

# QUICK SURVEY OF HERPETOFAUNA IN MANASLU CONSERVATION AREA, NEPAL

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## 1. Introduction

### 1.1 Background

Amphibians and reptiles are considered as beneficial faunal group due to the unique role they play in the ecosystem. They perform a very significant role in the food chain and control a wide variety of agricultural pests. In recent decades Amphibians and reptiles populations have suffered widespread declines and extinctions (Kiesecker *et al.* 2001). Limited dispersal ability may further increase the vulnerability of amphibians and reptiles to changes in climate. Slight changes in water level in breeding ponds can trigger reproductive failure and, in a single year, cause a severe drop in the population size of short-lived species; persistent changes can lead to extinctions of species (Araujo *et al.* 2006). Amphibian decline problem is a serious threat and reptiles appear to be in even greater danger of extinction worldwide (Gibbons *et al.* 2000). So, the assessments of amphibian and reptile diversity require exploration of previously unvisited areas, comprehensive surveys of poorly known areas, and revisiting of localities that have not been assessed in the last decade (Parra *et al.* 2007).

Nepal is extremely rich in habitat diversity, therefore a variety of habitats occurring in the Tropical to Nival zone are available for the native amphibians and reptiles. Based on their distribution and habits they utilize forests, grasslands, alpine meadows, trees, tunnels, cliffs, rocks, different aquatic bodies, agricultural lands and even houses as macro and micro habitats. Nepalese herpetofauna have a wide range of vertical (60m-5490m) and horizontal (Mechi to Mahakali) distribution. Studies to date have confirmed that Nepal's herpetofauna embraces Palearctic, Oriental, Indo-Chinese and Himalayan elements (Shah and Tiwari 2004). Fourteen species of herpetofauna are endemic to Nepal. Seventeen of the species of herpetofauna are nationally threatened, of which six species are globally threatened (ICIMOD & MOEST-GON 2007). A recent publication "Amphibians and Reptiles of Nepal" edited by Schleich and Catstle (2002) provides an account of 50 amphibians and 123 reptiles. The herpetofauna in Nepal is relatively richer compared to other South Asian countries-well over 206 species and sub-species, including 59 amphibian species of which 15 are listed as globally threatened. However, Amphibian and reptiles of Nepal face severe threat of extinction. Major threats include rapid deforestation, soil and water pollution, land use changes, habitat loss and unsustainable extraction. As herpetofauna (amphibians and reptiles) is the poorly studied group in the country, their present status is also poorly known (CEPF 2005). Nepal has a reduced species composition compared with the 2001 checklists (Molur 2008). Very few species have been described from disturbed habitats, indicating a diminished species composition when compared with the original habitat (Molur 2008). And, from a conservation point of view also, herpetofauna conservation efforts have been limited (Shah & Tiwari 2004). Even these days all snakes are considered to be poisonous and killed at sight. The tendency of indiscriminate exploitation of amphibians and reptiles species in the country has threatened the survival of some of the species so much (Shah 1995).

In this context, a quick survey of herpetofauna has been conducted to generate the current status of herps in Manaslu conservation area and to sensitize the conservation efforts. The current project has made exploration of the herpetofauna of Manaslu Conservation Area, to add the species to current list of herpetofauna. Additionally, the habitat situation and species association analyses are expected to add a new dimension in herpetological research in Nepal. Further, it is expected to fulfill the gap in herpetological studies from species and site conservation point of view in Nepal as no scientific exploration of herps has been conducted so far in the area.

### **1.2 Study Area**

The study area, Manaslu Conservation Area, is declared as a conservation area in 1998. It covers the area 1663 km<sup>2</sup> having altitudinal range 1360 to 8163m bordering the Annapurna Conservation Area to the west, the Tibetan plateau to the north and east and the mid-part of Gorkha district to the south. MCA covers 7 Village Development Committees. The region harbors a mosaic of habitats for various species of wildlife. There are 2,000 species of plants, 33 mammals, 110 birds, **3 reptiles** and 11 butterflies in 11 types of forests reported from the area (NTNC 2010). As MCA covers mountain areas, mountain biodiversity is not only a scientific theme of high interest, but also is perhaps the best indicator value of the integrity of mountain ecosystem (Körner 2002). As a consequence of physical heterogeneity of the mountains, mountain regions typically possess higher levels of biodiversity than plains, making it possible to conserve large amounts of diversity in relatively small areas (Lafon 2004).

### **1.3 Rationale**

The National Parks and Wildlife Conservation Act enacted in 1973 provides for the protection of only three reptilian species under its schedule 1, but none of the amphibian species is protected. No systematic exploration works are ongoing or seem in the area till date. The conservation area has mosaic habitat conditions due to geographical and microclimatic variations.

## **2. Research Objectives**

- i. To explore the herpetofaunal diversity in Manaslu Conservation Area
- ii. To identify the species composition and assemblage of herpetofauna in the area
- iii. To explain spatial patterns of distributions of the herpetofauna in the area

## **3. Methodology**

The field survey was conducted on September 2010. Stream survey and trail survey were conducted. Random transect method has been applied in order to sampling in the area for intensive study. In each transect along the forest trail and streams two persons walked covering a distance of 5m on both sides. Opportunistic survey has also be conducted in other parts from transect lines based on (Gardner & Fitzherbert 2007). Amphibians and reptiles were surveyed by using hand picking (using equipments for handling the reptiles and amphibians) in the sites. For nocturnal survey a torch beam was used to locate the animal (Behangana & Arusi 2004). Species caught during survey were identified on spot using field guide of Shah and Tiwari (2004) and released *in-situ*. The species encounter locations were recorded by using GPS.

The local residents were also contacted to collect information regarding herps in the area. Color photograph from field guide of potential amphibians and reptiles of the area were shown to the local residents and asked to explain the features including their local name.

#### 4. Results and Discussion

##### 4.1 Species inventory

Altogether 16 species of herpetofauna (7 amphibians and 9 reptiles) were recorded in the area. Among them, 12 (5 amphibians and 7 reptiles) were recorded through direct observation and other 4 species were recorded through secondary sources. Table 1 shows the list of herps recorded through direct observation in the area. *Laudakia tuberculata* (>100) is most observed species in the area followed by *Bufo microtypanum* (11), *Asymblepharus sikimmensis* (9), *Mabuya carinata* (7), *Bufo stomaticus* (6), *Amolops formosus* (5) and others.

Table 1: Species encountered during field survey

SN	Species	No. of individual observed
1	<i>Bufo himalayanus</i> Gunther, 1894	3
2	<i>Bufo microtypanum</i> Boulenger, 1882	11
3	<i>Bufo stomticus</i> Lutken, 1862	6
4	<i>Amolops formosus</i> (Gunther, 1875)	5
5	<i>Chaparana sikimensis</i> (Jerdon, 1870)	4
6	<i>Calotes versicolor</i> (Daudin, 1802)	2
7	<i>Laudakia tuberculata</i> (Hardwicke & Gray, 1827)	>100
8	<i>Oriotiaris tricarinatus</i> (Blyth, 1854)	2
9	<i>Asymblepharus sikimmensis</i> (Blyth, 1853)	9
10	<i>Mabuya carinata</i> (Schneider, 1801)	7
11	<i>Boiga multifasciata</i> (Blyth, 1861)	1
12	<i>Amphiesma platyceps</i> (Blyth, 1854)	3
Total Individuals		>153

According to local people *Paa blanfordii* and *Paa liebigii* are also found in the streams of Phillim and Dyang areas. We have made several attempts to observe these species but, we can't record. Local people suggest us to make the field visit in May- July to record these species from the area when streams have less amount of water. And the time when we visited the area was also close to hibernation time. Species records were also made through local information and communication with conservation area staff and expert. The following species records were made through secondary sources.

Table 1: Species record from secondary sources

SN	Species	Source
1	<i>Paa blanfordii</i> (Boulenger, 1882)	Local people
2	<i>Paa liebigii</i> (Gunther, 1860)	Local people
3	<i>Trimeresurus albolabris</i> (Gray, 1842)	Local people
4	<i>Oligodon erythrogaster</i> Boulenger, 1907	Shah & Tiwari

#### 4.2 Species Composition and Assemblage

We have recorded Bufo species mainly from settlement areas, agricultural land and forest areas. Paa and Amolops species were recorded from small streams of the areas. We observed *Laudakia tuberculata* everywhere in the trail from Jagat (starting point of MCA) to Prok. In Phillim we found the highest number of this species. We can see this everywhere in cultivated land, wall of houses, rocks etc. Most of the amphibian species were found in trails and streams of Phillim, Nyak and Dyang area. After Lihi (2927 m), we didn't find any species up to Larke (5106 m). However, intensive study is necessary in these areas as we just made trail survey. We didn't make any transect survey and stream survey based on no evidence of any herpetofauna with local people in the area.

#### 4.3 Spatial Pattern of Distribution

Based on the GPS point recorded during species encounter in the field distribution of herps in the area is mapped in Arc-GIS (Annexes).

#### 5. Conclusion

The survey of herpetofauna in Manaslu Conservation Area has been conducted within short period of time. Within this short period of time we are able to record 16 species of herpetofauna with other important information in the area so, the area is highly potential for herpetofauna studies. People consume Paa frog as a food. We have recorded four types of Paa frogs that people used as food in the area. Phillim, Nyak and Dyang area have high density of frogs. We have recorded all types in the list from these areas.

Since, this study was carried out for short period for inventory purpose, it was out scope to estimate complete species occurrence and populations. Thus detail study of herpetofaunal species based on the threats including population and habitat should be carried out.

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