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Prepared for:

Rewilding Maforki

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Environmental Management Services (SL) Limited.
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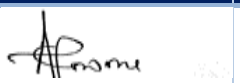
Alhaji Ibrahim Koroma	Team Lead		04.07.2023
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EXECUTIVE SUMMARY

Rewilding Maforki is embarking on a forestry project in the Port Loko District of Sierra Leone's North-western Province. Spanning approximately 466 hectares of land, this project aims to restore and regenerate the natural ecosystem while also creating economic opportunities through sustainable forestry practices. The goal is to expand these activities to cover a staggering 25,000 hectares within the Port Loko District, demonstrating a remarkable commitment to environmental preservation and community development. With a long-term perspective in mind, the planting of trees will be an ongoing effort over the course of the next six years. This timeframe allows for careful planning, execution, and monitoring to ensure the project's success and sustainability. By undertaking such an ambitious endeavor, Rewilding Maforki sets a shining example for ecological restoration, showcasing the potential for harmonious coexistence between humans and nature.

The project at hand can be categorized as Category B when considering its anticipated environmental and social impacts. However, it is important to note that the project is not expected to yield significant negative consequences in these areas. On the contrary, it is believed that this project will play a crucial role in mitigating the impacts of climate change while also supporting the implementation of various participatory forestry management activities that have been endorsed by the government. It is crucial to acknowledge that even in projects like these, there may be some adverse environmental and social effects. This serves as a reminder of the urgent need to comprehend how initiatives for technological development can influence ecological services and biodiversity. By carefully considering and addressing these factors, we can ensure that the project maximizes its positive impacts while minimizing any potential negative consequences, ultimately working towards a more sustainable future.

This is due to the fact that many of these initiatives frequently include resource alteration, exploitation, or even depletion, all of which may have significant consequences for the functions and balances of the ecosystem. It is essential to understand that ecosystems are delicate and intricate networks of interconnected organisms and their physical environment. Each component of an ecosystem plays a vital role in maintaining its stability and functionality. When human activities disrupt these systems by altering or exploiting resources, it can lead to a domino effect that impacts the entire ecosystem. For example, deforestation, which involves the removal of trees and vegetation, can have far-reaching consequences. Trees are not only crucial for providing oxygen and absorbing carbon dioxide but also serve as habitats for numerous species. By removing trees, entire ecosystems can be disrupted, leading to the loss of biodiversity and the

imbalance of predator-prey relationships. Similarly, overfishing can deplete fish populations, disrupt food chains, and impact the overall health of marine ecosystems. When resource alteration, exploitation, or depletion occurs on a large scale, it can result in irreversible damage to ecosystems, making it challenging for them to recover. Moreover, these activities can have broader implications for human well-being, as healthy ecosystems provide crucial services such as clean air, water, and food. Therefore, it is imperative to consider the environmental consequences of initiatives that involve resource alteration, exploitation, or depletion and prioritize sustainable practices that minimize harm to ecosystems and ensure their long-term health and resilience.

The rewilding forestry project planned for the Bureh, Kasseh, Maconteh, Debia, Bakeh Loko, and Kamasondo Chiefdoms in the Port Loko District, North-western Province of Sierra Leone is a significant endeavor aimed at restoring and conserving the natural environment while also promoting sustainable economic growth. Encompassing approximately 25,000 hectares of land, this project holds the potential to positively impact both the local communities and the wider ecosystem. To ensure the successful implementation of this project, it is crucial to adhere to established international standards, as outlined in the International Finance Corporation's guidelines from 2012. These standards will help mitigate any adverse effects on biodiversity, ensuring that the project does not contribute to a net loss of species and habitats. Furthermore, it is imperative that the land clearing and construction processes associated with the rewilding initiative comply with the existing environmental legislation in Sierra Leone. By doing so, the project can effectively avoid any detrimental effects on the region's fragile ecosystems and maintain a balance between conservation and economic development. Overall, the rewilding forestry project holds immense promise for Sierra Leone, offering a unique opportunity to restore and protect the natural environment while fostering sustainable growth and development.

Vegetation

The rewilding Maforkie concession areas are characterized by a diverse landscape comprising of woodland savanna, open grassland, disturbed farm bush, and patches of secondary forests. Within this unique ecosystem, one can find scattered wild oil palm trees, with very few planted oil palm trees, as well as elephant grass and various other tree species. Among the surveyed chiefdoms, Elaeis guineensis, commonly known as the African oil palm, emerges as the dominant species, followed by Mangifera indica, or the mango tree. Notably, Bureh, Kasseh, Maconteh, and Debia chiefdoms boast a higher percentage of woodland savanna vegetation cover compared to Bakeh Loko and Kamasondo chiefdoms. However, in the vicinity of Bakeh Loko and Kamasondo chiefdoms, evidence of cattle rearing is observed, indicating the influence of human activities on

the landscape. Despite its natural beauty, the site faces significant threats to its habitats. These include frequent fires, overgrazing by livestock, fuelwood cutting, and charcoal burning by the local communities. These anthropogenic actions have resulted in extensive modifications to the habitats within the site, posing a challenge to the conservation and preservation efforts in the rewilding Maforkie concession areas.

Fish

In the study conducted, a total of twenty-one (21) fish species were discovered, belonging to fourteen different families. Among these species, nineteen were classified as finfish, while the remaining two were categorized as shellfish. Interestingly, the researchers found that the species composition did not vary significantly across the surveyed sites, indicating a uniform distribution of fish species within the wetlands. The dominant family of fish species observed in the study was Mormyridae. However, it is important to note that two species from this survey, namely *Clarias laeviceps* and *Malapterurus teugelsi*, were identified as being of conservation concern. Both species have been listed in the IUCN Red List Category as "Vulnerable." Despite their conservation status, these two species are not endemic to the wetlands under investigation. Instead, they are known to inhabit other rivers and tributaries within Sierra Leone. This finding suggests that efforts to protect and conserve these vulnerable species should extend beyond the specific wetlands under study, taking into consideration their broader distribution and habitat requirements in the region.

Mammals

In the survey conducted, a comprehensive documentation of mammal species was achieved, revealing a total of sixteen (16) species belonging to nine (9) distinct families. This extensive research shed light on the diverse mammalian fauna present in the surveyed area. Notably, three (3) species, namely *Mastomys natalensis*, *Euxerus erythropus*, and *Funisciurus pyrropus*, were directly observed during field surveys, providing valuable firsthand data on their existence and behavior. The remaining species' presence was established through a meticulous literature review, which involved studying previous scientific studies and reports. Additionally, interviews with local community members proved to be a valuable source of information, as their knowledge and experiences provided insights into the mammal species residing in the area. This collaborative approach ensured a comprehensive understanding of the mammalian biodiversity in the surveyed region. It is worth mentioning that none of the identified species were listed on the IUCN red list, indicating that they are not currently considered endangered or threatened. This finding is encouraging and suggests that conservation efforts in the area have been successful in maintaining stable populations of these mammal species. Nonetheless, continued monitoring and conservation

initiatives are crucial to ensure the long-term survival and well-being of these diverse mammalian populations.

Lepidoptera: Butterflies

During the survey conducted, a remarkable total of sixty-one (61) butterfly species belonging to five (5) different families were discovered. The families observed included *Nymphalidae, Pieridae, Papillionidae, Hesperidae*, and *Lycaenidae*. Among these families, the highest number of species recorded was from *Nymphalidae*, with a total of thirth (30) species identified. Following closely, *Pieridae* accounted for sixteen (16) species, *Papillionidae* for four (4) species, *Hesperidae* for six (6) species, and *Lycaenidae* for five (5) species. For more detailed information, please refer to Appendix 4. It is worth mentioning that all the butterfly species encountered during the survey were not of global conservation concern, as confirmed by the International Union for Conservation of Nature (IUCN) in 2022. Moreover, although these butterflies were not endemic to the specific concession areas under investigation, they have been documented to exist in other parts of Sierra Leone. This highlights the significance of conserving their habitats and ensuring their continued presence in the region.

Reptiles

During the survey conducted in the concession areas, a comprehensive documentation of the local wildlife revealed the presence of a diverse range of species. Specifically, a total of eleven (11) species belonging to seven (7) different families were recorded. The data collection methods employed to document the presence of these species included observations, literature reviews, and interviews with members of the local community. These combined efforts ensured a thorough understanding of the biodiversity within the surveyed areas. It is noteworthy that none of the documented species are currently recognized as threatened on the IUCN red list, which is a significant observation indicating the relatively stable status of the wildlife population in this region. The absence of any threatened species highlights the importance of conservation efforts and sustainable practices implemented within the concession areas. These findings not only contribute to our knowledge of the local ecosystem but also emphasize the need to continue monitoring and protecting wildlife to maintain this favorable conservation status.

Amphibians

During the comprehensive field surveys conducted, a remarkable total of ten (10) amphibian species from five (5) different families were documented. This extensive study aimed to assess the biodiversity and conservation status of amphibians in a specific area. It is noteworthy that none of the identified species were recognized as threatened on the IUCN Red List, a globally recognized authority on species conservation status. The IUCN Red List provides a

comprehensive assessment of the extinction risk faced by various species, serving as a critical tool in conservation efforts worldwide. The fact that none of the documented amphibian species were flagged as threatened suggests that their populations are relatively stable and not currently at risk of extinction. However, it is crucial to continue monitoring these species to ensure their long-term survival and address any potential threats that may arise. The field surveys have provided valuable insights into the amphibian populations in the study area, contributing to our understanding of their distribution, abundance, and conservation needs. This information can be utilized to inform conservation strategies and management plans, ensuring the protection and preservation of these amphibians and their habitats. Such studies play a vital role in safeguarding biodiversity and maintaining the delicate balance of ecosystems.

Conclusion

The Rewilding Maforkie, despite not being classified as a protected area or a key biodiversity area, faces significant challenges in terms of vegetation cover and flora diversity. The site is characterized by a lack of plant life and a limited variety of species. However, it is worth noting that two fish species, namely *Clarias laeviceps* and *Malapterurus teugelsi*, have been identified as IUCN red list species and are classified as vulnerable. Although these fish species do not meet the threshold for critical habitat presence, their vulnerable status raises concerns. The vegetation in most parts of the study areas has been extensively disturbed due to various human activities, including frequent fires, overgrazing, fuelwood cutting, and charcoal burning by local communities. As a result, the habitat has been significantly altered, leading to a modified ecosystem. Given the current state of the site, it is believed that the proposed Rewilding Maforkie project would not have major impacts on biodiversity if the suggested mitigation measures were strictly followed. These measures would be essential in minimizing any potential negative effects on the already impoverished vegetation and limited flora diversity.

Recommendations

- The project should consider employing an ecologist who would routinely fast-track the recommended mitigation measures for different ecological receptors and monitor ecological aspects.

Implementing the recommended mitigation measures is crucial to safeguarding the ecological value of both the direct and surrounding areas of impact. These measures are designed to minimize the negative effects of a project on the environment and ensure the preservation of important ecological resources. By employing an ecologist who can fast-track these measures, the project can effectively address the specific needs of different ecological receptors. This includes identifying potential impacts and implementing appropriate actions to mitigate them.

The ecologist will play a vital role in monitoring the ecological aspects of the project, ensuring that the recommended measures are being implemented correctly and that any necessary adjustments are made in a timely manner. This proactive approach will help minimize the potential harm to the ecosystem and promote responsible environmental stewardship. By prioritizing the preservation of ecological value, the project can contribute to the long-term sustainability and health of the environment.

TABLE OF CONTENTS

Contents

List of Appendices

List of Figures

List of Tables

List of Acronyms

AT	Afro Tropical
CITES	Centre for International Trade in Endangered Species
CMS	Conservation of Migratory Species
EHS	Environment, Health, and Safety
EIB	European Investment Bank
EP	Environmental Protection
ESHIA	Environmental, Social and Health Impact Assessment
ESMP	Environmental and Social Management Plan
ESMS	Environmental and Social Management Systems
GC	Guinea-Congolean Borne
GHG	Green House Gas
GoSL	Government of Sierra Leone
IFC	International Financial Cooperation
IUCN	International Union for the Conservation of Nature
KII	Key Informant Interview
LC	Level of Concern
LC	Least Concern
PM	Paleartic Migrant
PS	Performance Standard
R	Resident
TOR	Terms Of Reference
VU	Vulnerable
X	Recorded

1 Introduction

1.1 Project Background

Rewilding Maforki is embarking on a rewilding forestry project in Port Loko District, North-western Province, Sierra Leone. Spanning across approximately 466 hectares, this project aims to establish a sustainable ecosystem and promote forestry practices. However, the goal is to expand these activities to cover a staggering 25,000 hectares of land within the district. Over the course of the next six years, diligent efforts will be made to plant trees and rejuvenate the ecosystem.

In terms of environmental and social impacts, the project falls under Category B, indicating moderate potential effects. Despite this classification, it is reassuring to note that no significant negative environmental or social impacts are expected to arise from the project. On the contrary, it is anticipated that the rewilding forestry endeavors will contribute to mitigating the adverse impacts of climate change. Moreover, the government has readily endorsed this project, as it aligns with their vision of implementing participatory forestry management activities.

By implementing this rewilding forestry project, Rewilding Maforki aims to restore and preserve the ecological balance of the region. Through the strategic planting of trees, the project will not only promote biodiversity but also provide economic opportunities. As the trees mature, they will aid in carbon sequestration, helping to combat the effects of climate change. Additionally, the forestry aspect of the project will generate sustainable income streams and employment opportunities for local communities.

Furthermore, the participatory forestry management activities endorsed by the government will foster community engagement and empowerment. By involving the local population in decision-making processes, the project aims to ensure that their needs and interests are considered. This inclusive approach will not only enhance the social acceptability of the project but also foster a sense of ownership and stewardship among the community members.

In conclusion, Rewilding Maforki's forestry project in Port Loko District, Sierra Leone, holds immense potential for environmental and social development. With a planned expansion to cover 25,000 hectares, this project represents a significant step towards mitigating climate change impacts and promoting participatory forestry management. By establishing a sustainable ecosystem and fostering community engagement, the project seeks to create a harmonious balance between ecological preservation and economic opportunities.

In any project, it is crucial to consider the potential negative environmental and social consequences that may arise. This is particularly important when it comes to technological development initiatives, as they often involve resource alteration, exploitation, or depletion, all

of which can have significant impacts on ecological services and biodiversity. Therefore, it is essential to comprehend how these initiatives affect the natural world. Impact assessments play a vital role in ensuring that development projects are properly planned and executed in a way that maximizes economic benefits while minimizing harm to natural processes. According to Bennun et al. (2021), such assessments can help guarantee that the project is implemented in line with international standards and does not contribute to the net loss of biodiversity.

One specific example of a project that requires careful consideration of its environmental impact is the rewilding forestry project in Sierra Leone. This project aims to cover approximately 25,000 hectares of land across several chiefdoms in the Port Loko District. It is crucial that this project adheres to established international standards, such as those outlined by the International Finance Corporation (IFC) in 2012b, to mitigate any negative impacts and ensure that it does not contribute to the overall loss of biodiversity. Furthermore, the land clearing and construction of facilities for the rewilding project must comply with existing environmental legislation in Sierra Leone.

To assess the potential impacts of the project on biodiversity and associated ecosystem services, a detailed ecological study was conducted within and around the project concession area. This study aimed to document any potential impacts and recommend appropriate mitigation measures to avoid or minimize harm to biodiversity and habitats. The study employed a combination of field surveys and desktop reviews, using standard methods to assess the flora and fauna present in the area. The surveys covered various taxa, including plants, mammals, avifauna (birds), Lepidoptera (butterflies), and herpetofauna (reptiles and amphibians). Additionally, the International Union for Conservation of Nature (IUCN) and migratory status of species occurring in the area were evaluated.

By conducting such comprehensive ecological studies and impact assessments, projects like the rewilding forestry initiative in Sierra Leone can ensure that they are implemented in a responsible and sustainable manner. These studies help identify potential risks and provide valuable information for decision-making processes. Ultimately, by incorporating environmental considerations into project planning and execution, we can strive to strike a balance between economic development and the preservation of ecological integrity.

1.2 Study Objectives

The primary objective of this study was to provide a thorough analysis of the flora and fauna found in the concession areas of the seven chiefdoms. This was done in response to a significant gap identified in the recent Environmental and Social Due Diligence report. The study aimed to gather comprehensive site-specific baseline data, which would serve as a crucial foundation for

future environmental assessments and conservation efforts. To achieve this, an extensive biodiversity inventory was conducted, focusing on various taxa including plants, mammals (both small and large), birds, reptiles, Lepidoptera, and amphibians. By documenting the presence and abundance of these species, the study aimed to establish a comprehensive understanding of the ecological diversity within the concession areas. Additionally, the study also sought to assess the potential impacts of the proposed project on these species and their habitats. Understanding these potential impacts is vital for informed decision-making and the development of effective mitigation measures. Ultimately, the study aimed to provide recommendations for mitigation strategies that would help minimize any adverse effects on the identified species and their habitats. By addressing this crucial gap in baseline data and providing recommendations for sustainable practices, this study contributes to the responsible management and conservation of the concession areas' biodiversity.

1.3 Police and Regulatory Context

This study was conducted in the context of various national and international policies, laws, and regulations, as outlined below. In today's interconnected world, governments and organizations have recognized the need for a framework to guide their actions and ensure the well-being of their citizens and stakeholders. At the national level, countries enact policies and laws to address a wide range of issues, from economic development and public health to environmental protection and social welfare. These policies and laws serve as a roadmap for decision-making and provide a legal framework within which individuals, businesses, and institutions operate. Similarly, at the international level, countries come together to establish treaties, agreements, and regulations that aim to promote cooperation, peace, and sustainable development. These international policies and regulations play a crucial role in shaping global norms and standards, facilitating trade and collaboration, and addressing transnational challenges such as climate change, human rights, and cybersecurity. By conducting this study within the context of such policies, laws, and regulations, the researchers ensure that their findings and recommendations align with the broader goals and principles set forth by the relevant authorities. Moreover, this approach allows for a comprehensive understanding of the socio-political landscape and enables the researchers to analyze the implications of these policies on the specific topic at hand. In conclusion, the study conducted considers the complex web of national and international policies, laws, and regulations, acknowledging their significance in shaping the research landscape and providing a holistic perspective on the chosen topic.

1.3.1 National Policies

The Government of Sierra Leone (GoSL) has established several policies and laws that are

relevant to the implementation of this project and to which this study will contribute. One of these is the National Policy on the Environment, which provides guidelines and strategies for sustainable development and environmental conservation in the country. This policy aims to address various environmental challenges and promote the efficient management of natural resources. Additionally, the Environmental Protection Act-2022 is another important legislation that governs the protection and conservation of the environment in Sierra Leone. This act provides a legal framework for the prevention and control of pollution, as well as the conservation of biodiversity.

The Environmental Protection Agency (Amendment) Act, 2022 is also a significant law that contributes to the implementation of environmental protection measures. This act establishes the Environmental Protection Agency (EPA) as the regulatory body responsible for enforcing environmental laws and regulations. The EPA plays a crucial role in monitoring and assessing environmental impacts, issuing permits, and promoting sustainable practices in various sectors.

Furthermore, the Forestry Act-1989 and Forestry Regulations-1989 are essential legislations that govern the management and conservation of forest resources in Sierra Leone. These laws aim to ensure the sustainable use of forests, protect wildlife habitats, and promote reforestation efforts. They establish mechanisms for the issuance of logging permits, the regulation of timber harvesting activities, and the protection of forest reserves.

In addition to environmental policies and laws, the Land Policy of 2005 is also relevant to the project. This policy provides guidelines for land administration, land tenure, and land use planning in Sierra Leone. It aims to promote equitable access to land, prevent land disputes, and ensure sustainable land management practices.

Lastly, the Local Government Act, 2004, which was amended in 2016, is another important piece of legislation that affects the implementation of this project. This act seeks to decentralize governance and empower local authorities in Sierra Leone. It provides a legal framework for the establishment and functions of local councils, enabling them to have more control over local development initiatives and decision-making processes.

Overall, the Government of Sierra Leone has implemented various policies and laws to address environmental issues, promote sustainable development, and empower local authorities. The implementation of this project will contribute to these existing efforts by aligning with the policies and laws mentioned above, thereby ensuring compliance, and contributing to the overall development and environmental well-being of Sierra Leone.

1.3.2 International Policies

The International Finance Corporation (IFC) Performance Standards play a crucial role in promoting sustainable development and ensuring environmental protection in various projects. In particular, PS 6 focuses on biodiversity conservation and sustainable natural resource management. This standard emphasizes the need for projects to analyze baseline information and identify measures to mitigate potential negative impacts on biodiversity. The aim is to achieve no net loss of biodiversity, ensuring that any potential harm to ecosystems is adequately addressed. Additionally, the European Investment Bank (EIB) is another important institution that contributes to sustainable development. The EIB has its own set of environmental and social standards that projects must adhere to, including measures to protect biodiversity. Moreover, the International Union for Conservation of Nature's Red List (IUCN) provides a valuable resource for identifying threatened species within project sites. By referencing the IUCN Red List, projects can better understand the potential impacts on endangered species and implement appropriate conservation measures. Another relevant convention is the Convention on Conservation of Migratory Species of Wild Animals (CMS), which focuses on protecting migratory species such as birds that may be present in the project concession areas. The CMS seeks to ensure the conservation of these species throughout their migratory routes. Lastly, the Convention on International Trade of Endangered Species of Wild Flora and Fauna (CITES) plays a crucial role in regulating international trade to prevent the exploitation of endangered species. This convention aims to ensure that any trade involving endangered species is sustainable and does not further endanger their survival. Overall, these international standards and conventions provide a comprehensive framework for promoting biodiversity conservation and sustainable resource management in various projects.

1.4 Terms of Reference

The Terms of Reference (ToR) for the assessments related to the permitting procedure have been meticulously crafted, considering the valuable insights obtained from the literature reviews. The objective of these ToR is to ensure a comprehensive examination of all relevant aspects and outlines the specific requirements and guidelines that must be followed during the biodiversity assessment process. The ToR has been designed with great care to address any potential environmental and social concerns, with a strong emphasis on promoting responsible and sustainable development practices. By incorporating the findings of the infield assessment, the ToR aims to create a robust framework that facilitates informed decision-making and fosters a harmonious balance between development and conservation.

The following essential phases will be part of the study:

- Stakeholder engagement.
- Baseline data collection.
- Project description and interaction with design and decision-making.
- Assessment of impacts and identification of mitigation measures.
- Integrated management system and plans; and
- Reporting and disclosure.

1.4.1 Equator Principle and the International Performance Standards

The Equator Principles and International Finance Corporation's Performance Standards (IFC PS) widely recognised as effective tools for the sustainable management of environmental and social risks of a project to ensure projects were developed, operated, and closed in a socially responsible manner and reflecting sound environmental management practices. These standards provide an approach to the determination, assessment, and management of environmental and social risk in project financing.

To comply with International Best Practice, the Equator Principles and IFC Performance Standards should be utilised as the regulatory framework for the project. A summary of the Equator Principles and IFC Performance Standards is provided in the tables 1.1 and 1.2 below.

Principle	Requirement
Principle 1	Under the Equator Principles, proposed developments are categorised depending onits potential environmental and social risks. The Sunshine Mining Company Limited Rutile and Zircon Project was classed as category A. Projects of this category are deemed to have potential adverse environmental and social risks and/or impacts that irreversible**,** irreversible**,** or unprecedented.
Principle 2	For a category A project, a suitably comprehensive assessment process appropriate to the nature and scale of the project is required. The nature of SMC Project necessitates a detailed ESHIA and ESMP is prepared.
Principle 3	For projects taking place in Designated countries (generally first world countries), the applicable standard will be hosting country laws, regulations and permitting requirements that pertain to Environmental and Social matters. For projects taking place in non-**Designated** countries, the Equator Principles requires compliance with the IFC Performance Standards and the World Bank Environmental, Health and Safety Guidelines (EHS Guidelines). In addition to the IFC Performance Standards and EHS Guidelines, compliance with in-country legislation is also required.
Principle 4	The Equator Principles will require a Category A project that an Environmental and Social Management System be composed of policies and procedures to manage environmental and social risks.
Principle 5	Category A projects require that effective stakeholder engagement is undertaken and is an ongoing process. Vulnerable and indigenous groups must be taken into consideration and all legal requirements of consultation met.

Principle 6	The Equator Principles require that a Category A project implement a grievance mechanism to record and document all concerns and issues raised by the communities, regarding the project.
Principle 7	The Equator Principles require a Category A project to undergo an independent review by a consultant.
Principle 8	The Equator Principles require the inclusion of covenants regarding the implementation of the Equator Principles III into legal documentation structuring the deal. This requirement gives the requirements of the Equator Principles III a legally binding nature between the contracting parties.
Principle 9	The Equator Principles requires a Category A project to appoint an independent environmental consultant to undertake the monitoring and reporting, or that applicable skills be retained in house.
Principle 10	The Equator Principles require a Category A project to make the ESHIA available online. It is further required that a GHG emissions report be publicly released if emissions exceed, or are anticipated to exceed, 100 000 CO_2 equivalent per annum. Once the likely mining and haulage scenarios are established the requirement for an emissions report will be evaluated.

Table 1. 1: Equator Principles (2013)

Performance Standard	Requirement
PS 1: Assessment and Management ofEnvironmental and Social Risks and Impacts:	PS 1 underscores the importance of managing environmental and social performance throughout the life of a project. An effective Environmental andSocial Management System (ESMS) is a dynamic and continuous process initiated and supported by management, and involves engagement between the project promoter, its workers, local communities directly affected by the project (the Affected Communities) and, where appropriate, other stakeholders. The ESMS entails a methodological approach to managing environmental and social risks and impacts in a structured way on anongoing basis.
PS 2: Labour and Working Conditions:	PS 2 recognises that the pursuit of economic growth through employment creation and income generation should be accompanied by protection of the fundamental rights of workers. Failure to establish and foster a soundworker-management relationship can undermine worker commitment and retention and can jeopardise a project. Conversely, through a constructive worker-management relationship, and by treating the workers fairly and providing them with safe and healthy working conditions, tangible benefits can be realised, such as enhancement of the efficiency and productivity of their operations.
PS 3: Resource Efficiency and Pollution Prevention:	PS 3 recognises that increased economic activity and urbanisation often generate increased levels of pollution to air, water, and land, and consume finite resources in a manner that may threaten people and the environment.More efficient and effective resource use and pollution prevention and mitigation technologies and practices have become more accessible and achievable in virtually all parts of the world.

PS 4: Community Health, Safety and Security:	PS 4 recognises that project activities, equipment, and infrastructure can increase community exposure to risks and impacts. In addition, communities that are already subjected to impacts from climate change may also experience an acceleration and/or intensification of impacts due to project activities. While acknowledging the public authorities' role in promoting the health, safety, and security of the public, this Performance Standard addresses the promoter's responsibility to avoid or minimise the risks and impacts to community health, safety, and security that may arise from project related activities, with particular attention to vulnerable groups.
PS 5: Land Acquisition and Involuntary Resettlement:	PS 5 recognises that project-related land acquisition and restrictions on land use can have adverse impacts on communities and persons that use this land. Involuntary resettlement refers both to physical displacement (relocation or loss of shelter) and to economic displacement (loss of assets or access to assets that leads to loss of income sources or other means of livelihood) because of project-related land acquisition and/or restrictions on land use. Resettlement is considered involuntary when affected persons or communities do not have the right to refuse land acquisition or restrictions on land use that result in physical or economic displacement. This occurs in cases of (i) lawful expropriation or temporary or permanent restrictions on land use and (ii) negotiated settlements in which the buyer can resort to expropriation or impose legal restrictions on land use if negotiations with the seller fail.
PS 6: Biodiversity Conservation and Sustainable Management of LivingNatural Resources:	PS 6 recognises that protecting and conserving biodiversity, maintaining ecosystem services, and sustainably managing living natural resources are fundamental to sustainable development. The requirements set out in this Performance Standard are guided by the Convention on Biological Diversity.
PS 7: Indigenous Peoples:	PS 7 recognises that Indigenous Peoples, as social groups with identities that are distinct from mainstream groups in national societies, are often among the most marginalised and vulnerable segments of the population. In many cases, their economic, social, and legal status limits their capacity to defend their rights to, and interests in, lands and natural and cultural resources and may restrict their ability to participate in and benefit from development. Indigenous Peoples may be more vulnerable to the adverse impacts associated with project development than non-indigenous communities. This vulnerability may include loss of identity, culture, and natural resource-based livelihoods, as well as exposure to impoverishment and diseases.
PS 8: Cultural Heritage:	PS 8 recognises the importance of cultural heritage for current and future generations. Consistent with the Convention Concerning the Protection of the World Cultural and Natural Heritage, this Performance Standard aims to ensure the protection of cultural heritage during project activities. Inaddition, the requirements of this Performance Standard on a project's use of cultural heritage are based in part on standards set by the Convention on Biological Diversity.

Table 1. 2: IFC Performance Standards (2012)

1.5 Biodiversity Studies

Biodiversity studies are crucial in understanding and conserving the rich variety of life forms that exist on our planet. These studies encompass various aspects of the natural world, including terrestrial flora and fauna, as well as aquatic and wetland ecosystems. When conducting biodiversity studies, scientists focus on documenting and analyzing the different species of plants and animals that inhabit specific regions or habitats. Terrestrial flora refers to the diverse range of plant life found on land, including trees, shrubs, grasses, and flowers. By studying terrestrial flora, scientists can gain valuable insights into the distribution patterns, ecological interactions, and adaptations of various plant species. Similarly, terrestrial fauna studies involve the examination of animals that live on land, such as mammals, birds, reptiles, and insects. Understanding the diversity and behavior of terrestrial fauna is essential for assessing the health of ecosystems, identifying endangered species, and implementing effective conservation strategies. On the other hand, aquatic and wetland studies focus on the biodiversity found in bodies of water, such as rivers, lakes, and oceans, as well as the unique ecosystems associated with wetlands. These studies encompass the examination of aquatic plants, marine animals, and the intricate web of interactions that occur within these habitats. By studying aquatic and wetland biodiversity, scientists can better comprehend the complex dynamics of marine ecosystems, monitor water quality, and assess the impact of human activities on these delicate environments. Overall, biodiversity studies encompass a wide range of research efforts aimed at understanding and preserving the diverse array of life forms that exist in terrestrial and aquatic ecosystems, highlighting the interconnectedness and immense value of our natural world.

1.5.1 Fauna and Flora

To gain a comprehensive understanding of the plant communities, species compositions, biodiversity, and potential presence of Red Data plant species and Protected tree species, it is essential to conduct a thorough vegetation study throughout the growing season. This study will serve to identify and document all the species present in the Project area. By conducting faunal investigations on various groups such as mammals, birds, reptiles, amphibians, and invertebrates, a comprehensive catalog of the fauna within the Project area can be created. These investigations will not only help in determining the biodiversity ranges but also in assessing the likelihood of any potential Red Data or protected species in the area. The objectives and deliverables of this study are outlined in Table 1.3, providing a clear roadmap for the research, and ensuring that all necessary aspects are covered. Through this thorough vegetation study and faunal investigation, a comprehensive understanding of the ecological

aspects of the Project area can be obtained, enabling informed decision-making and conservation efforts.

Objectives	Key Deliverables
▪ Determine the actual flora species present on site and discuss these in context of plant communities within the ecosystem of the area. ▪ Discuss protected, endemic, exotic, alien invasive and culturally significant plant species. ▪ Identify any rare or protected species. ▪ Identify mammals, birds, amphibians, and invertebrates potentially making use of the area.	▪ Fauna and Flora Baseline
▪ Identify and map sensitive areas, as described by the provincial and national legislation.	▪ Flora and Fauna Impact Assessment

Table 1. 3: Objectives and Key Deliverables for the Fauna and Flora Assessment

1.5.2 Aquatics

Aquatics study of rivers and tributaries downstream of key infrastructure is vital in assessing the aquatic composition of the system before any mining activities take place. Conducting a comprehensive study is essential for both high and low flows to establish a baseline understanding. Even during the dry season when smaller streams might have limited flows, it is crucial to survey the instream habitat to gather insights into the seasonal characteristics of the aquatic habitat. By conducting this study, valuable information can be obtained about the existing aquatic ecosystem, allowing for informed decision-making and implementation of measures to mitigate potential impacts caused by mining activities. The objectives and deliverables of the study, including data collection methods, sampling techniques, and analysis procedures, are outlined in detail in table 1.4, providing a clear roadmap for the study's execution and ensuring that the necessary information is gathered to assess and monitor the aquatic environment effectively.

Objectives	Key Deliverables

▪ Determine the actual aquatic species (fish and macroinvertebrates) present in the lake and its tributaries and discuss these in context of the ecosystem of the area. ▪ Identify and discuss any red data or protected species. ▪ Determine existing surface water quality by collecting water samples. ▪ Determine the existing status of the river**bed** by taking sediment samples.	▪ Aquatics Baseline
▪ Identify and map sensitive areas and determine the potential impacts from Rewilding operations.	▪ Aquatics Impact Assessment

Table 1. 4: Objectives and Key Deliverables for the Aquatics Assessment

1.5.3 Wetlands

The wetlands identified on site were predominantly floodplain wetlands, characterized by their unique hydrological characteristics and abundant biodiversity. These wetlands play a crucial role in maintaining the ecological balance of the surrounding ecosystem. However, there is a potential for the existence of further wetlands throughout the project area, which will be confirmed by a wetland specialist. It is widely recognized that wetlands are critical and sensitive habitats that must be conserved to preserve their ecological functions and the multitude of species they support. Fortunately, a few wetland areas have already been impacted by slash and burn activities, highlighting the urgent need for comprehensive wetlands study and conservation efforts.

To ensure a comprehensive understanding of the wetlands in the project area, the wetlands study will work in conjunction with findings from the fauna, flora, aquatics, and hydrological studies. This multidisciplinary approach will provide a holistic view of the wetlands' ecological importance and help identify potential impacts and mitigation measures. By considering the interdependence between wetlands and the surrounding ecosystem, the study aims to safeguard these valuable habitats for future generations.

Table 1.5 outlines the objectives and deliverables of the wetlands study, providing a clear roadmap for the research and conservation efforts. These objectives may include assessing the wetlands' current condition, identifying key species and habitats, evaluating potential threats and impacts, and proposing strategies for wetland management and restoration. The deliverables could range from detailed reports and maps to recommendations for conservation measures and policy guidelines.

Ultimately, the wetlands study serves as a vital tool for informed decision-making, ensuring

that any future development or activities in the project area are carried out in an environmentally responsible manner. By recognizing the importance of wetlands and working towards their conservation, we can protect these invaluable ecosystems and their associated ecological services for the benefit of both present and future generations.

Objectives	Key Deliverables
▪ Delineate the wetland areas of the project areas. ▪ Classify the soil characteristics of the wetland areas. ▪ Determine and classify the current health of the wetland systems. ▪ Determine the impact already being exerted on the systems.	▪ Wetlands Baseline.
▪ Identify and map the wetland areas and their health. ▪ Incorporate analysis from the fauna, flora, aquatics, and hydrological studies to determine the potential impacts from mining operations.	▪ Wetlands Impact Assessment.

Table 1. 5: Objectives and Key Deliverables for the Wetlands Assessment

1.6 Structure of this Report

The full and instructive comprehensive report that is offered here is divided into seven (7) sections, each of which contains important details about the project at hand. Section one of the report has a thorough introduction that gives you a broad overview of the project, its objectives, and a thorough policy, regulatory context, and terms of reference. The project's location, ecological assessment and survey methodology are briefly described in section two. In addition, section three offers an overview of the project fauna, and a thorough explanation of the current flora characterization of the proposed concession area and its sphere of influence, with an overview of the results for the biodiversity characterization and interaction. The preliminary identification of the impact and mitigation is described in section four. The conclusion and recommendations to be done are also included in section five. Section six of the report contains all the references consulted during its preparation, while section seven the appendices.

2 Ecological Assessment

2.1 Study Area

The project concession areas of Maforkie, Bureh, Kasseh, Maconteh, Debia, Bakeh Loko, and Kamasondo Chiefdoms are in the Port Loko District, within the North-western Province of Sierra Leone. Within these concession areas, at least three sections were carefully selected from each chiefdom. These sites are situated on a vast flat lowland, characterized by open wooded savannah and farm bush landscapes, with scattered wild palm oil trees and a few other tree species, primarily forming a secondary forest. While exploring the region, it was observed that apart from the Little Scarcies River, no other natural perennial streams or rivers were discovered. However, due to the low-lying nature of the concession areas, it is anticipated that flooding may occur in certain swampy regions during the peak of the rainy season. Spanning an extensive area of approximately 25,000 hectares, the project areas share borders with several neighboring communities. See Figure 2.1 below.

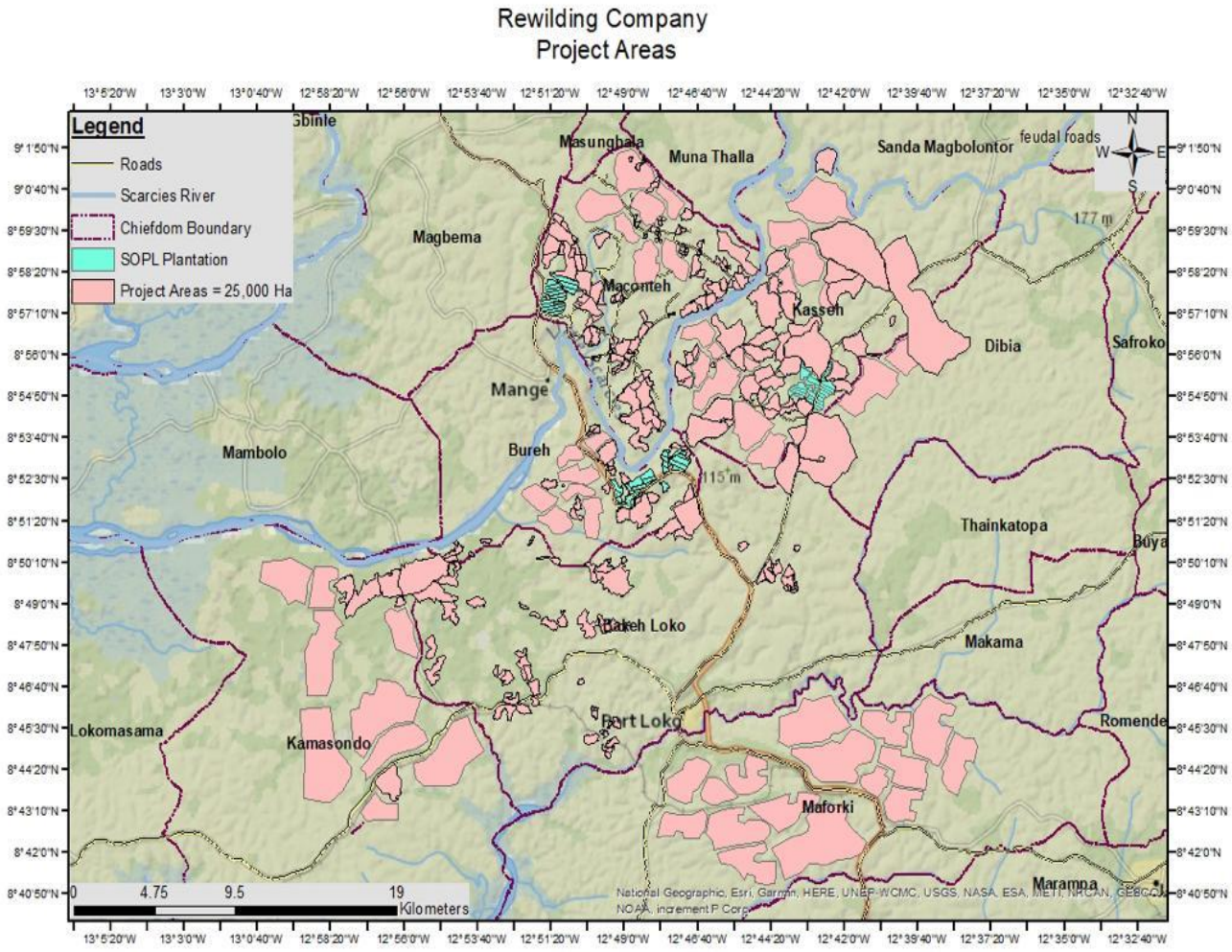

Figure 2. 1: Map of the Proposed Rewilding Maforki Project

2.2 Biodiversity Survey Methodology

As the first step towards the successful execution of the project, Environmental Management Services (SL) Limited biodiversity team conducted a comprehensive scoping assessment. This assessment aimed to gather all necessary information to understand the project's scope, challenges, and opportunities. The team undertook a meticulous review of all relevant desktop data. They also conducted a thorough on-site assessment of the project area, visiting the site to gain first-hand knowledge and insights.

The expertise of the team was instrumental in carrying out this assessment effectively. Their in-depth analysis of the data, combined with their extensive knowledge in the field, allowed them to obtain a comprehensive understanding of the project. By scrutinizing every piece of information, they were able to identify potential risks, constraints, and opportunities that could impact the project's success.

To ensure transparency and accountability, the methodology employed during the study was carefully crafted and documented. The team outlined all the details in the subsections below, providing a clear and well-documented process of their approach. This step was crucial to ensure that all stakeholders involved in the project, including clients, partners, and regulatory bodies, were fully aware of the methodology used. By having a transparent process, the team aimed to build trust and foster effective collaboration throughout the project.

The scoping assessment carried out by the Environmental Management Services (SL) Limited biodiversity team will undoubtedly set the foundation for a successful outcome. Their dedication to gathering all relevant information, combined with their expertise in the field, has equipped them to tackle the challenges that may arise during the project. By conducting a comprehensive review and on-site assessment, the team has ensured that they have a holistic understanding of the project's context, enabling them to develop effective strategies and solutions.

Moving forward, the scoping assessment will serve as a guidepost for the subsequent stages of the project. The comprehensive understanding gained through this process will enable the team to make informed decisions, mitigate potential risks, and leverage opportunities for the project's success. With a solid foundation established, the stakeholders can move forward with confidence, knowing that the project is built on a thorough and well-documented approach.

In conclusion, the scoping assessment conducted by the Environmental Management Services (SL) Limited biodiversity team has played a crucial role in setting the stage for the successful execution of the study. Through their meticulous review of all relevant data and thorough on-site assessment, they have gained a comprehensive understanding of the project's scope, challenges, and opportunities. The transparent and well-documented methodology employed during the study ensures that all stakeholders are fully aware of the approach used. With this foundation in place, the

team is well-prepared to navigate the project's complexities and deliver a successful outcome.

2.2 Desktop Assessment

The project area is a diverse environment that encompasses a wide range of biophysical and social elements that are crucial to consider when planning and executing any project. In order to gain a comprehensive understanding of this complex ecosystem, a thorough desktop review was conducted. This review involved examining various factors such as the geography, climate, and land use patterns of the area. By conducting this review, the project team was able to gather valuable information that informed the terms of reference (ToR) for the study, ensuring that the project adheres to all relevant laws and regulations.

To ensure that the project is executed in a responsible and sustainable manner, a comprehensive review of the relevant permitting processes was also conducted. This review provided vital information regarding the compliance requirements, allowing the team to navigate the project within the legal framework. By taking this approach, the team ensured that the project would be carried out in a manner that respects the environment and the local community.

Furthermore, as an integral part of the comprehensive assessment of the proposed conservation project, a thorough desktop review was conducted. This review involved an exhaustive analysis of various types of information gathered from different sources, including publicly accessible reports from Rewilding. These reports included Environmental, Social, and Health Impact Assessment studies conducted by Ecoworld (SL) Limited, as well as relevant legislation and regulations on tree planting, conservation, and permitting. By incorporating this information into the assessment, the team was able to develop a holistic understanding of the project area and its characteristics.

In June 2023, Environmental Management Services (SL) Limited (EMS-SL) initiated an assessment of the project area. While the initial desktop review had been completed, the team recognized the need for further information about the biophysical and socio-economic environment. To gather this information and ground-truth the existing data, a skilled team of experts was sent to the site for an infield assessment from June 9 to June 13, 2023. This infield assessment was a crucial step in orienting the project team and gathering additional data to ensure the success of the study. The team worked tirelessly to assess the environmental and social impact of the project, recognizing that this assessment was just the first step in a long journey towards benefiting both the local community and the environment.

The survey of the existing and potential project areas and their surroundings was conducted from a biophysical perspective, focusing on identifying high-level vegetation habitats, animals, land uses, and existing water resources, among other factors. This thorough investigation was vital in gaining a comprehensive understanding of the local environment and its characteristics. Additionally, consultations were held with Rewilding personnel and traditional authorities from the surrounding

communities to incorporate local knowledge and experiences of the biophysical characteristics into the assessment. This approach allowed for a holistic perspective that considers both scientific and traditional knowledge, ensuring that the project is carried out in a sustainable and environmentally friendly manner while respecting the cultural heritage and traditions of the local communities.

As the assessment progressed, the team also engaged in direct consultation with various communities, providing information on a need-to-know basis. This approach aimed to avoid raising expectations prematurely, as the project was still in its early stages. By adopting this approach, the team sought to build trust and foster a collaborative relationship with the local community, which would contribute to the long-term success of the project.

Primary data collection focused on communities within Maforkie, Bureh, Kasseh, Maconteh, Debia, Bakeh Loko, and Kamasondo Chiefdoms in the Port Loko District. This targeted data collection allowed the team to gather specific information from the communities directly affected by the project, ensuring that their voices and perspectives were incorporated into the assessment process.

In conclusion, the project area is a complex environment that requires a comprehensive understanding of its biophysical and social elements. By conducting thorough desktop reviews, engaging in infield assessments, and incorporating scientific and traditional knowledge, the project team can ensure that the study is carried out in a responsible and sustainable manner. Through direct consultations and targeted data collection, the team builds trust and fosters a collaborative relationship with the local community, ultimately contributing to the long-term success of the project.

Figure 2. 2: Fish Survey within the Concession


Rotuk plant site


Mabalama village plant site


Mabalama village plant site


Magbando village plant site


Makoth plant site


Gbarag Kabangura plant site


Mabureh plant site


Rogbalan plant site


Kumrabai village plant site


Katogha village plant site


Rokutollor Nursery


Little Scarcies

Figure 2. 3: Showing the Landscape and Vegetation Types within the Concession

2.3 Fauna Assessment Methodology

2.3.1 Mammals, Reptiles, and Amphibians

The sampling of mammals, reptiles, and amphibians was carried out in various habitat types within and around the project concession areas using an ecological transect walk. This method involved traversing through different sampling areas while observing ecological characteristics such as incidental sightings, calls, and remains of mammals, including faeces, footprints, and foraging sites. These observations were used to determine the presence of specific species. However, due to limitations in time and resources, this study also incorporated one-on-one interviews to gather

information about the existence of animal species that local inhabitants believed to be present in their areas. This approach is known as an ecological sampling technique.

For the survey of reptiles and amphibians, the focus was on habitats in close proximity to or in association with water bodies, including swamps, farm bush and grassland, leaf litter, logs, and trees for arboreal species. The search for aquatic and fossorial amphibians and reptiles was conducted, and species were recorded accordingly. Some sites were surveyed during both daytime and nighttime to capture a comprehensive understanding of the species present. Each search or survey at specific sites lasted for a minimum of two hours and involved at least two individuals conducting the investigation.

The results of the interviews were presented alongside the table of species recorded on-site. However, it is important to note that in some cases, the interview data may not reliably confirm the presence of species as determined by this study. To identify the species discovered during the searches, the researchers used various field guides, including the Kingdon Field Guide to African Mammals (Kingdon, 2015), Rödel's herpetofauna of West Africa (Rödel, 2000), and the Field Guide to the Frogs and other Amphibians of Africa (Allan et al., 2019). These resources provided valuable information for accurate species identification and documentation. Overall, this comprehensive approach to sampling and identification allowed for a more thorough understanding of the mammal, reptile, and amphibian populations within and around the project concession areas.

2.3.2 Avifauna Sampling

In the study conducted by Pomeroy in 1992, a combination of methods was employed to assess avian diversity. The researcher utilized various tools including a pair of binoculars, a telescope, a field identification guide, and a record-playback electronic device. These tools were essential in gathering data on bird species. The surveys were carried out during two time periods, from 6:30 am to 11:00 am and from 4:30 pm to 8:00 pm. During these times, birds encountered were identified through visual evidence and their distinctive calls.

While these methods proved useful in assessing avian diversity, it is important to acknowledge their limitations. One drawback is the potential for observer bias. As humans, our perception can be influenced by personal biases and expectations. This can lead to misidentifications or overlooking certain species. To overcome this challenge, researchers must be diligent in their observations and strive to maintain objectivity.

To aid in bird identification, the Field Guide to the Birds of Western Africa by Barrow and Demey (2008) was utilized. This comprehensive field guide provided valuable information on the characteristics, habitats, and distribution of bird species in the region. With the help of this guide, researchers were able to accurately identify the birds encountered during the surveys.

In summary, the study conducted by Pomeroy in 1992 employed a combination of methods to assess

avian diversity. The use of binoculars, a telescope, field identification guides, and a record-playback electronic device enabled researchers to collect visual and auditory data on bird species. However, it is important to consider the limitations of these methods, such as observer bias. To mitigate this, researchers must remain objective and rely on reliable field guides like the one used in this study.

2.3.3 Lepidopterology Assessment

In this assessment, relative abundance indices were generated through the utilization of transect counts. These indices are expected to exhibit a strong correlation with daily butterfly counts, although this may not always be the case when examining seasonal butterfly population sizes, as noted by Khyade et al. in their 2018 study. The surveys involved the implementation of the point-and-line transect method across various locations within the designated area and its surrounding vicinity, as documented by Barhaum et al. in their 1980-1981 research. Factors such as the time of day, as determined by a 24-hour clock, and weather conditions were taken into consideration during the conduct of these surveys. To minimize the number of variables, present, consistent observational paths were followed during subsequent visits to each location, following the methodology proposed by Pyle in 1984. The specific sampling techniques employed encompassed the use of butterfly nets, walk-and-capture methods, as well as photography.

2.3.4 Fish Assessment

In order to ensure a comprehensive survey of fish species in the aquatic systems of the survey areas, a range of fish sampling methods were employed. Both active and passive methods were used to increase the probability of selecting various finfish and shellfish species. The survey utilized G.P.S. coordinates at each sampling location to accurately document the data. Additionally, detailed observations and photographic records of habitats were made to provide a more holistic understanding of the aquatic ecosystems.

The methods employed included the use of set gill nets and hand nets, as well as a submersible waterproof video camera, specifically a GoPro camera. Locally made fish traps were also utilized to capture a diverse range of species. To gather information from locals about existing fish species and fishery dependence, Key Informant Interviews (KII) were conducted using unstructured questionnaires. This participatory appraisal method allowed for a more in-depth understanding of the local knowledge and perspectives on the fish populations.

Hand nets were primarily used in smaller streams, swamps, and tributaries, as they proved to be effective in these environments. Gill nets, on the other hand, were employed in larger water bodies during the day and strategically positioned to target nocturnal fish species at night. Locally made fish traps were set in slow-moving water bodies, specifically designed to capture both active and inactive swimmers. By utilizing these different methods, a wide range of fish species could be captured, increasing the overall effectiveness of the survey.

One innovative method used in this survey was the placement of an underwater video camera (GoPro camera) in shallow and transparent water bodies. This allowed for the capture of all moving objects, with a particular emphasis on finfish and shellfish species. The use of an underwater video camera trap provided credibility to the selection of diverse and habitat-specific fish species, as it provided visual evidence of their presence.

The use of hand nets in smaller streams, tributaries, and swamps had the added advantage of collecting juveniles and some killifish species that prefer staying at the edges of smaller water bodies. These smaller fish species are not easily caught using set gill nets, making the use of hand nets crucial for a comprehensive survey. Additionally, the catches of local fishers were assessed as an additional fish sampling strategy. This approach provided valuable insights into the fish populations from the perspective of those who have direct experience and knowledge of the local fishing practices.

Overall, the combination of active and passive fish sampling methods, including gill nets, hand nets, fish traps, underwater video cameras, and Key Informant Interviews, ensured a more accurate and comprehensive survey of the finfish and shellfish species in the survey areas. By employing these various methods, researchers were able to increase the probability of capturing a wide range of species, thereby enhancing the understanding of the fish populations and their ecological significance in the aquatic systems.

2.4 Flora Assessment

2.4.1 Plant and Vegetation Survey

In the study conducted by Hall and Swaine (1981), they employed a plot-less method to determine plant species and assess vegetation structure. This survey method involved the systematic random walks, which were carried out across the designated project area. During these walks, the researchers documented the various vascular plant species encountered. In cases where immediate identification of a species was not possible on site, the team collected specimens and took photographs for future reference. These references included the Njala University herbarium and online resources like Plant Resources of Tropical Africa (PROTA, 2022). Additionally, the researchers referred to publications on the Flora of West Tropical Africa, such as Hutchinson's work in 1954. By utilizing this plot-less method and employing multiple resources, the research team aimed to establish a comprehensive understanding of the plant species present in the study area and accurately assess the vegetation structure.

3 Results

3.1 Flora

3.1.1 Vegetation and Habitat Description

Table 3. 1: Surveyed Sites, Coordinates, and Summary of Vegetative Description

Survey Point & Nearest settlement	Eastings (28 P)	Northings (UTM)	Summary of vegetative description
Robesseh village. Rosela village	P1.738300 P2.739491	0992439 0994293	P1swamp is dominated by the Araceae plant family, and the other side is cultivated with rice plants. The vegetation type in the nearby environment is a farm bush dominated by dense wild oil palm trees. P2. Settlement surrounded by dense oil palm and other economic tree crop species.
Makoba village Mabobom village	P1.742464 P2.743660	0994533 0993845	P1. The settlement is surrounded by modern oil palm and wooded grassland. P2. Wild oil palm and secondary forest regrowth encountered around village.
Ferry village	736290	0985661	The little scarcies river hosting a disturbed gallery forest. Hippos are reported to be present in this part of the river.
Masinbo village plant site	P1.737785 P2.738779	0984167 0984517	P1. The plant site is brush land with low regenerating grasses. P2. A gallery forest alongside grassland dominated by imperata cylindrica plant species along the little scarcies river.
Cimbeck village plant site	739062	0982497	Brush land dominated by pennisetum purpureum plant species.
Makin village plant site	741460	0981031	The site is shrubby grassland dominated by Rophira lanceolata and scattered oil palm plant species.
Robella village plant site	736167	0981273	A parcel of farmland in patches and groundnut garden, Surrounded by woodland Savannah grassland.
Maseseh village plant site	737428	0979971	Parcel of shrubby grassland dominated by *Rophira lanceolata*, *Cassia seiberiana* and Pterocarpus e*rinaceus* plant species.
Romeni village plant site	750481	0984930	Brush land dominated by Pennisetum purpureum plant species.
Mabureh village plant site	747398	0986376	Acacia plant species planted within a brush land.
Rokutolor nursery	749297	0987964	This location is the nursery site. *Newboulda laevis* is the dominant plant species in nursery.
Robalan village plant site	748004	0991223	Open brush land dominated by *Rophira lanceolata* plant species regrowth.
Kumrabai village plant site	752054	0988013	Shrubby grassland dominated by *Lanceolata, militia* sp and annona arenaria plant species.

Magbando village plant site	752801	0992879	Shrubby grassland dominated by *Chromelaena odorata* plant species. Mature secondary forest near plant site.
Kukuna village plant site	749492	0993748	A shrubby one year old farm bush and newly planted Acacia plant species.
Kalangbani village plant site	752142	0987011	*Rophira lanceolata* woodland.
Makoth village plant site	728562	0971647	Rophira woodland savannah (*Pennisetum purpureum*).
Gbaray kabangura plant site	732354	0969155	Matured farmbush dominated by *Anisophyllea laurina* plant species with scattered wild oil palm trees (*Elaeis guineensis*).
Rotuk village plant site	738353	0968008	Matured farm bush dominated by *Anisophyllea laurina* mixed with Chromelaena odorata plant species. Modern Oil palm seen around plant site
Mabaylama village plant site	727263	0975389	*Rophira lanceolata* woodland and patches of cleistanthus collinus plant species.
Katoma village plant site	725761	0976757	Shrubby grassland is dominated by *rophira lanceolata* and *Annona arenaria* plant species. The surrounding is patches of wild oil palm.

The rewilding Maforkie concession areas exhibit a diverse landscape consisting of woodland savanna, open grassland, disturbed farm bush, and patches of secondary forests. These areas are adorned with scattered wild oil palm trees, with only a few planted oil palms, elephant grass, and other tree species. During a recent survey, the dominant plant species identified were Imperata cylindrica, Lophira lanceolata, Croton hirus, Elaeis guineensis, and Mangifera indica. The Bureh, Kasseh, Maconteh, and Debia regions are primarily characterized by farm bush and secondary forests, whereas the Bakeh Loko and Kamasondo chiefdoms are dominated by farm bush and savannah woodland. In the vicinity of Bakeh Loko and Kamasondo chiefdoms, evidence of cattle rearing was observed. However, these areas face significant threats to their habitats, including frequent fires, overgrazing, fuelwood cutting, and charcoal burning by local communities. Consequently, the habitats within the site have undergone substantial modifications due to these activities.

Figure 3. 1: Showing the Landscape and Vegetation Types at Kamasondo Chiefdom

In Table 3.2, a comprehensive list of economic trees found at the concession sites is presented, with their significance decreasing in descending order. Among these trees, the most prominent and economically successful ones include the oil palm (Elaeis guineensis), mango (Mangifera indica), and banana (Musa sapientum). The local communities heavily rely on these trees for their socioeconomic well-being. The oil palm holds immense importance as it is a common ingredient in regional cuisines and possesses a large market in Sierra Leone. Consequently, extensive oil palm plantations are being established across the nation to meet the demands of foreign markets. The oil palm's juicy mesocarp is the source of palm oil, which is widely extracted for various purposes. However, it is worth noting that one of the species identified in the survey, Terminalia ivorensis, is of conservation concern. This species has been listed as vulnerable in the IUCN Red List Category. Although it is not unique to the concession area under investigation, it is known to occur in other parts of Sierra Leone. This discovery highlights the need for conservation efforts to protect vulnerable species and their habitats to maintain the ecological balance and biodiversity of the region.

Table 3. 2: List of some Economic Trees Recorded During the Study.

Fruit species	Plant Family	Common name	Sites recorded					
			Bureh	Kasseh	Debia	Kamasondo	Bekeh L	Maconteh
Elaeis guineensis	Palmae	Oil palm	X	X	X	X	X	X
Mangifera indica	Anacardiaceae	Mango	X	X	X	X	X	X
Citrus sinensis	Rutaceae	Sweet orange	X	X			X	X
Ananas comosus	Bromeliaceae	Pineapple	X	X				X
Cocos	Palmae	Coconut	X	X		X	X	X

nucifera								
Annona muricata	Annonaceae	Sour sap						X
Anacardium occidentale	Anacardiaceae	Cashew	X	X		X		X
Musa sapientum	Musaceae	Banana	X	X		X	X	X
Carica papaya	Caricaceae	Pawpaw	X	X		X	X	X
Psidium guajava	Myrtaceae	Guava	X	X		X		X
Artocarpus comminis	Moraceae	Bread fruit	X	X				X
Spondias cythera	Anacardiaceae	Chuk chuk plum	X	X				X
Termarindus indica	Fabaceae	Tombi	X	X				X
Persea americana	Lauraceae	Piya	X	X				X
Saccharum offficinarum	Poaceae	Sugar cane	X	X				X

The mango, scientifically known as Mangifera indica, is the most found fruit tree in the chiefdoms that were studied. It was observed to be more prevalent in all the chiefdoms that were investigated. Mangoes are a viable hunger fruit due to their availability in various varieties and their seasonal nature, which makes them a valuable source of subsistence income during economically challenging times of the year. With up to five different types of mangoes, these fruits are not only diverse but also delicious, juicy, and sweet when they reach maturity. According to residents, mango fruits usually start appearing around the beginning of the rainy season, which typically falls between March and May. This period also marks the commencement of the farming season, coinciding with a scarcity of food resources for households. Mangoes play a crucial role in sustaining farming activities to a certain extent and contribute to the limited food supply and income available during this time. For further information, a comprehensive list of plant species, along with their coordinates and IUCN (International Union for Conservation of Nature) status, can be found in appendix 5.

3.2 FAUNA

3.2.1 Ichthyofaunal Assemblages and Habitat Description

In the chiefdoms surveyed, aside from the Little Scarcies/Kaba River, a few other waterbodies were discovered. These areas are primarily characterized by woodland savanna and marshland, which typically experience flooding during the peak of the rainy season. However, during the time of the visit, most of the surrounding wetlands were completely dried up, resulting in limited water

resources. As a result, most of the fish species recorded during the survey were found in the Little Scarcies River. The study identified a total of twenty-one (21) fish species, belonging to fourteen different families. Among these, nineteen (19) were finfish, while two were shellfish. Interestingly, there was little variation in the species composition across the different survey sites. The Mormyridae family dominated the fish species found in the wetlands under investigation. Notably, two species, Clarias laeviceps and Malapterurus teugelsi, were identified as being of conservation concern and listed in the IUCN Red List Category as Vulnerable. However, it is important to note that these species are not exclusive to the wetlands under investigation but are known to occur in other rivers and tributaries in Sierra Leone. Previous studies by Payne et al. (2010), Konoyima et al. (2020), Paugy et al. (2003, 2004), and Fermon & Gsegner (2006) have documented their presence. For a comprehensive list of the fish and shellfish recorded during the survey, along with their respective coordinates and habitat descriptions, please refer to Table 3.3.

Figure 3. 2: Photos of Fish Species Recorded During Survey- Left (Heterotilapia buettikoferi), Right (Neochelon falcipinnis)

3.2.2 Livelihood Dependence on Freshwater Fish

Fish food constitutes one of the key ecosystem services provided by aquatic ecosystems in rural settlements. This important aspect has been highlighted by researchers such as Payne et al. (2010) and Konoyima et al. (2020). The availability of fish as a food source plays a vital role in sustaining communities living in these areas. However, in the proposed concessions, fishery dependence by the communities is estimated to be at a relatively low level of 30%. This low dependence can be attributed to the limited presence of waterbodies that support fishing within these concessions, except for the Little Scarcies. It is the Little Scarcies that attracts migrant fishers, making it the primary source of fish for the local communities. Despite the relatively low level of fishery

dependence, the significance of fish as a food source cannot be understated, as it continues to provide sustenance and nourishment to the communities living in these rural settlements.

Table 3. 3:: Finfish and Shellfish Recorded in and around the Rewilding Maforki Concession Area, their IUCN Status and Geographic Range.

Family	Species	IUCN	Geographic Range
Finfish			
Procatopodidae	Propanchax normanii	LC	Africa: rivers in Senegal, Gambia, Guinea, Sierra Leone, Liberia, Mali, Burkina Faso, Côte d'Ivoire, Ghana, Niger, Nigeria, Cameroon, and Chad
Cichlidae	Hemichromis fastiatus	LC	Widely distributed in West Africa, where it is known from most hydrographic basins, from Senegal to the Chad basins, including the West African coastal rivers and the middle and lower parts of the Chad basin
	Coptodon Zillii	LC	Benin; Burkina Faso; Cameroon; Central African Republic; Congo; Congo, The Democratic Republic of the; Côte d'Ivoire; Gabon; Gambia; Ghana; Guinea; Guinea-Bissau; Liberia; Mali; Niger; Nigeria; Senegal; Sierra Leone; Tanzania, Togo; Zambia
	Heterotilapia buettikofer i	LC	Africa: lower reaches of coastal rivers from Guinea-Bissau (Geba and Corubal Rivers) to west Liberia (St. John River).
	Sarotherodon occidentalis	LC	Occurs in west West Africa, Senegal; Côte d'Ivoire; Ghana; Guinea; Liberia; Senegal; Sierra Leone
Cyprinidae	Labeo parvus	LC	Angola; Benin; Burkina Faso; Cameroon; Central African Republic; Chad; Congo; Congo, The Democratic Republic of the; Côte d'Ivoire; Gabon; Gambia; Ghana; Guinea; Guinea-Bissau; Liberia; Mali; Niger; Nigeria; Senegal; Sierra Leone; Tanzania, United Republic of; Togo; Zambia
	Raiamas steindachneri	LC	Côte d'Ivoire; Guinea; Liberia; Sierra Leone
Mormyridae	Mormyrops breviceps	LC	Know to Africa rivers in Côte d'Ivoire; Ghana; Liberia; Guinea-Bissau Guinea; Guinea-Bissau; Liberia; Sierra Leone
	Mormyrus tapirus	LC	Africa: Guinea; Sierra Leone; Liberia; Guinea-Bissau
	Marcusenius mento	LC	West Africa: known from Guinea; Sierra; Liberia
Anabantidae	Ctenopoma kingsleyae	LC	Africa: Senegal; Democratic Republic of the Congo; Mauritania; Guinea; Liberia; Sierra Leone.
Clariidae	Clarias buettikofer	LC	Africa: Gambia; Guinea Bissau, Guinea; Sierra Leone; Liberia; Côte d'Ivoire; Ghana
	Clarias laeviceps	VU	Endemic to Liberia; Ghana; Guinea; Guinea Sierra Leone
Malapteruridae	Malapterurus teugelsi	VU	Africa: endemic to the Kogon River, Guinea
Notopteridae	Papyrocranus afer	LC	Africa: Niger, Senegal, Gambia, Guinea, Liberia and Sierra Leone
Claroteidae	Chrysichthys johnelsi	LC	Widespread in West Africa. Occurring in Senegal; Côte d'Ivoire; Gambia; Ghana; Guinea; Liberia; Senegal; Sierra Leone

Mugilidae	Neochelon falcipinnis	DD	Widespread in West Africa. Occurring in Senegal; Côte d'Ivoire; Gambia; Ghana; Guinea; Liberia; Senegal; Sierra Leone
Monodactylidae	Monodactylus sebae	Not evaluated	Eastern Atlantic: west African coast
Sciaenidae	Pseudotolithus elongatus	LC	Eastern Atlantic: West African coast
Shellfish			
Polaemonidae	Macrobranchium vollenhoveni	LC	Côte d'Ivoire; Ghana; Liberia Burkina Faso; Guinea, Sierra Leone
Potamonautidae	Liberonautes latidactylus	LC	Widespread in West Africa. Occurring in Senegal; Côte d'Ivoire; Gambia; Ghana; Guinea; Liberia; Senegal; Sierra Leone.

***Key**: DD-Data deficient; LC- List concern; VU- Vulnerable*

3.3 Mammals

In this comprehensive survey, a total of sixteen (16) mammal species belonging to nine (9) different families were meticulously documented. The researchers employed various methods to gather data on these species, including direct observation during field surveys, literature review, and interviews with local community members. Among the documented species, three (3) of them, namely *Mastomys natalensis*, *Euxerus erythropus*, and *Funisciurus pyrropus*, were directly observed during the field surveys, providing valuable firsthand information about their presence and behavior. The remaining species' presence was established through a thorough literature review, examining existing knowledge and research in the field. Additionally, interviews with local community members proved to be an invaluable resource, as their insights and observations shed light on the presence of certain species. It is noteworthy that none of the documented species in this survey are currently listed on the IUCN red list, indicating that they are not considered endangered or threatened according to the most recent assessments. For further details and specific information on the documented mammal species, readers are encouraged to refer to Appendix 2, where additional data and findings can be found. This survey serves as a valuable contribution to the field of mammalogy, providing a comprehensive understanding of the mammal diversity within the surveyed area.

Figure 3. 3: Photos of Mammals Recorded within the Project Area During the Survey (Right-Bush buck, Left-Savana cat)

3.4 Birds

A comprehensive survey conducted at the project site revealed the presence of a diverse avian community, consisting of fifty-eight (58) species spanning across 17 different avian families. This remarkable number highlights the rich biodiversity within and around the project area. Remarkably, none of the recorded species were classified as being of global conservation concern according to the International Union for Conservation of Nature (IUCN) in 2022. This positive finding suggests that the local avian population is relatively stable and not at immediate risk of extinction.

However, the survey did identify the occurrence of migratory birds, which added an interesting dimension to the avifauna of the project site. Eight (8) migratory bird species were recorded in total, with four (4) belonging to the afro-tropical (AM) group and four (4) categorized as Palearctic migrants (PM). These migratory species play a crucial role in connecting different ecosystems and are known to undertake long-distance journeys, often crossing continents and oceans. The presence of both AM and PM migrants further underscores the project site's significance as a stopover or wintering ground for these remarkable avian travelers.

Among the recorded species, the majority were identified as resident birds, indicating that they reside in the project site or its vicinity throughout the year. These resident species are well-adapted to the local environment and have established stable populations within the area. Their presence highlights the importance of the project site as a suitable habitat for these avian residents, providing them with the necessary resources such as food, shelter, and breeding sites.

To delve deeper into the avian diversity observed during the survey, interested parties can refer to Appendix 3, which provides additional information, such as the specific species recorded, their distribution patterns, and any notable observations made during the survey. This supplementary information can offer valuable insights into the ecological dynamics and conservation implications

associated with the avian community within and around the project site. Overall, the findings of the survey affirm the ecological value of the project area and emphasize the need for its preservation and sustainable management to ensure the continued existence of this diverse avian community.

Figure 3. 4: Photos of Birds Recorded During the Survey

3.5 Lepidoptera: Butterflies

During the survey conducted, a remarkable total of sixty-one (61) species of butterflies belonging to five (5) different families were discovered. The families identified were *Nymphalidae, Pieridae, Papillionidae, Hesperidae,* and *Lycaenidae*. Among these families, the Nymphalidae family had the highest number of species recorded, with a total of thirty (30) species identified. The Pieridae family followed closely with sixteen (16) species recorded, while the Papillionidae, Hesperidae, and Lycaenidae families had four (4), six (6), and five (5) species recorded, respectively. For further details, please refer to Appendix 4.

It is worth noting that all the butterflies observed within and around the project site did not raise any concerns in terms of global conservation. According to the International Union for Conservation of Nature (IUCN) report of 2022, none of the recorded butterfly species were classified as globally endangered or threatened. This is a positive outcome, as it suggests that the butterfly populations in the survey area are currently stable and not at immediate risk.

However, it is important to mention that none of the recorded butterfly species were found to be endemic to the concession areas being investigated. This means that while these species were not exclusive to the study site, they are known to occur in other parts of Sierra Leone. This information indicates that the butterfly species identified during the survey have a wider distribution within the country, highlighting their ecological importance beyond the project site.

The discovery of such a diverse range of butterflies is significant as it indicates a healthy and diverse ecosystem within the study area. Butterflies play a crucial role in pollination and are often regarded

as indicators of ecosystem health. The presence of multiple butterfly families and species suggests the presence of suitable habitats and food sources for these insects.

Overall, the findings of this survey provide valuable insights into the butterfly diversity in the region. The absence of globally threatened species and the occurrence of butterflies in other parts of Sierra Leone indicate the need for a broader conservation approach beyond the specific project area. By understanding and protecting the habitats that support these butterfly populations, we can contribute to the preservation of Sierra Leone's rich biodiversity and ensure the long-term survival of these beautiful creatures.

Figure 3. 5: Photos of some Butterflies Recorded: Left (Presis pelarga) Middle (Graphium leonidas) Right (Hipolymnas missipus)

3.6 Reptiles

In the concession areas surveyed, a comprehensive study revealed the presence of a diverse range of reptile species. A total of 11 species belonging to seven families were documented through a meticulous process that involved observation, literature review, and interviews with local community members, as highlighted by Menzies in 1966. This collaborative approach ensured a comprehensive understanding of the reptile fauna in the area. It is worth noting that none of the documented species were recognized as threatened on the IUCN red list, as indicated by the latest report in 2022. This finding is encouraging, suggesting that the reptile populations in the concession areas are relatively stable and not facing immediate conservation concerns. For further details and specific information about these species, Annex 4 provides additional insights into their characteristics and distribution.

Figure 3. 6: Photo of Reptile Recorded During the Survey

Table 3. 4: Reptile Species likely to be present at the Concession Areas Based on Literature, Observation, and Interviews.

Species Likely to be Present at the Site Based on Interviews with Communities				
#	**Family**	**Common Name**	**Scientific Name**	**IUCN Status**
1	Elapidae	West African Green Mamba	*Dendroaspis viridis*	LC
2	Elapidae	Black-necked Spitting Cobra	*Naja nigricollis*	LC
3	Agamidae		*Agama*	LC
4	Colubridae	Red-lipped Snake	*Crotaphopeltis hotamboeia*	LC
5	Viperidae	Spotted Night Adder	*Causus maculatus*	LC
6	Viperidae	Puff Adder	*Bitis arietans*	LC
7	Scincidae	Benson's Mabuya	*Trachylepis bensonii*	LC
8	Colubridae	Spotted Bush Snake	*Philothamnus semivariegatus*	LC
9	Psammophidae	Elegant Sand Snake	*Psammophis elegans*	LC
10	Scincidae	Mochlus Fernandi	*Lepidothyris fernandi*	LC
11	Elapidae		*Naja melanoleuca*	LC

Key: LC = Least Concern

3.7 Amphibians

During the field surveys conducted, a comprehensive documentation of amphibian species was achieved, revealing a total of 10 different species belonging to five distinct families. This valuable information sheds light on the diverse amphibian population presents in the surveyed area. Furthermore, it is noteworthy to mention that none of the documented species have been recognized

as threatened on the IUCN red list, an internationally recognized platform for assessing the conservation status of species. This implies that, as of the latest IUCN assessment in 2022, the amphibian species identified during the surveys do not face immediate risks of extinction or severe population decline. This positive finding highlights the importance of conducting such surveys, as they contribute to our understanding of the distribution and conservation status of amphibians, helping inform future conservation efforts. For a detailed overview of the documented species and their respective families, please refer to Table 3.5, which provides a comprehensive summary of the findings.

Figure 3. 7: Photo of Amphibian Recorded During the Survey

Table 3. 5: List of Amphibian species likely to be present at the concession areas based on literature, observation, and interviews with the local community.

#	Family	Common Name	Scientific Name	IUCN Status
1	Dicroglossidae	African Grove-crowned Frog	*Hoplobatrachus occipitalis*	LC
2	Phrynobatrachidae	Ahl's River Frog	*Phrynobatrachus latifrons*	LC
3	Phrynobatrachidae	-	*Phrynobatrachus natalensis*	LC
4	Arthroleptidae	-	*Leptopelis viridis*	LC
5	Ptychadenidae	Sharp-nosed Frog	*Ptychadena oxyrhynchus*	LC
6	Ptychadenidae	Central Grassland Frog	*Ptychadena longirostris*	LC
7	Ptychadenidae		*Ptychadena tournieri*	LC
8	Pipidae	Tropical Clawed Frog	*Xenopus tropicalis*	LC
9	Ptychadenidae	Broad-banded Grass Frog	*Ptychadena bibroni*	LC
10	Ptychadenidae	Mascarene Grass Frog	*Ptychadena mascareniensis*	LC

***Key**: LC = Least Concern*

4 PROJECT IMPACTS AND MITIGATION

The proposed Rewilding Maforki project, with its infrastructural components such as nursery construction, office construction, and security buildings, is expected to have diverse impacts on biodiversity and associated ecosystem services in the concession area. During the land clearing and construction phases of these facilities, several potential impacts on biodiversity are anticipated. One significant impact is the loss of habitat for various fauna species, including mammals, birds, reptiles, amphibians, and invertebrates, due to vegetation clearance. The removal of vegetation can disrupt the natural homes and ecosystems of these animals, potentially leading to population declines or local extinctions.

Another impact is the barrier effect that may be created for crawling fauna such as herpetofauna and small mammals. The construction of physical structures may impede their movement and access to resources, fragmenting their habitats and affecting their ability to thrive. Additionally, habitat degradation may occur because of deforestation, which can lead to the loss of essential resources and disrupt the delicate balance of the ecosystem. The process of land clearing and construction can also introduce pollution, including noise and vibration, as well as solid and liquid waste. These pollutants can have detrimental effects on the surrounding biodiversity, potentially disturbing sensitive species and causing long-term harm.

Lastly, the introduction of alien species is another potential impact of the project. During the construction phase, there is an increased risk of unintentionally introducing non-native species to the area, which can disrupt the existing ecological dynamics and negatively impact native flora and fauna. Overall, while the Rewilding Maforki project aims to restore and conserve biodiversity, it is crucial to carefully consider and mitigate these potential impacts to ensure its success in preserving the ecosystem and its services.

4.1 Impact Assessment Methodology

The Rewilding Maforki project aims to restore and enhance biodiversity in the study area. To assess the potential impacts of this project on biodiversity, the guidelines provided by the International Finance Corporation's (IFC) Performance Standard 6 were utilized. These guidelines emphasize the importance of protecting and conserving biodiversity, maintaining ecosystem services, and sustainably managing natural resources for sustainable development. The potential impacts were evaluated based on several factors, including the location and scale of project activities, supply considerations, proximity to areas of known biodiversity value or ecosystem services, and the types of technology to be employed.

To determine the Level of Concern Category (LCC) for the planned concession areas of the Rewilding Maforki project, a biodiversity inventory was conducted. The LCC indicates the vulnerability of species and habitats based on available data. It considers the extent of project coverage, the probable magnitude and duration of impacts, and the probability of their occurrence. The assessment provides three sensitivity levels: low, medium, and high. The categorization helps in decision-making by considering the direct effect of impacts on development choices and the need for effective mitigation measures.

To minimize the impacts on biodiversity, the mitigation hierarchy recommended by Bennun et al. (2021) was followed. This hierarchy suggests a sequence of mitigation measures including avoidance, minimization, restoration, and offset. By adhering to this hierarchy, the project aims to achieve minimum negative impacts on biodiversity. The anticipated impacts and proposed mitigation measures are outlined in the subsequent sections.

Overall, the Rewilding Maforki project recognizes the significance of biodiversity conservation and ecosystem services in promoting sustainable development. By adhering to the guidelines set forth by the IFC and employing the mitigation hierarchy, the project endeavors to mitigate potential impacts and ensure the preservation and enhancement of biodiversity in the study area.

Table 4. 1: Criteria for Assessing Significance of Impacts (after IFC 2012)

EXTENT		MAGNITUDE	
Localized (At localized scale and a few hectares in extent)	1	Small and will have no effect on the environment	0
Study area (The proposed site and its immediate environs)	2	Minor and will not result in an impact on the processes	2
Regional (County level)	3	Low and will cause a slight impact on the processes	4
National (Country)	4	Moderate and will result in process continuing but in a modified way	6
International (Beyond Kenya)	5	High (processes are altered to the extent that they temporarily cease)	8
		Very high and results in complete destruction of patterns and permanent cessation of the processes	10
DURATION		**PROBABILITY**	
Very short (0 – 1 Years)	1	Highly improbable (<20% chance of occurring)	1
Short (1 – 5 Years)	2	Improbable (20 – 40% chance of occurring)	2
Medium term (5 – 15 years)	3	Probable (40% - 70% chance of occurring)	3
Long term (>15 years)	4	Highly probable (>70% - 90% chance of occurring)	4
Permanent	5	Definite (>90% chance of occurring)	5

Risk = (Extent + Duration + Magnitude) x Probability

Table 4. 2: Ranking of the Significance of Risk

PROBABILITY	CONSEQUENCE (Extent + Duration + Magnitude)																		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
2	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40
3	3	6	9	12	15	18	21	24	27	30	33	36	39	42	45	48	51	54	57	60
4	4	8	12	16	20	24	28	32	36	40	44	48	52	56	60	64	68	72	76	80
5	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100

KEY		
Low	<30	Where this impact would not have a direct influence on the decision to develop in the area
Medium	30-60	Where the impact could influence the decision to develop in the area unless it is effectively mitigated
High	>60	Where the impact must have an influence on the decision process to development.

4.2 Mitigation Measures for Anticipated Impacts on Flora and Fauna

The potential impacts that a project might have on different flora and fauna species can be of significant concern. When undertaking any project, it is crucial to consider the potential consequences it may have on the environment and the various species that inhabit it. Flora and fauna are essential components of ecosystems, and any disturbances or alterations to their habitats can have far-reaching effects. The impacts can range from habitat destruction and fragmentation to changes in population dynamics, species composition, and even the overall functioning of ecosystems. It is vital to assess these potential impacts before moving forward with a project to ensure that any negative consequences are minimized or mitigated.

To address these potential impacts, proposed mitigation measures are essential. These measures aim to reduce or eliminate the adverse effects on flora and fauna species and their habitats. They can include strategies such as habitat restoration, creation of alternative habitats, and implementation of protective measures for vulnerable species. It is crucial to tailor these mitigation measures to the specific needs and characteristics of the affected taxa. By doing so, the project can better address the potential impacts and minimize any negative consequences.

In instances where certain taxa may be more affected, specific attention should be given to developing targeted mitigation measures. For example, if a project involves construction in an area known to be a breeding ground for endangered bird species, special precautions must be taken to minimize disturbances during their breeding season. This could involve implementing buffer zones, restricting access to sensitive areas, or adjusting construction schedules to avoid critical periods for reproduction.

Furthermore, it is beneficial to conduct thorough environmental impact assessments (EIAs) before the initiation of any project. These assessments help identify potential impacts on flora and fauna species, allowing for the development of appropriate mitigation measures. EIAs often involve extensive research, data collection, and consultation with experts to ensure a comprehensive understanding of the potential consequences. This information forms the basis for the proposed mitigation measures, which can then be integrated into the project planning and implementation process.

In summary, considering the potential impacts that a project may have on different flora and fauna species is crucial for responsible and sustainable development. By understanding the potential consequences and implementing appropriate mitigation measures, it is possible to minimize negative impacts and protect the biodiversity and ecological integrity of the area. It is essential to tailor these mitigation measures to the specific needs of the affected taxa and conduct thorough environmental impact assessments to ensure a comprehensive understanding of the potential impacts. By doing so, we can strike a balance between development and environmental conservation, promoting a harmonious coexistence between humans and nature.

4.2.1 Habitat and Biodiversity Loss during Construction and Land Preparation for Planting

During the construction and preparation of land for planting, various activities such as clearing of vegetation and removal of topsoil are necessary. However, these actions can have significant impacts on the surrounding fauna species and their habitats. As the vegetation is cleared, many plants will be uprooted, leading to a loss of habitat for numerous animal species. The disruption caused by these activities forces the fauna to flee to nearby areas in search of new homes.

The challenges faced by fauna species during this migration are manifold. First and foremost, both inter- and intra-specific competition for limited resources such as space and food become a pressing issue. With an influx of individuals from different species into a new area, the struggle to find suitable living conditions and sustenance becomes intensified. This competition for resources can lead to increased stress levels and a decrease in overall population numbers.

Furthermore, the movement of fauna species to new areas can also result in heightened prey-predator interactions. As these animals navigate unfamiliar territories, they may come into contact with new predators or be exposed to increased predation pressure from existing ones. This can have cascading effects on the ecosystem as predator-prey relationships are disrupted, potentially leading to imbalances in the food chain and ecosystem dynamics.

Additionally, the movement of fauna species from their original habitats may expose them to threats such as poaching and persecution by humans. Displaced animals may find themselves in

close proximity to human settlements or areas where hunting activities are prevalent. This puts them at a higher risk of being targeted for illegal trade, trophy hunting, or even simply being seen as pests and subjected to persecution. Human-wildlife conflicts can escalate, posing further challenges for already stressed fauna populations.

In conclusion, during construction and land preparation for planting, the clearing of vegetation and removal of topsoil can have significant consequences for fauna species. The loss of habitat and the need to migrate to new areas can result in inter- and intra-specific competition for resources, increased prey-predator interactions, and exposure to human-related threats. It is crucial to consider and mitigate these impacts to ensure the long-term survival and well-being of the affected fauna populations.

Table 4. 3: Unmitigated Impacts Due Habitat Loss or Fragmentation

UNMITIGATED IMPACTS: Habitat Loss or Fragmentation					
Criteria	Geographic Extent	Magnitude of Impact	Duration	Probability	Risk
Rating	2	4	2	3	Low <30
Proposed mitigation measures 1. *Eighty percent (80%) of indigenous trees within the concession areas must be left intact and protected.* 2. *There should be no killing or harassing of any wildlife escaping/fleeing to other areas during vegetation clearing process.* **3.** *A wildlife relocation management plan needs to be established for the capture and safe release of wildlife encountered during the land clearing*					

4.2.2 Displacement and Mortality of Less Mobile fauna (Land Clearing)

During the clearance of vegetation and soil preparation, it is important to consider the potential impact on slow-moving animals, particularly small mammals such as rats, mice, and shrews, reptiles including snakes, lizards, tortoises, and chameleons, amphibians like frogs, and various invertebrates. These animals, due to their limited mobility and small home ranges, are especially vulnerable to disturbances caused by human activities in their habitats. When vegetation is cleared and soil is prepared, their natural shelters and foraging grounds are often disrupted or destroyed, leading to adverse consequences for their populations. Additionally, these animals may struggle to avoid danger as they are not equipped with rapid escape mechanisms like larger mammals or birds. Therefore, it is crucial for land managers and conservationists to employ strategies that mitigate the potential harm to these slow-moving creatures during habitat clearance and soil preparation, ensuring the preservation of biodiversity and the overall health of ecosystems.

Table 4. 4: Unmitigated Impact Due to Displacement and Killing of Less Mobile Fauna

UNMITIGATED IMPACTS: Displacement and Killing of Less Mobile Fauna					
Criteria	Geographic Extent	Magnitude of Impact	Duration	Probability	Risk
Rating	2	4	1	3	Low (<30)
Proposed mitigation measures 1. *A faunal capture and release exercise (trapping) must be conducted before land clearing commences to relocate any fauna species encountered on site.* 2. *Vegetation clearing should be done in a way that allows animals to flee to nearby suitable habitat which will not be cleared, i.e., systematic, and sequential clearing driving animals towards a direct of safe habitats.* 3. *Fleeing fauna species should be protected and given maximum care and if possible (and safe to do so), assisted to move to nearest suitable habitats*					

4.3 Solid and Liquid Waste Discharge (Land Clearing Phase)

Proper management of domestic and construction waste is crucial due to its potential impact on the environment and various organisms. When waste is generated on-site, it is important to implement effective strategies to handle and dispose of it responsibly. Domestic waste, which includes household garbage and other forms of waste produced in residential areas, can provide microhabitats for certain fauna, such as herpetofauna and invertebrates. These organisms can find shelter and resources within the waste, contributing to biodiversity in unexpected ways. Additionally, the garbage can serve as foraging areas for birds, allowing them to find food and sustenance. However, it is essential to note that the presence of waste also poses risks to the environment and its inhabitants. Amphibians, in particular, are highly sensitive to environmental changes due to their delicate skin structure. Any alterations in their habitat, such as the introduction of pollutants in aquatic environments, can have detrimental effects on their breeding sites and even lead to mass die-offs. This highlights the need for proper waste management practices to mitigate these risks and preserve the delicate balance of ecosystems. One significant concern is the potential presence of chemical residues in the waste, which can poison organisms and enter the food chain. This poses a threat not only to wildlife but also to humans who may consume contaminated food. Therefore, it is crucial to prioritize responsible waste management to minimize the negative impact on organisms and prevent the spread of harmful substances throughout the ecosystem.

Table 4. 5: Unmitigated Impact Due to Accumulation of Various Wastes in the Environment

UNMITIGATED IMPACTS: Accumulation of Various Wastes in the Environment					
Criteria	Geographic Extent	Magnitude of Impact	Duration	Probability	Risk
Rating	2	4	2	5	Low (<30)
Proposed Mitigation Measures: 1. Implement a waste management policy, where project staff should be taken through an induction on the dos and don'ts. This should be followed by constant monitoring and enforcement.					

2. Waste disposal bins should be provided on the project site, separating, organic plastic, paper waste etc., to facilitate recycling. Timely disposal should be ensured.
3. Ensure proper disposal methods for all waste whether solid, liquid, or chemical emanating from the site.

4.4 Management and Monitoring Plan

A biodiversity management and monitoring plan is a crucial tool in conserving and protecting our planet's diverse ecosystems and species. With the increasing threat of habitat loss, climate change, and pollution, it is imperative to implement effective strategies to mitigate these impacts and ensure the long-term survival of biodiversity. A comprehensive management and monitoring plan involves identifying and assessing key biodiversity areas, setting conservation goals, and implementing targeted actions to safeguard these areas. This includes measures such as habitat restoration, invasive species control, and sustainable resource management. Monitoring plays a vital role in evaluating the effectiveness of these conservation efforts and identifying any changes or threats to biodiversity. By regularly monitoring key indicators, such as species populations, habitat quality, and ecosystem health, we can adapt and refine our management strategies accordingly. Additionally, involving local communities, indigenous peoples, and stakeholders in the planning and implementation process is essential for the success of the plan, as it fosters a sense of ownership, knowledge sharing, and collaborative efforts in biodiversity conservation. A well-designed and effectively executed biodiversity management and monitoring plan is essential for maintaining the delicate balance of our ecosystems, preserving species diversity, and ensuring a sustainable future for generations to come.

Table 4. 6: Management and Monitoring Plan

No	Impact	Mitigation Action	Responsible Party	Monitoring Indicator	Monitoring period
Land Clearing/ Construction Phase					
1	Habitat and biodiversity loss due to vegetation clearing	• Retain flooded grassland and swampy areas. • Maintain and conserve the tiny forest patches within the site. • Established tree nurseries of some indigenous plant species for restoration. • Rescue and relocate any animals found	• Project Management/ • Project Ecologist/ Biodiversity consultant.	• Data on flora and fauna abundances, rescue incidences etc. • Availability of forest patches and flooded grasslands. • Frequency of grass fires	• Before the start of the land clearing, during land clearing and after land clearing

		stranded due to habitat loss. • Create awareness among local communities to stop grassland fires			
2	Displacement and mortality of less mobile fauna following vegetation clearance	• Clear vegetation in a way that allows animals to flee to nearby suitable habitats. • Ensure fleeing wildlife is not harassed or killed. • Create awareness among local community against wildlife harassment.	• Project Management/ Project Ecologist/	• Number of stranded animal individuals rescued and moved to safe habitats. • Levels of community awareness on wildlife harassment and animal welfare.	• Before the start of the land clearing, during land clearing and after land clearing.
3	Dust pollution during vegetation clearing and ground preparation for planting.	• Dust suppression during the dry season by spraying water on the ground to avoid dust emissions.	• Biodiversity consultant	• Air quality monitoring reports. • Amount of dust accumulating on plant leaves around the project area	• Before the start of the land clearing, during land clearing and after land clearing.
4	Loss of amphibians' species.	• Retain flooded grassland and swampy areas. • Install exclusion fencing along the wetland zone and 50m upland setback distance within the project area.	• Project Ecologist/ Contractor	• Monitoring the population of different taxa of amphibians within and around the site.	• During the early, mid, and late rainy season.
5	Loss of avian species	• Maintain and conserve mature ingenuous tree and forest patches that serve as nesting	• Project Ecologist/ Contractor	• Monitoring the population of different taxa of avian within and	• Quarterly.

		for birds within the site.		around the site.	
6	Loss of Butterflies species	• Dust suppression avoid dust emissions.	• Project Ecologist/ Contractor	• Monitoring the population of different taxa of butterflies within and around the site.	• Bimonthly
Planting and Other Operational Phase					
1	Influx of invasive alien plant species	• A thorough one-off cleaning of all equipment used from one site to another. • Monitor and physically remove invasive species when detected as they appear. • Create awareness among local staff on the danger of invasive.	• Project Ecologist/ Contractor	• Invasive species management plan. • Absence of invasive species within the project area.	• Bimonthly
2	Loss of fish species due to water pollution	• Implementation of runoff and sediment control measures during plant and fertilization application to greatly limit the number of materials and toxic substances eroded into nearby surface waterbodies. This must be supported by effective and comprehensive stormwater	• Project Ecologist/ Contractor	• Water quality monitoring. • Absence of toxic pollutant into waterbodies within the concession area.	• Bimonthly

		management plan.			

5 CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

The Rewilding Maforki is an interesting case study as it is neither a protected area nor a key biodiversity area. This means that it lacks the legal status and recognition typically associated with areas of high ecological importance. Furthermore, the site is characterized by a significant lack of vegetation cover and flora diversity, indicating a highly impoverished ecosystem. However, despite these challenges, it is worth noting that two fish species, namely *Clarias laeviceps* and *Malapterurus teugelsi*, have been recorded as IUCN red list species. These species are classified as vulnerable, highlighting their precarious status in the wild. It is important to acknowledge that their vulnerability does not meet the threshold for the presence of a critical habitat.

The vegetation in most parts of the study areas has been heavily disturbed due to a variety of factors. Frequent fires, overgrazing, fuelwood cutting, and charcoal burning by the local communities have all contributed to the modification of the habitat. These activities have resulted in significant alterations to the natural landscape, further exacerbating the existing challenges faced by the ecosystem.

Given the current state of the Rewilding Maforki site, it is reasonable to assume that clearing the area for the proposed Rewilding Maforki project will not have major impacts on biodiversity. However, it is important to emphasize that this assumption is contingent upon the implementation of appropriate mitigation measures. By adhering to these measures, it is possible to minimize potential negative impacts and ensure that the project proceeds with the least possible harm to the local flora and fauna.

In conclusion, the Rewilding Maforki represents a unique case where a site lacking legal protection and exhibiting significant ecological impoverishment is home to vulnerable fish species. The heavily disturbed vegetation and modified habitat pose challenges to the preservation of biodiversity. However, with careful planning and adherence to mitigation measures, it is possible to proceed with the proposed Rewilding Maforki project while minimizing negative impacts on the existing flora and fauna.

5.2 Recommendations

To ensure the ecological value of both the direct and surrounding areas of impact is safeguarded, it is crucial to implement the recommended mitigation measures. These measures are designed to mitigate any potential negative impacts that a project may have on the environment. By adhering to these recommendations, the project can minimize harm to the ecosystem and preserve its ecological

value. One effective approach is to employ an ecologist who specializes in understanding and managing ecological systems. This ecologist would play a pivotal role in fast-tracking the recommended mitigation measures for different ecological receptors. They would closely monitor the ecological aspects of the project, ensuring that any potential harm is minimized, and appropriate actions are taken promptly. With their expertise, the ecologist can identify potential ecological risks, propose mitigation strategies, and oversee their implementation. By having an ecologist on board, the project can ensure that ecological considerations remain a top priority, and that the long-term health of the ecosystem is protected.

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7 APPENDICES

Appendix 7. 1: Fish and Shellfish Recorded from the Survey, along with their Coordinates and Habitat Description.

SITE	GPS Coordinates Zone 28P	Species	Description
Byureh Chiefdom Mabombo Village Limpkasar swamp	0744233, 0993843 ELV: 37m	*Hemichromis fastiatus* *Coptodon Zillii* *Malapterurus teugelsi* *Clarias buettikofer* *Liberonautes latidactylus*	Limpkasar swamp is a natural and perennial swamp that flows slowly. Water depth was 2.5 m and width 6m at the time of visit. However, these measurements can exceed during the peak of the rainy season. Water clarity was good.
Bathbana swamp	0736743, 0990327 Elv: 34	*Hemichromis fastiatus* *Coptodon Zillii* *Ctenopoma kingsleyae*	A natural perennial stagnant water body with maximum depth and width of 1.0 and 5m respectively.
Little Scarcies point 1	0736283, 0985659 Elv: 34m	*Raiamas steindachneri* *Mormyrops breviceps* *Macrobranchium vollenhoenii (prawn)* *Sarotherodon occidentalis* *Mormyrus tapirus* *Marcusenius mento* *Notopterus afer* *Tilapia beuttikoferi* *Chrysichthys johnelsi*	Fast flow with high transparency. Average depth was 3m and width was 120m. Bottom sediment: rock/sand
Upper Little Scarcies	0738805, 0984160	*Sarotherodon occidentalis* *Mormyrops breviceps* *Macrobranchium vollenhoenii (prawn)* *Sarotherodon occidentalis* *Mormyrus tapirus* *Notopterus afer* *Liza falcipinnus* *Heterotilapia buettikoferi* *Chrysichthys johnelsi* *Propanchax normanii* *Labeo parvus*	A natural perennial river. The main sediments were rocks/sand. The water was very transparent. Riparian vegetation covered. The average width was about 120m, and the maximum depth was 4m at the point of visit but may exceed current measurements during the peak of the rainy season.
Lower Little Scarcies	0727740, 0977660 14m	*Mormyrops breviceps* *Chrysichthys johnelsi* *Sarotherodon occidentalis* *Macrobranchium vollenhoenii (prawn)* *Mormyrus tapirus* *Papyrocranus afer* *Neochelon falcipinnis* *Ctenopoma kingsleyae* *Monodactylus sebae* *Pseudotolithus elongatus*	A natural perennial river. The main sediments were sand. The water was clear. Low riparian vegetation covered due to high deforestation. The average width was about 130m, and the average depth was 5m at the point of visit but may exceed current measurements during the peak of the rainy season. This point is closer to the estuary. The electrical conductivity and total dissolved solid were high due to the presence of salinity. Some estuary species such as Liza falcipinnus, Psettias sebae and Pseudotolithus elongatus were recorded at this point.

Appendix 7. 2: Mammal's Species Recorded Through Observation and Interviews with Local Community During the Survey Period.

Common Name	Scientific Name	Family	IUCN	Surveyed Sites					
				Bureh	Kasseh	Debia	Kamasondo	Bekeh L	Maconteh
Green monkey	*Chlorocebus sabaeus*	Cercopithecidae	LC	x	x	x			
African giant pouched rat	Cricetomys gambianus	Nesomyidae	LC	x	x	x	x	x	x
Common forest rat	Praomys rostratus	Muridae	LC	x					
Common African rat	Mastomys natalensis		LC	x					
Black rat	*Rattus rattus*		LC						
Guinea multimammate mouse	Mastomys erythrolencus		LC	x	x	x	x		
Dwarf fruit bat	Micropteropus pusillus	Pteropodidae	LC						
Bushbuck	*Tragelaphus scriptus*	Bovidae	LC	x					
Maxwell's Duiker	*Cephalophus maxwelli*		LC	x	x	x			
Striped Ground Squirrel	*Euxerus erythropus*	Sciuridae	LC	x	x	x	x	x	x
Fire-foot rope squirrel	*Funisciurus pyrropus*		LC						x
Marsh Cane-rat	*Thryonomys swinderianus*	Thryonomyidae	LC	x	x	x	x	x	x
Common genet	*Genetta genetta*	Viverridae	Lc		x	x	x		
African Civet	*Civettictis civetta*		LC		x	x	x		x
Savannah Cat	*Leptailurus serval*	Felidae	LC	x	x	x	x	x	

Appendix 7. 3: Birds Species Recorded Through Observation and Interviews with Local Community During the Survey Period

Scientific Names	English Names	Survey sites						Status	
		Bureh	Kasseh	Debia	Kamasondo	Bekeh Loko	Maconteh	Migration Status	IUCN
ARDEIDAE									
Ardea cinerea	Grey Heron	x						PM	LC
Bubulus Ibis	Cattle Egret	x	x	x	x		x	R	LC
Microcarbo africanus	Long-Tailed Comorant	x					x	R	LC

Ciconia episcopus	Woolly-Necked Stock		x	x	x			R	LC
Dendrocygna viduata	White - Faced Whistling Duck	x					x	R	LC
Zapomia flavirostra	Black Crake	x	x	x	x		x	R	LC
Actophilomis africanus	African Jacana	x	x	x	x		x	R	LC
Milvus migrans	Yellow-billed Kite	x	x	x	x	x	x	AM	LC
Gypohierax angolensis	Palm-nut Vulture	x	x	x	x	x		R	LC
Polyboroides typus	African Harrier Hawk	x	x	x	x	x	x	R	LC
Buteo auguralis	Red-necked Buzzard	x		x	x	x	x	R	LC
Kaupifalco monogrammicus	Lizard Buzzard	x	x	x	x	x	x	R	LC
Lophaetus occiptalis	Long-Crested Eagle	x	x			x	X	R	LC
RALLIDAE									
Gallinula chloropus	Common Moorhen	x						R	LC
FALCONIDAE									
Falco biarmicus	Lanner Falcon			x				R	LC
PHASIANIDAE									
Francolinus ahantensis	Ahanta Francolin					x	x	R	LC
Francolinus bicalcaratus	Double-spurred Francolin	x	x	x	x	x	x	R	LC
Numida meleagris	Helemeted Guinea Fowl	x	x	x	x	x	x	R	LC
COLUMBIDAE									
Treron calvus	African Green Pigeon				x	x		R	LC
Turtur tympanistria	Tambourine Dove	x	x	x	x	x	x	R	LC
Turtur afer	Blue-spotted Wood Dove	x	x	x	x	x	x	R	LC
Streptopelia vinacea	Vinaceous Dove	x	x	x	x	x	x	R	LC
Streptopelia semitorquata	Red-eyed Dove	x	x	x	x	x	x	R	LC
Streptopelia senegalensis	Laughing Dove	x	x	x	x	x	x	R	LC
MUSOPHAGIDAE									
Corythaeola cristata	Great Blue Turaco	x	x	x	x	x	x	R	LC
Crinifer piscator	Western Grey Plantain-eater	x	x	x	x	x	x	R	LC
CUCULIDAE									
Oxylophus levaillantii	Levaillant's Cuckoo				x	x	x	R	LC
Chrysococcyx cupreus	African Emerald	x	x	x	x	x	x	R	LC

	Cuckoo								
Chrysococcyx klaas	Klaas's Cuckoo	x	x	x	x	x	x	AM	LC
Centropus senegalensis	Senegal Coucal	x	x	x	x	x		R	LC
STRIGIDAE									
Strix woodfordii	African Wood Owl	x	x	x	x	x	x	R	LC
CAPRIMULGIDAE									
Caprimulgus inornatus	Plain Nightjar	x	x	x	x	x	x	R	LC
APODIDAE									
Cypsiurus parvus	African Palm Swift	x	x	x	x	x	x	R	LC
Apus barbatus	African Black Swift	x	x	x	x	x	x	AM	LC
Apus apus	Common Swift							PM	LC
Apus affinis	Little Swift	x	x	x	x	x	x	R	LC
ALCEDINIDAE									
Halcyon malimbica	Blue-breasted Kingfisher	x	x	x	x	x	x	R	LC
Halcyon senegalensis	Woodland Kingfisher	x	x	x		x	x	R	LC
Alcedo cristata	Malakite Kingfisher	x		x				R	LC
Megaceryle maxima	Giant Kingfisher	x		x	x		x	R	LC
MEROPIDAE									
Merops persicus	Blue-cheeked beaeater	x	x	x	x	x	x	R	LC
Merops pusillus	Little Bee-eater			x	x	x	x	R	LC
CORACIIDAE									
Eurystomus glaucurus	Broad-billed Roller	x	x	x	x	x	x	R	LC
Coracias cyanogaster	Blue Bellied Roller	x	x	x	x	x	x	R	LC
BUCEROTIDAE									
Tockus fasciatus	African Pied Hornbill	x	x	x	x	x	x	R	LC
Bycanistes fistulator	Piping Hornbill	x			x		x	R	LC
CAPITONIDAE									
Gymnobucco calvus	Naked-faced Barbet	x	x	x	x	x	x	R	LC
Pogoniulus scolopaceus	Speckled Tinkerbird	x	x	x	x	x	x	R	LC
Pogoniulus atroflavus	Red-rumped Tinkerbird	x	x	x				R	LC
PICIDAE									
Dendropicos fuscescens	Cardinal Woodpecker	x	x	x	x		x	R	LC
Picus canus	Grey Woodpecker	x	x	x	x		x		LC
HIRUNDINIDAE									
Psalidoprocne nitens	Square-tailed Saw-wing	x	x	x	x	x	x	R	LC

Psalidoprocne obscura	Fanti Saw-wing	x	x	x	x	x	x	R	LC
Hirundo daurica	Red-rumped Swallow	x	x	x	x	x	x	AM	LC
Hirundo lucida	Red-chested Swallow	x	x	x	x			R	LC
Petrochelidon preussi	Preuss's Cliff Swallow				x	x	x	R	LC
Hirundo rustica	Barn Swallow	x	x	x	x			PM	LC
Delichon urbicum	Common House Martin					x	x	PM	LC

Key: Afro-tropical (AM), Palearctic migrants (PM), Resident (R), G Guineo-congolean biome (GC), Recorded (X)

Appendix 7. 4: Butterflies Species Recorded Through Observation and Interviews with local Community During the Survey Period

SPECIES	COMMON NAME	IUCN	Bureh	Kasseh	Debia	Kamasondo	Bekeh L	Maconteh
NYMPHALIDAE								
Precis Octavia	Gaudy commodore	LC	x	x		x	x	
Precis pelarga	Common Commondore	LC	x	x	x	x		
Junonia oenone	Dark Blue Pansy	LC	x	x	x	x	x	x
Junonia Sophia	Little Commodore	LC				x	x	x
Junonia terea	Soldier Pansy	LC	x	x	x	x	x	x
Neptis nemetes	Nemetes Sailer	LC	x		x			x
Neptis serena	River Sailer	LC	x	x		x	x	x
Neptis nicoteles	Clubbed Sailer	LC	x					x
Hamanumida dadaelus	Guinea Fowl	LC	x	x	x	x	x	x
Hypolimnas misippus	Danald Eggfly	LC	x	x	x	x		x
Danaus chrysippus	Plain Tiger	LC	x	x	x	x	x	x
Eurytela hiarbas	Pied Piper	LC						x
Eurytela dryope	Golden Piper	LC		x				
Bicyclus vulgaris	Vulgar bush Brown	LC	x			x		x
Bicyclus milyas	Lesser Bush Brown	LC						x
Bicyclus taenias	Grey Bush Brown	LC						x
Byblia itithyia	The Joker	LC				x	x	x
Byblia anvatara	The African Joker	LC	x	x				
Euriphene incerta	The Uncertain Nymph	LC	x		x			x
Euriphene amicia	The Friendly Nymph	LC	x		x			x

Euriphene leonis	The Sierra Leone Nymph	LC						x
Acraea parrhasia	the Yellow-Veined Acraea	LC	x	x	x	x		x
Acraea acrita	Fiery acraea	LC	x		x	x	x	x
Acraea pseudegina	Westwood acraea	LC		x				
Acraea pharsalus	The pharsalus Acraea	LC	x		x	x	x	
Acraea serena	Small Orange Acraea	LC	x	x	x	x	x	x
Acraea egina	The Elegant Acraea	LC		x		x	x	x
Acraea vestalis	The Smoky Bematistes	LC		x	x	x	x	
Acraea lycoa	Lycoa acraea	LC	x	x	x	x	x	x
Melanitis leda	Common Evening Brown	LC				x		x
PIERIDAE								
Catopsilia florella	African Emigrant	LC	x	x	x	x	x	x
Eurema senegalensis	Forest Grass Yellow	LC	x	x	x	x	x	
Eurema hecabe	Common Grass Yellow	LC	x	x	x	x	x	
Eurema brigitta	Small Grass Yellow	LC	x		x	x	x	x
Eurema regularis	Desjardins Grass Yellow	LC	x	x	x	x	x	x
Nepheronia argai	Large Vagrant	LC		x				
Nepheronia pharis	Round-winged Vagrant	LC				x	x	x
Colotis antevippe	The Large Orange Tip	LC		x	x	x	x	
Colotis euippe	Round-winged Orange Tip	LC	x	x	x	x	x	x
Colotis stygia	Tiny Orange Tip	LC	x	x				
Belonois calypso	Calypso Caper White	LC	x					x
Leptosia medusa	Dainty Spirit	LC	x				x	
Mylothris chloris	Common Dotted Border	LC					x	
Mylothris aburi	Savannah Dotted Border	LC					x	
Mylothris rhodope	Common Dotted Border	LC	x				x	
Nepheronia thalassina	Blue Vagrant	LC	x				x	
PAPILIONIDAE								
Papilio demodocus	Christmas butterfly	LC	x	x	x	x	x	x

Papilio dardanus	Flying Handkerchief	LC			x			
Graphium leonidas	Veined Swallowtail	LC	x			x	x	
Graphium angolanus	White lady	LC	x					x
HESPERIDAE								
Coeliades pisistratus	Two Pip Policeman	LC						x
Coeliades forestan	Striped policeman	LC						x
Eretis lagens	Savannah elf	LC	x	x	x	x		x
Pelopidas mathias	Dark small-banded swift	LC						x
Osmodes laronia	Large white spots	LC						x
Borbo borbonica	Olive haired swift	LC						x
LYCAENIDAE		LC						
Liptena helena	Red-Spot false dots	LC		x				x
Epitola urania	Purple giant epitola	LC						x
Iolaus eurisus	Royal sapphire	LC	x	x	x			x
Hypomyrina mimetica	Libert's orange	LC		x		x		
Anthene liodes	Liodes hairtail	LC						x

Appendix 7. 5: Plant Species Recorded during the Survey Period-June, 2023

PLANT SURVEY FOR RE-WILDING MAFORKI PROJECT							
SPECIES NAME	**FAMILY**	**CHIEFDOM**	**SECTION**	**GPS COORDINATE**	**VEGETATION**	**VILLAGE**	**IUCN**
Nauclea laitifolia	Rubiaceae	Maconthe	Mithormore	28P 073 83 25 099 24 73 E=34	Wetland	Rogbesseh	LC
peper umbellatum	Peperace	Maconthe	Mithormore	28P 073 83 25 099 24 73 E=34	Wetland	Rogbesseh	LC
Scleria berteri	Cyperaceae	Maconthe	Mithormore	28P 073 83 25 099 24 73 E=34	Wetland	Rogbesseh	LC
Urena lobata	Malvaceae	Maconthe	Mithormore	28P 073 83 25 099 24 73 E=34	Wetland	Rogbesseh	LC
Andelphia sp	Graminea	Maconthe	Mithormore	28P 073 83 25 099 24 73 E=34	Wetland	Rogbesseh	LC
Portuculaca oleracea	Portuaceae	Maconthe	Mithormore	28P 073 83 25 099 24 73 E=34	Wetland	Rogbesseh	LC
Thailia genniculata	Marantaceae	Maconthe	Mithormore	28P 073 83 25 099 24 73 E=34	Wetland	Rogbesseh	LC
Pterocarpus santalnoides	Papilionaceae	Maconthe	Mithormore	28P 073 83 25 099 24 73 E=34	Wetland	Rogbesseh	LC

Clappertonia ficifolia	Tiliaceae	Maconthe	Mithormore	28P 073 83 25 099 24 73 E=34	Wetland	Rogbesseh	LC
Alchornea cordifolia	Euphorbiaceae	Maconthe	Mithormore	28P 073 83 25 099 24 73 E=34	Wetland	Rogbesseh	LC
Commelina sp	Commelinaceae	Maconthe	Mithormore	28P 073 83 25 099 24 73 E=34	Wetland	Rogbesseh	LC
Ageratum conyzoides	Compositea	Maconthe	Mithormore	28P 073 83 25 099 24 73 E=34	Wetland	Rogbesseh	LC
Commelina sp	Commelinaceae	Maconthe	Mithormore	28P 073 83 25 099 24 73 E=34	Wetland	Rogbesseh	LC
Urena lobata	Malvaceae	Maconthe	Mithormore	28P 073 83 25 099 24 73 E=34	Wetland	Rogbesseh	LC
Sporobolus dinklagei	Graminea	Maconthe	Mithormore	28P 073 83 25 099 24 73 E=34	Wetland	Rogbesseh	LC
Imperata cylindrica	Graminea	Maconthe	Mithormore	28P 073 83 25 099 24 73 E=34	Wetland	Rogbesseh	LC
Sida spp	Malvaceae	Maconthe	Mithormore	28P 073 83 25 099 24 73 E=34	Wetland	Rogbesseh	LC
Weldelia africana	Compositea	Maconthe	Mithormore	28P 073 83 25 099 24 73 E=34	Wetland	Rogbesseh	LC
Mariscus spp	Cyperaceae	Maconthe	Mithormore	28P 073 83 25 099 24 73 E=34	Wetland	Rogbesseh	LC
Ipomoea spp	Convolvulaceae	Maconthe	Mithormore	28P 073 83 25 099 24 73 E=34	Wetland	Rogbesseh	LC
Solanus torvum	Solanaceae	Maconthe	Mabonbo	074 24 64 099 45 33 E=61	Farm bush	Mabonbo	LC
Lophira lanceolata	Ochnaceae	Maconthe	Mabonbo	75 24 64 099 45 33 E=61	Farm bush	Mabonbo	LC
Pennisetum purpureum	Graminea	Maconthe	Mabonbo	76 24 64 099 45 33 E=61	Farm bush	Mabonbo	LC
Parkia biglobosa	Mimosacea	Maconthe	Mabonbo	77 24 64 099 45 33 E=61	Farm bush	Mabonbo	LC
Pterocarpus santalinoides	Papilionaceae	Maconthe	Mabonbo	78 24 64 099 45 33 E=61	Farm bush	Mabonbo	LC
Imperata cydrical	Graminea	Maconthe	Mabonbo	79 24 64 099 45 33 E=61	Farm bush	Mabonbo	LC
Elaeis guineensis	Palmae	Maconthe	Mabonbo	80 24 64 099 45 33 E=61	Farm bush	Mabonbo	LC
Anisophyllea laurine	Rhizophoraceae	Maconthe	Mabonbo	81 24 64 099 45 33 E=61	Farm bush	Mabonbo	LC
Cassia sieberiana	Caesalpiniaceae	Maconthe	Mabonbo	82 24 64 099 45 33 E=61	Farm bush	Mabonbo	LC
Diospyros heudelotii	Ebenaceae	Maconthe	Mabonbo	83 24 64 099 45 33 E=61	Farm bush	Mabonbo	LC

Dioscorea sp	Dioscoreacea e	Maconthe	Mabonbo	84 24 64 099 45 33 E=61	Farm bush	Mabonbo	LC
Ficus exasperata	Moraceae	Maconthe	Mabonbo	85 24 64 099 45 33 E=61	Farm bush	Mabonbo	LC
Dissotis sp	Melastomace ae	Maconthe	Mabonbo	86 24 64 099 45 33 E=61	Farm bush	Mabonbo	LC
Albizia zygia	Mimosaceae	Maconthe	Mabonbo	87 24 64 099 45 33 E=61	Farm bush	Mabonbo	LC
Alchornea cordifolia	Euphorbiace ae	Maconthe	Mabonbo	88 24 64 099 45 33 E=61	Farm bush	Mabonbo	LC
Gmelina arborea	Verbenaceae	Maconthe	Mabonbo	89 24 64 099 45 33 E=61	Farm bush	Mabonbo	LC
Croton hirtus	Euphorbiace ae	Maconthe	Mabonbo	90 24 64 099 45 33 E=61	Farm bush	Mabonbo	LC
Panicum maximum	Graminea	Maconthe	Mabonbo	91 24 64 099 45 33 E=61	Farm bush	Mabonbo	LC
Centroscema pubeinsis	Papilionacea e	Maconthe	Mabonbo	92 24 64 099 45 33 E=61	Farm bush	Mabonbo	LC
Desmodium adscendens	Papilionacea e	Maconthe	Mabonbo	93 24 64 099 45 33 E=61	Farm bush	Mabonbo	LC
Side sp	Malvaceae	Maconthe	Mabonbo	94 24 64 099 45 33 E=61	Farm bush	Mabonbo	LC
Ceiba pentandra	Bombaceae	Maconthe	Mabonbo	95 24 64 099 45 33 E=61	Farm bush	Mabonbo	LC
Aframomum sp	Zingiberacea e	Maconthe	Mabonbo	96 24 64 099 45 33 E=61	Farm bush	Mabonbo	LC
Lophira lanceolata	Ochnaceae	Maconthe	Mithormore	28P 73 94 91 099 42 93 E=56	Farm bush	Rosellah	LC
Parkia biglobosa	Mimosaceae	Maconthe	Mithormore	28P 73 94 91 099 42 93 E=56	Farm bush	Rosellah	LC
Gmelina arborea	Verbenaceae	Maconthe	Mithormore	28P 73 94 91 099 42 93 E=56	Farm bush	Rosellah	LC
Uvaria chamea	Annonaceae	Maconthe	Mithormore	28P 73 94 91 099 42 93 E=56	Farm bush	Rosellah	LC
Anisophyllea laurina	Rhizophorac aea	Maconthe	Mithormore	28P 73 94 91 099 42 93 E=56	Farm bush	Rosellah	LC
Tetracera potatoria	Dilleniaceae	Maconthe	Mithormore	28P 73 94 91 099 42 93 E=56	Farm bush	Rosellah	LC
Hibiscus sp	Malvaceae	Maconthe	Mithormore	28P 73 94 91 099 42 93 E=56	Farm bush	Rosellah	LC
Diospyros heudelotii	Ebenaceae	Maconthe	Mithormore	28P 73 94 91 099 42 93 E=56	Farm bush	Rosellah	LC
Dialium guineensis	Caesalpiniac eae	Maconthe	Mithormore	28P 73 94 91 099 42 93 E=56	Farm bush	Rosellah	LC

Croton hirtus	Euphorbiaceae	Maconthe	Mithormore	28P 73 94 91 099 42 93 E=56	Farm bush	Rosellah	LC
Salacia senegalensis	Celastraceae	Maconthe	Mithormore	28P 73 94 91 099 42 93 E=56	Farm bush	Rosellah	LC
Pennistum purpureum	Graminea	Maconthe	Mithormore	28P 73 94 91 099 42 93 E=56	Farm bush	Rosellah	LC
Spondia mombin	Anacardiaceae	Maconthe	Mithormore	28P 73 94 91 099 42 93 E=56	Farm bush	Rosellah	LC
Elaeis guineensis	Palmea	Maconthe	Mithormore	28P 73 94 91 099 42 93 E=56	Farm bush	Rosellah	LC
Cassia sp	Caesalpiniaceae	Maconthe	Mithormore	28P 73 94 91 099 42 93 E=56	Farm bush	Rosellah	LC
Nauclea diderrichii	Rubiaceae	Maconthe	Mithormore	28P 73 94 91 099 42 93 E=56	Farm bush	Rosellah	LC
Mussaenda sp	Rubiaceae	Maconthe	Mithormore	28P 73 94 91 099 42 93 E=56	Farm bush	Rosellah	LC
Musanga cecropioides	Moraceae	Maconthe	Mithormore	28P 73 94 91 099 42 93 E=56	Farm bush	Rosellah	LC
Sporobolus dinkligea	Graminea	Maconthe	Mithormore	28P 73 94 91 099 42 93 E=56	Farm bush	Rosellah	LC
Diodia scendens	Rubiaceae	Maconthe	Mithormore	28P 73 94 91 099 42 93 E=56	Farm bush	Rosellah	LC
Tetracera potatoria	Dilleniaceae	Maconthe	Mithormore	28P 73 94 91 099 42 93 E=56	Farm bush	Rosellah	LC
Ipomoea sp	Convulvulaceae	Maconthe	Mithormore	28P 73 94 91 099 42 93 E=56	Farm bush	Rosellah	LC
Lantana camara	verbenaceae	Maconthe	Mithormore	28P 73 94 91 099 42 93 E=56	Farm bush	Rosellah	LC
Newbouldia leavis	Bignoniacea e	Maconthe	Mithormore	28P 73 94 91 099 42 93 E=56	Farm bush	Rosellah	LC
Ficus exasperata	Moracea	Maconthe	Mithormore	28P 73 94 91 099 42 93 E=56	Farm bush	Rosellah	LC
Uvaria chamea	Annonaceae	Maconthe	Mithormore	28P 73 94 91 099 42 93 E=56	Farm bush	Rosellah	LC
panicum maximum	Graminea	Maconthe	Mithormore	28P 73 94 91 099 42 93 E=56	Farm bush	Rosellah	LC
Dichrostachys glomerata	Caesalpiniaceae	Maconthe	Mithormore	28P 73 94 91 099 42 93 E=56	Farm bush	Rosellah	LC
Lophira lanceolata	Ochnaceae	Maconthe	Kayimbo	28P 737052 099 03 50 E=68	Farm bush	Faidug	LC
Anisophyllea laurine	Rhizophoraceae	Maconthe	Kayimbo	28P 737052 099 03 50 E=68	Farm bush	Faidug	LC
Cassia sp	Caesalpiniaceae	Maconthe	Kayimbo	28P 737052 099 03 50 E=68	Farm bush	Faidug	LC

Nauclea latifolia	Rubiaceae	Maconthe	Kayimbo	28P 737052 099 03 50 E=68	Farm bush	Faidug	LC
Pennisetum pur purum	Graminea	Maconthe	Kayimbo	28P 737052 099 03 50 E=68	Farm bush	Faidug	LC
Croyon hirtus	Euphorbiace a	Maconthe	Kayimbo	28P 737052 099 03 50 E=68	Farm bush	Faidug	LC
Elaeis guineenses	Palmae	Maconthe	Kayimbo	28P 737052 099 03 50 E=68	Farm bush	Faidug	LC
Clerodendron scandens	Verbenaceae	Maconthe	Kayimbo	28P 737052 099 03 50 E=68	Farm bush	Faidug	LC
Panicum repens	Graminea	Maconthe	Kayimbo	28P 737052 099 03 50 E=68	Farm bush	Faidug	LC
Parinari excelsa	Chrysobanac eae	Maconthe	Kayimbo	28P 737052 099 03 50 E=68	Farm bush	Faidug	LC
Parkia bicolor	Mimosaceae	Maconthe	Kayimbo	28P 737052 099 03 50 E=68	Farm bush	Faidug	LC
Ageratum conyziodes	Compositae	Maconthe	Kayimbo	28P 737052 099 03 50 E=68	Farm bush	Faidug	LC
Tetracera potatoria	Dilleniaceae	Maconthe	Kayimbo	28P 737052 099 03 50 E=68	Farm bush	Faidug	LC
Diodia scandens	Rubiacea	Maconthe	Kayimbo	28P 737052 099 03 50 E=68	Farm bush	Faidug	LC
Dioscorea sp	Dioscoreacea e	Maconthe	Kayimbo	28P 737052 099 03 50 E=68	Farm bush	Faidug	LC
Ficus exasperata	Moraceae	Maconthe	Kayimbo	28P 737052 099 03 50 E=68	Farm bush	Faidug	LC
Imperata cylindrica	Graminea	Maconthe	Kayimbo	28P 737052 099 03 50 E=68	Farm bush	Faidug	LC
Ipomoea sp	Convolvulac eae	Maconthe	Kayimbo	28P 737052 099 03 50 E=68	Farm bush	Faidug	LC
Alchornea cordifolia	Euphorbiace a	Maconthe	Kayimbo	28P 737052 099 03 50 E=68	Farm bush	Faidug	LC
Spondias mombin	Anacardiace ae	Maconthe	Kayimbo	28P 737052 099 03 50 E=68	Farm bush	Faidug	LC
Gmelina arborea	Verbenaceae	Maconthe	Kayimbo	28P 737052 099 03 50 E=68	Farm bush	Faidug	LC
Lophira lanceolata	Ochnaceae	Bureh	Ferry	28p 736 290 098 56 61 E=4M	Gallery Forest		LC
Nauclea latifolia	Rubiacea	Bureh	Ferry	28p 736 290 098 56 61 E=4M	Gallery Forest		LC
Naucle diderrichii	Rubiacea	Bureh	Ferry	28p 736 290 098 56 61 E=4M	Gallery Forest		LC
Pterocarpus santalinnoides	Papilionacea e	Bureh	Ferry	28p 736 290 098 56 61 E=4M	Gallery Forest		LC

Ficus sp	Morace	Bureh	Ferry	28p 736 290 098 56 61 E=4M	Gallery Forest		LC
Diospyros heudoletii	Ebenaceae	Bureh	Ferry	28p 736 290 098 56 61 E=4M	Gallery Forest		LC
Ficus sp	Moraceae	Bureh	Ferry	28p 736 290 098 56 61 E=4M	Gallery Forest		LC
Imperata cylindrica	Graminea	Bureh	Ferry	28p 736 290 098 56 61 E=4M	Gallery Forest		LC
Ceiba pentandra	Bombacacea e	Bureh	Ferry	28p 736 290 098 56 61 E=4M	Gallery Forest		LC
Eleais guineensis	Palmea	Bureh	Ferry	28p 736 290 098 56 61 E=4M	Gallery Forest		LC
Parinera excelsa	Chrysobalac eae	Bureh	Ferry	28p 736 290 098 56 61 E=4M	Gallery Forest		LC
Desmodium adscendes	Papiloinacea e	Bureh	Ferry	28p 736 290 098 56 61 E=4M	Gallery Forest		LC
Funtumia africana	Apocynaceae	Bureh	Ferry	28p 736 290 098 56 61 E=4M	Gallery Forest		LC
Macaranga sp	Euphorbicea e	Bureh	Ferry	28p 736 290 098 56 61 E=4M	Gallery Forest		LC
Newbouldia laevis	Bignoniacea e	Bureh	Ferry	28p 736 290 098 56 61 E=4M	Gallery Forest		LC
Phyllanthus discoideus	Euphorbiace ae	Bureh	Ferry	28p 736 290 098 56 61 E=4M	Gallery Forest		LC
Dialium guineensis	Caesalpiniac eae	Bureh	Ferry	28p 736 290 098 56 61 E=4M	Gallery Forest		LC
Selaginella myosurus	Selaginellace ae	Bureh	Ferry	28p 736 290 098 56 61 E=4M	Gallery Forest		LC
Scleria bartire	Cyperaceae	Bureh	Ferry	28p 736 290 098 56 61 E=4M	Gallery Forest		LC
Solanum torvum	Solanaceae	Bureh	Ferry	28p 736 290 098 56 61 E=4M	Gallery Forest		LC
Sorindeia juglandifolia	Anacardiace ae	Bureh	Ferry	28p 736 290 098 56 61 E=4M	Gallery Forest		LC
Lophira lanceolata	Ochnaceae	Bureh	Yele sanda	28P 737 785 098 41 67 E=41	Farm bush	Masimbo	LC
Anisophyllea laurine	Rhizophorac eae	Bureh	Yele sanda	28P 737 785 098 41 67 E=41	Farm bush	Masimbo	LC
Alchornea cordifolia	Euphorbiace ae	Bureh	Yele sanda	28P 737 785 098 41 67 E=41	Farm bush	Masimbo	LC
Albizia zygia	Mimosaceae	Bureh	Yele sanda	28P 737 785 098 41 67 E=41	Farm bush	Masimbo	LC
Geophila obvallata	Rubiaceae	Bureh	Yele sanda	28P 737 785 098 41 67 E=41	Farm bush	Masimbo	LC

Harungana madagascariensis	Hypericacea e	Bureh	Yele sanda	28P 737 785 098 41 67 E=41	Farm bush	Masimbo	LC
Spondias mombin	Anacardiace ae	Bureh	Yele sanda	28P 737 785 098 41 67 E=41	Farm bush	Masimbo	LC
Elaeis guineensis	Palmea	Bureh	Yele sanda	28P 737 785 098 41 67 E=41	Farm bush	Masimbo	LC
Ipomoea sp	Convolvulac eae	Bureh	Yele sanda	28P 737 785 098 41 67 E=41	Farm bush	Masimbo	LC
Landolphia calabaica	Apocynaceae	Bureh	Yele sanda	28P 737 785 098 41 67 E=41	Farm bush	Masimbo	LC
Lannea nigritana	Anacardiace ae	Bureh	Yele sanda	28P 737 785 098 41 67 E=41	Farm bush	Masimbo	LC
Panicum sp	Graminea	Bureh	Yele sanda	28P 737 785 098 41 67 E=41	Farm bush	Masimbo	LC
Spilanthes acmella	Compositae	Bureh	Yele sanda	28P 737 785 098 41 67 E=41	Farm bush	Masimbo	LC
Sporobolus dinklagei	Graminea	Bureh	Yele sanda	28P 737 785 098 41 67 E=41	Farm bush	Masimbo	LC
Parinera excesal	Chrysobalan aceae	Bureh	Yele sanda	28P 737 785 098 41 67 E=41	Farm bush	Masimbo	LC
Strchnos sp	Loganiaceae	Bureh	Yele sanda	28P 737 785 098 41 67 E=41	Farm bush	Masimbo	LC
Terminalia ivorensis	Combretacea e	Bureh	Yele sanda	28P 737 785 098 41 67 E=41	Farm bush	Masimbo	VU
Uapaca guineensis	Euphorbiace ae	Bureh	Yele sanda	28P 737 785 098 41 67 E=41	Farm bush	Masimbo	LC
Urena lobata	Malvaceae	Bureh	Yele sanda	28P 737 785 098 41 67 E=41	Farm bush	Masimbo	LC
Uvaria chamea	Ann0naceae	Bureh	Yele sanda	28P 737 785 098 41 67 E=41	Farm bush	Masimbo	LC
Imperata cylindrica	Graminea	Bureh	Yele sanda	28P 737 785 098 41 67 E=41	Farm bush	Masimbo	LC
Pterocarpus santalinoides	Papilionacea e	Bureh	Yele sanda	28P738 779 098 45 17 E=9	Gallery Forest	Masimbo river	LC
Myrianthus spp	Moraceae	Bureh	Yele sanda	28P738 779 098 45 17 E=9	Gallery Forest	Masimbo river	LC
Thalia geniculata	Marantaceae	Bureh	Yele sanda	28P738 779 098 45 17 E=9	Gallery Forest	Masimbo river	LC
Nauclea latifolia	Rubiaceae	Bureh	Yele sanda	28P738 779 098 45 17 E=9	Gallery Forest	Masimbo river	LC
Newbouldia laevis	Bignoniacea e	Bureh	Yele sanda	28P738 779 098 45 17 E=9	Gallery Forest	Masimbo river	LC
Elaeis guineensis	Palmea	Bureh	Yele sanda	28P738 779 098 45 17 E=9	Gallery Forest	Masimbo river	LC

Spondias mombim	Anacardiaceae	Bureh	Yele sanda	28P738 779 098 45 17 E=9	Gallery Forest	Masimbo river	LC
Anisophyllea laurine	Rhizophoraceae	Bureh	Yele sanda	28P738 779 098 45 17 E=9	Gallery Forest	Masimbo river	LC
Ceiba pentandra	Bombacaceae	Bureh	Yele sanda	28P738 779 098 45 17 E=9	Gallery Forest	Masimbo river	LC
Sorindeia juglandifolia	Anacardiaceae	Bureh	Yele sanda	28P738 779 098 45 17 E=9	Gallery Forest	Masimbo river	LC
Tetracera potatoria	Dilleniaceae	Bureh	Yele sanda	28P738 779 098 45 17 E=9	Gallery Forest	Masimbo river	LC
Geophila obvallata	Rubiaceae	Bureh	Yele sanda	28P738 779 098 45 17 E=9	Gallery Forest	Masimbo river	LC
Uvaria chamea	Annonaceae	Bureh	Yele sanda	28P738 779 098 45 17 E=9	Gallery Forest	Masimbo river	LC
Lantana camara	Verbenaceae	Bureh	Yele sanda	28P738 779 098 45 17 E=9	Gallery Forest	Masimbo river	LC
Harungana madagascariensis	Hypericaceae	Bureh	Yele sanda	28P738 779 098 45 17 E=9	Gallery Forest	Masimbo river	LC
Uapaca guineensis	Euphorbiaceae	Bureh	Yele sanda	28P738 779 098 45 17 E=9	Gallery Forest	Masimbo river	LC
Carapa procera	Meliaceae	Bureh	Yele sanda	28P738 779 098 45 17 E=9	Gallery Forest	Masimbo river	LC
Alchornea cordifolia	Euphorbiaceae	Bureh	Yele sanda	28P738 779 098 45 17 E=9	Gallery Forest	Masimbo river	LC
Uapaca heudelotii	Euphorbicea e	Bureh	Yele sanda	28P738 779 098 45 17 E=9	Gallery Forest	Masimbo river	LC
Drypetes spp	Euphorbiaceae	Bureh	Yele sanda	28P738 779 098 45 17 E=9	Gallery Forest	Masimbo river	LC
Dichrostachys glomerata	Mimosaceae	Bureh	Yele sanda	28P738 779 098 45 17 E=9	Gallery Forest	Masimbo river	LC
Pennisetum purpureum	Graminea	Bureh	Makanneh	28P 739 062 098 24 97 E=25	grassland	Cimbeac	LC
Imperata cylindria	Graminea	Bureh	Makanneh	28P 739 062 098 24 97 E=25	grassland	Cimbeac	LC
Croton hirtus	Euphorbiaceae	Bureh	Makanneh	28P 739 062 098 24 97 E=25	grassland	Cimbeac	LC
Commelina spp	Commelinaceae	Bureh	Makanneh	28P 739 062 098 24 97 E=25	grassland	Cimbeac	LC
Sporobolus dinklagei	Graminea	Bureh	Makanneh	28P 739 062 098 24 97 E=25	grassland	Cimbeac	LC
Lantana camara	Verbenaceae	Bureh	Makanneh	28P 739 062 098 24 97 E=25	grassland	Cimbeac	LC
Calagopogon spp	Papilionacea e	Bureh	Makanneh	28P 739 062 098 24 97 E=25	grassland	Cimbeac	LC

Sida acuta	Malvaceae	Bureh	Makanneh	28P 739 062 098 24 97 E=25	grassland	Cimbeac	LC
Diodia scandens	Rubiaceae	Bureh	Makanneh	28P 739 062 098 24 97 E=25	grassland	Cimbeac	LC
Spondias mombin	Anacardiaceae	Bureh	Makanneh	28P 739 062 098 24 97 E=	grassland	Cimbeac	LC
Eleais guineensis	Palmea	Bureh	Makanneh	28P 739 062 098 24 97 E=25	grassland	Cimbeac	LC
Parinera excelsa	Chrysobalanaceae	Bureh	Makanneh	28P 739 062 098 24 97 E=25	grassland	Cimbeac	LC
Mariscus spp	Cyperaceae	Bureh	Makanneh	28P 739 062 098 24 97 E=25	grassland	Cimbeac	LC
Cyperus articulatus	Cyperaceae	Bureh	Makanneh	28P 739 062 098 24 97 E=25	grassland	Cimbeac	LC
Ageratum conyzoides	Compositea	Bureh	Makanneh	28P 739 062 098 24 97 E=25	grassland	Cimbeac	LC
Chromolina odoratum	Compositea	Bureh	Makanneh	28P 739 062 098 24 97 E=25	grassland	Cimbeac	LC
Panicum maximum	Graminea	Bureh	Makanneh	28P 739 062 098 24 97 E=25	grassland	Cimbeac	LC
Clerodendron scandens	Verbenaceae	Bureh	Makanneh	28P 739 062 098 24 97 E=25	grassland	Cimbeac	LC
Wildelia africana	Compositea	Bureh	Makanneh	28P 739 062 098 24 97 E=25	grassland	Cimbeac	LC
Ficuc exasperata	Moraceae	Bureh	Makanneh	28P 739 062 098 24 97 E=25	grassland	Cimbeac	LC
Desmodium adscendens	Papilionaceae	Bureh	Makanneh	28P 739 062 098 24 97 E=25	grassland	Cimbeac	LC
Lophira lanceolata	Ochnaceae	Bureh	Rogbalam	28P 736 167 098 12 73 E=36	Farm bush	Rogbalam	LC
Parinera excelsa	Chrysobalanaceae	Bureh	Rogbalam	28P 736 167 098 12 73 E=36	Farm bush	Rogbalam	LC
Uvaria chamea	Annonaceae	Bureh	Rogbalam	28P 736 167 098 12 73 E=36	Farm bush	Rogbalam	LC
Lantana camara	Verbenaceae	Bureh	Rogbalam	28P 736 167 098 12 73 E=36	Farm bush	Rogbalam	LC
Pennisetum purpureum	Graminea	Bureh	Rogbalam	28P 736 167 098 12 73 E=36	Farm bush	Rogbalam	LC
Tetracera potatoria	Dilleniaceae	Bureh	Rogbalam	28P 736 167 098 12 73 E=36	Farm bush	Rogbalam	LC
Terminalia ivorenses	Combretaceae	Bureh	Rogbalam	28P 736 167 098 12 73 E=36	Farm bush	Rogbalam	VU
Eleais guineensis	Palmea	Bureh	Rogbalam	28P 736 167 098 12 73 E=36	Farm bush	Rogbalam	LC

Ceiba pentandra	Bombacacea e	Bureh	Rogbalam	28P 736 167 098 12 73 E=36	Farm bush	Rogbalam	LC
Dichstachys glomerata	MImosaceae	Bureh	Rogbalam	28P 736 167 098 12 73 E=36	Farm bush	Rogbalam	LC
Dialium guineense	Caesalpiniac eae	Bureh	Rogbalam	28P 736 167 098 12 73 E=36	Farm bush	Rogbalam	LC
Dioscorea spp	Dioscoraceae	Bureh	Rogbalam	28P 736 167 098 12 73 E=36	Farm bush	Rogbalam	LC
Phyllanthus discoideus	Euphorbia	Bureh	Rogbalam	28P 736 167 098 12 73 E=36	Farm bush	Rogbalam	LC
Croton hirtus	Euphorbicea e	Bureh	Rogbalam	28P 736 167 098 12 73 E=36	Farm bush	Rogbalam	LC
Nauclea latifolia	Rubiaceae	Bureh	Rogbalam	28P 736 167 098 12 73 E=36	Farm bush	Rogbalam	LC
Sida acuta	Malvaceae	Bureh	Rogbalam	28P 736 167 098 12 73 E=36	Farm bush	Rogbalam	LC
Parkia biglobosa	Mimosaceae	Bureh	Rogbalam	28P 736 167 098 12 73 E=36	Farm bush	Rogbalam	LC
Scleria berteri	Cyperaceae	Bureh	Rogbalam	28P 736 167 098 12 73 E=36	Farm bush	Rogbalam	LC
Spondias mombin	Anacardiace ae	Bureh	Rogbalam	28P 736 167 098 12 73 E=36	Farm bush	Rogbalam	LC
Ficus exasperata	Moraceae	Bureh	Rogbalam	28P 736 167 098 12 73 E=36	Farm bush	Rogbalam	LC
Lantana camara	Verbenaceae	Bureh	Rogbalam	28P 736 167 098 12 73 E=36	Farm bush	Rogbalam	LC
Croton hirtus	Euphorbiace ae	Bureh	Rogbalam	28P 736 167 098 12 73 E=36	Farm bush	Rogbalam	LC
Commmelina spp	Commeliniac eae	Bureh	Rogbalam	28P 736 167 098 12 73 E=36	Farm bush	Rogbalam	LC
Cassia sieberiana	Caesalpiniac eae	Bureh	Rogbalam	28P 736 167 098 12 73 E=36	Farm bush	Rogbalam	LC
Carapa procera	Meliaceae	Bureh	Rogbala	28p 737 428 097 99 71 E=31	Farm bush	Masesay	LC
Achornea cordifolia	Euphorbiace ae	Bureh	Rogbala	28p 737 428 097 99 71 E=31	Farm bush	Masesay	LC
Spondias mombin	Anacardiace ae	Bureh	Rogbala	28p 737 428 097 99 71 E=31	Farm bush	Masesay	LC
Ceiba pentandra	Bombacacea e	Bureh	Rogbala	28p 737 428 097 99 71 E=31	Farm bush	Masesay	LC
Lantana camara	Verbenaceae	Bureh	Rogbala	28p 737 428 097 99 71 E=31	Farm bush	Masesay	LC
Pennisetum purpureum	Graminea	Bureh	Rogbala	28p 737 428 097 99 71 E=31	Farm bush	Masesay	LC

Chlorophora regia	Moraceae	Bureh	Rogbala	28p 737 428 097 99 71 E=31	Farm bush	Masesay	LC
Uvaria chamea	Annonaceae	Bureh	Rogbala	28p 737 428 097 99 71 E=31	Farm bush	Masesay	LC
Desmodium adscendens	Papilionaceae	Bureh	Rogbala	28p 737 428 097 99 71 E=31	Farm bush	Masesay	LC
Diodia scandens	Rubiaceae	Bureh	Rogbala	28p 737 428 097 99 71 E=31	Farm bush	Masesay	LC
Dioscorae minutifora	Dioscoreaceae	Bureh	Rogbala	28p 737 428 097 99 71 E=31	Farm bush	Masesay	LC
Dracenea mannii	Agavaceae	Bureh	Rogbala	28p 737 428 097 99 71 E=31	Farm bush	Masesay	LC
Sida acuta	Malvaceae	Bureh	Rogbala	28p 737 428 097 99 71 E=31	Farm bush	Masesay	LC
Hibiscus sterculifoius	Malvaceae	Bureh	Rogbala	28p 737 428 097 99 71 E=31	Farm bush	Masesay	LC
Ficus exasperata	Moracea	Bureh	Rogbala	28p 737 428 097 99 71 E=31	Farm bush	Masesay	LC
Imperata cylindrica	Graminea	Bureh	Rogbala	28p 737 428 097 99 71 E=31	Farm bush	Masesay	LC
Landolphila calabarica	Apocynaceae	Bureh	Rogbala	28p 737 428 097 99 71 E=31	Farm bush	Masesay	LC
Diospyros heudelotii	Ebenaceae	Bureh	Rogbala	28p 737 428 097 99 71 E=31	Farm bush	Masesay	LC
Uapaca guineensis	Euphorbiaceae	Bureh	Rogbala	28p 737 428 097 99 71 E=31	Farm bush	Masesay	LC
Lophira lanceolata	Ochnaceaec	Bureh	Rogbala	28p 737 428 097 99 71 E=31	Farm bush	Masesay	LC
Vismia guineensis	Hypericaceae	Bureh	Rogbala	28p 737 428 097 99 71 E=31	Farm bush	Masesay	LC
Lophira lanceolata	Ochnaceae	Bureh	Makanneh	28P 741 460 098 10 31 E=59	Farm bush	Making	LC
Pennisetum purpureum	Graminea	Bureh	Makanneh	28P 741 460 098 10 31 E=59	Farm bush	Making	LC
Nauclea latifolia	Rubiaceae	Bureh	Makanneh	28P 741 460 098 10 31 E=59	Farm bush	Making	LC
Naulea diderrichii	Rubiaceae	Bureh	Makanneh	28P 741 460 098 10 31 E=59	Farm bush	Making	LC
Parkia biglobosa	Mimosaceae	Bureh	Makanneh	28P 741 460 098 10 31 E=59	Farm bush	Making	LC
Parinari excelsa	Chrysobalanaceae	Bureh	Makanneh	28P 741 460 098 10 31 E=59	Farm bush	Making	LC
Anisophyllea laurina	Rhizophoraceae	Bureh	Makanneh	28P 741 460 098 10 31 E=59	Farm bush	Making	LC

Lantana camara	Verbenaceae	Bureh	Makanneh	28P 741 460 098 10 31 E=59	Farm bush	Making	LC
Imperata cylindrica	Graminea	Bureh	Makanneh	28P 741 460 098 10 31 E=59	Farm bush	Making	LC
Pennisetum subangustum	Graminea	Bureh	Makanneh	28P 741 460 098 10 31 E=59	Farm bush	Making	LC
Musanga cecropioides	Moraceae	Bureh	Makanneh	28P 741 460 098 10 31 E=59	Farm bush	Making	LC
Rinorea spp	Violaceae	Bureh	Makanneh	28P 741 460 098 10 31 E=59	Farm bush	Making	LC
Samanea dinklagei	Mimosaceae	Bureh	Makanneh	28P 741 460 098 10 31 E=59	Farm bush	Making	LC
Alchornea cordifolia	Euphorbiaceae	Bureh	Makanneh	28P 741 460 098 10 31 E=59	Farm bush	Making	LC
Sapindus saponaria	Sapindaceae	Bureh	Makanneh	28P 741 460 098 10 31 E=59	Farm bush	Making	LC
Clerodendron scandens	Verbenaceae	Bureh	Makanneh	28P 741 460 098 10 31 E=59	Farm bush	Making	LC
Gmelina arborea	Verbenaceae	Bureh	Makanneh	28P 741 460 098 10 31 E=59	Farm bush	Making	LC
Anadelphia spp	Graminea	Bureh	Makanneh	28P 741 460 098 10 31 E=59	Farm bush	Making	LC
Solanus torvum	Solanaceae	Bureh	Makanneh	28P 741 460 098 10 31 E=59	Farm bush	Making	LC
Coffea spp	Rubiceae	Bureh	Makanneh	28P 741 460 098 10 31 E=59	Farm bush	Making	LC
Pennisetum purpureum	Graminea	Kasseh	Romeni	28P 750 481 098 49 30 E=41M	Farm bush	Romeni	LC
Lophira lanceolata	Ochnaceae	Kasseh	Romeni	28P 750 481 098 49 30 E=41M	Farm bush	Romeni	LC
Xylopia eathiopica	Annonaceae	Kasseh	Romeni	28P 750 481 098 49 30 E=41M	Farm bush	Romeni	LC
Sida stipulata	Malvaceae	Kasseh	Romeni	28P 750 481 098 49 30 E=41M	Farm bush	Romeni	LC
Coffea spp	Rubiaceae	Kasseh	Romeni	28P 750 481 098 49 30 E=41M	Farm bush	Romeni	LC
Desmodium adscendens	Papilionacea	Kasseh	Romeni	28P 750 481 098 49 30 E=41M	Farm bush	Romeni	LC
Dialium guineense	Caesslpiniaceae	Kasseh	Romeni	28P 750 481 098 49 30 E=41M	Farm bush	Romeni	LC
Imperata cylindrica	Graminea	Kasseh	Romeni	28P 750 481 098 49 30 E=41M	Farm bush	Romeni	LC
Urena lobata	Malvaceae	Kasseh	Romeni	28P 750 481 098 49 30 E=41M	Farm bush	Romeni	LC

Cassia sieberiana	Caesalpiniaceae	Kasseh	Romeni	28P 750 481 098 49 30 E=41M	Farm bush	Romeni	LC
Sida acuta	Malvaceae	Kasseh	Romeni	28P 750 481 098 49 30 E=41M	Farm bush	Romeni	LC
Psidium guajava	Myrtaceae	Kasseh	Romeni	28P 750 481 098 49 30 E=41M	Farm bush	Romeni	LC
Parkia biglobosa	Mimosaceae	Kasseh	Romeni	28P 750 481 098 49 30 E=41M	Farm bush	Romeni	LC
Chromolina odoratum	Compositea	Kasseh	Romeni	28P 750 481 098 49 30 E=41M	Farm bush	Romeni	LC
Nauclea latifolia	Rubiaceae	Kasseh	Romeni	28P 750 481 098 49 30 E=41M	Farm bush	Romeni	LC
Ficus exasperata	Moraceae	Kasseh	Romeni	28P 750 481 098 49 30 E=41M	Farm bush	Romeni	LC
Alusine indica	Graminea	Kasseh	Romeni	28P 750 481 098 49 30 E=41M	Farm bush	Romeni	LC
Croton hirtus	Euphorbiaceae	Kasseh	Romeni	28P 750 481 098 49 30 E=41M	Farm bush	Romeni	LC
Spondias mombin	Anacardiaceae	Kasseh	Romeni	28P 750 481 098 49 30 E=41M	Farm bush	Romeni	LC
Newbouldia leavis	Bignoniaceae	Kasseh	Romeni	28P 750 481 098 49 30 E=41M	Farm bush	Romeni	LC
Uvaria chamea	Annonaceae	Kasseh	Romeni	28P 750 481 098 49 30 E=41M	Farm bush	Romeni	LC
Fics exasperata	Moraceae	Kasseh	Romeni	28P 750 481 098 49 30 E=41M	Farm bush	Romeni	LC
Panicun maximum	Graminea	Kasseh	Rogbithan	28P 747 398 098 63 76 E=51	Secondary forest	Mabureh	LC
Lophira lanceolata	Ochnaceae	Kasseh	Rogbithan	28P 747 398 098 63 76 E=51	Secondary forest	Mabureh	LC
Pennisetum purpureum	Graminea	Kasseh	Rogbithan	28P 747 398 098 63 76 E=51	Secondary forest	Mabureh	LC
Imperata cylundrica	Graminea	Kasseh	Rogbithan	28P 747 398 098 63 76 E=51	Secondary forest	Mabureh	LC
Diodia scandens	Rubiaceae	Kasseh	Rogbithan	28P 747 398 098 63 76 E=51	Secondary forest	Mabureh	LC
Parkia bicolor	Mimosaceae	Kasseh	Rogbithan	28P 747 398 098 63 76 E=51	Secondary forest	Mabureh	LC
Sida acuta	Malvaceae	Kasseh	Rogbithan	28P 747 398 098 63 76 E=51	Secondary forest	Mabureh	LC
Lantana camara	Verbenaceae	Kasseh	Rogbithan	28P 747 398 098 63 76 E=51	Secondary forest	Mabureh	LC
Gmelina arborea	Verbenaceae	Kasseh	Rogbithan	28P 747 398 098 63 76 E=51	Secondary forest	Mabureh	LC

Geophila obvallata	Rubiaceae	Kasseh	Rogbithan	28P 747 398 098 63 76 E=51	Secondary forest	Mabureh	LC
Uvaria chamea	Annonaceae	Kasseh	Rogbithan	28P 747 398 098 63 76 E=51	Secondary forest	Mabureh	LC
Newbouldia leavis	Bignoniaceae	Kasseh	Rogbithan	28P 747 398 098 63 76 E=51	Secondary forest	Mabureh	LC
Tetracera potatoria	Dilleniaceae	Kasseh	Rogbithan	28P 747 398 098 63 76 E=51	Secondary forest	Mabureh	LC
Sida stipulata	Malvaceae	Kasseh	Rogbithan	28P 747 398 098 63 76 E=51	Secondary forest	Mabureh	LC
Ageratum conyzoides	Compositea	Kasseh	Rogbithan	28P 747 398 098 63 76 E=51	Secondary forest	Mabureh	LC
Weldelia africana	Compositea	Kasseh	Rogbithan	28P 747 398 098 63 76 E=51	Secondary forest	Mabureh	LC
Dissotis spp	Melastomaceae	Kasseh	Rogbithan	28P 747 398 098 63 76 E=51	Secondary forest	Mabureh	LC
Elaeis guineensis	Palmea	Kasseh	Rogbithan	28P 747 398 098 63 76 E=51	Secondary forest	Mabureh	LC
Terminalia ivorensis	Combretaceae	Kasseh	Rogbithan	28P 747 398 098 63 76 E=51	Secondary forest	Mabureh	VU
Diospyros heudelotii	Ebenaceae	Kasseh	Rogbithan	28P 747 398 098 63 76 E=51	Secondary forest	Mabureh	LC
Macaranga spp	Euphorbiaceae	Kasseh	Rogbithan	28P 747 398 098 63 76 E=51	Secondary forest	Mabureh	LC
Alchornea cordifolia	Euphorbiaceae	Kasseh	Rotifunk	28P 748 004 099 12 23 E=35	Farm bush	Rogbala	LC
Lophira alata	Ochnaceae	Kasseh	Rotifunk	28P 748 004 099 12 23 E=35	Farm bush	Rogbala	LC
Pennisetum pur pureum	Graminea	Kasseh	Rotifunk	28P 748 004 099 12 23 E=35	Farm bush	Rogbala	LC
Phyllanthus discoideus	Euphorbiaceae	Kasseh	Rotifunk	28P 748 004 099 12 23 E=35	Farm bush	Rogbala	LC
Pariinera excelsa	Chrysobalanaceae	Kasseh	Rotifunk	28P 748 004 099 12 23 E=35	Farm bush	Rogbala	LC
Chromolina odoratum	Compositea	Kasseh	Rotifunk	28P 748 004 099 12 23 E=35	Farm bush	Rogbala	LC
Gmelina arborea	Verbenaceae	Kasseh	Rotifunk	28P 748 004 099 12 23 E=35	Farm bush	Rogbala	LC
Ficus exasperata	Moraceae	Kasseh	Rotifunk	28P 748 004 099 12 23 E=35	Farm bush	Rogbala	LC
Mimosa pudica	Mimosaceae	Kasseh	Rotifunk	28P 748 004 099 12 23 E=35	Farm bush	Rogbala	LC
Geophila obvallata	Rubiaceae	Kasseh	Rotifunk	28P 748 004 099 12 23 E=35	Farm bush	Rogbala	LC

Harungana madagascariensis	Hypericeae	Kasseh	Rotifunk	28P 748 004 099 12 23 E=35	Farm bush	Rogbaia	LC
Pariinera excelsa	Chrysobalanaceae	Kasseh	Kangbatha	28P 752 054 098 01 13 E=48M	Farm bush	Kombrabia	LC
Chromolina odoratum	Compositea	Kasseh	Kangbatha	28P 752 054 098 01 13 E=48M	Farm bush	Kombrabia	LC
Gmelina arborea	Verbenaceae	Kasseh	Kangbatha	28P 752 054 098 01 13 E=48M	Farm bush	Kombrabia	LC
Lophira alata	Ochnaceae	Kasseh	Kangbatha	28P 752 054 098 01 13 E=48M	Farm bush	Kombrabia	LC
Pennisetum pur pureum	Graminea	Kasseh	Kangbatha	28P 752 054 098 01 13 E=48M	Farm bush	Kombrabia	LC
Gmelina arborea	Verbenaceae	Kasseh	Kangbatha	28P 752 054 098 01 13 E=48M	Farm bush	Kombrabia	LC
Ficus exasperata	Moraceae	Kasseh	Kangbatha	28P 752 054 098 01 13 E=48M	Farm bush	Kombrabia	LC
Mimosa pudica	Mimosaceae	Kasseh	Kangbatha	28P 752 054 098 01 13 E=48M	Farm bush	Kombrabia	LC
Geophila obvallata	Rubiaceae	Kasseh	Kangbatha	28P 752 054 098 01 13 E=48M	Farm bush	Kombrabia	LC
Harungana madagascariensis	Hypericeae	Kasseh	Kangbatha	28P 752 054 098 01 13 E=48M	Farm bush	Kombrabia	LC
Elaeis guineensis	Palmea	Kasseh	Kangbatha	28P 752 054 098 01 13 E=48M	Farm bush	Kombrabia	LC
Cassia sp	Caesalpiniaceae	Kasseh	Kangbatha	28P 752 054 098 01 13 E=48M	Farm bush	Kombrabia	LC
Nauclea diderrichii	Rubiaceae	Kasseh	Kangbatha	28P 752 054 098 01 13 E=48M	Farm bush	Kombrabia	LC
Mussaenda sp	Rubiaceae	Kasseh	Kangbatha	28P 752 054 098 01 13 E=48M	Farm bush	Kombrabia	LC
Parinari excelsa	Chrysobanaceae	Kasseh	Kangbatha	28P 752 054 098 01 13 E=48M	Farm bush	Kombrabia	LC
Parkia bicolor	Mimosaceae	Kasseh	Marenk 1	28P 752 801 099 28 79 E= 54M	Farm bush	Mbagbado	LC
Commelina spp	Commelinaceae	Kasseh	Marenk 1	28P 752 801 099 28 79 E= 54M	Farm bush	Mbagbado	LC
Sporobolus dinklagei	Graminea	Kasseh	Marenka 1	28P 752 801 099 28 79 E= 54M	Farm bush	Mbagbado	LC
Ipomoea sp	Convolvulaceae	Kasseh	Marenka 1	28P 752 801 099 28 79 E= 54M	Farm bush	Mbagbado	LC
Landolphia calabaica	Apocynaceae	Kasseh	Marenka 1	28P 752 801 099 28 79 E= 54M	Farm bush	Mbagbado	LC
Alchornea cordifolia	Euphorbiaceae	Kasseh	Marenka 1	28P 752 801 099 28 79 E= 54M	Farm bush	Mbagbado	LC

Lophira alata	Ochnaceae	Kasseh	Marenka 1	28P 752 801 099 28 79 E= 54M	Farm bush	Mbagbado	LC
Pennisetum pur pureum	Graminea	Kasseh	Marenka 1	28P 752 801 099 28 79 E= 54M	Farm bush	Mbagbado	LC
Phyllanthus discoideus	Euphorbiaceae	Kasseh	Marenka 1	28P 752 801 099 28 79 E= 54M	Farm bush	Mbagbado	LC
Pennisetum purpureum	Graminea	Kasseh	Marenka 1	28P 752 801 099 28 79 E= 54M	Farm bush	Mbagbado	LC
Imperata cylindria	Graminea	Kasseh	Marenka 1	28P 752 801 099 28 79 E= 54M	Farm bush	Mbagbado	LC
Achornea cordifolia	Euphorbiaceae	Kasseh	Marenka 1	28P 752 801 099 28 79 E= 54M	Farm bush	Mbagbado	LC
Spondias mombin	Anacardiaceae	Kasseh	Marenka 1	28P 752 801 099 28 79 E= 54M	Farm bush	Mbagbado	LC
Ceiba pentandra	Bombacaceae	Kasseh	Marenka 1	28P 752 801 099 28 79 E= 54M	Farm bush	Mbagbado	LC
Lantana camara	Verbenaceae	Kasseh	Marenka 1	28P 752 801 099 28 79 E= 54M	Farm bush	Mbagbado	LC
Pennisetum purpureum	Graminea	Kasseh	Marenka 1	28P 752 801 099 28 79 E= 54M	Farm bush	Mbagbado	LC
Chlorophora regia	Moraceae	Kasseh	Marenka 1	28P 752 801 099 28 79 E= 54M	Farm bush	Mbagbado	LC
Anisophyllea laurine	Rhizophoraceae	Kasseh	Marenka 1	28P 752 801 099 28 79 E= 54M	Farm bush	Mbagbado	LC
Alchornea cordifolia	Euphorbiaceae	Kasseh	Marenka 1	28P 752 801 099 28 79 E= 54M	Farm bush	Mbagbado	LC
Albizia zygia	Mimosaceae	Kasseh	Marenka 1	28P 752 801 099 28 79 E= 54M	Farm bush	Mbagbado	LC
Gmelina arborea	Verbenaceae	Kasseh	Marenka 2	28P 749 492 099 37 48 E=51M	Secondary forest	Kukuna	LC
Geophila obvallata	Rubiaceae	Kasseh	Marenka 2	28P 749 492 099 37 48 E=51M	Secondary forest	Kukuna	LC
Uvaria chamea	Annonaceae	Kasseh	Marenka 2	28P 749 492 099 37 48 E=51M	Secondary forest	Kukuna	LC
Terminalia ivorensis	Combretaceae	Kasseh	Marenka 2	28P 749 492 099 37 48 E=51M	Secondary forest	Kukuna	VU
Diospyros heudelotii	Ebenaceae	Kasseh	Marenka 2	28P 749 492 099 37 48 E=51M	Secondary forest	Kukuna	LC
Macaranga spp	Euphorbiaceae	Kasseh	Marenka 2	28P 749 492 099 37 48 E=51M	Secondary forest	Kukuna	LC
Weldelia africana	Compositea	Kasseh	Marenka 2	28P 749 492 099 37 48 E=51M	Secondary forest	Kukuna	LC
Dissotis spp	Melastomaceae	Kasseh	Marenka 2	28P 749 492 099 37 48 E=51M	Secondary forest	Kukuna	LC

Elaeis guineensis	Palmea	Kasseh	Marenka 2	28P 749 492 099 37 48 E=51M	Secondary forest	Kukuna	LC
Terminalia ivorensis	Combretaceae	Kasseh	Marenka 2	28P 749 492 099 37 48 E=51M	Secondary forest	Kukuna	VU
Tetracera potatoria	Dilleniaceae	Kasseh	Marenka 2	28P 749 492 099 37 48 E=51M	Secondary forest	Kukuna	LC
Sida stipulata	Malvaceae	Kasseh	Marenka 2	28P 749 492 099 37 48 E=51M	Secondary forest	Kukuna	LC
Ageratum conyzoides	Compositea	Kasseh	Marenka 2	28P 749 492 099 37 48 E=51M	Secondary forest	Kukuna	LC
Weldelia africana	Compositea	Kasseh	Marenka 2	28P 749 492 099 37 48 E=51M	Secondary forest	Kukuna	LC
Ceiba pentandra	Bombaceae	Kasseh	Marenka 2	28P 749 492 099 37 48 E=51M	Secondary forest	Kukuna	LC
Aframomum sp	Zingiberaceae	Kasseh	Marenka 2	28P 749 492 099 37 48 E=51M	Secondary forest	Kukuna	LC
Chromolina odoratum	Compositea	Dibia	Makump	28P 752 142 098 70 11 E=79M	Farm bush	Kalagborie	LC
Gmelina arborea	Verbenaceae	Dibia	Makump	28P 752 142 098 70 11 E=79M	Farm bush	Kalagborie	LC
Ficus exasperata	Moraceae	Dibia	Makump	28P 752 142 098 70 11 E=79M	Farm bush	Kalagborie	LC
Mimosa pudica	Mimosaceae	Dibia	Makump	28P 752 142 098 70 11 E=79M	Farm bush	Kalagborie	LC
Geophila obvallata	Rubiaceae	Dibia	Makump	28P 752 142 098 70 11 E=79M	Farm bush	Kalagborie	LC
Harungana madagascariensis	Hypericeae	Dibia	Makump	28P 752 142 098 70 11 E=79M	Farm bush	Kalagborie	LC
Parkia biglobosa	Mimosaceae	Dibia	Makump	28P 752 142 098 70 11 E=79M	Farm bush	Kalagborie	LC
Diospyros heudoletii	Ebenaceae	Dibia	Makump	28P 752 142 098 70 11 E=79M	Farm bush	Kalagborie	LC
Mimosa pudica	Mimosaceae	Dibia	Makump	28P 752 142 098 70 11 E=79M	Farm bush	Kalagborie	LC
melittia regia	Caesalpiniaceae	Dibia	Makump	28P 752 142 098 70 11 E=79M	Farm bush	Kalagborie	LC
Uvaria chamea	Annonaceae	Dibia	Makump	28P 752 142 098 70 11 E=79M	Farm bush	Kalagborie	LC
Xylopia eathiopica	Annonaceae	Dibia	Makump	28P 752 142 098 70 11 E=79M	Farm bush	Kalagborie	LC
Hypomea repens	Convolvulaceae	Dibia	Makump	28P 752 142 098 70 11 E=79M	Farm bush	Kalagborie	LC
Croton hirtus	Graminea	Dibia	Makump	28P 752 142 098 70 11 E=79M	Farm bush	Kalagborie	LC

Chromolina odoratum	compositea	Dibia	Makump	28P 752 142 098 70 11 E=79M	Farm bush	Kalagborie	LC
Newbouldia levis	Bignoniacea e	Dibia	Makump	28P 752 142 098 70 11 E=79M	Farm bush	Kalagborie	LC
Ficus exasperata	Moraceae	Dibia	Makump	28P 752 142 098 70 11 E=79M	Farm bush	Kalagborie	LC
Clerodendron scandens	Verbenaceae	Dibia	Makump	28P 752 142 098 70 11 E=79M	Farm bush	Kalagborie	LC
Dissotis spp	Melastomace ae	Beakehloko	Gberey morie	28P 728 562 097 16 47 E= 14M	Secondary forest	Makoth	LC
Elaeis guineensis	Palmea	Beakehloko	Gberey morie	28P 728 562 097 16 47 E= 14M	Secondary forest	Makoth	LC
Terminalia ivorensis	Combretacea e	Beakehloko	Gberey morie	28P 728 562 097 16 47 E= 14M	Secondary forest	Makoth	VU
Terminalia ivorensis	Combretacea e	Beakehloko	Gberey morie	28P 728 562 097 16 47 E= 14M	Secondary forest	Makoth	VU
sterculia tiagacanta	sterculiaceae	Beakehloko	Gberey morie	28P 728 562 097 16 47 E= 14M	Secondary forest	Makoth	LC
dalium guineense	Caesalpiniac eae	Beakehloko	Gberey morie	28P 728 562 097 16 47 E= 14M	Secondary forest	Makoth	LC
Lophira alata	ochnaceae	Beakehloko	Gberey morie	28P 728 562 097 16 47 E= 14M	Secondary forest	Makoth	LC
Alchornea cordifolia	Verbenaceae	Beakehloko	Gberey morie	28P 728 562 097 16 47 E= 14M	Secondary forest	Makoth	LC
Imperata cylindria	Graminea	Beakehloko	Gberey morie	28P 728 562 097 16 47 E= 14M	Secondary forest	Makoth	LC
Diodia scandens	Rubiaceae	Beakehloko	Gberey morie	28P 728 562 097 16 47 E= 14M	Secondary forest	Makoth	LC
Pannicum maximum	Graminea	Beakehloko	Gberey morie	28P 728 562 097 16 47 E= 14M	Secondary forest	Makoth	LC
cola nitida	sterculiaceae	Beakehloko	Gberey morie	28P 728 562 097 16 47 E= 14M	Secondary forest	Makoth	LC
cola latericia	sterculiaceae	Beakehloko	Gberey morie	28P 728 562 097 16 47 E= 14M	Secondary forest	Makoth	LC
gmelia arborea	Verbenaceae	Beakehloko	Gberey morie	28P 728 562 097 16 47 E= 14M	Secondary forest	Makoth	LC
Sida acuta	Malvaceae	Beakehloko	Gberey morie	28P 732 354 076 91 55 E=13M	Secondary forest	Gbaray Kabangura	LC
strychnos spp	Loganiaceae	Beakehloko	Gberey morie	28P 732 354 076 91 55 E=13M	Secondary forest	Gbaray Kabangura	LC
Lantana camara	Verbenaceae	Beakehloko	Gberey morie	28P 732 354 076 91 55 E=13M	Secondary forest	Gbaray Kabangura	LC
Croton hirtus	Euphorbiace ae	Beakehloko	Gberey morie	28P 732 354 076 91 55 E=13M	Secondary forest	Gbaray Kabangura	LC

Tetracera potatoria	Dilleniaceae	Beakehloko	Gberey morie	28P 732 354 076 91 55 E=13M	Secondary forest	Gbaray Kabangura	LC
Terminalia ivorensis	Combretaceae	Beakehloko	Gberey morie	28P 732 354 076 91 55 E=13M	Secondary forest	Gbaray Kabangura	VU
sterculia tiagacanta	sterculiaceae	Beakehloko	Gberey morie	28P 732 354 076 91 55 E=13M	Secondary forest	Gbaray Kabangura	LC
dalium guineense	Caesalpiniaceae	Beakehloko	Gberey morie	28P 732 354 076 91 55 E=13M	Secondary forest	Gbaray Kabangura	LC
Nauclea latifolia	Rubiaceae	Beakehloko	Gberey morie	28P 732 354 076 91 55 E=13M	Secondary forest	Gbaray Kabangura	LC
albizia regia	Mimosaceae	Beakehloko	Gberey morie	28P 732 354 076 91 55 E=13M	Secondary forest	Gbaray Kabangura	LC
Weldelia africana	Compositea	Beakehloko	Gberey morie	28P 732 354 076 91 55 E=13M	Secondary forest	Gbaray Kabangura	LC
Dissotis spp	Melastomaceae	Beakehloko	Gberey morie	28P 732 354 076 91 55 E=13M	Secondary forest	Gbaray Kabangura	LC
Elaeis guineensis	Palmea	Beakehloko	Gberey morie	28P 732 354 076 91 55 E=13M	Secondary forest	Gbaray Kabangura	LC
Lantana camara	Verbenaceae	Beakehloko	Gberey morie	28P 732 354 076 91 55 E=13M	Secondary forest	Gbaray Kabangura	LC
Pennisetum purpureum	Graminea	Beakehloko	Gberey morie	28P 732 354 076 91 55 E=13M	Secondary forest	Gbaray Kabangura	LC
Salacia sp	Celastraceae	Beakehloko	Gberey morie	28P 738 357 096 80 15 E=27M	Secondary forest	Rotuk	LC
Uvaria chamea	Annonaceae	Beakehloko	Gberey morie	28P 738 357 096 80 15 E=27M	Secondary forest	Rotuk	LC
Lophira alata	ochnaceae	Beakehloko	Gberey morie	28P 738 357 096 80 15 E=27M	Secondary forest	Rotuk	LC
Tetracera potatoria	Dilleniaceae	Beakehloko	Gberey morie	28P 738 357 096 80 15 E=27M	Secondary forest	Rotuk	LC
Ficus exasperata	moraceae	Beakehloko	Gberey morie	28P 738 357 096 80 15 E=27M	Secondary forest	Rotuk	LC
Croton hirtus	Euphorbiaceae	Beakehloko	Gberey morie	28P 738 357 096 80 15 E=27M	Secondary forest	Rotuk	LC
Panicum spp	Graminea	Beakehloko	Gberey morie	28P 738 357 096 80 15 E=27M	Secondary forest	Rotuk	LC
Lantana camara	Verbenaceae	Beakehloko	Gberey morie	28P 738 357 096 80 15 E=27M	Secondary forest	Rotuk	LC
Pennisetum purpureum	Graminea	Beakehloko	Gberey morie	28P 738 357 096 80 15 E=27M	Secondary forest	Rotuk	LC
Diospyros heudelotii	Ebenaceae	Beakehloko	Gberey morie	28P 738 357 096 80 15 E=27M	Secondary forest	Rotuk	LC
Bambusa vulgaris	Graminea	Beakehloko	Gberey morie	28P 738 357 096 80 15 E=27M	Secondary forest	Rotuk	LC

Newbouldia leavis	Bignoniacea e	Beakehloko	Gberey morie	28P 738 357 096 80 15 E=27M	Secondary forest	Rotuk	LC
Lophira alata	ochnaceae	Kamasodo	Kathugha	28P 072 726 097 53 89 E=13M	Farm bush	Mabalema	LC
pennisetum purpureum	Graminea	Kamasodo	Kathugha	28P 072 726 097 53 89 E=13M	Farm bush	Mabalema	LC
Albizia zygia	Mimosaceae	Kamasodo	Kathugha	28P 072 726 097 53 89 E=13M	Farm bush	Mabalema	LC
Alchornea cordifolia	Euphorbiace ae	Kamasodo	Kathugha	28P 072 726 097 53 89 E=13M	Farm bush	Mabalema	LC
Andropogon gabonensis	Graminea	Kamasodo	Kathugha	28P 072 726 097 53 89 E=13M	Farm bush	Mabalema	LC
Cassia sieberiana	Caesalpiniac eae	Kamasodo	Kathugha	28P 072 726 097 53 89 E=13M	Farm bush	Mabalema	LC
Chromolina odoratum	Compositae	Kamasodo	Kathugha	28P 072 726 097 53 89 E=13M	Farm bush	Mabalema	LC
Lantana camara	Verbenaceae	Kamasodo	Kathugha	28P 072 726 097 53 89 E=13M	Farm bush	Mabalema	LC
solanium toruum	Solanaceae	Kamasodo	Kathugha	28P 072 726 097 53 89 E=13M	Farm bush	Mabalema	LC
Croton hirtus	Euphorbiace ae	Kamasodo	Kathugha	28P 072 726 097 53 89 E=13M	Farm bush	Mabalema	LC
Newbouldia leavis	Bignoniacea e	Kamasodo	Kathugha	28P 072 726 097 53 89 E=13M	Farm bush	Mabalema	LC
Elaeis guineensis	Palmea	Kamasodo	Kathugha	28P 072 726 097 53 89 E=13M	Farm bush	Mabalema	LC
cajanus cajan	Papilionacea e	Kamasodo	Kathugha	28P 072 726 097 53 89 E=13M	Farm bush	Mabalema	LC
ceiba pentandra	Bombacacea e	Kamasodo	Kathugha	28P 072 726 097 53 89 E=13M	Farm bush	Mabalema	LC
solanium torvum	Solanaceae	Kamasodo	Kathugha	28P 072 726 097 53 89 E=13M	Farm bush	Mabalema	LC
Cassia sieberiana	Caesalpiniac eae	Kamasodo	Kathugha	28P 072 726 097 53 89 E=13M	Farm bush	Mabalema	LC
Aframomum sp	Zingiberacea e	Kamasodo	Kathugha	28P 072 726 097 53 89 E=13M	Farm bush	Mabalema	LC
mammea Africana	Guttiferae	Kamasodo	Kathugha	28P 072 726 097 53 89 E=13M	Farm bush	Mabalema	LC
Morinda germinata	Rubiaceae	Kamasodo	Kathugha	28P 072 726 097 53 89 E=13M	Farm bush	Mabalema	LC
Croton hirtus	euphorbiacea e	Kamasodo	Kathugha	28P 072 726 097 53 89 E=13M	Farm bush	Mabalema	LC
Parkia biglobosa	Mimosaceae	Kamasodo	Kathugha	28P 072 726 097 53 89 E=13M	Farm bush	Mabalema	LC

Lophira lanceolata	Ochnaceae	Kamasodo	Katongha	28P 072 576 097 67 57 E=10	Savanna woodland	Katoma	LC
Parkia biglobosa	Mimosasae	Kamasodo	Katongha	28P 072 576 097 67 57 E=11	Savanna woodland	Katoma	LC
Pterocarpus erinaceaus		Kamasodo	Katongha	28P 072 576 097 67 57 E=12	Savanna woodland	Katoma	LC
Dialium Guineense	Caesalpiniaceae	Kamasodo	Katongha	28P 072 576 097 67 57 E=13	Savanna woodland	Katoma	LC
Panicum Oduratum	Graminea	Kamasodo	Katongha	28P 072 576 097 67 57 E=14	Savanna woodland	Katoma	LC
Diospyros heudeloth	Ebenaceae	Kamasodo	Katongha	28P 072 576 097 67 57 E=15	Savanna woodland	Katoma	LC
Anisophyllea laurina	Rhizophoraceae	Kamasodo	Katongha	28P 072 576 097 67 57 E=16	Savanna woodland	Katoma	LC

Appendix 7. 6: Questions, Concerns and Response on Biodiversity Study

1. What are major species in the proposed area (by distribution, or other known parameter)?

- Those of IUCN concern> For plant, *Terminalia ivorensis* and *Malapterurus teugelsi* both are vulnerable species.

2. What is the population of these (flora, fauna, Avifauna)?

- It will be biased to estimate the population for a short period of study (only the wet season). An estimation can only be done after completing a circle (both dry and wet season surveys). Therefore, it is recommended that a dry season survey be conducted to estimate the population and compare any variation in number and diversity of species between the two seasons.

3. For the IUCN listed threatened species (*Clarias laeviceps* and *Malapterurus teugelsi*), how does their population compare globally to make them of concern?

- For a species to be listed as threatened there must be signs of decline in its population globally, which is the case for the two species. However, they are not endemic to the concession area but are known to occur in other rivers, streams, swamps and tributaries in Sierra Leone and the sub-region. Notwithstanding, there is no record that show their actual population number.

4. Any historical data available?

- No historical data specifically to the study area and its environs available

5. What are the suggested mitigation activities to protect and enhance biodiversity?

- See Table 4.3 to 4.5 for mitigations. In addition, during land clearing, adequate vegetation patches should be made available as alternate habitats for surviving/escaping species; *Terminalia ivorensis* must be protected during land clearing.

6. Is there a possibility of curving out biodiversity corridors to other eco-regions?

- Yes, it is possible. Adjacent vegetation needs to be maintained for dislodged/escaped organism. Biodiversity corridors are also necessary to allow a safe release of wildlife encountered during the land preparation and operation phases.

7. Does the little Scarcies and other forest reserves in the project area have any significant biodiversity classification?

- Yes, they have. For example, *Clarias laeviceps* and *Malapterurus teugelsi* recorded in Little Scarcies and *Terminalia ivorensis* in Kesseh, Bekeh Loko, etc. are key to conservation, and the need to prevent their extension is highly encouraged.

8. The presence of Hippos spotted in the Scarcies River is the population known?

- Hippos were not spotted but were reported by the locals. However, the population is not

known as there is no literature available on the subject.

9. Any invasive species identified?

- No invasive species detected.