Project Update: August 2021

Project Summary

Introduction

In Thailand, Human-Elephant Conflict (HEC) is widespread and can be intense in particular areas. Here, conflicts are often associated with fruit crops such as pineapple. In Kuiburi National Park in southwestern Thailand, HEC continues to be a problem, with at least three human injuries in 2020. Multiple types of mitigation methods have been used here including physical barriers, vigilance, deterrents, and repulsion. However, there has been no analysis of the pattern of elephant incursion, and given limited resources, there is no system of planning as to where mitigation infrastructure would likely be most effective.

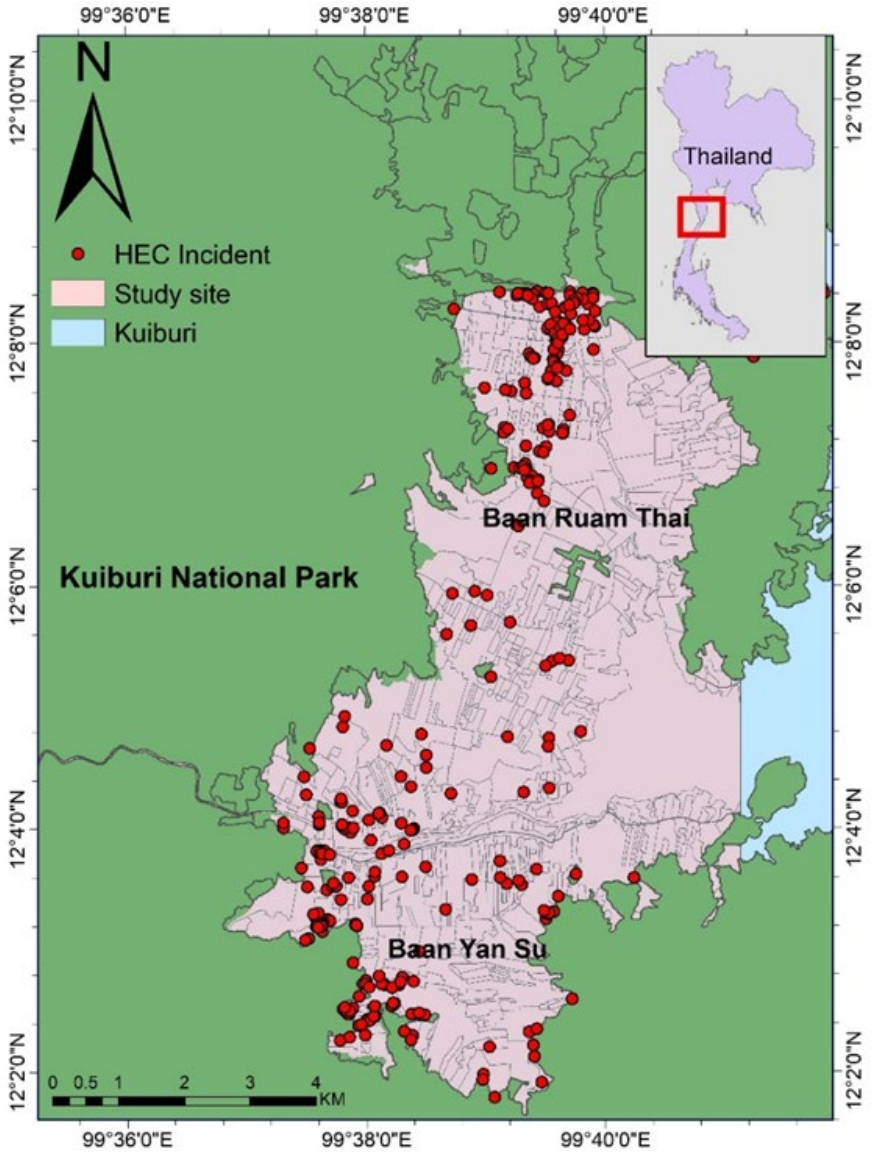

Figure 1. Map showing the study site and HEC incidents from August 2020 to June 2021 around Kuiburi National Park.

This study aims to understand the spatial-temporal trends of HEC by identifying conflict hotspots and thus help with mitigation strategies in Kuiburi. To do so, we first examined the spatial and temporal patterns of crop raiding by assessing crop availability in the area and determine which crop, and at which stage, was preferred by elephants. Mitigation methods used in the area and distance to elephant resources (water, saltlicks, and forest) will also be analysed to see how these influenced crop raiding. Then, we will identify which are the specific factors most likely driving crop raiding in the study site in order to identify conflict hotspots which we hope will lead to longer-term management plans and subsequent conflict reduction. We conducted field surveys of agricultural areas adjacent to the national park to collect HEC incident data. The study area covered approximately 200 km^2 which consist of two communities (Baan Ruam Thai (northern part of study site), Bann Yan Su (southern part of study site) (Figure 1).

Data collection

Data collection was conducted from August 2020 and until the end of July 2021. The collection of incident data was typically 3 days for the northern part and then followed by 3 days for southern part and looping to northern part again. In the process of data collection, the incident reports from park rangers were also utilised to cover more of the incidents than we could cover alone. Local villagers were also interviewed in order to obtain more detailed information at incident sites.

To better understand why elephants chose to raid at particular points, five sample plots were created at each incident site, one at the incident location and four in cardinal directions away from the incident position (one each to the North, East, South, and West). The four plots around the incident were initially located 200 m from the incident location to assess differences between "used" location and those available. Each plot was 100-m in radius.

From August 2020 to June 2021, we quantified 333 incidents. Damaged crops mostly included para rubber as the most frequently damaged and followed by pineapple, fruit orchards, and oil palm.

Incident variables

The incident data include: 1) the time and location of incident, 2) number of elephants, 3) approximate size of crop area and area damaged, 4) The activity of elephant (eating or passing by), and 5) Effectiveness of mitigation used (successful, partial success, unsuccessful). Other variables include: 1) crop type 2) crop stage (land preparation, seedling, immature, mature [ready for harvest], 3) Mitigation used in the area (physical barriers, guarding, patrolling, no mitigation), and 4) Nearest distance to elephant landscape resources (water, saltlick, and forest edge).

HEC events mostly happened during the mature stage of crops. 250 of the incident crops were mature/ready to harvest and followed by 49 incidents with crops in an immature state and 32 in the land preparation state. There were only two incidents at the seedling stage of crops.

Future plan

I am beginning the analysis. Multinomial logistic regression will be performed to test the variables that are associated with HEC events. HEC hotspot map will be developed to visualise the pattern of crop raiding events together with the analysis. A manuscript will also be developed and is expected to be finished by the end of November 2021.

Damage caused by elephants. The above is a mango tree and below property damage.

HEC Mitigation used in the area. From left, patrol team, trenches, and alarm fences.