Darwin Initiative Main Project Annual Report

To be completed with reference to the "Writing a Darwin Report" guidance: (http://www.darwininitiative.org.uk/resources-for-projects/reporting-forms). It is expected that this report will be a **maximum** of 20 pages in length, excluding annexes)

Submission Deadline: 30th April 2018

Darwin Project Information

Project reference	23-026
Project title	Domestication of Mulanje Cedar for Improved Livelihoods
Host country/ies	Malawi
Contract holder institution	Botanic Gardens Conservation International
Partner institution(s)	Mulanje Mountain Conservation Trust, Forestry Research Institute of Malawi
Darwin grant value	£252,172
Start/end dates of project	April 2016 – March 2019
Reporting period (e.g., Apr 2017 – Mar 2018) and number (e.g., Annual Report 1, 2, 3)	April 2017 – March 2018
Project Leader name	Paul Smith
Project website/blog/Twitter	http://www.bgci.org/where-we-work/malawi/ http://globaltrees.org/projects/save-our-cedar-malawis-national-tree/ http://globaltrees.org/news-blog/400000-trees-for-christmas/ #SaveOurCedar
Report author(s) and date	Kirsty Shaw and Paul Smith, April 2018

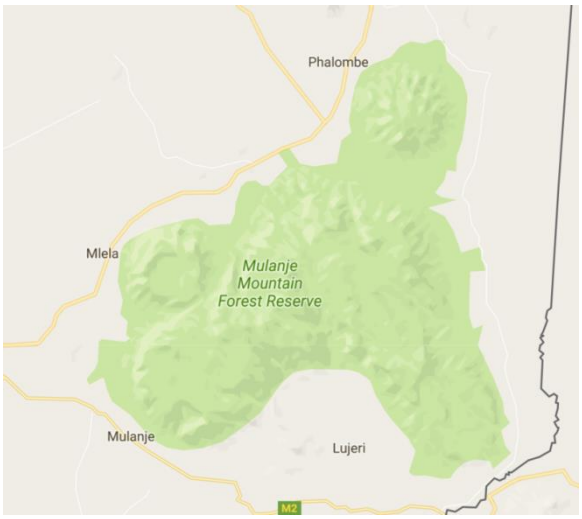
1. Project rationale

Malawi's national tree – the Mulanje cedar (*Widdringtonia whytei*) – occurs naturally only in the Mulanje Mountain Biosphere Reserve, and is critically endangered. Prior to the initiation of this project, it was estimated that cedar forest cover had declined by 37% in the last 28 years. The ecological baseline survey carried out in year 1 of this project indicates that the decline has been much more severe than this, and Mulanje cedar is now practically extinct from its natural habitat. The loss of Mulanje cedar and associated forest species on the mountain has resulted in soil erosion and flash flooding during rainy periods, resulting in the loss of 18 lives in 2016. Mulanje cedar is a high value timber tree and both legal and illegal cutting have represented an important source of income for local communities. In response to the cedar's decline, the Malawi Forestry Department developed a Cedar Management Plan (2014-2019). This document recommends that: (i) large scale ecological restoration of the cedar should be undertaken, and (ii) off-take of the cedar should be prohibited for at least the next five years. Previous attempts to restore cedar forests and to grow the species more widely have been limited by its poorly understood ecology, pathology and horticulture. The cutting ban will have a serious and detrimental impact on local

livelihoods. Although efforts to plant the tree on Mulanje Mountain have proved challenging, it has been successfully planted at small scale elsewhere in Malawi with better growth rates than on Mulanje. The cedar also grows in botanic gardens in Kenya, Tanzania, Indonesia and New Zealand. The Cedar Management Plan, combined with consultation with local partners, identified these problems and the need for this project. The project will generate new knowledge and deliver biodiversity and livelihood benefits by:

- Defining optimal growing conditions, and improving horticultural protocols for cedar restoration on Mulanje Mountain and for wider cultivation in Malawi.
- Generating alternative sustainable income sources for poor people through the sale and planting of cedar seedlings.
- Significantly reducing unsustainable exploitation and habitat loss of natural stands of cedar.

The main project activities are taking place on and around Mulanje Mountain Forest Reserve. Trial plots have also been set up across Malawi to test growth limits and identify optimal growing conditions for Mulanje cedar.



Mulanje Mountain Forest Reserve

2. Project partnerships

The two main implementing partners in Malawi are the Mulanje Mountain Conservation Trust (MMCT) and the Forestry Research Institute of Malawi (FRIM). Good partnerships between BGCI and these organisations, and between the two organisations in Malawi, have ensured successful delivery of project activities in year 2.

MMCT's mandate is to ensure conservation and sustainable utilisation of the natural resources of Mulanje Mountain, including the Mulanje cedar. MMCT has over 20 years' experience working on Mulanje Mountain and is well known by community members and the two district government offices that the mountain spans: Mulanje and Phalombe. FRIM's technical expertise in cultivating and managing stands of Mulanje cedar, on Mulanje Mountain and elsewhere, adds experience to the project team. FRIM staff, including the Director, Dr. Tembo Chanyenga, have decades of experience working on the Mulanje Cedar, and work closely with the Mulanje and Phalombe District Forest Officers.

BGCI's involvement in the project is based on the need for identification of optimal growing conditions (indicator 0.1) and improved horticultural protocols (i0.2) for cedar restoration on Mulanje Mountain and for wider cultivation in Malawi. BGCI's network of experts is helping to answer these questions. In year 2, staff from the UK Forestry Commission visited the trial plots set up across Malawi, nurseries and planting sites on the mountain to assess performance and provide guidance. A mycologist from Chicago Botanic Garden collected soil and foliage samples to analyse microbial associations of Mulanje cedar and the US Forest Service analysed DNA samples collected in year 1 to determine if there is a genetic difference between Mulanje cedar populations on the mountain. The Project Manager from BGCI, Kirsty Shaw, visited Mulanje four times during the second year of the project. The Principal Investigator from BGCI, Paul Smith, and Stephen Blackmore, Chair of BGCI and the Darwin Initiative, visited Malawi to promote the project and assess progress.

All lead partners were involved in project design, continue to make joint decisions about project implementation and are involved in project activities. For example, the national publicity campaign launched in year 2, involved staff from BGCI, MMCT and FRIM (i5.3).

The project Steering Committee continues to evaluate project progress, identify risks and actions to mitigate these risks (Activity 1.1). The Steering Committee has representation from the Traditional Authorities, the National Botanic Garden and Herbarium of Malawi, African Parks and the District Forest Officers (i1.1, see Annex 4.1 for Steering Committee minutes).

Additional partners to those included in the original project proposal have been brought on board to further support project implementation, either on a contractual basis, or through the development of an MOU. These partners include Starfish Malawi, an NGO linking schools in Malawi and the UK that is supporting the outreach components of the project (i5.3).

All partners involved in the project, including lead partners, contractors, BGCI members and new partners, have contributed to the successful delivery of year 2 activities.

3. Project progress

3.1 Progress in carrying out project Activities

Output 1 - Optimal cedar growing conditions characterised to improve reforestation success on Mulanje Mountain and to define areas suitable for cedar cultivation elsewhere in Malawi.

A project Steering Committee was established in year 1 of the project to monitor project progress and provide advice to the project team. The Steering Committee met twice during year 2 of the project, in June 2017 and February 2018. Minutes for both meetings are provided in Annex 4.1. Regular contact was maintained with the Steering Committee in between meetings, to enable them to provide advice on planting sites and to keep them up to date with the number of seedlings produced and planted so they were able to promote the project.

One consultancy contract was developed by MMCT during year 1: for Professor Charles Jumbe to repeat the socio-economic survey. Two consultancy contracts were developed by BGCI in year 2: for the United States Forest Service to carry out genetic analyses of DNA samples collected in year 1, and for Chicago Botanic Garden to collect soil and foliage samples and carry out analyses to identify microbial associations and pathology of Mulanje cedar. Louise Egerton-Warburton, a mycologist from Chicago Botanic Garden visited Malawi in March 2018 and collected soil samples from historic cedar clusters and newly planted areas on Mulanje Mountain. Foliage samples were taken from healthy and unhealthy seedlings planted on the mountain and in nurseries. MMCT are obtaining additional samples from across the mountain and other nurseries that will be sent to Chicago Botanic Garden. Soil analyses will identify if there is a strong microbial association that improves growth of Mulanje cedar. Nursery trials will also be carried out using soil from cedar stands to measure the effect this has on seedling performance. Foliage analyses will identify if it is a pathological agent causing seedling death, which affects around 2-3% of seedlings in nurseries and continues to cause early death after planting. Initial results of analyses are included in Annex 4.2.

Eight trial sites were set up across Malawi in year 1, to identify other areas where Mulanje cedar will grow. These sites are managed by local FRIM or Forestry Department Officers. Mismanagement at some sites led to seedling losses, e.g. the site at Dedza was grazed by goats and on the site at Chikamula seedlings were removed and the area was used for cultivation of sweet potatoes. The FRIM Director, Dr. Tembo Chanyenga, visited all sites and is trying to address mismanagement issues. Initial results from trial plots are provided in Annex 4.5. Alternative, private sites that are well-managed were identified during year 2, and additional trial plots will be planted at these sites. Data loggers were provided by the UK Forestry Commission and were installed at all original trial sites to record temperature ranges. Data loggers are also being installed at sites on Mulanje Mountain. In year 3, BGCI will also collect equivalent data from botanic gardens that hold Mulanje Cedar in their collections. This information will be used to map suitable growing areas for Mulanje Cedar in Malawi during year 3.

Output 2 - Improved horticultural protocols developed for the Mulanje cedar to improve survival and growth rates in community nurseries

Nursery trials were designed by Dan Luscombe from Bedgebury Pinetum and Richard Jinks from the UK Forestry Commission. Trials were implemented at Bedgebury Pinetum. The trials investigated optimal media, different pot types, watering regimes, light and temperature. These trials will be replicated in the community nurseries in year 3 of the project. Initial training on setting up nursery trials was given to nursery chairpersons in March 2018 by Richard Jinks. Dan Luscombe will return to Malawi in the first half of year 3 to help set up trials in community nurseries. This will include adding soil from cedar stands to the growing medium in nurseries. Some nurseries had previously trialled using soil from pine plantations, but Louise Egerton-Warburton informed the project team that the microbes in pine plantations are likely to be very

different to those in cedar stands so this would have limited success. During year 3, nursery groups will monitor the nursery trials and optimal horticultural protocols will be published.

Output 3 - Cedar propagation in community nurseries generates income for local households

Ten nurseries were established and equipped in year 1. Each nursery has one chairperson and nine additional nursery workers. Dropout rate has been very low, with only two people leaving nursery groups since project initiation. Nursery management and business skills training was delivered in year 1. A capacity gap assessment was carried out in December 2017, which identified that the business skills training (delivered to one representative from each nursery group) was not well disseminated to the rest of the nursery groups. As marketing will be crucial for the longer-term success of nurseries beyond the timeframe of the project, business skills training was delivered to all 150 nursery workers in year 2. Capacity gaps were also identified in terms of nursery management. Despite training being provided on monitoring growth and survival rates in year 1, and continued support from forestry extension workers during year 2, this is something that groups struggled to grasp. Further training will be provided by Dan Luscombe when he visits Malawi to set up the nursery trials in the first half of year 3.

In year 2, nursery groups continued to focus on raising Mulanje cedar seedlings. As this is the primary aim of the project, and the majority of nursery workers are raising seedlings for the first time, nursery groups asked to focus on this task for the first growing season of the project and seeds of other species were not provided to nursery groups in year 2. In year 3, nursery groups will be provided with seed of *Acacia lebbeck, Khaya anthoteca* and *Faidherbia albida*. Following recommendations from the socio-economic survey (Annex 4.3) which asked questions about the current use of natural resources. Nursery groups will be encouraged to produce seedlings to establish their own woodlots, as well as for sale.

Across the ten nurseries, 359,474 Mulanje Cedar seedlings were raised, representing 72% of the target for year 1. A working group was established to identify the most suitable planting site in each of the seven basins on Mulanje Mountain for the first planting season. This involved BGCI, FRIM, MMCT and local foresters. Information from the year 1 ecological baseline survey, as well as experience of working group members, was used to rank the sites based on accessibility, protection from fire, soil conditions and enthusiasm of local planting groups. A total of 335,973 seedlings have been planted on Mulanje Mountain. Table 1 provides a breakdown of numbers of seedlings planted per site. In March 2018, Kirsty Shaw, Richard Jinks and Louise-Egerton Warburton visited planting sites on the mountain with MMCT, FRIM and Forestry Department staff to check on progress. All team members were extremely impressed by the scale of the planting efforts.

Fort Lister	Nathaka	12,029
	Thuchila hut	33,383
	Sombani	60,258
	Nakhungubwe	14,851
	Thuchira wakuya	20,498
Eastern Outer Slopes	Mama	3,011
	Little Ruo	11,011
	Madzeka	5,380
	Madzeka River	9,198
	Nayawani	21,000
	Mbangwi	5,200
Likhubula	Mzimba	21,400
	Mikwasala	35,157
	Malevoni	31,922
	Lichenya + Limbe	30,275
	Nakhwimbi	21,400
Total		335,973

Table 1: Number of seedlings planted per site on Mulanje Mountain in year 2.

The socio-economic survey of recruited staff was repeated in year 2. The survey aimed to gather initial information on the impact of the project on household income levels and attitudes towards Mulanje cedar and the Mulanje Mountain Forest Reserve. The survey will be repeated again in year 3, but already in year 2 the positive impact of the project on household income is clearly demonstrated. Income of male-headed households increased by 90% over the past

year, and income of female-headed households increased by 277% over the past year. This is in part due to the reduction of annual inflation rates from 16 to 8%, but is also confidently attributed to this project. The survey also reported a reduced dependence on the forest reserve as a result of improved income. A draft version of the socio-economic report was received and reviewed by BGCI in March 2018. The final version will be submitted as an annex to this report when received (Annex 4.3).

Output 4 - Local and national cedar stakeholders work together with international experts to identify cedar markets, develop mechanisms for tapping into those markets and promote the cedar.

A cedar publicity campaign was launched in year 2 of the project, initially targeted at local people to promote the need for cedar conservation and dispel the myth that cedar cannot be planted. Three awareness campaigns were held in collaboration with nursery groups at Nessa, Nakhonyo and Kazembe. A poetry competition was held to promote the need for cedar conservation amongst local school children. Local radio and press were also involved in project activities, including nursery visits and planting, to promote the project activities. The project was also promoted nationally through a discussion on *SpeakOut!* on Malawi Broadcasting Corporation (MBC) involving staff from BGCI, MMCT and FRIM. Senior Chief Chikumbu represented the Traditional Authorities and Professor Stephen Blackmore represented the Darwin Initiative. The project was also covered in the national press. A summary of public outreach activities in year 2 and examples of newspaper articles is provided in Annex 4.4.

The concept of establishing a Mulanje Cedar Growers and Planters Association (CGPA) has received full support from nursery groups and local community leaders. The terms of reference for the group are currently being developed and the CGPA will become fully functioning in year 3. The benefits of the CGPA will include ensuring a fair price for seedlings, shared marketing and shared purchasing of nursery equipment. These are benefits that the group currently receives from their involvement in the project.

A working group was established to discuss appropriate licensing and benefit-sharing models for selling certified cedar stocks nationwide. The working group has members from BGCI, FRIM, MMCT and plantation managers. Additional representatives have been identified and invited to join the group from the Environmental Affairs Department and the Mulanje Trade Office. The group determined that the most appropriate mechanism will be a voluntary nursery certification scheme. The aims of the scheme are to ensure seedling quality and to ensure equitable sharing of benefits received from seedling sales amongst nursery groups. These elements are currently ensured through supervision from the project team, but need to become self-sustaining beyond the project timeframe. The next steps are for the working group to develop a draft certification scheme, with support from the UK Forestry Commission, to trial it with a couple of nursery groups, and formally establish the scheme under FRIM and the Forestry Department of Malawi, who would award and monitor certification in the long-term.

Output 5 - Unsustainable exploitation and damage to natural stands of cedar significantly reduced as a result of local communities working with the authorities to protect, restore and sustainably manage the remaining natural stands of cedar on Mulanje mountain

More than 600 people were involved in pit digging, seedling transportation and planting activities in year 2. This includes 64 people from nursery groups, and 572 additional people not previously benefitting from the project. Individuals were paid 962 Malawian Kwacha per day for pit digging and planting and 1000 kwacha per day for seedling transportation. During seedling transportation, 40 seedlings are carried per trip. This is a very demanding task due to the steepness of Mulanje Mountain. Some groups complained that the funds offered for this task were insufficient, despite the fact that the rates offered are higher than official Forestry Department rates for these activities. The project team therefore made a request to utilise unspent MMCT funding for international travel for transportation of seedlings. This request was approved and the project Steering Committee agreed that the most appropriate way to supplement the transportation wage was to provide food rations to groups, so as to not be unfair to groups that had already been paid for these activities. This was successful and a total of 335,973 seedlings were planted on Mulanje Mountain in year 2.

The socio-economic survey was repeated in year 2 and identified that groups differ in terms of how they think the Mulanje Mountain Forest Reserve should be managed, with 47% of

respondents preferring communities to have a higher level of management of the Forest Reserve, whereas 48% thought that management should be maintained under the Forestry Department and MMCT. When asked whether Mulanje Cedar can disappear from Mulanje Mountain due to uncontrolled harvesting, 48% of respondents did not think this was possible. This shows that outreach components are an important part of the project so that local communities fully appreciate the scale of destruction that has taken place on the mountain and the importance of the restoration project. Outreach components of the project will be scaled up in year 3.

3.2 Progress towards project Outputs

Change recorded to date is outlined for each project Output and evidence is provided through hyperlinks or accompanying annexes.

Output 1 - Optimal cedar growing conditions characterised to improve reforestation success on Mulanje Mountain and to define areas suitable for cedar cultivation elsewhere in Malawi.

Prior to project initiation, there was limited understanding of the optimal growing conditions for Mulanje cedar. It occurs naturally on Mulanje Mountain between an altitudinal range of 1800 and 2300m, but also grows well at lower altitudes on Zomba Mountain, 50 miles to the north, and various botanic gardens around the world.

Since project initiation, eight research plots have been set up to determine the growth limits of Mulanje cedar. Growth and survival rates are being monitored at each plot and data loggers have been installed to measure climatic and edaphic conditions. Data obtained from trial plots so far is included in Annex 4.5. Information obtained is helping to inform where markets for Mulanje cedar can be developed in year 3. The plots are regularly monitored by FRIM, but establishment of some plots has been hindered by bad management by local forestry staff. To prevent this from limiting the results we obtain, privately managed sites to establish additional plots in year 3 have been identified.

DNA samples were collected in year 1, and soil and foliage samples were collected during year 2. Initial analysis of DNA samples has shown that there is likely to be a genetic difference between cedar populations growing in different basins on the mountain. The analysis has also identified the source of the seed stands on Zomba and Chikangawa. Initial results suggest that the genetic diversity of seedlings that are replacing original populations represents less genetic diversity than there would have initially been, but due to limited seed sources available, the current effort represents the best possible option. A summary of the genetic analysis results obtained so far is provided in Annex 4.6. Soil and foliage samples will be fully analysed during the first quarter of year 3, and initial results are presented in Annex 4.2.

Overall progress towards this Output is good. Success will be indicated through the collation of all information obtained from analyses, publication and mapping of optimal cedar growing conditions by the end of year 3.

The project team and Steering Committee are happy with progress under this Output in year 2 and do not wish to add additional or alternative indicators at this stage.

Output 2 - Improved horticultural protocols developed for the Mulanje cedar to improve survival and growth rates in community nurseries

Prior to project initiation, success rates of growing Mulanje cedar had varied depending on nursery conditions, seedling growth rates were generally slow and there was no written guidance available on propagation requirements. There was also no data on protocols, growth rates or survival from previous efforts to cultivate the species.

Since project initiation, 10 community nurseries have been growing cedar seedlings and were trained and provided with logbooks to record survival and growth rates. Monitoring within the nurseries has been patchy and more training will be provided on record keeping in the first half of year 3. Nurseries managed to produce 72% of the seedling target in year 2.

Nursery trials have been designed by the UK Forestry Commission and set up at Bedgebury National Pinetum in the UK, to investigate optimal growing media, pot size, watering regimes, light and temperature. These trials will be replicated at each nursery in the next growing

season, and success rates will be monitored. Initial training on establishment of nursery trials was delivered in March 2018, and further training will be given in the first half of year 3.

The success of this Output will be indicated by the publication and dissemination of protocols and an increase in seedling production in the second growing season (year 3) from the baseline established in the first growing season (year 2, 72% of target 500,000 seedlings).

The project team and Steering Committee are very happy with progress under Output 2 in year 2. The majority of nursery workers had no experience raising seedlings prior to project initiation. Raising 359,474 seedlings within one growing season is therefore a huge success. The project team do not wish to add additional or alternative indicators at this stage.

Output 3 - Cedar propagation in community nurseries generates income for local households

Prior to project initiation, Mulanje cedar nurseries had been set up on Mulanje Mountain by MMCT and FRIM, but provided limited opportunity for community engagement or employment and survival rates were low due to frost killing seedlings.

Since project initiation, 10 nurseries have been set up around the base of Mulanje Mountain and 150 community members (>60% women) are receiving an income for growing cedar seedlings. At least one experienced person was appointed in each nursery group, and all group members received training in propagation techniques and business skills training.

The socio-economic status of nursery groups was measured through a baseline survey in year 1. This survey was repeated in year 2.

The success of this Output is indicated by the number of cedar seedlings produced and sold in year 2: 359,474 seedlings were raised by nursery groups and 335,973 seedlings were purchased by the project for reintroduction in year 2 (the remaining seedlings had not reached plant-able size).

Success is further indicated by an increase in annual income of nursery group members of 90% for male-headed households and 277% for female-headed households, which is attributed to the project. Success after the project ends will depend on local and national markets being developed for cedar seedlings (see Output 4). The socio-economic study is in Annex 4.3.

The project team and Steering Committee are happy with progress under Output 3 in year 2 and do not wish to add additional or alternative indicators at this stage.

Output 4 - Local and national cedar stakeholders work together with international experts to identify cedar markets, develop mechanisms for tapping into those markets and promote the cedar.

Prior to commencing the project there was a misunderstanding among communities around Mulanje Mountain that cedar cannot be planted (i.e. it is a wild plant only). A public outreach campaign was launched in year 2 to promote cedar growing and planting. As well as local activities, this included an hour-long programme on national television and widespread press coverage in Malawi highlighting both the plight and the potential of the cedar. This campaign will be expanded in year 3 to encourage purchase of cedar seedlings and planting in appropriate sites across Malawi.

The project is currently providing support to nursery groups in terms of provision of consumables, ensuring a fair price for cedar seedlings and supervising nursery groups to ensure benefits obtained from seedlings sales are shared equitably among groups. To ensure this continues beyond the timeframe of the project, and that the market for seedlings is a market for sustainably sourced, good quality seedlings from nurseries that are well managed, a Cedar Growers and Planters Association (CGPA) will be established that fully represents nursery groups. In addition, a nursery certification scheme is being developed by FRIM, MMCT, BGCI, the UK Forestry Commission and national government in Malawi, that will outlast the duration of the project. These mechanisms will also support marketing at the local and national level. Initial success is demonstrated by support from the nursery groups for both the CGPA and the certification scheme.

There project team and Steering Committee are happy with progress under Output 4 in year 2 and do not wish to add additional or alternative indicators at this stage.

Output 5 - Unsustainable exploitation and damage to natural stands of cedar significantly reduced as a result of local communities working with the authorities to protect, restore and sustainably manage the remaining natural stands of cedar on Mulanje Mountain

More than 600 people living around Mulanje Mountain were involved in pit digging, seedling transportation and planting during year 2, all receiving payments for this work. Coupled with public outreach activities to promote the status of Mulanje Cedar on the mountain and the need for cedar restoration and protection, this work is helping to change attitudes towards cedar exploitation and reduce dependence on the mountain for income. This is demonstrated by the socio-economic survey, which reports that nursery groups are less dependent on harvesting resources directly from the mountain, and that household incomes have increased as a result of involvement in activities that restore Mulanje Cedar populations on the mountain (Annex 4.2).

Protection of remaining natural stands on Mulanje Mountain is no longer possible as all mature individuals have been felled. Protection of the seed sources for the Mulanje nurseries (planted stands on Zomba and in Chikangawa) is therefore an essential activity for FRIM and the Forestry Department, as is protection of seedlings on Mulanje Mountain. Additional firebreaks were cleared around areas of natural cedar regeneration on Mulanje Mountain in year 2, and fire monitoring will be a key activity during year 3 to ensure planted seedlings are protected. At least 170 people will be involved in this activity, supported by funding from MMCT.

Whilst the project team and Steering Committee are very concerned about the critical status of Mulanje Cedar, they are happy with progress made during year 2 to ensure local communities are aware of the situation and directly involved in, and benefitting from, restoration efforts. The project team do not wish to add additional or alternative indicators at this stage.

3.3 Progress towards the project Outcome

Outcome: Income from Mulanje cedar propagation supports Malawian households currently dependent on unsustainable harvesting of the cedar, and prospects of the cedar becoming a sustainable forest product are improved.

Overall, good progress has been made towards the project outcome. 150 people have improved household incomes as a result of their involvement in community nurseries and more than 600 people have received payments for cedar planting. The status of Mulanje cedar, the need for conservation action and the economic potential of the species has been promoted widely (see Annex 4.4 for a summary of public outreach activities in year 2). More than 350,000 seedlings have been planted in restoration efforts on Mulanje Mountain, helping to correct the myth that Mulanje cedar cannot be planted. The public outreach campaign will expand through year 3, helping to extend the national market to areas that have been identified as suitable for cedar growth. An improved understanding of the optimal growing conditions and cultivation requirements for Mulanje cedar will improve nursery production rates in year 3, enabling expansion to a broader market. A nursery certification scheme is being developed to ensure that seedling production continues to be sustainable, providing benefits to community nursery groups.

The project team and Steering Committee are very pleased with progress so far and do not wish to add any additional or alternative indicators at this stage. The Steering Committee agree that the project is on track and likely to achieve the Outcome by the end of the funding period.

3.4 Monitoring of assumptions

Project risks and assumptions are discussed at Steering Committee meetings. So far the project team and Steering Committee are happy that the assumptions still hold true.

Assumption 1: Technical challenges can be overcome.
Comments: More than 350,000 seedlings have been raised in the project so far. The project will improve this rate in year 3 through technical assistance and guidance provided by the UK Forestry Commission, Bedgebury Pinetum and Chicago Botanic Garden. Nursery trials have been designed and will be implemented in all nurseries during year 3.

Assumption 2: Full participation of local communities.

Comments: Participation of local communities has been a key component of project success so far, aided by strong engagement of Traditional Authorities from the project outset and regular visits to the nurseries by project staff. Only two out of 150 people have stopped participation in nursery groups.

Assumption 3: Local politics and ethnic differences not inimical to creating a cohesive and representative Cedar Growers and Planters Association.
Comments: Nursery groups are fully supportive of the establishment of the Cedar Growers and Planters Association.

Assumption 4: Income obtained from selling and planting cedar seedlings replaces income from the exploitation of cedar timber and is regarded as an alternative, not an additional activity.
Comments: Nursery group members have increased incomes from seedling sales. As there is no remaining cedar on Mulanje Mountain, the only income to be made from the cedar will soon be by growing it and planting it (remaining felled stocks are still currently being moved illegally). The socio-economic report shows that reliance on forest products has decreased.

Assumption 5: Expertise is available to solve the technical challenges
Comments: The involvement of the UK Forestry Commission, Bedgebury Pinetum, US Forest Service and Chicago Botanic Garden, is helping solve technical challenges, complementing in-country expertise from FRIM.

Assumption 6: Expertise is available to optimise propagation
Comments: Nursery trials have been designed and implemented at Bedgebury Pinetum and will be replicated in community nurseries in year 3.

Assumption 7: New communities are receptive to nursery establishment
Comments: High morale and enthusiasm for the project continues from all nursery groups. Two original nursery group members from Kazembe nursery could not see that the benefits of participating in the project, but no other nursery group members have shared that view.

Assumption 8: Suitable nursery managers can be recruited from trainees
Comments: All nursery groups appointed nursery chairpersons through group decision making. There has been no changeover of chairpersons or evidence of problems with appointment.

3.5 Impact: achievement of positive impact on biodiversity and poverty alleviation

This project is contributing to biodiversity conservation by restoring populations of Mulanje cedar on Mulanje Mountain. 335,973 seedlings were planted this season in by far the biggest restoration effort for Mulanje cedar so far. Trial plots are providing *ex situ* conservation of Mulanje cedar. The public awareness campaign is highlighting the status of Mulanje cedar on Mulanje Mountain and encouraging more people to be involved in its conservation.

This project is contributing to poverty alleviation by providing performance based payments to 150 people from low-income rural communities for seedling production. This impact is documented in the socio-economic study. An additional >600 people have received payments for planting activities. Activities to ensure the sustainability of livelihood impacts beyond the life of the project are well under way.

4. Contribution to the Global Goals for Sustainable Development (SDGs)

SDG1: End poverty in all its forms everywhere. Project contribution: 150 people in low-income rural communities have improved household incomes from seedling sales. An additional 600 people from rural communities have received payments for planting activities.

SDG5: Achieve gender equality and empower all women and girls. Project contribution: 66% women appointed in nursery groups in an area where employment opportunities for women are limited. Female-headed household incomes of women involved in the project have increased by 277% since the baseline socio-economic survey was conducted.

SDG8: Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all. Project contribution: Employment opportunities are offered through the project. Public outreach and nursery certification will help develop a sustainable national commercial market for Mulanje cedar seedlings that lasts beyond the project.

SDG13: Take urgent action to combat climate change and its impacts. Project contribution: The project has planted more than 300,000 seedlings on Mulanje Mountain, helping to offset carbon emissions.

SDG15: Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss. Project contribution: The project is delivering restoration of cedar populations on Mulanje Mountain, and will help to reverse land degradation. The project will reverse biodiversity loss by replacing Mulanje cedar populations on Mulanje Mountain.

5. Project support to the Conventions, Treaties or Agreements

This project is helping Malawi to meet its obligations to the CBD by addressing the following Aichi Targets;

Target 1: Raising awareness. Project contribution: Public outreach components of the project are raising awareness of the need for biodiversity conservation.

Target 2: Integration of biodiversity values into development. Project contribution: The project is promoting and enabling sustainable commercial use of Mulanje cedar as a mechanism for community development.

Target 3: Development of positive incentives for conservation and sustainable use. Project contribution: The project is providing employment opportunities that help conserve and ensure sustainable use of Mulanje cedar, as an alternative to unsustainable exploitation.

Target 5: Rate of loss of natural habitats reduced. Project contribution: A baseline ecological survey was carried out, identifying areas requiring enhanced protection to reduce the rate of loss of Mulanje cedar. Additional firebreaks are protecting natural regeneration. Seedlings were planted in areas where risk is low, e.g. protection from fire during the dry season is possible.

Target 7: Forestry areas managed sustainably. Project contribution: The project has planted seedlings in optimum areas for restoration on Mulanje Mountain, and protection measures are planned.

Target 12: Prevention of species extinction. Project contribution: Trial plots are providing *ex situ* conservation of Mulanje cedar and additional safe sites for planting have been identified. More than 300,000 seedlings have been planted to restore natural populations.

Target 13: Genetic diversity of domesticated species maintained. Project contribution: Genetic analysis of Mulanje cedar samples collected during the ecological baseline survey indicates that seed stands are not as genetically diverse as original populations. Efforts will be made to collect seed from as many stands as possible to maximise genetic diversity of seedlings planted on Mulanje Mountain and in *ex situ* sites.

Target 14: Ecosystems safeguarded. Project contribution: Seedling protection and awareness raising measures are helping to safeguard Mulanje Mountain.

Target 15: Ecosystems restored. Project contribution: The project has planted 335,973 seedlings on Mulanje Mountain in restoration efforts so far.

Target 16: Equitable sharing of benefits. Project contribution: The project is providing payments for cedar cultivation in nurseries, following a performance-based scheme developed by the

project Steering Committee. A nursery certification scheme is being developed that will ensure equitable sharing of benefits beyond project support.

Target 19: Knowledge transferred. Project contribution: 150 community nursery group members have received nursery management and business skills training through the project.

Target 20: Resources mobilised. Project contribution: Additional funding will be raised for planting on Mulanje Mountain in future years.

Malawi's CBD Focal Point provided a letter of support for this project during the application process. Following the recommendations received, the project has incorporated an environmental and social impact assessment baseline study. In relation to the Nagoya Protocol, the project is working with the Environmental Affairs Department to develop Access and Benefit Sharing measures at the community and district level as the project progresses, i.e. through nursery certification.

6. Project support to poverty alleviation

As evidenced in Annex 4.3 (socio-economic report) and Annex 4.6 (payments to nursery groups), 150 people are benefitting from seedling sales from nurseries and an additional 600 people have received payments for planting activities. The direct benefits received from this project are illustrated in the socio-economic report, documenting that households have increased purchasing power and improved access to food, among other benefits. The income of male-headed households involved in nurseries has increased by 90% since the baseline socio-economic survey was conducted in year 1, and the income of female-headed households has increased by 277%. The year 2 socio-economic study safely attributes this to project activities, alongside annual inflation. Public outreach activities and the nursery certification scheme that is in development will ensure benefits continue beyond the project timeframe.

7. Project support to gender equality issues

Nursery groups involve 66% women. Female-headed household income for those involved in nursery activities has increased by 277% in the last year, showing that the project has provided new employment in areas where opportunities for women were very limited previously. Information about household incomes is taken from the year 2 socio-economic report (Annex 4.3 and Outcome indicator 0.3).

8. Monitoring and evaluation

A project Steering Committee (SC) was established to lead monitoring and evaluation of project progress. The SC met twice during year 2. At each meeting, the SC analyses progress against each Activity and Output, provides advice to address any shortfalls or delays and identifies any risks to successful project implementation. This approach has been successful as a result of appropriate people being appointed to sit on the SC (see meeting minutes in Annex 4.1). Monitoring and evaluation is also ongoing by the Project Manager (Kirsty Shaw, BGCI) and Henry Chintuli (MMCT).

The indicators of achievements are detailed in the logical framework outlined in Annex 1. No changes have been made to the M & E plan over the reporting period.

9. Lessons learnt

A key part of project success has resulted from our early and continued engagement of Traditional Authorities. The nursery groups noted that their visits to nursery sites help to motivate nursery groups. The project team recommends that similar projects also engage all leadership authorities from the outset.

It has been difficult to measure how many sawyers and sawyer families are included in nursery groups and planting activities, because people do not openly admit to being involved in illegal activities. Our nursery groups also aimed to employ 60% women and most of the sawyers are male. The socio-economic study indicates that improved household incomes are reducing direct reliance on forest materials. The public outreach component of the project is helping to engage sawyers and recruit them to planting teams.

Poor management of some of the cedar trial plots by Forestry Department personnel has been a disappointment. In one case, a forestry officer planted sweet potatoes in a plot, and no disciplinary action appears to have been taken. This has been mitigated by the identification of well-managed, private sites in equivalent climatic and soil conditions in which replacement plots will be established.

10. Actions taken in response to previous reviews (if applicable)

Recommendations from Year 1 Review.

Include more detail on how communication between project lead and in-country partners is handled between field visits -
Extensive email correspondence is the primary means of communication. For example, the PI sent over 400 emails to project participants in 2017/18. Regular Skype meetings also took place between Kirsty Shaw, Ibrahim Mitole, Henry Chinthuli and Kondwani Chamwala at MMCT, although bandwidths in Malawi sometimes make this difficult.

Additional partners are stated to include USFS and Starfish Malawi. Are there others?
Yes, Chicago Botanic Garden, Bedgebury Pinetum and UK Forest Research have all contributed to activities in 2017/18.

Will the study of genetic variability of Mulanje cedar include ex situ stands?
Yes. See Annex 4.6 for initial analyses of *ex situ* seed stands and cedar on Mulanje.

Clarify the number of growth monitoring plots established (8 in narrative, 10 at Annex 3).
8 plots have been established.

Payments made under the nursery payment schedule at Annex 4.5 could be made clearer at the next report.
See Annex 4.7.

11. Other comments on progress not covered elsewhere

A key risk identified by the Steering Committee in year 1 and evident from the ecological baseline survey carried out in year 1, is that illegal activities may continue on Mulanje Mountain and hinder the success of plantings. For example, intentional fires are common in the dry season, for hunting and locating remnant pieces of cedar. Sites for year 2 planting were therefore selected taking this risk into account. Additional firebreaks have been put in place and more are planned for this year. In general, human activities on the mountain are decreasing as there is no cedar left to harvest. The public awareness component of the project also aims to reduce illegal activities on the mountain by highlighting the impacts, and the involvement of local people carrying out cedar growing and planting aims to achieve an enhanced sense of ownership and responsibility for natural resources and decrease illegal activities.

12. Sustainability and legacy

The public outreach component of the project promotes the aims of the project and the status of Mulanje cedar on Mulanje Mountain. With the support of MMCT's Environmental Education and Communications Officer, the project received excellent coverage in local and national press and a discussion programme was aired on national TV (see summary in Annex 4.4).

The project exit strategy is still deemed valid. BGCI are identifying potential funders to enable purchase and planting of cedar seedlings on Mulanje Mountain. Public outreach in year 3 will focus on developing a national market for sustainably sourced Mulanje cedar seedlings to ensure continued benefits to communities beyond the timeframe of this project.

13. Darwin identity

The Darwin Initiative logo is used on project promotional and informational resources, including project web pages (see for example, http://www.bgci.org/where-we-work/malawi/ and http://globaltrees.org/projects/save-our-cedar-malawis-national-tree/). There is good understanding that the funding comes from the UK government's Darwin Initiative at all levels. In February 2018, an event was hosted at the British High Commission in Lilongwe to promote

the project. Professor Stephen Blackmore, Chair of the Darwin Initiative Committee, presented at this event, along with Dr. Paul Smith and Dr. Tembo Chanyenga. In addition, Paul Smith gave a presentation on the project to Defra and the Darwin Expert Committee in London on March 21st 2018.

We use #SaveOurCedar to promote the project on Twitter.

14. Project expenditure

Table 1: Project expenditure <u>during the reporting period</u> (1 April 2017 – 31 March 2018)

Project spend (indicative) since last annual report	2017/18 Grant (£)	2017/18 Total Darwin Costs (£)	Variance %	Comments (please explain significant variances)
Staff costs (see below)			1.2%	
Consultancy costs			2.6%	
Overhead Costs			0.0%	
Travel and subsistence			-0.8%	
Operating Costs			-2.7%	
Capital items (see below)			-46.5%	Additional budget was required for seed collection (see note below). This was taken from the nursery infrastructure budget as there is budget for nursery infrastructure in year 3 and no large improvements were needed on the nurseries in year 2. Nurseries cannot operate without seed.
Monitoring & Evaluation (M&E)			-0.8%	
Others (see below)			22.8%	Additional budget was provided to FRIM for see collection. Seed sources are extremely limited for Mulanje Cedar and are under threat from felling. Additional budget was therefore spent on collection of seed for propagation required by the nurseries, instead of nursery infrastructure.
TOTAL				

Annex 1: Report of progress and achievements against Logical Framework for Financial Year 2017-2018

Project summary	Measurable Indicators	Progress and Achievements April 2017 - March 2018	Actions required/planned for next period
Impact The Mulanje cedar is a sustainably managed commercial product, generating income for local households and the Malawian economy, and no longer threatened in the wild.		*Positive impact on biodiversity* – • 359,474 seedlings raised in ten community nurseries. • 335,973 seedlings planted on Mulanje Mountain. • Trial plots for Mulanje Cedar are providing *ex situ* conservation. • Publicity campaign launched to promote the need for Mulanje Cedar conservation. *Positive changes in the conditions of human communities associated with biodiversity* – • 150 community members in 10 villages receiving performance-based payments for growing seedlings. • >600 community members receiving payments for pit digging, seedling transportation and planting.	[redacted]
Outcome Income from Mulanje cedar propagation supports Malawian households currently dependent on unsustainable harvesting of the cedar, and prospects of the cedar becoming a sustainable forest product are improved.	0.1. Optimal growing conditions for the Mulanje cedar characterised, enabling broader use of this tree in the Malawian domestic market by the end of year 3. 0.2. Improved horticultural protocols developed for establishment and propagation of the Mulanje cedar in nurseries by the end of year 2. 0.3. Cedar propagation in community nurseries generates income for local	DNA and soil samples under analysis to identify genetic diversity and provenance of remaining cedar stocks and microbial associations. Growth and survival rates of seedlings in trial plots across Malawi are being monitored. Nursery trials undertaken by Bedgebury Pinetum. Guidance developed to implement trials in community nurseries in year 3.	• Continued analysis of DNA and soil samples • Implementation of trials in community nurseries • Second season of propagation in community nurseries • Public outreach campaign will be expanded

	households. 150 local people (at least 60% women) trained and earn >US$250 per annum each, directly from seedling sales, by the end of year 2 and 150 local people earn US$1.50 per day planting cedar on Mulanje Mountain in years 2 and 3. 0.4. Local and national markets are established for the Mulanje cedar based on the sale of 500,000 seedlings per annum for reforestation of Mulanje Mountain (years 2 and 3) and promotion and licensing of the cedar on the national market (year 3). 0.5. Unsustainable exploitation and damage to natural stands of cedar reduced by at least 50% against the year 1 baseline by the end of March 2019 as a result of local communities working with the authorities to protect, restore and sustainably manage the remaining natural stands of cedar on Mulanje mountain.	150 community members have received payments from seedling sales. >600 community members have received payments for pit digging, transportation and planting. Socio-economic survey repeated in year 2 to determine income levels and attitudes to the Mulanje cedar. Public outreach campaign launched in year 2 to change raise awareness of the status of Mulanje Cedar on Mulanje Mountain, the need for restoration and the commercial potential of this species. Cedar Growers and Planters Association and licensing of nurseries discussed with community nursery group members. A baseline ecological survey of the status of the cedar on Mulanje mountain was carried out in year 1 and used to identify optimum planting sites for year 2.	
Output 1. Optimal cedar growing conditions characterised to improve reforestation success on Mulanje Mountain and to define areas suitable for cedar cultivation elsewhere in Malawi.	1.1. Project infrastructure established, including project management, employment of experts, full stakeholder engagement, acquiring Prior Informed Consent and Monitoring and Evaluation. 1.2. Genetic diversity and provenance of remaining cedar seed stocks characterised by end of year 1, and cedar pathology and symbiont biology understood by end of year 2 1.3. Optimal abiotic (soil, climate) requirements for growing cedar elucidated and areas of Malawi suitable for cedar cultivation mapped and published by end of year 3.	Overall progress towards this Output is good. Evidence is provided in section 3.2 and Annexes 4.1, 4.2 and Annex 4.6. The project team and Steering Committee do not wish to add additional or alternative indicators at this stage.	

Activity 1.1 Inaugural Project Workshop held with all stakeholders present. Project plan communicated, refined and all necessary mechanisms for acquiring permits and Prior Informed Consent defined and implemented.	**Complete** (in year 1).
1.1 Project Steering Committee established, including all existing stakeholders (national and local authorities, communities, NGOs, academics etc.).	**Complete.** Project steering committee met twice during year 2 to evaluate project progress against indicators and provide advice on project activities. **Next steps –** At least two Steering Committee meetings will take place in year 3.
1.1. Detailed briefs written for external consultants	**Complete.** Three external consultants were appointed during year 2. • US Forest Service to carry out genetic analyses of DNA samples collected during year 1. • Chicago Botanic Garden to collect and analyse foliage and soil samples to determine microbial associations and pathology. • Professor Charles Jumbe to repeat the socio-economic study of nursery groups. **Next steps –** Analysis of DNA, soil and foliage samples will continue. Results will be published in peer reviewed journals and will be used to improve restoration on Mulanje Mountain and propagation measures. Socio-economic study will be repeated in year 3.
1.1. Monitoring and evaluation methodology defined and implemented.	**Complete.** Project Steering Committee met twice during year 2. In addition, Richard Jinks from the UK Forestry Commission visited trial plots and planting sites to evaluate progress. **Next steps** – At least two Steering Committee meetings will take place in year 3. Advice given by Richard Jinks will be followed to improve the next year of plantings on Mulanje Mountain.
1.2. Ecological survey of cedar populations (remnant and restored), measuring numbers of trees, size classes, genetic provenance, climate, soils and exploitation, carried out on Mulanje Mountain in year 1 and repeated in year 3.	**Complete** (in year 1). Baseline survey results were used to identify planting sites for year 2. **Next steps** – The ecological survey will be repeated in year 3.
1.2. International study carried out on microbial associations and pathology of cedar in years 1 and 2. Results published by end of year 2.	**In progress.** Louise Egerton-Warburton, a mycologist from Chicago Botanic Garden, visited Malawi in March 2018 and collected soil samples from historic clusters and newly planted areas on Mulanje Mountain to determine microbial associations, and foliage samples from healthy and unhealthy seedlings to study pathology. **Next steps** - MMCT and the Forestry Department are collecting additional samples from across the mountain and the ten nurseries. All samples will then be analysed by Chicago Botanic Garden and results shared in the first half of year 3.

1.3. Edaphic and climatic conditions measured for *in situ* populations of cedar on Mulanje Mountain and *ex situ* stands in Malawi and in botanic gardens around the world		**In progress** - Data loggers have been placed at all *ex situ* stands and two *in situ* stands on Mulanje Mountain to record temperature. Data is being collected from botanic gardens holding *ex situ* collections of Mulanje Cedar. **Next steps** - Data will be gathered and analysed to identify edaphic and climatic limits for cedar growth. These will be mapped by the end of year 3.
1.3. Cedar trial plots designed and planted (using existing seedling stocks) in 10 edaphically and climatically diverse sites across Malawi by end of year 1.		**Complete -** Although this activity was completed by end of year 1, seedlings at some sites have not survived well. **Next steps** - Additional private sites are being identified and will be planted in quarter 1 of year 3.
1.3. Cedar growth rates monitored in all trial sites (years 2 and 3), and optimal requirements for cedar growth determined by end of year 3.		**In progress.** Growth rates were measured at all trial sites in year 2. **Next steps** – Monitoring will continue at trial sites throughout year 3.
Output 2. Improved horticultural protocols developed for the Mulanje cedar to improve survival and growth rates in community nurseries	2.1. Improved horticultural protocols developed and available to local users by year 2 2.2. Seedling establishment and survival rates increased throughout life of the project)	Overall progress towards this Output is very good. The majority of nursery workers had no experience raising seedlings prior to project initiation. Raising 359,474 seedlings within one growing season is therefore a huge success. Evidence is provided in Section 3.2 and Annex 4.7. The project team and Steering Committee do not wish to add additional or alternative indicators at this stage.
Activity 2.1. Nursery trials designed and implemented by international experts within first 6 months of the project, investigating optimal media, watering regimes, light, temperature etc.		**Complete –** Nursery trials designed and implemented by Bedgebury Pinetum in the UK. Guidance developed and initial training given on how to set up nursery trials in community nurseries. **Next steps** - Trials will be set up in the nurseries in the first half of year 3, and monitored during the next growing season.
Activity 2.2. Seedling establishment, survival and growth baselines measured and monitored in nursery trials throughout the project		**In progress** – Measurements taken in trials led by Bedgebury Pinetum. Survival and growth rates measured in some nurseries. **Next steps** – Provide more training to nursery groups to ensure better monitoring in year 3.
2.3. Optimal horticultural protocols published and available in local languages to users by beginning of year 3.		**In progress** - Nursery trials are investigating optimal horticultural practices. The study to determine whether there are soil microbial associations and what causes seedling die-off will supplement the information from nursery trials. **Next steps** – Optimal protocols will be published and translated.
Output 3. Cedar propagation in community nurseries generates income for local households	3.1. 10 tree nurseries established in Mulanje and Phalombe Districts by the end of the third quarter of year 1 3.2. 150 people (60% women) from 10 different communities trained in nursery	Progress under Output 3 in year 2 is good. Evidence is provided in Section 3.2 and Annexes 4.3 and Annex 4.7. The project team and Steering Committee do not wish to add additional or alternative indicators at this stage.

	techniques, cedar propagation, and basic business skills by the end of the third quarter of year 1. 3.3. 10 community nursery managers appointed and trained in business skills by the end of year 1 3.4. 10 kg of cedar seed, and 15 kg of other tree species seed collected and sown in 2016, 2017, 2018 3.5. 10 nurseries produce a minimum aggregate total of 500,000 cedar seedlings and 50,000 other tree seedlings per annum in years 2 and 3 (assumes 60% cedar seedling survival). 3.6. 500,000 cedar seedlings sold at end of years 2 and 3 at a minimum cost of US$0.10 each to support the Mulanje cedar restoration programme (creates a 10% profit margin for each nursery). At least 25,000 other tree seedlings sold. 3.7. 150 local people earn >US$250 per annum each, directly from seedling sales, by the end of year 2.	
3.1 10 nurseries established and fully equipped with shade netting, grow bags and other consumables by the end of year 1.		**Complete** – 10 nurseries established and fully equipped in year 1. One nursery had to be relocated as its location had too much shade cover so seedling survival rate was low. Materials were also purchased in year 2 to repair and improve nursery structures, and additional consumable items were purchased for the next growing season, e.g. polythene bags for seedlings. Seed was also collected by FRIM. **Next steps** – Infrastructure and consumables budget will ensure nurseries are fully equipped and functioning through year 3 of the project and beyond.
3.2. 10 experienced nursery staff recruited to establish nurseries and act as mentors. These staff will be drawn from existing MMCT nurseries, prioritising women and people with a proven track record.		**Complete** – 10 chairpersons were recruited in year 1 and continue to represent the nursery groups, e.g. all chairpersons met at Nakhonyo nursery in March 2018 to discuss initiation of nursery trials in year 3.

	Next steps – Chairpersons will continue to represent the nursery groups. They will be involved in further training and consultations about establishing the Cedar Growers and Planters Association and nursery accreditation scheme.
3.2. 10 x 1 week nursery techniques training course offered for up to 20 people each (priority given to cedar sawyer families). 140 staff recruited from people who complete the course successfully (at least 60% women).	**Complete** – 150 people (including 10 chairpersons) were given nursery techniques training and appointed to work in 10 community nurseries in year 1. An assessment was undertaken in year 2 to identify remaining capacity gaps in nursery teams. **Next steps** – Further training will be provided in quarter 1 of year 3.
3.3. Nursery management and business skills training given to 10 individuals assessed by the Business skills consultant as having the necessary skills to manage production, nurture markets and make sales (end of year 1).	**Complete** – Nursery management and business skills training was provided to 10 individuals, 1 from each nursery, in year 1. It was observed that these skills were not passed on to other members of the nursery groups well, so in year 2 business skills training was repeated with all members of all nurseries taking part (150 people). **Next steps** – Nursery groups will manage production, nurture markets and make sales beyond those to MMCT and the Forestry Department. Nursery groups will continue to be supported by the project in year 3, and build skills to become self-sufficient beyond the timeframe of the project.
3.4. At least 10 kg of cedar seed collected and sown by the 10 nurseries in the fourth quarter of each year (equivalent to 900,000 seedlings).	**In progress** – Seed for the second year of planting has been delivered to MMCT. **Next steps** - Seed is being provided to nursery groups in batches to ensure good storage and avoid losses.
3.4. Seed collected and sown from at least five other useful tree species in local demand, equivalent to at least a further 10,000 seedlings.	**In progress** – Other species that nursery groups are keen to grow have been identified. Nursery groups requested to focus on growing Mulanje cedar in year 2, as that is the main focus of the project and many groups are involved in raising seedlings for the first time. The socio-economic survey recommends that some seedlings of other species are used for establishment of community woodlots, as well as for sale. **Next steps** – Seed will be distributed to nursery groups to enable them to diversify seedling production in year 3.
3.5. At least 500,000 cedar seedlings and 10,000 seedlings of other species produced by the 10 nurseries per annum in years 2 and 3.	**In progress** – 359,474 Mulanje Cedar seedlings were raised across the 10 nurseries in year 2. **Next steps** – Seed of Mulanje Cedar and other species is being distributed to nursery groups in batches. Based on new skills and lessons learnt during year 2, groups are aiming to achieve 100% of the target in year 3.
3.6. Based on survey carried out in 1.2. MMCT and FRIM identify suitable sites for reintroduction of cedar by end of year 1.	**Complete** – A working group session was held using information from the baseline survey carried out in year 1 and knowledge from MMCT, FRIM and local Forestry Department Officers, to identify priority sites for planting in year 2.

		Next steps – The same exercise will be repeated in year 3 to identifying planting sites for the next season.
3.6. 500,000 cedar seedlings sold at the end of years 2 and 3 to support the Mulanje cedar restoration programme. At least 25,000 other tree seedlings sold to local people.		**In progress** – 335,973 Mulanje Cedar seedlings sold at the end of year 2. **Next steps** – Nursery groups are aiming to produce sufficient seedlings in year 3 to supply 500,000 seedlings to the Mulanje Cedar restoration programme, additional seedlings of Mulanje Cedar and other species for sale to other buyers.
3.7. Baseline socio-economic survey of recruited staff (disaggregated by gender) carried out by socio-economic consultant, assessing household income levels, income sources, use of natural resources and attitudes to cedar and natural resource conservation and management. Survey repeated in years 2 and 3.		**Complete** – The baseline socio-economic survey carried out in year 1 was repeated in year 2. The survey assessed attitudes towards the project, and impact of the project so far. *Key findings of the year 2 socio-economic survey* – • The study identified a 90% increase in income of male-headed households involved in nursery groups • The study identified a 277% increase in income of female-headed households involved in nursery groups. **Next steps** – The survey will be repeated in year 3.
Output 4. Local and national cedar stakeholders work together with international experts to identify cedar markets, develop mechanisms for tapping into those markets and promote the cedar.	4.1. Mulanje Cedar Growers and Planters Association formed from nursery staff, cedar planters and local community leaders in year 2 4.2. Forestry Department and Environmental Affairs Department works with local growers to promote cedar to farmers in appropriate areas nationwide by end of year 3. 4.3. Consultant works with Cedar Growers and Planters Association and EAD to develop licensing and benefit-sharing models for selling certified cedar stocks nationwide by end of year 2.	Progress under Output 4 in year 2 has been good. Evidence is provided in Section 3.2 and Annex 4.4. The project team and Steering Committee do not wish to add additional or alternative indicators at this stage.
4.1. Mulanje Cedar Growers and Planters Association formed from nursery staff, cedar planters and local community leaders.		**In progress** – All nursery workers have been consulted about formation of the Cedar Growers and Planters Association (CGPA) and are keen to be members. **Next steps** – Finalise Terms of Reference for the CGPA and formally sign up members.
4.2. National cedar publicity campaign launched by FRIM and EAD with support from the Eden Project, targeted at areas of Malawi where the cedar will grow successfully as defined in Output 1.		**In progress** – Publicity campaign launched in year 2 to promote the status of Mulanje Cedar on Mulanje Mountain and the need for its conservation. This included 3 awareness raising campaigns at 3 nurseries, local and national radio

		programmes and a roundtable discussion on national TV with representation from Traditional Authorities, MMCT, FRIM and BGCI. **Next steps** – The awareness raising campaign will continue and be scaled up in year 3, promoting the planting of Mulanje Cedar in suitable areas across Malawi.
4.3. Consultant works with Cedar Growers and Planters Association and EAD to develop licensing and benefit-sharing models for selling certified cedar stocks nationwide.		**In progress –** A working group meeting was held in March 2018 to identify the best approach for licensing and benefit-sharing for selling cedar stocks. The meeting involved FRIM, MMCT, BGCI, plantation managers and the socio-economic consultant. The group decided that voluntary certification of nurseries would be the best approach. The aim of certification is to ensure that good quality seedlings are being produced by the nurseries, and that funds received from seedling sales continue to be shared equitably among nursery group members. The idea of nursery certification was introduced to nursery caretakers during a meeting at Nakhonyo nursery in March 2018. Ideas on licensing and benefit-sharing were also gathered from nursery groups as part of the year 2 socio-economic baseline survey. **Next steps** – A draft nursery certification scheme is being developed by FRIM, MMCT, BGCI and the UK Forestry Commission. The working group will meet again in May 2018 to review the draft nursery certification scheme that will then be tested with nursery groups.
Output 5. Unsustainable exploitation and damage to natural stands of cedar significantly reduced as a result of local communities working with the authorities to protect, restore and sustainably manage the remaining natural stands of cedar on Mulanje mountain	5.1. Mulanje Cedar Growers and Planters Association adopts the Cedar Management Plan by the end of year 2. 5.2.150 local people earn US$1.50 per day planting cedar on Mulanje Mountain in years 2 and 3. 5.3. Local cedar public awareness programme launched by end of year 2 5.4. In 2019, a >40% increase in positive responses are recorded in the socio-economic survey for both attitudes to, and benefits received from, the cedar compared to the 2016 baseline study. 5.5. Cutting and fires demonstrably reduced by end of year 3 against year 1 baseline.	Whilst the project team and Steering Committee are very concerned about the critical status of Mulanje Cedar, they are happy with progress made during year 2 to ensure local communities are aware of the situation and directly involved in, and benefitting from, restoration efforts. Evidence is provided in Section 3.2 and Annexes 4.3 and 4.4. The project team do not wish to add additional or alternative indicators at this stage.
5.1. Cedar Management Plan discussed, modified as appropriate and adopted by Cedar Growers and Planters Association.		**Not yet initiated. Next steps -** This activity will take place when the CGPA has been fully established. A consultation exercise will be carried out with CGPA

	members, Traditional Authorities and Forestry Department representatives. The Cedar Management Plan will then be modified and adopted by the CGPA.
5.2. At least 150 people employed at US$ 1.50 per day to plant 500,000 cedar seedlings per annum on Mulanje Mountain in years 2 and 3 as stipulated in the Cedar Management Plan (2014-2019).	**Complete** – More than 600 people have been involved in pit digging, transportation and planting of seedlings. People receive 962 Malawian Kwacha (96 pence) for pit digging and planting and 1000 Kwacha (£1) for transportation of seedlings. This is higher than the standard Forestry Department rates. As transportation of seedlings up the mountain is very physically demanding, groups were also offered food rations to supplement the payments received. **Next steps** – MMCT and BGCI will aim to raise additional funds so higher rates can be paid for seedling transportation in year 3.
5.3. Mulanje Cedar Growers and Planters Association works with MMCT and FRIM to promote the Cedar Management Plan, and the value of the cedar to local communities.	**In progress** – The public outreach campaign launched in year 2 in collaboration with nursery groups promoted the value of cedar to local communities, including through the ecosystem services that healthy Mulanje cedar forests provide. **Next steps** – The CGPA, once fully established, will continue to promote the need for Mulanje cedar conservation and the revised Cedar Management Plan, with support from MMCT.
5.4. Socio-economic survey outlined in 3.7 re-assesses attitudes to and benefits received from cedar amongst growers and planters	**Complete** – The survey was repeated in year 2. A key finding related to attitudes to and benefits received from cedar is that nursery groups are less dependent on harvesting resources directly from the mountain as a result of involvement in activities that restore Mulanje cedar populations on the mountain. **Next steps** – The survey will be repeated again in year 3.

Annex 2: Project's full current logframe as presented in the application form (unless changes have been agreed)

Project summary	Measurable Indicators	Means of verification	Important Assumptions
Impact: The Mulanje cedar is a sustainably managed commercial product, generating income for local households and the Malawian economy, and no longer threatened in the wild. (Max 30 words)			
Outcome: Income from Mulanje cedar propagation supports Malawian households currently dependent on unsustainable harvesting of the cedar, and prospects of the cedar becoming a sustainable forest product are improved. (Max 30 words)	0.1. Optimal growing conditions for the Mulanje cedar characterised, enabling broader use of this tree in the Malawian domestic market by the end of year 3. 0.2. Improved horticultural protocols developed for establishment and propagation of the Mulanje cedar in nurseries by the end of year 2 0.3. Cedar propagation in community nurseries generates income for local households. 150 local people (at least 60% women) trained and earn >US$250 per annum each, directly from seedling sales, by the end of year 2 and 150 local people earn US$1.50 per day planting cedar on Mulanje Mountain in years 2 and 3. 0.4. Local and national markets are established for the Mulanje cedar based on the sale of 500,000 seedlings per annum for reforestation of Mulanje Mountain (years 2 and 3) and promotion and licensing of the cedar on the national market (year 3). 0.5. Unsustainable exploitation and damage to natural stands of cedar reduced by at least 50% against the year 1 baseline by the end of March 2019 as a result of local communities working with the authorities to protect, restore and sustainably manage the	0.1. Scientific papers & reports 0.2. Protocols published. Seedling production records 0.3. Nursery records and accounts. Training course attendance figures and attainment certificates. Socio-economic survey report against project inception baseline. MMCT Annual Report and accounts. 0.4. MMCT Annual Reports and accounts (reforestation). Publicity materials, radio broadcasts, policy documents etc. (cedar promotion). 0.5. Meeting minutes and records. Posters and leaflets produced. Socio-economic survey report. Cedar ecological survey, satellite imagery fire study, scientific papers.	• Technical challenges can be overcome. • Full participation of local communities. • Local politics and ethnic differences not inimical to creating a cohesive and representative Cedar Growers and Planters Association • Income obtained from selling and planting cedar seedlings replaces income from the exploitation of cedar timber and is regarded as an alternative, not an additional activity.

	remaining natural stands of cedar on Mulanje mountain		
Outputs: 1. Optimal cedar growing conditions characterised to improve reforestation success on Mulanje Mountain and to define areas suitable for cedar cultivation elsewhere in Malawi.	1.1. Project infrastructure established, including project management, employment of experts, full stakeholder engagement, acquiring Prior Informed Consent and Monitoring and Evaluation. 1.2. Genetic diversity and provenance of remaining cedar seed stocks characterised by end of year 1, and cedar pathology and symbiont biology understood by end of year 2 1.3. Optimal abiotic (soil, climate) requirements for growing cedar elucidated and areas of Malawi suitable for cedar cultivation mapped and published by end of year 3.	1.1. Employment contracts, Workshop minutes, Steering Committee minutes, consultant contracts, permits, M & E reports. 1.2. Scientific papers & reports 1.3. Trial plot records, scientific reports and papers, maps.	• Expertise is available to solve the technical challenges
2. Improved horticultural protocols developed for the Mulanje cedar to improve survival and growth rates in community nurseries	2.1. Improved horticultural protocols developed and available to local users by year 2 2.2. Seedling establishment and survival rates increased throughout life of the project	2.1. Propagation leaflets 2.2. Nursery seedling production figures	• Expertise is available to optimise propagation
3. Cedar propagation in community nurseries generates income for local households	3.1. 10 tree nurseries established in Mulanje and Phalombe Districts by the end of the third quarter of year 1 3.2. 150 people (60% women) from 10 different communities trained in nursery techniques, cedar propagation, and basic business skills by the end of the third quarter of year 1. 3.3. 10 community nursery managers appointed and trained in business skills by the end of year 1	3.1. Infrastructures and consumables in place 3.2. Staff records. Training course attendance figures and attainment certificates 3.3. Staff records. Training course attendance figures and attainment scores 3.4. Nursery records 3.5. Nursery records 3.6. Nursery accounts and records	• New communities are receptive to nursery establishment • Suitable nursery managers can be recruited from trainees

	3.4. 10 kg of cedar seed, and 15 kg of other tree species seed collected and sown in 2016, 2017, 2018 3.5. 10 nurseries produce a minimum aggregate total of 500,000 cedar seedlings and 50,000 other tree seedlings per annum in years 2 and 3 (assumes 60% cedar seedling survival). 3.6. 500,000 cedar seedlings sold at end of years 2 and 3 at a minimum cost of US$0.10 each to support the Mulanje cedar restoration programme (creates a 10% profit margin for each nursery). At least 25,000 other tree seedlings sold. 3.7. 150 local people earn >US$250 per annum each, directly from seedling sales, by the end of year 2.	3.7. Socio-economic research results (disaggregated by gender). 3.7. MMCT Annual Report and accounts	
4. Local and national cedar stakeholders work together with international experts to identify cedar markets, develop mechanisms for tapping into those markets and promote the cedar.	4.1. Mulanje Cedar Growers and Planters Association formed from nursery staff, cedar planters and local community leaders in year 2 4.2. Forestry Department and Environmental Affairs Department works with local growers to promote cedar to farmers in appropriate areas nationwide by end of year 3. 4.3. Consultant works with Cedar Growers and Planters Association and EAD to develop licensing and benefit-sharing models for selling certified cedar stocks nationwide by end of year 2.	4.1. Association registered as an entity, meeting minutes 4.2. Publicity materials, radio broadcasts, policy documents etc. 4.3. Report, certification scheme.	• Local politics and ethnic differences not inimical to creating a cohesive and representative Cedar Growers and Planters Association
5. Unsustainable exploitation and damage to natural stands of cedar significantly reduced as a result of local communities working with the authorities to protect, restore and sustainably manage the remaining	5.1. Mulanje Cedar Growers and Planters Association adopts the Cedar Management Plan by the end of year 2. 5.2.150 local people earn US$1.50 per day planting cedar on Mulanje Mountain in years 2 and 3.	5.1. Meeting minutes and records. 5.2. Cedar seedlings planted on Mulanje 5.3. Posters and leaflets produced 5.4. Socio-economic research report	• Income obtained from selling and planting cedar seedlings replaces income from the exploitation of cedar timber and is regarded as an alternative, not an additional activity.

natural stands of cedar on Mulanje mountain	5.3. Local cedar public awareness programme launched by end of year 2 5.4. In 2019, a >40% increase in positive responses are recorded in the socio-economic survey for both attitudes to, and benefits received from, the cedar compared to the 2016 baseline study. 5.5. Cutting and fires demonstrably reduced by end of year 3 against year 1 baseline.	5.5. Cedar ecological survey results, satellite imagery fire study, scientific papers.	

Activities (each activity is numbered according to the output that it will contribute towards, for example 1.1, 1.2 and 1.3 are contributing to Output 1)

1.1. Inaugural Project Workshop held with all stakeholders present. Project plan communicated, refined and all necessary mechanisms for acquiring permits and Prior Informed Consent defined and implemented.

1.1. Project Steering Committee established, including all existing stakeholders (national and local authorities, communities, NGOs, academics etc.).

1.1. Detailed briefs written for external consultants

1.1. Monitoring and evaluation methodology defined and implemented.

1.2. Ecological survey of cedar populations (remnant and restored), measuring numbers of trees, size classes, genetic provenance, climate, soils and exploitation, carried out on Mulanje Mountain in year 1 and repeated in year 3.

1.2. International study carried out on microbial associations and pathology of cedar in years 1 and 2. Results published by end of year 2.

1.3. Edaphic and climatic conditions measured for *in situ* populations of cedar on Mulanje Mountain and *ex situ* stands in Malawi and in botanic gardens around the world

1.3. Cedar trial plots designed and planted (using existing seedling stocks) in 10 edaphically and climatically diverse sites across Malawi by end of year 1.

1.3. Cedar growth rates monitored in all trial sites (years 2 and 3), and optimal requirements for cedar growth determined by end of year 3.

1.3. Areas of Malawi suitable for cedar cultivation mapped and published by end of year 3.

2.1. Nursery trials designed and implemented by international experts within first 6 months of the project, investigating optimal media, watering regimes, light, temperature etc.

2.2. Seedling establishment, survival and growth baselines measured and monitored in nursery trials throughout the project

2.3. Optimal horticultural protocols published and available in local languages to users by beginning of year 3.

3.1. 10 nurseries established and fully equipped with shade netting, grow bags and other consumables by the end of year 1.

3.2. 10 experienced nursery staff recruited to establish nurseries and act as mentors. These staff will be drawn from existing MMCT nurseries, prioritising women and people with a proven track record.

3.2. 10 x 1 week nursery techniques training course offered for up to 20 people each (priority given to cedar sawyer families). 140 staff recruited from people who complete the course successfully (at least 60% women).

3.3. Nursery management and business skills training given to 10 individuals assessed by the Business skills consultant as having the necessary skills to manage production, nurture markets and make sales (end of year 1).

3.4. At least 10 kg of cedar seed collected and sown by the 10 nurseries in the fourth quarter of each year (equivalent to 900,000 seedlings).

3.4. Seed collected and sown from at least five other useful tree species in local demand, equivalent to at least a further 10,000 seedlings.

3.5. At least 500,000 cedar seedlings and 10,000 seedlings of other species produced by the 10 nurseries per annum in years 2 and 3.
3.6. Based on survey carried out in 1.2. MMCT and FRIM identify suitable sites for reintroduction of cedar by end of year 1.
3.6. 500,000 cedar seedlings sold at the end of years 2 and 3 to support the Mulanje cedar restoration programme. At least 25,000 other tree seedlings sold to local people.
3.7. Baseline socio-economic survey of recruited staff (disaggregated by gender) carried out by socio-economic consultant, assessing household income levels, income sources, use of natural resources and attitudes to cedar and natural resource conservation and management. Survey repeated in years 2 and 3.

4.1. Mulanje Cedar Growers and Planters Association formed from nursery staff, cedar planters and local community leaders.
4.2. National cedar publicity campaign launched by FRIM and EAD with support from the Eden Project, targeted at areas of Malawi where the cedar will grow successfully as defined in Output 1.
4.3. Consultant works with Cedar Growers and Planters Association and EAD to develop licensing and benefit-sharing models for selling certified cedar stocks nationwide.

5.1. Cedar Management Plan discussed, modified as appropriate and adopted by Cedar Growers and Planters Association.
5.2. At least 150 people employed at US$ 1.50 per day to plant 500,000 cedar seedlings per annum on Mulanje Mountain in years 2 and 3 as stipulated in the Cedar Management Plan (2014-2019).
5.3. Mulanje Cedar Growers and Planters Association works with MMCT and FRIM to promote the Cedar Management Plan, and the value of the cedar to local communities.
5.4. Socio-economic survey outlined in 3.7 re-assesses attitudes to and benefits received from cedar amongst growers and planters
5.5. Ecological survey of remaining cedar populations' exploitation and damage by fire repeated on Mulanje Mountain at end of year 3, and compared to baseline (Output 1.2)

Annex 3: Standard Measures

Code No.	Description	Gender of people (if relevant)	Nationality of people (if relevant)	Year 1 Total	Year 2 Total	Year 3 Total	Total to date	Total planned during the project
6A 6B	*Training courses* – *Nursery training -* Provided to 10 trainers from FRIM, MMCT & forestry extension workers. Disseminated to 150 nursery workers *Business skills training -* Provided to chairperson from each nursery (10 people) in year 1. Provided to 150 nursery workers in year 2. *Length of training* – *Nursery training -* 1 week training of trainers 1 week training for community groups *Business skills training -* 3 days	60% nursery workers are women	Malawian	160	160 (same people)		160	160
7	*Resources* – *Nursery resources* Print out guide for nursery managers Published horticultural protocols for growing cedar	60% nursery workers are women	Malawian	1			1	2
9	Cedar Management Plan to be updated by end of project							1
11A 11B	*Peer-reviewed papers to be submitted and published – 2 papers* Results of ecological baseline survey Results of genetic analyses							2
13A 13B	*Number of species reference collections established* – 8 *ex situ* trial plots that represent reference collections and provide *ex situ* conservation. Set up by Forestry Commission UK and FRIM. To be managed in the long-term by FRIM.			8				8

14A	*Number of conferences/seminars/ workshops to be organised* – Project launch to present project plan (year 1) Workshop with all nursery workers to discuss and establish the Cedar Growers and Users Association (year 2 – delayed to year 3) Workshop to improve forest management and forest policy in Malawi (year 2 / 3, matched funding required) Workshop to identify next steps for project when Darwin funding comes to an end (year 3)		Malawian	1				4
14B	*Number of conferences/seminars/ workshops attended* – UNESCO Man & Biosphere World Conference, Lima, Peru June 2016 IUCN World Conservation Congress, Hawaii, September 2016 Ecological Restoration Alliance of Botanic Gardens Annual Conference, Mexico, December 2016 BGCI's Global botanic Garden Congress, Geneva, June 2017 Society for Ecological Restoration World Congress, Brazil, September 2017 British High Commission in Lilongwe, February 2018 Darwin Expert Committee, March 2018 Aim for at least 3 more over project timeframe			3	4		7	10
20	*Estimated value (£'s) of physical assets to be handed over to host country* – £16,000 nursery infrastructure			£10,000	£1,604		£11,604	£16,000

22	*Number of permanent field plots and sites to be established* 8 trial plots for testing growth limits of Mulanje Cedar			8				8
23	*Value of resources raised from other sources -* Total £156,409			£30,193 In-kind	£64,921 In-kind		£95,114	£156,409

Table 2 Publications

Title	**Type** (e.g. journals, manual, CDs)	**Detail** (authors, year)	**Gender of Lead Author**	**Nationality of Lead Author**	**Publishers** (name, city)	**Available from** (e.g. weblink or publisher if not available online)
Save Our Cedar	Booklet of poems produced by schools	Chamwala, K. (eds), 2018	Male	Malawian	MMCT, Wildlife Environmental Society of Malawi (Mulanje branch) and Mulanje Poetry Association	Printed (extract in Annex 4.4)

Checklist for submission

	Check
Is the report less than 10MB? If so, please email to Darwin-Projects@ltsi.co.uk putting the project number in the Subject line.	Yes
Is your report more than 10MB? If so, please discuss with Darwin-Projects@ltsi.co.uk about the best way to deliver the report, putting the project number in the Subject line.	No
Have you included means of verification? You need not submit every project document, but the main outputs and a selection of the others would strengthen the report.	Yes
Do you have hard copies of material you want to submit with the report? If so, please make this clear in the covering email and ensure all material is marked with the project number.	No
Have you involved your partners in preparation of the report and named the main contributors	Yes
Have you completed the Project Expenditure table fully?	Yes
Do not include claim forms or other communications with this report.	