Baseline survey of Bears in Bangladesh

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1. INTRODUCTION

Of the eight species of bears, three species namely the Asiatic Black Bear (*Ursus thibetanus*), the Sloth Bear (*Melursus ursinus*) and the Malayan Sun Bear (*Ursus malayanus*) are known to occur in Bangladesh (Hussain 1974, Khan 1985, IUCN Bangladesh 2000). However, information on their present status and distribution is scanty and elusive (Hussain 1974, Khan 1985, Bear Specialist Group 1996a, 1996b, 1996c, Sarker 2006). The presence of these three species is due to the biogeographic location of the country under Indo-Malayan biographic zone. The Malayan Sun bear and Sloth bear have been rated as Vulnerable worldwide (IUCN 2010) while it is Critically Endangered in Bangladesh (IUCN Bangladesh 2000). The Sloth Bear had been traditionally considered to be rare and the most recent records are from 1995 (NCSIP-1 2001, Sarker 2006). Some authorities consider them to be possibly extinct in Bangladesh (Bear Specialist Group 1996a). Similarly, the Malayan Sun bear is also considered extinct in Bangladesh by some authorities (Pappas and McLennan 2002), although recent reports suggest occasional presence of the species in parts of northeastern and southeastern Bangladesh as recently as 2005 (Sarker 2006). The Black bear is categorized as Endangered based on national IUCN Red list Criteria (IUCN Bangladesh 2000) and vulnerable according to international IUCN criteria (Bear Specialist Group 1996c).

The Sloth bear has historically been rare in Bangladesh in the southeast, east and northeastern parts (Sarker 2006). They were occasionally recorded from the central and north-central regions namely Madhupur Gar and Garo Hills in Mymensingh and Sherpur districts respectively. Forest patches in the region have been largely decimated suggesting that the species is unlikely to occur any more. The last known reports are from the mid-1990’s (NCSIP-1 2001, Sarker 2006).

The Malayan Sun bear has been reported from Satchari National Park in Habiganj district close to the Indian border in northeastern Bangladesh (Sarker 2006). Additionally, they have been reported recently from Korerhat in Misarai Forest Range and Rangamati in southeastern Bangladesh. They have also been reported by local people in Sangu-Matamuhuri, Naikhongchhari, Dulahazra, Cox’s Bazar, Inani, Rangkheong and Teknaf in the southeast (SE).

The Asiatic Black bear has been recorded in the 1990’s from bamboo clusters and tea gardens in Banchara in Sreemangal and areas in the Maulvi Bazar district in the Sylhet division (Khan 1992, Sarker 2006) in the NE. They have also been reported in the 1990’s from Pablakhali Wildlife Sanctuary, Rangamati, Kaptai National Park of the Chittagong Hill Tracts. This species of bear has also been reported from Khagrachhari, Kassalong, Bandarban, Dulahazra, Naikhongchhari, Cox’s Bazar and Teknaf in the greater Chittagong division in the SE.

The Sylhet Division in the northeast of Bangladesh is surrounded by Meghalaya, Tripura and Assam states of India. In the southeast, the Chittagong division shares borders with Tripura and Mizoram states of India, and Northern Myanmar. Extensive surveys have already been conducted on the status and distribution of bears in India (Sathyakumar 2001, 2006). In Mizoram and Meghalaya, black bears occur in 8 protected areas, with decreasing trends in 6 protected areas and increasing trends in 2 protected areas (Sathyakumar and Choudhury...
In Tripura, the species occurs in scattered populations in hill forests (Sathyakumar 2006) and are considered to be common in Trishna Wildlife Sanctuary. In Assam, black bears have been reported from 7 protected areas and occur fairly commonly in unprotected forests in Karbi Anglong and North Cachar Hills District. Several districts of Meghalaya, Tripura, Mizoram have bear populations that adjoin the Bangladesh border and associated forest patches. Assessment of Black bear and Malayan Sun bear populations in these areas will therefore address not only the status of these species, but also potential trans-boundary population management concerns.

Historically bears were distributed in the central to the north, northeast (NE), east and southeast of the country but due to habitat destruction they have almost completely disappeared from their distributional ranges (Khan 1985, Sarker 2006). However, bears were not a rare sight even three decades ago (Husain 1974). The present bear population is confined to the forests along the India and Myanmar borders. Because of the rapid rate of forest clearing, shifting cultivation and the increasing human population pressure in both protected and unprotected areas, the remaining small and fragmented habitats may no longer support a viable population of bears. So, the future of bear population is precarious and therefore the need to study their status, population and threats is urgently needed to formulate a conservation and management plan. Given these rationales, this study was carried out to 1) find out their present distributional range and population status, 2) assess threats to bear and its habitats, 3) study human-bear conflicts, 4) raise awareness among the local people, planners and foresters, and 5) recommend conservation measures.
2. STUDY AREAS

2.1. General
Three broad study regions namely the northeast, north and central, and southeast have been considered for this survey. Under these three regions, a total of 88 study sites were selected on the basis of published and unpublished research papers, articles, government records and newspaper clippings. Some of the sites were also considered on the basis of likelihood of bear presence and by interviewing wildlife biologists and researchers. These study sites fall under three upazilas in Maulvi Bazar district, one upazila in Habiganj district in the northeast; two upazilas in Sherpur district and two upazilas in Tangail and Mymensingh districts in north and central; seven upazilas in Bandarban district, seven upazilas in Rangamati district and three upazilas in Khagrachhari district in the southeast (Fig. 2.1). Surveys were conducted in 29 sites in the northeast, three in north and central and 56 in the southeast (Fig. 2.2). Both the northeast and southeast have mixed-evergreen forests including tea gardens, homesteads and planted forests while the north and central regions have the deciduous forest.

2.2. The Northeastern Region

Horinchara
A total of 19 sites were visited in Horinchara. These sites are Nahar Punji, Sheshil Bari, Longlia Punji, Mechanicheera, Horinchara, Biddabeel, Shibbari, Horinchara sector 87, Horinchara sector 10, Valu Kuchi, Nirala Punji, Kuttamara, Alubari, Sukcheera, Mohadebtila, Chalta Punji, Nahar Tea Garden, Tipracheera and Aslam Punji.

Horinchara is situated (N 24°10.339’ E 91°44.701’) in Sreemangal upazila of Maulvi Bazar district. It is about 25 km away from Sreemangal town. On the north of Horinchara is Sreemangal town; on the southeast is the border of India (Tripura). Horinchara is a tea estate of Finlay Tea Company, Bangladesh, with a total area of 875.29 ha and it contains scattered patches of trees mostly planted and maintained by the estate. The hillocks in this area are also covered by tea gardens. There are three forest villages known as Khasia Punji at Horinchara. These are Nirala Punji, Chalta Punji and Nehal Punji. Nirala Punji is the largest with more than 3000 families. The main occupation of the villagers is betel leaf cultivation and shifting cultivation. Some hillocks are covered with bamboo thickets and low scrub vegetation. Some large trees such as Albizia sp., Acacia sp., Ficus sp., Artocarpus sp. are found scattered throughout the area. Rhesus macaque, Wild boar, Barking deer and many species of birds are known to occur in the area.
Fig. 2.1. Bear survey districts in Bangladesh (inset: Bangladesh and neighboring countries).
Lawachara National Park
Lawachara is a National Park and currently covers an area of 1250 ha which falls in the West Bhanugach Reserve Forest in the Maulvi Bazar Forest Range of the Sylhet Forest Division (FD/MoEF 2000). It is located (N 24°19.595’ E 91°47.246’) at 7 km east of Sreemangal upazila town. The topography of the area varies from medium to steep hilly slopes. Many water streams (locally called chara) pass through and around the numerous hillocks (locally called tila of height about 25-30 m). The forest is of a semi evergreen type and the canopy height varies from 10-30 m (FD/MoEF 2000). The top canopy comprises of Tectona grandis, Artocarpus chaplasha, Tetrameles sp., Hopea sp., Pygeum sp. and Ficus sp. The second storey consists of Quercus sp., Syzygium sp., Gmelina sp., Dillenia sp. and Ficus sp. The undergrowth includes Bambusa, Geodorum sp., several ferns and epiphytes. The forest is largely secondary growth forest, much of the trees have been planted in the early to mid 1900’s. Some areas have been planted very recently (Kalachara areas, late 1990’s) while patches of tea gardens also exist (e.g. Jankichara). Lawachara is rich in faunal diversity; especially avifauna, with more than 200 species being represented. Among mammals, 6 species of primates (out of 10 known from Bangladesh) are found here. Orange-bellied squirrels, Himalayan squirrel, Large Indian civet, Barking deer, Leopard cat, Crab-eating mongoose also occur in this forest.

Chautoli
Chautoli is close to the Lawachara NP which is a forest beat (N 24° 21.092’ E 91° 47.452’) of Maulvi Bazar Forest Range under Sylhet Forest Division. Most of the natural forests of the area has been replaced with plantation of Tectona grandis (Shegun) and only a few small scattered natural patches occur in the area, that support Syzygium sp., Artocarpus chaplasha (Chapalish), Ficus sp. (Dumur) and bamboo thickets. Three species of primates, namely the Hoolock gibbon, Pig-tailed macaque and the Rhesus macaque are found in this area. Besides, avifauna of the site is also notable.

Adampur
Adampur is situated (N 24°24.392’ E 91°90.582’) in the southeast of the Lawachara NP. It is under the jurisdiction of Rajkandi Forest Range in Kamalganj thana of Maulvi Bazar district. Total area of this forest is about 5295 ha. The Dhalai River flows adjacent to this forest. Numerous hillocks with water streams form part of the topography of Adampur. There are two-forest villages within this mixed evergreen forest. Major trees of this forest are Dipterocarpus sp. Alangium agallocha, Artocarpus chaplasha, Anthocephalus chinensis, Tectona grandis, Lagerstroemia parviflora, Ardisia solanacea, Hibiscus macrophyllus, Antidesma ghasebilla, Syzygium grandis, Ficus religiosa, Ficus benghalensis, Ficus glaberrima, etc. Various species of Bambusa, Coccinea cordifolia, Eupatorium odoratum, Heliotropium indicum, etc., form rich undergrowth. Adampur forest beat has three forest blocks – the Lawachara block, Daluachara block and Baghachara block. Like Lawachara NP, Adampur is also rich in faunal diversity, particularly in avifauna. Among the primates, Rhesus macaque, Pig-tailed macaque, Capped langur, Phayre’s langur, Hoolock gibbon, and Bengal slow loris occur in this forest. Among the other mammals, Orange-bellied squirrel, Hoary-bellied Himalayan squirrel, Large Indian civet, Leopard cat, Crab-eating mongoose also occur in this area.

Hosenabad
In Hosenabad, two sites were surveyed. These are Jungle Bari and Patharkhola. Hosenabad is situated (N 24°10.258’ E 91°44.705’) in Sreemangal upazila of Maulvi Bazar district. It is
about 20 km away from the Sreemangal town. On the northeast of Hosenabad is Sreemangal town; on the southeast is the border of India (Tripura). Hosenabad is a tea estate of Finlay Tea Company, Bangladesh and it contains scattered patches of trees mostly planted and maintained by the estate. The hillocks in this area are also covered by tea gardens. The main occupations of the villagers are working in tea gardens as daily labourer and shifting cultivation. Some hillocks are covered with bamboo thickets and low scrub vegetation. Some large trees such as *Albizia* sp., *Acacia* sp., *Ficus* sp., *Artocarpus* sp. are found scattered throughout the area. Rhesus macaque, Wild boar, Barking deer and many species of birds are known to occur in the area.

**Juri**

Juri (N 24°33.559'E 92°13.386') is a forest range of Maulvi Bazar district under Sylhet forest division. It has an area of 6844.67 ha. This range is divided into four forest beats. These are (i) Lathitila (2278.28 ha), (ii) Putichara (1368.01 ha), (iii) Shagarnal (1700.4 ha) and (iv) Ragna (1497.98 ha). In Juri the forest type is semi-evergreen with the dominant tree species being *Dipterocarpus turbinatus*, *Tectona grandis*, *Lagerstroemia* sp., *Syzygium grandis* and *Salmalia* sp. Undergrowth comprises of mostly various types of bamboo (*Bambusa* sp.), *Eupatorium odoratum*, etc. Rhesus macaque, Capped langur and a number of bird species are known to occur within the forest.

**Satchari National Park**

Satchari national park is under the jurisdiction of Satchari Forest Range in Habiganj district under Sylhet Forest Division. The forest patch lies (N 24°12.713'E 91°44.436') within the Raghunandan Hill Reserve Forest and is bounded on the south by the international boundary with India’s Tripura state. Area of this forest is about 242.91 ha. The area occupies the higher ridges of the northernmost extension of Dupitila, Tipam and Surma sedimentary rocks extending from the Chittagong Hill Tracts through Tripura State of India. The area has a moist tropical climate, with high rainfall concentrated during the monsoon from June to September and generally 4 to 5 months of dry period. Among primates Rhesus macaque, Capped langur, Phayre’s langur, Slow loris and Hoolock gibbon occur in Satchari.

**2.3. The North and Central Regions**

**Madhupur Gar**

The Madhupur Tract also famously known as Madhupur Gar is the largest remaining sal forests and located in central and northern (N 24°67.540', E 90°12.502') parts of the country. This tract is distributed over Gazipur, Mymensingh and Tangail districts with a total area of 0.12 million ha. Sal forests are classified as tropical moist deciduous forests. FAO (2000) categorizes Sal forest into two subtypes, pure Sal and mixed Sal, on the basis of soil type and tree canopy. In the past pure Sal stands had a canopy that was nearly 100 percent and the growth of the trees was so rapid that these forests were considered inexhaustible (Khan 1998). Mixed Sal forests are dominated by Sal in the top storey but include many other associated species such as *Terminalia belerica*, *Dillenia pentagyna*, *Albizia.procera* and, *Lagerstroemia parviflora*. The understory is more complex and includes a variety of deciduous and evergreen species. The flora of this Sal forest type includes about 271 species of which 41 are tree species. Sal forests also include a high number of climbers and woody perennials of medicinal value. Rhesus Macaque, Capped Langur, Wild Boar, Barking Deer, Fishing Cat, Indian Porcupine, Rock Python, Hoary-bellied Himalayan Squirrel, Red Jungle Fowl, Red-breasted Parakeet, etc. are commonly found in these forests.
Garo Hills
Gazni (N 25°25.781', E 90°05.112') was surveyed as the adjoining part of the Garo hills and situated at northern border of Bangladesh. It has also been taken into survey list due to having previous records of bear presence (Sarker 2006). It shares similar topography and vegetation with Garo hills of Indian state of Meghalaya. Gazni is located at Jhenaigati upazila of Sherpur district. Total area of Gazni is about 3000 acres of which patches of sal forests remain only over about 1000 acres. Sal (Shorea robusta) is the principal tree in these areas along with Ficus sp., Kathal (Artocarpus heterophyllus), Am (Mangifera indica), Gamar (Gmelina arborea), etc. The remaining areas are profusely planted with exotic species such as Eucalyptus sp., Acacia sp., Tectona grandis, etc. under social forestry sharing agreement by the forest department and local people. Among the wild animals, Orange-bellied Squirrel, Indian Porcupine, Wild Boar, etc. could be commonly found. Rhesus Macaque and Capped Langur are rarely seen in the forests, although once they were very common. Vagrant elephants (Elephas maximus) which come down from the Garo hills of Indian state of Meghalaya have become a rampant pest for paddy fields in Bangladeshi border areas. Black-crested Bulbul, Red-vented Bulbul, Black-hooded Oriole, White-rumped Shama, Spangled Drongo, etc. are the notable birds.

Madhutila
Madhutila is located (N 25°20.213’, E 90°03.112’) at Nalita Bari upazila of Sherpur district. It is the part of Madhutila forest range under Mymensigh Forest Division which is closed to Indian border state of Meghalaya in the north. It has three forest beats, namely the Shandhyakura (662.66 acres), Bathkuchi (1968.20 acres) and Shamashchura (1350.40 acres). Total area is 1611.46 ha. There is an ecopark under this forest range called the Madhutila ecopark. Exotic plants like Acacia sp., Eucalyptus sp. and Tectona grandis have been planted in almost all of areas of these three forest beats. However, the native plant species which are mainly found in homestead gardens and some also within the ecopark include Bahera (Terminalia bellerica), Chalta (Dillenia indica), Bot (Ficus sp.), Kathal (Artocarpus heterophyllus), Am (Mangifera indica), Gamar (Gmelina arborea), etc. Indian Porcupine, Wild Boar, Black-rumped Shama were the notable animal species. Asian Elephant (Elephas maximus) coming from bordering Indian Meghalaya state used to make huge crop damage every year.

Plate 2.1. Madhutila in the north of Bangladesh.
Fig. 2.2. Bear survey sites in Bangladesh.
2.4. The Southeastern Region

Ruma
Two sites were surveyed in Ruma. Ruma is a Forest Range of Bandarban Forest Division. These are Ruma Sadar and Prangsa. Ruma (N 22°02.958’ E 92°29.509’) is bounded by Rowangchhari upazila on the north, Thanchi upazila on the south, Belaichhari upazila on the east, Bandarban Sadar and Lama upazilas on the west. The main river is the Shankha (Sangu). Major tree species includes Ficus sp., Bursera serrata, Syzygium sp., Michelia champaca, etc.

Lama
Two sites were surveyed within Lama. These are Budonjiri and Kaprupara. Lama (N 21°60.288’ E 92°16.156’) is a Forest Range of Bandarban Forest Division. Kaprupara contains more than 20 families. Important tree species in these areas include Ficus sp., Bursera serrata, Syzygium sp., Michelia champaca, etc. There are plantations in these areas which include Michelia champaca, Tectona grandis, etc.

Thanchi
Thanchi is a Forest Range of Bandarban Forest Division. It has a total area of 6870.45 ha. It is bounded by Ruma upazila on the north, Arakan of Myanmar on the south, Chin of Myanmar and Belaichhari upazila on the east, Alikadam and Lama upazilas on the west. The main river is the Sangu (Shankha). It is one of the remote areas in Bandarban hill district which has scattered forests of mixed-evergreen type. Important tree species include Ficus sp., Bursera serrata, Syzygium sp., Michelia champaca, etc. Plantations include species such as Michelia champaca, Tectona grandis, etc.

Alikadam
This site falls within the Matamuhuri Forest Range under the Bandarban District. Alikadam upazila with an area of 885.78 sq km is bounded by Lama on the north, Arakan of Myanmar on the south, Thanchi upazila on the east and Naikhongchhari and Lama on the west. The Bakkhali, a downstream branch of Matamuhuri is the only river flowing across the area. This areas also supports mixed-evergreen forests and plantations with exotic tree species. Syzygium sp., Ficus sp., Lagerstroemia sp., etc. are some of the common plant species.

Bandarban Sadar
A total of 5 sites were surveyed in Bandarban sadar (N 22°11.121’ E 92°23.416’). These are Rinikhyang Bagan Para, Ranglai Chairman Para, Empu Para, Chini Para and Kurang para. These areas contain more than 3000 households. Important tree species include Ficus sp., Bursera serrata, Syzygium sp., Michelia champaca, etc. Plantations include species such as Michelia champaca, Tectona grandis, etc.

Rowangchhari
Rowangchhari upazila (N 22°15.308’ E 92°34.735’) is bounded by Rajasthali and Belaichhari upazilas on the north, Ramu upazila on the south, Belaichhari and Ramu upazilas on the east, Bandarban sadar upazila on the west. Mountain range and forests cover most part of the upazila. In total 6 places were visited which are Swanglu Para, Bijoy Para, Khamtang Para, Paglachara Para, Rowangchhari Sadar Para, and Tulachari Para. Important tree species include Ficus sp., Bursera serrata, Syzygium sp., Michelia champaca, etc. Plantations include species such as Michelia champaca, Tectona grandis, etc.
**Barkal**
A total of six sites were surveyed in and around Barkal which falls under Rangamati district. The surveyed sites are Garjantali, Dumoujjechara, Jakkobajei, Begencachari, Nah-Vanga and Bagchari. Barkal (N 22°44.867’, E 92°26.212’) is bounded by Baghaichhari and Langadu upazilas on the north, Juraichhari and Rangamati Sadar upazilas on the south, Mizoram of India on the east and Langadu and Rangamati Sadar upazilas on the west. Important tree species include *Dipterocarpus* spp., *Artocarpus chaplasha*, *Tectona grandis*, *Albizia* sp., *Swietenia mahagoni*, *Eugenia* sp., and *Tetrameles* sp. The main animal species include Rhesus macaque, Wild boar, Barking deer, lesser cats, a variety of reptiles and birds.

**Belaichhari**
A total of 4 sites were surveyed in Belaichhari ((N 22°50.780’ E 92°38.321’)). These sites are Ajachara o Belaichhari Moan, Punkua Para, Pukur par and Boratoli. Belaichhari is bounded by Juraichhari and Rangamati Sadar upazilas on the north, Ruma and Thanchi upazilas on the south, Mizoram of India and Myanmar on the east, Kaptai, Rajasthali and Rowangchhari upazilas on the west. Important tree species include *Dipterocarpus* spp., *Artocarpus chaplasha*, *Tectona grandis*, *Albizia* sp., *Swietenia mahagoni*, *Eugenia* sp., and *Tetrameles* sp. The main animal species include Rhesus macaque, Wild boar, Barking deer, lesser cats, a variety of reptiles and birds.

**Baghaichhari**
Baghaichhari (N 23°27.971’, E 92°15.585’) is bounded by Tripura and Mizoram states (India) on the north, Langadu upazila on the south, Mizoram (India) on the east and Dighinala upazila on the west. *Syzygium* sp., *Ficus benghalensis*, *Lagerstroemia* sp. are some of the common plant species.

**Longadu**
Longadu (N 23°00.876’ , E92°14.514’) is bounded by Baghaichhari and Dighinala upazilas on the north, Barkal upazila on the south and east, Rangamati sadar, Nanearchar, Mahalchhari and Khagrachhari sadar upazilas on the west. Important tree species *Artocarpus chaplasha*, *Tectona grandis*, *Albizia* sp., *Swietenia mahagoni*, *Eugenia* sp., and *Tetrameles* sp. The main animal species include Rhesus macaque, Wild boar, Barking deer, lesser cats, a variety of reptiles and birds.

**Rajasthali**
Rajasthali (N 22°41.810’, E92°24.490’) is bounded by Kaptai upazila on the north, Bandarban sadar and Rowangchhari upazilas on the south, Belaichhari upazila on the east, Rangunia upazila on the west.

**Dighinala**
Dighinala (N 23°22.527’, E 92°09.871’) is under the Forest Range of Khagrachhari. It has forested areas and scattered bamboo thickets. Local villagers grow homestead forests. Rhesus macaques, Hoolock gibbons and other small mammals occur along with a rich abundance of birdlife.
Matiranga
Matiranga (N 23°04.051', E 91°87.566') is bounded by the Indian state of Tripura on the north and west, Ramgarh upazila on the south, Panchhari, Khagrachhari sadar and Mahalchhari upazilas on the east. Scattered bamboo thickets occur and local villagers have some homestead forests in the area. Rhesus macaques and other small mammals occur along with a rich abundance of bird species. Major tree species of these areas are Artocarpus chaplasha, Anthocephalus chinensis, Lagerstroemia parviflora, Ardisia solanacea, Antidesma ghasembilla, Syzygium grandis, Ficus religiosa, Ficus benghalensis, Ficus glaberrima, Tectona grandis, Alangium agallocha, Hibiscus macrophyllus, etc. Most of the area is covered with bamboo thickets. Among the mammals Asian Elephant (Elephas maximus), Rhesus Macaque (Macaca mulatta), Wild Boar (Sus scrofa), Barking Deer (Muntiacus muntjak), Sambar (Cervus unicolor) and Indian Leopard (Panthera pardus). Among the reptiles King Cobra (Ophiophagus hannah) Monitor Lizard (Varanus salvator) and Bengal Monitor Lizard (Varanus bengalensis) are remarkable.

Plate 2.2. Typical bear habitat in the southeast of Bangladesh.
3. METHODS AND MATERIAL

3.1. General
The study was conducted from March 2008 to May 2010. Data were collected by field visits and structured questionnaire interviews. A team of three to four members comprising investigators, researchers and research students of the University of Dhaka conducted field visits and interviews. Local assistants also accompanied the survey team to facilitate communication in the field for survey and interviewing local communities and local staff of the forest department. During field visits, data were collected on direct sightings, footprints, claw marks, feces, den and nest, while local people living close to proposed study sites were interviewed to supplement findings of the field surveys. Additional data were collected from literature search, newspaper and media clippings, and records of the Bangladesh Forest Department. All existing zoos and Safari park were also visited to record bear species in their collections.

3.2. Field survey
We carried out random transects in the study sites to understand the presence and distribution of bear species in the Bangladesh. During transect walking, we concentrated on identifying signs of the bears such as claw markings, footprints, feeding signs, feces, crop raiding in addition to direct sighting. To note on the data sheet, a detailed sketch of the claw marks of bears were made including: i) measurements of claw marks for species identification, ii) photographs of the claw marks for further analysis to determine age of the species, iii) diameter at breast height (dbh) of the trees used for climbing, and iv) GPS coordinates of the trees. A detailed measurement protocol is illustrated in the Figure 1. Additionally, feces were examined to confirm as bear feces through presence of seeds, and other residues and photographs were taken for future reference. Dens and nests were thoroughly checked for confirmation of the presence of the bears in the study sites. Major flora and fauna of the survey sites were recorded including nature and scale of habitat destruction and degradation.

Identification of Asiatic Black Bear and Malayan Sun Bear from their claw marks
Both Asiatic Black Bear and Malayan Sun Bear are active climbers. These bear species have been known to climb mainly for feeding on fruits, nesting, resting and even sometimes escaping from imminent danger. As a result, claw marks on the climbed trees provided useful clues to presence and identification of both of these species where they co-exist (Steinmetz and Garshelis 2008). Following 4 steps are useful for classification and measurement of the claws (Steinmetz and Garshelis, 2008):

Step 1: Recognizing claw marks of the hind foot. Claw marks of only the hind foot were used for measurements. Usually, the claw set axis from hind foot marks is horizontal with respect to the tree trunk while the front foot marks are oriented diagonally (Plate 3.1a).

Step 2: Making a template of the claw mark set. A template of the claw mark was prepared by placing a piece of paper over the claw mark set following the curvature of the tree trunk. Holes were then punched at the bottom center of each claw mark (Plate 3.1b) and the outline of each claw mark drawn above the holes (Fig. 3.1).
Plate 3.1. Making template of the claw marks.

Step 3: Measuring the claw marks. After preparing the template, straight-line measurements were taken a) the middle 3 claws, b) the outer 5 claws, c) the shortest distance between 4 claws as shown in Figure 3.1.

Step 4: Comparing with reference table. We then compared the measurements obtained from the template with reference table (Table 3.1).

![Fig. 3.1. Straight-line measurements of claw marks.](Plate 3.1a Plate 3.1b)

<table>
<thead>
<tr>
<th>Species/unclassified</th>
<th>STEP 1</th>
<th>STEP 2</th>
<th>STEP 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asiatic Black Bear</td>
<td>4-claw width (cm)</td>
<td>5-claw width (cm)</td>
<td>3-claw width (cm)</td>
</tr>
<tr>
<td></td>
<td>&gt; 6.6</td>
<td>&gt; 9.0</td>
<td>&gt; 4.1</td>
</tr>
<tr>
<td>Malayan Sun Bear</td>
<td>&lt; 6.0</td>
<td>&lt; 8.2</td>
<td>&lt; 4.0</td>
</tr>
<tr>
<td>Indeterminate</td>
<td>6.0-6.6</td>
<td>8.2-9.0</td>
<td>4.0-4.1</td>
</tr>
</tbody>
</table>
However, there are some guidelines to use reference table as follows: i) Starting comparison 4 claw width ii) If step 1 in the reference table remained indeterminate, step 2 was followed and so on. For positive identification, only as many steps were used as necessary. There is no need to proceed to further steps if an earlier step provides the required. It is known that this method results in 90-95% accuracy depending on how many steps are required. Fewer steps give higher accuracy but leaves indeterminate samples unclassified. More steps provide lower accuracy but leave fewer indeterminate samples (Steinmetz and Garshelis, 2008).

**Calculation of age of claw marks**

Condition and freshness of the claw marks on the tree trunk are often used to infer the time period when claw marks are printed. Following indicators have been used to track time of claw markings (Steinmetz and Garshelis, 2008).

a. Fresh claw mark (< 2 months); woody grit and sharp edge seen in the mark (Plate 3.2A)
b. Recent claw mark (2-12 months); woody grit disappeared and edge not sharp in mark (Plate 3.2B)
c. Old claw mark (> 1 years); bark growth inside and around marks (Plate 3.2C)
d. Very old mark (1-3 years); marks are extruded (pop-out) from trunk (Plate 3.2D)

![Plate 3.2. Different aged claw marks (after Steinmetz and Garshelis, 2008).](image_url)

**Identification of Asiatic Black Bear and Malayan Sun Bear from footprint morphology**

**Morphology:** Differences between footprints of both of these species are also useful to distinguish the Asiatic Black Bear from the Malayan Sun Bear. There are a lot of overlap and variation of the footprints between these species. However, on average footprints of the Asiatic Black Bear is wider and longer than the Malayan Sun Bear. Measurements obtained from small captive animals suggests the threshold that the total length (from heel to leading edge of toes) of the hind footprints is likely 18 cm and width of the hind foot along with pad is >10 cm in case of adult animal. In some cases, foot shape has been also useful when hind foot print with pad was measured as equal as around 10 cm for both of the species in the wild.

**Arc of toes:** The thumb (Toe 1) of the Asiatic Black Bear is usually dropped back further compared to the Malayan Sun Bear and also the toe 5 is further back from the middle three toes relative to Malayan Sun Bear. Thus, toes of the Asiatic Black Bear form more of an arc along the plantar pad whereas a straight-line along the pad of the Malayan Sun Bear.

**Claws:** Claw marks are also used to distinguish the Asiatic Black Bear from the Sun Bear. It is known that the claws of the front foot of the Malayan Sun Bear are much longer than the
Asiatic Black Bears; claw marks sometimes appear in footprints. However, in the field, claws of both species often do not register in footprints, so claw length is an unreliable indicator of species.

**Symmetry:** The metatarsal (heel) pad of the hind feet of the Asiatic Black Bear seems asymmetric compared to the Malayan Sun Bear. This occurs because the two sides of the heel pad of the Asiatic Black Bear make different paths up to the top of the pad — one side curves around more, while the other side makes a straighter line (Fig. 2). Thus, the “U-” or “V-shaped” back portion of the heel swerves out to one side. This can be seen on the Asiatic Black Bear’s feet and in their footprints. It is not sure if this is a reliable diagnostic feature, but it seems to appear even in somewhat vague footprints (Plate 3.3).

Plate 3.3. Morphology of feet of bears (Steinmetz, 2008).
3.3. Questionnaire Survey

Structured questionnaire surveys were conducted to supplement findings obtained during field visits and also to gather additional information on past and present status, distribution, types and scales of human-bear interactions, threats to bear, etc. Interviews covered diverse groups of people including farmers, forest resource users, housewives, field level staff of Bangladesh Forest Department, headman (village level leaders of ethnic communities), NGO workers, etc. Before starting the survey the questionnaire was developed and sent to bear specialists for review and improvement. The issues addressed in structured questionnaire format could be found in the Annex 1.
4. RESULTS AND DISCUSSION

4.1. General

Presence of bear signs was observed in 26 sites in the northeast (mostly in forested sites in Sreemangal), 45 sites in the southeast and one site in the north and central regions. All signs were of Asiatic black bear’s although one site in the southeast (Pukur Par, N 22°01.131’, E 92°32.587’ in Rangamati) yielded bear signs that could have been from the Malayan Sun bear. The survey results indicated that most populations in the northeast possibly moved to and from neighboring Tripura State of India. In the southeast, populations were likely exchanged between Tripura and Mizoram states of India and Rakhain states of Myanmar. While in the north (Gazni sal forest patch), some vagrant population were supposed to come down to sal forest patches in Bangladesh from adjoining Garo hills of the Meghalaya state of India. The bear distribution in the northeast region is apparently restricted primarily to forest patches on private lands (e.g., tea estates) although their presence in state forests or protected areas cannot be ruled out. Loss of forested areas both inside and outside protected areas, hunting for human consumption and traditional medicinal use constitute a major threat to bears in Bangladesh. In addition, lack of awareness and appropriate management of protected areas, and human-bear conflicts are thought to be the major challenges of bear conservation in the country.

4.2. Status and distribution

A total of 88 sites under three major study regions were surveyed to record the presence of bears, their signs (nest, den, claw marks, foot prints, and body parts) and people’s experiences on encounter/sighting, and use and consumption of bears during 2008 to 2010 (Table 4.1). Out of 88 study sites, we recorded information on the presence and distribution of bears in 72 sites comprised of the north and central (1 site), northeast (26 sites) and southeastern (45 sites) regions of Bangladesh (Table 4.1).

In the northeast, presence of bear signs was recorded from the 26 sites out of 29 survey sites. The signs were recorded as hunting and killing records, nests and dens, claw marks and respondent’s sightings. Of the 56 sites visited in the southeast, three nests and dens, 15 different claw marks, 16 different body parts were observed in 45 sites. Body parts were five gall bladders, three skins, a lower jaw, three claws and four teeth. While in the central and northern regions, no signs of bear presence were recorded in the Madhupur Gar and Madhutila. However, only 1.13% respondents inhabiting in the forest areas of Gazni located at Sherpur district in the north told that few years back one mother with two cubs had come down to sal forests and their homesteads from the adjoining border areas of Meghalaya state of India.
Table 4.1. Summary of sign records of bear presence in the study areas

<table>
<thead>
<tr>
<th>Survey regions</th>
<th>Survey sites</th>
<th>Presence of bear signs</th>
<th>Interview</th>
<th>Bear species</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total sites visited</td>
<td>Presence of signs in total survey sites</td>
<td>Nests &amp; dens</td>
<td>Claw marks</td>
</tr>
<tr>
<td>Northeast</td>
<td>29</td>
<td>26</td>
<td>9</td>
<td>7</td>
</tr>
<tr>
<td>Southeast</td>
<td>56</td>
<td>45</td>
<td>45</td>
<td>3</td>
</tr>
<tr>
<td>North &amp; Central</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
4.2.1. The Asiatic Black Bear

Northeastern region
Out of 29 survey sites, signs of bear were found in 26 sites in the northeast (Table 4.2). These field sites fall within the Sreemangal and Kamalganj upazilas under the Maulvi Bazar district and Madhabpur upazila of Habiganj district. Of the 26 sites, claw marks were recorded from 23 sites which are in fact the scattered pockets of remaining forests in and outside of protected areas. All signs were identified to be of Asiatic black bears. These sites were the Rajkandi, Jungle Bari, Patharkhola, Nahar Punji, Sheshil Bari, Longlia Punji, Mecharnicheera, Horinchara, Biddabeel, Shibbari, Horinchara 87 sector, Horinchara 10 sector, Valukuchi, Nirala Punji, Kuttamara, Alubari, Sukcheera, Moha Debtila, Chalta Punji, Nihar Tea Garden, Tiracheera and Aslam Punji in Maulivi Bazar while Satchari NP in Habiganj district. Presence of bears in the remaining three sites was confirmed by interviewing the local people. Interviews of 1645 people within these areas revealed that 73 (4.43%) had seen or encountered the Asiatic black bear in the wild. Frequency of bear signs and people’s sightings indicate a very low abundance of population of the Asiatic black bear in these sites. Most of the interviewees told that they saw the bears mainly during monsoon when jackfruits were abundant.

During the survey, we have recorded killing and capture records of black bears along with some supplementary previous reports of capture and killings. Between 2006 and 2007, four bears were killed in Lonjliapunji, Nahar punji, Chautoli and Satchari national park while two cubs were captured at Mechanicheera and two cubs in Nahar tea garden during the same period. However, no body parts were recorded from these study sites.

Plate 4.1. Claw marks of Asiatic Black Bear.
<table>
<thead>
<tr>
<th>Site No.</th>
<th>Study sites</th>
<th>GPS coordinates</th>
<th>Data sources</th>
<th>Habitat types</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Rajkandi Reserve</td>
<td>N 24°24.392', E 91°90.582'</td>
<td>Interview, claw mark, nest</td>
<td>Mixed-evergreen forest</td>
</tr>
<tr>
<td>2</td>
<td>Chautali</td>
<td>N 24°21.092', E 91°47.452'</td>
<td>Interview</td>
<td>Mixed evergreen forest</td>
</tr>
<tr>
<td>3</td>
<td>Lawachara NP</td>
<td>N 24°19.595', E 91°47.246'</td>
<td>None</td>
<td>Mixed evergreen forest</td>
</tr>
<tr>
<td>4</td>
<td>Jangal Bari</td>
<td>N 24°10.258', E 91°44.705'</td>
<td>Interview, claw mark, nest</td>
<td>Mixed evergreen forest</td>
</tr>
<tr>
<td>5</td>
<td>Patharkhola</td>
<td>N 24°14.907', E 91°47.405'</td>
<td>Interview, claw mark, den</td>
<td>Mixed evergreen forest</td>
</tr>
<tr>
<td>6</td>
<td>Nahar Punji</td>
<td>N 24°10.547', E 91°44.464'</td>
<td>Interview, claw mark</td>
<td>Battle leaf garden</td>
</tr>
<tr>
<td>7</td>
<td>Sheshil Bari</td>
<td>N 24°13.887', E 91°44.876'</td>
<td>Interview, claw mark</td>
<td>Jackfruit garden</td>
</tr>
<tr>
<td>8</td>
<td>Longlia Punji</td>
<td>N 24°11.121', E 91°44.876'</td>
<td>Interview, claw mark</td>
<td>Battle leaf garden</td>
</tr>
<tr>
<td>9</td>
<td>Mechanicheera</td>
<td>N 24°09.423', E 91°43.529'</td>
<td>Interview, claw mark</td>
<td>Mixed evergreen forest</td>
</tr>
<tr>
<td>10</td>
<td>Horinchara</td>
<td>N 24°10.339', E 91°44.701'</td>
<td>Interview, claw mark</td>
<td>Tea garden</td>
</tr>
<tr>
<td>11</td>
<td>Biddabeel</td>
<td>N 24°16.477', E 91°70.517'</td>
<td>Interview, claw mark</td>
<td>Tea garden</td>
</tr>
<tr>
<td>12</td>
<td>Shibbari</td>
<td>N 24°17.625', E 91°73.251'</td>
<td>Interview, claw mark</td>
<td>Tea garden</td>
</tr>
<tr>
<td>13</td>
<td>Horinchara sector 87</td>
<td>N 24°18.073', E 91°73.489'</td>
<td>Interview, claw mark</td>
<td>Tea garden</td>
</tr>
<tr>
<td>14</td>
<td>Horinchara sector 10</td>
<td>N 24°16.943', E 91°72.846'</td>
<td>Interview, claw mark</td>
<td>Tea garden</td>
</tr>
<tr>
<td>15</td>
<td>Valu Kuchi</td>
<td>N 24°09.423', E 91°43.529'</td>
<td>Interview, claw mark, den</td>
<td>Tea garden and evergreen forest</td>
</tr>
<tr>
<td>16</td>
<td>Nirala Punji</td>
<td>N 24°09.542', E 91°44.318'</td>
<td>Interview, claw mark</td>
<td>Battle leaf garden</td>
</tr>
<tr>
<td>17</td>
<td>Kuttamara</td>
<td>N 24°15.237', E 91°73.053'</td>
<td>Interview, claw mark</td>
<td>Tea garden</td>
</tr>
<tr>
<td>18</td>
<td>Alubari</td>
<td>N 24°16.347', E 91°73.076'</td>
<td>Interview, claw mark</td>
<td>Tea garden forest</td>
</tr>
<tr>
<td>19</td>
<td>Sukcheera</td>
<td>N 24°15.301', E 91°73.519'</td>
<td>Interview, claw mark</td>
<td>Mixed evergreen forest</td>
</tr>
<tr>
<td>20</td>
<td>Mohadebtila</td>
<td>N 24°16.214', E 91°74.548'</td>
<td>Interview, claw mark, den</td>
<td>Mixed evergreen forest</td>
</tr>
<tr>
<td>21</td>
<td>Chalta Punji</td>
<td>N 24°16.214', E 91°74.548'</td>
<td>Interview, claw mark</td>
<td>Battle leaf garden</td>
</tr>
<tr>
<td>22</td>
<td>Nihar Tea Garden</td>
<td>N 24°17.056', E 91°74.787'</td>
<td>Interview, claw mark</td>
<td>Tea garden</td>
</tr>
<tr>
<td>23</td>
<td>Tiprancheera</td>
<td>N 24°19.374', E 91°72.354'</td>
<td>Interview, claw mark</td>
<td>Tea garden</td>
</tr>
<tr>
<td>24</td>
<td>Aslam Punji</td>
<td>N 24°16.214', E 91°74.548'</td>
<td>Interview, claw mark</td>
<td>Battle leaf garden</td>
</tr>
<tr>
<td>25</td>
<td>Juri Forest</td>
<td>N 24°33.559', E 92°13.386'</td>
<td>None</td>
<td>Mixed evergreen forest</td>
</tr>
<tr>
<td>26</td>
<td>Satchari NP</td>
<td>N 24°12.713', E 91°44.436'</td>
<td>Interview, claw mark</td>
<td>Mixed evergreen forest</td>
</tr>
<tr>
<td>27</td>
<td>Lebucheera</td>
<td>N 24°11.752', E 91°45.229'</td>
<td>Interview</td>
<td>Tick Garden</td>
</tr>
<tr>
<td>28</td>
<td>Chankhola</td>
<td>N 24°10.746', E 91°46.672'</td>
<td>Interview</td>
<td>Deforested area</td>
</tr>
<tr>
<td>29</td>
<td>Duncan Brothers Tea Garden</td>
<td>N 24°12.652', E 91°47.065'</td>
<td>None</td>
<td>Tea garden</td>
</tr>
</tbody>
</table>
Northern and central region
In the northern and central region, three survey sites were visited which included Garo hills and Madhutila ecopark under Sherpur district and Madhupur Gar (Madhupur NP) in Tangail district (Table 4.3). No information on the presence of bears in terms of signs, claw mark, den, nest, capture or killing and sighting or encountering by local people have been found in these survey sites in the recent past. However, in Gazni of Sherpur some local people have opined that very rarely the Asiatic black bears come down from the Garo Hills of Meghalaya state of India to the adjoining sal forests and homestead forests of local ethnic communities, the Kuch inhabiting in the border areas of Bangladesh. Local people reported that three years back, three black bears (mother and two cubs) had come down from the Garo Hills of India and had wandered around the remnants of sal and planted forests in Bangladesh. The FD source also claimed that one black bear was killed few years back by the local people in sal forests adjacent to the Garo Hills in Bangladesh. On the other hand, local ethnic communities, the Mandi who are traditionally forest dwellers for generations in the Madhupur Gar, told that they had seen the Asiatic black bears about 50 years ago. They did not see any bears after independence of Bangladesh in their surroundings. No body parts of killed bears were found in these study areas.

Table 4.3. Study sites, coordinates and presence of Asiatic black bear in northern and central region

<table>
<thead>
<tr>
<th>Site No.</th>
<th>Study sites</th>
<th>GPS coordinates</th>
<th>Data sources</th>
<th>Habitat types</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Garo Hills</td>
<td>N 25°25.781′, E 90°05.112′</td>
<td>Interview</td>
<td>Deciduous and planted forests</td>
</tr>
<tr>
<td>2</td>
<td>Madhutila</td>
<td>N 25°20.213′, E 90°03.112′</td>
<td>Interview</td>
<td>Planted forest</td>
</tr>
<tr>
<td>3</td>
<td>Madhupur Gar</td>
<td>N 24°67.540′, E 90°12.502′</td>
<td>Interview</td>
<td>Deciduous and planted forests</td>
</tr>
</tbody>
</table>

Plate 4.2. Den of Asiatic Black Bear.
Southeastern region
A total of 56 sites were surveyed in the southeastern region of the country which covers Cox’s Bazar, Chittagong and three hill districts – Khagrachhari, Rangamati, and Bandarban. Of these, presence of bear signs have been recorded from 45 sites (Table 4.4). All signs and local information were of Asiatic black bear’s. The sites of bear presence included the Pransa, Ghalangya, Alikadam, Naikhongchhari, Budenjhiri, Kapru Para, Rinikhyang Bagan Para, Ranglai Chairman Para, Empu Para, Chini Para, Kurang Para, Swanglu Para, Bijoy Para, Paglachara Para, Tulachari Para, Garjantali, Dhumoujjejchara, Jakkobajei, Begenchari, Nah-Vanga, Bagchari, Ajachara o Bilaichari Moan, Punkua Para, Pulur par, Boratoli, Jurachhari, Sajek, Baro Para, Krista Para, Boli Para, Wagga, Kaptola Para, Chenachara Para and Alutila. No signs of bear presence were found in the other 11 survey sites (Table 4.4).

Table 4.4. Study sites, coordinates and presence of Asiatic black bear (except Jurachari) in the southeast

<table>
<thead>
<tr>
<th>Site No.</th>
<th>Study sites</th>
<th>GPS coordinates</th>
<th>Data sources</th>
<th>Habitat types</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Pransa N 22°03.513’, E 92°28.764’</td>
<td>Interview</td>
<td>MEF**</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Ghalangya, Ruma N 22°02.958’, E 92°29.509’</td>
<td>Interview, body parts</td>
<td>MEF</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Thanchi Sadar --</td>
<td>None</td>
<td>MEF</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Alikadam --</td>
<td>Claw mark</td>
<td>MEF</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Naikhongchhari --</td>
<td>Claw mark</td>
<td>MEF</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Budenjhiri N 21°60.288’, E 92°16.156’</td>
<td>Interview</td>
<td>MEF</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Kapru Para N 21°91.839’, E 92°32.774’</td>
<td>Interview</td>
<td>MEF</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Rinikhyang Bagan Para N 22°11.121’, E 92°23.416’</td>
<td>Interview</td>
<td>MEF</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Ranglai Chairman Para N 22°08.775’, E 92°25.192’</td>
<td>Interview</td>
<td>MEF</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Empu Para N 21°97.643’, E 92°30.010’</td>
<td>Interview</td>
<td>MEF</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Chini Para N 21°98.515’, E 92°26.237’</td>
<td>Interview</td>
<td>MEF</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Kurang Para N 21°97.333’, E 92°30.477’</td>
<td>Interview</td>
<td>MEF</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Swanglu Para N 22°15.862’, E 92°34.533’</td>
<td>Interview</td>
<td>MEF</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Bijoy Para N 22°19.539’, E 92°33.322’</td>
<td>Interview</td>
<td>MEF</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Khamtang Para N 22°12.722’, E 92°38.225’</td>
<td>None</td>
<td>MEF</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Paglachara Para N 22°15.003’, E 92°31.964’</td>
<td>Interview</td>
<td>MEF</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Rowangchhari Sadar Para N 22°15.308’, E 92°34.735’</td>
<td>None</td>
<td>MEF</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>Tulachari Para N 22°18.928’, E 92°34.536’</td>
<td>Interview</td>
<td>MEF</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>Garjantali N 22°78.621’, E 92°40.590’</td>
<td>Interview</td>
<td>MEF</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>Dhumoujjejchara N 22°79.058’, E 92°40.590’</td>
<td>Interview</td>
<td>MEF</td>
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<tr>
<td>21</td>
<td>Jakkobajei N 22°78.005’, E 92°38.745’</td>
<td>Interview</td>
<td>MEF</td>
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<tr>
<td>22</td>
<td>Begenchari N 22°77.865’, E 92°32.008’</td>
<td>Interview</td>
<td>MEF</td>
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<tr>
<td>23</td>
<td>Nah-Vanga N 22°77.956’, E 92°32.153’</td>
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<td>MEF</td>
<td></td>
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<tr>
<td>24</td>
<td>Bagchari N 22°44.867’, E 92°26.212’</td>
<td>Interview, claw mark, nest</td>
<td>MEF</td>
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<td>25</td>
<td>Ajachara Bilaichari Moan N 22°50.780’, E 92°38.321’</td>
<td>Interview, claw mark, nest</td>
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<td>26</td>
<td>Punkua Para N 22°43.878’, E 92°34.661’</td>
<td>Interview</td>
<td>MEF</td>
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Total six survey sites yielded direct claw marks of the Asiatic black bears in the southeast. However, no footprints were recorded from these study sites. The sites of direct claw marking included Alikadam, Naikhongchhari, Bagchari, Ajachara-Bilaichari Moan, Pukurpar and Boli para. Of the 886 people interviewed, only 9.14% of respondents have seen the black bears in the wild.

There are many reports on the presence of Asiatic black bear in central, north-central, northeastern and southeastern parts of Bangladesh (Khan 1992, Sarker 2006). It was recorded from some areas of Maulvi Bazar of northeast and from Pablakhali Wildlife Sanctuary, Rangamati, Kaptai National Park of the Chittagong Hill Tracts in the SE during 1990’s (Khan 1992, Sarker 2006). This species of bear has also been reported from Khagrachhari,
Kassalong, Bandarban, Dulahazra, Naikhongchhari, Cox’s Bazar and Teknaf in the greater Chittagong division.

Bangladesh is surrounded by Meghalaya, Tripura and Assam states of India in the northeast, and Tripura and Mizoram states of India, and Northern Myanmar in the southeast. However, our northeastern regions close to border have some scattered bear populations compared to some good populations in Indian states (Sathyakumar 2001, 2006; Sathyakumar and Choudhury 2005). Southeastern region of Bangladesh could possibly have some good populations comparing other parts of the country but not in good shape comparing to Indian populations (Sathyakumar 2001, 2006; Sathyakumar and Choudhury 2005). Based on our observations from this survey, the Asiatic Black Bear can be categorized as Critically Endangered according to IUCN (2000) guidelines.

4.2.2. The Malayan Sun Bear
This study did not find any reliable information on the presence of the Malayan Sun Bear in Bangladesh both in wild and captivity. However, only one site in the southeast (Pukur Par in Rangamati) yielded bear signs that could be of the Malayan Sun bear’s. One respondent of Belaichhari of the hill district Rangamati opined that he saw the Malayan Sun Bear 5-6 years ago at Monpara forest. Another respondent of Jurachhari of Rangamati, which is near Belaichhari, told that he hunted one Malayan Sun Bear about 10 years ago from the nearby forest. Some local people of Pashing Para (N 21° 56.597’, E 92° 30.881’) at Ruma upazila of Bandarban also told that they used to see the Malayan Sun bear every year (M.M.H. Khan pers. obs.). However, during this survey, no claw marks or any body parts were seen of this bear species in the study sites in the country. No Malayan Sun bear has been recorded in zoos, safari park or in personal collections in Bangladesh.

There are some reports on the occasional presence of Malayan Sun bear from northeast and southeast as recently as 1995 (Sarker 2006). This bear species also has been reported from Korerhat of Chittagong, Sangu-Matamuhuri, Naikhongchhari, Dulahazra, Cox’s Bazar, Inani, Rangkheong and Teknaf in the southeast and Satchari National Park in the northeast (Sarker 2006). However, this study has not found enough information to support the findings of Sarker (2006). Further, our study has found information on the presence of Malayan Sun bears only in two sites – the Pukurpar and Belaichhari of Rangamati, although the Malayan Sun bear is considered extinct in Bangladesh (Pappas and McLennan 2002). We cannot categorize the Malayan Sun Bear as extinct in Bangladesh due to the possibility that some signs could have been from this species. Based on our survey, the Malayan Sun bear can be regarded as vagrant in Bangladesh and could be categorized as Critically Endangered under IUCN Bangladesh (2000) guidelines.

4.2.3. The Sloth Bear
No Sloth bear was recorded in the wild or in zoos and recreational parks in the country. Footprints, body parts or any other signs of this bear species have not been found during this survey.

The Sloth Bear has historically been rare in Bangladesh in the southeastern, eastern and northeastern parts (Sarker 2006). Occasional presence of Sloth bear has been recorded from Madhupur Gar, Garo Hills and Sherpur districts located at central and north-central regions respectively (NCSIP-1 2001, Sarker 2006). However, no signs in terms of footprint, claw marks, body parts, hunting and sighting records of the Sloth Bear has been found in areas as
recorded earlier by Sarker (2006). Local people have opined that this bear species has been absent in these areas for many years; although the last known reports are from the mid-1990’s (NCSIP-1 2001; Sarker 2006). Forests in these areas have largely been cleared and planted with exotic Acacia and Eucalyptus species. The present condition of the remaining forest patches is also not suitable to support bear species. Some authorities have considered them to be possibly extinct in Bangladesh (Bear Specialist Group 1996a). We support this idea based on our survey and suggest that this species might have gone extinct from Bangladesh.

Plate 4.3. Nest (top & bottom) of Asiatic Black Bear.
4.3. Bears in captivity
In captivity, a total of 36 individuals of Asiatic black bear in different zoos, recreation parks and Safari park were found during 2008-2010 in Bangladesh. However, no Malayan Sun bear or Sloth bear were found in captivity in the country. Of the captive populations, two bears were found in Arannalaya Zoo maintained by Savar Senanibash located close to Dhaka; two in Chittagong Zoo, 15 in Bangabandu Sheikh Mujib Safari Park in Cox’s Bazar, two in Meghla Zoo in Bandarban, one in Sobalong Army camp in Rangamati, one in Rangamati Zoo, two in Ruma in personal collection in the southeast regions. In the northeast, two bears were found in a private zoo at Sreemangal, Maulvi Bazar. Two bears were recorded in Swapnopuri amusement park of Dinajpur in central and northern region. Two individuals were recorded in Niribili recreation park located in Norail district and two bears in another recreation park ‘Muzaffar Garden’ located at Satkhira Sadar of Satkhira district in the southwest (SW) of the country. Two individuals of black bears are kept in Banbilash Zoo maintained by Jahanabad Senanibash located at Khulna sadar in the SW.

4.4. Threats and challenges

4.4.1. Hunting and poaching
Hunting and capturing of Asiatic black bears has been a commonplace occurrence across their habitats. In addition to hunting of other wildlife species, bears often have become superior target due to its large size and easy handling comparing other wildlife fauna. A total of 48 individuals of Asiatic black bears were recorded from killing and consumption records between 2007 and 2010. Highest killings (63%) were killed in the survey sites of Punkupara, Kalaboyna, Dhanuchari para, Swanglu para, Paglachara para, Rinikhyang Bagan para, Empu para, Chini para, Lui-lui para, Sajek and Pukurpara during 2007 to 2009. Others included eight in Belaichhari Mon para, Rangi Para and Madya Karikata in 2008; seven in Bame Atarokchara, Maddochara, Ronjit Para, Arachori Para and Chenachora para in 2009; two in Ghalangya of Ruma in 2010. All are located in the SE. During this time, different body parts of at least 16 individuals of Asiatic black bears were recorded from southeast which comprised of five gall bladders, three skins, a lower jaw, three claws and four teeth. Observations indicate that all these bears were killed for meat consumption and medicinal use.

Hunting of bears had largely occurred in remote areas in the Chittagong Hill Tracts in the SE and mainly by some specific ethnic communities. For example, Bwam and Mro communities of Swanglu Para and Empu Para respectively regularly hunt bears along with other available wildlife species. Some people also kill bears just because they are considered to be a threat.

4.4.2. Habitat loss and destruction
Habitat loss and degradation are the primary reasons for the decline of bear population across their habitats in Bangladesh. Habitat loss and fragmentation occur mainly due to selective and illegal logging, firewood and timber collection, shifting cultivation, plantation of exotic tree species, habitat encroachment, and unplanned tourism (Ahsan 2000; Molur et al. 2003, 2005; Islam et al. 2006; Walker et al. 2009; Brindle 2009). Conversion of bear habitats into jhumland, farmland, tea gardens, etc. is apparent in all of the study sites. Plantation of tea, teak, rubber, agar, acacia, eucalyptus, etc. are widely practiced both in the northeastern and southeastern regions throughout the bear habitats. For example, Gazni under Garo Hill region at Sherpur comprises of about 4000 acres of natural sal forests. Currently, original sal forest
remains only in less than 700 acres while the remaining areas have been profusely planted with *Acacia* sp. and *Eucalyptus* sp. under social forestry partnership. In addition, regular felling of trees from the remaining bear habitats, particularly in protected areas in the northeast and southeast have caused irreversible degradation and destruction of bear habitats. Annual illegal logging, for instance, in 2005-2006 averaged to 1188 trees in Lawachara National Park alone (Roy and DeCosse 2006). The root causes of habitat loss and fragmentation are the growing human population and their ever-growing demand for forest resources (Islam *et al.* 2007; Österberg 2007). Local people have a constant demand for forest resources but even bigger and more pervasive demand comes from illegal commercial entities for timber extraction (Roy and DeCosse 2006; DeCosse and Huda 2006).

4.4.3. **Lack of awareness**

Under the circumstance of hardcore poverty and lack of other basic needs, wildlife conservation is exceedingly difficult since it ranks low in priority to most village communities (Islam *et al.* 2006). One of the major causes of hunting and poaching of bears have been ingrained with this poverty issue of local communities living in and around bear habitats. However, lack of awareness on the importance of wildlife in general and bears in particular are also another critical element prompting local people to hunt and consume bears. Records of bear killing and consumption of bear meat simply manifest the severity of hunting practices on the remaining bear population. It has been revealed that Bwam and Mro ethnic communities in the southeast regularly hunt bears for meat consumption. Some other communities across bear habitats are also not aware of the threats faced by bears and their conservation importance.

Previous efforts in awareness raising (Islam *et al.* 2006) showed that people living in and around protected areas can be made to understand that the presence of certain wildlife species, such as hoolock gibbons, bears, etc. may indicate good quality habitat. Long-term FD-led awareness programmes along with other conservationists could be instrumental for local communities as well as for the bears.

4.4.4. **Human-bear conflict**

Bear-human conflict is not a very common incidence in bear habitats. However, there are conflicts in the northeast and southeast. In the northeast, bear population is relatively less than the southeast. So the frequency of conflicts is higher in the southeast than the northeast. In the northeast, most of the bear conflicts occur in June-July (when jackfruits are available) and again in the breeding season (September–November). In the northeast, people kill bears as they consider it as a threat. In the southeast conflict occurs mainly when jhum crops are harvested (August-December). Bears destroy jhum crops. Bears also eat and destroy other fruits like banana, jackfruit, papaya etc. Local tribal people kill bear to protect their crops and for their meat. During 2007-2010 more than 48 bears were killed by these locals.

4.4.5. **Lack of commitment and conservation measures**

As habitat loss and destruction are the most important factors for decline of bears, a firm commitment from the government is urgently needed for the habitat protection and restoration of bear habitats. The widely cited reason for not being able to protect habitat is illegal felling and acute population pressure. However, the greater problem lies in the short-term motives of production forestry of the government that need to be urgently replaced by conservation forestry to ensure continued services to human and wildlife. In addition to
production forestry, corruption and greed are also thought to be the major cause of serious
degradation for most of the reserved forests including bear habitats.

4.4.6. Research and monitoring
Long-term studies on habitat requirements, food preference and regular monitoring of the
remaining bear populations are urgently required. These prerequisites could be instrumental
to formulate an effective management and conservation plan for bears. Hence, the above
mentioned priority research windows are urgently needed along with conservation awareness
campaign in the field. Scientific studies on these issues will also help understand more detail
about threats and their root causes of rapid decline of bear populations across their habitats.

Plate 4.4. Different body parts of Asiatic Black Bear recorded during survey.
Plate 4.5. Skin drying (top) and limb parts (bottom) of Asiatic Black Bear recorded during survey.
Plate 4.6. A survivor of bear victim in the northeast.

4.7. Shitesh R. Deb - a survivor of bear victim with bears of his private zoo located at Sreemangal.
5. AWARENESS EDUCATION ACTIVITIES

5.1. Awareness activities
Recognizing the importance of conservation awareness programmes, we have carried out awareness campaigns in the study areas particularly in the northeast and southeast. In the northeast, we have conducted awareness programmes at Rajkandi, Hosenabad, Biddabeel, Horincheera, Satchari, Nahar Punji and Sheshil Bari. Activities included school programmes with presentation and drawing, rally, discussion and other forms of interactions with all age groups of people in these areas. Programmes were also arranged in local market for older people. Bear posters, masks, leaflet, placards, T-shirt, etc. were distributed among the participants including hotel, restaurants and roadsides. More than 300 hundred local people and 100 students participated in these programmes. At Biddabeel of Sreemangal bear conservation education programme was held in a primary school and a local market. Twenty five students and 60 villagers have participated in the programme. At Horincheera, bear awareness programme was arranged in the village market and more than 120 villagers participated.

In the southeast more than 30 places were covered for education programmes. More than 30 villagers with children participated in such programmes at Kamalganj in Khagrachhari, 25 villagers in Kaptalapara and 15 villagers participated in Alutila village. Bear conservation posters were also distributed there. At Garjantali of Barkal more than 40 villagers participated in the conservation education programme. More than 160 villagers with students and children took part in the bear conservation education programme in three villages of Belaichhari upazila. Conservation activities were arranged in primary schools, local markets, and villages in Barkal. More than 120 villagers with children and students participated in the conservation education programme. At Rajasthali upazila in Rangamati 8 villages were visited and 200 villagers participated in the bear conservation education programmes.

At Baghaichhari upazila, 40 villagers with children took part in the bear conservation education programmes in three villages. Different types of activities such as bear habitat dance, training, rally were arranged in these events. Different education materials like bear masks, placards, T-shirts and posters, etc. were distributed among the participants. In Bandarban, conservation awareness programmes were arranged in five villages of Bandarban sadar upazila and Rowangchhari upazila. About 100 villagers participated in these programmes.

5.2. Training and workshops
Management and long-lasting conservation of any threatened species like bears needs skilled manpower, efficient and knowledgeable forest managers and awareness of the people who live in and around the bear habitats. Keeping this in mind, Wildlife Trust of Bangladesh (WTB) had organized several training and workshops at Sreemangal (NE), Dulahazra Safari Park and Lama of Bandarban (SE) in association with International Association for Bear Research and Management (IBA). Each programme had 2 parts: a classroom session, followed the next day by a field visit to practice interviews and sign survey techniques. Mr. Robert Steinmetz, Co-chair of the Sun Bear Specialist Group, IUCN, SSC attended a few training programmes and workshops as trainer. A total of about 60 participants attended the two workshops and field trips (Annex II)
Plate 5.1. Bear education and awareness activities around bear habitats.
Plate 5.2. Bear training activities for students/researchers in the field.
LITERATURE CITED


APPENDICES

Appendix I: Questionnaire used for survey of bears.

Bear Survey Questionnaire

Date:....../....../......                                                                                    Time:………am/pm

1. Respondent’s Name: ___________________________Sex: Male / Female

2. Age:________________________ Occupation:________________________________

3. Address:_____________________________________________________________

4. Have you seen a bear? Yes No Unsure

5. If no, were bears present in this area before? Yes _____ years ago, _____                       No          Unsure

6. If yes to question 4, When: _________ Where: ___________ Habitat: __________________

Do people recall them? Yes No Unsure

If yes, name and address? ___________________________________________

7. If bear was seen, outcome usually was (can circle more than one)
a) Respondent: Bear avoided Bear attacked People avoided People attacked

b) People say: Bear avoided Bear attacked People avoided People attacked

8. How many types of bears you have seen and where (showing the bears photographs)?

1 / 2 / 3 _____________________________________________
9. Do you have any information that people were attacked/chased/killed by bear?

   **Yes**  **No**  **Unsure**

   If yes, **name** and **address**?

10. Do you have any information about crops destroyed/damaged by bears?  **Yes**  **No**  **Unsure**

   If yes, **when** and **where**?

11. Have you seen bears destroying/damaging crops?  

   **Yes**  **No**  **Unsure**

   If yes, **when** and **where** and **what types** of crops?

---

Which bears? *(showing the bears photographs)*? Black Bear Sun Bear Sloth Bear

12. What type of food do bears prefer to eat?

13. Have you seen any cub with the bears? **Yes**/**No**

   If yes, **how many**?

14. What the bear usually do?

15. Which season is best for bear observation?

---

16. **Beliefs/taboo**s related to bear.

17. Do you know anybody uses bear parts for medicine or other purposes? **Yes**/**No**

   If yes, **who**? **where**? **bear parts**? **Ask**?

18. Do you know anybody who keeps/kept bears? **Yes**/**No**

   If yes, **who** and **where**?

19. Do you know anybody who hunts/hunted bears? **Yes**/**No**

   If yes, **who** and **where**?

20. Have bears been killed in this area? **Yes**/**No**

   If yes, **why** killed? self-defense/body parts/accidental/others
21. Do you think bears are our enemies/friends? _________________________
   Why?
   ________________________________________________________________

22. Do you know any place, named after bear? (e.g. Bhallukmara)
   ________________________________________________________________

23. Do you think bears are still surviving? Yes /No
   If yes, where? __________________________________________________

24. Do you think populations of bears are going up, down, or staying about the same over
   the past 10 years?______________________________________________

25. What are the main threats to bear? __________________________________

26. Do you think we should conserve bears? Yes /No
   Why and how? _________________________________________________

27. Status of bears in captivity/in circus/bear dancing?
   __________________________

28. If we have found bears in the zoos/in captivity
   Name of collector/Zoo authority: bv
g
   ________________________________________________________________
   Type of bear Black Bear Sun Bear Sloth Bear
   Date/Time of collection ________ ________ ________
   Place of collection ________ ________ ________
   Age sex-class ♂ ♀
cub
juvenile
adult

Remarks:

.................................................................

Name and signature of interviewer
Appendix IIa: Participants of the workshop held at Dulahazra Safari Park, June 20-22, 2008

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<tr>
<td>1.</td>
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<td>10.</td>
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<td>11.</td>
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<td>14.</td>
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<td>19.</td>
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<td>24.</td>
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<td>25.</td>
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## Appendix IIb: Participants of the workshop held at Sreemangal on June 23-25, 2008

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<td>Mr. Md. Abdul Matin</td>
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<td>Prof. Md. Anwarul Islam</td>
<td>CEO, Wildlife Trust of Bangladesh</td>
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