



Measuring Asian Elephant Abundance and Mitigating Human-Elephant Conflict in Cambodia

Annual report for the International Elephant Foundation

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Prepared by Fauna & Flora International, in collaboration with Ministry of Environment and Forestry Administration, Royal Government of Cambodia

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Project title: Measuring Asian Elephant Abundance and Mitigating Human-Elephant Conflict in Cambodia

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Project starting date: January 2015

Project completion date. 31 Dec 2016

Conservation needs

FFI has been working with our government partners within the southern Cardamoms to establish a monitoring program for Asian elephant based on fecal DNA surveys and capture-mark-recapture analysis. Although one study has previously been conducted across the Cardamom Mountains Landscape as a whole, the survey only managed to estimate a minimum population size (135 individuals) rather than give a population estimate (Maltby & Bouchier, 2011) as a result of the survey area being too large and consequently not all hotspots were identified. In order to be able to establish a rigorous and standardized monitoring program in the southern Cardamoms (following the MIKE protocol for elephant dung surveys, DNA analysis and capture-mark recapture analysis) (Hedges & Lawson, 2006), we first needed to conduct interview surveys with local communities, followed by field surveys to identify and map Asian elephant “hotspots” of activity (e.g. saltlicks, water holes, trails, corridors etc.) as a precursor for conducting a fecal DNA survey. The main elephant hotspots in the southern Cardamom mountain landscape have now been identified, through support from the IEF, and will now be used as the survey locations for DNA mark-capture-recaptured sampling to estimate elephant population dynamics for establishment of a long term monitoring program.

This survey will enable a long-term monitoring program to be established, which has been recognized as a priority in all range states by the range-wide Asian elephant Conservation Strategy (Hedges et al., 2008).

Monitoring the distribution, status, threats and habitat of Asian elephants will improve our limited knowledge in these areas, and allow assessment and evaluation of conservation efforts.

Summary of goals and objectives

The long-term goal of the project is to develop a monitoring program for Asian elephants in the Cardamom Mountain Landscape and to ensure conservation efforts of this core population are strategic, effective and adaptive. The short-term goals of this project are to estimate the elephant population in the core area of the Cardamom Mountains, and to improve human-Asian elephant coexistence through HEC mitigation.

Progress towards objectives:

Objective 1: Estimate the elephant population through capture-mark-recapture analysis of DNA extracted from dung samples collected within the eastern and southern Cardamom Mountains Landscape.

Field collection of DNA from elephant dung was completed in mid-2016. Eight field teams surveyed a total of 5600km across five different sampling occasions in the Cardamom Mountain Landscape, and collected a total of 371 samples. Based on these samples we have been able to map elephant activity in hotspots within the Cardamom Mountains (Figure 1).

FFI has partnered with the Royal Zoological Society of Scotland (RZSS) to conduct the DNA analysis of our samples. In an effort to build national genetics capacity, we collaborated with WWF and WCS to create the first

conservation genetics lab housed at the Royal University of Phnom Penh (RUPP). Two technicians from RZSS have now trained two of our Cambodian lab technicians. These staff members are now fully trained in DNA extraction and augmentation, allowing for future DNA extraction and amplification work to be conducted in our lab in Cambodia, independent of external geneticists. The DNA extraction and amplification was conducted in our lab in Cambodia by newly trained FFI and RUPP technicians, and has been sent to the RZS in Scotland for final sequencing and scoring. We anticipate the final analysis to be complete by March 2017.

In support of the long term monitoring of Asian elephants, we have recently placed a total of 46 camera traps in elephant hotspots throughout the Cardamom Mountains landscape. Our preliminary results have captured footage of a 12 individual elephants, including ten adults and two calves within the first two months of deployment (Figure 2). These images will not only be useful in population assessments, they will also support pride-building community outreach activities, which will help to mitigate HEC in the long term.

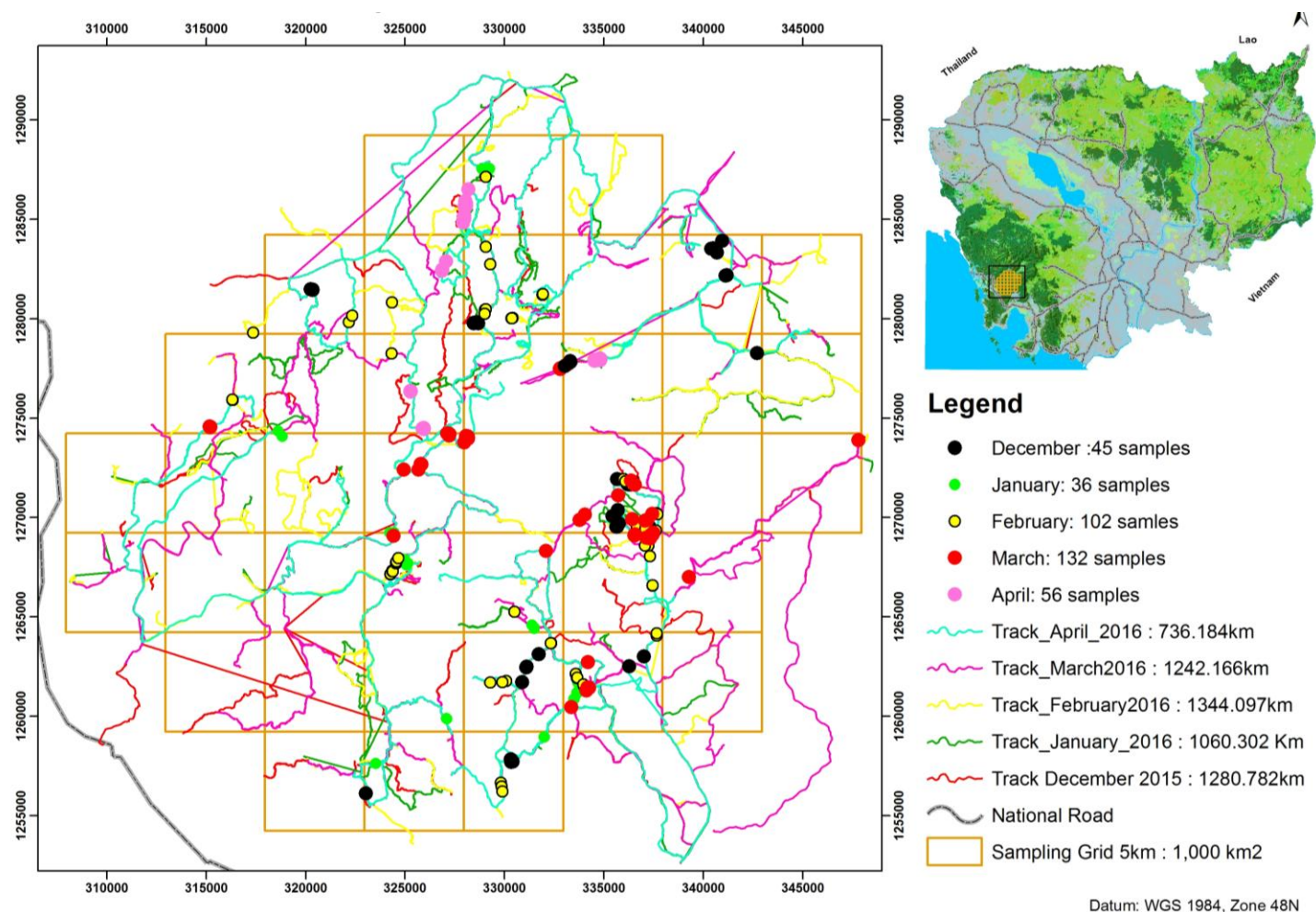


Figure 1. Map of elephant dung collection in central Cardamom Mountains between December 2015 and April 2016 (total number of samples: 371).



Figure 2. Family of three Asian elephants captured on camera trap roaming through their Cardamom Mountain landscape.

Objective 2. Reduce human-elephant conflict through strengthening local management of HEC at key sites.

We continue to support local community members in mitigating HEC. This year, we have trained guarding groups from four different communities in HEC mitigation techniques and provided the following materials: alarm bell fencing, bamboo fencing, chili-rope fencing, fireworks, and flashlights. We have also shown environmental videos within these communities, engaging with people from 210 local communities between November and December, 2016.

The community members are satisfied with our support and have expressed their willingness to continue to work with us to safely mitigate HEC. Community members of Tmor Rong, where HEC is fairly, continue to maintain a positive attitude towards elephants as a result of our support and awareness raising programs. Some community members have expressed admiration towards elephants, stating that they are clever animals who have lived in the area for a long time and that they are just doing what they are naturally inclined to do. They have since asked us to set up camera traps in the area so that they can see elephants in their natural habitats.

We also continue to support two non-government teachers in two villages where children would not get access to school otherwise. This has included salary support, and the provision of 100 textbooks and stationary to over 80 students in both communities. In addition FFI has printed 1000 posters that discuss wildlife conservation and specifically focus on Elephant conservation. Posters inform the public not to eat, feed, hunt or buy wildlife products that comes from animals such as the Asian elephant. Included in the poster is a hotline to report on wildlife trade. A total of 400 of these posters have already been distributed to communities within the Cardamom Mountains.

Objective 3. Information collected by the project is represented within the National Action Plan for Asian elephants

In early 2016 there was a reshuffling of the government ministries responsible for managing protected areas. The Ministry of Environment (MoE) is now responsible for all protected area management. We have since been

working with them to finalize the Action Plan. The Action Plan has been reviewed twice now by MoE officials and has been preliminarily accepted. It is currently with the Director General awaiting final approval. The reshuffling of roles within the ministry has resulted in the delayed sign off. MoE officials presented the Action Plan at the IUCN Asian Elephant Specialist Group meeting in November 2016, where they indicated it would be approved imminently. Despite this and our frequent follow-ups, we are still waiting for official approval. Hopefully it will be done in March, but it is frustratingly hard to know.

The new reshuffling of protected area management to the MoE has led to the creation of the newly promulgated Southern Cardamom National Park. This means that all main elephant habitat in the Cardamoms area now protected. The MoE have also been very supportive of approving the elephant Action Plan. We are hesitantly optimistic that this National Park will help secure habitat for elephants into the future, and we will engage with the MoE as they begin the process of zoning these protected areas for management.

Problems and changes

The biggest problems facing our project has to do with HEC. The biggest issue is that all of the methods used here (and most places honestly) are inherently unsustainable, and nothing is perfect. The most effective method, electric fencing, is extremely expensive. Currently, we are paying for all the materials to local people for HEC mitigation, which has brought us to a situation where local people are dependent and lack a level of personal ownership over the problem that makes it difficult for locally lead management. Ultimately, our goal is to prevent elephant deaths and injuries in retaliation, which has been a success. But the sustainability of the current HEC support model is questionable.

In the next few years we will try to slowly wean communities off of our full support of all HEC equipment. Rather, we will provide trainings, and when necessary subsidize the costs of materials. Ideally, local people would be more responsible for the financial support of HEC mitigation. We will investigate things like savings groups and other community-based initiatives to support this.

We will also look more into the possibilities of electric fencing in the area. At our annual meeting of the Elephant Conservation Group meeting in Thailand in October 2016 we discussed HEC at length. The general consensus was that electric fencing is the most effective way to sustainably mitigate HEC, and that elephants habituate to almost everything else. Thus, we are looking to work with the Centre for Conservation Research (<http://ccrsl.gadola.com/>) who are true leaders in electric fencing for HEC reduction. Given funding, we would like to have their staff teach our project team proper electric fencing techniques, so we could support similar initiatives in our communities.

Government delays are a typical problem, especially now with elections on the horizon, they appear to be more inactive than usual. Luckily this has not impeding our work on the ground, but it certainly has not allowed us to deliver the Action Plan as a government endorsed document. It's almost impossible for us to do more than frequently follow-up.

Conservation outcomes

- A total of 1000 poster have been printed that address on wildlife conservation specifically focus on Elephant conservation produced, 400 already distributed
- A total of 100 biodiversity and zoology textbooks have been distributed to children through community outreach programs
- Four different communities (O'kei, Veal Thaphou, Tmor ROUNG and Phoum 6) have received training and support in HEC mitigation
- We have worked with a total of 368 children ranging from class 1-6 in elephant educational programs.

- A total of 210 local communities from the Cardamom Mountains have participated in our community outreach programs between November and December.
- We broadcast a cartoon highlighting the importance of elephants (<https://www.facebook.com/134611936610849/videos/899423410129694/>) twice a week for a month during a popular cartoon show on television, likely viewed by thousands of children.
- 12 elephants (ten adults and three calves) have been recorded on camera traps within hotspot areas of the Cardamom landscape.

Monitoring and evaluation procedures

Objective	Indicator	Monitoring Method	Current Status
1. Elephant population assessment	Hotspots surveyed	GPS points and GIS analysis	Finished 100% coverage of sample areas (100,000 ha)
	# of dung samples collection	Counts of dung samples collected	371 dung samples collected
	Elephant sightings on camera traps	Counts of elephants on camera trap footage	12 elephants recorded (10 adults and two calves) during November/December
2. Human elephant conflict is reduced and locally managed	# of incidences of HEC	Records collated and catalogued by CECG	63 recorded incidences
	# of elephant deaths due to HEC		None since 2005

Human interest story

Two positive incidences have stood out over the past year.

1. During a visit by our team to one of the Cardamom communities that are at risk from HEC, a farmer told us a story of how using fireworks has helped him in warding off elephants. While he was sleeping at night, an elephant came close to his farm. Quick to respond, the farmer let off two fire works and scared the elephants away. He says the greatest factor for helping to keep elephants away is to make sure you are living close to your farm, as opposed to living in a house where your farm is out of view. He is now a strong advocate for fireworks as a means of managing elephant disturbance, and shares his story with the rest of the community, in the hope that others will benefit from his own experience.
2. Research officer Ret Thaug spends a good deal of time with local communities of the southern Cardamoms, providing education to young children about the importance of conserving Asian Elephants in the wild in Cambodia. Whilst undertaking activities in the village of Veal Thaphou, the children were showing an interest towards elephants. One child was shown a picture of a family of elephants and asked: 'Whose elephant is this?'. He responded passionately that 'these are OUR elephants. Our Cambodian elephants, and we need to protect them'. When shown additional footage of elephants, the children expressed a strong desire to see the elephants in real life, saying that they love elephants because elephants are 'big and look cool. We need to protect them so they can live here for our next generation'.

Summary of progress

In the past year, our team has made substantial progress in the population assessment of Asian elephants in one of their most important landscapes in Cambodia, the Cardamom Mountains. Monitoring elephant populations is a key part of managing and protecting elephants. The best way to estimate population abundance is by using the DNA extracted from their dung collected in the field to conduct capture-mark-recapture analysis. Our team conducted five different sampling occasions covering 100,000 ha of core elephant habitat. In total we collected 371 dung samples and are now well underway to analyzing the samples for DNA. We also continued our ongoing support of local communities in Human-Elephant Conflict mitigation. We provided training and equipment to local farmers across four different communities. The most effective methods we have found to scare away elephants are using fireworks and flashing lights, but we have also helped farmers install alarm bells, to inform other guarding group members of elephant presence, and trained some people in the use of chili-rope fences, bamboo fences and bee fences. Our mitigation support has helped community members better cope with HEC; there has not been a retaliatory killing since 2005.

Brief summary of progress

The CECG completed field collection of dung for DNA analysis to estimate the abundance of Asian elephants in the Cardamom Mountain Landscape. They also continued their ongoing support of communities in mitigating HEC.

Organizations involved

- The Cambodian Forestry Administration and the Cambodian Ministry of Environment are both partners in the CECG. We second staff to work on our project and they take the lead in HEC mitigation activities in the field.
- The Royal Zoological Society of Scotland is training our genetics lab staff in DNA extraction and amplification techniques and will be conducting the final stages of DNA analysis.
- We have collaborated with World Wildlife Fund (WWF) and Wildlife Conservation Society (WCS) to create the first conservation genetics lab housed at the Royal University of Phnom Penh.

Videos and pictures accompany this report.

A full financial report accompanies this report.

Media

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