CEPF FINAL PROJECT COMPLETION REPORT

I. BASIC DATA

Organization Legal Name: Smithsonian Institution

Project Title (as stated in the grant agreement): *The Golden-Headed Lion Tamarin Connection*

Implementation Partners for this Project: IESB, The Royal Zoological Society of Antwerp

Project Dates (as stated in the grant agreement): July 1, 2005 – December 31, 2007

Date of Report (month/year): February 2008

II. OPENING REMARKS

Provide any opening remarks that may assist in the review of this report.

The Golden-Headed Lion Tamarin Connection (Conexão Mico-Leão) has been highly successful. Our understanding of the state of golden-headed lion tamarins (GHLTs) across their range was significantly improved as a result of this project. No project of this magnitude had previously been implemented for the species. Firstly, as a result of our extensive travels in southern Bahia and numerous discussions with local residents, we saw first hand the state of the landscape in southern Bahia, increased our understanding of the threats to the flora and fauna in the region, and were able to recognize many of the concerns of the local residents. Over 95% of the remaining forest for GHLTs is in private hands and thus these people represent significant stakeholders in the long term viability of the species. Secondly, we are in the process of demonstrating that the use of novel and leading-edge conservation biology computer simulation tools can be an effective means to guide conservation planning. Population Viability Analysis (PVA) is a powerful predictive tool, and in combination with Geographic Information Systems (GIS) it is capable of modeling a species response to spatial and temporal changes in the landscape. This type of modeling can serve as a significant tool for understanding the outcome of increasing forest linkage via corridors.

Our results show that GHLT populations in the east, especially in the area around Una Biological Reserve may have good chances of survival over the next 100 yrs, but that a crisis threatens western populations. Small populations in highly fragmented landscapes are at extreme risk of local extinctions. Moreover, our modeling indicates that the presence of smaller fragments bordering larger one may create instability in the larger populations due to source/sink dynamics. Our methods and results are valuable not only for what they have indicated to us about GHLTs, but as tools for the study of any endangered species within a fragmented and threatened habitat.

The Golden-Headed Lion Tamarin Connection has run behind schedule from its inception to present due to original implementation setbacks and numerous administrative problems. Our GHLT field survey (which serves as the basis for many other parts of the project) ran longer than expected and required shifting of funds. The magnitude of conducting detailed PVA and GIS modeling across a large and fragmented landscape with infinite number of potential scenarios became increasingly more evident as the project progressed. The preparations leading towards the modeling (obtaining, summarizing, and converting demographic, habitat, landscape and animal movement

data, making decisions on which parameters to use and why, choosing scenarios to run, running preliminary models, and conducting sensitivity testing) were in an of themselves more time-consuming than originally predicted. Our modeling progress was also delayed in part by the speed at which we have been able to work with our collaborators on conservation biology software development. Currently, we are still working on our modeling in order to prioritize forest fragments and linkage areas throughout the GHLT range.

Because of the setbacks in our timeline of activities and challenges we have met in raising additional funds, we were not able to achieve everything we specified in our original proposal within the timeframe of the CEPF funding. None-the-less, we are confident that the work already carried out in our project will have a great impact on developing conservation action for the species and its habitat and directing future studies. It is important to keep in mind that we view the GHLT Connection as an on-going project with opportunity to evolve new phases and expand its mission. Project participants and additional collaborators are actively working towards the goal of holding a conservation action plan workshop and designing an action plan for the species. Although having a workshop with broad attendance from a varied set of stakeholders would be extremely valuable, the results of our GHLT Connection project to date in and of themselves can be used to help prioritize conservation action.

We thank CEPF and the other project sponsors for their generous support of this project.

III. ACHIEVEMENT OF PROJECT PURPOSE

Project Purpose*: Conservation Action Plan for GHLTs created with stakeholder input and implemented by both the public and private sectors in Brazil, and internationally where appropriate (see annex 1 for a list of potential stakeholders)*

Planned vs. Actual Performance

Indicator	Actual at Completion
Purpose-level:	
1. Local and national conservation NGOs in Brazil, the Brazilian Government, and influential international organizations consider suggestions in the GHLT Action plan as guidelines for the development, modification or continuation of RPPN and reforestation programs, conservation fundraising, or dissemination of information regarding these issues.	The creation of a GHLT Action Plan did not occur as a direct result of our CEPF project as originally intended. However, preliminary observations from the GHLT Connection project were incorporated into the 2005 Lion Tamarin PHVA sponsored by IBAMA. It is still our intent to carry out a workshop specifically for GHLTs using updated information and incorporating feedback from a diverse set of local stakeholders, but this will require obtaining future funding. In the meantime, this document (our final CEPF project report) with supplementary material will be disseminated to various organizations in lieu of an Action Plan. The Lion Tamarin ICCM (2005, 2006) and the GHLT Discussion Group (2005, 2007) have already used GHLT Connection results to guide discussions about potential future conservation action for GHLTs.
2. Local and national conservation NGOs in Brazil, the Brazilian Government, and influential international organizations implement new policies to conserve forest and promote linkage in regions suggested in the GHLT Action Plan within 1-5 years of project	As above, this indicator relies on the dissemination of this CEPF report and/or a GHLT action plan document, which has not yet happened but should occur sometime within 2008-2009. The success of achieving our overall project purpose as indicated to the left will be evident only after organizations

| completion. | have been presented with and had a chance to assess these materials. |

Describe the success of the project in terms of achieving its intended impact objective and performance indicators.

This is addressed above.

Were there any unexpected impacts (positive or negative)?

No.

IV. PROJECT OUTPUTS

Project Outputs: Enter the project outputs from the Logical Framework for the project

Planned vs. Actual Performance

Indicator	Actual at Completion
Output 1: GHLT population survey conducted	
1.1 Survey team of two individuals implemented in the field by Apr 1, 2005	The survey team was implemented, operating out of IESB.
1.2 By July 2005, 25% of study fragments visited; by October 2005, 50% of study fragments visited; by January 2006, 75% of study fragments visited	98 fragments were visited by the end of the CEPF-funded period.
1.3 Survey completed by 31 March, 2006 with at least 10% of all fragments in the GHLT range (the size of at least one GHLT groups home range or larger) visited.	The survey is on-going, but was completed in terms of meeting the objectives of visiting 10% of all fragments in the GHLT range. We were able to visit 12.5%. Appendix 1: Characterization of the landscape Appendix 2: Final survey report Appendix 3. Discretionary assessment of important areas for GHLT conservation
1.4 Digital survey layer completed by 1 May 2006	The digital survey layer (in actuality, a series of maps; Appendix 2.b.-2.e.) was completed except for the creation of a predictive map of GHLT presence and absence. Extensive logistic regression analyses were performed using a series of landscape and habitat metrics, but no model was found to be statistically significant to adequately predict GHLT presence (Appendix 4). The model was able to predict GHLT absence. Appendix 2.b.: Map of interview and playback results Appendix 2.c.: Map demonstrating evidence of range reduction in GHLTs Appendix 2.d.: Map of proposed current GHLT distribution Appendix 2.e.: Assignment of presence or absence to sample fragments Appendix 4. Predictive logistic regression model of GHLT presence and absence
Output 2: Priority areas for forest conservation and corridor building identified through population and	

landscape modeling	
2.1 The 50 most important fragments listed in 10 percentile classes from highest conservation priority to lowest by 1 Feb 2007	This work is still in progress. Preliminary models and prioritization schemes have already been created, but further work is still planned. Appendix 5. PVA modeling Appendix 6. Preliminary prioritization results
2.2 The 50 most important corridor linkage areas listed in 10 percentile classes from highest conservation priority to lowest by 1 Feb 2007	This work is still in progress. Preliminary models and prioritization schemes have already been created, but further work is still planned.
Output 3: Species Action Plan created and disseminated to key stakeholders (NOT TO BE CEPF FUNDED)	
Output 4: Brazilian students and professors from the local university, UESC, and Biologists at IESB, trained in GIS and population modeling techniques within the infrastructure of the project	
4.1 At least 1 student but preferably more working within project infrastructure to develop thesis project	Four students have been involved in carrying out research relating to this project : 2 Ph.D. students that have recently advanced to candidacy; 1 master's student preparing for his final defense, and one project intern who has become a prospective Ph.D. student. Current students are working on: 1) Developing more complex modeling tools to bridge PVA and GIS to understand functional connectivity of certain landscape attributes 2) Understanding how the complexity and diversity of shade-cocoa forests effects GHLT demographic and movement parameters 3) Implementing survey techniques to identify other threatened primates sympatric to GHLTs
4.2 Two to three curriculum development meetings held with UESC Faculty members	No curriculum development meetings were held

Describe the success of the project in terms of delivering the intended outputs.

Survey: The survey was a major undertaking, yielding abundant information. In addition to the aforementioned successes (see opening remarks) for increasing our understanding of the state of the landscape and threats to GHLTs, we obtained information on many other endangered species. These data are still being analyzed. We will be able to generate maps of primate diversity across Southern Bahia and correlate measures to landscape and habitat features. For GHLTs, we determined current threats and documented a reduced distribution from the last few decades. Another interesting finding was our observations of GHLTs at altitudes previously thought not able to support populations of GHLTs.

Modeling: Despite the fact that this work is still in progress, initial models have already revealed interesting patterns in GHLT demographics and their chances of survival. One such finding is that source-sink dynamics may be destabilizing populations in the really fragmented areas. This is a potential concern when thinking about how to prioritize fragments for conservation and future forest linkage. Our collaboration with the Conservation Breeding Specialist Group to develop and test new conservation biology simulation modeling software will undoubtedly lead to many more successes, not only for GHLTs, but for threatened species/habitats in general.

Training: A great deal of scientific training was accomplished through one-on-one interactions within the infrastructure of the GHLT Connection project. IESB biologists working in collaboration on this project were trained extensively in survey techniques, introductory GIS and PVA. Other student collaborators were trained extensively in modeling threatened species demographics. We also collaborated with colleagues to teach two field courses on survey techniques.

<u>Dissemination:</u> We gave several talks throughout the last three years at scientific conferences and in smaller meeting settings. These presentations contributed towards our successes at delivering the three above listed outputs. Locations of presentations included: American Society of Primatology; Society for Conservation Biology; Society for Conservation GIS; Brazilian Ecological Society; Brazilian Primate Society; Lion Tamarin ICCM; CEPF meetings, and Metamodeling meetings at the Brookfield Zoo. Additionally, a few popular articles were written about our project.

Were any outputs unrealized? If so, how has this affected the overall impact of the project?

1) The Action Plan has not yet been created. We addressed this in the above sections.
2) No curriculum development meetings were held with UESC. There is no negative impact associated with not having accomplishing this goal in terms of developing conservation solutions for the GHLTs. However, in terms helping to stimulate sound conservation science practice and novel conservation solutions for other endangered fauna in Brazil, it is unfortunate that we were not able to achieve this goal.

V. SAFEGUARD POLICY ASSESSMENTS

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

VI. LESSONS LEARNED FROM THE PROJECT

Describe any lessons learned during the various phases of the project. Consider lessons both for future projects, as well as for CEPF's future performance.

Project Design Process: (aspects of the project design that contributed to its success/failure)

Our survey work was an outstanding success, in part because of our carefully thought out experimental design, and in part because of the good nature of both the survey team and the local residents. Most of the people we interacted with were extremely helpful and demonstrated an interest in learning about our work. In a sense, in addition to collecting data for the survey, we were able to achieve outreach work as an unintended outcome of our informal conservations with local residents. Some landowners indicated interest in working with us or other organizations towards forest and/or species conservation. In terms of our interview strategy, we discovered how a few critical choices in the timing and types of questions asked could yield abundant and high quality information. We followed a strategy to inquiring about many different forest species, including those that were endangered and common, and to bring up GHLTs after a general discussion of forest fauna. This helped to gauge the reliability of information obtained. We were particularly satisfied with our strategy of choosing informants by asking people to identify someone who might have good forest knowledge and then seeking this person out even though it was sometimes difficult to find them. The interviews succeeded in helping us to obtain large amounts of information quickly. The combination of implementing interviews and playbacks together was an especially good strategy. Running playback transects helped us gauge the quality of the forests and enabled us to also obtain actual sightings. The workload to run transects however was extremely labor intensive and sample sizes were much smaller than interviews.

The impact of using somewhat outdated satellite imagery may have confounded our ability to make an accurate predictive model of GHLT presence and absence. The size and shapes of fragments have likely changed since the period of 1996-97.

Project Execution: (aspects of the project execution that contributed to its success/failure)

The intense drive and passion of key project members drove this project to its success. IESB provided critical support in getting this project off the ground and supervising the survey work.

Our collaboration with CBSG was/is critical not only for the continued development of innovate conservation biology modeling tools, but our project members picked up many useful pointers on conservation workshop design/facilitation (tasks that CBSG are renowned for internationally) that will help with next steps of our intended GHLT Action Plan workshop.

One of the largest and most significant problems encountered while carrying out this project were the bureaucratic and administrative problems which arose from interactions within and between organizations involved in this project. There were delays in receiving the original award because complications with finalizing the contract between SI and CEPF. There were delays in SI's ability to get payments sent down to the subcontracting organization IESB which led to three pauses in field work. Within SI there were multiple levels of administration all with different policies and reporting mechanisms in place. Administrative challenges such as legal issues with how to deal with software development continued for some time.

Another challenge was learning how to organize team of numerous individuals mostly working on a volunteer basis. Lack of paid project direction/coordination contributed to prolonging some of the administrative setbacks. Moreover, a lack of substitute project direction/coordination also caused delays when director had medical/maternity leave.

An additional challenge was in the fact that a great deal of coordination and decision making of the local project in Brazil was done from the United States. Communication via the Internet was not reliable and phone calls were costly. The original intent of the project was to support a paid full time project coordinator in Brazil, but funds were never able to be obtained for this.

Field related delays were the norm in the survey work. Our field jeep, despite its good condition on original purchase (paid for by the AZA) rapidly declined in condition as a result of the bad roads on which we had to drive. The car broke down on several occasions and we had no substitute mechanism to conduct our work.

Our software development was much slower than expected and we ended up depending on key personnel running on their own tight schedules.

VII. 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
Lion Tamarins of Brazil Fund	A C C	$ 5,000 Y1 $ 3,468 Y2 $ 3,432 Y3	For survey work
AZA	A	$ 17,640	For field vehicle
Smithsonian	A	$ 1,400 plus institutional	Travel and Institutional support

		support	
IESB	A	Institutional support	The institutional support from IESB was the key factor in the success of our survey
Antwerp	B	Institutional support	Collection of demographic data for models
Brookfield Zoo/ CBSG	B	-	Private donors gifted funds to Biocomplexity Network for the continued development of meta-modeling software using GHLTs as one of the test cases
International Primate Society	C	$ 1000	GHLT website in which information from the GHLT Connection will be posted along with other GHLT field projects
University of Maryland	B	Institutional Support	Supporting 2 students carrying out research in infrastructure of GHLT Connection
UESC	B	Institutional Support	Supported a Master's student carrying out research in infrastructure of GHLT Connection

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   *Complementary funding (Other donors contribute to partner organizations that are working on a project linked with this CEPF project)*

C   *Grantee and Partner leveraging (Other donors contribute to your organization or a partner organization as a direct result of successes with this CEPF project.)*

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

Provide details of whether this project will continue in the future and if so, how any additional funding already secured or fundraising plans will help ensure its sustainability.

We intend for the project to continue into the future although we have only a small outstanding balance from the Lion Tamarins of Brazil Fund to be used on survey work and no additional funding available. We will work to fundraise in the near future.

VIII. ADDITIONAL COMMENTS AND RECOMMENDATIONS

One recommendation for CEPF is to put a mechanism in place that allows science/research based projects to have a way to easily impart scientific knowledge gained from carrying out projects in the half year technical reports. Reports seem to focus more on the 'process' than on the results.

VIII. INFORMATION SHARING

CEPF is committed to transparent operations and to helping civil society groups share experiences, lessons learned and results. One way we do this is by making programmatic project documents available on our Web site, www.cepf.net, and by marketing these in our newsletter and other communications.

These documents are accessed frequently by other CEPF grantees, potential partners, and the wider conservation community.

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