CEPF Final Completion and Impact Report

Organization's Legal Name:	Ecosystem Restoration Alliance Indian Ocean
Project Title:	Mauritian Fruit Bat (Pteropus Niger) – A Tool for Forest Regeneration
Grant Number:	66369
Hotspot:	Madagascar and Indian Ocean Islands
Strategic Direction:	1 Empower local communities to protect and manage biodiversity in priority key biodiversity areas.
Grant Amount:	$243,146.00
Project Dates:	July 01, 2017 - August 31, 2021
Date of Report:	January 12, 2022

IMPLEMENTATION PARTNERS

Food and Agricultural Research & Extension Institute- Provided essential contact for fruit farmers to implement bat deterrence project.
National Park and Conservation Service/ Ministry of Agroindustry and Food Security- provided general permission for implementing the project
Generation Plus- Helped develop and establish the sound system to deter bats from the orchards
Tel Aviv University (Dr Yossi Yovel)- provided equipment and assistance to do GPS tracking of the bats
The Mauritius Herbarium- help in plant identification for the project especially during the forest surveys; advice on reforestation activities in regards to forest and species composition
Baie du Cap estate Ltd- entered Mou with ERA and provide over 200ha of forest for restoration
Lagoon Attitude Hotel (Attitude Group)- entered MoU with ERA for future conservation efforts and public education
The University of Bristol (Prof Gareth Jones) an The University of Exeter (Prof Paul Racey) acted as project advisors

CONSERVATION IMPACTS

Planned Long-Term Impacts: 3+ years (as stated in the approved proposal)

Impact Description	Impact Summary
1. Establish longlasting conservation areas in Longue Mountain under community	Due to permit issues the site has been moved to Baie du Cap Estate- private owner of over 200ha of

Impact Description	Impact Summary
management (around 100ha in total) and in YemenTakamaka corridor under a private status (around 100ha in total).	forest. A long-lasting (initially 10 years) conservation of the forest has been started.
10. Increased engagement of local communities in conservation work	Local people from the surrounding the forest area have been employed for plant propagation and forest restoration.
11. ERA establishes as one of the main conservation organisations in Mauritius	ERA is becoming recognized in Mauritius and the number of its partners is growing. Our forest restoration project is one of the largest in Mauritius
12. Expansion of ERA work into other sites outside National Parks e.g. Calebasses Mountain	Our restoration project is outside National Park
2. Passive and active regeneration in the areas enhanced	Active restoration of the forest is being conducted and the passive restoration will follow
3. Refugee and food source for threatened Mauritian fruit bat	With over 5000 plants planted so far (and many more to come) the forest will become a refugee and food source for the fruit bats
4. Reintroduction of endemic bird species to both areas, which will help to balance the ecosystem	In the future when the planted forest become established the introduction will be possible
5. Change of the attitude of Mauritians towards the bats due to new methods of bats deterrence	The sound system was successful in application and after additional test will be placed on market which will help the farmers to change the attitude towards the bats
6. Cohabitation of both humans and bats on the island with no more threats of national culls	with sound system in place and development of soundless system for backyards the threat to bats should significantly decrease
7. Improved conservation status of Mauritian fruit bat	with less threat of the cull and more forest resources the status of the bats will improve
8. Longue Mountain act as tourism site and bring more income to the local people	longue Mountain has not been establish as conservation area but we will try to list Baie du Cap as a privet reserve
9. Bats become tourism attraction (such approached worked in southeast Asia and should be applied in Mauritius).	With Baie du Cap as a private reserve the bats there may still become a tourist attraction

Planned Short-Term Impacts: 1 to 3 years (as stated in the approved proposal)

Impact Description	Impact Summary
1. Inventory and improved knowledge of at least 60 ha of remnant forest area	Full forest survey of both Les Mariannes and Long Mountain and now Baie du Cap has been conducted
10. Longue Mountain listed as 'Managed Conservation Area'	That has not been achieved but we will try to list Baie du Cap as a private reserve
2. Updated status of distribution of some of the rarest plant species over 200ha of forest	The distribution of the rare species in the forests has been collected
3. Enhanced forest quality on the 60 ha of managed forest	So far only 5ha of forest has been improved
4. 2500 of fruit growers participate in 'attitude survey' and are educated about bats and forest ecosystem	in total 2398 people participated in attitude survey. The COVID-19 restrictions prevented us to reach higher number of participants

Impact Description	Impact Summary
5. 30 bats GPS tagged and their navigation methods assessed	Study was conducted but unfortunately was unsuccessful
6. Nonlethal bat control identified and applied in at least 7 major orchards in Mauritius	The sound system was applied in 2 orchards with more application in the near future
7. Governmental encouragement towards use of nonlethal bat repellent methods	the report about the sound system deterrence results has been submitted to the Government
8. Decreased risk of bat cull in Mauritius	commercialization of the sound system should reduce the risk of cull
9. Raised awareness about Mauritian fruit bat through media	We continue to rise awareness about bats and Mauritian ecosystem through social media

Unexpected impacts (positive or negative)?
N/A

PROJECT RESULTS/DELIVERABLES

Overall results of the project:
The project managed to deliver on most of its objectives. Orchard assessment of the bat damage has been conducted and new technology to deter bats (sound system) tested. The sound system was successful in its application and further tests will be conducted. The GPS tracking of mother bats and their pups was also conducted however it was unsuccessful.
The major delay was faced with the reforestation project of Les Mariannes. After years of struggle to secure the permit, we have decided to move the site to Baie du Cap Estate, a private land for which we secured 10 years collaboration of forest restoration. With over 200ha of forest, we have managed to have 5ha free of invasive species and planted with over 5,000 native and endemic plants. A new nursery has been constructed at Baie du Cap to accommodate up to 20,000 plants a year. The reforestation project although significantly delayed it is now on track.
Our educational program was a success with all the social and welfare centers visited along with public and private schools. In total 2398 participants attended the talks and workshop- 866 for the social and welfare centers and 1532 for the schools. The data collected during the talks through pre and post talk questionaries is being analyzed. Posters on Mauritian frit bat as well as the insectivorous bats have been distributed in both centers and schools. Both educational project and reforestation project are continued.

Results for each deliverable:

Component		Deliverable		
#	**Description**	**#**	**Description**	**Results for Deliverable**
6.0	Fundraising and meeting attending	6.2	At least one grant a year from other sources is secured to contribute to the project	ERA managed to secure at least one grant a year from a different source to contribute to the study or to conduct additional studies.
6.0	Fundraising and meeting attending	6.3	Increased institutional development and fundraising of ERA	ERA is now involved in supervising 3 PhD students from the University of Mauritius. ERA has also a long term collaboration with Tel Aviv University and its PhD students working on fruit bats in Mauritius.
6.0	Fundraising and meeting attending	6.4	Strengthened institutional capacity of ERA, as evidenced by comparison of Civil Society Tracking Tool scores at project start and end.	The CSTT has been conducted at the start and the end of the project.
6.0	Fundraising and meeting attending	6.1	Attendance at two annual workshops held by CEPF in Madagascar and built up network with other regional NGOs and conservation organisations	ERA has attended the workshop in Madagascar organized by CEPF and met all the other grantees.
3.0	Managed forested area in Yemen-Takamaka (30ha) and Longue-Mountain (30ha) corridor	3.2	60 ha of forest with removed invasive species by the end of the project (20ha/year) mapped in ArcGIS.	ERA did not manage to secure the long term reforestation permit for its initial site at Les Mariannes (governmental land) and had to find alternative site to conduct reforestation. The new privately hold site at Baie du Cap was established by the end of the project and only 5ha of forest has been freed of invasive species with over 5000 trees planted in the

Component		Deliverable		
#	Description	#	Description	Results for Deliverable
				cleared area. The new site has been secured for the next 10 years and the reforestation activities (weeding and planting of endemic species) will continue.
4.0	Navigation of Mauritian fruit bats	4.3	Forest enriched in planted fast growing Ficus and other tree species	5ha of forest has been enriched in native and endemic plants (ca.5000 trees planted).
4.0	Navigation of Mauritian fruit bats	4.1	Map of movements and feeding of 10 adult bats and 15 mothers and their pups presented on google earth and analysed in the report at the end of the study.	Although the study was conducted we did not manage to get the movement map. Most of the bats were beyond the RF range or changed the roost completely. We were thus unsuccessful in locating the bats and retrieving the tags.
4.0	Navigation of Mauritian fruit bats	4.2	Majority of nvasive species removed	5ha of forest free of invasive species
5.0	Monitoring of safeguard policies	5.2	Indicated orchards which bats avoided during the fruiting season	Since the movement study was unsuccessful we were not able to locate orchards which could have been avoided by bats.
5.0	Monitoring of safeguard policies	5.1	Six-monthly report on implementation of safeguard policies produced and approved by CEPF	The six month reports were always submitted to CEPF and approved as required by the grant conditions.
2.0	Alternative non-lethal methods to deter bats from orchards (other than netting)	2.2	Four different organic deer repellents tried between October and December in Medine, Calebassess, Savannah and Constance litchi orchards and Medine and Labourdonais mango	The four organic deer repellents have been tested along with a home made organic repellent. The results were rather inconclusive, the repellent helped on certain trees but had no effect on others. Further studies would be necessary to have more conclusive results on the effect of deer repellent on bats.

Component		Deliverable		
#	Description	#	Description	Results for Deliverable
			orchard (October-February). Report synthetizing results.	
2.0	Alternative non-lethal methods to deter bats from orchards (other than netting)	2.1	Audio-visual system applied in Callebasses and Medine litchi orchards between October and December as described in the report on the percentage of damaged fruits on 20 trees tested with the system and 20 left as a control.	The system has been applied in litchi and mango orchard and was very successful. The sound system reduced the fruit damage by 80%. Further study would be needed to collect more data on the system and to commercialize it in Mauritius.
2.0	Alternative non-lethal methods to deter bats from orchards (other than netting)	2.3	Most efficient method described in the report presented to Government and applied nation-wide as an alternative to netting. Promotion of the method through meetings and workshops with farmers.	Full report about both deer repellent and sound system have been submitted to the Government. The sound system method was also incorporated in talks and workshops. To commercialize the sound system at least one more fruiting season of testing would be required.
3.0	Managed forested area in Yemen-Takamaka (30ha) and Longue-Mountain (30ha) corridor	3.4	Longue Mountain gains status of 'Managed Conservation Area' by the end of the project, improved protection status	not achieved. The site has changed to Baie du Cap which we will try to turn into a private reserve
3.0	Managed forested area in Yemen-Takamaka (30ha) and Longue-Mountain (30ha) corridor	3.1	Assessed forest composition of 30 ha of the Longue Mountain and 30 ha of Yemen-Takamaka corridors represented by the report produced after the survey	The survey of Long Mountain, Les Mariannes and Baie du Cap was conducted and plants present in the forest recorded.

Component		Deliverable		
#	Description	#	Description	Results for Deliverable
			during the first 3 months of the project.	
3.0	Managed forested area in Yemen-Takamaka (30ha) and Longue-Mountain (30ha) corridor	3.3	The management of Yemen-Takamaka corridor is improved, as indicated by comparison of the METT scores at the beginning and end of the project.	that deliverable was cancelled
1.0	Raised awareness among local communities (farmers and backyard growers)	1.1	Weekly workshops (min 20 local growers) in major community centres about bats, forest ecosystem and mitigation of bat damage, represented by minutes, participant list and attitude survey. 144 local community centres covered - at least 2500 participants.	Weekly workshop have been conducted in all community centers and welfare centers in Mauritius. Additionally, workshops took place in local primary and secondary schools. Attitude survey have been conducted.
1.0	Raised awareness among local communities (farmers and backyard growers)	1.2	150 Posters and 150 brochures explaining the role of bats, their status and need for protection as well as methods to protect crop from bat damage distributed in major community centres and 6 major tourist attractions.	The posters have been distributed in all community and welfare centers along with schools. Posters were also placed in major attractions in Mauritius. leaflets and brochures were distributed to the participants of the talks and workshops.

Tools, products or methodologies that resulted from the project or contributed to the results:
The project allowed us to test for the first-time automated sound deterrence system for bats. The system was successful in its application and currently awaits further improvements and re-application to test it again before it can be placed on market.

The questionaries for educational talks will continue to be used to assess the impact of the talks and in the near future to revisit the schools and centers and see if the talks had long lasting impact.

PORTFOLIO INDICATORS

Portfolio Indicator Number	Portfolio Indicator Description	Expected Numerical Contribution	Expected Contribution Description	Actual Numerical Contribution	Actual Contribution Description

GLOBAL INDICATORS

Protected Areas

Protected areas that have been created and/or expanded as a result of the project. Protected areas may include private or community reserves, municipal or provincial parks, or other designations where biodiversity conservation is an official management goal.

Name of Protected Area	WDPA ID*	Latitude	Longitude	Country	Original Total Size (Hectares) **	New Protected Hectares ***	Year of Legal Declaration or Expansion

*World Database of Protected Areas

**If this is a new protected area, 0 should appear in this column

*** This column excludes the original total size of the protected area.

Key Biodiversity Area Management

Key Biodiversity Areas (KBAs) under improved management—where tangible results have been achieved to support conservation—as a result of the project.

KBA Name	KBA Code	Size of KBA	Number of Hectares with Improved Management

Production Landscapes

Production landscapes with strengthened management of biodiversity as a result of the project.

A production landscape is defined as a site outside a protected area where commercial agriculture, forestry or natural product exploitation occurs.

Name of Production Landscape	Latitude	Longitude	Hectares Strengthened	Intervention

Benefits to Individuals

- **Structured Training:**

Number of Men Trained	Number of Women Trained	Topics of Training

- **Cash Benefits:**

Number of Men – Cash Benefits	Number of Women – Cash Benefits	Description of Benefits

Benefits to Communities

View the **characteristics** column below with the following corresponding codes:	View the **benefits** column below with the following corresponding codes:
1- Small Landowners	a. Increased Access to Clean Water
2- Subsistence Economy	b. Increased Food Security
3- Indigenous/ Ethnic Peoples	c. Increased Access to Energy
4- Pastoralists / Nomadic Peoples	d. Increased Access to Public Services
5- Recent Migrants	e. Increased Resilience to Climate Change
6- Urban Communities	f. Improved Land Tenure
7- Other	g. Improved Use of Traditional Knowledge
	h. Improved Decision-Making
	i. Improved Access to Ecosystem Services

Community Name	**Community Characteristics**							**Type of Benefit**								**Country**	**Number of Males Benefitting**	**Number of Females Benefitting**
	1	**2**	**3**	**4**	**5**	**6**	**7**	**a**	**b**	**c**	**d**	**e**	**f**	**g**	**h**	**i**			

Characteristics of "Other" Communities:

Policies, Laws and Regulations

View the **topics** column below with the following corresponding codes:			
A- Agriculture	E- Energy	I- Planning/Zoning	M- Tourism
B- Climate	F- Fisheries	J- Pollution	N- Transportation
C- Ecosystem Management	G- Forestry	K- Protected Areas	O- Wildlife Trade
D- Education	H- Mining and Quarrying	L- Species Protection	P- Other

No.	**Name of Law**	**Scope**	**Topics**														
			A	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**L**	**M**	**N**	**O**	**P**

"Other" Topics Addressed by the Policy, Law or Regulation:

No.	Country/ Countries	Date Enacted/ Amended	Expected impact	Action Performed to Achieve the Enactment/ Amendment

Companies Adopting Biodiversity-friendly Practices

A company is defined as a for-profit business entity. A biodiversity-friendly practice is one that conserves or uses natural resources in a sustainable manner.

Name of Company	Description of Biodiversity-Friendly Practice	Country/Countries where Practice was Adopted

Networks and Partnerships

Networks/partnerships should have some lasting benefit beyond immediate project implementation. Informal networks/partnerships are acceptable.

Name of Network/Partnership	Year Established	Country/ Countries	Established by Project?	Purpose
Baie du Cap Estate	2021	Mauritius	Yes	Restoration of over 200ha of forest
Attitude hotel group	2021	Mauritius	Yes	Environmental education of local community as well as hotel tourists

Sustainable Financing

Sustainable financing mechanisms generate funding for the long-term (generally five or more years). These include, but are not limited to, conservation trust funds, debt-for-nature swaps, payment for ecosystem services (PES) schemes, and other revenue, fee or tax schemes that generate long-term funding for conservation.

Name of Mechanism	Purpose	Date Established	Description	Country/ Countries	Project Intervention	Delivery of Funds?

Globally Threatened Species

Globally threatened species (CR, EN, VU) on the IUCN Red List of Threatened Species, benefitting from the project.

Genus	Species	Common Name (English)	Status	Intervention	Population Trend at Site

LESSONS LEARNED

Our major challenge was to secure permission to conduct reforestation of the Governmental land. It turned to be unsuccessful with no apparent reason. If we approached a private sector much earlier we would have met more of our reforestation target by the end of the grant. It seems important to keep the options open and seek alternatives in advance.

SUSTAINABILITY/REPLICATION

Our educational program was a success and will continue once the COVID-19 restrictions are down. We will continue our forest restoration efforts at the new site at Baie du Cap Estate and try to list the land as a private reserve. Our sound deterrence system was a success and now we are seeking funds to improve it and re-test it so it can be placed on the market and also develop a soundless system suitable for the backyards.
We will continue our project about GPS tracking of bats with collaboration of Tel Aviv University.

ENVIRONMENTAL AND SOCIAL SAFEGUARDS/STANDARDS

N/A

ADDITIONAL COMMENTS/RECOMMENDATIONS

ADDITIONAL FUNDING

Total Amount of Additional Funding Actually Secured (USD)	$19,900.00
Breakdown of Additional Funding	1500 Tel Aviv University start fund to try the devices on the bats (tracking and equipment) 1000 Tel Aviv University travel grant to get training in operation of fully developed GPS devices in Israel for Dr Oleksy to be then applied in Mauritius 14,400 Tel Aviv University Equipment donation 40 GPS trackers 500 NPCS plant donation and herbicide 2,500 NPCS donation of deer repellents to be tested

INFORMATION SHARING AND CEPF POLICY

CEPF is committed to transparent operations and to helping civil society groups share experiences, lessons learned and results. For more information about this project, you may contact the organization and/or individual listed below.

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