

The Rufford Foundation

Final Report

Congratulations on the completion of your project that was supported by The Rufford Foundation.

We ask all grant recipients to complete a Final Report Form that helps us to gauge the success of our grant giving. The Final Report must be sent in **word format** and not PDF format or any other format. We understand that projects often do not follow the predicted course but knowledge of your experiences is valuable to us and others who may be undertaking similar work. Please be as honest as you can in answering the questions – remember that negative experiences are just as valuable as positive ones if they help others to learn from them.

Please complete the form in English and be as clear and concise as you can. Please note that the information may be edited for clarity. We will ask for further information if required. If you have any other materials produced by the project, particularly a few relevant photographs, please send these to us separately.

Please submit your final report to jane@rufford.org.

Thank you for your help.

Josh Cole, Grants Director

Grant Recipient Details

Your name	Chung Liu
Project title	Avian Habitat Conservation through Shade Cacao and Coffee Cultivation in the South Rupununi, Guyana
RSG reference	16476-1
Reporting period	June – August 2016
Amount of grant	£5,000
Your email address	chung.liu@gmail.com
Date of this report	9 April 2017

1. Please indicate the level of achievement of the project's original objectives and include any relevant comments on factors affecting this.

Objective	Not achieved	Partially achieved	Fully achieved	Comments
(A) Farm surveys and participatory rural appraisal				A combination of farm surveys, semi-structured interviews, informal interviews, and focus groups were conducted, primarily with residents of Katoonarib Village, and also with residents and SRCS Rangers from Shulinab, Rupunau, and Sawariwau Villages.
(B) Training of three local junior members as research assistants				More four local junior members were trained as research assistants, all of whom have since continued on to pursue various opportunities in higher education, local conservation, and as local Secondary School teachers.
(C) Maintaining coffee, cacao, and other seedlings at SRCS Dadanawa				SRCS shade nurseries were established at Nat'toon, Katoonarib, at Kaiambe Ranch, Shulinab, and at SRCS headquarters at Dadanawa Ranch.
(D) Establishment and maintenance of shade nurseries at participating local farms				Coffee, cacao, and canopy tree seedlings have been planted at four sites at Katoonarib, three in Shulinab, one in Rupunau, and one in Sawariwau.
(E) Periodic assessment of bird species present				Village bird lists have been started and kept following SRCS Primary School education outreach sessions in each of the four villages.

2. Please explain any unforeseen difficulties that arose during the project and how these were tackled (if relevant).

There were two major unforeseen difficulties during the course of project, including (i) national, local, and village elections causing delays in permission process; and (ii) seasonal drought impeding plant work.

The May 2015 national election saw substantial changes in national organisation, with similar change reflected in local and village elections that followed, and in new community responsibilities of several key SRCS members involved in the project. The project obtained all necessary formal permissions for research by March 2016, massively reducing the time available for formal interviews, which were conducted with a greater focus on one village, Katoonarib, over the various other communities. This reduced the quantity of ethnographic data collected, but data collected was nonetheless more than sufficient in depth to strategically inform subsequent planting work as planned.

The project engaged four youths during the 2015 rainy season (June – September 2015) to set up their own small nurseries at home, and also participated on regular SRCS Red Siskin fieldwork to acquire a detailed understanding of bird watching and research. Despite their initial success with germinating several fruit trees (cashew, sugar apple, tamarind etc.), almost none survived, as 2015 was the driest year in recent history. The planting work during the 2016 rainy season was undertaken by SRCS members, youths, and children at Dadanawa, Katoonarib, and Shulinab, with better success in planting fruit trees (e.g. cashew, mango, jamoon, tamarind), and moderate success in germinating NTFP and timber seeds collected by Rangers (e.g. copaiba, locust, andiroba, redwood).

Ultimately, coffee and cacao were found to have limited viability in the South Rupununi. Three of the four villages that the SRCS and this project worked with (Sand Creek, Shulinab, and Rupunau) have traditional farms at higher altitudes, where shade coffee is cultivated and we have planted coffee and cacao here. The remaining village (Katoonarib, and the neighbouring Sawariwau which was not included in the project but shares similar geography) is in bush island and savannah terrain with traditional farms at lower altitudes and water supply being a critical issue. Here, villagers have voiced strong opinions on forest composition change despite little land cover change. This was attributed to overharvest of timber trees, burning due to clearing of new farm areas, and uncontrolled savannah fire. As all coffee planted in Katoonarib perished during the dry season, the project refocused on fruit, NTFP, and timber trees in this area.

3. Briefly describe the three most important outcomes of your project.

The three most important outcomes of the project include (1) background research on knowledge and use of indigenous tree species, local terrain and possible planting areas, and issues in agriculture and rural development; (2) the establishment of SRCS nurseries and the cultivation and transplant of various coffee, cacao, fruit, NTFP, timber, and shade canopy trees in participating village communities; and (3) the

training and inclusion of several local youths and school-leavers in conservation research, bird monitoring, tree-planting, and education outreach for village primary schools.

1. Research on knowledge and use of indigenous tree species, local terrain and possible planting areas, and issues in agriculture and rural development.

The project examined traditional ethnobotanical knowledge, present plant cultivation and use, local terrain types, and possible planting areas, eliciting over 100 plant species that the team considered for canopy and supplementary trees to coffee and cacao sites. This investigation was crucial in the subsequent implementation of the tree-planting section of this project, including determining that coffee and cacao have both been historically planted successfully throughout the region and that their decline was due to socio-economic rather than biological factors; investigating various important NTFP, timber, and fruit trees, to determine species and potentially viable for cultivation, and to begin identifying seasonal patterns in order to collect seeds more systematically; understanding of plants in various environments including at kabaun (home), baarazi (savannah), kanoko (forest), baarazi-kanoko (savannah-forest [edge]) katonaru (bush island), waozi danamanda (creek edge), zakapu (farm), and piidauni (old farm), which provided further context for site and species selection; and highlighting several factors including savannah fire, bush island depletion, livestock and wildlife damage, and critical constraints on the local economic income from cash crops that continue to affect Makushi and Wapishana agricultural activity. Katoonarib and Sawariwau are farming communities that not only depend on katonaru (Bush Island) for materials, game, and other resources, but also farm within them. Widespread sentiments of bush island depletion have led SRCS efforts in these areas to focus on using coffee and cacao cultivation to prevent careless fire damage, and fencing is a necessity due to otherwise serious threat of livestock damage to zakapu (farm). Shulinab and Rupunau are both communities where farms are in the kanoko (forest), with previous village projects have involved construction of a fence along the bush edge to deter livestock damage to farms. These areas have critical bird habitats at piidauni (old farms), including several Red Siskin habitats in Rupunau and also neighbouring Sand Creek village. Coffee and cacao cultivation around old farm areas can also forestall fire damage from hunting, and allow for young timber trees to regenerate.

The region is severely hindered by a lack of infrastructure, with little to no functioning local processing facilities, poor access to and lack of knowledge of national and international demand, and three years of increasingly severe drought being cited as the main barriers to economic income for local farmers. There is significant impetus from local community groups including most notably several village women's' groups aimed at developing agricultural and foodstuff commodities, and indigenous artisanal craft industries, and several projects by the South Central People's Development Association (SCPDA) aimed at developing savannah farming and other agricultural projects, that all seek to improve the current situation. Various government agencies (e.g. NAREI, EPA Guyana, Ministry of Indigenous Peoples' Affairs) also expressed enthusiasm when approached by the SRCS to collaborate and assist in this project.

2. Establishment of SRCS nurseries and the cultivation and transplant of various coffee, cacao, and shade canopy trees in participating village communities. Project members have established three SRCS Nurseries at Nat'toon (Katoonarib), Kaiambe (Shulinab) and Dadanawa (SRCS headquarters), which have focused on transplanting and cultivating coffee (52 plants; introduced in the early 1900s, from remaining indigenous coffee farms in Shulinab), cacao (27 plants; sourced from NAREI, the National Agricultural Research and Enterprise Institute), and successful sourcing and germination of local seeds for indigenous NTFP-producing trees including copaiba (*Copaifera* sp.), locust (*Hymenaea courbaril*), crabwood (*Carapa guianensis*), and itai (*Mauritania flexuosa*), timber trees including mora (*Mora excelsa*), redwood (*Centrobolum paraense*), and other many other less successfully cultivated species, as well as various indigenous and locally successful trees including tamarind, mango, cashew, French cashew, soursop, jamoon, sugar apple, wild cashew, neem, and citrus, to name a few. Coffee, cacao, canopy, and other trees have been planted at nine sites including five in Katoonarib, three in Shulinab, two at Rupunau, and one each at Sawariwau and Wichabai, with further trees also donated to various village Primary Schools, and individual households and farms.

Most coffee seedlings perished in the dry season with notable exceptions at Shulinab, where there already is some coffee remaining from trees introduced in the early 1900s, and Rupunau, where due to villagers' sustained efforts about a dozen small trees have clung to survival. Cocoa has fared a little better with several plants remaining in Katoonarib, Shulinab, and Rupunau. SRCS Rangers at Sawariwau have also managed to germinate redwood this year. Despite the lack of initial success with many trees planted dying, the Rufford grant has managed to inspire rangers and other interested villagers alike in proactively planting trees and we foresee healthy grassroots involvement continuing, regardless of whether further formal activities in the immediate future can be funded.

3. Training of youths and inclusion of several local youths and school-leavers in conservation research, bird monitoring, tree-planting, and education outreach for village primary schools.

The four youths (16+) involved at the start the project included: (1) Vidia Caitano (Rupunau), presently pursuing additional support education in Georgetown; (2) Maya de Freitas (Rupunau), who has since completed her first year in Environmental Science at the University of Guyana, Georgetown, and returned in 2016-2017 to coordinate SRCS red siskin research; she has now left for Brazil to study Portuguese and Biology; (3) Leandrew Fredericks (Shulinab), presently attending Bina Hill Institute, North Rupununi, with a focus on tourism; and lastly but certainly not least (4) Kim Spencer (Katoonarib), presently a teacher at Sand Creek Secondary School, South Central Rupununi, who also should be given special recognition for her assistance to SRCS efforts over the entire project including leading SRCS education outreach in Sand Creek Secondary School. Two more youths who have also been of significant assistance to the SRCS as the project continued were: (5) Nathaniel Wilson (Katoonarib); and (6) Judah Kenyon (Saddle Mountain), a young vaquero entering his second year of engineering at University of Guyana, Georgetown. Several students (under 15) in each village have also assisted, with special

acknowledgements to: (7) L Cyril (Katoonarib), (8) V Cyril (Katoonarib), (9) I Ignace (Shulinab), (10) L Joseph (Rupunau), and (11) L Joseph (Rupunau), for their indefatigable planting efforts throughout the project.

These youths and children have worked alongside with SRCS Rangers to plant, transplant, cultivate, and maintain all the seeds and seedlings of the canopy, cacao, and coffee species mentioned above. They are also as experienced in the identification by sound and sight, safe mist-net extracting, handling, measuring, banding, and releasing of birds. Many have assisted and led education outreach introducing village primary school students to bird identification. Unequivocally speaking, they have been central in the project's success. Their performance has uniformly been spectacular and they have been an absolute privilege and blessing to work with.

4. Briefly describe the involvement of local communities and how they have benefited from the project (if relevant).

I (Chung) was the sole non-local participant in the project. This project involved: (1) SRCS Rangers and cadet rangers volunteered by the four participating Wapishana and Makushi villages involved in the project, who carried out the project; bird-based education outreach efforts to (2) village primary school and Sand Creek secondary school students, with several subsequently participating on SRCS plant and bird activities; (3) village bitter-cassava farming households involved in transplant, ownership, and cultivation of project trees; (4) the village, Toshao, and Village Council who are kept informed prior to, during, and following all project activities; (5) the former District Toshao Council recently renamed the South Rupununi District Council (SRDC), and other relevant local organisations including the South Central Peoples Development Association (SCPDA), who are likewise updated on the project.

SRCS rangers and cadet rangers (<1 year participation in SRCS projects) played key roles in data collection (interviews, focus groups, site visits), project design, planting activities (seed collection, nursery construction, seedling cultivation, transplant, ownership, cultivation), and conservation outreach (village school birdwatching field trips, village council and public meetings, SRDC quarterly meetings, the International Biodiversity of the Guiana Shield conference held in Georgetown between 8-11 August 2016, meetings with NAREI, EPA Guyana etc.).

Primary school and secondary school students receive education in bird identification, and schools have begun to receive seedlings donated from SRCS nurseries to cultivate as part of the school. Several of these students have also participated on SRCS activities. Individual farming families have been given coffee, cacao, canopy, and fruit tree seedlings too to transplant, own, and cultivate around their households, current and old farms.

Village Tshaos and/or Village Councillors are informed prior to, during, and following all project activities. The SRDC, which meets quarterly, is regularly kept apprised of the situation. Several SRCS members and rangers are also participating

members of SCPDA whose projects have taken similar routes in addressing crosscutting local issues in agriculture, environment and rural development.

5. Are there any plans to continue this work?

Yes. Coffee and cacao take 4-5 years to bear, and similarly most of the canopy trees take 5-15 years to reach canopy heights. This project is a long-term approach to conservation-friendly agroforestry, and the SRCS team is committed to continue to collect seeds, cultivate, and transplant for years to come. We have also received some assistance from the Smithsonian Migratory Bird Institute on shade coffee guidelines that were invaluable in helping us plan and organise our work.

More specific further plans are discussed in Section 9 of this report.

6. How do you plan to share the results of your work with others?

We are presently preparing written reports and presentations to participating village councils, the SRDC, EPA Guyana, and the Ministry of Indigenous Peoples', education materials for village students, and practical materials for local farmers to get involved in coffee, cocoa, and indigenous canopy tree planting.

All seedlings that are successfully cultivated by the SRCS have to date, and will continue to be, transplanted in the South Rupununi, and owned by participating local community members and groups.

7. Timescale: Over what period was The Rufford Foundation grant used? How does this compare to the anticipated or actual length of the project?

RSG funding was to be used between April 2015 and September 2016. Due to the aforementioned difficulties this period was extended through to September 2016, with a five-month increase in duration overall. While project activities were not conducted as scheduled, all activities and objectives have been met during this longer period.

8. Budget: Please provide a breakdown of budgeted versus actual expenditure and the reasons for any differences. All figures should be in £ sterling, indicating the local exchange rate used.

Item	Budgeted Amount	Actual Amount	Difference	Comments
EPA-Guyana Research Permit	£452	£0	+ £452	The EPA-Guyana research permit fee was waived as this project works through the auspices of a local conservation organisation.

Georgetown-Lethem return flight	£157	£147	+ £10	Lethem-Georgetown between February and March 2016.
Local transportation and fuel costs	£481	£696	- £215	2 barrels of gasoline for transportation between May 2015 and April 2016; 1 barrel between May to August 2016.
Equipment and Materials for Shade House	£480	£900	- £420	The Shade House was constructed at Kaiambe Ranch, Shulinab as planned. Materials and fuel for transportation ended up costing more than budgeted for.
Bags for seedling transplants	£290	£63	+ £227	An initial round of bags was purchased (5,000 bags) that has proven sufficient up until this point.
Birds of Northern South America guides	£450	£447	+ £3	Eight books purchased in total rather than 10 as planned.
Binoculars	£600	£220	+ £380	Twelve small binoculars purchased more suitable for children's usage. The project otherwise used SRCS binoculars available from our Red Siskin work.
Junior Research Assistant Stipend (3x£5/diem)	£1,800	£1,800	0	Stipends for aforementioned youths over the duration of the project, for seed collection, cultivation, and research.
Ranger Stipend (£5/diem)	£500	£350	+ £150	Including stipends for research assistant work, seed collection, and nursery construction.
Unscheduled Expense: Bank Transfer Fee	-	£18	- £18	Regular bank transfer fee.
Unscheduled Expense: Katoonarib Construction	-	£143	-£143	Costs were for wire and nails to secure transplanted trees from livestock, fire, and wildlife.
Unscheduled Expense: Coffee seeds, Cacao and Neem seedlings	-	£90	-£90	Purchase of coffee seeds, and cocoa and neem seedlings for planting.
Unscheduled Expense: Shulinab collection trip	-	£121	-£121	Cost of rations, fuel, to collect seedlings
Unscheduled Expense:	-	£192	-£192	Cost of fuel for trip to collect

Sand Creek collection trip				seedlings
TOTAL	£5,000	£4,977	£23	*Note: Balance remaining will be put towards administrative costs of printing reports to share with villages

9. Looking ahead, what do you feel are the important next steps?

This project has the curiosity of many village members, who are very interested in not only planting coffee and cacao for subsistence, but more broadly bird and landscape conservation, and the development of sustainable agricultural and forest products to improve sparse village incomes. It has further enabled several individual villagers and households to participate, and there is a great deal of interest from village schools in project activities.

The next important steps include: (i) giving interested members of each community the tools to work with (e.g. seeds, seedlings, literature on specific species, equipment) to continue plant work; (ii) mapping out and inventorying currently standing trees in shade coffee and cacao areas with a focus on those species identified in the survey, (iii) to investigate market demand, rural value-added processing solutions, and potential commodity chains for local communities and specifically women's groups in particular to be able to better benefit, (iv) scaling up the project to be able to cultivate sufficient coffee, cacao, and other seedlings to meet the increasing village interest in the project. Lastly, the research component of the project has highlighted (v) other existing problems to address, including bush island deforestation, waterway erosion, and the lack of traditional restraint in savannah burning during dry season that future steps of this project would need to investigate and hopefully be able to address. There is a great deal of work to be done.

10. Did you use The Rufford Foundation logo in any materials produced in relation to this project? Did The Rufford Foundation receive any publicity during the course of your work?

Yes. The RSGF has been officially recognised and thanked by the SRCS for enabling this project since letters were sent to village councils in July 2015, and mentioned in all official reports and presentations of project activities including to the SRDC, regulatory government ministries (EPA Guyana, Ministry of Indigenous Peoples' Affairs), our funding agencies for red siskin research (Conservation Leadership Project, UNDP Small Grants Program, and the Mohamed bin Zayed Conservation Fund), conservation partners (Smithsonian Institution, Red Siskin Initiative) the March 2016 newsletter when the plant nursery phase of the project had all the necessary official permissions, people, and parts to begin, and in all newsletters since. In addition, we have thanked the RSGF on the SRCS Facebook social media page for the generous support towards this project.

11. Please provide a full list of all the members of your team and briefly what was their role in the project.

12. Any other comments?

This was a well-intentioned and long-term project that will not achieve its ultimate objectives for years ahead. Most importantly, it has inspired local farmers and communities to begin thinking about proactively planting trees at increasing scales in a region where harvest and use are prevalent but planting and replanting less so. With the baseline research collected on locally occurring and useful tree species, the SRCS intends to continue planting work, albeit likely at a grassroots level with minimal dependency on funding at this point.