure that intentional introductions, including those for biological control purposes, are properly evaluated in advance with full regard to their potential impacts on the environment and economic development; (iv) develop and implement eradication and control programmes for invasive species; (v) facilitate necessary research and introduce communication strategies to enhance Uganda's knowledge base in order to address the problem of invasive species; and (vi) development of a comprehensive framework for national legislation and international cooperation for IAS management.

2.5 Stakeholder Analysis and Roles

There is growing interest in biological resources as awareness and appreciation of the value of biodiversity increases in Uganda. The management of ecosystems and biodiversity is also scattered across different organisations and agencies, and are governed under different legislative instruments. There is no specific legislation or designated institution for management of invasive species. Stakeholders in the management of invasive species are therefore wide and varied across different sectors, institutions and agencies. Besides, Uganda's position as one of the most biologically diverse countries make invasive species management a specific issue of interest for trans-national and global economic, social, cultural, environmental and scientific interest groups. This strategy and implementation framework recognizes various stakeholders. It encourages and provides a framework for all stakeholders to participate and cooperate for its effective implementation. Accordingly, there is adequate space for national authorities and agencies (various ministries, NEMA, NARO, etc.), Universities and research institutions, Local Governments, NGOs, donors, regional/trans-boundary ecosystem management agencies, etc., to actively participate and complement the efforts of UWA. Theres is scope in resource mobilization, research and knowledge development, capacity building, knowledge development, information dissemination and advocacy around invasive plant species management.

2.6 Current Management Responses and Effectiveness

Although UWA recognized the challenge of invasive species and outlined several control measures, little has been done to effectively eliminate or reduce invasives. Currently, a number of measures are employed or have been proposed to control the invasive species, albeit at small scale. Key of the initiatives undertaken across the PAs are:

1) ***Mechanical uprooting***: This task involves physical uprooting of the plants using local man power. The challenge with this is that it is slow, time consuming and limited in scope and hence inefficient. It's also expensive as it requires human labour to be imported from more distant villages. In these circumstances, the approach spreads seed and pieces of root which eventually sprout, giving rise to new individuals. Mechanical uprooting is reported to have been fairly successful in reducing the spread of for Acacia hockii and the thicket forming species but unsuccessful for L. camara. Investment needs to be focused on regularly planned uprooting programs spanning a period of several years to avoid re-establishment of the uprooted species.

Although mechanical removal is suitable for perennial plants (such as species with large woody biomass, the approach would be less effective to perennial plants which tend to flower multiple times during their growing seasons. Timing is also critical, as the seeds may sprout if the plants are uprooted after flowering, yet inadequate budgets mean activities are undertaken when funds are available rather than when it is the right time. This inevitably means that the activity has to be repeated several times (and seasons) until the seeds are exhausted from the soil. The main challenge with this approach is that the machinery can be damaging to sensitive ecosystems as plants must be mowed by uprooting them. The approach does not discriminate and there it's difficult to target specific plants without affecting other species. Shrubs are usually the most affected plants in this respect.

2) ***Chemical treatment*** essentially involves use of herbicides. This has been used where salt is applied after cutting the trees. This, however, did not prove to be successful. A key lesson is that herbicides may be effective in controlling resprouting or totally destroy remnants of invasive plant species when they are applied in combination with other techniques..

3) ***Cultural method***: This relates to altering the structure of conditions that favour the invasive species. Cultural control of invasive species describes changes to the structure or nutrient availability of a site to create conditions that do not favor invasive plants. This form of control includes:

- ***minimising the edge habitats that are prone to invasion (through proper buffer zone management),***
- ***amending soil to tie up excess nutrients, or, for example, removing multiflora rose from a habitat as a way of preventing it from serving as a ladder for vines,***
- ***replanting with various desirable species which can shade out invasive species.***

When natural vegetation or soil is disturbed, cultural control can be an effective tool in invasive plant management.

4) ***Manual control measures involved*** hand-pulling or digging. Manual control works well for dealing with single plants or small infestations that can be eradicated with a small amount of labour. This will be most effective in areas that have recently been colonised when they invasive plants are still young and shallow-rooted, and the soils are loose and moist. It is certainly not effective with plants that propagate by roots and rhizomes. In this situation, hand-pulling or digging may actually escalate rather than control the invasion. In difficult terrains and ecologically sensitive systems (where of course there is no danger of wildlife attacks to humans), manual control approach could be deployed especially if the affected area targeted is small (e.g. isolated invasives in small patches of an ecosystem) and the soils are moist and loose.

It will not work if deployed over a large area as its labour intensive. Timing will be critical as plants have to be uprooted when young before flowering sets in. Extreme care and strict supervision will have to be undertaken when deploying external personnel, as the activity relies on casual labours from the community who, through movements in and out of the PA, carry the risk of being dispersal agents for target species and possibly new ones.

5) ***Biological control***: One of the factors driving invasive plant species is the absence of or disappearance of living organisms (worms, insects, birds, rodents, grazers and browsers) to keep them controlled under certain conditions that maintain the ecological balance with other species. Biological control

techniques involve use of living organisms to reduce seed production and dispersal or/ and growth vigor of an invasive plant species which ultimately reduces their aggressiveness and competitive ability. In many PAs, some species became invasive when the animal populations that kept them under check declined (due to hunting and other human induced activities), while others emerged when growth of certain other species was suffocated as a result of degradation (now increasingly fuelled by climate change).

Biological control is a long-term approach as its results will often take long to be realised after the control agents have been established. It usually works best on a large affected area. Some cases may require a single biological control agent while in most cases, it takes multiple agents to effectively control an invasive plant species. The agents work indirectly by slowing down the growth vigour and seed production of the invasive plant species. It is recommended to be sued in combination with other techniques to optimise the results.

2.7 Potential Threats and Justifications for Interventions

Invasive plant species pause a threat to Uganda's natural heritage of biodiversity, most of which is now concentrated in the wildlife protected areas that are comparatively more pristine. In some PAs notably parts of KVNP and much of LMNP, large sections of grasslands are turning into woodlands tending to near pure stands of Acacia. Meanwhile, a large section of grasslands in QENP has been colonised by the Lantana Camara shrubs, which formed thickets that not only reduced grazing and browsing resources for large herbivores, the thickets obstruct the hunting opportunities for large carnivores. The implication is reduced wildlife presence in the tourism trails and poor economic output due to reduced tourist visits. The intensification of climate change will drive invasive species spread and escalate biodiversity losses. Conducting patrols and working within some PAs with underdeveloped infrastructure (e.g. the expansive Bokora-Matheniko Wildlife Reserve) is difficult because of lack of a reliable road network.

Despite the threats, little is currently being undertaken in most PAs to manage the invasive species, due to inadequate funding. The Invasive species monitoring and management initiatives are further constrained by poor accessibility in many PAs where the road network remains poor.

Dichrostachys cinerea

Wildlife Protected Areas in Uganda

Source: CRA Team

3.0 Strategy and Action Plan

3.1 Vision

The **vision** of UWA for invasive plant species control is *"Uganda's Protected Areas with healthy ecosystems that are free from negative impacts of biological invasions.*

3.2 Mission

To promote ecologically sound management of invasive plant species in Uganda's Protected Areas through establishing an efficient institutional framework that proactively acts through early detection, rapid response to effectively remove invasive species where they exist, prevention of spread by suppressing them to levels where they are no longer considered invasive, promotes the restoration of ecosystems, and reduction of the negative impacts of the invasive species.

Both the Vision and Mission of this plan reinforce the wider mission of UWA i.e. to conserve and sustainably manage wildlife and the protected areas of Uganda in partnership with neighbouring communities and other stakeholders, for the benefit of the people of Uganda and the global community.

3.3 Strategic objectives, targets and actions

The main objective of this strategy and action plan is to control the introduction and spread of invasive plant species within and around Uganda's Wildlife Protected Areas. Under the prevailing circumstances with vast invasion of woody encroachers in several PAs, the main objective will be achieved through the following strategic objectives that focus first on restoring the affected areas, then preventing further spread and new invasions, and finally controlling the conditions that favour invasion and spread.,

Specific Objectives:

Restoration

1) Eliminate invasive species and restore ecosystems to reduce the impacts of invasion.

Prevention

2) Prevent new invasions and manage established ones.

Control

3) Strengthen institutional capacity to manage woody species encroachment and invasion by other species.
4) Collaborate with other agencies and stakeholders to do research and manage invasive plant species.
5) Leverage funding for control and management of invasive plant species in the PAs..

Locally, animal, wind and water dispersal mechanisms were identified as the drivers of spread of invasive plant species in the PAs. However, globally, the key drivers of encroachment of native woody species are already documented as; fire, grazing and climate change. Whereas fire and grazing can be human controlled, we can only adopt strategies that make our ecosystems resilient to effects of climate change. Thus, the strategic objectives and targets given below are cognizant of the need to act in resilience to an unbridled changing environment.

Strategic Objective 1. Eliminate Invasive species and Restore ecosystems to reduce the impacts of invasion

Short-term targets

Target 1.1: Reduce invasive plant species to at least 50 % by 2030 in all PAs with a focus on areas where invasions have exceeded tolerable levels.

Action 1.1.1: Review the invasive plant species cover in all PAs and prioritise areas of focus for elimination, determine approaches for Invasive species removal;

Action 1.1.2: Develop Operational plans for local specific invasive plant species removal;

Action 1.1.3: Develop area specific protocols and guidelines and secure PA and senior level approval

Action 1.1.4: Identify and train teams for invasive plant species removal and review the protocols;

Action 1.1.5: Carry out invasive plant species elimination and integrate the activities within overall PA management plan;

Action 1.1.6: Synchronise removal of Invasive plant species with area-specific ecosystem restoration activities.

Target 1.2 At least 30 % of the encroached ecosystems are restored by 2030

Action 1.2.1 Develop an institutional restoration framework

Action 1.2.2 Develop restoration guidelines for each PA

Action 1.2.3 Build and strengthen capacity of staff in ecosystem restoration procedures

Long-term target

Target 1.3 All restored ecosystems are tended to maturity by 2035

Action 1.3.1 Restored sites are biannually actively managed

Action 1.3.2 Assess the performance of planted material within restored sites biennially

Action 1.3.3 Conduct comparative ecological studies on restored and non-invaded habitats in 2035

Performance Indicators for strategic objective 1:

1. An increase in animal wildlife numbers can be viewed in the restored areas.
2. A decrease in the numbers of wildlife sited outside the PA.
3. A decrease in cases of human-wildlife conflicts.

Strategic Objective 2. Prevent new invasions and manage established ones

It is desirable to prevent further encroachment by not allowing the expansion of the already established thickets, formation of new thickets, nor increase in number of invasive species in a PA from those that are already known. The vegetation in the PAs is potentially not true open grasslands, but grasslands with varying composition of woody species. Most are potentially grasslands with thickets, the thickets being relatively small in diameter and are maintained so by grazing and fire.

Short-term targets

Target 2.1 Extent of undesirable thickets reduced by at least 50 % by 2030

Action 2.1.1 Prioritize thicket forming species in each PA.

Action 2.1.2 Conduct thorough study to map and stratify encroached/ invaded areas into zones of priority for management.

Action 2.1.3 Seek technical know-how from local communities and other countries where thicket invasion has been managed successfully.

Action 2.14 Develop and adopt integrated management techniques including indigenous knowledge and scientifically proved methods.

Target 2.2 New woody encroachments and all emerging invasive species are detected and eradicated by 2030

Action 2.2.1 Develop and implement early detection and rapid response procedures

Action 2.2.2 Develop and implement a surveillance system

Action 2.2.3 Develop and adopt a risk assessment protocol

Action 2.2.4 Popularize lists of invasive and potentially invasive species among staff

Action 2.2.5 Train staff in identification techniques of the invasive and potentially invasive plant species

Action 2.2.6 Publish watch lists of invasive species

Long-term target

Target 2.3 All invasive plant species management efforts within/around UWA-managed PA system are monitored and evaluated by 2035

The Challenge: Whereas most PAs have well planned road and track systems, many of the tracks are not regularly maintained and are thus difficult to navigate through especially in the rainy seasons. On the other hand, some PAs have a few road network systems that are limited to the tourism zones of the PA. This hinders access to many areas that may need surveillance, managing and monitoring.

Action 2.3.1 Develop and adopt an invasive plant species monitoring plan

Action 2.3.2 Develop and implement an institutional invasive plant species management monitoring and evaluation framework

Action 2.3.3 Plan and develop physical infrastructure within relevant PAs in order to aid the management and monitoring activities

Performance Indicators for strategic objective 2:

1. Decrease in extent of areas covered in thickets.

Strategic Objective 3. Strengthen institutional capacity to manage woody species encroachment and invasion by other species

This involves developing the institutional capacity of UWA and riparian communities to undertake early detection and effective response to threats of invasive plant species in/and around PAs in order to reduce their potential adverse effects on the ecosystems as well as the social and economic systems that depend on them.

Short-term targets

Target 3.1 All relevant personnel trained in identification and handling of Invasive plant species by 2030.

Action 3.1.1 Develop training programs in detection and control of invasive species, and restoration of ecosystems.

Action 3.1.2 Develop Standard operating Procedures and manuals for invasive species identification and management

Action 3.1.3 Benchmark countries that have had successful eradication of thicket forming species.

Target 3.2 All required equipment and tools for eradication and restoration procedures in place and effectively deployed by 2030

Action 3.2.1 Adopt management technologies that utilize modern equipment that minimize habitat destruction especially during eradication, and generate list of required equipment

Action 3.2.2 Develop and adopt plant sourcing strategies for the restoration exercises, and generate list of required equipment

Action 3.2.3 Identify and procure required equipment and tools (basic and specialized) for ecosystem restoration and monitoring.

Target 3.3 All staff needed to manage the eradication and restoration exercises recruited by 2030

Rapid response requires presence of adequate numbers of personnel thus, enhancement of current staffing levels will be needed.

Action 3.3.1 Conduct a needs assessment to establish sustainable staff numbers that would be responsible for physical activities of invasive species management

Action 3.3.2 Development and approval of new staffing structure to include personnel responsible for conducting physical activities of invasive species management

These staff could be hired on contractual terms, for the duration of this management strategy and action plan.

Long-term targets

Target 3.4 Establish frameworks for coordination and management of invasive species at institutional and PA levels by 2035

Action 3.4.1 Mainstream invasive species management activities across all staff functions and departments in the PAs

Action 3.4.2 Establish an invasive species incident command structure in the PAs

Action 3.4.3 Develop and implement a framework for quarterly reporting on invasive species issues.

Target 3.5: Develop and implement a robust monitoring system for invasive plant species across the entire protected area system by 2035

Action 3.5.1 Document and regularly update information on the distribution and density of invasive species within each protected area and ensure effective and appropriate response;

Action 3.5.2 Recommend the type(s) of control measures that are most appropriate for each invasive species occurrence

Action 3.5.3 Monitor the effectiveness of control efforts and evaluate whether alternate or additional control measures are required to provide effective control of the identified invasive species.

Performance Indicators for strategic objective 3:

1. Number of relevant staff recruited
2. Number of relevant staff trained
3. Equipment purchased
4. Timely quarterly reports received

Strategic Objective 4. Collaborate with other agencies and stakeholders to do research and manage invasive plant species

This involves establishment of effective framework for stakeholder collaboration in research, monitoring and management of invasive plant species, to ensure timely detection, effective response to drivers and threats of invasive plant species.

Short-term targets

Target 4.1 Awareness raised with all relevant agencies and stakeholders by 2030

Action 4.1.1 Identify relevant agencies and stakeholders to collaborate with

Action 4.1.2 Disseminate and popularize lists of invasive species and watch lists among all stakeholders

Target 4.2 Research on invasive species increased by 50 % by 2030

Action 4.2.1 Support research on priority species in the PAs

Action 4.2.2 Build inter-institutional partnerships to conduct collaborative research on invasive species

Action 4.2.3 Develop a data storage and management system

Long-term target

Target 4.3 At least 80 % of stakeholders participating in management of invasive species by 2035

Action 4.3.1 Develop and implement a system for collaboration and coordination among stakeholders

Action 4.3.2 Create messaging platforms on management of invasive species

Action 4.3.3 Recognize participation and exemplary performance in management of invasive species

Action 4.3.4 Mainstream invasive species management into national communication strategy

Action 4.3.5 Monitor and evaluate cross-sectorial collaboration on the invasive species management

Performance Indicators for strategic objective 4:

1. Number of stakeholders involved
2. A growing database on invasive species

Strategic Objective 5. Leverage funding for control and management of invasive plant species in the PAs

This involves mobilizing and ensuring availability of adequate financial resources to facilitate activities for effective control and management of invasive plant species in Uganda's protected area system.

Short-term target

Target: 5.1 Develop a financing plan for the management of encroaching/invasive plant species by 2030

Action 5.1.1 Develop institutional and PA specific budgets for (i) managing invasive plant species and (ii) research on invasive species by 2026

Action 5.1.2 Develop proposals for funding invasive species management activities for respective PAs

Action 5.1.3 Undertake fundraising promotions and expeditions with a broad spectrum of partners (local and international)

Action 5.1.4 Develop fund allocation guidelines for managing invasive species

Performance Indicators for strategic objective 5:

1. Amount of funds secured

Lantana camara

Wooded grassland in KVNP invaded by Harrisonia abyssinica

4.0 Implementation Arrangements

A multi-pronged approach will be used to implement the strategy and action plan. Key of these elements are summarized in the sub-sections hereunder:

4.1 Internal Mechanisms and Resources

Up til now, UWA has operated with a very limited budget for control of invasive species. Nearly all PAs use internal own tools and human resources to undertake routine PA management activities. As expected, these efforts have hardly made any impact. The PA management will leverage existing internal resources and infrastructure to implement the planned activities. See Annex 1 and 2.

4.2 Research Partnerships and collaboration

UWA will partner with academic and research institutions within the country and internationally to undertake extensive research to generate the evidence base needed to support long-term monitoring and effective control of Invasive plant species. Besides Universities, NARO and the Uganda Wildlife Training and Research Institute (UWTRI), strategic partnerships will be supported with NGOS, Consultancy organisations, external Universities and research agencies with long-term interest and experience in biodiversity and invasive species research, and are able to support in resource mobilization, knowledge and skills transfer for long-term invasive species monitoring.

4.3 Community-based initiatives and Engagement

Partnership with community, particularly those neighbouring protected areas, is a key strategy of wildlife management that UWA has embraced and is reflected in its Vision and Corporate identity. UWA will, through this plan, leverage the wealth of ethno-botanical knowledge, cultural and human capital as well as other resources that neighboring communities possess, to effectively manage the challenge of Invasive plant species. The starting point will be to raise awareness of communities of the invasive plant species, the threats they pause; sensitise and train communities on control measures for invasive species control; establish platforms and mechanisms for community-led invasive species control interventions, and monitoring.

4.4 Rehabilitation and Restoration

A key aim of the invasive species control strategy, will be to rehabilitate and restore the ecological integrity of affected habitats upon removal of the invasive plants. The areas from which invasive plants are removed will be replanted with native species, and to the extent possible, to restore the previous biodiversity status. This activity needs to be planned and synchronized with the invasives removal so that there is no gap. Several techniques, including assisted regeneration, will be undertaken in order to facilitate faster recovery and prevention of re-emergence of invasive plant species. As such, efforts to mobilise resources for rehabilitation will have to assure timely availability of corresponding resources to avoid time lags in selection and replanting of appropriate replacement species.

4.5 Investment Requirements and Resource Mobilisation Strategy

4.5.1 Investment costs and broad benefits

An estimated UGX 25.23 billion (approximately US $ 6.82 million), from the conservative low scale scenario will be required to eliminate and sustainably contain the menace of invasive plant species in/ around UWA managed Uganda's protected area system. The costs and distribution are summarized in Table 4.1 hereunder.

Wooded grassland in KVNP invaded by Harrisonia abyssinica

Table 4.1 Summary of costs and distribution

SN	Hierarchy of Results (Outcomes and Corresponding Outputs)	Total (UGX'000)
Outcome 1	**Invasive plant species are controlled and ecosystems restored**	**15,170,000**
Output 1.1	Invasive Plant species are removed in all PAs with a focus on areas where invasions have exceeded tolerable levels.	7116000
Output 1.2	At least 75 % of the encroached ecosystems are restored by 2030	790000
Output 1.3	All restored ecosystems are tended to maturity by 2035	7264000
Outcome 2	**New invasions effectively prevented and established managed to satisfactory levels**	**8,355,400**
Output 2.1:	Extent of undesirable thickets reduced by at least 75 % and suppressed to below invasive levels by 2032	3900000
Output 2.2:	New woody encroachments and all emerging invasive species are detected and eradicated by 2030	225400
Output 2.3:	All invasive plant species management efforts within/around UWA-managed PA system are monitored and evaluated by 2030	230000
Outcome 3:	**Institutional capacity strengthened to effectively manage woody species encroachment and invasion by other species**	**926,000**
Output 3.1:	All staff needed to manage the eradication and restoration exercises recruited by 2027	120000
Output 3.2:	All required equipment & tools for eradication and restoration procedures in place and effectively deployed by 2027	252000
Output 3.3:	All relevant personnel trained in identification and handling of Invasive plant species by 2027.	142000
Output 3.4:	Establish frameworks for coordination and management of invasive species at institutional and PA levels by 2026	252000
Output 3.5:	Robust monitoring system for invasive plant species develop and implemented across the entire UWA-managed PA system	160000
Outcome 4	**Effective mechanisms in place for collaborative research and stakeholder coordination in management of invasive plant species**	**575,5000**
Output 4.1	Awareness raised with all relevant agencies and stakeholders by 202	49500
Output 4.2	Research on invasive species increased by 50 % by 2030	301000
Output 4.3	At least 80 % of stakeholders participating in management of invasive species by 2030	225000
Outcome 5	**Effective Framework in place to mobilise and leverage financing for control and management of invasive plant species in the PAs**	**202,500**
Output 5.1:	Develop a Resource mobilisation and financing plan for the sustainable management of invasive plant species	**202,500**
TOTAL (Outcomes 1+2+3+4+5)		**25,229,400**

As shown in Table 4.1 above, the main cost drivers will be physical activities to remove the invasive plant species (especially clearing the thickets and woodlands) and restoring the ecosystems through reestablishment of appropriate plant species.

4.5.2 Resource Mobilisation Strategy

UWA will require extensive amount of financing for this activity in the short to medium term to undertake the intensive and urgent activity of removing the invasive plant species and restoring the areas degraded by these species. These efforts will be undertaken through:

i) Increments in annual sector budget provisions specifically earmarked for the task of addressing invasive species;

ii) Leveraging additional resources and partnerships with riparian Local Governments and communities.

iii) External financing support through existing and new project financing arrangements.

iv) Leveraging resources from Biodiversity and Climate Finance mechanisms (both in-country) and through global Multilateral Environmental Agreements (Rio MEAs), including under the National Biodiversity Strategy and Action Plan (NBSAP:2015-2025).

5.0 Monitoring, Evaluation and Reporting

5.1 Overall M&E Framework

The planned activities will be implemented and monitored as integral part of the overall UWA PA management and reporting system. It will be aligned with the current UWA Strategy (2020-2025) and will likely reflect priorities for the next Strategic plan. Therefore, the progress monitoring activities will be embedded in the reporting activities strategy and action plan. As such, the proposed action plans and expected outputs will have to be aligned with the Implementation matrix and results framework of the UWA Strategic Plan.

5.2 Indicators, Targets and Reporting

The indicators and performance targets relate to three key areas of performance, viz:

i) Progress on the intervention activities to remove the invasive plants from target areas;

ii) Progress on planned activities to rehabilitate the areas where invasive plants have been removed;

iii) Monitoring of the invasive species to ensure that rehabilitated areas return to their original ecological status and invasive species (both removed and new) do not occur.

The first two sets relate to specific outputs tagged to invasive species management as a special intervention with a separate Strategy and action plan, while the third category relates to outcomes and ensuring sustainable control. This is particularly important to identify new populations of invasive species or re-emergence of previously eliminated ones when the challenge is still small.

A key performance indicator to be monitored will be institutional and specific technical capacity at local PA level to monitor and report any emerging issue with the invasive species.

The indicators and targets outlined in Chapter 3.2 will be translated into results through the implementation plan in Annex 2 (actions with resource requirements) and results management framework (Annex 3).

5.3 Reporting

Although invasive species management is an integral part of the UWA management plan, the urgency and severity of the change has required that a specific strategy and action plan be developed to enable senior management to pay specific attention to addressing the challenge.

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Thicket of Senegalia senegal in KWR

Annexes

Annex 1: Implementation Schedule for Invasive Plant Species Control

HIERARCHY OF RESULTS	ACTIVITY		ANNUAL TARGETS										RESPONSIBLE
		2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	
Outcome 1: Invasive plant species are controlled and ecosystems restored													
Output 1.1: Invasive Plant species are removed in all PAs with a focus on areas where invasions have exceeded tolerable levels.	Review the invasive plant species cover in all PAs and prioritise areas of focus for elimination, determine approaches for Invasive species removal;	X											UWA, NEMA
	Develop Operational plans for local specific invasive plant species removal;	X	X										UWA, NEMA
	Develop area specific protocols and guidelines and secure senior leadership approval at PA and HQ level	X	X										UWA HQ
	Identify and train teams for invasive plant species removal and review the protocols;	X	X										UWA HQ
	Carry out invasive plant species elimination and integrate the activities within overall PA management plan;		X	X	X	X	X						UWA HQ
	Planning activities to synchronise removal of Invasive plant species with area-specific ecosystem restoration activities.		X	X									UWA HQ
Output 1.2: At least 30 % of the encroached ecosystems are restored by 2030	Develop an institutional restoration framework		X	X									UWA HQ
	Develop restoration guidelines for each PA	X	X										
	Organise training and PA specific human resource capacity building activities in ecosystem restoration procedures	X	X	X									UWA HQ
	Procure appropriate equipment & tools for invasive species restoration and monitoring for target PAs (including info resources)	X	X	X									UWA HQ

HIERARCHY OF RESULTS	ACTIVITY		ANNUAL TARGETS										RESPONSIBLE
Output 1.3: All restored ecosystems are tended to maturity by 2035	Implement activities for biannual management of restored sites		X	X	X	X	X	X	X	X	X	X	UWA Hq, PAs
	Carry out biannual progress assessment of planted material within restored sites				X	X	X	X	X	X	X	X	UWA HQ, PAs
	Conduct comparative ecological studies on restored and non-invaded habitats						X	X	X	X	X	X	UWA, NGOs
Outcome 2: New invasions effectively prevented and established managed to satisfactory levels													
Output 2.1: Extent of undesirable thickets reduced by at least 50 % and suppressed to below invasive levels by 2030	Identify and map out vulnerable areas for potential invasions and proritise thicket forming species for control,	X	X										UWA HQ; PAs
	Conduct thorough study to map and stratify encroached/ invaded areas into zones of priority for management.		X										UWA HQ; PAs
	Regular maintenance of vulnerable areas to ensure that undesirable thickets are not established			X	X	X	X						UWA HQ; PAs
	Develop and adopt integrated management techniques including indigenous knowledge and scientifically proved methods.			X	X	X							UWA HQ; PAs
Output 2.2: New woody encroachments and all emerging invasive species are detected and eradicated by 2030 Develop and implement early detection and rapid response procedures					X	X							UWA HQ; PAs
	Develop and implement a surveillance system					X	X						UWA HQ
	Develop and adopt a risk assessment protocol			X	X								UWA, NARO
	Popularize lists of invasive and potentially invasive species among staff		X	X									UWA HQ
	Train staff in identification techniques o invasive and potentially invasive plant species	X	X	X	X								UWA HQ
	Publish watch lists of invasive species	X	X	X									UWA, NEMA, NFA, NARO

HIERARCHY OF RESULTS	ACTIVITY		ANNUAL TARGETS										RESPONSIBLE
Output 2.3: All invasive plant species management efforts within/ around UWA-managed PA system are monitored and evaluated by 2035	Develop and adopt an invasive plant species monitoring plan		X	X	X	X	X						UWA HQ, PAs
	Develop and implement an institutional invasive plant species management monitoring and evaluation framework				X	X	X						UWA HQ, PAs
	Plan and develop physical infrastructure within relevant PAs in order to aid the management and monitoring activities					X	X	X	X	X	X	X	MAAIF
Outcome 3: Institutional capacity strengthened to effectively manage woody species encroachment and invasion by other species													UWA, NEMA, NFA
Output 3.1: All staff needed to manage the eradication and restoration exercises recruited by 2030	Conduct a needs assessment to establish sustainable staff numbers that would be responsible for physical activities of invasive species management	X	X										UWA HQ, PAs
	Development and approval of new staffing structure to include personnel responsible for conducting physical activities of invasive species management	X	X	X									UWA HQ
	Develop and implement a schedule of recruitment of personnel (as per categories of technical/ non-technical; permanent and short term)	X	X	X	X	X							UWA HQ
Output 3.2: All required equipment & tools for eradication and restoration procedures in place and effectively deployed by 2030	Adopt management technologies that utilize modern equipment that minimize habitat destruction especially during eradication, and generate list of required equipment			X	X	X	X						UWA HQ, PAs
	Develop and adopt plant sourcing strategies for the restoration exercises, and generate list of required equipment		X	X	X								UWA HQ, PAs
	Identify and procure required equipment and tools (basic and specialized) for ecosystem restoration and monitoring.		X	X	X								UWA HQ, PAs

HIERARCHY OF RESULTS	ACTIVITY		ANNUAL TARGETS										RESPONSIBLE
Output 3.3: All relevant personnel trained in identification and handling of Invasive plant species by 2030	Develop training programs in detection and control of invasive species, and restoration of ecosystems.		X	X	X								UWA HQ, Universities
	Develop Standard Operating Procedures and manuals for invasive species identification and management		X										UWA HQ, Universities
	Benchmark countries that have successfully eradicated thicket forming invasive plant species.	X	X										UWA HQ
Output 3.4: Establish frameworks for coordination and management of invasive species at institutional and PA levels by 2035	Mainstream invasive species management activities across all staff functions and departments in the PAs			X	X	X	X						UWA HQ
	Establish an invasive species incident command structure in the PAs	X	X										UWA HQ
	Develop and implement a framework for quarterly reporting on invasive species issues.		X	X	X	X	X	X	X	X	X	X	UWA HQ
Output 3.5: Robust monitoring system for invasive plant species developed and implemented across the entire UWA-managed PA system by 2035	Develop capacity to document and regularly update information on the distribution and density of invasive species within each protected area and ensure effective and appropriate response;		X	X	X	X	X	X	X	X	X	X	UWA, NEMA
	Undertake continuous review and recommend the most effective invasive species control measures for each PA and specific species.				X	X	X						UWA HQ, MTWA, UWTRI

HIERARCHY OF RESULTS	ACTIVITY		ANNUAL TARGETS										RESPONSIBLE
Outcome 4: Effective mechanisms in place for collaborative research and stakeholder coordination in management of invasive plant species													
Output 4.1: Awareness raised with all relevant agencies and stakeholders by 2030	Identify relevant agencies and stakeholders to collaborate with	X	X										UWA HQ
	Disseminate and popularize lists of invasive species and watch lists among all stakeholders	X	X	X									UWA HQ
	Organise stakeholder mobilisation and engagement meetings at national, regional and PA (ecosystem) level	X	X	X									UWA HQ, PAs
Output 4.2: Research on invasive species increased by 50 % by 2030	Support research on priority species in the PAs		X	X	X	X	X						UWA HQ, MTWA
	Build inter-institutional partnerships to conduct collaborative research on invasive species		X	X	X	X	X						UWA HQ
	Develop a data storage and management system	X	X										UWA HQ
Output 4.3: At least 80 % of stakeholders participating in management of invasive species by 2035	Develop and implement a system for collaboration and coordination among stakeholders		X	X									UWA HQ
	Develop & operationalise messaging platforms on management of invasive species		X	X	X	X	X	X	X	X	X	X	UWA HQ
	Establish a system of recognising participation and exemplary performance in management of invasive species					X	X	X	X	X	X	X	UWA, MTWA
	Mainstream invasive species management into national communication strategy		X	X	X	X	X						UWA HQ, PAs
	Monitor and evaluate cross-sectoral collaboration on the invasive species management				X	X	X	X	X	X	X	X	PAs

HIERARCHY OF RESULTS	ACTIVITY		ANNUAL TARGETS										RESPONSIBLE
Outcome 5: Effective framework in place to mobilise and leverage financing for management of invasive plant species in the Pas													
Output 5.1: Develop a Resource mobilisation and financing plan for the sustainable management of invasive plant species by 2030	Develop institutional and PA specific budgets for (i) managing invasive plant species and (ii) research on invasive species by 2026	X	X										UWA
	Develop proposals for funding invasive species management activities		X	X	X	X	X						UWA, NARO
	Undertake fundraising promotions and expeditions with a broad spectrum of partners (local and international)		X	X	X	X	X						UWA, MTWA
	Develop fund allocation guidelines for managing invasive species		X										UWA, MTWA

Annex 2: Detailed Cost Estimates for Invasive Plant Species Management Program

Results Hierarchy	Activities	Units	Qty	Rate (UGX'000)	Total (UGX'000)
Outcome 1: Invasive plant species are controlled and ecosystems restored					
Output 1.1: Invasive Plant species are removed in all PAs with a focus on areas where invasions have exceeded tolerable levels.	Review the invasive plant species cover in all PAs and prioritise areas of focus for elimination, determine approaches for Invasive species removal;	Days/PAs	14	500	7000
	Develop Operational plans for local specific invasive plant species removal;	Days	30	1000	30000
	Develop area specific protocols and guidelines and secure senior leadership approval at PA and HQ level	Days	30	1000	30000
	Identify and train teams for invasive plant species removal and review the protocols;	Days /PAs	70	500	35000
	Carry out invasive plant species elimination and integrate the activities within overall PA management plan;	Ha/PAs	7000	1,000	7000000
	Planning activities to synchronise removal of Invasive plant species with area-specific ecosystem restoration activities.	PAs	14	1,000	14000
	Sub-total 1.1				**7116000**
Output 1.2: At least 75 % of the encroached ecosystems are restored by 2030	Develop an institutional restoration framework	Days	30	3000	90000
	Develop restoration guidelines for each PA	Days/PAs	140	1,000	140000
	Organise training and PA specific human resource capacity building activities in ecosystem restoration procedures	Days/PAs	420	1000	420000
	Procure appropriate equipment & tools for invasive species restoration and monitoring for target PAs (including info resources)	Sets	14	10,000	140000
	Sub-total 1.2				**790000**
Output 1.3: All restored ecosystems are tended to maturity by 2035	Implement activities for biannual management of restored sites	Has/PAs	7000	1000	7000000
	Carry out biannual progress assessment of planted material in restored sites	PAs	28	500	14000
	Conduct comparative ecological studies on restored and non-invaded habitats	Nos	5	50,000	250000
	Sub-total 1.3				**7264000**
Outcome 2: New invasions effectively prevented and established managed to satisfactory levels					
Output 2.1: Extent of undesirable thickets reduced by at least 75 % and suppressed to below invasive levels by 2032	Identify and map out vulnerable areas for potential invasions and proritise thicket forming species for control,	Days/PAs	60	1000	60000
	Conduct thorough study to map and stratify encroached/invaded areas into zones of priority for management.	Days	90	3000	270000
	Regular maintenance of vulnerable areas to ensure that undesirable thickets are not established	Ha/PAs	7000	500	3500000
	Develop and adopt integrated management techniques including indigenous knowledge and scientifically proved methods.	PAs	14	5000	70000
	Sub-total 3.1				**3900000**

Results Hierarchy	Activities	Units	Qty	Rate (UGX'000)	Total (UGX'000)
Output 2.2: New woody encroachments and all emerging invasive species are detected and eradicated by 2030	Develop and implement early detection and rapid response procedures	Days/PAs	140	500	70000
	Develop and implement a surveillance system	PAs	14	5000	70000
	Develop and adopt a risk assessment protocol	PAs	14	500	7000
	Popularize lists of invasive and potentially invasive species among staff	Days	14	500	7000
	Train staff in identification techniques of the invasive and potentially invasive plant species	Days/PAs	70	1000	70000
	Publish watch lists of invasive species	PAs	14	100	1400
	Sub-total 3.2				**225400**
Output 2.3: All invasive plant species management efforts within/around UWA-managed PA system are monitored and evaluated by 2030	Develop and adopt an invasive plant species monitoring plan	Days	30	1500	45000
	Develop and implement an institutional invasive plant species management monitoring and evaluation framework	Days	30	1500	45000
	Plan and develop physical infrastructure within relevant PAs in order to aid the management and monitoring activities	PAs	14	10000	140000
	Sub-total 2.3				**230000**
Outcome 3: Institutional capacity strengthened to effectively manage woody species encroachment and invasion by other species					
Output 3.1: All staff needed to manage the eradication and restoration exercises recruited by 2027	Conduct a needs assessment to establish sustainable staff numbers that would be responsible for physical activities of invasive species management	Days/PAs	60	1000	60000
	Development and approval of new staffing structure to include personnel responsible for conducting physical activities of invasive species management	Days/PAs	30	1000	30000
	Develop and operationalise a schedule of personnel recruitment (categorised into technical/non-technical; permanent & short term)	Days/PAs	30	1000	30000
	Sub-total 3.1				**120000**
Output 3.2: All required equipment & tools for eradication and restoration procedures in place and effectively deployed by 2027	Adopt management technologies that utilize modern equipment that minimize habitat destruction especially during eradication, and generate list of required equipment	PAs	14	5000	70000
	Develop and adopt plant sourcing strategies for the restoration exercises, and generate list of required equipment	Days /PAs	140	1000	140000
	Identify and procure required equipment and tools (basic and specialized) for ecosystem restoration and monitoring.	PAs	14	3000	42000
	Sub-total 3.2				**252000**
Output 3.3: All relevant personnel trained in identification and handling of Invasive plant species by 2027.	Develop training programs in detection and control of invasive species, and restoration of ecosystems.	Days /PAs	70	1000	70000
	Develop Standard Operating Procedures and manuals for invasive species identification and management	Days	30	1000	30000
	Benchmark countries that have successfully eradicated thicket forming invasive plant species.	Nos	14	3000	42000

Results Hierarchy	Activities	Units	Qty	Rate (UGX'000)	Total (UGX'000)
	Sub-total 3.3.				**142000**
Output 3.4: Establish frameworks for coordination and management of invasive species at institutional and PA levels by 2026	Mainstream invasive species management activities across all staff functions and departments in the PAs	Days/PAs	140	1000	140000
	Establish an invasive species incident command structure in the PAs	PAs	14	3000	42000
	Develop and implement a framework for quarterly reporting on invasive species issues.	Days/PAs	70	1000	70000
	Sub-total 3.4				**252000**
Output 3.5: Robust monitoring system for invasive plant species develop and implemented across the entire UWA-managed PA system	Develop capacity to document and regularly update information on the distribution and density of invasive species within each protected area and ensure effective and appropriate response;	Days/PAs	70	1000	70000
	Undertake continuous review and recommend the most effective invasive species control measures for each PA and specific species.	Days/PAs	60	1500	90000
	Sub-total 3.5				**160000**
Outcome 4: Effective mechanisms in place for collaborative research and stakeholder coordination in management of invasive plant species					
Output 4.1: Awareness raised with all relevant agencies and stakeholders by 2027	Identify relevant agencies and stakeholders to collaborate with	Days	15	500	7500
	Disseminate and popularize lists of invasive species and watch lists among all stakeholders	PAs	14	500	7000
	Organise stakeholder mobilisation and engagement meetings at national, regional and PA (ecosystem) level	Days/PAs	70	500	35000
	Subtotal 4.1				**49500**
Output 4.2: Research on invasive species increased by 50 % by 2030	Support research on priority species in the PAs	Nos	5	50,000	250000
	Build inter-institutional partnerships to conduct collaborative research on invasive species	Days	30	1000	30000
	Develop a data storage and management system	Days	21	1000	21000
	Subtotal 4.2				**301000**
Output 4.3: At least 80 % of stakeholders participating in management of invasive species by 2030	Develop and implement a system for collaboration and coordination among stakeholders	Days	21	1000	21000
	Develop & operationalise messaging platforms on management of invasive species	Days/PAs	14	1000	14000
	Establish a system of recognising participation and exemplary performance in management of invasive species	Days	30	1000	30000
	Mainstream invasive species management into national communication strategy	Days /PAs	70	1000	70000
	Monitor and evaluate cross-sectoral collaboration on the invasive species management	Days	90	1000	90000
					225000

Results Hierarchy	Activities	Units	Qty	Rate (UGX'000)	Total (UGX'000)
Outcome 5: Effective Framework in place to mobilise and leverage financing for control and management of invasive plant species in the PAs					
Output 5.1: Develop a Resource mobilisation and financing plan for the sustainable management of invasive plant species	Develop institutional and PA specific budgets for (i) managing invasive plant species and (ii) research on invasive species by 2026	Days/PAs	15	500	7500
	Develop proposals for funding invasive species management activities for respective PAs	Days	30	3000	90000
	Undertake fundraising promotions and expeditions with a broad spectrum of partners (local and international)	Days	90	1000	90000
	Develop fund allocation guidelines for managing invasive species	Days	15	1000	15000
					202,500

Fruits and seeds of Acacia mearnsii on the forest floor in MENP

Saplings of Dichrostachys cinerea in a grassland in KVNP