

Vegetation Composition and Structure of the Great Outdoors Kalanamu, Uganda

Regenerate Africa & The Great Outdoors

Introduction

Uganda's diverse climate and terrain support a rich variety of plant life, ranging from tropical rainforests in the west to savannas and wetlands in the east. Over 5,000 plant species have been recorded, including economically and ecologically important trees such as Mahogany (*Khaya anthotheca*) and Mvule (*Milicia excelsa*). The country's forests, particularly those in the Albertine Rift, host numerous endemic species that play vital roles in maintaining biodiversity and supporting local livelihoods (Kalema & Beentje, 2012).

The Great Outdoors Kalanamu represents a critical landscape for biodiversity conservation and ecological restoration in Uganda. Understanding baseline vegetation composition and structure is fundamental to developing evidence-based restoration strategies and adaptive management plans. Vegetation surveys provide essential data on species diversity, community composition, and structural attributes that inform restoration and conservation priorities and enable long-term monitoring of ecological recovery.

Objectives

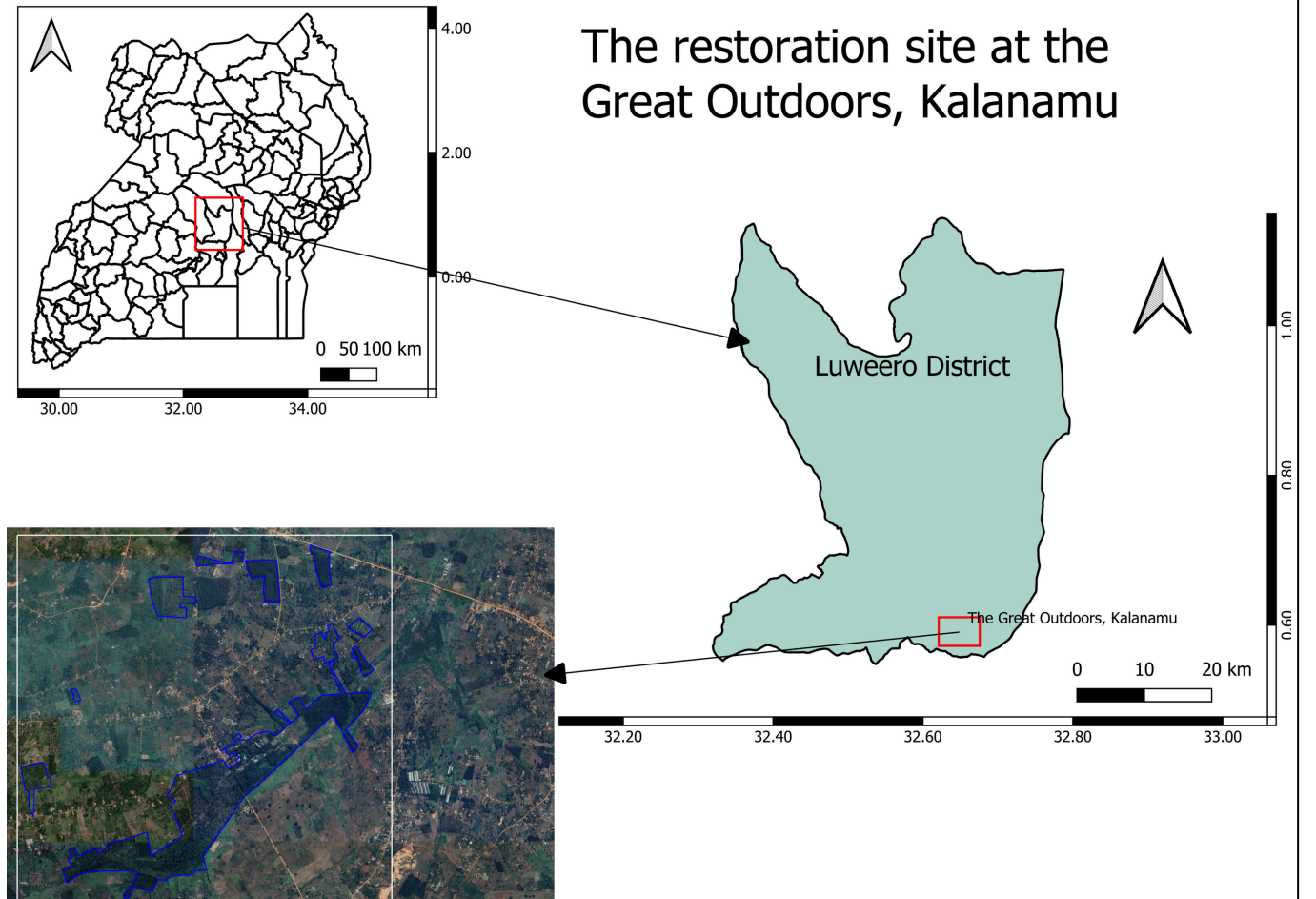
- Characterize baseline vegetation composition and species richness
- Document dominant growth forms and vegetation structure
- Identify key species relevant to restoration planning
- Assess current ecological condition to inform management priorities

Methods

Stratified random sampling and meandering walks. Conducted during peak growth (Mar-May 2022). Recorded vascular plant species presence & abundance. Classified growth forms (trees, shrubs, herbs, grasses, climbers). Field IDs via regional flora guides; uncertain taxa vouchered & verified.

Assessed vegetation structure, cover, and growth-form composition. Identified dominant species by importance values.

Study area



The Great Outdoors Kalanamu is located in central Uganda, within a landscape mosaic of agricultural lands, forest fragments, and regenerating vegetation. The site represents a transitional zone between savanna and forest ecosystems.

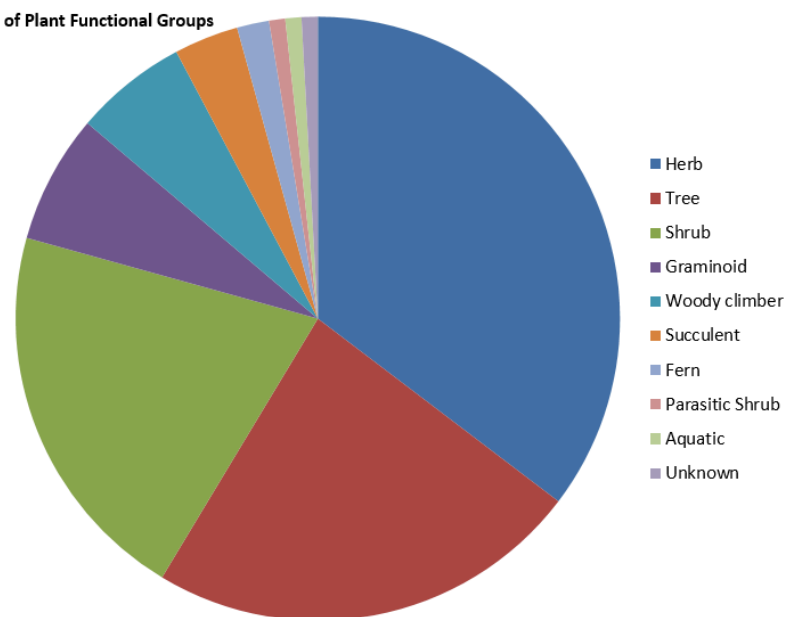
Environmental Setting:

- Climate: Tropical, bimodal rainfall pattern (800-1200 mm annually)
- Elevation: Approximately 1,100-1,300 m above sea level
- Land-use History: Previously subjected to agricultural conversion and selective timber extraction

Current Status: Undergoing natural regeneration with active restoration interventions

Results

Distribution of Plant Functional Groups

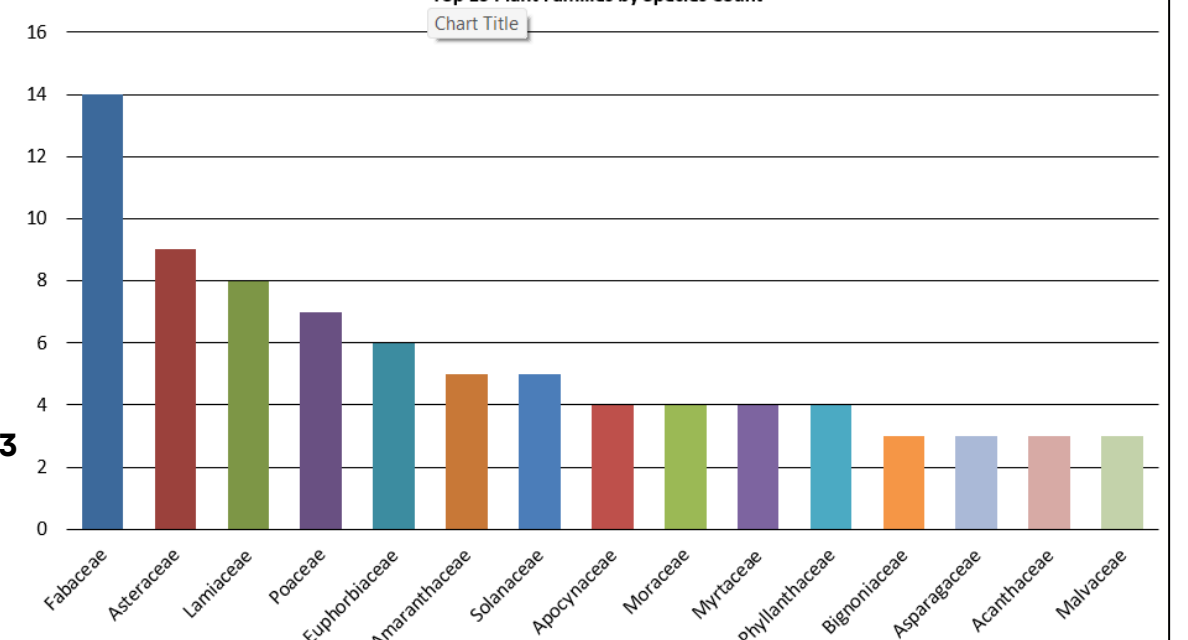


Diversity:

Total Species: **116**
 Total Genera: **103**
 Total Families: **42**
 Average Species per Genus: **1.13**
 Genera with 1 Species: **91**
 Genera with 2 Species: **11**
 Genera with 3+ Species: **1**

Simpson's Diversity Index (D): **0.9893**
 Shannon Diversity Index (H'): **4.5937**
 Pielou's Evenness (J): **0.9912**

Top 15 Plant Families by Species Count



Discussion

Vegetation patterns and site condition

Vegetation at Great Outdoors Kalanamu reflects an ecosystem undergoing active ecological recovery. Species richness is high (116 species, 103 genera, 42 families), with very low taxonomic redundancy (mean 1.13 species per genus), indicating broad phylogenetic representation. Diversity and structural complexity are strongly supported by high Simpson's diversity ($D = 0.989$), Shannon diversity ($H' = 4.59$), and near-complete evenness (Pielou's $J = 0.99$). The dominance of pioneer tree taxa (e.g., *Albizia*, *Markhamia*, *Bridelia*) and a relatively young stand structure (mean DBH 12.6 cm) are consistent with early- to mid-successional woodland following historical disturbance, while the high proportion of native species (89%) underscores substantial conservation and restoration value.

Successional trajectory

The current species composition and diversity patterns indicate robust natural regeneration, with a trajectory toward woodland and forest development. The presence of late-successional forest taxa (*Entandrophragma*, *Prunus africana*) in the seedling and sapling layers suggests viable pathways toward mature forest conditions. High evenness implies limited dominance by a few taxa, which may enhance ecosystem resilience and facilitate successional advancement, although long-term recruitment may remain constrained by dispersal limitation and competitive exclusion by fast-growing pioneers.

Management challenges

The frequent occurrence of *Lantana camara* (recorded in 45% of plots) constitutes a key ecological constraint. This invasive shrub poses risks to native regeneration and may disrupt successional processes despite the site's high diversity and evenness. Targeted, sustained control will be necessary to safeguard regeneration niches and maintain positive successional momentum.

Regional context

Relative to reference forest systems in central Uganda, the site exhibits reduced canopy height and limited representation of old-growth forest specialists, reflecting its disturbance legacy. Nonetheless, the exceptionally high diversity indices and strong alignment with regional floristic assemblages indicate favourable conditions for restoration toward native forest states, provided that invasive species pressures are effectively managed and natural regeneration processes are supported.

Conclusion

Great Outdoors Kalanamu exhibits high plant diversity and evenness, reflecting strong natural regeneration after disturbance. While structurally early- to mid-successional, the site has clear potential for recovery toward native forest, contingent on effective control of exotic and invasive species.

References & Further reading

1. Kalema, J., & Beentje, H. (2012). Flora of Tropical East Africa: Uganda Checklist. Royal Botanic Gardens, Kew.
2. Mugisha, S., Nakangu, B., & Mfitumukiza, D. (2020). Forest Landscape Restoration in Uganda: Progress and Challenges. World Agroforestry Centre (ICRAF).