CEPF Final Project Completion Report

Instructions to grantees: please complete all fields, and respond to all questions listed below.

Organization Legal Name	Central Institute for Natural Resources and Environmental Studies
Project Title	In search of Edwards's Pheasant (*Lophura edwardsi*) in the Annamese lowlands of Vietnam
Grant or GEM Number	CEPF 64630
Date of Report	September 20, 2017

CEPF Hotspot: Indo-Burma

Strategic Direction: Strategic Direction 1. Safeguard priority globally threatened species by mitigating major threats; 1.3. Conduct research on globally threatened species for which there is a need for greatly improved information on status and distribution

Grant Amount: $90,000.00

Project Dates: October 1, 2014 – June 30, 2017

PART I: Overview

1. Implementation Partners for this Project *(list each partner and explain how they were involved in the project)*

Newcastle University's School of Natural and Environmental Sciences conducted previous CEPF funded surveys for Edwards's pheasant in 2011 alongside CECARD (Quang Tri Center of Education and Consultancy on Agriculture and Rural Development). The team coordinated the recent Strategic Planning Workshop in Hanoi, and wrote the Strategic Conservation Plan for the species. The Newcastle Team are also a part of the Galliformes Specialist Group which is committed to the world wide conservation and sustainable management of all native populations of Galliformes species and their habitats.

During the course of the project, the Newcastle Team advised on questionnaire design, survey planning and methods as well as other conservation strategies for the species. In addition, the Team conducted a desk-based strategic conservation assessment of potential opportunities and threats at priority sites for reintroduction as well as future conservation directions for protecting the species.

2. Summarize the overall results/impact of your project

The project has enhanced scientific knowledge of the Edwards's Pheasant through extensive interview surveys throughout its range and field surveys in its priority sites, including Bach Ma National Park and its extension, Hue Saola Nature Reserve, Phong Dien Nature Reserve of Thua Thien Hue Province, and Bac Huong Hoa Nature Reserve of Quang Tri Province. In-depth camera trap surveys were also conducted in Hue Saola Nature Reserve, between November 2015 and January 2017, and Bac Huong Hoa Nature Reserve, between April 2016 and March 2017. Furthermore, the project develops a strategic conservation assessment for the Edwards's Pheasant, which identifies gaps and opportunities, including prioritized next steps in conserving the critically endangered species. The conservation assessment will serve as guidelines for future conservation actions to secure wild populations of the pheasant.

During camera trap surveys, the project team identified a number of nationally and/or globally threatened species, including the Annamite-stripped Rabbit (*Nesolagus timminsi*), the Owston's Civet (*Chrotogale owstoni*), the Red-shanked Douc (*Pygathrix nemaeus*), the Sunda Pangolin (*Manis javanica*), the Bourret's Box Turtle (*Cuora bourreti*), the Crested Argus (*Rheinardia ocellata*), and the Silver Pheasant (*Lophura nycthemera*) in Hue Saola Nature Reserve and the Pig-tailed Macaque (*Macaca leonina*), the Stump-tailed Macaque (*Macaca arctoides*), and the Silver Pheasant (*Lophura nycthemera*) in Bac Huong Hoa Nature Reserve. The results have a strong implication for future conservation of the two protected areas in central Vietnam.

Collaboration between related stakeholders working on conservation of the Edwards's Pheasant has been strengthened during the process of the project implementation. The research team has gained valuable experience in surveying the critically endangered species, especially applying camera-trap techniques to studying elusive species in remote areas in Vietnam. Specifically, we successfully used this technique to record some of most endangered species, such as the Owston's Civet, the Sunda Pangolin, the Bourret's Box Turtle, and the Red-shanked Douc. These skills are essential in developing conservation actions for critically endangered species in Vietnam. Moreover, the project trained a number of conservation practitioners in both Thua Thien Hue and Quang Tri Provinces and two graduate students at Vietnam National University. The capacity built by the project will have significant and lasting impacts on conservation efforts in Vietnam.

3. Briefly describe actual progress towards each planned long-term and short-term impact (as stated in the approved proposal)
List each long-term impact from Grant Writer proposal

a. Planned Long-term Impacts - 3+ years (as stated in the approved proposal)

Impact Description	Impact Summary
A viable population of the Edwards's Pheasant will exist in the wild within its native range of central Vietnam.	We have increased scientific knowledge of the species through the project by confirming that the species might not have any viable population in the priority sites. The next steps should focus on reintroduction efforts by selecting suitable protected areas and pure-bred individuals from captive populations.

b. Planned Short-term Impacts - 1 to 3 years (as stated in the approved proposal)

Impact Description	Impact Summary
After 2 years we will be in a position to determine the future direction of Edwards's pheasant conservation.	We are now in a better position to determine the future direction of the species conservation. We recommend that future conservation measures should focus on reintroduction of captive individuals to suitable sites in the species range.
We will have identified at least two sites that have potential habitat conditions to act as focal Edwards's pheasant conservation sites. These sites will either contain viable populations of Edwards's pheasant or will be suitable sites for (re)introduction.	Based on our interview and field surveys in combination with other studies, we recommend Bach Ma National Park and its extension and Hue Saola Nature Reserve as priority sites for reintroduction of the species, although protection levels of the two protected areas must be improved before reintroduction can be started.
Our project will also add to the knowledge based on Galliformes and large mammals in the region as camera traps set for Edwards's pheasant will detect other species of conservation interest.	Our project greatly enhance knowledge of other globally threatened species including Galliformes, mammals, and reptiles in Hue Saola Nature Reserve, Thua Thien Hue Province, and Bac Huong Hoa Nature Reserve, Quang Tri Province.

4. Describe the success or challenges of the project toward achieving its short-term and long-term impacts

The project has succeeded in providing additional data on the status of the species in priority sites through interview and field surveys, including long-term camera trap monitoring. The project has also been able to identify future direction for the species, i.e., reintroduction of captive individuals to suitable sites, and determine priority protected areas in the region for conservation actions. Knowledge of other globally threatened Galliformes, mammals, and reptiles in the studied areas has been significantly improved through camera-trap surveys.

Nonetheless, challenges remain. These include improving current conditions of priority protected areas, especially reducing pressures from hunting, snaring, and illegal logging, genetic screening to identify pure-bred individuals for reintroduction efforts, building capacity in species recovery and captive management programs for relevant stakeholders, developing a cohesive working group to efficiently coordinate conservation actions, and identify donors with interest to support conservation efforts of the species.

5. Were there any unexpected impacts (positive or negative)?

No

PART II: Project Components and Products/Deliverables

6. Components (as stated in the approved proposal)

List each component and product/deliverable from Grant Writer

6. Describe the results for each deliverable:

Component		Deliverable		
1	**Description**	**Sub-**	**Description**	**Results for Deliverable**
	Suitable sites for conservation action identified (these will be sites where the species is found during surveys or sites where reintroduction could take place).	1.1	Camera trap surveys and intensive field surveys carried out at priority sites	Camera trap surveys were successfully conducted in two priority sites, Saola Nature Reserve in Thua Thien Hue Province, and Bac Huong Hoa Nature Reserve in Quang Tri Province
		1.2	Technical reports produced for each Provincial Forest Protection Department outlining the results of the surveys (inclusive of all sightings and assessment of threats for each protected area visited).	All technical reports of field surveys have been submitted to protected areas and provincial forest protection departments.
		1.3	Survey results disseminated via popular and peer-reviewed articles where appropriate	One manuscript has been drafted for publication.
		1.4	DNA assessment of leech gut contents from key priority sites	DNA screening of leech gut contents is currently under way. The work expected to complete by October or November.
		1.5	Desk-based assessment of potential opportunities and threats at survey sites for future reintroduction (if necessary)	A draft of desk-based strategic conservation assessment for the Edwards's Pheasant has been completed.

7. Please describe and submit any tools, products, or methodologies that resulted from this project or contributed to the results.

We setup one camera trap per site using Bushnell Trophy Cam. The microsite was chosen base on the natural habitat that might attract the pheasant, where the ground vegetation is more open, fruiting trees are present, or water source is close by, and the slope is less than 45°. CTs were attached to the suitable tree above 20 – 30 cm from the ground surface, and setup to optimally cover the detection area. CTs were set to face north or south to avoid overexposure to sunlight. The location of the CT was taken before clear the vegetation. The location photos were taken on the same film card that would be used in the CT, using a handheld camera (a photo at eye level looking in the same direction as camera, a photo from the end of site look back to the front CT, and some photos of each site of camera location that look back to the front of the CT from the end of site).

Next step, we cleared vegetation that would obstruct detection of small animals (the vegetation have a height of about 1.5m that might easily move in a breeze and could thus trigger the camera). We also minimized clearance of vegetation structure (whose loss might cause animals to avoid the detection area), especially thicker sturdy stems and low sub-canopy vegetation lower than 1.5 m above ground, and removed fallen leaves and branches closely the ground). After setup and clear the detection site, all CTs were tested the sensor by a test set of photos. This step ensured the sensor was able to detect the small animals that are lower than 20cm. Before left the station, metadata about the site and camera setup was recorded on a data sheet. Then we took a photo of the data sheet using the same film card that used in the CT. A photo was taken by triggering the CT of a GPS screen showing the time about 40-50cm in front of the CT. Finally, another photo was taken by triggering the CT of a sheet paper with the information included the time, date, location code, name of CT and film card.

Camera traps were checked once per two or three months, contingent on weather conditions, to replace their memory cards and batteries. The cameras were triggered by motion sensor, active 24h a day, with an interval of 10s between exposures and were set up to take one photos per second. Cameras were set to record time and date of every photo taken. We removed grass, branches and scrubs right in front of the cameras to increase the depth of view and to keep vegetation from triggering cameras.

In total, 197 gigabytes (about 221,800 photos) of raw photos were obtained. We discarded photos that were unidentifiable, over-exposed, blank, ghost-triggered, or contained unwanted features, e.g., local people and rangers and so on. After the identification process, around 60 gigabytes (about 66,500 files) of fauna photos were resorted into respected folders. Our analyses focus on 46 camera sites with about over one year of continuous data (approximately 427 total days). We conducted most analyses in R (R Development Core Team) using camtrapR package. It was used to create a general report on camera trapping surveys and species detections, a species record table from camera trap images, species detection histories for occupancy analyses, maps of observed species richness and species presences by station, histogram of single-species activity, and kernel density estimation of single-species activity.

To exclude the effect of multiple photos triggered by one individual/group of individuals that foraged/moved slowly at sampling points, we set the interval time of 30 minutes to segregate independent detections of the same individual. We use GMT +07 time zone for time chain analysis, and WGS-84 coordinate for mapping. Recommended occasion length for rainforest

mammals is from 5 to 10 days, so we selected five-day length for our calculation. After all analyses, we use EstimateS to calculate species accumulation curve.

About 42 vertebrate species has been identified, and a number of others that could not be correctly identified which were mostly caused by poor lighting conditions and camera shortcomings. Of those 42 species, 26 are mammals, 15 are birds, and 01 is reptile. Using Coleman rarefaction to calculate species accumulation curve, we calculated that theoretically speaking, there are about 51 species in study area, so we have already observed 90% of its species (Fig. 3). To achieve maximum species observation, namely, the last 10% of species, we would need to spend around 850 days, which is about double of our actual spent time (427 days). We checked their characteristics using The IUCN Red List of Threatened Species (http://www.iucnredlist.org/). Nine of them (7 mammals, 1 reptile, 1 bird) are CR, EN, VU, or NT as categorized by the IUCN Redlist. One of them, the Annamite Striped Rabbit is Data Deficient, and the remaining are Least Concern.

PART III: Lessons, Sustainability, Safeguards and Financing

Lessons Learned

8. Describe any lessons learned during the design and implementation of the project, as well as any related to organizational development and capacity building.

Consider lessons that would inform:

- Project Design Process *(aspects of the project design that contributed to its success/shortcomings)*
  No
- Project Implementation *(aspects of the project execution that contributed to its success/shortcomings)*
  The project was delayed for several reasons. In 2016, several big floods hit the surveyed area in Hue Saola Nature Reserve. As a result, a number of planned trips to check camera traps was postponed. In addition, the volume of photos needed to identify was so substantial that it took several months for team members to sort them out. Finally, going through a high quantity of low-quality photos took much longer than expected.
- Describe any other lessons learned relevant to the conservation community
  Field surveys often take longer than originally planned due to unexpected weather or other natural conditions and additional human factors, including coordination between team members and between different stakeholders. Processing of survey data is also time consuming because of inconsistency or low quality. As a result, future projects should take these issues into account when plan field activities.

Sustainability / Replication

9. Summarize the success or challenges in ensuring the project will be sustained or replicated, including any unplanned activities that are likely to result in increased sustainability or replicability.

Methods for camera trap development and photo analyses developed through this project can be used in future survey efforts to survey wild populations of elusive and endangered species in

remote areas in Vietnam. In addition, the project helped to train 16 conservation practitioners in Quang Nam, Thua Thien Hue, and Quang Tri Provinces and two young graduate students at Vietnam National University, Hanoi, in application of the techniques. The training activities are unplanned originally, but will certainly result in increased sustainability and replicability of the project in the future.

Safeguards

10. If not listed as a separate Project Component and described above, summarize the implementation of any required action related to social or environmental safeguards that your project may have triggered.

Additional Funding

11. Provide details of any additional funding that supported this project and any funding secured for the project, organization, or the region, as a result of CEPF investment

a. Total additional funding (US$)

b. Type of funding

Please provide a breakdown of additional funding (counterpart funding and in-kind) by source, categorizing each contribution into one of the following categories:

Donor	Type of Funding*	Amount	Notes
Central Institute for Natural Resources and Environmental Studies (CRES)	A	$3,500	Screening of leech gut contents

** Categorize the type of funding as:*

A Project Co-Financing (other donors or your organization contribute to the direct costs of this project)

B Grantee and Partner Leveraging (other donors contribute to your organization or a partner organization as a direct result of successes with this CEPF funded project)

*C Regional/Portfolio Leveraging (other donors make large investments in a region because of CEPF investm*ent or successes related to this project)

Additional Comments/Recommendations

12. Use this space to provide any further comments or recommendations in relation to your project or CEPF.

PART IV: Impact at Portfolio and Global Level

CEPF requires that each grantee report on impact at the end of the project. The purpose of this report is to collect data that will contribute to CEPF's portfolio and global indicators. CEPF will aggregate the data that you submit with data from other grantees, to determine the overall impact of CEPF investment. CEPF's aggregated results will be reported on in our annual report and other communications materials.

Ensure that the information provided pertains to the entire project, from start date to project end date.

Contribution to Portfolio Indicators

13. If CEPF assigned one or more Portfolio Indicators to your project during the full proposal preparation phase, please list these below and report on the project's contribution(s) to them.

Indicator	Narrative

Contribution to Global Indicators

Please report on all Global Indicators (sections 16 to 23 below) that pertain to your project.

14. Key Biodiversity Area Management
Number of hectares of Key Biodiversity Areas (KBA) with improved management
Please report on the number of hectares in KBAs with improved management, as a result of CEPF investment. Examples of improved management include, but are not restricted to: increased patrolling, reduced intensity of snaring, invasive species eradication, reduced incidence of fire, and introduction of sustainable agricultural/fisheries practices. Do not record the entire area covered by the project - only record the number of hectares that have improved management.

If you have recorded part or all of a KBA as newly protected for the indicator entitled "protected areas" (section 17 below), and you have also improved its management, you should record the relevant number of hectares for both this indicator and the "protected areas" indicator.

Name of KBA	# of Hectares with strengthened management *	Is the KBA Not protected, Partially protected or Fully protected? Please select

		one: NP/PP/FP

** Do not count the same hectares more than once. For example, if 500 hectares were improved due to implementation of a fire management regime in the first year, and 200 of these same 500 hectares were improved due to invasive species removal in the second year, the total number of hectares with improved management would be 500.*

15. Protected Areas

Number of hectares of protected areas created and/or expanded

Report on the number of hectares of protected areas that have been created or expanded as a result of CEPF investment.

Name of PA*	Country(s)	# of Hectares	Year of legal declaration or expansion	Longitude**	Latitude**

* *If possible please provide a shape file of the protected area to CEPF.*

** Indicate the latitude and longitude of the center of the site, to the extent possible, or send a map or shapefile to CEPF. Give geographic coordinates in decimal degrees; latitudes in the Southern Hemisphere and longitudes in the Western Hemisphere should be denoted with a minus sign (example: Latitude 38.123456 Longitude: -77.123456).

16. Production landscape

Please report on the number of hectares of production landscapes with strengthened biodiversity management, as a result of CEPF investment. A production landscape is defined as a landscape where agriculture, forestry or natural product exploitation occurs. Production landscapes may include KBAs, and therefore hectares counted under the indicator entitled "KBA Management" may also be counted here. Examples of interventions include: best practices and guidelines implemented, incentive schemes introduced, sites/products certified and sustainable harvesting regulations introduced.

Number of hectares of production landscapes with strengthened biodiversity management.

Name of Production Landscape*	# of Hectares**	Latitude***	Longitude***	Description of Intervention

* *If the production landscape does not have a name, provide a brief descriptive name for the landscape.*

***Do not count the same hectares more than once. For example, if 500 hectares were strengthened due to certification in the first year, and 200 of these same 500 hectares were strengthened due to new harvesting regulations in the second year, the total number of hectares strengthened to date would be 500.*

*** Indicate the latitude and longitude of the center of the site, to the extent possible, or send a map or shapefile to CEPF. Give geographic coordinates in decimal degrees; latitudes in the Southern Hemisphere and longitudes in the Western Hemisphere should be denoted with a minus sign (example: Latitude 38.123456 Longitude: -77.123456).

17. Beneficiaries

CEPF wants to record two types of benefits that are likely to be received by individuals: formal training and increased income. Please report on the number of men and women that have benefited from formal training (such as financial management, beekeeping, horticulture) and/or increased income (such as tourism, agriculture, medicinal plant harvest/production, fisheries, handicraft production) as a result of CEPF investment. Please provide results since the start of your project to project completion.

17a. Number of men and women benefitting from formal training.

# of men benefiting from formal training*	# of women benefiting from formal training*
18	1

**Please do not count the same person more than once. For example, if 5 men benefited from training in beekeeping, and 3 of these also benefited from training in project management, the total number of men who benefited should be 5.*

17b. Number of men and women benefitting from increased income.

# of men benefiting from increased income*	# of women benefiting from increased income*

**Please do not count the same person more than once. For example, if 5 men benefited from increased income due to tourism, and 3 of these also benefited from increased income due to handicrafts, the total number of men who benefited should be 5.*

17c. Total number of beneficiaries - Combined

Report on the total number of women and the number of men that have benefited from formal training and increased income since the start of your project to project completion.

Total # of men benefiting*	Total # of women benefiting*

**Do not count the same person more than once. For example, if Paul was trained in financial management and he also benefited from tourism income, the total number of people benefiting from the project should be 1 = Paul.*

18. Benefits to Communities

CEPF wants to record the benefits received by communities, which can differ to those received by individuals because the benefits are available to a group. CEPF also wants to record, to the extent possible, the number of people within each community who are benefiting. Please report on the characteristics of the communities, the type of benefits that have been received during the project, and the number of men/boys and women/girls from these communities that have benefited, as a result of CEPF investment. If exact numbers are not known, please provide an estimate.

18a. Please provide information for all communities that have benefited from project start to project completion.

Name of Community	Community Characteristics (mark with x)							Type of Benefit (mark with x)									# of Beneficiaries	
	Subsistence economy	Small landowners	Indigenous/ ethnic peoples	Pastoralists / nomadic peoples	Recent migrants	Urban communities	Other*	Increased access to clean water	Increased food security	Increased access to energy	Increased access to public services (e.g. health care,	Increased resilience to climate change	Improved land tenure	Improved recognition of traditional knowledge	Improved representation and decision-making in	Improved access to ecosystem services	# of men and boys benefitting	# of women and girls benefitting
	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No

*If you marked "Other" to describe the community characteristic, please explain:

18b. Geolocation of each community

Indicate the latitude and longitude of the center of the community, to the extent possible, or upload a map or shapefile. Give geographic coordinates in decimal degrees; latitudes in the

Southern Hemisphere and longitudes in the Western Hemisphere should be denoted with a minus sign (example: Latitude 38.123456 Longitude: -77.123456).

Name of Community	Latitude	Longitude

19. Policies, Laws and Regulations

Please report on change in the number of legally binding laws, regulations, and policies with conservation provisions that have been enacted or amended, as a result of CEPF investment. "Laws and regulations" pertain to official rules or orders, prescribed by authority. Any law, regulation, decree or order is eligible to be included. "Policies" that are adopted or pursued by a government, including a sector or faction of government, are eligible.

19a. Name, scope and topic of the policy, law or regulation

No.		Scope (mark with x)	Topic(s) addressed (mark with x)

	Name of Law, Policy or Regulation	Local	National	Regional/International	Agriculture	Climate	Ecosystem Management	Education	Energy	Fisheries	Forestry	Mining and Quarrying	Planning/Zoning	Pollution	Protected Areas	Species Protection	Tourism	Transportation	Wildlife Trade
1																			
2																			
3																			

19b. For each law, policy or regulation listed above, please provide the requested information in accordance with its assigned number.

No.	Country(s)	Date enacted/ amended MM/DD/YYYY	Expected impact	Action that you performed to achieve this change
1				
2				
3				

20. Best Management Practices

Please describe any new management practices that your project has developed and tested as a result of CEPF investment, that have been proven to be successful. A best practice is a method or technique that has consistently shown results superior to those achieved with other means.

No.	Short title/ topic of the best management practice	Description of best management practice and its use during the project
1		
2		

21. Networks & Partnerships

Please report on any new networks or partnerships between civil society groups and across to other sectors that you have established as a result of CEPF investment. Networks/partnerships should have some lasting benefit beyond immediate project implementation. Informal networks/partnerships are acceptable even if they do not have a Memorandum of Understanding or other type of validation. Examples of networks/partnerships include: an alliance of fisherfolk to promote sustainable fisheries practices, a network of environmental journalists, a partnership between one or more NGOs with one or more private sector partners to improve biodiversity management on private lands, a working group focusing on reptile conservation. Please do not use this tab to list the partners in your project, unless some or all of them are part of such a network / partnership described above.

No.	Name of Network/ Partnership	Year established	Country(s) covered	Purpose

<u>Part V. Information Sharing and CEPF Policy</u>

CEPF is committed to transparent operations and to helping civil society groups share experiences, lessons learned, and results. Final project completion reports are made available on our Web site, www.cepf.net, and publicized in our newsletter and other communications.

Please include your full contact details below:

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