### **Progress Report**

Conservation of the King Cobra *Ophiophagus hannah* (Cantor 1836) in Palpa, a western mid hill district of Nepal

> <u>Submitted by</u> Kul Bahadur Thapa

> **Himalayan Nature**

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## Project title: Conservation of the King Cobra Ophiophagus hannah (Cantor 1836) in Palpa, a western mid hill district of Nepal

#### Study area:

Geographic location: Palpa district, the project area is located in the mid hill region of western Nepal. It is about 300km away from the capital city, Kathmandu. The district starts immediately after the end of low land in the south. The elevation lies approximately between 200m and 2000m, and the position lies between 27°40' N to 27°57' N and 83°14' E to 84°02' E. This district has a diverse topography, from steep slope of mid hill to Siwalik, river valleys, alluvial fans, flood plains, which are dissected by a number of streams and gullies, thus exhibiting a rugged landscape. Palpa district extends over two physiographic units i.e. mid hill (82%) and Siwalik hill (18%).



Map 1. Map showing the study area

Climate: The climate varies from sub-tropical sub-humid to warm-temperate humid climate. The temperature ranges from 4°C to 32°C and receives an average 1903.2mm of rainfall annually, with the maximum rain occurring during the monsoon i.e., June to August. Vegetation:

Southern Siwalik Region: Shorea robusta, Terminalia alata, Syzygium cumini, Adina cardifolia, Terminalia chebula, Terminalia bellirica, etc.

Northern Mahabharata Region: *Pinus* sp. *Schima wallichii, Castanopsis indica, Shorea robusta, Rhododendron arboretum, Alnus nepalensis,* etc.

#### **Objectives:**

The major objective of this project during these field visits was to conduct surveys to locate globally threatened snake species, the King Cobra.

#### Methods:

- Visual Encounter Survey and Active Searches
- Key Informant Interview and Questionnaire Survey

#### Activities:

#### Visual Encounter Survey and Active Searches in Line Transect

A total of 10 lines transect of one km (1 km) length each were laid in different locations of the proposed study area i.e. in the northern part of Palpa district (see map 2). Lines transect were laid randomly in the potential habitats of King Cobra.



Map 2. Map showing lines transect laid in the study area





Pic 1-10. Google Earth images showing lines transect laid down at Argali, Sardewa, Dambak, Bougha Gumha, Bandipokhara, Aul, Ranimahal, Shikhardanda, Ramdi and Aryabhanjyang of the study area

Survey was carried out two times in a day (morning or evening and afternoon). The principal researcher, assistant researcher and field assistant walked along the line transects looking for the King Cobra, its exuviae and nest. Vegetation and geographical data (vegetation type, canopy cover, ground cover, slope, aspect, altitude, GPS

coordinates, distance from settlement and distance from water source) were recorded in the starting and end point of the line transect to document habitat of the King Cobra.



Fig 1. Pictorial representation of the survey design

#### **Opportunistic Survey:**

Active searches in and outside the targeted line transects were carried out in potential habitats of King Cobra in the study area. This survey was not bound by any parameter like time and frequency.

#### Key Informant Interview and Questionnaire Survey:

Key Informant Interview and Questionnaire Survey were carried out among 15 and 110 local people respectively to understand King Cobra's distribution, human-King Cobra conflict, people's perception towards King Cobra and threats to the survival of King cobra.

#### **Results:**

#### **Occurrence and Distribution**

Till now, a total of 18 King Cobras have been recorded from 15 different locations of Palpa district. Thapa (2016) had reported the occurrence of eight individuals. Of which, six were found killed and only two were live. During this project period, information on occurrence of 10 King Cobras from eight locations including a juvenile was obtained from the study area (Table 1). Among them, eight were live and two were dead (Fig 3). One of them had to be rescued from inside a restaurant located alongside a highway. Six individuals were recorded from the forest, three from home premises and one from agricultural land (Fig 5). However, among overall records, eight of them were found killed and 10 were live (Fig 4) and nine individuals were recorded from forest, five from home premises and four from agricultural land (Fig 5 to 15). The recorded King Cobras were not farther than 200m from the nearby human settlements and 500m from the water source. They were found from 535 m to 1225 m elevation.



Map 3. Distribution of King Cobra in Palpa district

SN	Latitude	Longitude	Altitude (m)	Location	No. of KC Sighted	Age status	Living status	Distance from settlement (m)	Distance from water source (m)
1	27.769783	83.445791	589	Suketaal, Dobhan RM	1	Adult	Live	97	41
2	27.771688	83.452033	654	Suketaal, Dobhan RM	1	Juvenile	Live	8	1
3	27.785203	83.539805	692	Jordhara, Tinau RM	1	Adult	Live	0	5
4	27.919352	83.617096	535	Darpuk, Baganaskali RM	2	Adult	Killed	131	51
5	27.904016	83.625876	684	Sunadi, Baganaskali RM	1	Adult	Live	96	5
6	27.894937	83.424061	986	Dambak, Ribdikot RM	1	Adult	Live	17	269
7	27.900702	83.475979	727	Jorte, Tansen M	1	Adult	Live	2	10
8	27.86384 8	83.463221	1225	Kusumkhola, Rainadevi Chhahara RM	2	Adult	Live	101	166
9	27.93089 6	83.566517	629	Shikhardanda, Baganaskali RM	2	Adult	Killed	54	426
10	27.918491	83.452217	683	Argali, Tansen M	1	Adult	Killed	9	16
11	27.931285	83.459574	604	Argali, Tansen M	1	Adult	Killed	0	327
12	27.931530	83.460031	593	Argali, Tansen	1	Adult	Killed	0	296

Table 1. All King Cobras recorded in Palpa district

				М					
13	27.929450	83.43989 9	605	Kamalpokhari, Tansen M	1	Adult	Live	137	349
14	27.934822	83.436628	489	Ridi, Tansen M	1	Adult	Live	58	41
15	27.726848	83.710293	910	Rahabaas, Mathagadi RM	1	Adult	Killed	167	85

Note: RM: Rural Municipality I M: Municipality

Green colour: Recorded during this project I Red colour: Recorded before this study



Fig 2 & 3. Pie charts showing the percentages of live and killed King Cobras recorded during this study (left) and overall study till now (right) in Palpa district



Fig 4 & Fig 5. Pie charts showing the percentages of King Cobra recorded in different habitat types during this study (left) and overall study till now (right) in Palpa district







Pic 11-25. Google images showing habitats of all King Cobras recorded from Palpa district

A total of 15 local people were in a state to give us at least some information on King Cobra and acted as key informants. Among 110 respondents of our questionnaire survey, only 17 said that they have seen King Cobra at least once in their lifetime. Validation of the snake they saw was a King Cobra was done based on their independent description and later by cross-questioning, followed by displaying of images. Additional, 28 people said that they haven't seen by themselves but have heard about such snakes from their neighbours, villagers or relatives. Ninety seven respondents expressed their extreme fear from King Cobra basically due to its large body size and hood-making ability when threatened. This has led to human-King Cobra conflict. Thus, about ninety percent people exhibited negative perception towards King Cobra. Eighty percent people were unknown about the threats but 20% saw high human persecution as threats to survival of King Cobra.

Similarly, 79 respondents said that they either attended our King Cobra conservation awareness raising programmes, read news on newspapers, poster, brochure, watched

interview on TV, saw somebody putting on King Cobra printed T-shirt with conservation message, listened to interview on local FM radios or heard from friends, relatives or neighbours. However, other 31 respondents said that they didn't know about King Cobra and our conservation campaign through any medium.



Fig 6. Number of respondents who knew and didn't know about our King Cobra conservation programme

Habitat variables (vegetation, geographical and human disturbance) in quadrates at the beginning and end points of the lines transect were recorded. However, because no King Cobra within the predetermined fixed length lines transect was recorded, any relation of King Cobra occurrence to those variables couldn't be demonstrated. Opportunistic survey proved to be the better option for recording King Cobra but assessment of their status and abundance cannot be done through this method. Hence, assessing the status and abundance was not possible.



Fig 7 & 8. Doughnut chart showing percentage of people who have seen, heard and not seen King Cobra (left) and their fear towards King Cobra (right)

#### Threats as observed by the researcher:

Seven years of observation including 18 months of this project, the researcher has identified threats to survival of King Cobra as below:

1. High Human persecution: Out of 18 King Cobras recorded from the study area (10 during this study and eight reported by Thapa 2016) till now, eight of them (44.4%) were found killed. Also, a nest found in north-west of the district with 26 eggs inside it was entirely destroyed and the mother King Cobra was harassed. However, some of the local people's plan to kill the female was hindered by this researcher's proactive

initiative through Himalayan Nature; supported by government authorities and other local people. High human persecution was resulted mostly by people's ignorance, large size of the snake and hood making behaviour. Hence, high human persecution was found to be the greatest threat to survival of King Cobra.



Pic 26-31. Some pictures of the King Cobras killed by local people of the study area

2. Habitat destruction: Human population is growing continuously. The growing population is intruding into the King Cobra's habitat. Agricultural land expansion, mining (especially limestone) and haphazard developmental activities in recent years have largely destroyed the prime habitats of King Cobra. Quarries of Siwalik and Mahabharata hills of Palpa district supply about 80% of the raw materials for cement factories in the area (Rupandehi, Nawalparasi and Kapilvastu). Among developmental activities, road construction, dissecting habitat of the species seems to be the matter of serious concern. Development of ad hoc road networks has not only fragmented the habitat but has also increased the possibility of human-King Cobra confrontation and risk of road kill incidents in future. For example; Kali Gandaki corridor which is expected to connect India and China runs through the best known King Cobra habitat in the district till now from where 11 out of 18 King Cobras have been recorded.



Pic 32. Google image showing King Cobra recorded locations and Ridi-Ramdi section of Kali Gandaki Corridor (one of the nation pride projects, connects India and China) that runs through the habitats of King Cobra



Pic 33-36. Google images showing some of the large scale limestone extraction sites in Palpa district

Some pictures from the field:

![](_page_12_Picture_1.jpeg)

Pic 37. King Cobra habitat in north-west Palpa

![](_page_12_Picture_3.jpeg)

Pic 38. An adult King Cobra in Dobhan, Palpa

![](_page_13_Picture_0.jpeg)

Pic 39. Researcher photographing a rescued King Cobra at Division Forest Office, Palpa for preparing individual profile so that if this particular King Cobra ever caught again could be identified.

![](_page_13_Picture_2.jpeg)

Pic 40. Researcher with a rescued King Cobra at Division Forest Office, Palpa

![](_page_14_Picture_0.jpeg)

Pic 41-43. Female King Cobra building nest, eggs exposed after locals destroyed the nest, female still guarding her destroyed nest

#### Participation in the events:

1. **Rufford Nepal Conference 2018:** The researcher attended Rufford Nepal Conference 2018 held on 29 and 30 January at Marshyangdi Hotel, Thamel, Kathmandu. Presentations made by the grantees and comments from the experts and audiences threw a lot to learn during the programme.

![](_page_15_Picture_0.jpeg)

Pic 44. Researcher with Grants Director-Rufford Foundation Mr. Josh Cole and other grantees

2. Nepal Owl Festival 2018: The researcher actively participated in Nepal Owl Festival organised at Jiri, Dolakha on 2 and 3 February 2018. He was invited by the organiser (Friends of Nature) for poster presentation. He had also kept on display the King Cobra promotional materials along with other publications of Himalayan Nature in a separate stall provided by the organiser. The stall was visited by hundreds of visitors who were briefed by the researcher on King Cobra and its conservation efforts in progress supported by the Rufford Foundation. During this visit, a good contact with the local people was made which proved to be productive because the researcher was informed about King Cobra sightings few months later and they didn't kill them rather informed concerned authorities in time. Thus, the project supported by The Rufford Foundation not only helped the researcher to study King Cobra and raise awareness for its conservation in targeted district but also provided opportunity to explore in other places as well. However, the monetary supported provided by The Rufford Foundation was exclusively utilised in proposed study area only.

![](_page_16_Picture_0.jpeg)

Pic 45-47. Researcher presenting the poster, promoting the conservation materials at stall and briefing students about King Cobra and its conservation

**3. Presentations on various wildlife trainings and programmes:** The researcher made his presentations on King Cobra and its conservation on various important wildlife trainings and programmes. Some of them have been listed below:

SN	Name of the training	Organiser
1.	Wildlife Research Techniques	Friends of Nature (FoN)
	Training	
2.	Training on Field Herpetology	Companion for Conservation of
		Amphibians and Reptiles of Nepal
		(CARON)
3.	Wildlife Training	Nepal Youth Council (NYC)
4.	Guest Presenter at Pralad Yonzon	Environmental Graduates in Himalaya
	Conservation Forum Series LXVIII	(EGH) and Resources Himalaya
		Foundation (RHF)

**4. Publication:** A scientific paper on distribution of King Cobra in Nepal was published on The Himalayan Naturalist including distribution data derived during this project from Palpa district. This paper provides the most detailed distribution information of King Cobra in Nepal till now. Please find the article reference as below and follow the given links to read the full article.

Thapa, K.B., Rana, N. and Shah, K.B. (2019). Distribution of King Cobra in Nepal. The Himalayan Naturalist 2(1). Pp 26-33.

http://fonnepal.org/userfiles/3Distribution%200f%20King%20Cobra%20in%20Nepal\_the HimalayanNaturalist\_Volume2Issue1April2019.pdf

#### OR https://www.researchgate.net/publication/332464570\_Distribution\_of\_King\_Cobra\_i n\_Nepal

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