



Food and Agriculture
Organization of the
United Nations



HWC Baseline Survey Report

Strengthening community-based human–wildlife conflict management in Cox’s Bazar



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Introduction

Elephants are keystone species that play a vital role in maintaining ecosystem function. In Bangladesh, the Asian elephant is critically endangered due to the shrinking of its natural habitat caused by fragmentation (IUCN Bangladesh, 2015). According to a census conducted by IUCN Bangladesh in 2016, the population of Asian elephants in the Chittagong region, Chittagong Hill Tracts, and Cox's Bazar is estimated to be between 210 and 330 individuals. As large mammals, elephants require a significant amount of food each day, prompting them to move from one forest to another through corridors. In Cox's Bazar, there are 03 identified corridors; however, these have been severely impacted by infrastructure development and settlements. Additionally, the creation of the Rohingya refugee camp has further obstructed a crucial corridor, isolating about 40 wild elephants. Consequently, the conflict between humans and elephants in this region has intensified, adversely affecting the elephant population and human property. Alongside elephants, other wildlife animals are also affected by losing core habitats including carnivore mammals, primates, birds, venomous and non-venous snakes, turtles, and amphibians. As a result, conflicts such as snake bites, crop damage by wild animals, and the intentional killing of snakes and other wild animals by humans in this region also increase over time.

To address human-elephant conflicts, IUCN Bangladesh has been collaborating with UNHCR in the Rohingya camps and surrounding host areas since 2018. Establishing coexistence between humans and elephants is vital for protecting the elephant population in this region. In October 2024, IUCN initiated a project with FAO titled "Strengthening Community-Based Human-Wildlife Conflict Management in Cox's Bazar." The project aims to engage the local community and the Forest Department through capacity development to reduce conflicts and ensure the protection of elephants and other wildlife animals. Additionally, support will be provided for non-preferred crops to vulnerable farmers in conflict-prone areas. A key activity in implementing this project involved conducting a baseline survey to identify areas in the Cox's Bazar South Forest Division that are prone to human-wildlife conflict (HWC).

Method

Survey plan and schedule

To identify the human-wildlife conflict-prone area, a detailed baseline survey was conducted in the Cox's Bazar South Forest Division covering the four administrative sub-districts including the Cox's Bazar Sadar, Ramu, Ukhiya and Teknaf Upazila. The survey was carried out for 12 days of active field work starting from 26 October to 07 November 2024 (Table 1). During this survey, 12 enumerators engaged who had experience with the questionnaire survey and got to know about the local dialect of the Cox's Bazar region. However, IUCN experts thoroughly described the method of the HWC survey and trained them on data collection tools before fieldwork (Figure 1).

Table 1: HWC survey plan and schedule

| Date | Forest Range | Forest Beat |
|-----------------|-----------------------|---|
| 26-October-24 | Rajarkul | Dariardighi, Upper Reju, Rajarkul |
| 27- October -24 | Panerchara, Doapalong | Panerchara, Tulabagan, Dhoapalong, Khuniapalong |
| 28- October -24 | Ukhiya | Dochari, Thainkhali, Ukhiya Ghat |

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| | | |
|-----------------|--------------------------|--|
| 29- October -24 | Whykheong | Shaplapur, Monkhali, Raikhiyong, Whykheong |
| 30- October -24 | Teknaf-Sadar | Teknaf-Sadar, Nhila, Madhya Nhila, Mochoni |
| 31- October -24 | Shilkhali | Shilkhali, Mathabhanga, Rajachara |
| 2-November-24 | Inani | Swankhali, Choto Inani, Iani |
| 3- November -24 | Inani, Cox's Bazar Sadar | Himchari, Rajapalong, Jaliapalong |
| 4- November -24 | Cox's Bazar Sadar | Kalatali, Chainda, Linkroad, Gilingja |
| 5- November -24 | Gap filling | Gap filling |
| 6- November -24 | Gap filling | Gap filling |
| 7- November -24 | Gap filling | Gap filling |

HWC data collection

To delineate the HWC-prone area, a total of 108 transects were created which covered 9 forest ranges and 33 forest beats in Cox's Bazar South Forest Division (Figure 2). The transects were outlined in a way to avoid the forest area and mainly focus on the buffer zones, households, and cultivated areas where conflicts mostly occurred by the elephants and other wild animals. Previous IUCN survey results on human-elephant conflict (2021) in this region were used as a baseline for selecting transects in this HWC survey.



Figure 1: Filed demonstration with enumerators on the HWC survey

HWC data was collected through a questionnaire survey targeting households and croplands (Figure 3). Besides, the footprints and dung data were also collected to understand the regular movement of elephants in recent times and validation of the response from the local people. The nature and scale of damages were determined through types of damage and frequency of damage within in last one year by the elephants. The injury and causality of humans were also taken to demark the intense HEC-prone areas. Additionally, damage caused by the other wildlife animals and the nature of interventions were delineated from the response by affected

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people. However, the detailed questionnaire is available in the Annex. The HWC data was collected using ArcGIS Survey123 application whereas SW Maps were followed to access the transect areas and record tract lines in the field (Figure 2). Finally, all GPS points were used to mark the HWC-prone area through mapping.

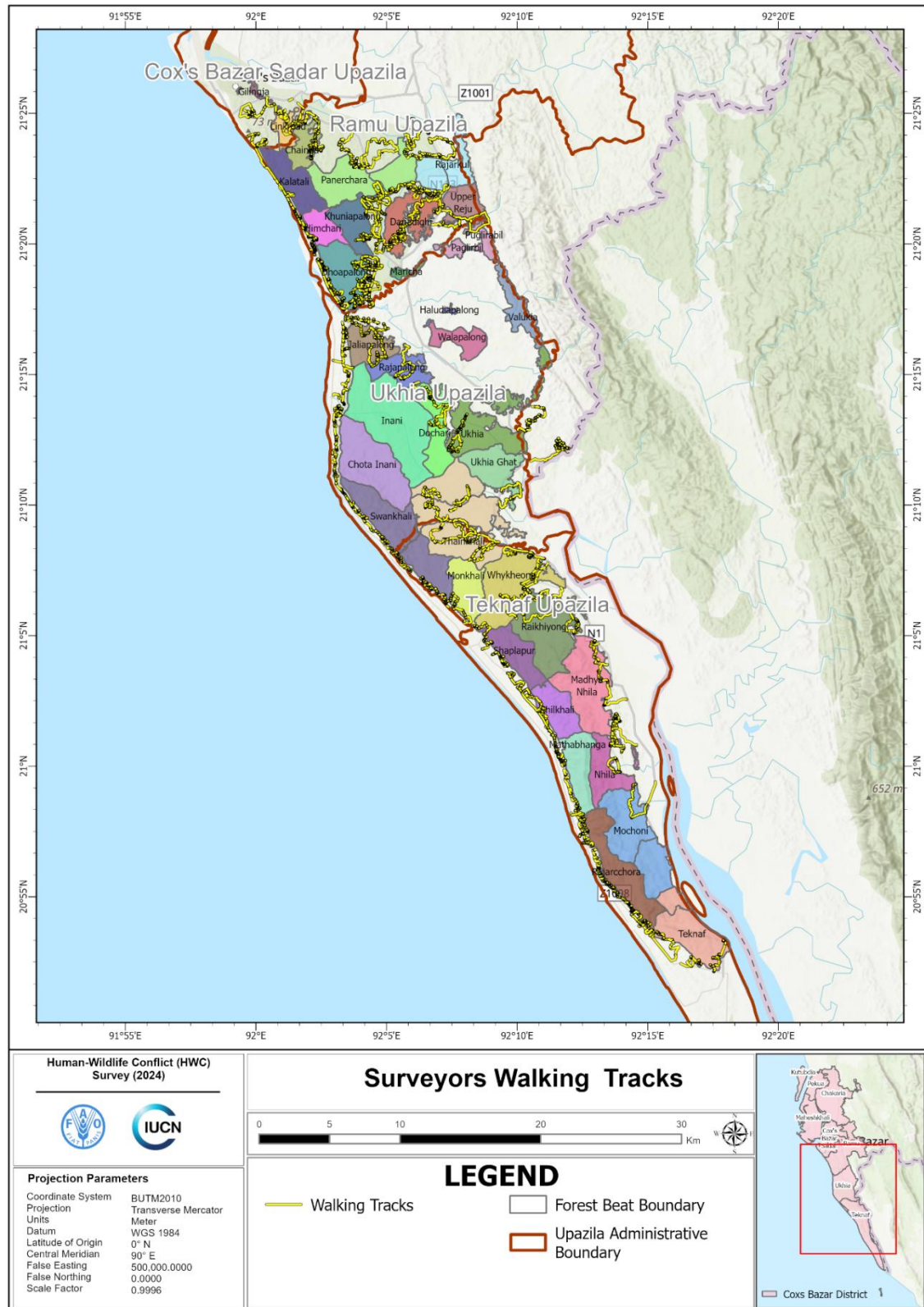


Figure 2: Survey tracts of the HWC survey in Cox's Bazar South Forest Division



Figure 3: HWC data collection by the enumerators



Figure 4: FAO visit during the HWC data collection

Result

A total of 954.87 km area was covered within 12 days to collect the HWC information from the four sub-districts including Cox's Bazar Sadar, Ramu, Ukhiya, and Teknaf. This survey resulted in 4204 observations, with 3234 respondents from households, 607 cultivated lands, and, 363 direct movement signs of elephants including dung (53) and footprints (310) (Figure 5; Table 2). From the direct signs, it was evident that elephant movement in human-dominated areas was relatively high in Teknaf upazila followed by Ukhiya, Ramu, and Cox's Bazar Sadar (Table 2).

Table 2: Overview of the HWC data collection in Cox's Bazar area

| Upazila | Cropland | Dung | Footprint | Household | Total |
|-------------|----------|------|-----------|-----------|-------|
| Cox's Bazar | 37 | 17 | 28 | 354 | 436 |
| Ramu | 177 | 9 | 48 | 940 | 1174 |
| Ukhiya | 161 | 10 | 96 | 874 | 1141 |
| Teknaf | 232 | 17 | 138 | 1066 | 1453 |
| Total | 607 | 53 | 310 | 3234 | 4204 |



Figure 5 Humam wildlife conflict data collection (a) footprint (b) dung (c) cropland farmer (d) household

Human-elephant Conflicts in Cox's Bazar

The HEC frequency over the past year was used to delineate the scale of the conflict zones in four Upazilas. To assess the scale, five categories were applied: very high (frequency >150 times), high (101-150 times), moderate (51-100 times), low (26-50 times), and very low (1-25 times) (Table 3). According to this categorization, the Shilkhali area was identified as a very high HEC-prone area, where 33 respondents reported more than 150 instances of elephant visits and damage (Figure 6,7 and 8; Table 3). Following Shilkhali, Inani was identified as another high HEC-prone area, where 49 respondents reported 101-150 instances of elephant damage in the past year (Figure 7; Table 3). A very high HEC frequency was also observed in the Rajakul area of Ramu Upazila (Table 3). In contrast, only low and very low categories of HEC frequency were recorded in Cox's Bazar Sadar Upazila. (Figure 6; Table 3).

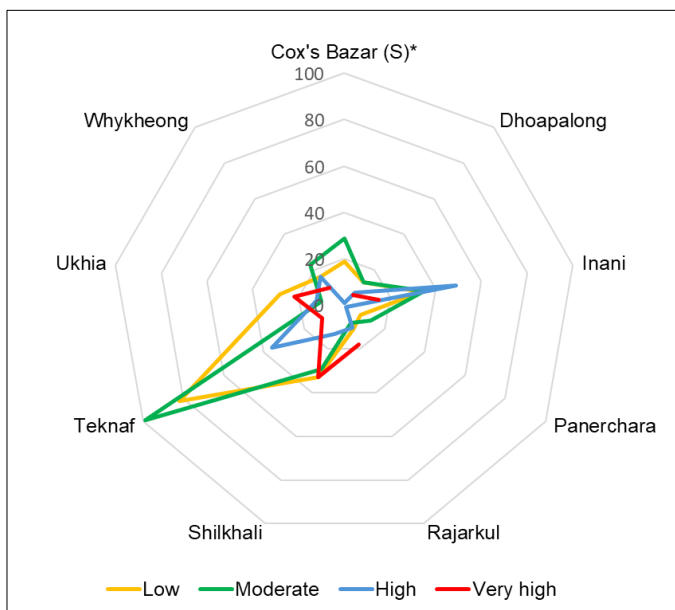


Figure 6 : Human-wildlife conflict in different forest ranges in Cox's Bazar

Table 3: Scale of the HEC-frequency in Cox's Bazar

| Upazila | Range | The number of respondents mentioned on the HWC frequency | | | | | Total |
|-------------|-------------------|--|-------------|-------------------|----------------|------------------|-------|
| | | Very low (1-25) | Low (26-50) | Moderate (51-100) | High (101-150) | Very high (>150) | |
| Cox's Bazar | Cox's Bazar Sadar | 69 | 1 | - | - | - | 70 |
| Cox's Bazar | Ramu | 141 | 18 | 29 | 1 | - | 189 |
| Ramu | Dhoapalong | 206 | 13 | 13 | 7 | 6 | 245 |
| Ramu | Rajarkul | 137 | 11 | 8 | 10 | 18 | 184 |
| Ramu | Panerchara | 108 | 8 | 13 | 1 | - | 130 |
| Ukhiya | Inani | 244 | 34 | 35 | 49 | 15 | 377 |
| Ukhiya | Ukhia | 149 | 28 | 10 | 12 | 22 | 221 |
| Teknaf | Shilkhali | 86 | 33 | 29 | 13 | 33 | 194 |
| Teknaf | Teknaf | 329 | 82 | 99 | 36 | 11 | 557 |
| Teknaf | Whykheong | 190 | 16 | 23 | 16 | 10 | 255 |
| Teknaf | Grand Total | 1659 | 244 | 259 | 145 | 115 | 2422 |

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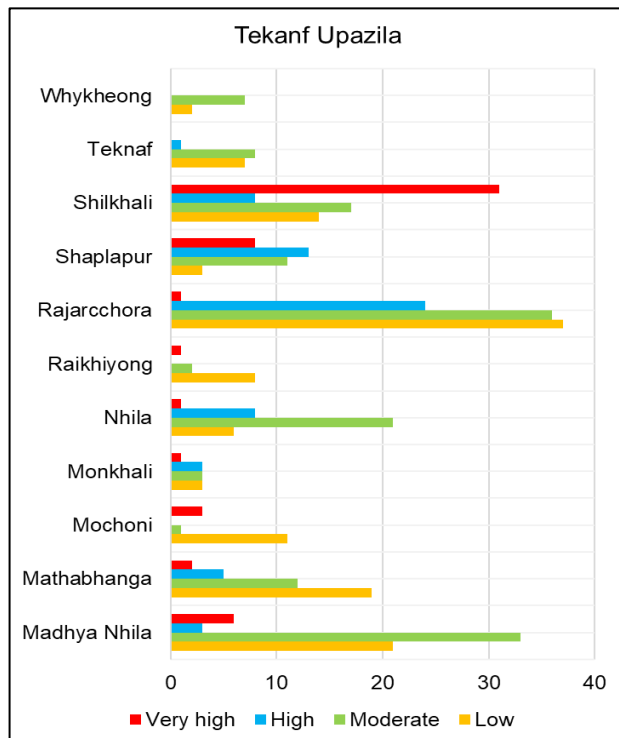
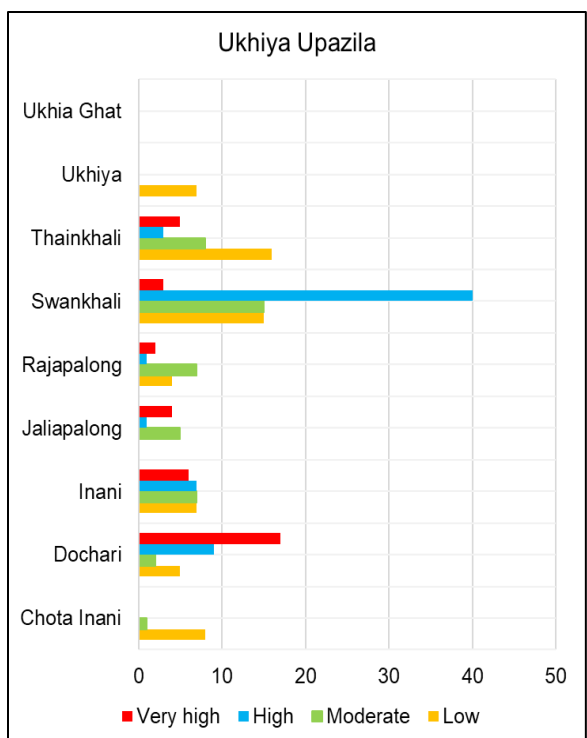
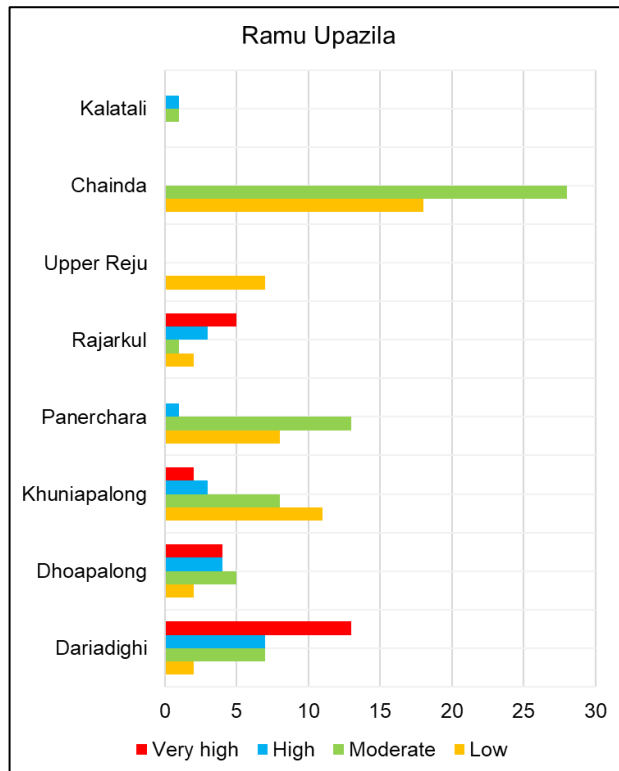
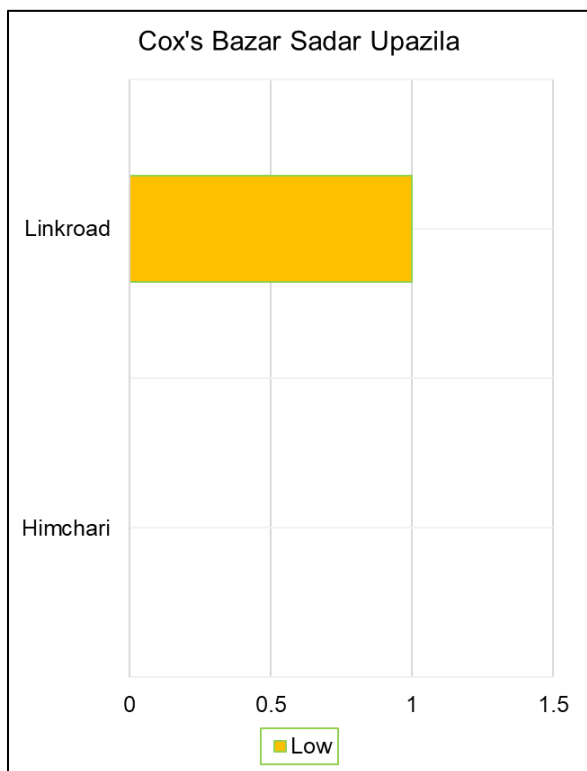
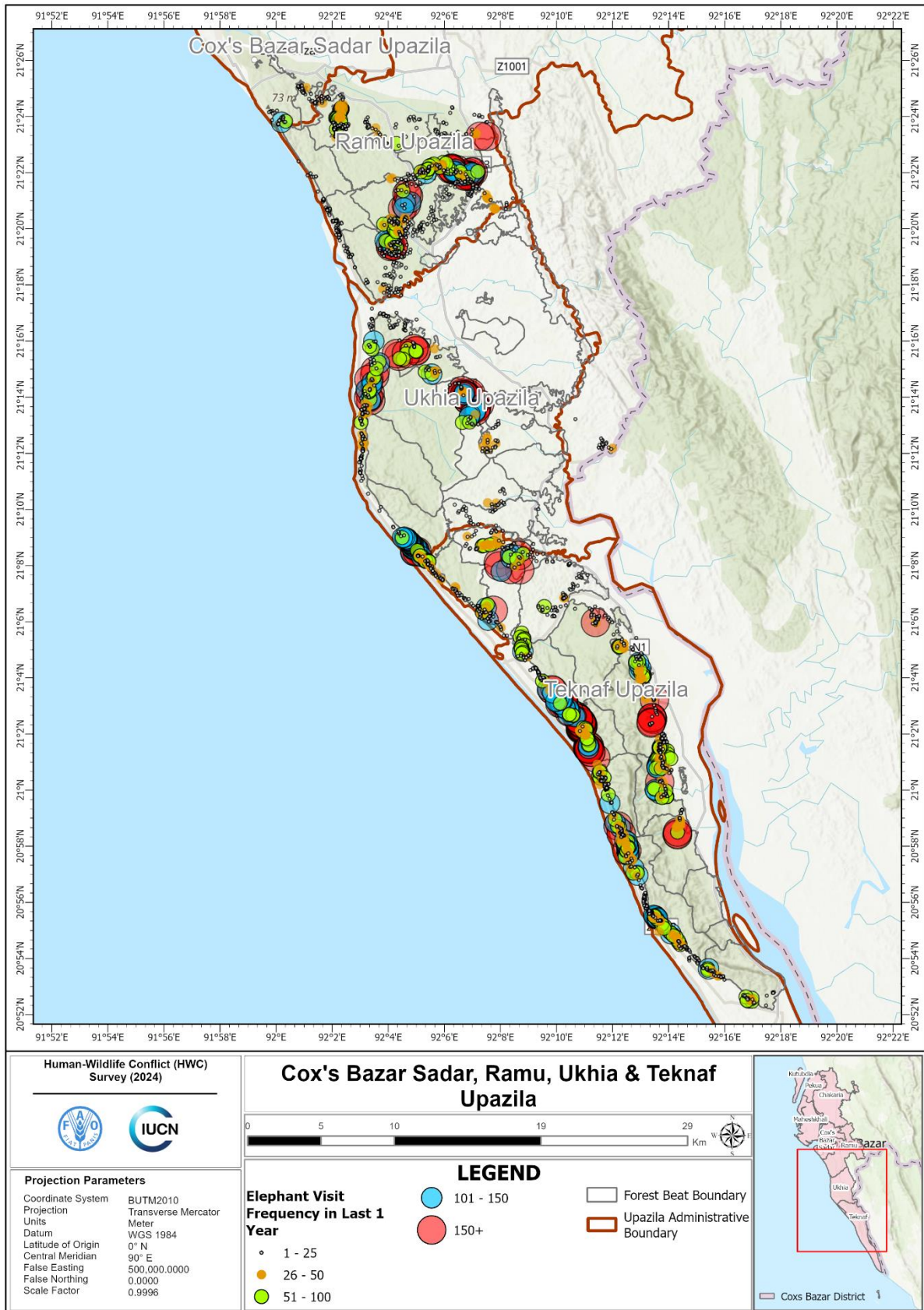


Figure 7: HEC in four subdistricts in Cox's Bazar

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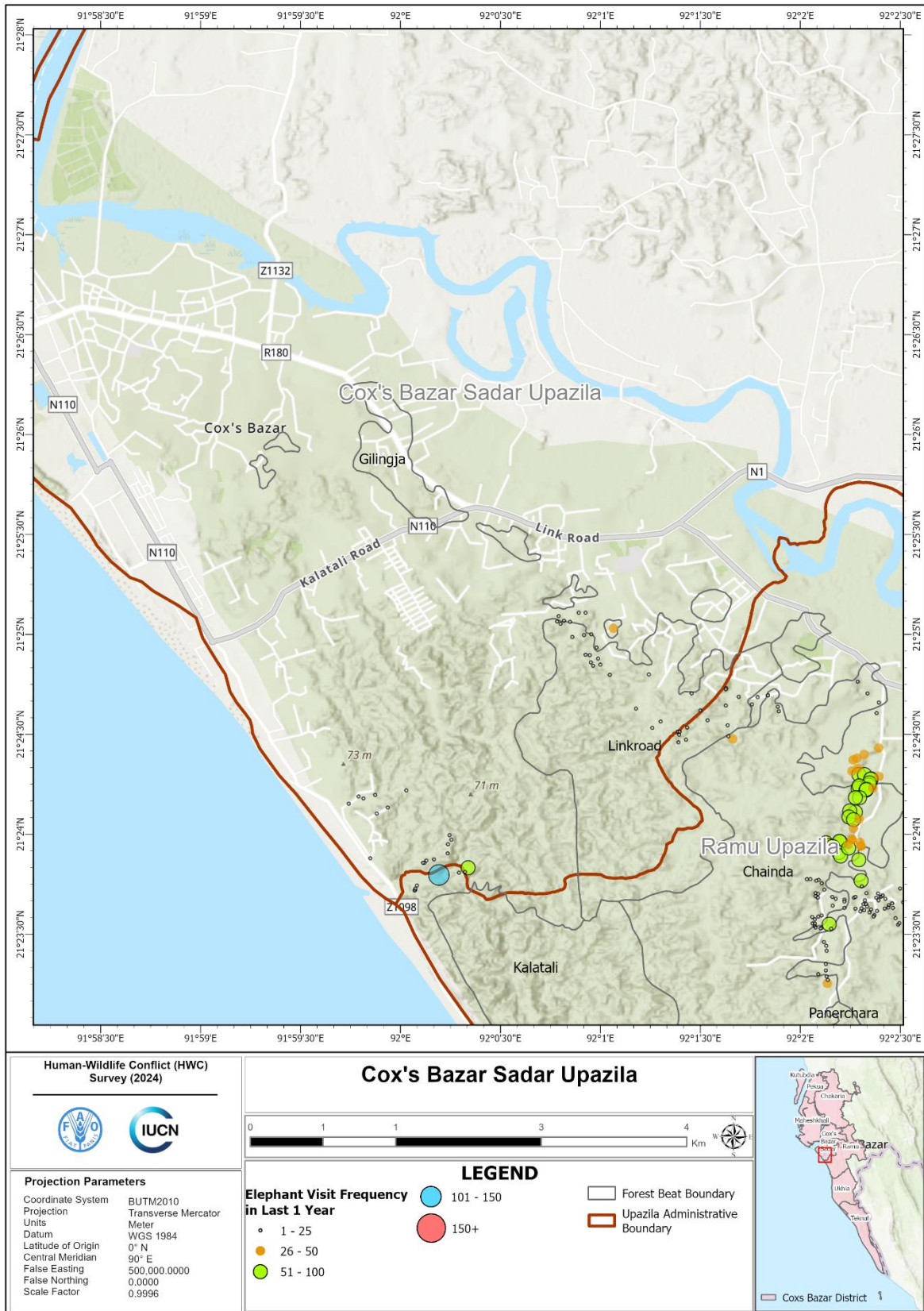


Figure 9: HEC in the Cox's Bazar Sadar Upazila

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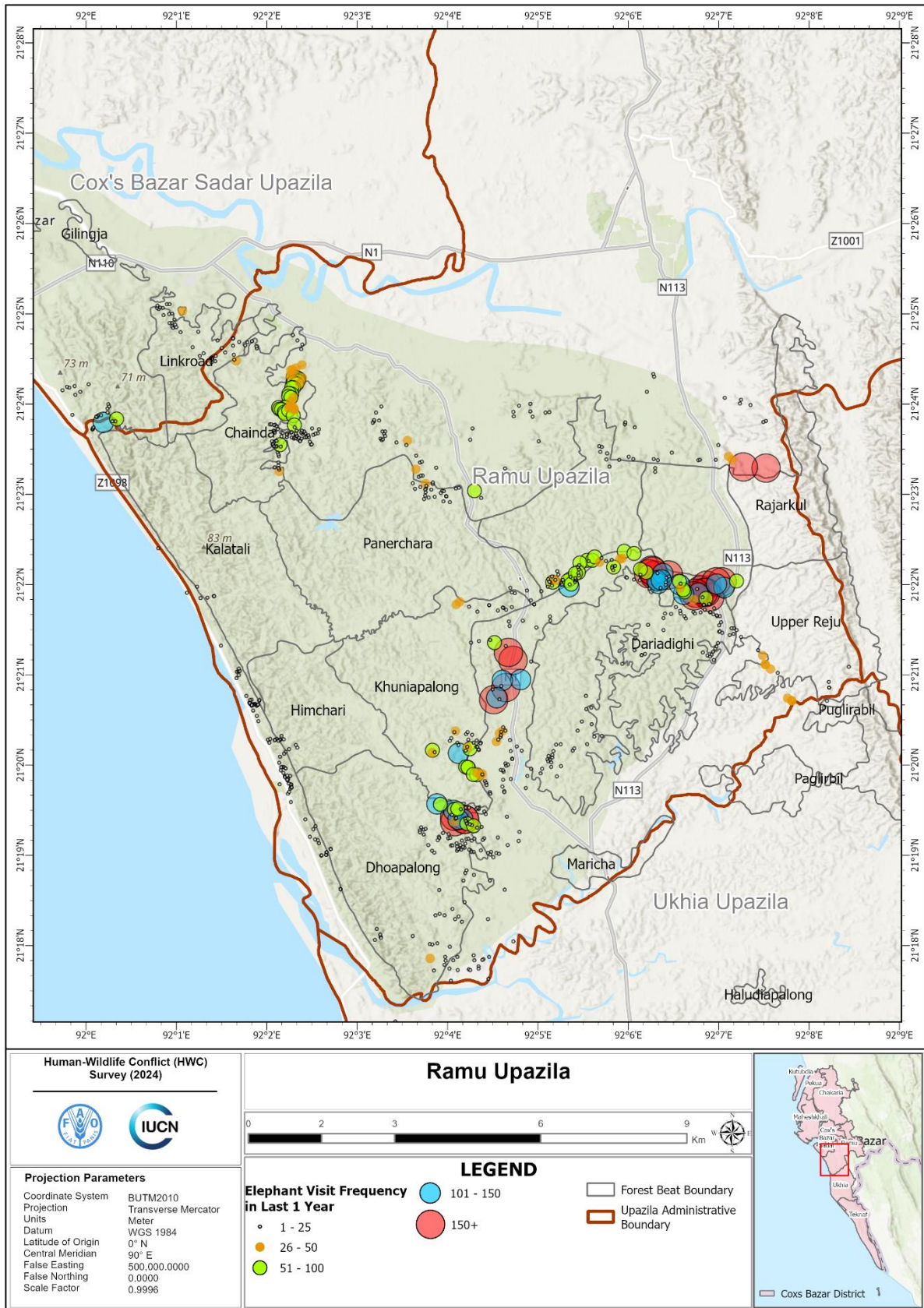


Figure 10: HEC in the Ramu Upazila

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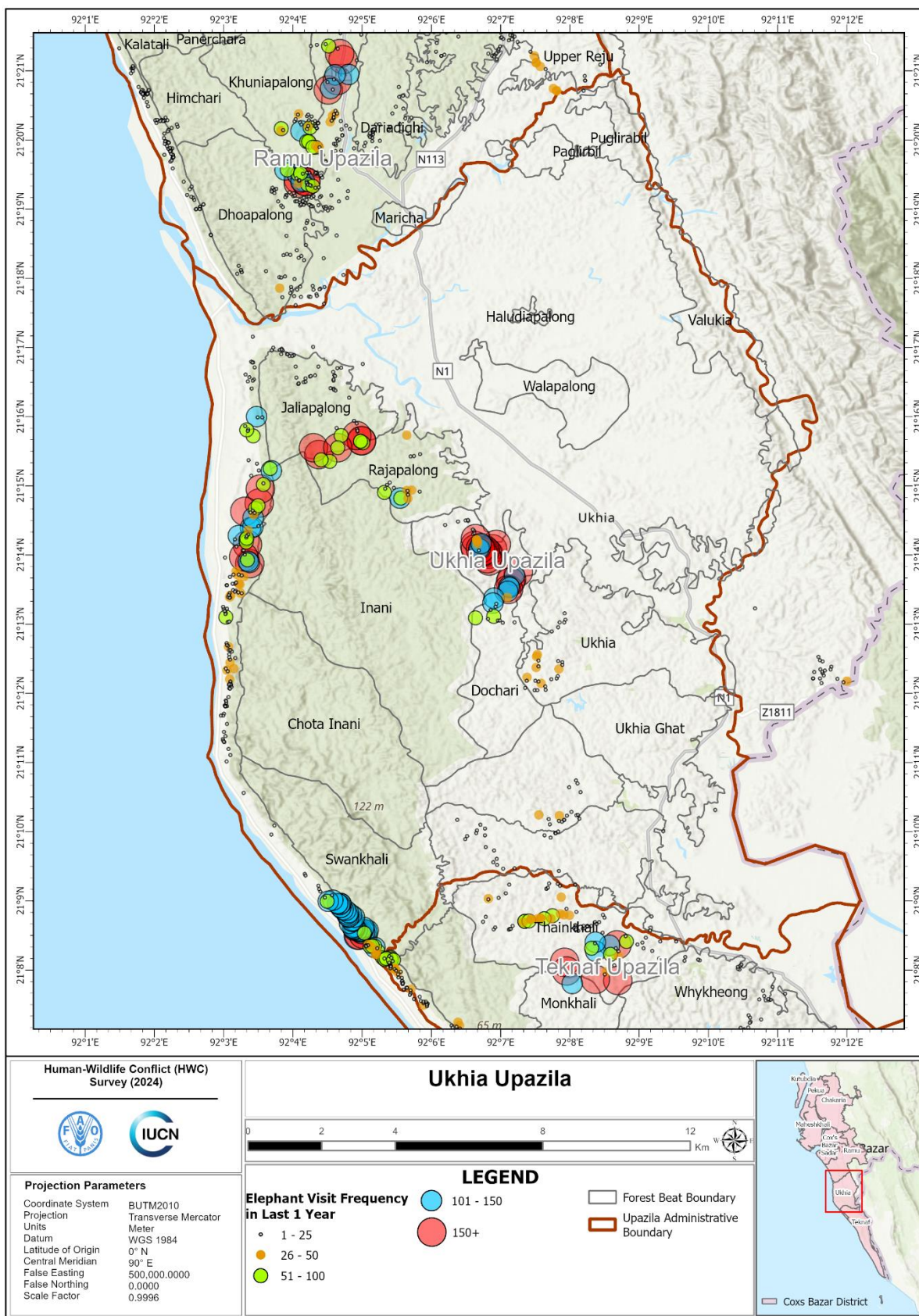


Figure 11: HEC in the Ukhia Upazila

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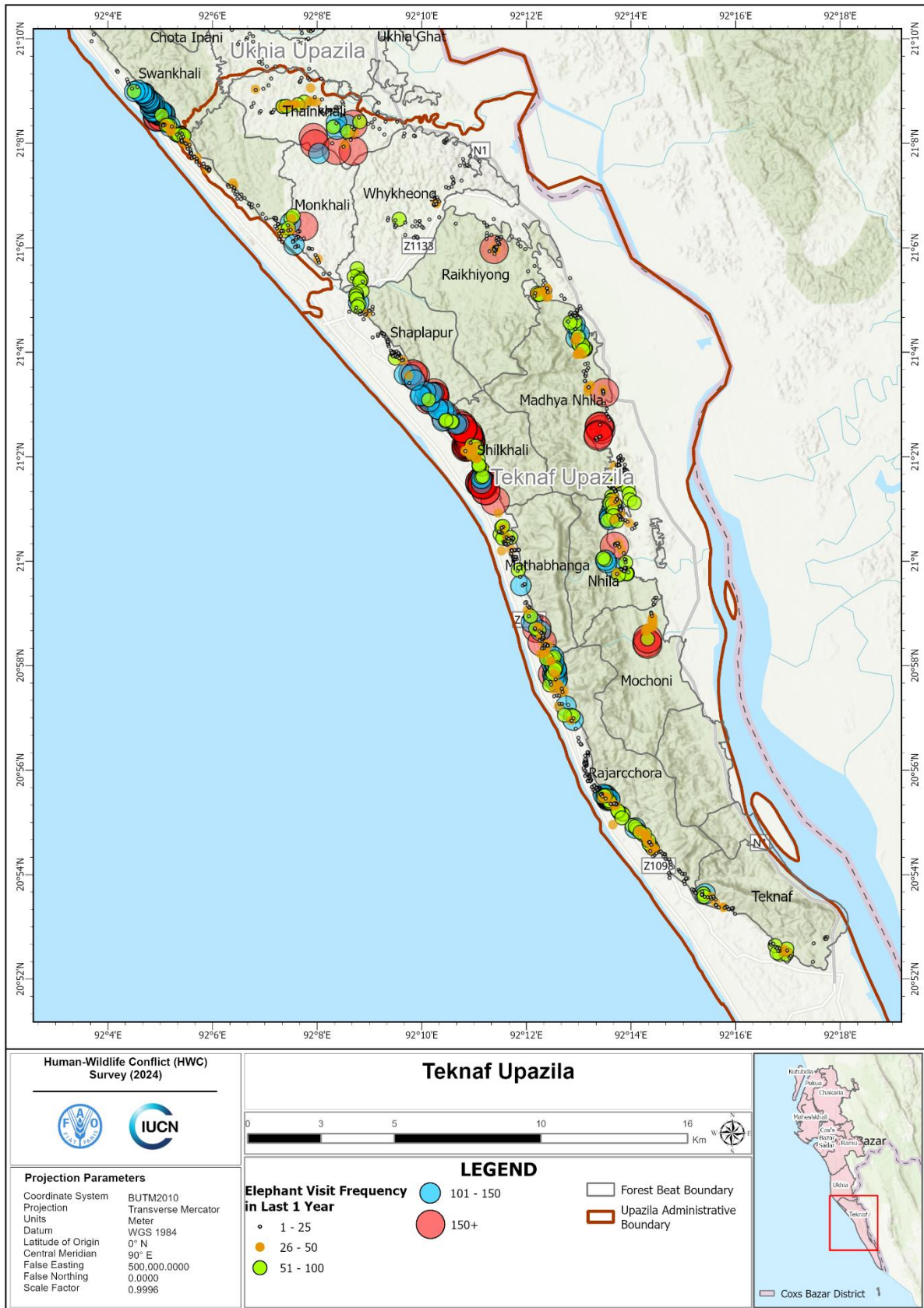


Figure 12: HEC in the Teknaf Upazila

Human-elephant conflict-prone areas following the forest beats

Overall, Shilkhali and Rajachara were found to be very high and high categories of the HEC-prone areas respectively, under the Teknaf Upazila (Figure 7; Figure 12). In Ukhiya, the HWC frequency was categorized as very high and high in the Dochari and Swankhali areas respectively (Figure 7; Figure 11). Although HWC frequency was low in Ramu, Dariadighi area was found to be a high conflict zone where both very high and high categories responses were quantified than other areas (Figure 7; Figure 10). Only a low category of HWC frequency was found in the Liankroad area from Cox’s Bazar Sadar Upazila (Figure 7; Figure 9).

Nature of damage by wildlife animals

Most of the respondents reported that elephants primarily damaged the homestead plantation while roaming around the household areas at night (Figure 13). Occasionally, they damage the households of the local people while seeking stored paddy or vegetables. Raiding crops and vegetables was also very common during the harvesting season. Human injury caused by wild elephants is rare but can occur when locals attempt to deter them during household invasions or crop raiding (Figure 13).

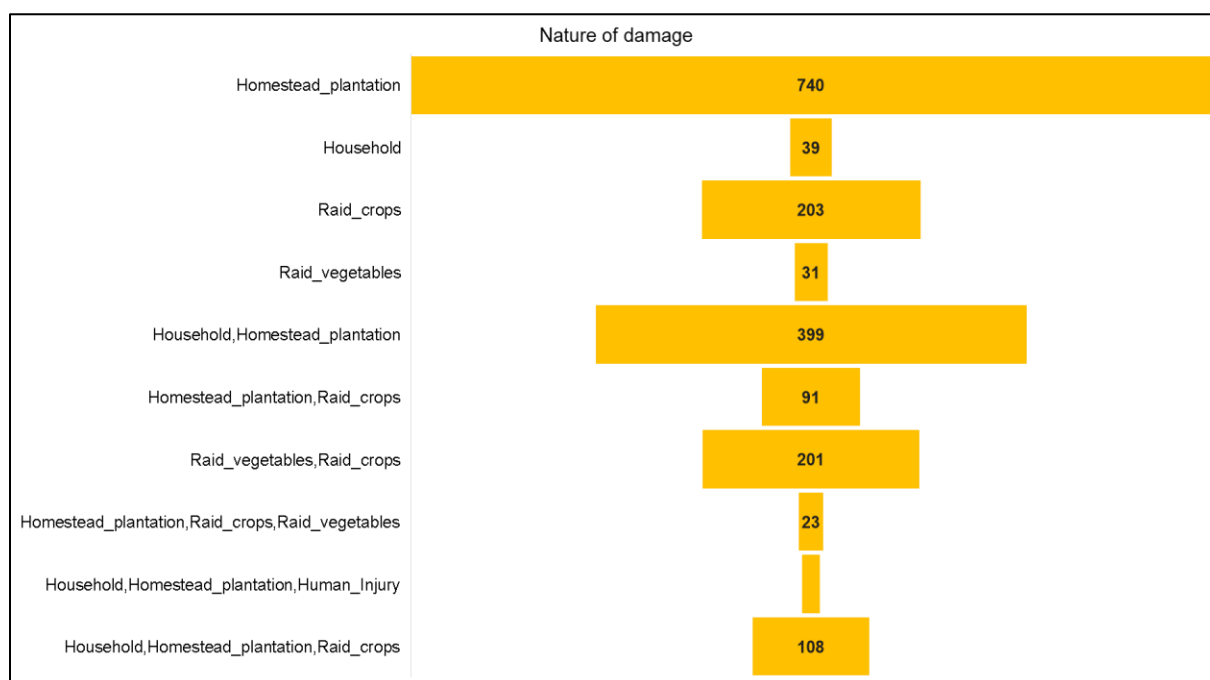


Figure 13: Types of damages by the wildlife animals

Spatial types of damage by wildlife animals

While comparing the nature of damages, it was evident that they were spatially varied in Cox’s Bazar area. The homestead plantation was mostly damaged in the Inani and Teknaf range area whereas household invasion was prominent in Teknaf followed by Shilkhali and Ukhiya (Figure 14). Although crop raiding was common in different ranges, Dhopalong was the most affected area followed by Whykong (Figure 14). Overall, vegetable damage was found to be high in Ukhiya after Teknaf range. Finally, human injury tends to be high in the Shilkhali area followed by the Inani and Teknaf (Figure 14).

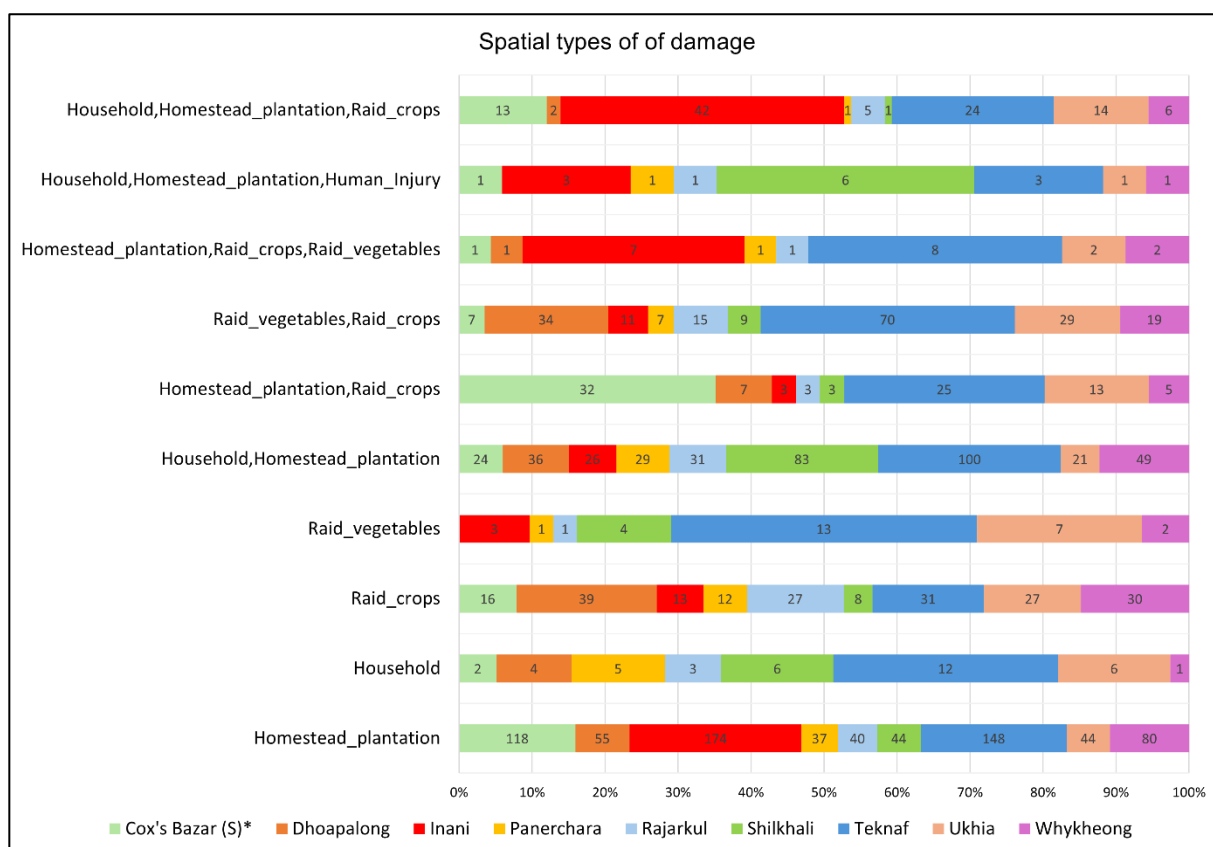


Figure 14: Types of damages in Cox’s Bazar area

HWC conflict related to other wild animals

Overall, 2260 respondents mentioned the damage to other wild animals including the Wild Boar, Jungle Cat, Small-Indian Mongoose, Asian Golden Jackal, and Indian Porcupine. Some respondents also mentioned Pythons and monkeys, although they were aware of the species. The nature of the damages was mainly poultry (chickens and ducks), occasionally goats, and crops and vegetables. However, the Teknaf was the most HWC-prone area in terms of damage caused by other wild animals rather than elephants and followed by Doapalung and Inani range areas (Figure 15; Table 4). In contrast, Shilkhali, Panerchara and Rajarkul were the least HWC-prone areas (Figure 15; Table 4). However, it is difficult to understand the scale of conflict between humans and other wildlife in this region based on the questionnaire survey because it persists in all forest ranges (Figure 16). A long-term study is needed implying camera traps to delineate the conflict scenario of other wildlife animals.

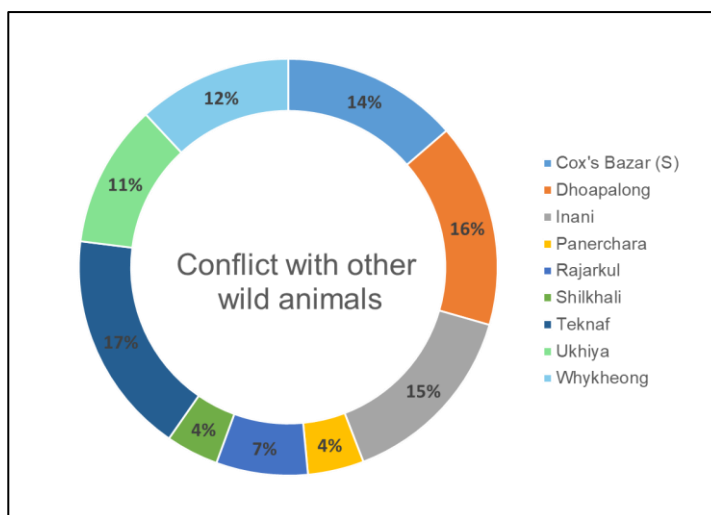


Figure 15: Conflict scenario of the other wildlife

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Table 4: HWC through other wildlife animals in Cox's Bazar region

| Forest Range | Number of respondents |
|-------------------|-----------------------|
| Cox's Bazar Sadar | 308 |
| Dhoapalung | 358 |
| Inani | 332 |
| Panerchara | 98 |
| Rajarkul | 160 |
| Shilkhali | 92 |
| Teknaf | 392 |
| Ukhiya | 251 |
| Whykheong | 269 |
| Grand Total | 2260 |

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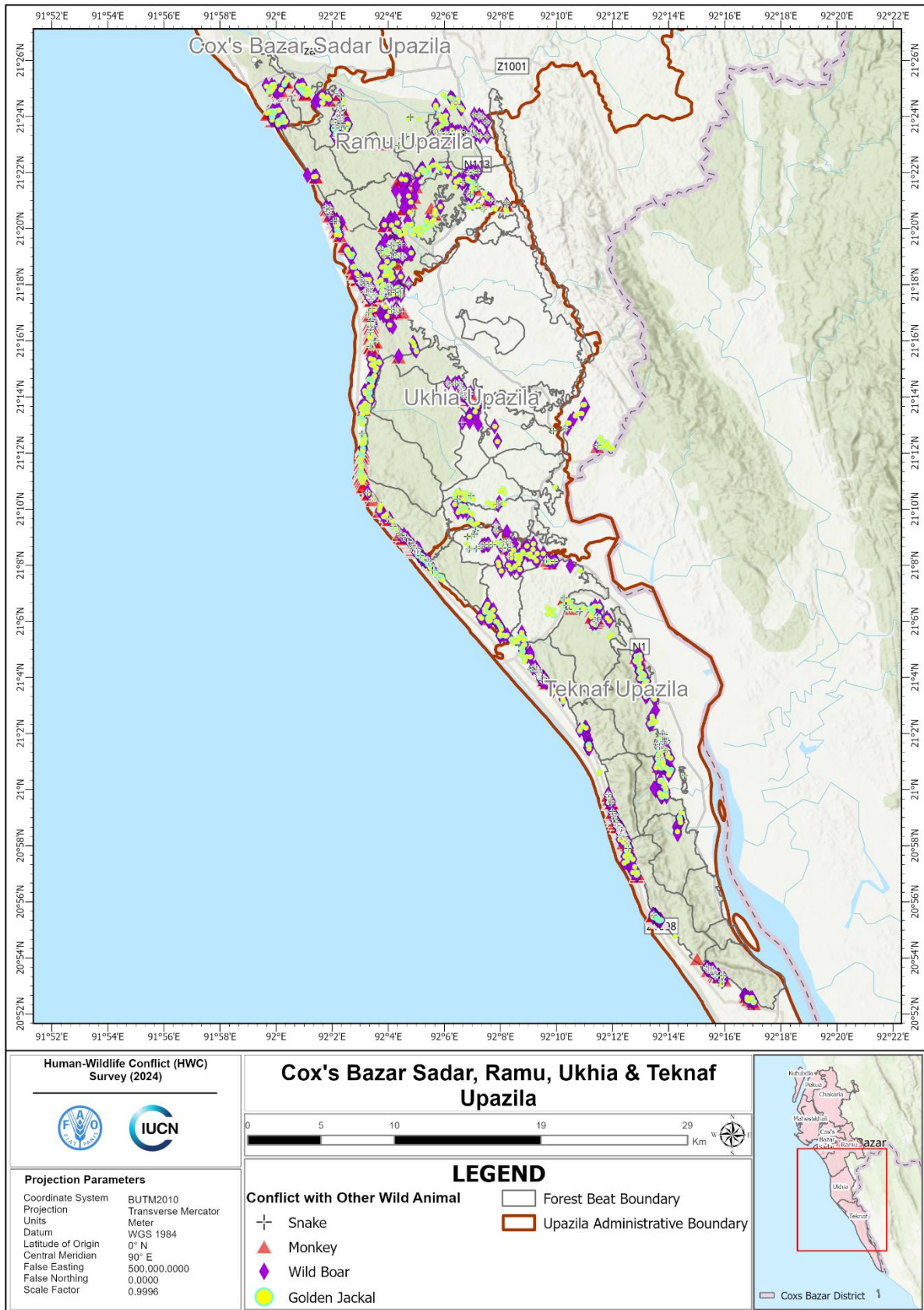


Figure 16: Conflict between human and other wild animals in Cox's Bazar

Way forward from the HWC-baseline survey

- Identification of the 1400 forest-dependent households (HHs) for the non-preferred crop support.
- Selection of the 150 HHs to capacitate wildlife non-preferred crop farming.
- Identification of the 100 HHs to provide logistic support and training to mitigate human-wildlife conflicts.

Annex

Strengthening community-based human–wildlife conflict management in Cox’s Bazar

Human-Wildlife Conflict Baseline (HWC) Survey 2024

Questionnaire

General

1. **Date:**
2. **Name of the Surveyor:**
3. **Type of response:**
 - Household
 - Cropland
 - Dung
 - Footprint

HWC information

4. **Does elephant visit in your area?**
 - Yes
 - No
5. **If yes, do they cause any damage?**
 - Yes
 - No
6. **What kind of damages are caused by elephants?**
 - Raid crops
 - Raid vegetables
 - Homestead plantation
 - Household
 - Human injury

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- Human death
- 7. How many times elephants came in last one year?**
- 8. Do elephants come and damage in a regular basis?**
 - Yes
 - No
- 9. Does an elephant die in your area within the last one year?**
 - Yes
 - No
- 10. Do other wild animals cause any damage?**
 - Yes
 - No
- 11. If yes, which wild animals?**
 - Wild Boar
 - Golden Jackal
 - Monkey
 - Porcupine
 - Snake
 - Others
- 12. If others, please mention them.**
- 13. What kind of damage is caused by the wild animals?**
 - Crop
 - Vegetable
 - Poultry
 - Human injury
 - Human death
 - Others
- 14. If others, please mention them?**
What kind of damage is caused by the other wild animals?
 - Crop
 - Vegetable
 - Poultry
 - Human Injury
 - Others

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15. If others please mention?

16. GPS point: