



Darwin Initiative/Darwin Plus Projects
Half Year Report
(due 31st October 2020)

Project reference	26-017
Project title	Maximising community and conservation benefits from plants of Mount Mulanje
Country(ies)/territory(ies)	Malawi
Lead organisation	Botanic Gardens Conservation International (BGCI)
Partner(s)	Mulanje Mountain Conservation Trust (MMCT), Forestry Research Institute of Malawi (FRIM)
Project leader	Kirsty Shaw
Report date and number (e.g. HYR3)	<i>HYR2</i>
Project website/blog/social media	https://globaltrees.org/news-blog/new-value-for-an-endangered-tree-to-serve-mulanje-mountain/ https://globaltrees.org/projects/save-our-cedar-malawis-national-tree/

1. Outline progress over the last 6 months (April – Sept) against the agreed project implementation timetable (if your project has started less than 6 months ago, please report on the period since start up to end September).

1.1 Ten nurseries, established and certified in project 23-026, produce a minimum aggregate total of 400,000 Mulanje Cedar seedlings in years 1-3, benefiting 150 nursery workers.

The remaining eight community nurseries have continued to propagate Mulanje Cedar (*Widdringtonia whytei*) seedlings. At the end of year 1, they had produced 75,700 seedlings, 37,418 of which MMCT planted on the mountain and in community hedges (for use in essential oil developments in the future). There are currently 199,572 seedlings in nurseries (see table 1 below), which includes the seedlings not planted in year 1. In year 2, so far community nurseries have propagated 161,290 Mulanje Cedar seedlings.

Table 1: Seedling propagation of Mulanje Cedar and other companion species at the 8 community nurseries (species with local names only are being identified by botanists at FRIM).

Nursery	Species	Seedlings propagated
Makolera	<i>Widdringtonia whytei</i>	31,627
	<i>Pittosporum viridiflorum</i>	0
Lomoliwa	<i>Widdringtonia whytei</i>	24,450
	<i>Kiggelaria africana</i>	0
Kadewere	<i>Widdringtonia whytei</i>	26,450
Nakhonyo	<i>Widdringtonia whytei</i>	18,564
	<i>Maesa lanceolata</i>	0
Kazembe	<i>Widdringtonia whitei</i>	17,421
Chole	<i>Widdringtonia whytei</i>	15,200
	<i>Dodonaea viscosa</i>	0
	<i>Rytigynia monantha</i>	0
Gambeya	<i>Widdringtonia whytei</i>	34,000
	<i>Podocarpus</i> sp.	0
	<i>Psychotria zombamontana</i>	0
	<i>Newtonia buchananii</i>	95
Nessa	<i>Widdringtonia whytei</i>	31,860
	<i>Podocarpus</i> sp.	23,031
	<i>Adina microcephala</i>	560
	Navaka (local name)	1,200
	Phamba (local name)	3,800
	<i>Erica benguelensis</i>	0
	<i>Newtonia buchananii</i>	350

With the figure propagated halfway through the project, and the propagation rate increasing as more seed has been distributed to the community nurseries, the target of 400,000 seedlings propagated by the end of the project is achievable. It should also be possible to sell these, with the local restoration NGO, WeForest, agreeing to purchase 140,000 seedlings in the coming

tree-planting season for mountain restoration. The project will also purchase up to 2,000 seedlings to plant in the new restoration trials (see 1.2 below). The public awareness campaign to build the market for seedlings is also due to take place following essential oils research and business engagement, which will increase the market for the final project year.

1.2 Design and implement planting trials at 8 sites on Mount Mulanje by end of year 1, benefiting people employed to transport and plant seedlings

Two online meetings have been held with the Ecological Restoration Alliance of Botanic Gardens (ERA) experts from Australia, the United States and South Africa: in May and September. These included updates of the current progress and adaptive management decisions. In September, due to low numbers of companion species able to be collected and propagated (many species are fruiting now or in the next few months), it was decided to use the stocks that are in good condition in December to supplement plant sites that have populations of the target species already present. MMCT and FRIM will collect and propagate seedlings in the next year to set up the full restoration trial design in December 2021. Monitoring will continue beyond the project.

We will hold one final ERA meeting this year in November 2020 to finalise the new trial design based on fieldwork to identify potential sites in October 2020.

1.3 FRIM and restoration experts from BGCI's network monitor planting trials in years 1, 2 and 3.

In December this year, MMCT and FRIM will reassess the 10 plots at 5 sites established in December 2019. They will also set up initial restoration trial plots (see 1.2 above). Due to COVID-19 travel restrictions, in person support from ERA experts for this trip is not expected.

2.4 MMCT and FRIM monitor nursery certification scheme and Cedar Growers and Planters Association (CGPA) (established in project 23-036) which becomes fully inclusive of planters for essence extraction by end of year 3.

FRIM have monitored all the nurseries a second time this year. Of the 8 project nurseries, 7 received certification for the standard of seedlings propagated and the practices they are implementing, including grading of propagated seedlings. This is up from 2 in 2019. Only Chole nursery has not yet achieved certification and MMCT will continue to support them to improve practices in the next year.

3.1 Identify optimal sustainable extraction techniques for Mulanje Cedar essence by end of year 1.

The researcher from Mzuzu University, Prof John Kamanula, has partially completed the essential oils research in the past 6 months. He completed fieldwork to collect twig and leaf materials from Zomba, successfully produced oil and has produced preliminary results from laboratory analyses. This included moisture content, specific gravity and determination of heavy metals in the oil. However, the analysis of refractive index and optical rotation was not possible due to a lack of oil (more leaves and twigs are to be collected and methods altered to be more productive); and analysis of volatile components could not be completed because of machinery malfunction at Chancellor College, and alternative options not available in Malawi.

3.3 Equip communities with essence extraction equipment at start of year 2.

The equipment provider identified at the end of the first year, Essential Distillation Equipment, has agreed to sell and transport distillation equipment to Malawi and to deliver training on use as soon as possible. This has been slowed due to COVID-19 restrictions, but should still be possible before March 2021.

4.1 Conduct survey to identify other plant species of Mount Mulanje and their potential uses and commercial value in year.

This was supposed to be completed at the end of the first project year, but has been delayed due to COVID-19 (see section 2b below). The Ethnobotanist consultant has carried out a literature review of 25 known potential target taxa and prepared the questionnaires needed to carry out focus groups and household surveys. The team has also continued engagement with

the Access and Benefit Sharing (ABS) National Focal Point, Ms Mphatso Kalemba, to ensure the national guidelines are followed in the research.

4.2 Seed collected from est. 10 additional over-exploited species in years 1 and 2, stored at FRIM and distributed to at least ten botanic gardens.

FRIM and MMCT have carried out fieldwork to collect seeds of other species from Mount Mulanje. So far, they have collected 7 species which are being propagated at MMCT nursery and 10 new nurseries have been established on the mountain that are managed by the hut watchmen, for future propagation of these species.

4.3 FRIM develop propagation protocols, communities test protocols and publish protocols for all species by end of year 3.

BGCI are going to organise some online training, with experts from the ERA, to carry out propagation trials that can feed into published propagation protocols. This will be provided to staff at MMCT and FRIM and they will act as trainers for the community nursery groups. MMCT will collate the data from nurseries to then publish protocols.

2a. Give details of any notable problems or unexpected developments/lessons learnt that the project has encountered over the last 6 months (for Covid-19 specific delays/problems, please use 2b). Explain what impact these could have on the project and whether the changes will affect the budget and timetable of project activities.

The essence extraction equipment quotes were roughly equal to the budgets for the essence extraction equipment planned for years 2 and 3 combined for the project. As a result, we have combined the budgets together to be all spent in year 2 (approved via a change request).

The quantity of oil produced by the research so far has been low (1%) but the researcher has learnt that the distillation process can be run for longer than normal and still produces oils - it can be run for up to 4.5 hours where usually 3 hours is the limit for other species. The time of year of harvesting may also influence the quantities of oil produced. These factors will be further tested in the second round of analysis to be undertaken in October 2020.

If the quantities produced cannot be improved then the amount of material (leaves and twigs) would need to be high to produce good volumes of oil (ca. 100kg material for 1kg oil) for any business application. This may require longer than the project timeframe for the planted hedges to be able to sustainably provide the materials. With the purchase of a smaller distillation equipment and training from South African experts, MMCT will be able to investigate other mountain species that could produce oils and to send samples of these to potentially interested businesses, ultimately diversifying the available opportunities for local communities.

The propagation of companion species has proved difficult in the first year because a lot of mountain species come into fruit from September to December, which was before we were able to finalise a list of target species. This means the restoration trials are being adapted this year to plant Mulanje Cedar in sites with populations of target companion species that are already established, with a view to implement a larger planting trial in the final project year.

2b. Please outline any specific issues which your project has encountered as a result of Covid-19. Where you have adapted your project activities in response to the pandemic, please briefly outline how you have done so here. Explain what residual impact there may be on your project and whether the changes will affect the budget and timetable of project activities.

Because of COVID-19, the development of essential oil enterprises has been delayed. Fieldwork to Mount Mulanje was not possible from Mzuzu University and it was not possible for Chancellor College to fix machinery needed for the Mzuzu University researcher to analyse the components of the oils produced. Other options for carrying out the analysis were investigated, but none could be found in Malawi and it is too costly to send samples abroad. The Chancellor College machine has now been fixed so the research is to be undertaken and report on findings written in November 2020.

This has had knock on effects on the other following project activities:

- Engagement with local businesses, including sending oil samples, to understand what opportunities for value chain development exist.
- Public outreach campaign to promote the results and grow the market.
- Nagoya compliance training for Mulanje Cedar producers.
- Sustainable essence extraction training, including harvesting and processing methods.

These activities will be picked up once the results of the research have been produced from November 2020 onwards.

The purchase of essence extraction distillation equipment from South Africa has also been delayed due to an inability to transport the machinery to Malawi; and for trainers to travel to support the equipment set up and train MMCT staff and community members how to use it. As a result, the full budget for essence extraction consumables in year 2 is not going to be needed so we have moved budget for year 2 into year 3 (approved via a change request), to allow the provision of more consumables in year 3 instead, as the potential industry takes shape.

The ethnobotanical survey has also been delayed due to restrictions on group meetings which the researcher needs to carry out the research and difficulties finding a willing research assistant/translator during the pandemic. The researcher has used the time to carry out further literature review research and communicate further with the Malawi ABS National Focal Point to ensure the research is within national ABS guidelines when it is undertaken. Meetings are going to be held with Traditional Authority Leaders in November to get Prior Informed Consent and Mutually Agreed Terms for the community meetings to go ahead.

The Covid-19 pandemic has delayed business skills and cedar hedge planting and management training for community nursery groups and other interested community members. The hedge planting training will take place in the next tree-planting season (December 2020 to March 2021). 50 farmers (including 50% women) will be identified to be involved in this training in November / December 2020. The advertisement for a business skills trainer will be created in October / November in order to select a trainer in December to carry out training in the first quarter of 2021.

Funds for travel to Uganda for BGCI staff and Restoration Ecologists to support the project probably will not be spent this year (see estimated underspend below). Once we confirm the virus will stop travels from January to March 2021, we plan to submit a change request to support other project activities instead. We have messaged LTS regarding this concern already. This could involve funds being transferred to the final year to support the ERA experts to travel to Malawi in December 2021 to take part in the establishment of restoration trials; and / or to support conservation genetics research to understand the genetic variability of the Mulanje Cedar in Zomba, Chicangawa, and on Mount Mulanje.

2c. Have any of these issues been discussed with LTS International and if so, have changes been made to the original agreement?

Discussed with LTS:

Yes/No

Formal change request submitted:	Yes/No
Received confirmation of change acceptance	Yes/No

3a. Do you currently expect to have any significant (e.g. more than £5,000) underspend in your budget for this year?

Yes No Estimated underspend: £

3b. If yes, then you need to consider your project budget needs carefully. Please remember that any funds agreed for this financial year are only available to the project in this financial year.

If you anticipate a significant underspend because of justifiable changes within the project, please submit a rebudget Change Request as soon as possible. There is no guarantee that Defra will agree a rebudget so please ensure you have enough time to make appropriate changes if necessary. Please DO NOT send these in the same email as your report.

4. Are there any other issues you wish to raise relating to the project or to Darwin's management, monitoring, or financial procedures?

None at this time.

If you were asked to provide a response to this year's annual report review with your next half year report, please attach your response to this document.

Please note: Any planned modifications to your project schedule/workplan can be discussed in this report but **should also be raised with LTS International through a Change Request. **Please DO NOT send these in the same email.****

Please send your **completed report by email** to Darwin-Projects@ltsi.co.uk. The report should be between 2-3 pages maximum. **Please state your project reference number in the header of your email message e.g. Subject: 25-001 Darwin Half Year Report**