Monitoring Asian Elephants and Mitigating Human-Elephant Conflict in the Core Landscape of the Southern/Eastern Cardamom Mountains, Cambodia

Final report for the International Elephant Foundation

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

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Report author: Jackson Frechette, Flagship Species Manager, Fauna & Flora International-Cambodia

Project title: **Monitoring Asian Elephants and Mitigating Human-Elephant Conflict in the Core Landscape of the Southern/Eastern Cardamom Mountains, Cambodia**

Names of Investigator(s), Affiliation and contact information
Name & Title: Jackson Frechette, Flagship Species Manager
Institution: Fauna & Flora International, Cambodia Programme
Institution Address: FFI Cambodia Programme, PO Box 1380, # 19, Street 360, BKK 1, Phnom Penh, Cambodia
Phone, Fax, email: +855 (0)23 211 142; Jackson.frechette@fauna-flora.org

Name & Title: Eam Sam Un, Flagship Species Research Officer
Institution: Fauna & Flora International, Cambodia Programme
Institution Address: FFI Cambodia Programme, PO Box 1380, # 19, Street 360, BKK 1, Phnom Penh, Cambodia
Phone, Fax, email: +855 (0)23 211 142; SamUn.Eam@fauna-flora.org

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Conservation needs
FFI has been working with our government partners within the southern Cardamom Mountains to establish a monitoring program for Asian elephant based on fecal DNA surveys and capture-mark-recapture analysis (through previous support from IEF). Our analysis of the data suggests that the population in our core focal area is around 45 individuals. This result indicates that the population is, as best, stable. We have seen evidence of breeding in our camera traps, and there has been no poaching in 10 years, therefore, the slow recovery is hard to understand. In order for better conservation management we need to monitor the population so that we are able to assess breeding, group composition, body condition, seasonal changes in habitat use and group dynamics, and identify threats. Long-term monitoring 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
Fauna & Flora International's Cambodian Elephant Conservation Group's (CECG) goal is to establish a monitoring program of Asian elephants within the south-eastern Cardamom Mountains Landscape to better understand population trends, localized threats, and demographic composition and support communities to mitigate human-elephant conflict (HEC).

Objective 1: Establish a long-term monitoring program of the resident elephant population through camera trap deployment and survey.

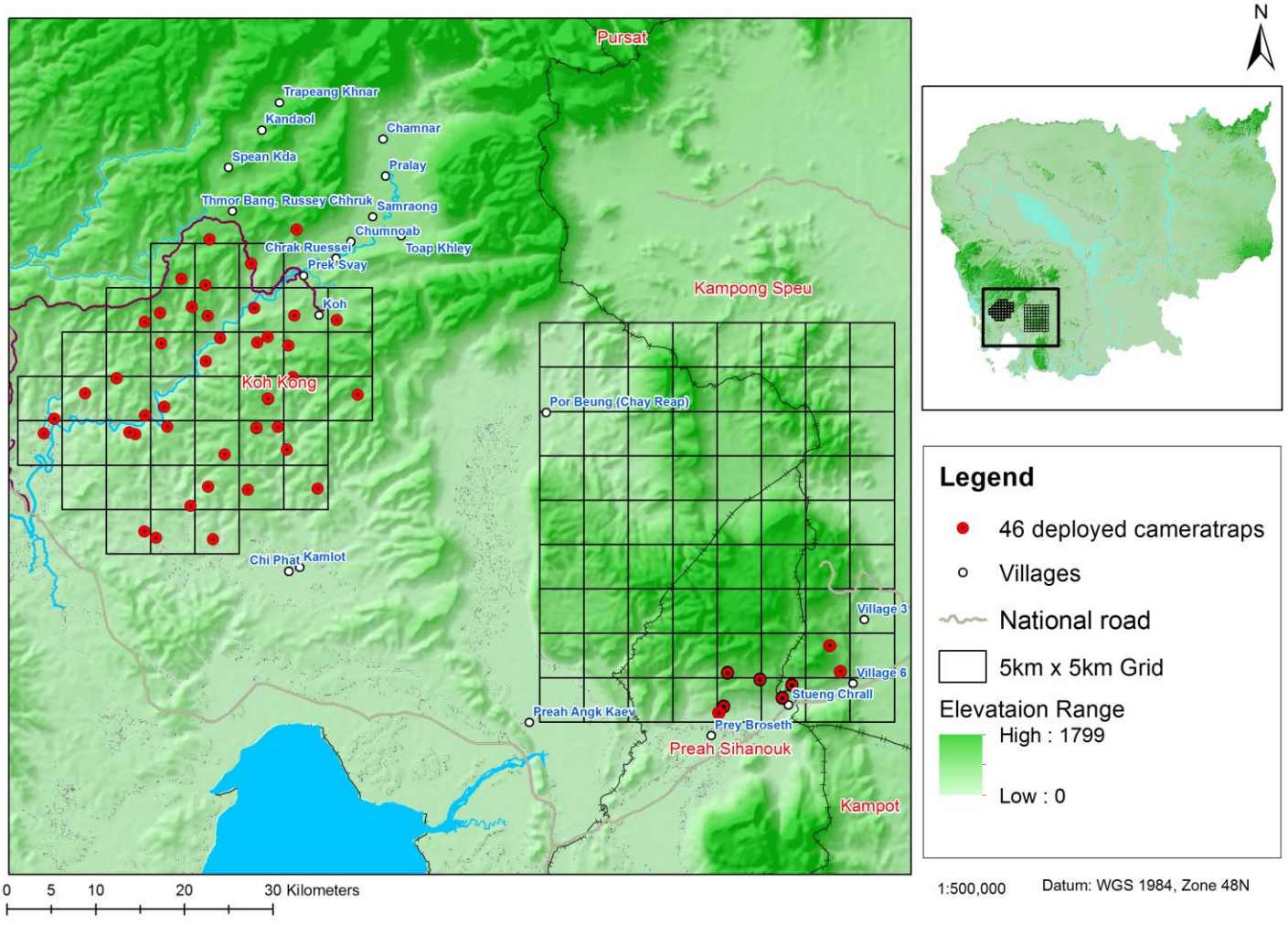
Guided by previous surveys for elephant hotspots and our previous fecal DNA survey, the CECG currently has 39 camera traps deployed (six were stolen or broken by locals) in highly used areas, such as mineral deposits and water sources, and along highly used trails in the 100,000 ha core elephant area (eastern grids on Map). We currently have an additional six camera traps (one was previously broken) set to monitor the small subpopulation of elephants in Kirrirom National Park (western grid in Map). These elephants frequently raid the crops of adjacent farms. We set the cameras to collect video and placed them at a height of 1.5-2m high, to optimize our capture of elephants' heads. This height allows for better capture of a range of features as well as reduces the likelihood of missing individuals in a group.

The cameras proved to be well-placed to record elephants. Compiling the elephant videos into a database of individually recognized individuals has proven to be extremely labor intensive. But the goal is to use the data for adaptive conservation management as well as improving our basic understanding of the population. The first major result is that four out of the six calves (<1 year old) have severe leg injuries from wire snares. The wire snares are set to catch smaller animals for the bushmeat trade, but baby elephants are inadvertently stepping on the snares and getting them caught on their legs. Our local wardens found the skeleton of a calf that reportedly died of snare injuries in mid-2017, and in 2016 a calf died from a leg infection from a wire snare

wound in Mondulkiri Cambodia. Thus, these injuries are potentially life threatening and could be preventing the recovery of this population. We also saw two adult males with lacerations on their trunks that could be due to snares. A write-up of this will be published in *Orxy* news in July 2018. We are still in the process of compiling the photos and data into a database to understand the overall composition of the population. Initially though, it is a very good sign to see breeding (calves and juveniles). The body condition of almost all the observed individuals looked good, aside from the one adult with a severely injured trunk that may have impacted feeding behavior. Thus the elephants appear to have adequate access to food and water. The sizes of the herds are still difficult to work out, as camera traps cannot capture all individuals if they do not pass in front of the cameras. Through our very preliminary assessment we have documented 15 different 'herds' ranging from 2-9 individuals, we've identified an additional five individual adult males. This includes the single herd of six individuals in Kirriom National Park, which includes one calf with a snare injury. This herd is of particular concern to us because there appeared to be only one adult male, who last year was electrocuted to death by a power line that came down after he pushed the tower over. Thus the matriarch now does not have a mate. This herd also frequently raids farms.

We will continue to compile the data, build our database and learn more about this elephant population and identify emerging threats and conservation opportunities. We have a considerable amount of data now, and are just now able ready to run basic analyses of the data for the rest of the biodiversity captured on film, which includes dhole, clouded leopards, sambar, and sun bear. Our plan is to also analyze the data spatially, to learn about movement patterns and better understand some of the herd dynamics.

Map of the 46 camera traps deployed in the southern Cardamom Landscape. The western grids represent monitoring of the main Cardamom elephant population, while the eastern grids are focused on a small sub-population in Kirrirom Naitonal Park.



Objective 2. Reduce human-elephant conflict through strengthening local management of HEC at key sites and the development of innovative mitigation techniques.

The project provides ongoing support to enable government-led HEC teams to assist communities in effectively responding to HEC incidences. This entails HEC teams travelling to rural communities as quickly as possible once an incident or threat of an incident is reported, and providing flashlights, noise-makers, and other supplies as well as technical assistance to the affected communities to help prevent and reduce crop damage and property destruction. Since January, we have documented 85 incidents of HEC, affecting 44 families in 5 villages. Elephants have destroyed a variety of crops, including: bananas, mangos, jackfruit, coconut, and papaya. This is a slight increase from last year (63). HEC incidences have hovered between 60-90 per year for the past several years, thus I don't think we can say that the increase is an indication of a trend. But it does show that there is a baseline level of HEC that local communities are dealing with. Our overarching goal is to avoid retaliatory killing or injuring of elephants; which there hasn't been since 2006. Our constant presence and interaction with the community members as HEC support appears to maintain a level of tolerance but also provides a level of oversight in which people know that they cannot get away with killing an elephant. HEC is notoriously difficult to manage as elephants frequently habituate to the techniques, and more effective measures like electric fences are very costly and labor intensive. In most communities there is reluctance to install electric fences for fear of children and livestock being injured. But when we monitor HEC and interview community members, there is still a certain level of satisfaction with using bright flashlights, fireworks, other noisemakers. We are trying to move more towards a more sustainable community-centered model, where there is less reliance on us, as an NGO. Thus we are reducing the amount of free supplies we give them and try more to engage more from the standpoint of training in mitigation techniques and outreach (see below) to promote coexistence.

As noted above, we have seen several elephants with injuries from wire snares. We have showed this videos of injured elephants to locals in villages and they were surprised to see that the elephants were being injured. The people reported to us that these imagines have caused some people to change their snaring methods and possible locations. The SMART monitoring hopefully will be able to document any real change.

We also continue to support two non-government teachers in two villages where children would not get access to school otherwise. Additionally, we are continuing our education and outreach programs with student volunteers assisting our project team. We have conducted three outreach events, one at the zoo and two in communities. In each we passed out posters about elephants and conservation, engaged students with games and contests with prizes. At night we played a movie about Cambodian wildlife to an audience of 50 villagers. In five other more remote villages we distributed posters, notebooks, and school supplies to 170 students. In total we reached around 370 people directly.

Problems and changes

Our objectives remained the same during the year. But our monitoring program has revealed that hunting with wire snares may the most pressing issue facing wild elephants in this landscape. Thus we are attempting to address this now by initiating a behavioral change campaign to reduce the demand for bushmeat, which is the main driver of snaring.

Road construction, agricultural expansion, and land grabbing is reducing habitat and fragmenting the landscape. Corruption and large scale economic pressures are the main drivers and are incredibly hard to tackle, especially in Cambodia. As an organization we are now working to develop a strategy to deal with these large-scale threats that operate at high levels.

Conservation outcomes

-Initiated our long-term elephant monitoring program through the deployment of 46 camera traps.
-The monitoring program has provided essential threat information, which means that our conservation initiatives are more adaptive, better informed and the protected area can be better managed.
-Our project impacts about 50 elephants, our HEC work impacts 44 families, and our support of schools impacts around 80 children.
-Reached around 370 people through our education and outreach program.

Monitoring and evaluation procedures

Indicator		Monitoring Method	Current Status	Desired Outcome
Objective 1: Establish a long-term monitoring program of the resident elephant population through camera trap deployment.	# of camera traps placed and extent of area covered	Team oversight and GPS of camera locations	46 cameras deployed	~50 cameras placed in key hotspots across 100,000 ha core area
Objective 2. Reduce human-elephant conflict through strengthening local management of HEC at key sites and the development of innovative mitigation techniques.	# of reported HEC incidences	Records collated and catalogued by CECG	85 incidents in 2017	< 75 incidents in 2017
	# of elephants deaths due to HEC		None since 2005	None

Human interest story

Using wire snares to capture wildlfie is a significant issue throughout the areas we work. We have captured evidence on our cameratraps that wire snares are injuring and possibly killing elephants, even though they are not the target. When we asked locals about this, they did not believe that snare had any impact on elephants, in fact they claimed that elephats remove and break the wire snares. Our team then showed the photos and videos of elephants with snare injuries, inclduing a baby with a severe limp. The villagers were very surprised, and told us that they not use snares in the elephant areas. Although this is anecdotal and hard to verify that a behavioral change is actually taking shape, I think that this is a good first step, and we will use more of this type of information in our outreach and engagement.

We conducted some outreach in the city of Kampong Thom, where the popualtion has long been removed form elepahnt habitat. Part of enagement involved showing people Cambodian nature films and camera trap footage of elephants. Our team were shocked at a commong reaction: many people didn't know that Cambodia still has wild elephants. This result is striking, because it highlights the massive need for more outreach and education to the populace as a whole. These people quickly became interested and engaged in learning about elepahnts and their conservation. If the popualtion doesn't know they have elepahnts, they certianly won't notice if they are gone, and there will be no public support for sustianable growth that incorportates elephants.

Summary of project

In the past year we have fully initiated our elephant monitoring program through the deployment of camera traps (46) across the landscape. Our initial analysis has shown that snaring poses a significant threat to calves through potentially fatal injuries. Aside from that though, the presence of calves and juveniles shows that there is breeding and the majority of the elephants have good body condition, indicating good habitat. We will continue to monitor the elephants and learn more about their movement patterns and demographics. We have conitnued to monitor HEC incidents, and will support communities as needed in mitigation. But we need to really begin working with the communities in more sustainable mitigation and adaptation plans, as we are looking to move away from just giving people tools that may not be used properly. Increasing our outreach programs in specially prone areas as well as looking in to some of the drivers of HEC will help us better desgin

methods for reduction and mitigation. We have also continued with our educational support and outreach programs in rural communities, directly engaging over 370 people.

Brief summary of project
We have successfully begun our long-term elephant monitoring program. This along with our community engagement has helped us to better identify, monitor and mitigate threats to elephants in the globally important Cardamom Mountain Landscape.

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.

Videos and pictures accompany this report.

A full financial report accompanies this report.

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