ATLAS

ELEPHANT ROUTES AND CORRIDORS IN BANGLADESH
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The conservation significance of Asian Elephants is widely recognized in the world, across all the Asian Elephant range countries. Referred to as engineers of the forests, they act as an integral part of the ecosystems they inhabit. Over the past century, the number of elephants has declined drastically with disappearing forest cover and it is no different in Bangladesh. Elephants were once widespread in most of the forests of the country, but it has now reached the brink of extinction, categorized as Critically Endangered in Bangladesh. The conservation of Asian Elephants, therefore, deserves appropriate attention in Bangladesh.

Accepting the reality and recognizing the necessity for taking urgent steps, Bangladesh Forest Department, with the financial support from The World Bank has undertaken a project entitled ‘Strengthening Regional Cooperation for Wildlife Protection (SRCWP)’. This project is by far the largest initiative of Bangladesh Forest Department to conserve the most vulnerable wildlife species and their habitats in Bangladesh. The sub-project entitled ‘Status Survey and Development of Elephant Action Plan (SSDEAP)’ implemented by IUCN Bangladesh is one of the key initiatives of the SRCWP Project that focused solely on the conservation of Asian Elephants. Atlas: Elephant Routes and Corridors in Bangladesh is one of the main outcomes of this sub-project. Undisturbed routes and corridors are essential for the free movement and survival of a foraging species like elephants in the natural environment. However, due to the establishment of settlements and other human interventions, there are interruptions or permanent fragmentation of routes and corridors. This atlas is of enormous benefit because for the very first time in Bangladesh this publication illustrates the comprehensive GIS-based imageries of the elephant routes, corridors, human-elephant conflict sites and transboundary crossing points spread across entire elephant ranges of Bangladesh. The principal aim of this book is two-folded. First, to provide detail maps of the routes, corridors, human-elephant conflict sites and transboundary crossing points with all necessary references so that it can be used as an inclusive reference for future conservation actions. Second, to depict the present status, relevant threats, and challenges towards improving the routes and corridors as well as habitat condition, to direct relevant policies and site-specific conservation interventions.

I hope this important publication will be extremely helpful for its target audiences and have a significant impact in ensuring the healthy survival of elephants in the wilderness of Bangladesh.

Md. Abdul Mabud
Project Director
Strengthening Regional Cooperation for Wildlife Protection Project
Bangladesh Forest Department
Asian Elephants play the crucial role of umbrella and flagship species for most of the remaining Asian forest ecosystems. The importance of this magnificent species in maintaining complex biodiversity and ecosystem resources is now widely recognized. Asian Elephants are already in peril as most of their habitats are threatened in Bangladesh. Among other challenges, habitat loss is the leading reason for jeopardizing the fate of the remaining wild elephant populations. Bangladesh has the responsibility to protect and ensure the steady survival of this species within their natural environment.

Considering its conservation significance against all odds, the Government of Bangladesh is committed to elephant conservation. In recent times, it has brought the species under several conservation endeavors. As a custodian of elephants and its habitat, we need to make sure that sufficient attention and resources are channeled to the conservation of elephants.

This publication, for the first time ever, illustrates geo-satellite based maps of all known routes and corridors used by the Asian elephants in Bangladesh. This also demonstrates the need for a holistic and fortified conservation attempt to save this flagship species through committed Government efforts and partnership at all levels. I believe this publication will be a worthy addition to the ongoing efforts of the Government of Bangladesh to help conserve this majestic wildlife.

Md. Yunus Ali
Chief Conservator of Forests
Bangladesh Forest Department
Wild elephants create an environment conducive to the regeneration of healthy forest ecosystems. Being a keystone species, elephants often benefit other species. In Bangladesh, most elephants are found in the forest areas of Chittagong Hill Tracts, Chittagong, Cox’s Bazar, Sherpur, Mymensingh and Sylhet. Elephant ranges in Bangladesh have mostly become confined due to small patches occupied by only a single or few small herds. This is due to degradation of forests from unsustainable slash and burn practice, monoculture and intensification of agricultural practice, unplanned construction of roads and sprawling human settlements. Other reasons attributable to the decline of elephants in Bangladesh are destruction of habitats, fragmentation, scarcity of food and lack of sustainable management practices. The above circumstances have resulted in isolated elephant habitats connected with narrow corridors and movement paths. Both routes and corridors are under heavy anthropogenic pressure, causing a sharp spike in human-elephant conflicts and ultimately putting the species in the Critically Endangered category in the IUCN Red List of Bangladesh.

Elephants follow a specific route in their movement and this is passed down genetically from generation to generation. A comprehensive mapping of elephant movement routes and corridors is essential to identify the ecological requirements and their home ranges in Bangladesh. IUCN Bangladesh has taken the initiative and developed elephant Atlas: Elephant Routes and Corridors in Bangladesh, which is a giant step towards that direction.

This is the first initiative for chalking out and presenting comprehensive geo-satellite based elephant routes and corridors maps in Bangladesh. I am hopeful that the findings of this study will strengthen the management of elephants and their habitats. I also believe this book will play an important role to foster the ongoing and future efforts for the conservation of Asian Elephants in Bangladesh.

Ashit Ranjan Paul
Conservator of Forests
Wildlife and Nature Conservation Circle
and
Deputy Project Director
Strengthening Regional Cooperation for
Wildlife Protection Project
Bangladesh Forest Department
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This Atlas has been prepared with primary data collected from all elephant ranges spread across the country and involved transect surveys inside the forest areas, social surveys with relevant informants, and consultations with concerned communities. We express our heartiest gratefulness to all the local level Forest Department officials including the Forest Rangers, Beat Officers, and Foresters who provided information and extended their cooperation during the data collection and information gathering process.

Our special thanks also go to Dr. Raman Sukumar, prominent elephant expert for providing his technical feedback and valuable suggestions for organizing this Atlas. We would also like to recall the contributions from Dr. A.H.M. Rafiul Sarker of Chittagong University, for his input during the preparation of the methodology for the research. Thanks also go to Ms. Remeen Firoz for her input as language editor.

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Ishitaq Uddin Ahmad
Country Representative
IUCN Bangladesh
<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
</tr>
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<tbody>
<tr>
<td>ASTER</td>
<td>Advanced Spaceborne Thermal Emission and Reflection Radiometer</td>
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<td>BFD</td>
<td>Bangladesh Forest Department</td>
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<tr>
<td>BND</td>
<td>Boundary</td>
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<tr>
<td>BTM</td>
<td>Bangladesh Transverse Mercator</td>
</tr>
<tr>
<td>CHT</td>
<td>Chittagong Hill Tracts</td>
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<tr>
<td>EROS</td>
<td>Earth Resources Observation and Science</td>
</tr>
<tr>
<td>FD</td>
<td>Forest Department</td>
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<tr>
<td>GIS</td>
<td>Geographic Information Systems</td>
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<td>HEC</td>
<td>Human-Elephant Conflict</td>
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<tr>
<td>IUCN</td>
<td>International Union for Conservation of Nature</td>
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<tr>
<td>Km</td>
<td>Kilometer</td>
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<tr>
<td>LGED</td>
<td>Local Government and Engineering Department</td>
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<td>MoEF</td>
<td>Ministry of Environment and Forests</td>
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<tr>
<td>OLI</td>
<td>Operational Land Imager</td>
</tr>
<tr>
<td>RIMS</td>
<td>Resources Information Management System</td>
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<td>SoB</td>
<td>Survey of Bangladesh</td>
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<tr>
<td>SRCWP</td>
<td>Strengthening Regional Cooperation for Wildlife Protection</td>
</tr>
<tr>
<td>SSDEAP</td>
<td>Status Survey and Development of Elephant Action Plan for Bangladesh</td>
</tr>
<tr>
<td>FGD</td>
<td>Focused Group Discussion</td>
</tr>
<tr>
<td>GoB</td>
<td>Government of Bangladesh</td>
</tr>
<tr>
<td>TM</td>
<td>Thematic Mapper</td>
</tr>
<tr>
<td>SFNTC</td>
<td>Social Forestry Nursery Training Centre</td>
</tr>
<tr>
<td>Union Parishad</td>
<td>Union Council; Union is the lowest local government unit of Bangladesh</td>
</tr>
<tr>
<td>Upazila Parishad</td>
<td>Local government body; Upazila is the lowest administrative unit of Bangladesh</td>
</tr>
<tr>
<td>Mouza</td>
<td>Lowest revenue collection unit</td>
</tr>
</tbody>
</table>
# Table of Contents

## Section 1

1.1 Introduction .......................................................... 1
1.2 Routes, Corridors and Transboundary Crossing Points .......... 4
1.3 Why Mapping of Routes, Corridors and Transboundary Crossing Points is So Important .................. 5
1.4 Road to This Atlas .................................................... 6
1.5 Key Findings ........................................................... 7
1.6 How This Atlas is Organized ........................................ 8

## Section 2

2.1 Cox’s Bazar South Forest Division ................................ 11
  Teknaf Sadar Range ................................................... 14
  Shikhalı Range ......................................................... 15
  Whykheong Range .................................................... 16
  Inani Range ............................................................ 17
  Ukhaı Range ........................................................... 18
  Dhupalong Range ...................................................... 19
  Cox’s Bazar Sadar Range ........................................... 20
  Panerchara Range ..................................................... 21
  Rajarkul Range ......................................................... 22

2.2 Cox’s Bazar North Forest Division ................................ 23
  Bagkhali Range ......................................................... 26
  Joarianala Range ..................................................... 27
  Meherghona Range .................................................. 28
  Idgar Range ............................................................ 29
  Idgaon Range .......................................................... 30
  Fulcharı Range .......................................................... 31
  Fashiakhali Range ................................................... 32

2.3 Chittagong South Forest Division .................................. 33
  Kalipur Range .......................................................... 36
  Madarsha Range ....................................................... 37
  Jaldi Range .............................................................. 38
  Chunati Wildlife Range .............................................. 39
  Chunati Range .......................................................... 40
  Padua Range ............................................................ 41
  Dohazari Range ........................................................ 42
  Patiya Range ............................................................ 43
  Khurushia Range ...................................................... 44
  Rangunia Range ........................................................ 45

2.4 Lama Forest Division .................................................. 47
  Naikhongchhari Range ................................................ 50
  Sangu Range ............................................................ 51
  Lama Sadar Range ..................................................... 52
  Daluchari Range ....................................................... 53
2.5 BANDARBAN FOREST DIVISION  
  Bandarban Sadar Range  
  58

2.6 CHITTAGONG HILL TRACTS  
SOUTH FOREST DIVISION  
  Kaptai Range  
  62
  Karnafuly Range  
  63
  Raikhali Range  
  64

2.7 CHITTAGONG HILL TRACTS  
NORTH FOREST DIVISION  
  Pablakhali Range (Bhasanya Adam Union)  
  68
  Pablakhali Range (Baghachatar Union)  
  69
  Pablakhali Range (Amlali and Gutshakhali Union)  
  70

2.8 MOULVIBAZAR FOREST DIVISION  
(JURI RANGE)  
  71

2.9 MYMENSINGH FOREST DIVISION  
  Durgapur Range  
  74
  Mymensingh Sadar Range  
  77
  Madhutila Range  
  78
  Rangtia Range  
  79
  Balijuri Range  
  80
  Jamalpur Range (SFNTC)  
  81

3.1 ELEPHANT CORRIDORS IN  
BANGLADESH  
  Ukhia-Ghundhum Corridor  
  85
  Tulabagan-Panerchara Corridor  
  86
  Naikhongchari-Rajarkul Corridor  
  87
  Bhomariaghona-Raighat Corridor  
  88
  Tulatali-légar Corridor  
  89
  Khuntakhali-Medhakassapia Corridor  
  90
  Fashiakhali-Chairakhali Corridor  
  91
  Fashiakhali-Manikpur Corridor  
  92
  Chunati-Satgar Corridor  
  93
  Lalutia-Barduara Corridor  
  94
  Sukhibilash-Kodala Corridor  
  95
  Narischa-Kodala Corridor  
  96

4.1 TRANSBOUNDARY ELEPHANT  
CROSSING POINTS  
  Natural Transboundary Crossing Points  
  100
  Abandoned Transboundary Crossing Points  
  101
  Vagrant Transboundary Crossing Points  
  102

REFERENCES  
  103
INTRODUCTION
1.1 INTRODUCTION

Elephants exhibit true evolutionary adaptation through their large body size, to feed upon coarse plant materials and to withstand all predators. There are two species of elephants which can be found currently: the Asian Elephants (Elephas maximus) and the African Elephants (Loxodonta africana). Bangladesh is in the particular list of 13 Asian Elephant Range Countries together holding 35,000 - 40,000 wild elephants that still roam around freely [Figure 1].

In Bangladesh, resident wild elephants are present mostly in the forests of Chittagong, Chittagong Hill Tracts (CHT) and Cox’s Bazar areas. Transboundary elephants occur in the central-north and southeast international borders, with ranges overlapping with India and Myanmar. Elephants were common in most of the evergreen, semi-evergreen and moist deciduous forests of Bangladesh even during the middle of the last century. But presently the distribution of Asian Elephants in Bangladesh is limited only to the forests of southeast, northeast, and central-north of Bangladesh [Figure 2]. Over the last couple of decades, the population of wild elephants faced a sharp decline due to the combined effects of the habitat destruction, scarcity of food and other associated threats.

Route and corridor fragmentation is the immediate result of habitat degradation that puts elephants in solemn danger by shrinking space, splitting shelters and downsizing their foraging areas. Habitat degradation rate is alarming at present and manifested in encroachment, illegal extraction of forest resources, unplanned development interventions and detrimental land use practices. Protection of habitats is therefore crucial for ensuring undisturbed routes and corridors for wild elephants.

Authentic information and reliable scientific knowledge are critical for taking initiatives to protect elephant routes and corridors. With that in mind, this atlas has been compiled with detailed geo-spatial illustrations and necessary information. This atlas is expected to help practitioners locate and understand the elephant movement routes, corridors and transboundary crossing points down to Forest Range level and take appropriate conservation actions.
Figure 1: Global distribution of Asian Elephants

Figure 2: Distributions of Asian Elephants in Bangladesh

Source: Survey of Bangladesh, field survey
1.2

ROUTES, CORRIDORS AND TRANSBOUNDARY CROSSING POINTS

Elephant routes are the paths that elephants use on a regular basis for foraging and day-to-day movement (Gittins & Akonda, 1982; Doyle et al., 2010). Because of huge dietary requirements, elephants extensively search for food, water, and shelter within a particular habitat or other habitats. During the early wet season elephants are scattered throughout the forest areas, when food and water are available. The quality of habitat and resources begins to deprecate during the summer and then the elephants move to other appropriate habitats where food and shelter are available (Varma, 2013). When elephant routes get destroyed because of human activities, human-elephant conflict (HEC) arises in that region (Zimmermann et al., 2009; Kar et al., 2016).

A corridor is an area used by elephants to pass from one habitat patch to another or defined as an area that connects two patches of suitable habitat by passing through a surrounding substance of incongruous habitat (Jones et al., 2009). Elephant habitat condition deteriorates mainly because of increasing human population, new settlements in previously unpopulated areas, land use shifts towards cultivation, changing infrastructure, and people’s dependency on forest areas for the ecosystem services these provide (Zimmermann et al., 2009; Kar et al., 2016). All these interventions result in the fragmentation and degradation of elephant habitat that ultimately impedes elephants from moving liberally. Elephants are, therefore, forced to use the fragmented and degraded habitat to move from one forest patch to another for food, water and shelter and also for breeding. Elephant corridors are extremely important for the survival of elephant populations in terms of maintaining the genetic viability of isolated population, rescuing population from local extinction in a habitat, increasing the area and diversity of habitats over and above the area of the two habitat patches that it connects and transforms unsuitable habitats to more suitable habitats (Beier & Noss, 1998; Jones et al., 2009).

Elephants are migratory species. They can move over considerable distances even within a short period of time (Sukumar, 1989). Bangladesh shares international political boundaries with India in the central-north and northeast and with Myanmar in the southeast parts of the country inhabiting migratory elephant populations. A widespread movement of elephants across borders indicates that they are simply part of the larger contiguous population encompassing habitats across bordering countries (Choudhury, 2007; Hossen, 2013). Elephants cross the international boundary frequently in the regions of Jamalpur, Sherpur, Mymensingh, Netrokona, Sunamganj, Moulvibazar, Rangamati and Bandarban. They also vagrantly use the bordering districts of the north-west region of Bangladesh. The international boundary that elephants used previously in Khagrachari and Rangamati districts is now abandoned. The challenges towards conserving transboundary migratory elephant are unsuitable habitat condition, barbed wire fencing, and bilateral issues.
1.3 WHY MAPPING OF ROUTES, CORRIDORS AND TRANSBORDINARY CROSSING POINTS IS SO IMPORTANT

In Bangladesh, the wild elephants are mostly present in the CHT, Chittagong, Cox’s Bazar, but some are also found in the areas in close proximity to Jamalpur, Sherpur, Mymensingh, Sunamganj and Moulvibazar.

All of the elephant ranges are located in the forested areas of the above locations. However, elephant ranges are gradually turning into small patches occupied by a single or a few herds due to several causes like illegal hunting, human interventions, infrastructure development through loss or fragmentation of habitats and foraging places. In the past, there were a number of elephant routes and corridors found in the country as cited by many authors. Some of those routes and corridors are yet to be identified and have been totally abandoned due to degradation of forest cover, extension of human settlements, intensification of agricultural practice, unsustainable slash and burn practice, unplanned road construction, and the establishment of monoculture forests.

As elephants most often follow specific routes and corridors in their movement, any interventions in these areas result in the rise of HEC and it is a common phenomenon in the hilly areas of the country. If the mapping of elephant routes and corridors is not initiated before establishing new infrastructures, elephant will lose their corridors which will aggravate HEC in the region. So, a comprehensive mapping of routes and corridors is absolutely necessary to initiate further development work. If the elephant corridors can be chalked out, HEC and crop damage will be reduced in the areas that fall within elephant ranges and they will be able to move peacefully from one place to another through those corridors. Identifying transboundary crossing points is crucial to conserve and manage migratory elephants through effective transboundary cooperation between neighboring countries. In addition, the mapping will help us learn about the ecological requirements of elephants and their home ranges, which are essential in preparing proper conservation plans.
1.4 ROAD TO THIS ATLAS

Identification of routes, corridors and HEC sites

Field data were collected through direct field visits, focus group discussions (FGD), and one-to-one discussions in all the elephant ranges of Bangladesh. Standard data collection format was prepared and field tested before commencing the field work. With the help of local people and local Forest Department staff, the elephant habitats were identified. On the presence of different elephant signs, like footprints, dung piles, and associated marks, the routes and corridors were identified. The conflict data were collected through consultation with the local people, especially the affected communities. Handheld GPS was used to locate the spatial locations at the field level. Secondary literature including published and unpublished research studies, books, electronic and printed media was also reviewed during the analysis of conflict data.

Identification of transboundary elephant crossing points

Before beginning the field work in the middle of 2016, two working groups (headed by Assistant Conservator of Forests) were formed with support from Bangladesh Forest Department (BFD). Direct field visits, one-to-one discussions and FGD were conducted in the border areas to identify transboundary crossing points.

Mapping

Several spatial layers (routes, HEC area, Corridor area etc.) were generated using Geographical Information System (GIS) for the purpose of mapping. In addition, contemporary LandsatTM and OLI images retrieved from EROS data center were used to identify forests, agricultural lands, and human settlement areas. While doing this, images were re-projected to BTM projection system and converted to surface reflectance. Finally, maximum likelihood supervised classification algorithm was used to demarcate those land covers. LGED road network and BFID vegetation cover spatial data were used to fine-tune extracted land cover information. This land cover layer was used in calculating damaged settlement and cropland areas caused by HEC.
After three years (2013-2015) of robust survey under the Status Survey and Development for Elephant Action Plan project in Bangladesh, many significant results have been achieved. Some major findings are provided in this section, such as elephant corridors, routes, their spatial location, and elephant ranges throughout the country.

The surveys were carried out in nine forest divisions of the BFD. Throughout the surveys elephants were recorded from 44 forest ranges including reserved forests, national parks and wildlife sanctuaries. The total range of elephants in the country is found to be approximately 1,018 Km².

In each forest range/division, elephants use certain routes for their movement. Elephants not only use these routes but also often use several feeder routes too. Along their movement paths, apparent damage of croplands and homestead areas were found which shows that elephants can damage human properties that fall in or around their routes. Maximum damages occurred in the croplands and settlement areas that have expanded inside the forest ranges towards elephant habitats. As a result, elephants come in contact more frequently with humans and their settlements and cause damage.

From the field surveys, 12 elephant corridors were identified in several locations of the country. Elephants come in the forest habitats of the country crossing borders from the neighboring countries. Fifty-seven transboundary elephant crossing points were also identified which are mostly concentrated in the eastern, southeastern, northern, northeastern and northwestern borders of the country. Among these points 39 points are natural crossing points through which elephants pass regularly, seven points are vagrant which elephants use occasionally, and 11 points are no longer used by elephants and hence declared abandoned.
1.6

HOW THIS ATLAS IS ORGANIZED

The story of each of the elephant movement routes and corridors is told via maps, narratives, facts, most importantly the images of field situations.

The maps and narrative sketch the journey of elephants, where and how elephants moves in search of their food and shelter.
2. **LEGEND**

- A map contains elephant route, road/highway, international boundary, district area, elephant corridor, forest, crop damage and household damage.

4. **PHOTOGRAPHS**

- Used in this book are taken by surveyors, who include present elephant sightings, habitats, elephant movements, etc., which enhance the visual appearance of the atlas and act as reference points for future initiatives.

3. **DESCRIPTION**

- A map contains the names of survey areas, elephant movement routes and corridors, types and causes of damages, and data on human-elephant conflicts.

5. **MAPS**

- Forest divisions and ranges particularly show two types of information: elephant routes in solid red lines and corridors in black dotted lines. In addition, these include geo-political boundary, existing forest coverage, elephant corridors, types and causes of damages, and data on human-elephant conflicts.

6. **COORDINATE SYSTEM**

- All spatial data set to the Bangladesh transverse Mercator (BTM) projection system, BTM is spatially developed for Bangladesh by the Survey of Bangladesh (SoB).

7. **INSET MAPS**

- Used at the bottom in route maps or on the right side of corridor maps. They help in locating the places of administrative units. Relative location of the map places are shown in the inset maps with red dots.
SECTION 2

ELEPHANT MOVEMENT ROUTES
2.1 COX’S BAZAR SOUTH FOREST DIVISION

The light green colored area on the map shows Cox’s Bazar South Forest Division, a natural habitat of wild Asian Elephants of Bangladesh. The map mainly focuses on elephant movement routes, corridors and HEC scenarios of this Forest Division. Under this division, there are nine Forest Ranges and 33 Forest Beats where elephants’ movement is observed on a regular basis. Three Protected Areas, namely Teknaf Wildlife Sanctuary, Inani National Park and Himchari National Park are situated in this Forest Division.

Narrow red lines of the map show the frequently used elephant movement routes in almost all the areas of Cox’s Bazar South Forest Division. Three elephant corridors (yellow cross mark and black dotted box), namely Ukhiya – Gashobhum, Tulabagan – Panerchara and Naikhongchari – Rajarkul were found in this division.

Numerous road networks (brown color) and human settlements were observed throughout this Forest Division. With the expansion of human settlements, croplands have also extended and in many places these are inside the forest areas. HEC is a common scenario of this division and green apple colored areas on the map show the crop damage, whereas purple colored areas indicate household damage.
FOREST RANGES AND BEATS OF THIS DIVISION

1. Teknaf Sadar Range
   i. Teknaf Sadar Beat
   ii. Nhila Beat
   iii. Madhya Nhila Beat
   iv. Mochni Beat

2. Shilkhali Range
   i. Shilkhali Beat
   ii. Mathabhanga Beat
   iii. Rajarcha Beat

3. Whykheong Range
   i. Shaplapur Beat
   ii. Monkhali Beat
   iii. Rakhoniyong Beat
   iv. Whykheong Beat

4. Inani Range
   i. Swankhal Beat
   ii. Chota Inani Beat
   iii. Inani Beat
   iv. Rajapalong Beat
   v. Jaliapalong Beat

5. Ukhia Range
   i. Thaimkhali Beat
   ii. Ukhia Ghat Beat
   iii. Ukhia Beat
   iv. Dohari Beat
   v. Haludiapalong Beat

6. Dhoapalong Range
   i. Dhoapalong Beat
   ii. Khuniaapalong Beat

7. Cox’s Bazar Sadar Range
   i. Himchari Beat
   ii. Kalatati Beat
   iii. Chainta Beat
   iv. Linkroad Beat
   v. Gilingia Beat

8. Panerchara Range
   i. Panerchara Beat
   ii. Tulabagar Beat

9. Rajarkul Range
   i. Dariardighi Beat
   ii. Upper Reju Beat
   iii. Rajarkul Beat
ATLAS: ELEPHANT ROUTES AND CORRIDORS IN BANGLADESH

Legend
- Elephant Route
- Road / Highway
- International BND
- Beat Boundary
- Water Bodies
- Upazila Boundary
- District Area
- Elephant Corridor
- Forest
- Crop Damage
- Household Damage

Features
- Beat Office
- Corridor Point
- Upazila Parishad
- Cox's Bazar South Forest Division

Location Index: Cox's Bazar South Forest Division

District Index: Cox's Bazar

Cox's Bazar South Forest Division

Data Source: Field Survey 2013-2016, ScB, Map Projection: Bangladesh Transverse Mercator (ETM)
Light green colored area on the map shows Teknaf Sadar Range. Under this Range there are four Beats, namely Teknaf Sadar, Nhila, Madhya Nhila and Mochoni. The narrow red lines illustrate elephant movement routes, whereas the purple colored area shows households damage by elephants and the deep green colored area is crop field damage. Here regular incidents of HEC were observed because of the existence of human settlements and croplands within and/or near elephant movement routes and forest areas. During 2011-2015, four people died and two were injured in elephant attacks. Besides, more than 100 incidences of elephant attacks on households and crop fields were reported.
Light green colored area on the map shows Shilkhali Range. Under this Range there are three Beats, namely Shilkhali, Mathabhanga and Rajarchara. The narrow red lines illustrate elephant movement routes, whereas the purple colored area shows household damage by elephants and deep green colored area shows crop damage. Incidents of HEC were observed here because of the existence of human settlement and croplands within and/or near elephant movement routes and forest areas. During 2011-2015, four people were injured due to elephant attacks. Besides, more than 10 elephant attacks on households and crops were reported.
Light green colored area on the map show Whykheong Range. Under this Range there are four Beats, namely Shaplapur, Monkali, Raikhliying and Whykheong. The narrow red lines illustrate elephant movement routes, whereas the purple colored area shows household damage by elephants and deep green colored area shows extent of crop damage. Here regular incidents of HEC were observed because of the presence of human settlement and croplands within and/or near elephant movement routes and forest areas. During 2011-2015, more than 150 elephant attacks were observed by the local people.
Light green colored area on the map shows Inani Range. Under this Range there are five Beats, namely Swankhali, Chota Inani, Inani, Rajapalong, and Jaliapalong. The narrow red lines illustrate elephant movement routes, whereas the purple colored area shows household damage by elephants and deep green colored area shows damages to crops. Here regular incidents of HEC were observed because of the existence of human settlement and croplands within and/or near elephant movement routes and forest areas. During 2011-2015, more than 150 elephant attacks were reported on households and more than 220 on crop fields.
Light green colored area on the map shows Ukhiya Range. Under this Range there are five Beats, namely Thainkhali, Ukhiya Ghat, Ukhiya, Dochari, and Haludipalong. The narrow red lines illustrate elephant movement routes, whereas the black dotted box shows the corridor. The purple colored area shows household damage done by elephants and deep green colored area shows crop damage. Here regular incidents of HEC were observed because of the existence of human settlements and croplands within and/or near elephant movement routes and forest areas. During 2011-2013, more than 50 elephant attacks were observed and more than 189 crop fields were damaged. It is observed that elephant movement is blocked between Inani range and Dhaupalong range due to the existing road network, large human settlement and crop field. Elephants use Ukhiya-Ghundhum corridor to migrate from Bangladesh to Myanmar and vice versa. Presence of Cox’s Bazar–Teknaf highway, Refugee camp, crocodile farm, TV station, encroachment and rubber garden is a matter of concern for the protection of this corridor.
DHOAPALONG RANGE

Light green colored area on the map shows Dhoapalong Range. Under this Range there are two Beats, namely Dhoapalong and Khuniapalong. The narrow red lines illustrate elephant movement routes, whereas the purple colored area shows household damage done by elephants. The deep green colored area shows crop damage in that area. Here regular incidents of HEC were observed because of the existence of human settlement and croplands within and/or near elephant movement routes and forest areas. During 2011-2015, three people lost their lives and two were injured in elephant attacks. Besides these, more than 40 elephant attacks were observed on households and 105 attacks on the crop fields.
Light green colored area on the map shows Cox’s Bazar Sadar Range. Under this Range, there are five Beats, namely Himchari, Kalatai, Chainda, Linkroad and Gilingia of which elephants roam in the first three. The narrow red lines illustrate elephant movement routes. The purple colored area illustrates household damage by elephants and deep green colored area shows crop damage. Here regular incidents of HEC were observed because of the existence of human settlement and croplands within and/or near elephant movement routes and forest areas. During 2011-2015, three people died and three were injured in elephant attacks. Besides these, more than 50 elephant attacks were observed on households and 100 attacks on the crop fields.
Light green colored area on the map shows Panerchara Range. Under this Range there are two Beats, namely Panerchara and Tulabagan. The narrow red lines illustrate elephant movement routes, whereas the black dotted box shows the elephant corridor. The purple colored area shows household damage by elephants and deep green colored area indicates crop damage. Here regular incidents of HEC were observed because of the existence of human settlement and croplands within and/or near elephant movement routes and forest areas. During 2011-2015, two people died and three were injured. In addition, more than 40 elephant attacks took place on the households and 85 attacks on crop fields. Elephants use Panerchara–Tulabagan corridor to move from Panerchara forest to Tulabagan and vice versa. Presence of Cox’s Bazar–Teknaf highway, construction of new road network from Cox’s Bazar–Teknaf highway to Rajawul army camp and deforestation within the corridor are putting the survival of this corridor at threat.
Light green colored area on the map shows Rajarkul Range. Under this Range there are three Beats, namely Dinardighi, Upper Reju and Rajarkul. The narrow red lines illustrate elephant movement routes, whereas the black dotted box shows the elephant corridor. The purple colored area shows household damage by elephants and deep green colored area shows crops destroyed. Here regular incidents of HEC were observed because of the existence of human settlement and croplands within and/or near elephant movement routes and forest areas. During 2011-2015, four people died and three were injured in elephant attacks. Besides these, more than 125 elephant attacks were observed on the households and 233 attacks took place on the crop fields. Elephants use Naikhongchari – Rajarkul corridor to migrate from Naikhongchari forest to Rajarkul Forest and vice versa. Presence of Ramu-Maricha road, army camp, RGB camp, botanical garden, coconut garden within the corridor are a matter of grave concern for the protection of this corridor. If this corridor is blocked elephant will lose a substantial foraging ground and will become isolated and gradually lose genetic viability.
2.2 COX’S BAZAR NORTH FOREST DIVISION

Cox’s Bazar North Forest Division, a natural habitat of wild Asian Elephants of Bangladesh, is shown on the map by the light green colored area. The map mainly focuses on elephant movement routes, corridors and HEC scenarios of this Forest Division. Under this division, there are seven Forest Ranges and 25 Forest Beats, where elephant movement is observed on a regular basis.

Two Protected Areas, namely Fashiakhalii Wildlife Sanctuary, and Medhakassapia National Park, are situated in this Forest Division.

Narrow red lines on the map show the frequently used elephant movement routes. As a matter of fact, elephants move in almost all the areas of Cox’s Bazar North Forest Division. Five elephant corridors (yellow cross mark and black dotted box), namely Bhomariaghona – Rajgati, Tulai – Idgar, Khuntakhali – Madhakassapia, Fashiakhalii – Chairakhalii and Fashiakhalii – Manikpur, were found in this division.

Numerous road networks (brown color) and human settlements were observed throughout this forest division. With the expansion of human settlements, croplands have also extended and in many places, these have sprawled inside the forest areas. HEC is a common scenario of this division and green apple colored areas on the map show the extent of crop damage whereas purple colored areas indicate household damage.
FOREST RANGES AND BEATS OF THIS DIVISION

1. Bagkhali Range
   i. Bagkhali Beat
   ii. Ghilatoli Beat
   iii. Kassapia Beat

2. Joarianala Range
   i. Joarianala Beat
   ii. Rangdeba Beat

3. Meherghona Range
   i. Meherghona Sadar Beat
   ii. Kalirchara Beat
   iii. Dhalirchara Beat
   iv. Machuakhali Beat

4. Idgar Range
   i. Idgar Beat
   ii. Baishari Beat
   iii. Tulatali Beat

5. Idgaon Range
   i. Idgaon Beat
   ii. Bhomariaghona Beat
   iii. Punnogram Beat

6. Fulchari Range
   i. Fulchari Beat
   ii. Khuntakhal Beat
   iii. Medhakassapia Beat
   iv. Napakhal Beat
   v. Rajhat Beat

7. Fashiakhali Range
   i. Dulanazara Beat
   ii. Fashiakhali Beat
   iii. Manikpur Beat
   iv. Kakara Beat
   v. Naibila Beat
Light green colored area on the map shows Baghkhali Range. Under this Range there are three Beats, namely Baghkhali, Ghilatali and Cassapia. The narrow red lines illustrate elephant movement routes. The purple colored area shows household damage by elephants and the deep green colored area shows crop damage. Here, incidents of HEC were observed because of the existence of human settlement and croplands within and/or near elephant movement routes and forest areas, but it is not as severe as other Beats and Ranges. During 2011-2015, more than 50 elephant attacks took place on households and 35 attacks were on crop fields.
Light green colored area on the map shows Joarianala Range. Under this Range there are two Beats, namely Joarianala and Bangladesh. The narrow red lines illustrate elephant movement routes, whereas the purple colored area shows household damage by elephants. The deep green colored area shows crop damage. Here incidents of HED were observed because of the existence of human settlement and croplands within and/or near elephant movement routes and forest areas. During 2011-2015, more than 70 elephant attacks were observed on households and 55 attacks on crop fields.
Light green colored area on the map shows Meherghona Range. Under this Range there are four Beats, namely Meherghona Sadar, Kalirchara, Dhalirchara and Machuakhali. The narrow red lines illustrate elephant movement routes. The purple colored area shows household damage and the deep green area shows damages to crops. Regular incidents of HEC were observed here because of the existence of human settlement and croplands within and/or near elephant movement routes and forest areas. During 2011-2015, four people died and two were injured. Beside these, more than 110 elephant attacks were observed on households and 150 attacks on crop fields.
Light green colored area on the map shows Idgar Range. Under this Range there are three Beats, namely Idgar, Baishari and Tulatalli. The narrow red lines illustrate elephant movement routes, whereas the black dotted box shows the corridor. The purple colored area shows household damage by elephants and the deep green colored area indicates crop field damage.

Here regular incidents of HEC were observed because of the existence of human settlement and croplands within and/or near elephant movement routes and forest areas. During 2011-2015, due to elephant attacks, three people were killed and two were injured. Besides these, more than 65 elephant attacks happened on households and 170 attacks on crop fields. Elephants use Tulatalli-Idgar corridor to migrate from Tulatalli forest to Idgar forest and vice versa. Presence of Idgar road (locally called Suja Road) and crop field within the corridor poses a concern for the protection of this corridor.
Light green colored area on the map shows Idgaon Range. Under this Range there are three Beals, namely Idgaon, Bhomariaghona and Punnogram. The narrow red lines illustrate elephant movement routes, whereas the black dotted box shows the corridor. The purple colored area shows household damage by elephants and the deep green colored area represents damages to crop fields. Here incidents of HEC were observed because of the existence of human settlement and croplands within and/or near elephant movement routes and forest areas, but not very severe. During 2011-2015, 15 elephant attacks were observed on households and 25 attacks recorded on crop fields. Elephants use Bhomariaghona-Rajghat corridor to migrate from Bhomariaghona forest to Rajghat forest and vice versa. Presence of Idgar road and crop field within the corridor is a grave matter of concern.
Light green colored area on the map shows Fulchari Range. Under this Range there are five Beats, namely Fulchari, Khuntakhali, Medhakassapia, Napitkhali and Raighat. The narrow red lines illustrate elephant movement routes, whereas the black dotted boxes show corridor. The purple colored area shows household damage by elephants and the deep green illustrates crop field damage. Here regular incidents of HEC were observed because of the existence of human settlement and croplands within and/or near elephant movement routes and forest areas. During 2011-2015, due to elephant attacks six people died and five were injured. Besides, more than 120 elephant attacks were observed at household level and 180 attacks on the crop fields. Elephants use Medhakassapia–Napitkhali corridor to migrate from Medhakassapia National Park to Dulahazara forest and vice versa. Presence of Chittagong-Cox’s Bazar highway, human settlement, and crop fields within the corridor is alarming for the sustenance of this corridor.
Light green colored area on the map shows Fashiakhali Range. Under this Range there are five Beats, namely Dulahazara, Fashiakhali, Manikpur, Kakara and Naiboha. The narrow red lines illustrate elephant movement routes, whereas the black dotted boxes show corridor. The purple colored area shows household damage by elephants and the deep green colored area illustrates crop field damage. Here regular incidents of HEC were observed because of the existence of human settlement and croplands within and/or near elephant movement routes and forest areas. During 2011-2015, six people died and one person was injured in elephant attacks. More than 150 elephant attacks were observed on the households and 370 attacks on the crop fields. Two corridors were found within this range. Elephants use Fashiakhali–Chairakhali corridor to migrate from Chairakhali forest to Fashiakhali forest and vice versa; and Fashiakhali–Manikpur corridor is used to migrate from Fashiakhali to Manikpur forests and vice versa. Presence of Chittagong–Cox's Bazar highway and Lama road, army camp, human settlements, and crop fields are major concerns for the protection of the corridors.
2.3 CHITTAGONG SOUTH FOREST DIVISION

Chittagong South Forest Division, a natural habitat of wild Asian Elephants of Bangladesh, is shown as the light green colored area on the map. The map mainly focuses on elephant movement routes, corridors and HEC scenarios of this Forest Division. Under this division there are 10 Forest Ranges and 34 Forest Beats, where elephant movement is observed regularly.

Two Protected Areas, namely Chunali Wildlife Sanctuary and Dudukuria-Dhopachari Wildlife Sanctuary are situated in this Forest Division.

Narrow red lines of the map show the frequently used elephant movement routes and further reveal that elephants move in almost all the areas of Chittagong South Forest Division. Four elephant corridors (yellow cross mark and black dotted box), namely Chunali-Salghar, Lalulia-Bardua, Sukhailash-Kodala and Narischa-Kodala, were found in this division.

Numerous road networks (brown color) and human settlements were seen throughout this Forest Division. With the expansion of human settlements, croplands have expanded and in many places these are stretched inside the forest areas. HEC is a common scenario of this division and green apple colored areas on the map show the extent of crop damage and purple colored areas indicate exposed households.
FOREST RANGES AND BEATS OF THIS DIVISION

1. Kalipur Range
   i. Kalipur Beat  
   ii. Pukuria Beat  
   iii. Sadhanpur Beat  
   iv. Chechuria Beat

2. Madarsha Range
   i. Madarsha Beat  
   ii. Bara Madarsha Beat  
   iii. Churamoni Beat

3. Jaldi Range
   i. Pulchari Beat  
   ii. Chamal Beat  
   iii. Napura Beat  
   iv. Jaldi Beat

4. Chunati Wildlife Range
   i. Chunati Beat  
   ii. Azimgarh Beat  
   iii. Harbang Beat

5. Chunati Range
   i. Satgar Beat  
   ii. Bara Hatia Beat  
   iii. Harbang Beat  
   iv. Baratati Beat

6. Padua Range
   i. Dalu Beat  
   ii. Tankwati Beat  
   iii. Hangar Beat  
   iv. Bardakura Beat

7. Dohazari Range
   i. Lalutia Beat  
   ii. Dhopachari Beat

8. Patiya Range
   i. Srimul Beat  
   ii. Barguni Beat  
   iii. Vondaichari Beat  
   iv. Kelishahar Beat

9. Khurushia Range
   i. Khurushia Beat  
   ii. Dudpukuria Beat  
   iii. Kamalchari Beat  
   iv. Sukhlalash Beat

10. Rangunia Range
    i. Narischa Beat  
    ii. Pomara Beat  
    iii. Kodala Beat  
    iv. Chiringa Beat
Light green colored area on the map shows Kalipur Range. Under this Range there are four Beats, namely Kalipur, Pukuria, Sadhanpur, and Chechuria. The narrow red lines illustrate elephant movement routes, whereas the purple colored area shows household damage and the deep green colored area shows crop damage by elephants. Here regular incidents of HEC were observed because of the existence of human settlement and croplands within and/or near elephant movement routes and forest areas. During 2011-2015, three people died and four were injured in elephant attacks. Beside these, more than 15 elephant attacks were observed on households and 50 attacks on crop fields.
Light green colored area on the map shows Madarsha Range. Under this Range there are three Beats, namely Madarsha, Bara Madarsha, and Churamoni. The narrow red lines illustrate elephant movement routes, whereas the purple colored area shows household damage by elephants and the deep green colored area shows crop damage. Here regular incidents of HEC were observed because of the existence of human settlement and croplands within and/or near elephant movement routes and forest areas. During 2011-2015, two people were killed and five were injured in elephant attacks. Beside this, more than 25 elephant attacks were observed on households and 80 on crop fields.
Light green colored area on the map shows Jaldi Range. Under this Range there are four Beats, namely Pulchhari, Chambal, Napura and Jaldi. The narrow red lines illustrate elephant movement routes, whereas the purple colored area shows household damage by elephants and the deep green colored area shows crop damage. Here regular incidents of HEC were observed because of the existence of human settlement and croplands within and/or near elephant movement routes and forest areas. During 2011-2015, due to elephant attacks four people died and nine were injured. Beside these, more than 80 elephant attacks were observed on households and 140 attacks on crop fields.
Light green colored area on the map showed Chunati Wildlife Range. Under this Range there are three Beats, namely Chunati, Azimgar and Harbang. The narrow red lines illustrate elephant movement routes, whereas the black dotted lines show the corridor. The purple colored area indicates household damage by elephants and the deep green colored area shows crop damage. Here regular incidents of HEC were observed because of the existence of human settlement and croplands within and/or near elephant movement routes and forest areas. During 2011-2015, eight people died and 12 were injured in elephant attacks. Beside these, more than 150 elephant attacks were observed on households and 220 attacks on crop fields. Elephants use Chunati–Satgar corridor to migrate from Chunati Wildlife Sanctuary to Satgar Reserve Forest and vice versa. The existence of Chittagong–Cox’s Bazar highway, brickfields, orchards, barbed wire fences, mosque, shrine, human settlements, small shops and crop fields are a concern for the protection of this corridor.
Light green colored area on the map shows Chunati Range. Under this Range there are four Beats, namely Salgar, Bara Hatia, Harbang and Baraitari. The narrow red lines illustrate elephant movement routes, whereas the purple colored area shows household damage by elephants. The deep green colored area shows crop damage. Regular incidents of HEC were observed here because of the existence of human settlement and croplands within and/or near elephant movement routes and forest areas. During 2011-2015, eight people died and two were injured in elephant attacks. Besides these, more than 150 elephant attacks were observed on households and 250 attacks on crop fields.
Light green colored area on the map shows Padua Range. Under this Range there are four Beats, namely Dalu, Tankwat, Hangar and Barduara. The narrow red lines illustrate elephant movement routes. The black dotted lines show the corridor, the purple colored area depict household damage by elephants and the deep green colored area shows crop field damage.

Here regular incidents of HEC were observed because of the existence of human settlement and croplands within and/or near elephant movement routes and forest areas. During 2011-2015, eight people died and 14 were injured in elephant attacks. Beside these, more than 75 elephant attacks were reported on households and more than 290 attacks were on crop fields. Elephants use Lalulia–Barduara corridor to migrate from Dhupachari forest to Pauda forest and vice versa. Presence of Keranihat–Bandarban highway, Army camp, BGB headquarters, human settlements, shrine, military practice zones and private crop fields are impediments to the survival of this corridor.
Light green colored area on the map shows Dohazari Range. Under this Range there are two Beas, namely Lalulia and Dhupachari. The narrow red lines illustrate elephant movement routes, whereas the purple colored area shows household damage by elephants and the deep green colored area shows crop field damage. Here regular incidents of HEC were observed because of the existence of human settlement and croplands within and/or near elephant movement routes and forest areas. During 2011-2015, one person died and three were injured in elephant attacks. Beside these, more than 30 elephant attacks were observed on household and 85 attacks on crop fields.
Light green colored area on the map shows Patiya Range. Under this Range there are four Beats, namely Srimai, Barguni, Vendashari and Keilishahan. The narrow red lines illustrate elephant movement routes. The purple colored area shows household damage by elephants and the deep green colored area covers crop damage. Here incidents of HEC were observed because of the existence of human settlement and croplands within and/or near elephant movement routes and forest areas, but not to a serious extent. During 2011-2015, more than 20 elephant attacks were recorded on households and 40 attacks on crop fields.
Light green colored area on the map shows Khurushia Range. Under this Range there are four Beats, namely Khurushia, Dudpukuria, Kamalachari and Sukhiblash. The narrow red lines illustrate elephant movement routes, whereas the black dotted lines showed the corridor. The purple colored area shows household damage by elephants and the deep green colored area shows crop field damage. Here regular incidents of HEC were observed because of the existence of human settlement and croplands within and/or near elephant movement routes and forest areas. During 2011-2015, one person died and three were injured in elephant attacks. Besides these, more than 90 elephant attacks were observed on households and 180 attacks were inflicted on crop fields. Elephants use Sukhiblash-Kodala corridor to migrate from Dudpukuria forest to Kodala forest and vice versa. Presence of road, human settlements and crop fields are a concern for the protection of this corridor.
Light green colored area on the map shows Rangunia Range. Under this Range there are four Beats, namely Narischa, Pemara, Kodala and Chiringa. The narrow red lines illustrate elephant movement routes, whereas the black dotted lines show the corridor. The purple colored area shows household damage by elephants and the deep green colored area shows crop damage. Here incidents of HEC were observed because of the existence of human settlement and croplands within and/or near elephant movement routes and forest areas. During 2011-2015, more than 95 elephant attacks took place on households and 400 on the crop fields. Elephants use Narischa-Kodala corridor to migrate from Kamalachhari forest to Kodala forest and vice versa. Presence of road, human settlements and crop fields pose as a threat for the protection of this corridor.
2.4 LAMA FOREST DIVISION

Lama Forest Division, a natural habitat of wild Asian Elephants of Bangladesh is shown by the light green colored area on the map. The map mainly focuses on elephant movement routes, corridors and HEC scenarios of this Forest Division. Under this division, there are four Forest Ranges and nine Forest Beats, where elephant movement is observed on a regular basis.

Numerous road network (brown color) and human settlements were observed throughout this forest division. With the expansion of human settlements, croplands have also been extending in many places inside the forest. HEC is a common scenario of this division and green apple colored areas on the map show crop damage, whereas purple colored areas indicate exposed household damage.
FOREST RANGES
AND BEATS OF THIS DIVISION

1. Naikhongchari Range
   i. Naikhongchari Beat
   ii. Tulatuli Beat
   iii. Rehu Beat

2. Sangu Range
   i. Sangu Beat
   ii. Baishari Beat

3. Lama Sadar Range
   i. Yancha Beat

4. Daluchari Range
   i. Dalu Beat
   ii. Faltang Beat
   iii. Sarai Beat
Light green colored area on the map shows Naikhongchari Range. Under this Range there are three Beats, namely Naikhongchari, Tutatali and Reju. The narrow red lines illustrate elephant movement routes, whereas the purple colored area shows household damage by elephants. The deep green colored area shows crop field damage. Here regular incidents of HEC were observed because of the existence of human settlement and croplands within and/or near elephant movement routes and forest areas. During 2011-2015, three people died and 10 were injured. In addition, more than 80 elephant attacks were observed on households and 125 attacks recorded on crop fields.
Light green colored area on the map shows Sangu Range. Under this Range there are two Beats, namely Sangu and Baishar. The narrow red lines illustrate elephant movement routes and purple colored area shows household damage by elephants. During 2011-2015, one person died in elephant attacks.
Light green colored area on the map shows Lama Sadar Range. Under this Range elephants are found in the Yancha forest Beat areas. The narrow red lines illustrate elephant movement routes. The purple colored area shows household damage and the deep green colored area shows crop field damage. Here incidents of HEC were relatively low, because human settlement and croplands are away from forests. During 2011-2015, two people died in elephant attacks and only few households and crop fields damaged.
Light green colored area on the map shows Daluchari Range. Under this Range there are three Beats, namely Dalu, Faitang and Sarai. The narrow red lines illustrate elephant movement routes, whereas the purple colored area shows household damage by elephants and the deep green colored area indicates crop damage. Here regular incidents of HEC were observed because of the existence of human settlement and croplands within and/or near elephant movement routes and forest areas. During 2011–2015, three people died and eight were injured in elephant attacks. Along with that, over 150 attacks were observed on households and 80 attacks on crop fields.
2.5
BANDARBAN FOREST DIVISION

Bandarban Forest Division, a natural habitat of wild Asian Elephants of Bangladesh, is shown by the light green colored area on the map. The map mainly focuses on elephant movement routes, corridors, and HEC scenarios of this Forest Division. In this division, elephants were found only in Bandarban Sadar Range.

Numerous road networks (brown color) and human settlements were observed throughout this forest division. With the expansion of human settlements, croplands have also extended into the forest areas. HEC is a common scenario of this division and green apple colored areas on the map show the crop damage, whereas purple colored areas indicate household damage.
FOREST RANGES AND BEATS OF THIS DIVISION

1. Bandarban Sadar Range
Light green colored area on the map shows Bandarban Sadar Range. Under this Range elephants were found in Suwalak, Renikhyong, Uttar Hangar, Dakshin Hangar and Tankawati forest areas. The narrow red lines illustrate elephant movement routes, whereas the purple colored area shows household damage by elephants and the deep green colored area shows crop damage. Here regular incidents of HEC were observed because of the existence of human settlement and croplands within and/or near elephant movement routes and forest areas. During 2011-2015, four people died and ten were injured in elephant attacks. Besides these, more than 95 elephant attacks were reported on households and more than 130 attacks on crop fields.
2.6

CHITTAGONG HILL TRACTS SOUTH FOREST DIVISION

Chittagong Hill Tracts South Forest Division, a natural habitat of wild Asian Elephants of Bangladesh is shown by the light green colored area on the map. The map mainly focuses on elephant movement routes and HEC scenarios of this Forest Division. Under this division there are three Forest Ranges and ten Forest Beats. One Protected Area, namely Kaptai National Park is situated in this Forest Division.

Narrow red lines of the map show the frequently used elephant movement routes and demonstrate that elephants move in almost all the areas of CHT South Forest Division.

Numerous road networks (brown color) and human settlements were observed throughout this forest division. With the expansion of human settlements, croplands have also spread inside the forest areas. HEC is a common scenario of this division and green apple colored areas on the map show crop damage, whereas purple colored areas depict the extent of household damage.
FOREST RANGES
AND BEATS OF THIS
DIVISION

1. Kaptai Range
   i. Kaptai Sadar Beat
   ii. Shuknachari Beat
   iii. Kamrulchari Beat
   iv. Bengchari Beat
   v. Rampahar Beat

2. Karnafully Range
   i. Karnafully Sadar Beat
   ii. Kaptai Mukh Beat
   iii. Fringkheong Beat
   iv. Kalmichara Beat
   v. Brick Field Beat

3. Raikhali Range
   (Pulpwood Division, Kaptai)
Light green colored area on the map shows Kaptai Range. Under this range there are five Beas, namely Kaptai Sadar, Shuknachhari, Kamlachari, Bengchari and Rampahar. The narrow red lines illustrate elephant movement routes. The purple colored area shows household damage by elephants and the deep green colored area shows crop damage. Here incidents of HEC were observed because of the existence of human settlement and croplands within and/or near elephant movement routes and forest areas. During 2011-2015, more than 15 elephant attacks were observed on households and 40 attacks on crop fields.
The light green colored area on the map shows Karnafully Range. Under this Range, there are five Beats, namely Karnafully Sadar, Kapai Mukh, Kalmichara, Fringkheong, and Brick Fields. The narrow red lines illustrate elephant movement routes. The purple colored area shows household damage by elephants and the deep green colored area shows damages to crops. The incidents of HEC were observed here because of the existence of human settlement and croplands within and/or near elephant movement routes and forest areas. During 2011-2015, more than 20 attacks on households and 48 attacks on crop fields were observed.
Light green colored area on the map shows Raikhali Range. The narrow red lines illustrate elephant movement routes. The purple colored area shows household damage by elephants and the deep green colored area shows crop field damage. Here incidents of HEC were observed because of the existence of human settlement and crop lands within and/or near elephant movement routes and forest areas. During 2011-2013, more than 40 attacks were observed on households and 85 attacks on crop fields.
2.7

CHITTAGONG HILL TRACTS
NORTH FOREST DIVISION

CHT North Forest Division, a natural habitat of wild Asian Elephants of Bangladesh, is shown as the light green colored area on the map. The map mainly focuses on elephant movement routes and HEC scenarios of this Forest Division. Under this division, there is one Forest Range and three Forest Beats where elephant movement was observed frequently. Pabia Wildlife Sanctuary is situated within this Forest Division.

Narrow red lines on the map show the frequently used elephant movement routes. HEC was a common scenario of this division and green apple colored areas on the map show the crop damage, whereas the purple colored areas indicate household damage. Due to elephant attacks 23 persons died and 18 were injured during 2011-2015. Beside these, more than 690 elephant attacks were observed on households and 130 on crop fields.
FOREST RANGES AND BEATS OF THIS DIVISION

1. Pablakhal Range  
   (Bhasanya Adam Union)

2. Pablakhal Range  
   (Baghachatar Union)

3. Pablakhal Range  
   (Amtali and Gulshakhali Union)
Light green colored area on the map shows Pablakahi Range (Bhasanya Adam Union). The narrow red lines illustrate elephant movement routes, whereas the purple colored area shows household damage by elephants. Here regular incidents of HEC were observed because of the existence of human settlement and croplands within and/or near elephant movement routes and forest areas.
Light green colored area on the map shows Pablakhali Range (Baghachatar Union). The narrow red lines illustrate elephant movement routes and the purple colored area shows household damage by elephants. Here, regular incidents of HEC were observed because of the existence of human settlement and croplands within and/or near elephant movement routes and forest areas.
Light green colored area on the map shows Pabla Khali Range (Amtali and Gulshakhali Union). The narrow red lines illustrate elephant movement routes, whereas the purple colored area indicates household damage. Here, regular incidents of HEC were observed because of the human settlement and croplands within and/or near elephant movement routes and forest areas.
2.8

MOULVIBAZAR FOREST DIVISION (JURI RANGE)

Juri Range of Moulvibazar Forest Division, a natural habitat of wild Asian Elephants of Bangladesh, is shown by the light green colored area on the map. The map mainly focuses on elephant movement routes and HEC scenarios of this Forest Range. Narrow red lines of the map show the frequently used elephant movement routes and further explain that elephants move in most of the areas.

Human settlements and crop fields were sighted throughout this Range. With the expansion of human settlements, croplands have also infiltrated into the forest. HEC is being observed in recent times and the green apple colored areas on the map show the crop damage, whereas areas in purple show household damage. In this Range, elephants regularly migrate between India and Bangladesh.
2.9

MYMENSINGH FOREST DIVISION

Mymensingh Forest Division, a habitat of wild Asian Elephants, is shown as light green colored area on the map. The map mainly focuses elephant movement routes and HEC scenarios of this Forest Division. Under this division, there are six Ranges and 13 Forest Beats where elephant movements were observed regularly.

Narrow red lines of the map show frequently used elephant movement routes. Numerous road networks (brown color), cropland and human settlements were observed throughout this forest division. With the expansion of human settlements, croplands have also expanded inside the forest areas. HEC is very common in this division. The green apple colored areas on the map show the crop damage, whereas the purple colored areas depict household damage.
FOREST RANGES AND BEATS OF THIS DIVISION

1. Durgapur Range
   i. Durgapur Beat
   ii. Nalubari Beat

2. Mymensingh Sadar Range
   i. Gopalpur Beat

3. Madhutila Range
   i. Batkuchi Beat
   ii. Somashchura Beat
   iii. Sandhyakura Beat

4. Rangtia Range
   i. Rangtia Sadar Beat
   ii. Gazni Beat
   iii. Taokocha Beat

5. Balijuri Range
   i. Balijuri Sadar Beat
   ii. Karnajora Beat
   iii. Malakocha Beat
   iv. Dumurtala Beat

6. Jamalpur Range (SFNTC)
ATLAS: ELEPHANT ROUTES AND CORRIDORS IN BANGLADESH

Legend
- Elephant Route
- Road / Highway
- International BND
- Mouza Boundary
- Water Bodies
- Union Boundary
- Upazila Boundary
- District Area
- Elephant Corridor
- Forest
- Crop Damage
- Household Damage

Features
- Best Office
- Union Parishad
- Upazila Parishad
- Mymensingh Forest Division

Location Index: Mymensingh Forest Division

District Index: Mymensingh, Sherpur, Jamalpur & Netrokona

Mymensingh Forest Division

Data Source: Field Survey 2013-2016,
SoB, Map Projection: Bangladesh Transverse Mercator (BTM)
The light green colored area on the map shows Durgapur Range. The narrow red lines illustrate elephant movement routes, whereas the purple colored area shows household damage done by elephants. The deep green colored area illustrates the extent of crop damage. Here regular incidents of HEC were observed because of the existence of human settlement and croplands within and/or near elephant movement routes and forest areas. During 2011-2015, one person was killed in elephant attack and four others were injured. Besides these, more than 95 attacks were observed on households and 140 attacks on crop fields.
The light green colored area on the map shows Mymensingh Sadar Range. Elephant’s movement was frequently observed in Gopalpur Beat of this range. The narrow red lines illustrate elephant movement routes, whereas the purple colored area shows household damage by elephants and the deep green colored area shows crop field damage. Here regular incidents of HEC were observed because of the existence of human settlement and croplands within and/or near elephant movement routes and forest areas. During 2011-2015, one person died and two were injured in elephant attacks. More than 120 and 225 elephant attacks were reported on households and crop fields, respectively.
The light green colored area on the map shows Madhutila Range. Here three forest Beats are present where elephant movement was frequently observed. The narrow red lines illustrate elephant movement routes, whereas the purple colored area shows household damage by elephants, and the deep green colored area shows crop damage. Here regular incidents of HEC were observed because of the existence of human settlement and croplands within and/or near elephant movement routes and forest areas. During 2011-2015, nine persons died in elephant attacks and three more were injured. Besides these, more than 150 elephant attacks were observed on households and 350 attacks on crop fields.
The light green colored area on the map shows Rangtia Range. Here three forest Beats are present where elephant movement was frequently observed. The narrow red lines illustrate elephant movement routes, whereas the purple colored area shows household damage by elephants. The deep green colored area shows crop damage. Here regular incidents of HEC were observed because of the existence of human settlement and croplands within and/or near elephant movement routes and forest areas. During 2011-2015, three persons died and one was injured in elephant attacks. Besides, more than 120 attacks were reported on households and 240 attacks on crop fields.
The light green colored area on the map shows Baljuri Range. Here four forest Beats are present where elephant movement was frequently observed. The narrow red lines illustrate elephant movement routes. The purple colored area shows household damage by elephants and the deep green colored area shows crop damage. Here regular incidents of HEC were observed because of the existence of human settlement and croplands within and/or near elephant movement routes and forest areas. During 2011-2015, three people died in elephant attacks and five were injured. Beside these, more than 135 elephant attacks were observed on households and 274 attacks on crop fields.
There are no forests in this area, but elephants enter into the homesteads and croplands in the nearby forest areas. The narrow red lines illustrate elephant movement routes, whereas the purple colored area shows household damage by elephants and the deep green colored area indicates damages to crops. Incidents of HEC were severe in this range. In 2015, two elephants were killed by electrocution.
SECTION 3

ELEPHANT CORRIDORS IN BANGLADESH
3.1 ELEPHANT CORRIDORS IN BANGLADESH

During the survey (2013-2014) 12 elephant corridors were identified that were used by the wild elephants to pass from one habitat to another within the natural habitat of Bangladesh. Among them five corridors were found in Cox’s Bazar North Forest Division, three in Cox’s Bazar South Forest Division, and four in Chittagong South Forest Division. The corridors are marked as black broken lines on the map.
ELEPHANT CORRIDORS

Cox’s Bazar South Forest Division
- C1: Ukhia–Ghundhum
- C2: Tulabagan–Panerchara
- C3: Naikhogchari–Rajarkul

Cox’s Bazar North Forest Division
- C4: Bhomariaghona–Rajghat
- C5: Tulatali–Idgar
- C6: Khuntakali–Medhakassapia
- C7: Fashakhali–Chairakhali
- C8: Fashakhali–Manikpur

Chittagong South Forest Division
- C9: Chunati–Satgar
- C10: Lalulta–Bardura
- C11: Sukhibilash–Kodala
- C12: Narisha–Kodala
Black broken line on the map shows the Ukhia–Ghundhum corridor passage that falls under Cox’s Bazar South Forest Division. Elephants frequently use this passage to move from Ukhia Reserve Forest to Myanmar through Naikhongchari (Reju Beat) Reserve Forest and vice versa.

Approximate length of the corridor is 4.35 Km and width is 1.13 Km. Major threats to this corridor were Cox’s Bazar–Teknaf highway, Ukhia TV station, rubber garden, crocodile farm, refugee camp, human settlement, crop fields, cattle grazing, and proposed rail tracks from Dohazari to Ghundhum.
Tulabagan–Pancharha passage, shown in black broken line on the map falls within Cox’s Bazar South Forest Division. Elephants frequently use this passage to move from Himchari Reserve Forest to Rajarkul through Pancharha Range and vice versa. Approximate length of the corridor is 2.36 Km and width is 0.67 Km. Major problems for this corridor were Cox’s Bazar–Teknaf highway, human settlements, cattle grazing, crop fields, social forestry, mono-culture, and newly constructed road from Pancharha to Rajarkul Army camp.
Black broken line on the map shows the Naikhongchari–Rajarkul corridor passage that falls under Cox’s Bazar South Forest Division. Elephants frequently use this passage to move from Naikhongchari Reserve Forest to Rajarkul Reserve Forest and vice versa. Approximate length of the corridor is 4.42 Km and width is 1.00 Km. Major challenges to the survival of this corridor were Ramu–Mariccha road, existing Army cantonment and its extension, BGB camp, coconut garden, botanical garden, human settlements, crop fields, and cattle grazing.
Black broken line on the map shows the Bhomariaghon–Rajghat corridor passage that falls under Cox’s Bazar North Forest Division. Elephants frequently use this passage to move from Légar Reserve Forest to Fulchari Reserve Forest through Bhomariaghona and vice versa. Approximate length of the corridor is 1.88 Km and width is 1.13 Km. Major problem of this corridor were Légar road, along with crop fields and cattle grazing.
Black broken line on the map shows the Tulatali–Idgar corridor passage which is under the jurisdiction of Cox's Bazar North Forest Division. Elephants frequently use this passage to move from Idgar Reserve Forest to Fulchari Reserve Forest through Tulatali and vice versa. Approximate length of the corridor is 3.95 Km and width is 2.14 Km. Major obstacles of this corridor were road, human settlement, shelter centre, crop fields, and cattle grazing.
Black broken line on the map shows the Khuntakali–
Medhakassapia corridor
passage falls under Cox’s
Bazar North Forest Division.
Elephants frequently use
this passage to move from
Khuntakali Reserve Forest to
Medhakassapia National Park
and vice versa. Approximate
length of the corridor is 1.86
Km and width is 0.63 Km.
Major obstacle of this corridor
were Chittagong-Cox’s Bazar
highway, human settlement,
crop field, cattle grazing, and
proposed Dehazari-Bhundhum
rail line.
Black broken line on the map shows the Fashiakhali –Chairakhali corridor passage that has fallen under Cox’s Bazar North Forest Division. Elephants frequently use this passage to move from Fashiakhali forest to Ringbhong and Chairakhali and vice versa. Approximate length of the corridor is 1.76 Km and width is 0.60 Km. The key threats to this corridor were Chittagong–Cox’s Bazar highway, human settlement, crop field, cattle grazing, proposed Dohazari–Ghundhum rail line, fish culture, mosque, and madrasha.
Black broken line on the map shows the Fashiakhali-Manikpur corridor passage that falls under Cox's Bazar North Forest Division. Elephants frequently use this passage to move from Fashiakhali forest to Yeancha and Manikpur forest and vice versa. Approximate length of the corridor is 2.3 Km and width is 0.53 Km. Major obstacle of this corridor were Lama road, human settlement, crop field, cattle grazing, and fuel wood collection.
Black broken line on the map shows the Chunati-Satgar corridor passage that falls under Chittagong South Forest Division. Elephants frequently use this passage to move from Chunati Wildlife Sanctuary to Satgar forest and vice versa. Approximate length of the corridor is 2.77 Km and width is 0.57 Km. Major impediments for the protection of this corridor were Chittagong - Cox’s Bazar highway, human settlements, shrine, mosque, brick field, poultry farm, wire fence, crop field, cattle grazing, fuel wood collection, and proposed rail line from Dohazari to Ghundhum.
Black broken line on the map shows the Lalutia-Barduara corridor passage that falls under Chittagong South Forest Division. Elephants use this passage to move from Dohazari forest to Padua through Lalutia and Barduara and vice versa. Approximate length of the corridor is 9.48 Km and width is 1.39 Km. Major challenges were Keranirhat- Bandarban highway, human settlement, markets, BGB camp, Army camp, bombing zone, crop field, and cattle grazing.
Black broken line on the map shows the Sukhbilash–Kodala corridor passage that falls under Chittagong South Forest Division. Elephants frequently use this passage to move from Dudukuria forest to Kodala through Sukhbilash and vice versa. Approximate length of the corridor is 1.72 Km and width is 0.77 Km. Major obstacles of this corridor were road, human settlement, crop field, and cattle grazing.
Black broken line on the map shows the Narischa–Kodala corridor passage that falls under Chittagong South Forest Division. Elephants frequently use this passage to move from Kamalachari forest to Kodala through Narischa and vice versa. Approximate length of the corridor is 3.22 Km and width is 0.98 Km. Major challenges of this corridor were roads, human settlement, crop fields, and cattle grazing.
SECTION 4

TRANSBOUNDARY ELEPHANT CROSSING POINTS
4.1

TRANSBOUNDARY ELEPHANT CROSSING POINTS

A total of 57 transboundary elephant crossing points were identified, of which 39 are active natural crossing points, 11 are abandoned crossing points and seven are vagrant crossing points. Map showed the three types of transboundary Elephant crossing points along the border areas.
Elephants from Meghalaya, Mizoram and Tripura of India and Arakan of Myanmar enter into Bangladesh, using 39 active transboundary crossing points (brick red triangle sign) and vice versa. These crossing points fall under Jamalpur, Sherpur, Mymensingh, Netrokona, Sunamganj, Moulvibazar, Rangamati and Bandarban districts of Bangladesh. Most of the crossing points are along the Meghalaya state of India.
Eleven crossing points were identified (yellow circle with dot), which were used by the elephants previously to enter into Bangladesh from India and vice versa. Currently they are abandoned. These points were found in Khagrachari and Rangamati districts that are adjacent to Mizoram and Tripura of India.
Seven crossing points were found that were used by elephants occasionally (magenta colored circles on map). All these were located in the northwestern districts of Bangladesh, namely Lalmonirhat, Panchagarh, Naogaon, Chapainawabganj and Meherpur.
REFERENCES


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