RESTORE KALANAMU

WORK PACKAGE 2: HABITAT MAPPING AND RESTORATION ZONING

MARCH 2026

Prepared by: The Ecological Restoration Team

RESTORE KALANAMU

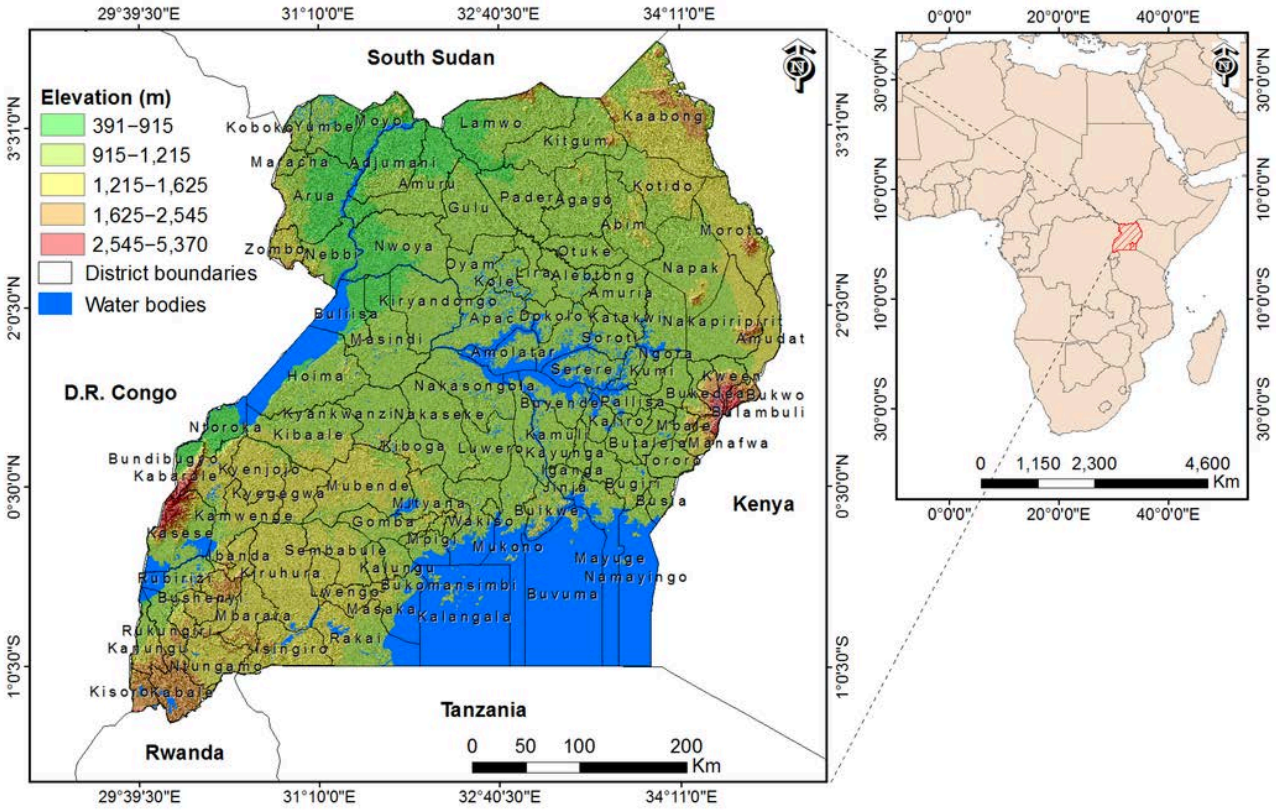
This reporting period marks a significant transition from ecological assessment to active restoration at Great Outdoors Kalanamu. Building on rapid site assessments and detailed biodiversity surveys, the project has established a robust ecological baseline and identified priority restoration zones across a mosaic of savanna, forest, wetland, and riparian habitats. Vegetation inventories recorded 48 tree species on site, more than 75% of which are indigenous, with widespread natural regeneration through seedlings, wildlings, and coppice growth—indicating retained ecological resilience and functional seed dispersal processes. Several near-intact habitat blocks, including an approximately seven-acre patch of dense native vegetation with high avifaunal activity, provide important nuclei for restoration.

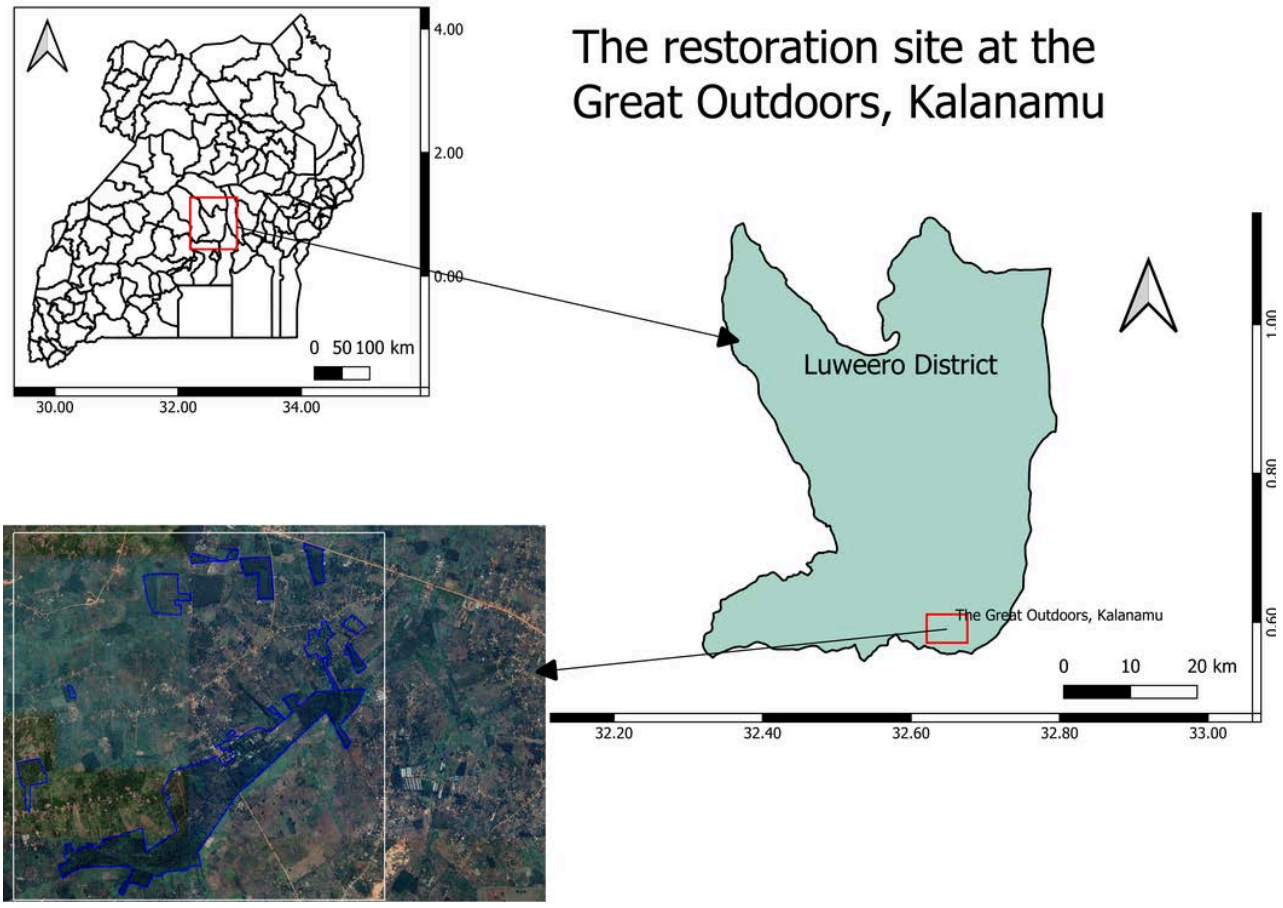
Comparative ecological assessments with the nearby Nalumuli reference site—where over 90% of the 56 recorded species are indigenous—identified 25 species shared between the landscapes, providing a scientifically grounded basis for selecting locally appropriate and genetically compatible planting material. Soil surveys conducted across mapped restoration blocks show predominantly sandy loam topsoils with slightly acidic to near-neutral pH (5.1–6.1) and moderate organic matter levels, conditions generally suitable for restoration planting but requiring targeted soil fertility management to address low nitrogen, phosphorus, and potassium levels.

During this period, the project also secured over 6,700 high-quality indigenous seedlings and established a comprehensive biodiversity baseline, documenting 204 bird species across the landscape. Together, these findings confirm both the ecological significance and the high restoration potential of the site. This report therefore provides an integrated update on completed activities, ongoing interventions, and priority next steps, as the project advances a restoration strategy integrating invasive species management, assisted natural regeneration, targeted native species reintroduction, biodiversity monitoring, and improvements in nursery capacity to ensure that all interventions remain ecologically appropriate and evidence-based.

INTRODUCTION

Uganda faces extensive and accelerating ecosystem degradation driven by soil erosion, deforestation, and wetland conversion. National assessments estimate that approximately 62 million tons of soil are lost annually, with nearly two-thirds of districts experiencing erosion rates above sustainable thresholds (Karamage et al., 2017). Over the past three decades, natural forest cover has declined by approximately 45%, while wetland extent has reduced from about 15% of national land area in the mid-1990s to roughly 10.9% in recent assessments (Gideon & Bernard, 2018; Mutesi et al., 2021). These trends are largely driven by agricultural expansion, biomass energy demand, settlement growth, and infrastructure development, compounded by underlying pressures including poverty, rapid population growth, insecure land tenure, and governance constraints. Although Uganda has established progressive national policy frameworks supporting ecological restoration and forest landscape restoration, a persistent gap remains between policy commitments and landscape-scale outcomes. In this context, the Restore Kalanamu project contributes to ongoing efforts to reverse ecosystem degradation by applying evidence-based ecological restoration approaches that prioritize disturbance exclusion, natural regeneration, targeted native species planting where necessary, and community-engaged landscape stewardship.





Site Context

The project site, situated within the Great Outdoors, is 35 km south of Kampala and encompasses approximately 287 acres of mixed woodland, grassland, and wetland mosaics. The resort's infrastructure, including 70 wooden cottages built with 90% plantation-grown timber sourced from its own land, represents a functional circular bioeconomy model that minimizes embodied carbon and supports local green jobs.

No study maps soil types specifically for Luweero, but work from the Buganda region (which includes Luweero) indicates that soil type is mainly moderately fertile black to red tropical soils that vary with topography, describes the main soil types and how they change along hillslopes (Kyebogola et al., 2020). Because soils change quickly over short distances, we have been identifying the exact soil at each restoration block using local auger pits and profile descriptions (See the tables below for one of the blocks).

Similarly, there are no specific rainfall records from a weather station explicitly for Luweero district, but regional hydrometeorological work in Uganda and the Lake Kyoga basin allows a robust estimate.

Uganda's national mean annual rainfall is ~1200 mm (Okirya & Plessis (2024). The Lake Kyoga basin, which includes central districts climatically similar to Luweero, shows station means from about 1300 mm to 1700+ mm depending on location (Babaousmail et al. 2025). Stations in the wetter eastern part of the basin, such as Tororo and Namulonge, have annual means around 1500–2000 mm, while others, including Jinja and Soroti, are closer to 1300–1500 mm. Luweero is in central Uganda, away from the very wet highlands but not in the driest northeast; it falls toward the lower to mid-range of this Kyoga-basin spectrum. As such, the restoration site receives about 1100–1300 mm of rain per year, with a bimodal pattern: main rainy seasons in March–May and September–November.

Biome type

Luweero district, in central Uganda, falls within the tropical savanna / woodland biome of East Africa, originally characterized by a mix of woody cover (trees/shrubs) and grassy understory under a seasonal tropical climate with ~1100–1300 mm rainfall (Luwa et al., 2020). This region is part of Uganda's extensive forest–woodland–grassland transition zone rather than closed equatorial rainforest

The land cover is strongly shaped by human land use. The landscape is dominated by rain-fed smallholder agriculture interspersed with grasslands, woodlands, and remnant forest patches. Extensive conversion of natural woodland and forest to cropland and pasture has reduced overall tree cover and simplified species composition. As a result, remaining woody vegetation typically occurs as scattered trees within farms, live fences, fallows, and small woodlots rather than as continuous natural woodland (Luwa et al., 2020).

THE RESTORATION WORK

Reference framework and seed source mapping

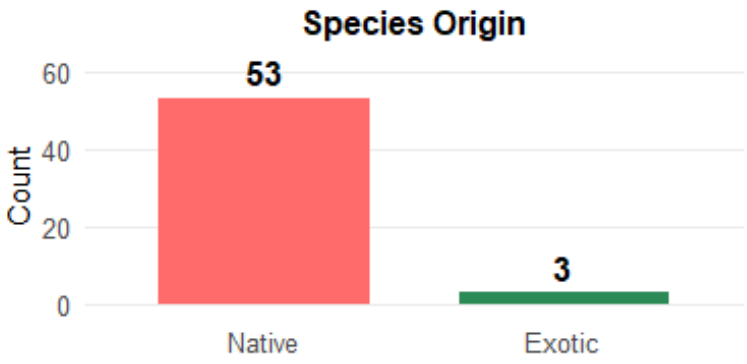
Restoration activities at the Kalanamu site have progressed successfully through the foundational planning and ecological baseline phase. To define ecologically appropriate restoration targets, a suitable reference site (Nalumuli) was identified and assessed alongside the Kalanamu restoration site. This comparative framework ensures that species selection reflects locally appropriate assemblages and that planting material is genetically compatible with the landscape context.

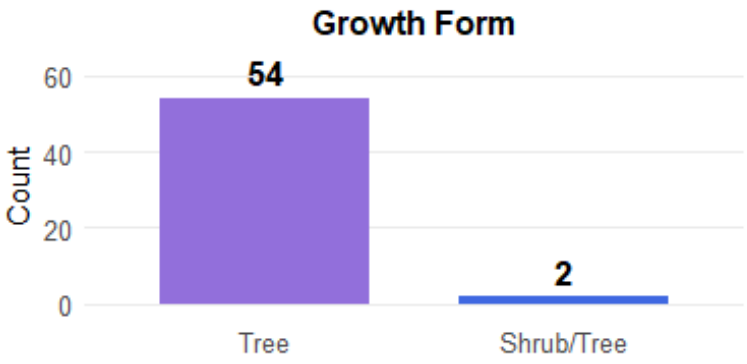
Reference site

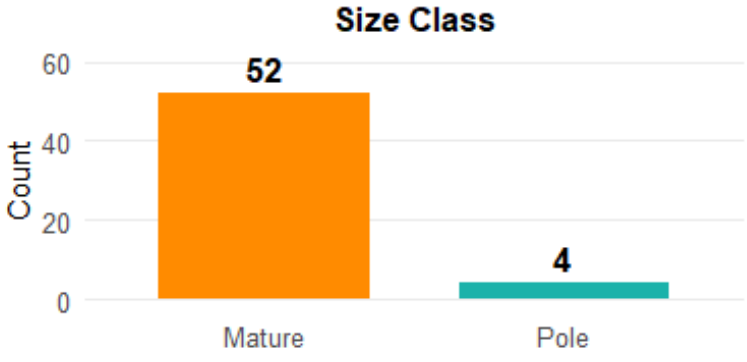
Detailed species inventory, phenology assessment, and seed source mapping were completed across both sites between December 2025 and January 2026. These assessments generated high-quality, site-specific ecological data to support informed restoration decision-making.

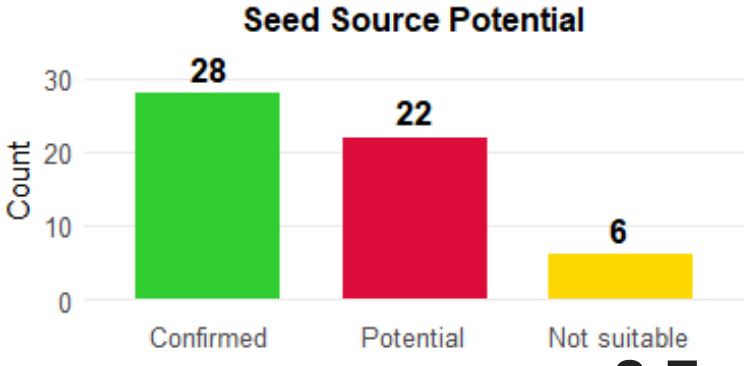
Nalumuli reference site

Complementary seed source mapping at the Nalumuli reference site covered approximately 140 acres and documented 56 tree species, of which over 90% were indigenous. Several species were actively flowering or fruiting at the time of assessment, confirming their suitability as reliable seed sources. Nalumuli also supports threatened taxa, including Milicia excelsa and nationally rare Lovoa species, reinforcing its strategic importance as a reference and seed sourcing landscape.









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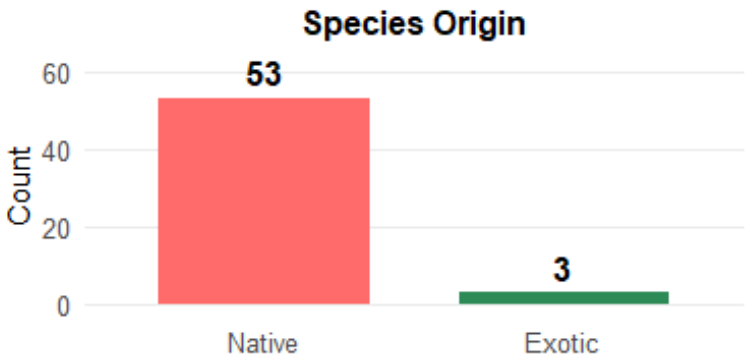
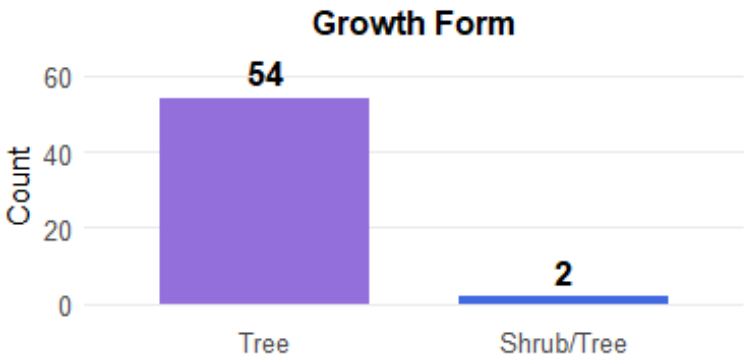
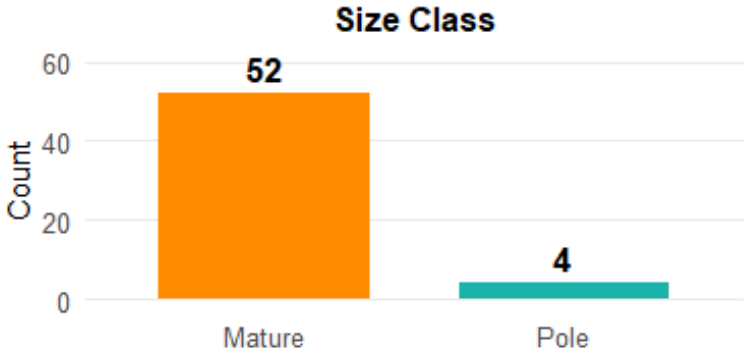






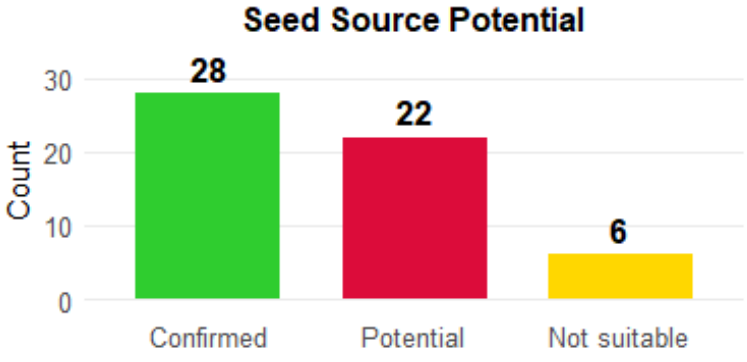


Table. Inventory of tree species identified one of the reference sites, Nalumuli Farm in Buikwe district .

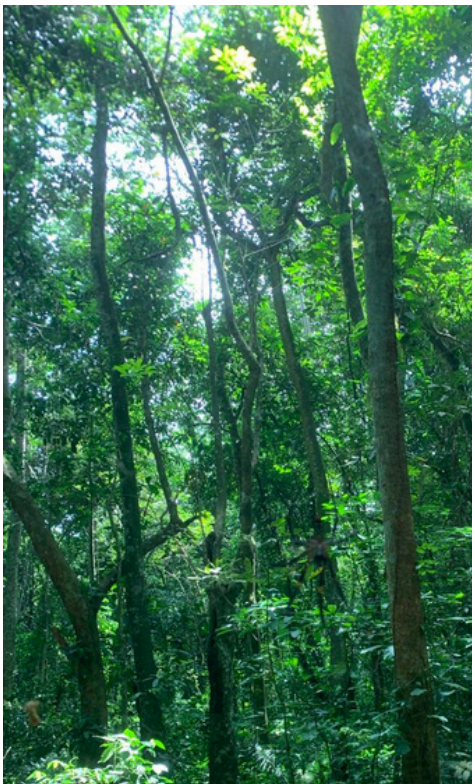
Name	Origin	Size	Tally	Seed source potential
Albizia grandibracteata (Nongo)	*Native*	*Mature*	*Common*	*Confirmed mother tree*
Albizia zygia (Nongo)	Native	Mature	Common	Confirmed mother tree
Alstonia boonei	Native	Mature	9	Potential mother tree
Anthocleista grandiflora	Native	Mature	Common	Confirmed mother tree
Anthocleista schweinfurthii	Native	Mature	Common	Confirmed mother tree
Anthocleista vogelii	Native	Mature	Common	Confirmed mother tree
Antiaris toxicaria (Kirundu)	Native	Mature	2	Potential mother tree
Bridelia micrantha (Katazamiti)	Native	Mature	Common	Confirmed mother tree
Broussonetia papyrifera (Nkulaido)	Exotic	Mature	Common	Not suitable
Canarium schweinfurthii (Muwafu)	Native	Mature	Common	Confirmed mother tree
Cordia millenii (Mukebu)	Native	Mature	1	Not suitable
Croton macrostachyus (Musogasoga)	Native	Mature	9	Potential mother tree
Croton sylvaticus (Musogasoga)	Native	Mature	Common	Confirmed mother tree
Dracaena fragrans (Luwanyi)	Native	Pole	Common	Potential mother tree
Erythrina abyssinica (Jirikiti)	Native	Mature	Common	Confirmed mother tree
Euphorbia tirucalli (Nkoni)	Native	Pole	4	Not suitable
Ficus brachypoda (Mukokowe)	Native	Mature	Common	Potential mother tree
Ficus exasperata (Luwawu)	Native	Mature	Common	Potential mother tree
Ficus mucuso (Kabalila)	Native	Mature	Common	Potential mother tree
Ficus natalensis (Mutuba)	Native	Mature	2	Not suitable

Table. Inventory of tree species identified one of the reference sites, Nalumuli Farm in Buikwe district .

Name	Origin	Size	Tally	Seed source potential
Ficus sur (Kabalila)	Native	Mature	6	Potential mother tree
Funtumia africana (Nkago)	Native	Mature	28	Confirmed mother tree
Garcinia buchananii (Musaali)	Native	Mature	7	Potential mother tree
Harungana madagascariensis (Mulilira)	Native	Mature	Common	Confirmed mother tree
Jatropha carcus (Kiroowa)	Native	Mature	18	Potential mother tree
Lovoa trichilioides (Nkoba)	Native	Mature	7	Potential mother tree
Macaranga kilimandscharica	Native	Mature	Common	Confirmed mother tree
Macaranga spinosa	Native	Mature	Common	Confirmed mother tree
Maesa lanceolata (Kiwondowondo)	Native	Mature	4	Potential mother tree
Maesopsis eminii (Musizi)	Native	Mature	Common	Confirmed mother tree
Margaritaria discoidea (Kamenyambazzi)	Native	Mature	17	Potential mother tree
Milicia excelsa (Muvule)	Native	Mature	5	Potential mother tree
Mimusops bagshawei (Musaali)	Native	Mature	13	Potential mother tree
Mitragyna rubrostipulata (Muzingu)	Native	Mature	12	Potential mother tree
Monodora myristica (Naggomola)	Native	Pole	3	Potential mother tree
Morinda lucida (Mubajansanyi)	Native	Mature	Common	Potential mother tree
Musanga ceropioides (Kaliba)	Native	Mature	Common	Confirmed mother tree
Newtonia buchananii (Mpewere)	Native	Mature	Common	Confirmed mother tree
Piptadeniastrum africanum (Mpewere)	Native	Mature	Common	Confirmed mother tree
Polyscias fulva (Ssetala)	Native	Mature	Common	Confirmed mother tree
Pseudospondias microcarpa (Muziru)	Native	Mature	Common	Confirmed mother tree
Pycnanthus angolensis (Kinaaba)	Native	Mature	Common	Confirmed mother tree
Rauvolfia vomitoria (kawule)	Native	Mature	Common	Confirmed mother tree

Table. Inventory of tree species identified one of the reference sites, Nalumuli Farm in Buikwe district .

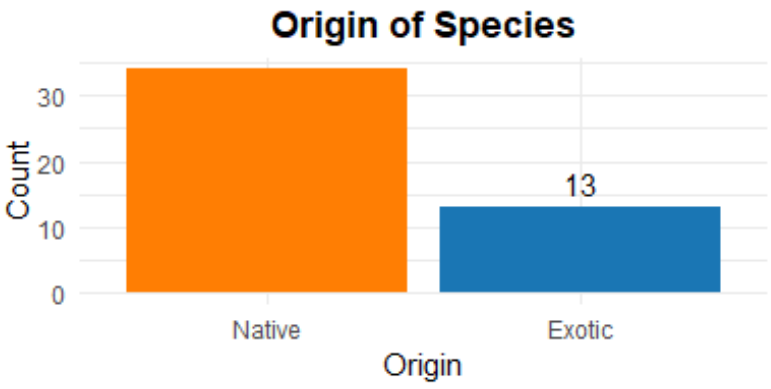
Name	Origin	Size	Tally	Seed source potential
Sapium ellipticum (Musasa)	Native	Mature	Common	Confirmed mother tree
Senna siamea (Cassia)	Exotic	Mature	Common	Not suitable
Senna spectabilis (Cassia)	Exotic	Mature	Common	Not suitable
Spathodea campanulata (Kifabakazi)	Native	Mature	12	Confirmed mother tree
Sterculia dawei	Native	Mature	Common	Confirmed mother tree
Syzygium cordatum (Kanzirinziro)	Native	Mature	14	Potential mother tree
Tetrorchidium didymostemon	Native	Mature	5	Potential mother tree
Trema orientale (Kasisa)	Native	Mature	Common	Confirmed mother tree
Trichilia dregeana (sekoba)	Native	Mature	18	Potential mother tree
Trichilia emetica	Native	Mature	6	Potential mother tree
Uapaca guineensis (Munamagulu)	Native	Mature	Common	Confirmed mother tree
Vangueria spp (Katugunda)	Native	Pole	6	Confirmed mother tree
Xylopia eminii (Nsagalanyi)	Native	Mature	12	Confirmed mother tree

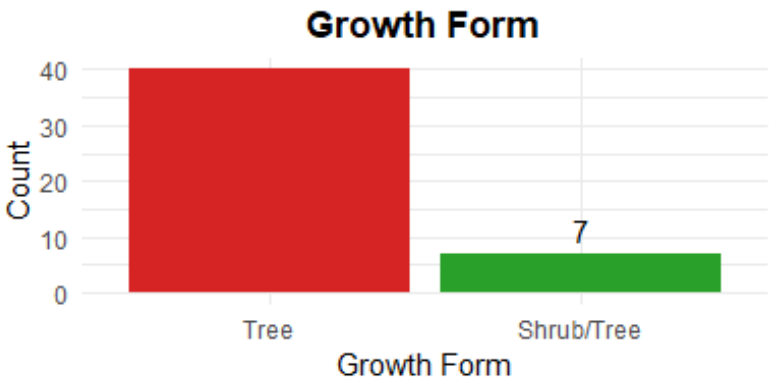


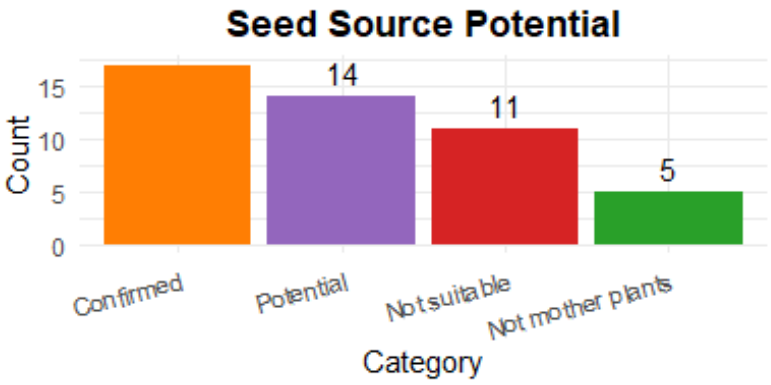
Kalanamu (Great Outdoors) Site

A comprehensive tree species inventory recorded 48 tree species, of which over 75% were indigenous, indicating a predominantly native and ecologically functional system. The vegetation exhibited good overall health, with no significant evidence of disease or pest infestation, and widespread natural regeneration in the form of seedlings, wildlings, and coppice growth. These patterns indicate retained ecological resilience, functional seed dispersal processes, and viable soil seed banks.

Approximately 31% of recorded species were confirmed as mother trees, meeting established criteria for sustainable seed collection based on maturity, reproductive status, and spatial distribution. An additional 31% were classified as potential future mother trees, requiring seasonal monitoring to confirm fruiting and seed viability. The presence of a globally endangered species (*Milicia excelsa*), with at least 19 mature individuals recorded, underscores the high conservation value of the site and its relevance for threatened species recovery.







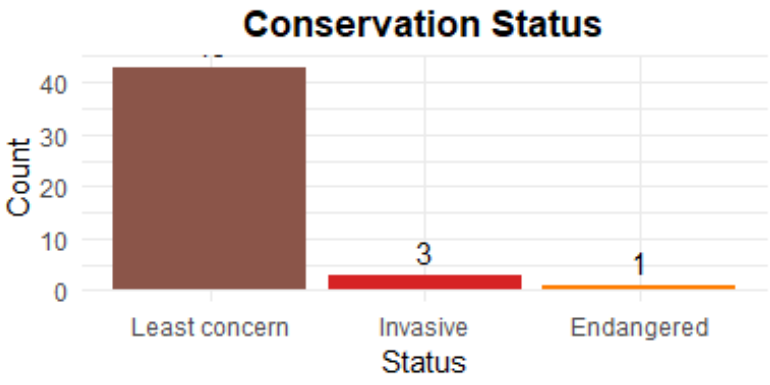


Table. Inventory of tree species identified at the restoration site, The Great Outdoors.

Name	Origin	Size	Tally	Seed source potential
Acanthus polystachyus (Matovu)	Native	Mature	Common	Not suitable
Albizia coriaria (Mugavu)	Native	Mature	Common	Confirmed mother tree
Albizia grandibracteata (Nongo)	Native	Mature	Common	Confirmed mother tree
Anthocleista grandiflora	Native	Pole	2	Not mother
Antiaris toxicaria (Kirundu)	Native	Sapling	1	Not mother tree
Atrocarpus hetrophyllus	Exotic	Mature	Common	Not suitable
Bridelia micrantha (Katazamiti)	Native	Mature	Common	Confirmed mother tree
Broussonetia papyrifera (Nkulaido)	Exotic	Mature	Common	Not suitable
Canarium schweinfurthii (Muwafu)	Native	Mature	16	Potential mother tree
Casalabeca thevetia	Exotic	Mature	Common	Confirmed mother tree
Croton macrostachyus (Musogasoga)	Native	Pole	35	Not mother
Dovyalis affra	Native	Mature	Common	Confirmed mother tree
Dracaena fragrans (Luwanyi)	Native	Pole	Common	Potential mother tree
Eryobotia Japonica (Nsaali)	Exotic	Mature	3	Not suitable
Erythrina abyssinica (Jirikiti)	Native	Mature	Common	Confirmed mother tree
Eucalptus grandis	Exotic	Mature	Common	Not suitable
Euphorbia tirucalli (Nkoni)	Native	Pole	4	Not suitable
Ficus asperlifolia (Luwawu)	Native	Mature	Common	Confirmed mother tree
Ficus brachypoda (Mukokowe)	Native	Mature	Common	Potential mother tree
Ficus exasperata (Luwawu)	Native	Mature	Common	Potential mother tree
Ficus natalensis (Mutuba)	Native	Mature	common	Potential mother tree
Ficus vallis-choude (Kikokowe)	Native	Mature	Common	Confirmed mother tree
Jatropha carcus (Kiroowa)	Native	Mature	Common	Potential mother tree
Macaranga schweinfurthii	Native	Mature	8	Potential mother tree

Table. Inventory of tree species identified at the restoration site, The Great Outdoors.

Name	Origin	Size	Tally	Seed source potential
Maesa lanceolata (Kiwondowondo)	Native	Mature	9	Potential mother tree
Maesopsis eminii (Musizi)	Native	Mature	28	Potential mother tree
Margaritaria discoidea (Kamenyambazzi)	Native	Sapling	6	Not mother tree
Melia azedarach	Exotic	Mature	112	Not suitable
Milicia excelsa (Muvule)	Native	Mature	19	Potential mother tree
Morus spp	Exotic	Mature	4	Not suitable
Nauclea nyasica	Exotic	Pole	12	Not suitable
Neobutonia macrocalyx (Mweganza)	Native	Mature	Common	Confirmed mother tree
Phoneix reclinata (Muziru)	Native	Mature	Common	Confirmed mother tree
Pseudospondias microcarpa (Muziru)	Native	Mature	3	Confirmed mother tree
Psidium guajava (Mupeera)	Exotic	Pole	Common	Potential mother tree
Rhus vulgaris	Native	Pole	3	Not mother
Sapium ellipticum (Musasa)	Native	Mature	Common	Confirmed mother tree
Senna spectabilis (Cassia)	Exotic	Mature	Common	Not suitable
Spathodea campanulata (Kifabakazi)	Native	Mature	Common	Confirmed mother tree
Syzygium cordatum (Kanzirinziro)	Native	Mature	Common	Potential mother tree
Terminalia superba	Exotic	Mature	Common	Not suitable
Trema orientale (Kasisa)	Native	Mature	Common	Confirmed mother tree
Trichilia dregeana (sekoba)	Native	Mature	5	Potential mother tree
Vachellia spp (Munyinya)	Native	Mature	Common	Confirmed mother tree
Vepris nobilis (Muzo)	Native	Pole	Common	Potential mother tree
Vernonia amygadylina (Mululuza)	Native	Mature	Common	Confirmed mother tree
Vernonia auriculifera (kikookoma)	Native	Mature	Common	Confirmed mother tree

Comparative analysis

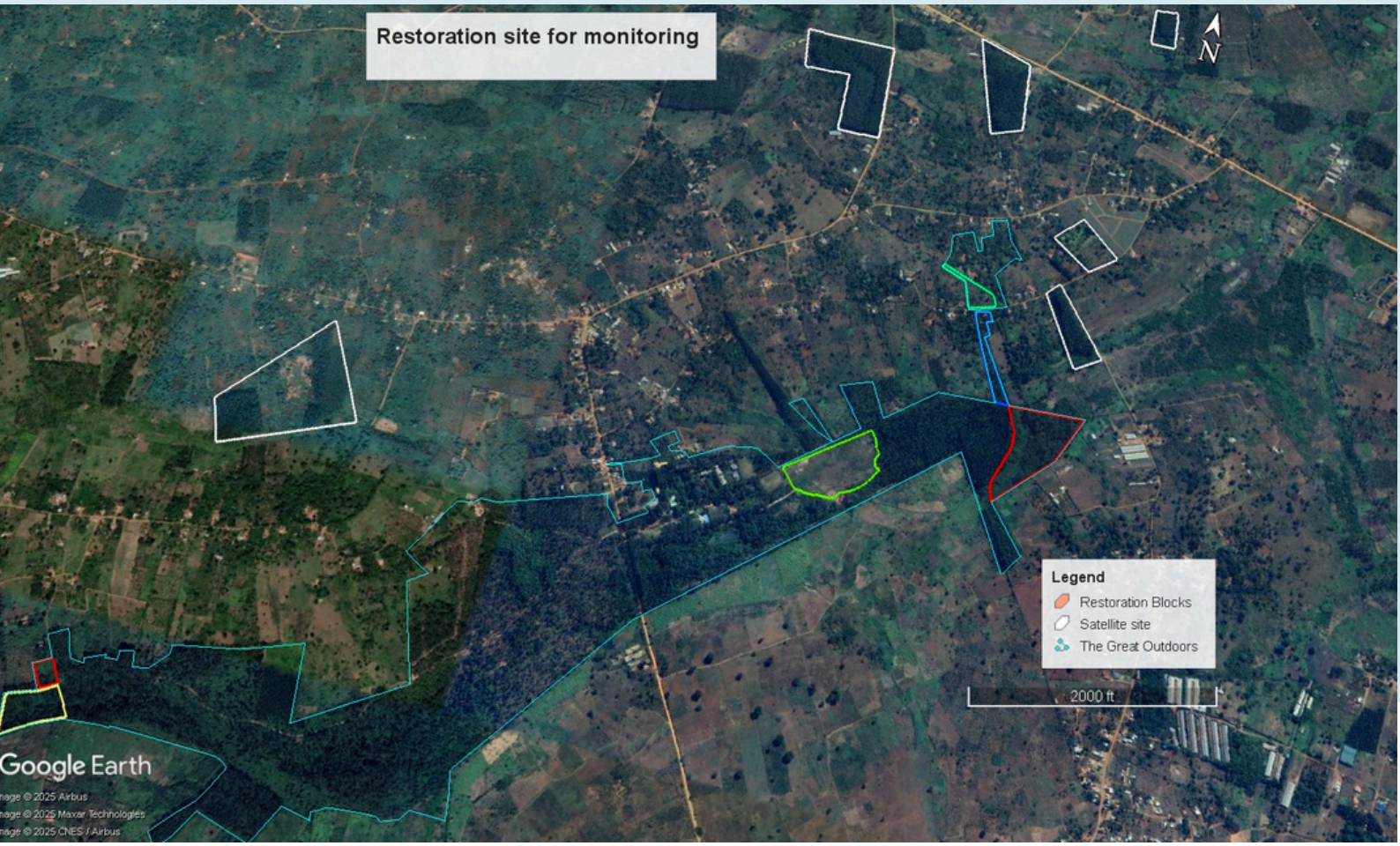
Comparative analysis revealed substantial overlap in indigenous species composition between the two sites, providing a strong scientific basis for species matching. The analysis revealed 25 species common to both survey sites, representing a 32% overlap (Jaccard Similarity Index) .

Species composition by origin across the two sites

Nalumuli demonstrated a stronger focus on native species, with greater diversity within key genera like Anthocleista and Macaranga. Despite distinct species compositions, both datasets shared several ecologically significant species, including the threatened Milicia excelsa and key wildlife food sources like Bridelia micrantha and Maesopsis eminii.

A preliminary phenology calendar was developed from field observations, enabling the alignment of seed collection windows with nursery production and planting schedules.

Ecological Baselining



Spatial planning for restoration implementation at Kalanamu has been completed through the delineation and mapping of four restoration blocks, enabling a structured and scalable approach to baseline data collection. Within these blocks, soil sampling and biodiversity surveys have been completed, generating a comprehensive baseline dataset.

Rapid ecological assessment.

A rapid site assessment was conducted to evaluate the ecological condition, restoration potential, and management context of the Great Outdoors Kalanamu landscape. The assessment was guided by principles from The Global Biodiversity Standard (TGBS), which emphasizes evaluation of ecosystem integrity, biodiversity attributes, and management capacity to inform restoration and conservation planning. Field observations were undertaken across representative habitat types within the site, including savanna, wetland, forest patches, and riparian areas. The assessment combined structured field walks, visual vegetation appraisal, and rapid habitat characterization to document native species presence, regeneration patterns, invasive species occurrence, hydrological condition, and landscape connectivity.

Key attributes—ecosystem condition, native species diversity, invasive species presence, hydrological function, soil characteristics, restoration potential, and landscape connectivity—were assessed using qualitative ratings based on field indicators and comparison with expected regional ecosystem conditions. Observations included dominant plant species, natural regeneration, invasive species distribution, and disturbance indicators. Soil characteristics were evaluated through visual inspection and reference to baseline soil sampling, while hydrological conditions were assessed through wetland vegetation structure and stream flow.

Institutional and management factors, including nursery infrastructure and research partnerships, were also considered. Findings were synthesized into an ecological scorecard to identify priority restoration actions such as invasive species control, assisted natural regeneration, and native species enrichment planting.

Rapid ecological assessment of ecosystem integrity, restoration potential, and management capacity

The site shows strong ecological foundations, including intact wetlands, high restoration potential, and strong institutional partnerships, while invasive/exotic species management and nursery diversification remain key priorities.

Ecosystem Condition	Native Species Diversity	Invasive/Exotic Species
Moderate–High	Moderate	Moderate Concern
Near-intact habitat patches; dense native vegetation; some invasive impact.	Indigenous canopy/understory present; regeneration occurring; nursery diversity limited.	*Lantana*, *Solanum*, *Broussonetia*, *Tithonia and exotics a*present; suppressing native

Hydrology & Wetlands	Soil Health	Restoration Potential
Good	Moderate	High
Wetlands/streams intact; native papyrus and wetland vegetation healthy.	Sandy soils; baseline sampling complete; fertility analyses underway.	Minimal intervention needed—mainly invasive removal + assisted natural regeneration.

Landscape Connectivity	Research Infrastructure	Community Engagement
Moderate	Moderate	Strong
Savanna, wetland, forest, pond habitats form partial corridors.	Nursery, observation structures, research facilities present but need strengthening.	Active partnerships with universities and conservation organizations.

Key soil findings

Soil analyses show slightly acidic to near-neutral conditions (pH 5.1–6.1), with topsoils generally suitable for establishment, except in Block 2 where liming is required. Topsoil organic matter is moderate, while subsoil values are consistently lower, indicating declining fertility with depth.
Available nitrogen, phosphorus, and potassium are low across most samples, whereas calcium and magnesium are sufficient. Soils are predominantly sandy loam in the topsoil and sandy clay loam in the subsoil, implying good drainage but limited water- and nutrient-holding capacity.

Management implications

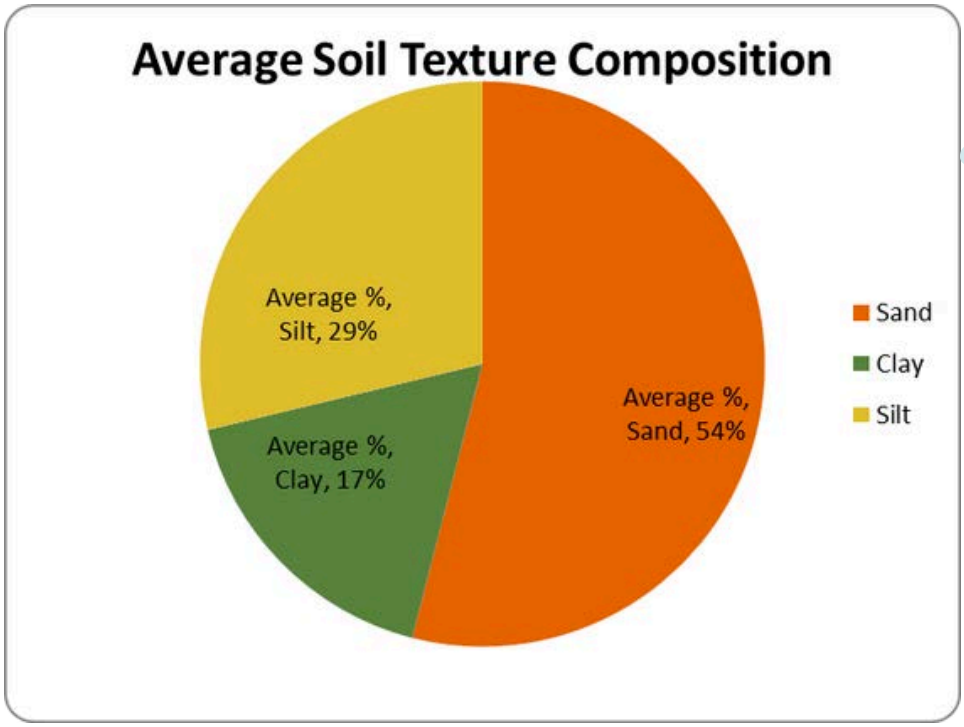
Overall, the soils are suitable for restoration planting but require integrated soil fertility management, including organic amendments, selective liming in Block 2, and balanced nutrient inputs to support long-term establishment.

pH Analysis

Parameter	Range	Status	Interpretation
pH	5.1 - 6.1	Slightly Acidic	All samples fall within slightly acidic to near-neutral range. Block 3 has optimal pH (6.1) for most crops.
Mean pH	5.6	Acceptable	Average pH is suitable for most agricultural crops. Consider liming for acid-sensitive crops.

Nutrient status

Nutrient	Mean Value	Status	Recommendation
Organic Matter	0.031	Good	Adequate OM levels. Maintain through organic amendments.
Nitrogen (N)	0.001	Low	Consider nitrogen fertilization for optimal crop growth.
Phosphorus (P)	5.1 ppm	Low	Apply phosphate fertilizers. Critical for root development.
Calcium (Ca)	1575 ppm	Adequate	Sufficient calcium levels for most crops.
Magnesium (Mg)	283 ppm	Adequate	Good magnesium availability.
Potassium (K)	171 ppm	Moderate	May need supplementation for high-demand crops.



"The soil has a sandy loam texture, which is generally well suited for most crops when supported by appropriate irrigation management."

Key soil management recommendations include the application of lime in Block 2 to raise the pH from 5.1 and improve nutrient availability. A nitrogen fertilization program should be implemented across all blocks, alongside the application of phosphate fertilizers to address low phosphorus levels. Potassium supplementation may also be considered for high-demand crops. To enhance soil structure and fertility, organic matter should be maintained through the use of cover crops and organic amendments. In addition, irrigation management should be carefully implemented due to the sandy loam soil texture.

Seedling sourcing and phased planting

Following the finalization of the priority species list, procurement was initiated from two native tree nurseries in Fort Portal. These nurseries were selected based on:

(i) verified seed sourcing practices
(ii) adherence to appropriate propagation protocols
(iii) Handling standards that preserve seedling vigor, and
(iv) Evidence of maintaining genetic diversity within seed lots.

This rigorous selection ensures that planting material is resilient, locally adapted, and suitable for long-term ecosystem recovery.

Seedling procurement summary

A total of 18 indigenous tree species were procured, comprising 6,750 seedlings, inclusive of a 10% buffer to account for potential losses associated with transport stress. Of these, 8 species—representing 44% of the total species selected—are classified as rare or threatened. These priority species accounted for 1,350 seedlings, equivalent to 20% of the total planting stock. The deliberate inclusion of a substantial proportion of rare and threatened species enhances the conservation value of the intervention and contributes directly to broader efforts aimed at regional biodiversity recovery.

Out of the 6,750 procured seedlings, 3,467 individuals have been planted in restoration Blocks 4 and 5 (Shown below). This includes 16 species, 7 of which are rare or threatened. The species composition within the planted areas is predominantly comprised of *Maesopsis lutea* (Musambya), *Maesopsis eminii* (Musizi), *Prunus africana* (Ntasesa), and *Pseudospondias microcarpa* (Muziru), which together account for the bulk of the planted stock.

Initial assessment of survival rate was conducted a week after planting, with findings indicating a high establishment success rate (95%), with the majority of seedlings well-rooted and showing healthy growth. A complete list of the species and numbers planted in the first phase are show in the table below.

Restoration block 4 approximately 2.35 acres (above) and block 5 about 3.4 acres (below). Seedlings have been planted on ~ 4 acres.

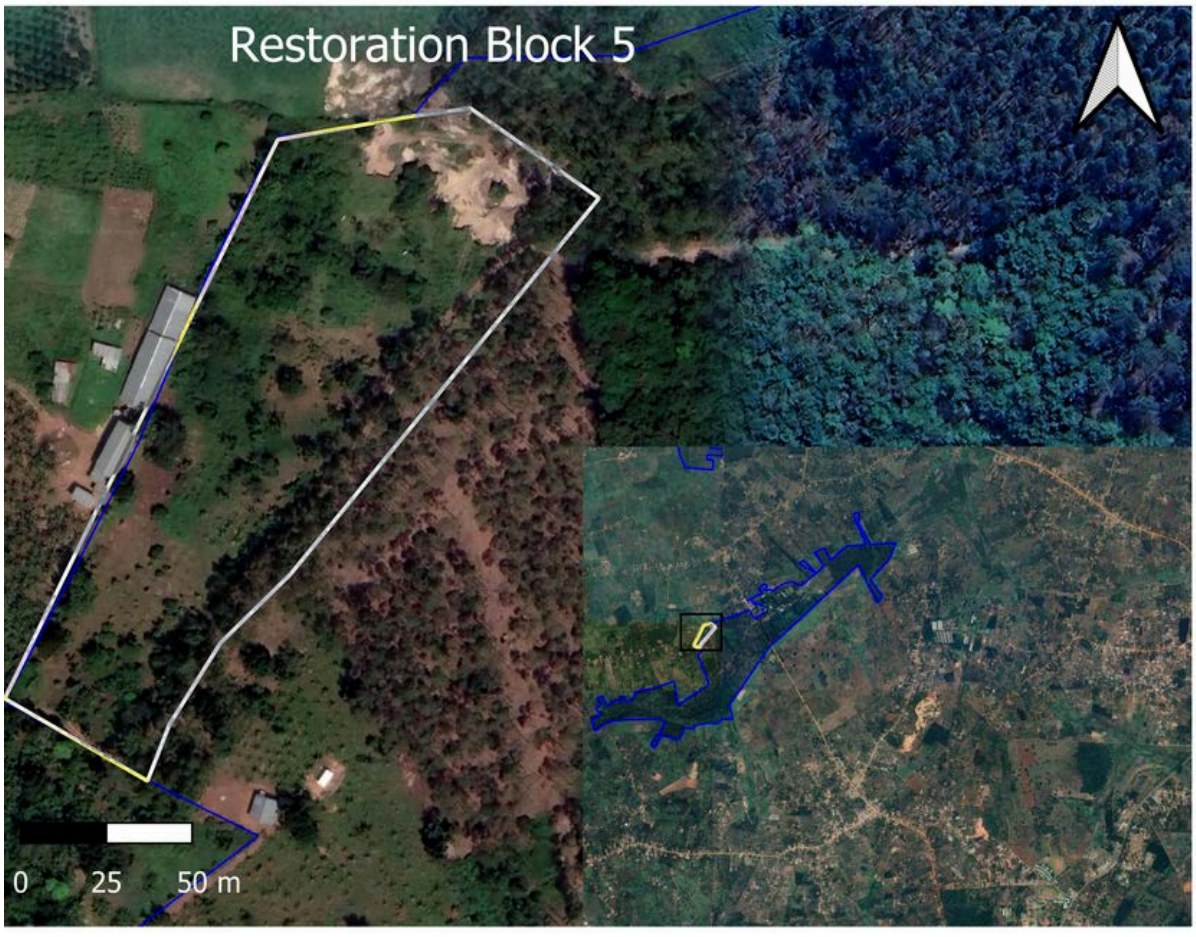


Table. List of species planted in Blocks 4 and 5 during Phase 1 of planting in March, 2026

No	Scientific Name	Common name	Quantity
1	*Cordia africana*	Mukebu	200
2	*Croton megalocarpus*	Nkulumire	85
3	*Gambeya albida (syn. Chrysophyllum*	Nkalate	54
4	*Maeasopsis eminii*	Musizi	750
5	*Markhamia lutea*	Musambya	850
6	*Milicia excelsa*	Muvule	60
7	*Polyscias fulva*	Setaala	280
8	*Prunus africana*	Ntasesa	370
9	*Pseudospondias microcarpa*	Muziru	450
10	*Tamarindus indica*	Mukooge	30
11	*Warbugia ugandensis*	Mukuzanume	65
12	*Zanthozylum giletii*	Munyenye	75
13	*Mimusops bagshaweii*	Musaali	35
14	*Entandrophragma utile*		55
15	*Treculia africana*	Muzinda	58
16	*Monodora myristica*	Naggomola	50
		Total	3,467

Next steps

The following implementation roadmap translates the ecological baseline findings, restoration block delineation, and seedling procurement into a structured, time-bound action plan. Activities are sequenced across three phases to ensure that establishment interventions are followed by rigorous monitoring and adaptive management responses.

Immediate 0-3 months (ongoing)

The immediate phase consolidates all ground-preparation and site-documentation activities required before the full planting campaign commences. Priorities are to finalise site conditions, establish monitoring infrastructure, and ensure that all planted material can be tracked from day one.

Table. Activity schedule for the next 3 months

Final site preparation & planting
• Complete site preparation across all targeted restoration blocks, including invasive species clearance (*Lantana camara*, *Tithonia diversifolia*, *Broussonetia papyrifera*) within designated planting zones. • Execute phased planting of the 6,750 procured indigenous seedlings, beginning with Restoration Block 4 where approximately one acre has already been planted. • Apply targeted soil amendments in Block 2 (liming to raise pH above 5.5) and implement organic matter augmentation across all blocks prior to planting. • Establish mulching protocols suited to the sandy loam soil texture to support seedling establishment during dry spells.
Survival monitoring protocol
• Design and operationalise a standardised survival monitoring protocol covering all planted restoration blocks. • Define monitoring plot layout, sampling intensity, and recording methodology consistent with internationally recognised restoration monitoring standards. • Train field staff in data collection procedures and establish a data management system for systematic recording of plant survival, condition, and early growth indicators. • Set baseline survival benchmarks (target: ⩾80% survival at 3 months post-planting).
GPS mapping of planted areas
• Conduct high-resolution GPS mapping of all planted areas, recording individual planting locations for rare and threatened species and cluster-level locations for common species. • Integrate spatial data into a GIS layer linked to species identity, planting date, and seedling source nursery. • Generate updated restoration block maps showing planted versus unplanted zones to inform second-phase planting scheduling.
Tagging of rare & threatened species
• Physically tag all 1,350 seedlings representing the 8 rare or threatened species (44% of procured stock) using durable, weather-resistant labels. • Record GPS coordinates, species identity, source nursery, and planting date for each tagged individual. • Establish a tagged individual database to support targeted monitoring, survival tracking, and long-term population assessment for threatened taxa including Milicia excelsa.

Medium term 3–12 months

The medium-term phase shifts focus to ecological response assessment. Survival data will drive replanting decisions, while early growth monitoring and regeneration assessments will provide the first evidence of whether restoration interventions are achieving their intended outcomes.

Table. Activity schedule for the next 3 to 12 months

Survival assessment and gap-filling replanting
Conduct formal survival censuses at 3, 6, and 12 months post-planting across all restoration blocks. Compare recorded survival rates against the 80% threshold and trigger targeted gap-filling replanting where survival is below this benchmark. Investigate causes of mortality (drought stress, herbivory, soil conditions) and adjust management protocols accordingly.
Early growth monitoring
Initiate regular measurement of key growth indicators — height increment and basal diameter — at 6-month intervals for a representative sample of planted individuals per species per block. These data will establish species-specific growth trajectories under site conditions, informing expectations for canopy closure timescales and enabling early identification of species performing below expected growth rates.
Natural regeneration assessment
Conduct a systematic assessment of natural recruitment occurring within and adjacent to restoration blocks. Document seedling and wildling density, species composition, and spatial distribution to evaluate the contribution of assisted natural regeneration (ANR) relative to direct planting. High natural recruitment in any zone may reduce the density of further interventional planting required.
Repeat bird monitoring
Undertake a repeat avifaunal survey at the 6- and 12-month marks, using the same survey methodology as the baseline assessment that documented 204 species. Comparative analysis will detect early ecological responses to restoration, such as changes in species composition, abundance of forest-dependent species, and use of restored areas by taxa previously confined to the near-intact seven-acre native vegetation nucleus.

Long term 1 – 3 years

The long-term monitoring phase evaluates structural and functional ecological recovery, assessing whether the restoration trajectory is consistent with the reference conditions documented at Nalumuli. Findings will inform adaptive management and validate the restoration strategy.

Long-Term Monitoring Framework	
Canopy development monitoring	• Track canopy height, crown cover, and vertical stratification development across restoration blocks at annual intervals. • Use repeat photography from fixed monitoring points and drone or satellite imagery to quantify canopy closure rates and spatial patterns of vegetation recovery. • Compare canopy structure metrics against those recorded at the Nalumuli reference site to assess trajectory toward the target ecosystem condition.
Structural complexity assessment	• Assess the development of vertical and horizontal structural complexity, including the emergence of distinct canopy, sub-canopy, shrub, and ground layers. • Document the establishment of epiphytes, lianas, and dead wood components as indicators of increasing structural diversity. • Structural complexity scores will be integrated into annual restoration performance reports.
Understory regeneration tracking	• Monitor understory species recruitment annually, with particular attention to shade-tolerant species indicative of advancing successional stages. • Assess whether species absent from the current planting stock are recruiting naturally from the seed bank or dispersed from adjacent native vegetation patches. • Identify any understory regeneration gaps that may require targeted enrichment planting in the second and third years.
Wetland–forest connectivity evaluation	• Evaluate the development of functional ecological connectivity between the restored forest zones, the intact wetland habitat, and adjacent native vegetation patches. • Use bird and herpetofauna assemblage data as indicators of habitat connectivity, with particular focus on wetland-dependent and forest-interior species. • Assess hydrological linkages between restoration blocks and riparian/wetland areas to evaluate whether restored vegetation is contributing to catchment water regulation functions.

Strategic considerations

The following considerations are designed to support strategic decision-making as the project transitions from baseline establishment to active restoration and long-term stewardship. Each area reflects an evidence-based priority identified through the ecological baseline work completed in this reporting period.

Strategic area	Recommendation and rationale
Nursery Establishment	An investment should be made to establish an indigenous tree nursery at the GO to secure future planting stock beyond the current procurement. Capacity-building support — including phenology-aligned seed collection calendars developed from baseline data — will improve the availability of genetically appropriate, locally provenance material for successive planting phases. The 25 species shared between Kalanamu and Nalumuli provide a clear priority species list for nursery production planning.
Monitoring Framework	Development of a long-term, structured biodiversity monitoring framework is a strategic priority. The framework should integrate plant survival and growth metrics, natural regeneration assessments, annual bird surveys, and wetland condition indicators within a unified adaptive management system. Alignment with internationally recognised standards — such as those of the Global Biodiversity Standard (TGBS) used in this reporting period — will strengthen the scientific credibility of reported outcomes.
Reporting Dashboards	It is recommended that we develop a real-time restoration performance dashboard integrating key metrics: survival rates by block and species, total area planted, seedling costs, natural regeneration indices, and biodiversity response indicators. Dashboard reporting will improve transparency, support evidence-based adaptive management, and strengthen the project's accountability to funders and institutional partners.
Community Engagement & Education	The exceptional avifaunal richness documented at the site, 204 bird species, presents a compelling and accessible basis for developing a community conservation education component. Linking local communities and lodge guests to the site's biodiversity value through guided birding experiences, species interpretation, and school outreach programmes would generate co-benefits for conservation awareness, stakeholder buy-in, and the long-term social licence for the restoration programme. We are encouraged to explore partnership opportunities with ornithological societies and conservation education organisations to develop this strand.