



Project Updates – October 2025

Conservation, Restoration and Cultivation of threatened medicinal plants in Kalinzu Central Forest Reserve, Uganda.

Rufford Project ID.: 45481-1



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Executive Summary

This update presents progress of the project titled “*Conservation, Restoration and Cultivation of Threatened Medicinal Plants in Kalinzu Central Forest Reserve (KCFR)*”, which is supported by the Rufford Foundation (Grant No. 45481-1) and Environs Conservation Services-Uganda (ECOSEV-U). The project is being implemented by a team of young male and female professional foresters and environmental conservationists. These operate in close collaboration with ECOSEV-U, the National Forestry Authority (NFA) and local communities adjacent to KCFR. The current update covers the period of May-October 2025 and builds on an earlier update that was submitted to Rufford Foundation in April 2025. It documents information about the completed forest-based survey, the established tree nursery beds, the propagated tree seedlings, local community engagement programs, community-based planting of nursery raised seedlings (villages and schools), restoration of some degraded KCFR areas and monitoring of seedlings planted in communities.

The forest survey findings indicate that *Prunus africana* had a reasonable regeneration potential, *Zanthoxylum gillettii* had a fair distribution across different forest areas, *Warburgia ugandensis* is largely confined to the interior of the relatively closed forest areas and *Citropsis articulata* was not recorded. The absence of *C. articulata* suggests that it has either critically declined or is locally extinct. Concerning propagation of the medicinal tree seedlings, over 18,000 healthy seedlings of the target species have been raised. In addition, an extra 1,200 seedlings of *Spathodea companulata* seedlings have been raised in response to the local communities expressing that the species serve significant medicinal purposes. The raised seedlings were mainly propagated from seeds and wildings collected from KCFR. Additional seedlings were purchased from the National Tree Seed Centre (NTSC) so as to raise a sufficient number of seedlings. Engagements and trainings were conducted in the target local communities in order to strengthen the capacities of the tree nursery management committees, teachers, school children and volunteers in seedling propagation, management of planted out seedlings and sustainable harvesting of herbal medicine.

Below are highlights of other activities, achievements and challenges associated with planting out the tree nursery-raised tree seedlings in the communities (villages and schools) and the degraded areas of KCFR;

- In May-June 2025 period, community members planted over 1,600 seedlings in their homesteads and private farms while 760 seedlings were planted on three school compounds.
- Between September and October 2025, the project planted over 7,000 seedlings of the target medicinal tree species on approximately 33 hectares of degraded KCFR areas.
- Tree seedlings planted in communities were monitored in October and the results indicated encouraging survival and growth vigour while some planted seedlings died.

Several challenges were faced during the implementation of this project including irregular rainfall, fungal infections in tree nurseries, elephant invasion in the forest and logistical setbacks. These were mitigated through various adaptive measures to ensure steady progress of the project.

1.0 Introduction

This October 2025 update presents progress made under the project “*Conservation, Restoration and Cultivation of Threatened Medicinal Plants in KCFR*”, implemented with funding support from the Rufford Foundation and ECOSEV-U. It builds on the earlier April 2025 updates and outlines the project's continued progress between May and October 2025. The report documents the successful execution of all planned activities, with a focus on forest-based surveys, nursery establishment and tree seedling propagation, community engagement, in-forest restoration and monitoring of tree seedlings planted by community members. It also highlights the challenges encountered, mitigation measures adopted, lessons learned and next steps as the project approaches completion in December 2025.

2.0 Implemented Project Activities

2.1 Forest-based surveys

2.1.1 In-forest plot surveys

During June-July 2025 the project completed stratified in-forest plot-based surveys using research methods described earlier in the April updates. A total of 125 plots were sampled across forest edge, interior open and interior closed strata. This aimed at understanding of the status, distribution and abundance of target medicinal tree species namely; *Prunus Africana*, *Zanthoxylum gillettii*, *Warburgia ugandensis* and *Citropsis articulata*. The considered variables included DBH, tree height, GPS location, health condition and signs of utilization. Purposive searches targeting rare species of *W. ugandensis* and *C. articulata* were also conducted with technical guidance from NFA patrolmen.



Figure 1: In-forest survey methods including; (a) observations and height estimation, and (b) DBH measurement with a calliper. (Photo credit: Benard Tumwekwatse)

2.1.2 In-forest Survey Findings

Results obtained from the in-forest survey provided a detailed overview of population structure, distribution and condition for target species. *P. africana* individuals were most abundant (N = 404) and were mostly recorded on in forest edges and on slopes (Table 1). *Z. gilletii* (N = 161) occurred across the different forest strata and *W. ugandensis* (N = 69) was largely restricted to interior closed forest, on steep slopes and stony loamy soils. *Citropsis articulata* was not recorded in all the surveyed areas.

Table 1: The spatial (by forest type and topographic characteristics) and size class distribution of selected medicinal plant species in KCFR.

Species name	Forest type				Size classes (DBH)(cm)					Topography		
	Edge	Open interior	Closed interior	Total	None	(1-10)	(11-30)	(31-50)	(>50)	Valley bottom	Slope	Top
<i>Prunus africana</i>	196	106	102	404	145	59	53	77	70	31 (7.5%)	230 (57%)	143 (35.5%)
<i>Xanthoxylum gilletii</i>	46	53	62	161	19	41	38	59	4	29 (18.0%)	97 (60.2%)	35 (21.7%)
<i>Warburgia ugandensis</i>	-	17	52	69	3	5	27	20	24	1 (1.4%)	44 (63.8%)	24 (34.8%)
<i>Citropsis articulata</i>	-	-	-	-	-	-	-	-	-	-	-	-

The results show notable evidence of human utilization with bark removal (N = 232) being the dominant extraction method (Table 2). This was noted mainly on *P. africana* and *Z. gilletii*. Stem cutting and leaf extraction was mostly associated with *W. ugandensis* while root removal was less common on the

target species but community reports indicate it has driven local losses of *C. articulata*.

Table 2: Forms of utilization of selected medicinal plant species and their health in KCFR

Species name	Forms of extracting herbal medicine					Health status		
	None	Bark removal	Root removal	Leaf extraction	Cutting of a tree /part	Good	Poor	Dead
<i>Prunus africana</i>	283	113	3	0	5	340 (84.2%)	49 (12.1%)	15 (3.7%)
<i>Xanthoxylum gilleti</i>	62	94	1	0	4	96 (59.6%)	46 (28.7%)	19 (11.8%)
<i>Warburgia ugandensis</i>	27	25	1	9	16	35 (50.7%)	13 (18.8%)	21 (30.4%)
<i>Citropsis articulata</i>	-	-	-	-	-	-	-	-
Total	372	232	5	9	25	471	108	55



Figure 2: Assessments of extraction methods of herbal medicine including; (a) debarking of *Z. gilleti*, (b) debarking of *P. Africana*, (c) root extraction and (d) cutting branches of *W. ugandensis*. (Photo credit: Benard Tumwekwatse)

2.1.3 Conservation recommendations based on the survey findings.

Spatial analysis showed *P. africana* clustering on forest edges and mid-slopes. *Z. gillettii* evenly distributed across the three sampled forest strata while *W. ugandensis* exhibited a highly restricted spatial range, as it is localized mainly in the interior closed forest with minimal disturbance. Based on these findings, it is recommended that *P. africana* be enriched along forest edges and mid-slopes, *Z. gillettii* can be planted in most parts of the forest reserve, and *W. ugandensis* can be restored within shaded interior forest areas where it naturally occurred. The absence of *C. articulata* highlights urgency for ex-situ conservation. Recommendations from these patterns also informed the restoration site choices and community domestication priorities. Furthermore, according to the noted destructive harvesting methods, it is recommended that the stakeholders (NFA, herbalists and local communities) ensure application of sustainable herbal medicine harvesting techniques.

2.2 Nursery establishment, propagation and management

2.2.1 Establishment and infrastructure

Three community tree nurseries (Toro-Toro, Kayanga, Kyanika) and three school nurseries (Ndekye Secondary, Mashonga, Butinde Primary) were fully established and upgraded. Communities continued to provide in-kind materials, tools, equipment and labour. In addition, essential tools and supplies were procured for tree nursery operations.

2.2.2 Propagation and seedling production

By October 2025 the tree nurseries had raised good stock with over 12,400 seedlings of *P. africana* and 3,604 of *Z. gillettii*. Additionally, 549 seedlings of *W. ugandensis* were procured from NTSC and 304 were raised locally. Community members proposed and supported propagation of *Spathodea campanulata* (African tulip), a locally threatened tree that is highly valued for wound and skin treatments and for ecological benefits. Approximately, 1,200 seedlings of

this species have been propagated and are being hardened for future planting in local communities and in degraded forest areas. All together, over 18,000 seedlings have so far been raised.



Figure 3:(a) Propagation of *Z. gilleti* wildings and (b) sowing of *S. companulata* seeds in project established tree nursery beds. (Photo credit: Benard Tumwekwatse)

Figure 4: Seedlings purchased from NTSC being introduced to a community-based tree nursery. (Photo credit: Benard Tumwekwatse)

Efforts to propagate and/or procure planting materials of *C. articulata* are still being hindered by availability and high cost of a few seedlings raised in commercial tree nurseries. The only known source of *C. articulata* in Uganda, "Tooro Botanical Gardens" offers seedlings at a cost beyond the project's current budget capacity. However, the project team in collaboration with local community members are continuing to explore opportunities propagating and conserving the species within and around KCFR.

2.2.3 Management and capacity building

Community Nursery Management Committees were formed to manage daily operations, record keeping and maintenance schedules. Regular on-site trainings by the project team and NFA focused on seed handling, pest control, potting, hardening-off and record management. Schools integrated nursery work into environmental education, with teachers and clubs supporting continuity.

2.2.4 Performance and lessons

By October 2025 all nurseries were fully functional, producing high-quality seedlings. Correct watering, shading and pest management resulted in strong survival rates. Early nursery preparation before rains, continuous technical supervision and school community integration have helped to improve seedling quality and long-term sustainability.

2.3 Community engagement, training and school outreach

2.3.1 Mobilization and sensitization

Community mobilization across Toro-Toro, Kayanga and Kyanika through LC1s and community groups was enhanced. This was to archive project objectives and the links between biodiversity and livelihoods through direct participation in tree seedling propagation, domestication of medicinal plants and forest restoration engagements.



Figure 5: Community sensitization meetings in communities of; (a) Toro-Toro, (b) Kyanika and (c) Kayanga villages. (Photo credit: Benard Tumwekwatse)

2.3.2 Training and capacity building

Training sessions used demonstrations and field practicals covering nursery management, sustainable harvesting, planting techniques and post-planting care. Pre- and post-training assessments showed clear knowledge gains and improved practical skills.



Figure 6: The project team conducting training sessions in; (a) sustainable methods of harvesting medicinal plants to a local community in Rubirizi district and (b) tree planting techniques to pupils of Butinde Primary school. (Photo credit: Benard Tumwekwatse)

2.3.3 School outreach

Environmental clubs and teachers actively participated in tree nursery operations and planting trees on school lands. Each tree planted on school land was assigned to a student caretaker to instil responsibility. These schools now serve as demonstration sites and practical learning centres for propagation and conservation.

a



c



Figure 7: The project team undertaking school outreaches and environmental education sessions in; (a) Mashonga primary, (b) Ndekye Secondary and (C) Butinde primary schools (Photo credit: Benard Tumwekwatse)

2.3.4 Community uptake and outcomes

Community response has been positive with volunteers who were involved in tree planting events and several households began on-farm domestication of priority species. Strengthened collaboration between NFA, CFM groups and residents has increased stewardship and sustainability prospects.

2.4 In-forest restoration and community planting activities

2.4.1 Site identification

Joint assessments with the project team, NFA and CFM groups helped to identify two priority sites in northern KCFR. These were named; Site A (Kyamaringi Valley) a historically intact valley now degraded by logging and extraction and Site B a wider forest reserve area of over 50 hectares that is currently degraded due to agricultural activities.



Figure 8: Project team, NFA staff and CFM group representatives inspecting degraded sections of KCFR that were identified for restoration as (a) site A and (b) site B. (Photo credit: Benard Tumwekwatse)

2.4.2 Planting and restoration in the degraded KCFR areas.

Approximately 33 hectares were restored through open planting and enrichment. Enrichment planting was basically carried out on site A with the operations championed by a CFM group Ndangara-Nyakiyanja Parishes Tutungukye CFM Group (NNTG). Tree planting on site B was led by two private tree planters with the help of community volunteers and the project team members, where over 15 hectares were planted with medicinal tree seedlings. Around 7,000 seedlings were planted following standard spacing and pit preparation. Seedlings were transported using crates and basins; community teams prepared pits with minimal clearing to reduce disturbance.





Figure 9: A pictorial presentation illustrating the tree planting and forest restoration process from top to bottom including preparation, transportation, reception, and distribution of seedlings, to pitting and planting across designated restoration sites within KCFR. (Photo credit: Benard Tumwekwatse)

2.4.3 Community management roles

Community members involved in tree planting and in-forest restoration activities included CFM groups, local volunteers, and village organised groups. NFA patrols and volunteers helped in staking each planted spot and in some

cases simple barriers were erected to reduce grazing. At Site B, two private tree planters were assigned to care for the planted trees under a restoration responsibility self-will. Site A is managed by CFM members with project support.



Figure 10: Community groups of; (a) Toro-toro, (b) Kayanga and (c) Kabukwili villages that were involved in tree planting and in-forest restoration activities. (Photo credit: Benard Tumwekwatse)

2.5 Monitoring, evaluation and preliminary survival assessment

The monitoring conducted covered trees in homesteads, private farms and school compounds. Community and household plantings were assessed in October 2025 about 4 months after planting in May-June period. The preliminary results showed high survival where maintenance including watering, mulching and weeding was generally in place and a few mortalities resulted from livestock browsing and short dry spells. The assessed seedlings in village communities indicated an average maturity height of 45-55 cm in *P. Africana*, 30-40 cm in *Z. gillettii* and 38-50 for *W. ugandensis*. Quantitative monitoring of in-forest plantings is scheduled for November 2025, which will yield survival percentages and guide adaptive management.





Figure 11: Project team together with community members monitoring the survival and growth of seedlings planted on private farms and home gardens. (Photo credit: Benard Tumwekwatse)

Similarly, monitoring of trees planted within school grounds specifically at Mashonga Primary and Butinde Primary Schools was carried out in the same period. Measurements of seedling height and general condition showed excellent establishment and steady growth, with *P. africana* averaging 40-55 cm, *Z. gillettii* averaging 30-45 cm and *W. ugandensis* 26-35 cm.



Figure 12: Project team members with school staff representatives taking height measurements of seedlings planted in; (a) Butinde Primary School and (b) Mashonga Primary School. (Photo credit: Benard Tumwekwatse)

3.0 Challenges, mitigation and lessons learned

3.1 Key challenges

Major challenges that have been faced during the implementation period include;

- Irregular rainfall and dry spells that resulted in delays to execute in-forest restoration planting activities and also caused harsh conditions for seedling growth in the project tree nurseries.
- Fungal attacks on *P. africana* seedlings in some nurseries which caused damping-off leaf wilting).



Figure 13: *P. africana* seedlings affected by fungi that caused leaf scorching and defoliation in the established tree nurseries. (Photo credit: Benard Tumwekwatse)

- Lack of *C. articulata* planting materials for propagation and subsequent planting by local communities and restoration in KCFR.
- Invasion of elephants in KCFR occasionally disrupted in-forest survey activities and threatened lives of project team members. In addition, vermin animals especially, baboons were reported for uprooting the newly planted seedlings in restoration areas.
- Planted seedling mortality noted during the monitoring of seedlings planted in local communities, mostly attributed to livestock browsing and harsh weather conditions.
- Vehicle breakdowns during field operations especially as the project team was navigation through rough terrains of the Kalinzu landscape.

3.2 Mitigation measures

Adaptive responses included rescheduling planting to wetter periods, supplementary watering in tree nursery beds, spot mulching of planted seedlings, tree nursery sanitation and fungicidal treatment, partnership building to source rare species, installation of protective stakes/barriers to control livestock browsing, intensified NFA patrols and community whistle blowing, temporary vehicle repairs and use of alternative transport, and better field coordination.



Figure 14: Chemical treatment of tree seedlings in community nurseries as a remedy to fungal attack and disease control.

3.3 Lessons learned

Key lessons: early nursery preparation and continuous pest monitoring are essential; synchronizing planting with rainfall improves establishment; investing in ex-situ propagation and research is urgent for scarce species such as *C. articulata*; and strong community–institutional collaboration enables adaptive management and long-term project sustainability.

4.0 Review of the Project Timelines

Implementation has progressed largely according to the approved workplan. Most core activities are complete; outstanding tasks focus on post-planting monitoring, data analysis and dissemination scheduled for completion by December 2025.

4.1 Summary of key activities and status

1. Project inception and planning: Completed (Jan 2025)
2. Baseline surveys and plot establishment: Completed (Feb–Jul 2025)
3. Community and school mobilization: Completed (Feb–Apr 2025)
4. Nursery establishment: Completed (Mar–Jun 2025)
5. Propagation of seedlings: Completed / Ongoing maintenance (Mar–Oct 2025)
6. Trainings: Completed (May–Jul 2025)
7. In-forest restoration: Completed (Sept–Oct 2025)
8. Community and household planting: Ongoing (May 2025 onwards)
9. School greening: Completed / Ongoing maintenance (May–Oct 2025)
10. Monitoring of community and school trees: Completed (Sept–Oct 2025)
11. Monitoring of in-forest plantings: Pending (Scheduled Nov 2025)
12. Data analysis and reporting: Ongoing (Nov–Dec 2025)
13. Dissemination and stakeholder feedback: Pending (Scheduled Dec 2025)

4.2 Next steps

1. Conduct comprehensive quantitative monitoring of in-forest plantings in November 2025 and compile survival statistics.
2. Finalize data analysis and prepare the final project report by December 2025.
3. Organize a dissemination workshop with NFA, communities and partners in December 2025.
4. Hand-over community-managed tree nurseries to respective community settings of schools and villages.
5. Continue supporting community nurseries and promote on-farm domestication and value-chain opportunities for propagated species.

Project Partners and supporters

