Restore Kalanamu
Project Progress Update

Work Package 2: Habitat mapping and restoration zoning

1. Introduction

The Great Outdoors Nature Resort is a 280-acre biodiverse sanctuary and social enterprise integrating conservation, education, and sustainable tourism. The site encompasses wetlands, stream systems, and forest ecosystems that host over 181 bird species, growing populations of velvet monkeys and monitor lizards, and diverse native flora. With accommodation and research facilities for up to 170 guests, the site is ideally positioned to become a regional hub for ecological research, field training, and restoration science.

The current initiative seeks establish a robust ecological data infrastructure that combines geospatial mapping, field-based ecological monitoring, and longitudinal research design to inform ecological restoration and future scientific outputs.

2. Context

Restoration activities at the Kalanamu site are underway and have progressed successfully through the foundational planning and ecological baseline phase, establishing a robust, evidence-based framework to guide species selection, seed sourcing, nursery development, and restoration design.

3. Reference sites and seed source mapping

To define ecologically appropriate restoration targets, a suitable reference site (Nalumuli) was identified and assessed alongside the Kalanamu restoration site (at the Great Outdoors).

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.

3.1 Kalanamu (Great Outdoors) site

At the 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 (**Figure 1**). 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.

Importantly, 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 and indigenous forest restoration.

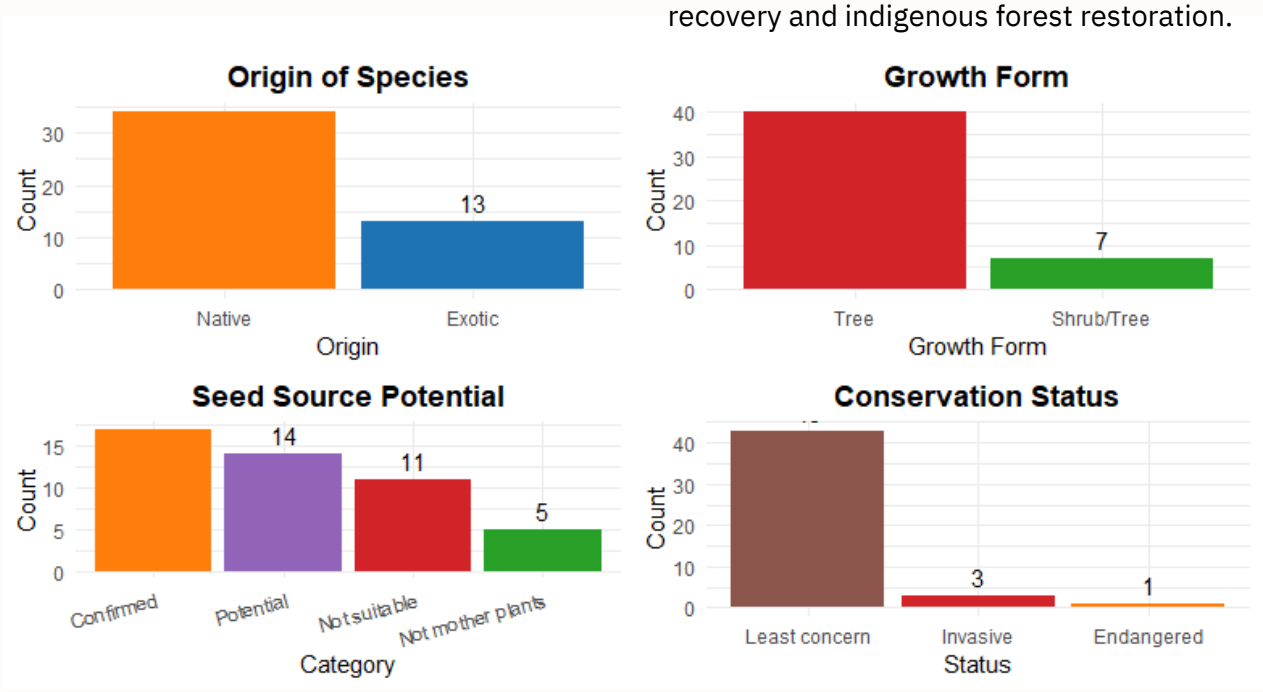

Figure 1. Characteristics of the assessed species at the Great Outdoors Kalanamu

3.2 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 (**Figure 2**).

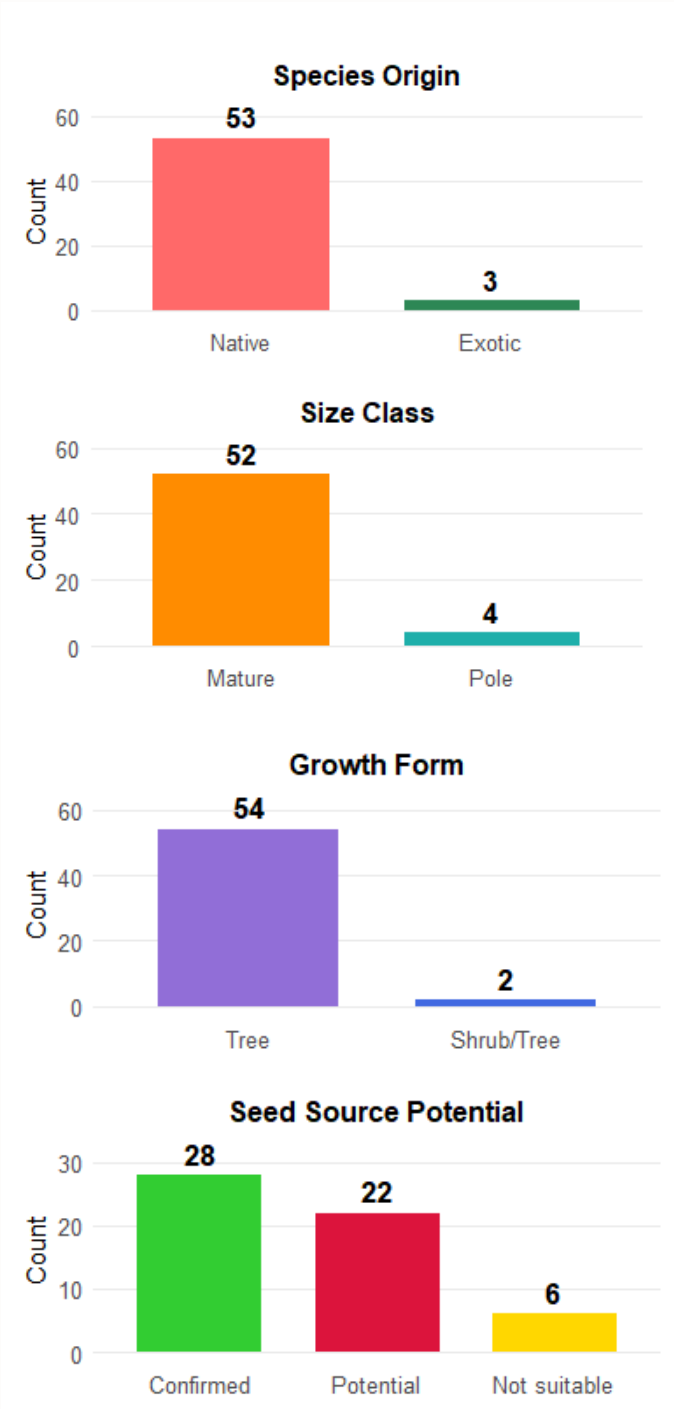

Figure 1. Characteristics of the assessed species at Nalumuli.

3.3. Similarities between the sites

Comparative analysis revealed substantial overlap in indigenous species composition between Nalumuli and Kalanamu, providing a strong scientific basis for species matching between reference and restoration sites. This overlap supports the use of locally appropriate and genetically compatible planting material, reducing ecological risk and enhancing long-term restoration success.

The analysis revealed 25 species common to both survey sites, representing a 32% overlap (Jaccard Similarity Index). GO contained 47 species (34 native, 13 exotic), while Nalumuli had 56 species (53 native, 3 exotic). Nalumuli demonstrated a stronger focus on native species, with a greater diversity within key genera like *Anthocleista* and *Macaranga*. Despite the 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.

4 Baseline ecological data collection

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.

4.1 Soil surveys

Within these blocks, soil sampling and laboratory analyses have been completed, generating a comprehensive soil baseline dataset. These results provide critical insights into soil fertility, constraints, and site suitability, directly informing species selection, nursery planning, and restoration design.

Soil analyses show slightly acidic to near-neutral conditions (pH 5.1–6.1), with topsoils generally suitable for establishment, except Block 2 where liming is required. Topsoil organic matter is moderate, while subsoil values are consistently lower, indicating declining fertility with depth **(Table 1 & 2)**.

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.

Overall, the soils are suitable for restoration planting but require integrated soil fertility management, including organic amendments, selective liming, and balanced nutrient inputs.

Table 1. Soil physio-chemical properties for the different samples for the topsoil (0 – 20 cm).

Analytical Lab:	Soil and Plant Analytical Laboratories at NARL													
Client:	L.M.K Mutesasira c/o Dr. Joshua Zake													
District	Luweero													
Village	Katanamo													
Type of Sample:	8 soil													
Date of Analysis:	Dec 2025													
Lab no.	Client's Reference			pH	OM	N	P	Ca	Mg	K	Sand	Clay	Silt	Textural Class
	Co-ordinates	Block	Depth (CM)		----------%--------		----------ppm----------				----------%----------			
S/25/2670	N 00 ^{0} 35.1164, E 032 0 36.6170	1	Top	5.8	3.3	0.1	4.9	1850	479	389	57	18	25	Sandy loam
S/25/2672	N 00 ^{0} 35.0536, E 032 ^{0} 36.5825	2	Top	5.1	3.6	0.1	5.1	940	183	120	65	16	19	Sandy loam
S/25/2674	N 00 ^{0} 35.9594, E 032 ^{0} 37.7202	3	Top	6.1	3.0	0.1	4.6	1980	280	98	49	17	34	Sandy loam
S/25/2676	N 00 ^{0} 35.9333, E 032 ^{0} 37.7216	4	Top	5.5	2.5	0.1	5.7	1530	190	78	45	18	37	Sandy loam
	Mean			**5.6**	**3.1**	**0.1**	**5.1**	**1575**	**283**	**171**				
	Minimum			**5.1**	**2.5**	**0.1**	**4.6**	**940**	**183**	**78**				
	Maximum			**6.1**	**3.6**	**0.1**	**5.7**	**1980**	**479**	**389**				

Table 2. Soil physio-chemical properties for the different samples for the subsoil (20 – 40 cm).

Lab no.	Client's Reference			pH	OM	N	P	Ca	Mg	K	Sand	Clay	Silt	Textural Class
	Co-ordinates	Block	(CM)		----------%--------		----------ppm----------				----------%----------			
S/25/2671	N 00 ^{0} 35.1164, E 032 ^{0} 36.6170	1	Sub	5.4	2.0	0.1	4.9	1160	354	187	59	24	17	Sandy clay loam
S/25/2673	N 00 ^{0} 35.0536, E 032 ^{0} 36.5825	2	Sub	5.3	1.8	Trace	5.5	1460	102	41	59	15	26	Sandy loam
S/25/2675	N 00 ^{0} 35.9594, E 032 ^{0} 37.7202	3	Sub	5.8	2.1	0.1	4.8	1680	158	88	57	23	20	Sandy clay loam
S/25/2677	N 00 ^{0} 35.9333, E 032 ^{0} 37.7216	4	Sub	5.1	1.9	0.1	5.2	960	189	101	53	27	20	Sandy clay loam
	Mean			**5.4**	**2.0**	**0.1**	**5.1**	**1315**	**201**	**104**				
	Minimum			**5.1**	**1.8**	**0.1**	**4.8**	**960**	**102**	**41**				
	Maximum			**5.8**	**2.1**	**0.1**	**5.5**	**1680**	**354**	**187**				

4.2 Vegetation surveys

Vegetation baselining has commenced within the mapped blocks, with two vegetation plots established and surveyed to date. The surveyed plots contained a total of 44 species comprising 1,673 individual specimens, with the second plot exhibiting greater abundance (1,001 specimens) than the first (672 specimens), indicating high spatial correlation (r = 0.960) in species distribution between plots.

Herbaceous life forms dominated both in species richness (22 species) and total abundance (1,397 specimens), averaging 63.5 individuals per species, far exceeding trees which averaged only 6.8 individuals across 13 species. Natural regeneration was the predominant origin mode (38 species, 1,587 specimens), while the community was predominantly mature (28 species, 1,443 specimens), reflecting an established vegetative structure with limited recent recruitment in younger size classes.

These surveys have generated initial data on species composition and structural attributes, forming the foundation for expanded vegetation sampling across the remaining blocks. Together with the soil and phenology datasets, these data establish a quantitative baseline against which restoration outcomes can be monitored over time.

Complete data analysis will be done after completion of the survey.

Next steps will include expanded surveys, a local nursery, and informed restoration planting.