CEPF SMALL GRANT FINAL PROJECT COMPLETION REPORT

Organization Legal Name:	-
Project Title:	Identifying historic and present connectedness in the unique montane "sky-island" ecosystem in the Western Ghats.
Date of Report:	-
Report Author and Contact Information	*Robin Vijayan*

CEPF Region: Western Ghats

Strategic Direction: Strategic Direction 2: Improving the Conservation of Globally Threatened Species through Systematic Conservation Planning and Action

Grant Amount: $ 17,820

Project Dates: August 2009 to August 2012

Implementation Partners for this Project (please explain the level of involvement for each partner):

Dr. Uma Ramakrishnan, National Centre for Biological Science
Co-investigator in whose lab the analysis was conducted and from where the project was executed.

Conservation Impacts

Please explain/describe how your project has contributed to the implementation of the CEPF ecosystem profile.

This study has collected data from five of the nine 'Wholly Irreplaceable Sites' in Western Ghats. The study locations include 18 site outcome locations and all three critical link corridor outcomes in southern Western Ghats. With data from these sites for two globally endangered bird species the study was able to examine the genetic connectivity between different locations – protected and unprotected areas in India, most of them in the CEPF priority outcome areas. The study, thus provides crucial information to the implementation of the CEPF ecosystem profile by providing important data on the CEPF investment priority of evaluating the existing protected area network for globally threatened species while also providing information to monitor and assess the conservation status of such species.

Please summarize the overall results/impact of your project against the expected results detailed in the approved proposal.

Our study proposed to examine the genetic connectivity between different protected areas and CEPF priority outcome locations using two species of understory birds as models. We were able to use genetic data from almost all proposed sites to examine population structure and connectivity. We used standardized microsatellite data to reveal that populations of birds in certain protected areas are presently isolated from each other though there were previously contiguous. We infer that this loss of connectivity may be directly due to anthropogenic deforestation and fragmentation of habitat that lies between these priority areas. Using the baseline data generated from this study, we can focus conservation efforts in areas that are directly between areas that have lost contiguity as probably corridors of connectivity. On the other hand, we also discovered gene flow between protected areas separated by extensive production landscapes. We infer that this connectivity was perhaps supported by the presence of native forest fragments as windbreaks or woodlots within the production landscape. We also discovered

populations that naturally had extremely low population density and hence could not be sampled. Such populations may face probable extinction in future climate change circumstances.

Please provide the following information where relevant:

Hectares Protected: Nil
Species Conserved: Two
Corridors Created: Nil

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

Short-term:

This study was, for the first time in India, able to generate genetic data from all populations of a bird species to examine connectivity. This involved working with several state forest departments in south India. As a study involving capture and blood sample collection, there were several challenges faced (some listed in section below).
Capacity building: The project was able to train a number of students in various field and lab techniques. We trained seven such students and three of them have moved into their own PhD programmes, while two are in Masters programmes.
Making field protocols: We were also able to collate information on international standards followed in field techniques that we collated along with our own knowledge to make a protocol that could be widely followed by other researchers.
Publications: The project resulted in one publication (accepted), though not directly connected to the project, it reviews research and conservation in this habitat. At least two other manuscripts are in different stages of completion.

Long term:
Connectivity/ corridors in production landscape: The study clearly shows that the landscape (often production landscape) between protected areas have a critical role in maintaining connectivity. The landscape can act as corridors or barriers depending on the land use patterns. Often this production landscape is owned by private companies and the ability to involve such groups in conservation plans will directly impact species population trajectories.

Collaborations: IISER-Pune: We were able to pass on the expertise developed, partly through this project, to researchers working at Eagle Nest Sanctuary as part of Indian Institute of Science Education and Research, Pune's bird research programme. We have also shared with these researchers aliquots of microsatellite primers (about 100) tested for this study.
Loyola and FMNH Chicago: Our inability to obtain field samples of Shortwings from some populations pushed us to obtain historical samples from the British Museum of Natural History collected from the same region. These samples, however, could not be imported into India due to ambiguous biological material import laws in India. We thus started a collaboration with colleagues at Field Museum of Natural History and Loyola University to obtain these samples to their lab. Although the results from these samples are not presented here, they are being analyzed and CEPF will be updated on these results eventually.

Were there any unexpected impacts (positive or negative)?

Positive:
Forest department: As stated before, this study involving capture and blood sample collection faced several challenges in dealing with the agency that grants permissions to conduct study in the forests – the state forest departments. Several officers in the state forest departments of Tamil Nadu and Kerala welcomed the project indicating that they could use such information on connectivity to bolster cases to procure land for wildlife corridors. We were also told that the results of the study may even be used as evidence in court proceedings where land acquisition was being considered. In a larger effort to engage with the forest department we participated in meetings and workshops organized by Kerala Forest department's biodiversity wing for both

capacity building and charting future research priorities for the state department. Such exercises were very useful in building bridges with the conservation implication agency in India.

Funding: We were glad to receive financial support for three years from Council for Scientific and Industrial Research (CSIR), Government of India for this project and a matching support from National Centre for Biological Sciences through grants to Dr. Uma Ramakrishnan's programme. This permitted us to increase the scope of the project from one year to three years and to obtain more samples and data. We were able to work on more microsatellites and run several more analysis with this additional time. We were also able to hire an additional person to help us with lab work for this period.

Collaborations: We were glad to be able to collaborate, and in some cases, help other research groups through the duration of this project (indicated in the section above).

Expanding the project: One of the major outcomes of the project was that based on the interesting preliminary results of this study, further investigations with two other major projects have already started. Since there was an early indication in this study that forest patches between protected areas, in the production landscape, may play an important role in the connectivity of species, a project, also a CEPF-ATREE supported project, was started to examine this. This project uses bird song recorded through automated bird song recorders and algorithms developed in collaboration with IIT Chennai. The project has, since then, got other funding and developed into a parallel research programme. The preliminary results of this study also indicated that we may need data from several other species to get a comprehensive idea of connectivity in this landscape. Having already developed methodological protocols through the present project we have since started another project, funded by National Geographic Society and National Centre for Biological Sciences, to examine the genetic connectivity of the entire understory bird community in this habitat. The two parallel, ongoing projects, direct by-products of the current CEPF-ATREE supported project will provide more detailed information on connectivity in this landscape.

Negative:
Despite strong support from many individual forest department officials, such officials are often moved from their positions as part of regular organizational shifts within these agencies. Such transfers often resulted in re-setting the relationship built and in some extraordinary cases when the individual officer was not convinced of the project, it affected our ability to conduct research in some locations.

Lessons Learned

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 projects designed or implemented by your organization or others, as well as lessons that might be considered by the global conservation community.

Project Design Process: (aspects of the project design that contributed to its success/shortcomings)
Study design: We believe we had a good study design to start with. We had extensive species information from different scales and using different techniques. This permitted us to decide sampling strategy and plan logistics to be able to execute this project efficiently. This also allowed us to increase the scope of the project into various new projects.
Expertise in the lab: The lab that the genetic study was conducted in (Dr. Uma Ramakrishnan's lab) had expertise working on microsatellite data with other species that could be transferred to this project.

Project Implementation: (aspects of the project execution that contributed to its success/shortcomings)

Personnel and lack of capacity: Although the lab had trained people working on microsatellite data, we had difficulty recruiting new people to the project who had skills to take the project forward. New recruits often had to be trained from scratch to be able to generate data for the project.

Documentation of work: We believe that our project benefited from maintaining extensive cloud-based documentation of our work. This permitted people from field and lab to keep communicating to keep the project going. This increased productivity and efficiency while also maintaining transparency of the project functioning.

Internationally procured materials: We faced our biggest hurdle with obtaining field and lab supplies from international sources. Our initial attempts to obtain field gear from Europe and USA took very long and the Indian import regulations caused further delay. Once we had identified microsatellite markers, we had to procure them internationally, which always caused a delay of 2-3 months for each batch. Crucial reagents like Master Mix were also sourced from the international market that also often caused delays.

Other lessons learned relevant to conservation community:

One of the major lessons learnt was the understanding that the matrix between protected areas can play a significant role in determining the functional role of a population in a protected area. Although no major conservation measures have been undertaken in what is largely a production landscape with private land holdings, there needs to be a focused inclusion of such hitherto unrecognized stakeholders. A subsequent (and now parallel) CEPF-ATREE project titled "Assessing biodiversity value of production landscape and non-protected forests on skyislands by establishing occurrence of cryptic, threatened birds" attempts to address some of these key issues and fill knowledge gaps. This information can be further turned into actionable policies by conservation implementation agencies on including the production landscape in the conservation outlook.

ADDITIONAL FUNDING

Provide details of any additional donors who supported this project and any funding secured for the project as a result of the CEPF grant or success of the project.

Donor	Type of Funding*	Amount	Notes
Council for Scientific and Industrial Research (CSIR), Government of India	B	USD36,000	
National Centre for Biological Sciences	A	USD20,000	
Keystone foundation	A	USD 100	In lieu of accommodation support
Vattacanal Trust	A	USD 200	In lieu of accommodation support

***Additional funding should be reported using the following categories:**

A *Project co-financing (Other donors contribute to the direct costs of this CEPF 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 project.)*

C *Regional/Portfolio leveraging (Other donors make large investments in a region because of CEPF investment or successes related to this project.)*

Sustainability/Replicability

Summarize the success or challenge in achieving planned sustainability or replicability of project components or results.

Permits: Having had some experience in working with the forest department, we believe that it is best if permits are obtained for capture, handling and sample collection are obtained from the Ministry of Environment and Forests directly. This permits the work to be carried out uninterrupted even with local changes in the administration at each state.

Engagement with private land owners: One of the main challenges in the future will be to increase the involvement of private land owners from the production landscape to participate in conservation

Summarize any unplanned sustainability or replicability achieved.

None

Safeguard Policy Assessment

Provide a summary of the implementation of any required action toward the environmental and social safeguard policies within the project.

None

Performance Tracking Report Addendum

CEPF Global Targets

(Enter Grant Term)

Provide a numerical amount and brief description of the results achieved by your grant.
Please respond to only those questions that are relevant to your project.

Project Results	Is this question relevant?	If yes, provide your numerical response for results achieved during the annual period.	Provide your numerical response for project from inception of CEPF support to date.	Describe the principal results achieved from July 1, 2007 to June 30, 2008. (Attach annexes if necessary)
1. Did your project strengthen management of a protected area guided by a sustainable management plan? Please indicate number of hectares improved.	No			Please also include name of the protected area(s). If more than one, please include the number of hectares strengthened for each one.
2. How many hectares of new and/or expanded protected areas did your project help establish through a legal declaration or community agreement?	No			Please also include name of the protected area. If more than one, please include the number of hectares strengthened for each one.
3. Did your project strengthen biodiversity conservation and/or natural resources management inside a key biodiversity area identified in the CEPF ecosystem profile? If so, please indicate how many hectares.	No			
4. Did your project effectively introduce or strengthen biodiversity conservation in management practices outside protected areas? If so, please indicate how many hectares.	No			
5. If your project promotes the sustainable use of natural resources, how many local communities accrued tangible socioeconomic benefits? Please complete Table 1below.	No			

If you answered yes to question 5, please complete the following table.

Table 1. Socioeconomic Benefits to Target Communities

Please complete this table if your project provided concrete socioeconomic benefits to local communities. List the name of each community in column one. In the subsequent columns under Community Characteristics and Nature of Socioeconomic Benefit, place an X in all relevant boxes. In the bottom row, provide the totals of the Xs for each column.

Name of Community	Community Characteristics								Nature of Socioeconomic Benefit												
									Increased Income due to:												
	Small landowners	Subsistence economy	Indigenous/ ethnic peoples	Pastoralists/nomadic peoples	Recent migrants	Urban communities	Communities falling below the poverty rate	Other	Adoption of sustainable natural resources management practices	Ecotourism revenues	Park management activities	Payment for environmental services	Increased food security due to the adoption of sustainable fishing, hunting, or agricultural practices	More secure access to water resources	Improved tenure in land or other natural resource due to titling, reduction of colonization, etc.	Reduced risk of natural disasters (fires, landslides, flooding, etc)	More secure sources of energy	Increased access to public services, such as education, health, or credit	Improved use of traditional knowledge for environmental management	More participatory decision-making due to strengthened civil society and governance.	Other
Total																					

If you marked "Other", please provide detail on the nature of the Community Characteristic and Socioeconomic Benefit:

Additional Comments/Recommendations

Detailed technical report: Annexure 1.
Incidental Publication: Annexure 2

Information Sharing and CEPF Policy

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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