Diversity of Wildlife in the Campus of Bangladesh Forest Research Institute: an Area for Successful Wildlife Conservation in a City of Bangladesh

M. M. Rahman, M. A. Rahman, M. K. Islam* and S. M. Mainuddin

Bangladesh Forest Research Institute, Chittagong, Bangladesh

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Correspondence to

**E-mail*: kamrul79bfri@yahoo.com

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Abstract

At the very out set of establishment of the Bangladesh Forest Research Institute (BFRI) in 1955, its campus of 75 acres was barren and a few wildlife was found. Now the campus is a unique urban green place with exceptional hilly areas in the heart of the Chittagong Metropolitan City (CMC). Due to careful protection and plantations regularly in the campus increased the variety of vegetations and the diverse habitat of wildlife species. A study was conducted between 2010 and 2011 in the campus of BFRI to evaluate mainly the species diversity and breeding status of some wildlife for sustainable development of the wildlife conservation to ensure the environmental equilibrium in a city area. A total of 98 wildlife species of different classes: Amphibia 8, Reptilia 16, Aves 59 and Mammalia 15 were recorded in the BFRI campus where 15 species were threatened. There is no bird species as threatened while amphibia 1, Reptilia 8, Mammalia 6. The paper also highlights the ecology of small Indian civet (*Vivericula indica*), jungle cat (*Felis chaus*), Indian porcupine (*Hystrix indica*), jackal (*Canis aureus)* and rock python (*Python molurus*).Threats to wildlife were also identified and recommendations have been made for sustainable conservation of the resources.

1. Introduction

Bangladesh Forest Research Institute (BFRI) Campus, a unique urban green place with exceptional hilly areas in the heart of Chittagong Metropolitan City (CMC) is the diverse habitat for its very rich wildlife species. The BFRI was started in 1955. At that time the institute campus was barren and very few wildlife was found. But with the growth of variety of vegetations and a careful protection on the floral composition the wildlife populations are increasing here and recorded a total of 47 bird species in the campus (Faizuddin, 1987). A total of 121 species of mammals, 690 birds, 158 reptiles, and 53 amphibia are expected to occur in Bangladesh (Khan, 2008).

Once a bird watcher could record minimum 50 species of birds in a city of Bangladesh (Khan, 1982). Rahman (2010) recorded 154 wildlife species belonging to 9 species of amphibian, 20 species of reptilian, 95 species of birds and 30 species of mammals in the Chunati Wildlife Sanctuary. In recent times, different organizations including universities and non government agencies are recording data on wildlife diversity in the protected areas but information on wildlife and its adaptation in the city areas is really scarce. The wildlife population of Bangladesh is decreasing due to the destruction of the habitat, shortage of food and lack of safe breeding facilities. In Bangladesh threaten wildlife is the highest among the countries of SAARC region due to indiscriminate destruction of habitats and inadequate management policies (Rahman, 2010).

The country has already lost a considerable number of wildlife species like Rhino, Gaur etc. due to mainly the ecological disturbance (Rahman, 2010). Up till now the faunal biodiversity has remained a neglected resource in Bangladesh. A number of scientists on this field have published several scientific paper and report since 1970. However, there are still remaining more unknown facts on this field are to be explored to develop strategic plans for the conservation and reproduction of the wildlife resources in the country.

2. Materials and Methods

2.1. Study site

The institute has an area of 75 acres of land. It is located in the heart of the Chittagong city under Panchlaish Police Station (P.S.). Its geographical location is approximately at 91º48'E and 22º25'N. There are two big housing societies in northern and western boundary of the Institute campus namely

Mominbag and Hillveiw Residential area where residing more than one lakh peoples. Sholashahar Railway Junction with residential area and slum contains about ten thousand people is in the southern while Bibirhat residential area along with the Hathazari main road located with the eastern boundary of institute campus have more than twenty five thousand people. Within the institute campus, residential areas for officers and staff makes home of about one thousand people. More over, about two hundred visitors' gathers for roaming and exercise every day in the campus and this number increase more in the weekend.

Topographically, it is of hillocks and valleys with the elevation varying from 6.0m to 40m from the sea level. The soil is sandy loam to clayey loam. The average temperature is 23.0ºC, maximum temperature about 32.5ºC and the minimum temperature 13ºC.The hottest months are April to June. The total annual rainfall is about 2687 mm. (Banglapedia, 2003).

2.2. Wildlife habitat in the campus

At the establishment of BFRI in 1955 there was no vegetation in the campus. The programme was taken up to make the area aesthetically beautiful and protect from soil erosion. So the area was protected from grazing and done planed plantation. Now its vegetation consists of grasses, weeds, bamboos and indigenous trees and also exotic pines, acacia and eucalyptus. There are garden flowers and fruit trees of various types are also seen in the campus. About 141 species of weeds of 45 families and about 75 tree species in the area (Alam, 1980). The top canopy is usually comprised of telsur (*Tamrindus indica)*, chapalish (*Artocarpus chaplasha*), shimul *(Bombax cieba*), bandarhola (*Duabanga grandifolia),* pitraj (*Aphanamixix polystchya)*. The second storey comprises evergreen the tree species of jam (*Syzygium* spp.), jarul (*Lagerstroemia* spp.), gamar (*Gmelina arborea*), champa (*Pterospermum acerifolium*). The weedy and grassy forest floor of this campus supports for amphibian, reptilian and small mammals. The entire area of this campus is now covered with dense forest and due to intensive protection efforts by the institute authority the area still has greenery. The institute campus embodied diversified vegetation attracts birds to take shelter and provides sufficient space for them to construct their nest for breeding. These nesting sites also provide the highest security from predators.The Institute has developed a number of bamboo clams which have been a great shelter for wildlife species.

2.3. Methods

Observation on the presence of wildlife species was made during July, 2010-June, 2011. Day and night observations were made within the area. During the survey direct observation as well as indirect clues (calls, foot prints, droppings, scratches on ground, nest, tadpole and movement sound) were noted for the presence of wildlife.

Besides, the residents and guards of the campus were interviewed to collect information on the existence of wildlife within the study area. Observation was started at dawn and continued till evening using binocular, digital camera, field guides and reference books for identification of the wildlife species.

3. Results and Discussion

Once wildlife diversity was very rich in CMC areas. Elephant, tiger, leopard, monkey, langur, black bear, spotted deer, peacock pheasant were found in the area. There was no systematic and scientific survey report on wildlife status of the city. Through this study a total of 98 wildlife species of different classes including Amphibia 8, Reptilia 16, Aves 59 and Mammalia 15 were recorded in the BFRI campus. All amphibian species was under order-Anura belonging family-Ranidae (four species), Rhacophoridae (two species), Microhylidae (one species) and Bufonidae (one species).The reptilian species included three order-Testudines, family-Testudinidae (one species); order-Lacertlia, family-Testudinidae (one species), Gekkonidae (three species), Varanidae (one species), Agamidae (one species), Scincidae (one species); order-Serpents, Elaphidae (two species), Colubridae (five species), Boidae (one species). Bird species consisted of twelve order possessed family-Turnicidae (one species), Ardeidae (three species), Accipitridae (one species), Culumbidae (three species), Ralidae (one species), Psittacidae (one species), Strigidae (three species), Centropodidae (four species), Apodidae (two species), Alcedinidae (one species), Meropidae (three species), Picidae (six species), Megalaimidae (four species), Upupidae (one species), Sturnidae (four species), Corvidae (five species), Pycnonotidae (two species), Muscicapidae (two species), Sylviidae (two species), Nectarinidae (two species), Passeridae (six species), Paridae (two species). Mammalian species comprised of order-Carnivora consisted of family-Canidae (one species), Viverridae (two species), Herpestidae (three species), order-Rodentia had family Sciuridae (one species), Hystricidae (one species), Muridae (three species), order-Insectivora contained family Soricidae (one species) and order-Chiroptera had family Pteropodidae (two species), Vespertilionidae (one species).

Despite a small area within CMC, BFRI campus is very rich in wildlife diversity and important breeding ground especially for birds. Among the IUCN, Bangladesh- 2000 declared threatened wildlife species, a total of 15 of them in different categories were observed in BFRI campus (Table 1).

3.1. Special observations

3.1.1. Small indian civet (*Viverricula indica*)

Table 1: Threatened wildlife species in BFRI campus

Sr. No.	Name of the Class	Scientific Name	Common English Name	IUCN Category Bangladesh
01.	Mammals	*Canis aureus*	Jackal	VU
02.		*Viverra zibetha*	Large Indian Civet	EN
03.		*Viverricula indica*	Small Indian Civet	VU
04.		*Herpestes edwardsi*	Common Indian Mongoose	VU
05		*Felis chaus*	Jungle cat	EN
06		*Hystrix indica*	Indian Porcupine	EN
07	Reptiles	*Indotestudo elongata*	Elongated Tortoise	CR
08		*Gekko gecko*	Tokkhak	VU
09		*Varanus bengalensis*	Grey Monitor Lizard	VU
10		*Naja kauthia*	Monocellate Cobra	VU
11		*Coluber mucosus*	Rat Snake	VU
12		*Ahaetulla nasutus*	Common Vine Snake	VU
13		*Lycodon aulicus*	Common Wolf Snake	VU
14		*Python molurus*	Rock Python	EN
15	Amphibia	*Euphlyctis hexadactylus*	Indian Green Frog	EN

The civet prefers scrubby forests or bushy grasslands. It is not seen in open areas and lives in holes. It is a nocturnal animal that feeds on birds, bats, squirrels, fruit and poultry. Negi (1992) reported that the small Indian civet prefers habitat with tall grasses. Being carnivores, they have a large home range but due to the human population increases the habitat has been destroyed and fragmented with construction of roads and settlements (unauthorized staff colony in the valleys of different hills of the campus).The Civet has an elongated and laterally compressed body with short and stumpy legs. The snout is pointed, neck is elongated and the tail is long, cylindrical and bushy. There is a transverse black band under the neck, forming a collar. On the back are longitudinal black strips which are not always continuous. The trail has alternate transverse white and dark bands.

3.1.2. Jungle cat (Felis chaus)

The jungle cat is a very common solitary hunter in this campus. It can efficiently hunt vertebrates of its own size. Preferably hunts rodents, birds, non poisonous snakes, frogs and large insects. Bushy forest floor, tree hole, uninhibited houses and hills' den are its abiding places and roam for hunt from forest patch to residential areas. Voice loud and repeated mob .Habits mainly nocturnal, but often active during dawn and dusk.

3.1.3. Indian porcupine (Hystrix indica)

It is also a common crop damaging rodent in this campus. It was observed at night roaming in the east and west hill areas of the campus and damages crops in the residential areas garden. It plunders papaya, capsicums, pumpkin, potatoes, and egg plants, rhizome of banana and arum and bamboo shoot. It was seen most of the times moving alone and only once a group of two individuals was observed. Porcupine is stocky rodent covered by multibanded black and white quills. Short and powerful feet, short tail. Habits nocturnal and solitary and lives on ground and in burrows.

3.1.4. Jackal (Canis aureus)

This campus is living ground of about 50 Jackals that call at dawn and dusk and sometimes at noon and night. In the study period a large group of eight jackals was observed at the west hill areas of the campus in the evening. At night it is very common that single or twice jackal are wandering or crossing the roads inside the institute. Existence of jackal at the institute located in the centre of CMC is rare and symbol of rich diversity.

3.1.5. Rock python (Python molurus)

During study, the python was observed two times. At first it was seen on a *kaju badam* (*Anacardium occidentale*) tree about 5 meters top in the north side of the campus. It was climbed up for food source like squirrel, eggs and nestlings or birds. Later it was captured and released in the safe place of the campus. It was a 4.50 feet long male young python. And second time it was found on the bamboo clumps about 3 meters top in the south side of the campus near boiler house.

3.2. Breeding of wildlife species

BFRI campus has become a safe breeding ground of many wildlife species. Successful breeding of endangered mammalian species like Indian porcupine, large Indian civet and jungle cat has occurred here without any disturbance and their populations have been increased. It is also a safe and sound area for nesting and breeding of permanent resident avian species like red vented bulbul, black headed oriole, spotted dove, rock pigeon, tree pie, golden woodpecker, tickell's flower picker, purple sun bird, tailor bird, house crow and jungle crow. Along with other endangered reptilian species monocellate cobra, black krait and rock python hatchlings were observed one more times in the campus. On the other hand, the drains and near by wetland areas

are suitable breeding sites for amphibian species including tree frog and an endangered species like Indian green frog have also been observed in the rainy season

3.3. Conservation issues

Habitat is an area providing feeding, resting and breeding facilities for existence of wildlife species. When the habitat fails to provide opportunities to sustain life function, species are wiped out or leaves for a better living area. For successful conservation of wildlife resources in the campus, the ultimate causes of environmental degradation and species loss must be considered. The best way to protect faunal diversity is to protect the habitats of the campus for conservation aspects.

BFRI was declared as a forest laboratory in around 1950 and a very few wildlife was found in this area due to barren hills. After that the activities of BFRI was started with a careful design and planning in the 75 acres land. In 1955 the authority of BFRI was taken initiatives for plantation in systematic way with a good design which turned into good patches of forest in the city area of Chittagong as a result the campus of 75 acres land has been a good habitat for different types of wildlife species.

3.4. Threats to wildlife

3.4.1. Road inside the institute

A road inside the institute where every day about 5000 people use this road with their vehicle as link road to high way as a result many wildlife species feel disturbance specially some birds and squirrel can not move freely in their habitat.

3.4.2. Killing of wildlife

As people roaming and sitting in the campus it is noisy for wildlife suitable environment. Sometimes young boys around the campus kill birds, mammals and reptilian species. On the other hand they also destroy the nest of birds during the nesting time. As a result some species of the bird really disturbed in their breeding success.

3.4.3. Safety coverless electric wire

Uncovered electric line run trough the campus, office and residential areas causes death toll of a number of flying fox, crow and also small mammals. During the study it is seen a total of 48 flying foxes, 3 crows and a wild cat electrocuted to death in the campus.

3.4.4. Removal of floor leaf litter

Many poor people live in two big housing areas near the campus. So, poor women and girls come to collected dry leafs, dry brunches of tress as their fuel demand which disturb birds of forest floor, reptilian and amphibian species.

3.4.5. Lack of fruit trees

There is no sufficient fruit bearing trees. The fruit trees act as a good source for attracting bird species. So more fruit trees like aam (*Mengiferra indica*), kathal (*Artocurpus hterophyllus),* peyara (*Psidium guajava*), bot (*Ficus* spp.), Jam (*Syzygium* spp.). should be planted

3.4.6. Scarcity of water

No permanent water sources are found in the institute campus. Dirty water of the drains is the only water sources for wildlife. During rainy season, the roofs of buildings retain some rainy water where most of the birds of the campus bath and drink.

4. Conclusion

BFRI campus is a small area but its wildlife diversity is very rich. The study has provided important baseline information on the wildlife diversity of the campus for the first time. The observed wildlife species indicates a good faunistic variety in the study area. It is the time to take necessary steps to retain the wildlife diversity for sustainable conservation by protecting their habitat and good management.

5. Recommendations

- Water bodies like pond, tank, and reservoir have to make to ensure necessary water for the wildlife species.
- Fruits trees should be panted in every year for some frugivorous animals.
- Leaf litter collection and dead trees felling should be controlled in all the areas of the institute.
- Access of general people should be restricted for safe movement, resting and undisturbed breeding facilities of wildlife species.

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