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	Clay Plager-Unger
Project title	Dry Tropical Forest Revegetation and Bioregional Education Project
RSG reference	18448-D
Reporting period	December 21st, 2015 - December 20th, 2016
Amount of grant	£10,000
Your email address	planetdrumecuador@yahoo.com
Date of this report	December 30th, 2016

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
Greenhouse operation and native plant propagation: - Distribute 2,000 trees to rural communities. - Plant 1,000 trees at revegetation sites. - Produce 5,000 more trees.				3,219 trees representing 30 native tree species were distributed to 19 communities throughout the Manabí province, directly benefiting hundreds of regional families. 947 trees were planted by Planet Drum in coordination with local partners including other NGOs and government organisations such as the National Electric Company and the Corporation of Reforestation in Manabí, as well as schools, communities, and neighbourhoods. The original Planet Drum greenhouse was destroyed during an earthquake on April 16th 2016 and the project was without a fully functioning greenhouse facility for nearly 6 months. As a result, we were only able to produce 4,000 new trees.
Implementation of three new, community-based greenhouse facilities and produce 3,000 trees at each location (9,000 total).				After the earthquake, the original Planet Drum greenhouse needed to be completely rebuilt at a different location at the Catholic University. This new facility now serves as the central greenhouse for revegetation operations. Additionally, three smaller community-based greenhouse facilities were initiated in central Bahia, the Bellavista community, and the Los Algarrobos school in Canoa. Only 1,000 trees total were produced at these new mini-greenhouses, as a result of

				construction complications and earthquake related setbacks.
Urban Reforestation: - - Plant 2,000 trees with local residents				Only 679 trees were planted in the Bahía de Caráquez urban setting.
- Ecological Transportation: - Educate and train eco-taxi operators - Promote eco-taxi use.				Clay attended several city planning meetings and proposed promoting eco-taxi use whenever possible. However, since approximately half the local population migrated out of Bahía after the earthquake, eco-taxi operations have fallen by an estimated 80%. Despite this, one of the rebuilding plans includes bicycle and eco-taxi lanes in the city, as suggested by Planet Drum.
Remanufacturing and Waste Reutilisation: - Support municipal garbage separation and composting. - - Remanufacturing workshops.				Planet Drum continues to maintain a close relationship with the city government, but it was not possible to make advances in municipal garbage separation because City Hall was damaged and local government processes were completely disrupted after the April 2016 earthquake. However, Planet Drum started an urban composting model at its central Bahía location, and remanufacturing practices are an integral aspect of Planet Drum's approach to ecosystem restoration. These techniques were shared while working with communities, schools, and individuals this year.
Urban Green Spaces: - Improve city parks. - Implement sidewalk gardens.				Initial meetings were conducted with city officials to implement sidewalk gardens, but it is impossible to move forward until the city has approved an urban rebuilding plan.
Green Businesses: - Work with local				After the earthquake, Clay met with local business owners to discuss ways

businesses to identify and achieve green business goals in the context of the Ecological City.				in which Bahía can maintain and improve its identity as an Ecological City. There is strong interest in developing environmental strategies, but specific plans have not been established yet.
Bioregional Education Programs: - Host 24 revegetation workshops. - 12 school visits to teach bioregional principles. - Develop urban environmental outreach materials.				Planet Drum hosted 14 revegetation workshops throughout Manabí Province at schools, and with ecological and government organisations. More than 500 individuals directly participated in the workshops. Besides these workshops, six school visits were conducted, and approximately 380 students received bioregional lessons. Also, motivational ecological stickers were produced to help elevate spirits post-earthquake. 300 stickers that read "Plant Hope" and included the project title as well as the Planet Drum Foundation and The Rufford Foundation logos were printed and distributed.

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

Without question, the greatest unforeseen difficulty was the 7.8 earthquake on April 16th 2016, which struck the central to northern coastal region of Ecuador, including the city of Bahía de Caráquez, where Planet Drum's revegetation and bioregional education project is based. In total, more than 673 people were killed, 6,200 were injured and 27,000 people were left homeless. President Rafael Correa declared the entire area in a state of emergency from April through September. There have been thousands of aftershocks, including several that were above 6.0 on the Richter scale. In Bahía de Caráquez, a very small city with approximately 12,000 permanent residents, 15 people were killed, more than 400 buildings were destroyed and in excess of 5,000 residents migrated out of the city. The total economic toll is estimated in the billions. And the psychological damage on the affected population is impossible to quantify. The recovery process will take years.

Planet Drum was in the process of relocating to its new house and office when the earthquake occurred, which was extremely fortunate, since the previous residence was badly damaged and demolished. Many pieces of Planet Drum's equipment and personal belongings were lost. Miraculously, the new house was only minimally impacted, providing Planet Drum volunteers a home and headquarters to continue our work.

Immediately after the earthquake, Field Foreman Orlando Arias saved more than 3,000 trees at the greenhouse by making emergency provisions to connect to a nearby water source. Every tree at the greenhouse would have died if not for his heroic efforts. Due to damages at the Catholic University, one half of the university is in the process of being demolished. The Planet Drum greenhouse, which was located directly behind a building slated for demolition, needed to be moved. The university generously offered a new greenhouse space, located slightly farther away from the university buildings. In the months following the earthquake, the old greenhouse was dismantled and a brand new greenhouse area was created.

Other major logistical disruptions to the project caused serious challenges. The University of Oregon was planning a Study Abroad program in collaboration with the Planet Drum Ecuador Projects for July-August 2016, which had to be cancelled. Several international volunteers cancelled their visits entirely, while those who came despite the earthquake, spent much of their time assisting in the rebuilding of houses in low-income communities.

Throughout the mayhem, crisis, and challenges presented by the earthquake, the local population was dealing with immediate basic priorities so involvement with Planet Drum's projects and productivity was reduced. One of the strengths of the project, integrating with local communities, suddenly became a weakness.

Additionally, all four of the schools in central Bahía were destroyed and thousands of students missed 2 months of school, they continued to attend school in provisional classrooms. The massive destruction of school infrastructure and the disruption to the academic year has made collaborating with schools especially difficult.

It is clear that the need for ecological planning and projects is greater than ever and will be crucial for rebuilding in the long term. In the short term, much of the local population simply does not have the time to collaborate with us. In the immediate aftermath of the earthquake, Planet Drum assisted with water filter distribution to marginalized neighbourhoods and volunteers assisted with the reconstruction of houses in the Bellavista community.

Planet Drum continues to focus on the core aspects of its project: habitat restoration, erosion control, fruit tree propagation/distribution, and bioregional education. As the local population rebuilds their houses, businesses and lives, it is clear that there is an underlying desire to also repair the damaged ecosystems, plant trees, and stabilise dangerous hillsides. Planet Drum is as dedicated as it has always been to providing the necessary support, resources, and expertise to facilitate these activities.

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

The three most important outcomes are bioregional education, habitat restoration, and native fruit tree propagation.

Bioregional education: Quality education in Ecuador is extremely lacking, especially in regard to the environment. Many of the pressing ecological issues that threaten the livelihoods of the local population are poorly understood, rarely addressed, and hardly ever acted upon. One of Planet Drum's central objectives is to disseminate bioregional knowledge which provides children and adults not only with information about the vital importance of local ecosystems and their extremely precarious condition, but also the knowledge and skills to mitigate the damages caused by destructive human activities. Local ecosystems have been exploited to the brink of collapse. Forests are almost completely destroyed, soil has been depleted, and water systems contaminated. The abundance of nature, upon which subsistence populations depend for their survival, has been nearly exhausted. Without a change in human activities, the quality of life and the ability of the population to sustain itself is increasingly vulnerable. By reaching out to locals and educating them, Planet Drum provides the knowledge and skills to create positive ecological change.

Habitat restoration: The dry tropical forest is one of the most damaged, threatened, and fragile ecosystems on the planet. Its vast biodiversity is on the verge of disappearing before it has even been properly documented and studied by scientific and academic communities. Since less than 1% of the original forest ecosystem remains at present, the only way to preserve it is through active habitat maintenance and restoration. Native tree propagation and revegetation site implementation by Planet Drum provides a model of dry tropical forest ecosystem recovery which it enthusiastically shares with all local, national, and international ecological organisations. Without this work, native species, with their often unknown uses and potential benefits, could be lost forever. In this regard, Planet Drum has begun collecting and documenting native plant species with traditional medicinal uses.

Erosion control is also an important outcome of habitat restoration. The hillsides least affected by landslides surrounding the city of Bahía were in the places where Planet Drum has planted the most trees. The Bellavista community, where Planet Drum has planted trees for 15 years, was one of the least impacted hillside neighbourhoods and none of the residents were evacuated. In comparison, portions of the La Cruz, San Roque, and Astillero communities, which had fewer revegetated trees, were evacuated due to landslide risk. It is highly probably that the strong root systems of the planted trees helped minimise the earthquake damages on those steep, erosion-prone hillsides.

Native fruit tree propagation: This focus connects the social and environmental aspects of the project in one tangible activity with a significant result. When someone plants a native fruit tree, the impact of that action has a myriad of positive effects. In addition to the ecological benefits, such as flora and fauna habitat creation, carbon sequestering, soil stability, and oxygen production, there are social benefits as well. With the act of planting a tree, each person takes a step towards improving their environment, commits to caring for the tree, and begins a history that they can share with others. All of sudden, their contribution to the environment is a topic of conversation. They care for their tree, watch it grow, and eventually they will literally eat the fruits of their labour. Friends and family can share in the experience and become a part of the narrative. And finally, many of the native fruits are marketable and can provide an ecologically sustainable source of income. Thus a seemingly minor action can have an enormous impact.

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

Planet Drum's grassroots approach to ecological restoration ensures that local communities are the primary drivers and beneficiaries of the project's impacts. Through their participation, residents benefit from improved environmental conditions (more trees, increased soil stability, and improved ecological habitats), fruit harvests from native trees, and bioregional knowledge which aids them in becoming more involved with their natural surroundings.

A fundamental aspect of the project is that its participants take an active role in the work, and are directly responsible for its success (or failure). They influence the direction, impact, and outcomes. Planet Drum's role is to teach, motivate, guide, and assist with the work to ensure the highest possible level of success. But ultimately, the project and its benefits belong to and are driven by local communities.

Planet Drum is diligent in its effort to reach as many different people and communities as possible. Dozens of local communities, hundreds of families and

thousands of individuals throughout the region have been direct beneficiaries of tree donation campaigns, revegetation workshops and bioregional education activities conducted by Planet Drum during the past year. In nearly every instance, the interest, participation, and collaboration develops into a long-term relationship where Planet Drum's contact with participants is maintained well into the future.

For example, a tree donation campaign leads to new contacts who want to develop new initiatives that are related to the project. When one landowner receives a tree donation, often his or her neighbours also request tree and thus an entire community is inspired to participate in revegetation efforts.

While residents in Bahía were still struggling to recover the most basic aspects of their homes, businesses, and lives, Planet Drum reached out to communities, schools, organizations, and individuals in San Vicente, Canoa, and Rio Muchacho where contacts had previously been made, and was able to continue making progress in areas less affected by the earthquake.

5. Are there any plans to continue this work?

Yes! This is a critical time for Bahía, and the greater Manabí region. As people struggle to recover from the earthquake, there is an opportunity to shape the future of their relationship with the environment in a very proactive, mutually beneficial direction. By promoting the recovery of damaged ecosystems and sharing bioregional principles, Planet Drum will be influencing the future impact of humans on the environment.

People who live on deforested lands literally no longer have trees to rebuild their damaged homes. Farmers face daunting obstacles, such as depleted soil conditions and decreased levels of precipitation during the rainy season. The impacts of an over-exploited environment are increasingly startling and difficult to ignore. The residents of the region, many of whom depend entirely on the dry tropical forest environment for their livelihoods, have been presented with a compelling opportunity to shift from activities that deplete natural resources to activities that collaborate with nature and restore it.

With its new house and office location, Planet Drum has the capacity to receive large numbers of international students, interns, and volunteers. The main greenhouse has been rebuilt and is fully operational again. New partners are beginning to join the project and plans for expanding mini-greenhouse operations at more locations are developing. The goal is to emerge from the crisis stronger than before. While the dry tropical forest remains threatened and there are people who are interested and motivated to participate in its recovery, Planet Drum will continue

to provide the expertise, leadership, and resources to foment and facilitate that process.

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

An important aspect of the project is the creation of working models for Dry Tropical Forest restoration and sharing them with locals and foreigners alike.

Visitors regularly see first-hand the results of the project at Planet Drum revegetation sites and the greenhouse. When people see recovered landscapes and/or harvests from fruit-producing trees, they are often inspired to become involved in bioregional activities.

Project results are published on the new website and blog: http://planetdrumecuador.weebly.com/ and on the Planet Drum Foundation Facebook page: Facebook "Planet Drum Foundation"

Planet Drum Foundation in San Francisco publishes a semi-annual newsletter, PULSE, which also covers project developments in Ecuador (700 copies per printing).

Planet Drum's Ecuador Projects were featured on the High School NGO Connect blog on November, 30, 2016:
https://highschoolngoconnect.net/2016/11/30/survival-on-the-line/

Finally, Planet Drum works with national and international universities to showcase the results of the project as a model for ecological restoration that can be replicated in other threatened environments world-wide.

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

As anticipated, The Rufford Foundation grant funded the project for 12 months—from December, 2015 through November, 2016. The funds were integral to the successful operation and expansion of the project during that time.

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
Greenhouse Transportation	£593	£297	-£296	Progress on the implementation of new community-based greenhouse operations was impeded by the earthquake so there were fewer related transportation expenses.
Greenhouse Infrastructure Materials	£711	£1,462	£751	More materials were needed than expected due to damages from the earthquake including the unexpected need to relocate the entire greenhouse facility at the Catholic University.
Greenhouse Operation Supplies	£1,107	£1,450	£343	In order to recoup losses incurred during the earthquake, more operation supplies were needed than expected.
Greenhouse Tools	£553	£553	£0	
Greenhouse Labourers	£1,581	£1,581	£0	
Revegetation Field Supplies	£474	£650	£176	More field supplies were needed than expected due to earthquake damages.
Revegetation Tools	£435	£435	£0	
Revegetation Site Transportation	£474	£237	-£237	In-kind transportation donations from project participants such as government and non-government organizations and individuals reduced transportation expenses.
Revegetation Labourers	£1,107	£1,107	£0	
Urban Green Spaces Materials and Supplies	£315	£141	-£174	Progress on the implementation of Green Spaces in the city was cut short by the earthquake.

Urban Green Spaces Transportation	£158	£62	-£96	The crisis of the earthquake made it impossible to make progress on Urban Green spaces and less transportation was needed than expected.
Urban Green Spaces Tools	£158	£79	-£79	Same as above.
Eco-City Outreach Materials	£198	£97	-£101	Planet Drum participated with Bahía city government on Eco-City activities up until the earthquake in April. In its aftermath, motivational stickers promoting revegetation efforts were printed and distributed.
Eco-City Green Business Education Supplies	£198	£41	-£157	This aspect of the project was still in the planning phase when the earthquake struck and it was impossible to make significant progress on Green Business Education afterwards.
Eco-City Remanufacturing Workshops	£198	£68	-£130	Remanufacturing practices are promoted during activities with regional partners and communities, but Planet Drum was unable to host these workshops.
Bioregional Education Community Workshops	£198	£198	£0	
Bioregional Education School Programs	£198	£198	£0	
Bioregional Education Teachers	£949	£949	£0	
Urban Ecosystem Education Centre Supplies	£395	£395	£0	
Total	£10,000	£10,000	£0	

Exchange rate: £1 (GBP) = $1.45 (USD)

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

The goals of the Dry Tropical Forest Ecosystem Restoration and Bioregional Education Project are to recover habitats, control erosion, preserve threatened species, and promote fruit production—all by using native species and involving as many different participants as possible while educating them about bioregional principles. Future project endeavours need to, and will, ensure that all of these objectives are being specifically addressed. Next steps are:

1. Soil Recovery One of the most critical components of ecosystem restoration is the recovery of soil through the implementation of composting systems. Local residents can participate in the process of removing organic materials from waste streams and converting them into nutrient rich soil amendments for gardens, food production, and revegetation initiatives. Good soil is one of the key components of ecosystem restoration and is also an excellent way to directly involve community members in the project. This will be an important next step.

2. Greenhouse & Education The expansion of Planet Drum's greenhouse operations during the past 12 months has been well received in the schools and communities. Another important next step will be to further integrate revegetation initiatives into these areas. This will require continuing to educate, train, motivate and integrate individuals and organizations in bioregional methods and techniques, including composting, remanufacturing, and native tree and plant revegetation. Once communities are producing their own soil, plants, and trees, they will be able to manage ecosystem restoration more autonomously and effectively.

3. Bahía de Caráquez Eco-City Program We will continue to share Planet Drum's bioregional message with urban populations. The earthquake devastated the entire region, physically, socially, and economically. But the impacts have been particularly acute in the urban centres where populations are more concentrated and infrastructure damages more debilitating. Business activities, including eco-taxi operations have fallen approximately 80%. About half of the city's population simply packed up and left. Despite these distressing trends, the remaining residents are determined to rebuild, others will return, and hope remains that Bahía will eventually re-establish itself.

The need to rebuild presents a unique opportunity to explore new approaches to providing basic human needs, such as food, water, shelter, transportation, and energy. A bioregional vision promotes the sustainable use of locally available natural resources to meet these needs. By providing bioregional education, Planet Drum can influence Bahía's reconstruction process and achieve a more ecologically sustainable future for the entire region.

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

The Rufford Foundation logo is displayed prominently in the "About" section of the new project website, which was launched in June, 2016:
http://planetdrumecuador.weebly.com/about.html

The logo is also displayed on the original "Eco Ecuador" page of the Planet Drum Foundation website:
http://www.planetdrum.org/eco_ecuador.htm

300 stickers promoting the revegetation project were designed, printed and distributed during tree donation campaigns to provide motivation for local residents after the earthquake. The stickers read "Plant Hope", inspire revegetation, and feature the Planet Drum Foundation and The Rufford Foundation logos. More stickers will be printed and distributed in the coming months as more trees are distributed.

The Rufford Foundation logo is on the Planet Drum Bahía Eco-City flyer (2015) and "Dry Tropical Forest Revegetation Manual" (2014), both of which continue to be distributed in print form and are also available digitally on the Planet Drum website.

Credit is given to The Rufford Foundation for supporting the project in conversations, presentations, and workshops with national and international volunteers, students, and visitors.

11. Any other comments?

The crisis of the earthquake has been incredibly difficult for the residents of the impacted areas and the country of Ecuador as a whole. For example, the rest of the country has been paying 2% more sales tax since the earthquake to fund reconstruction efforts. Additionally, generous individuals and organisations nationally and internationally have made great sacrifices to support the earthquake victims. The road to recovery will be a long one.

Needless to say, the project and the Planet Drum team (and their families) were greatly affected. The Rufford Foundation's support for the project has been a sustaining and motivating force and has provided inspiration to continue forward progress. Planet Drum's ecological work in Ecuador has always been a struggle, similar to the struggles of all the environmental efforts taking place daily across the planet. The earthquake was one more challenge… a monumental one. The thousands of native trees that were planted, the thousands of participants who were

educated in bioregional practices, and the overall impact of the project during the past year was made possible in large part by The Rufford Foundation. Thank you!