

Surveys of Venomous Snakes and other Reptiles in the Himalayan Biodiversity Hot-Spot

Interim Report for Rufford Small Grants

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Prepared and Submitted by

Vishal Santra

Project Lead

Interim Report

Field work for this survey was initiated at the end of June 2018. The field and lab work for the survey is being conducted in collaboration with experts from Bangor University, UK, Captive and Field Herpetology, UK and Himachal Pradesh Department of Health and Family Welfare. All the activities related to the survey were carried out with proper written permissions from the state Forest Department. The first team consisted of 8 individuals, and began the field and awareness work from Solan district.

There has been extremely heavy rainfall this monsoon season and weather conditions became steadily more challenging with every passing day. Landslides became frequent and roads started being washed away by suddenly developing waterfalls. Due to these natural challenges we had to keep changing the schedule and locations quite often. However, once we reached our destinations, the target areas were explored on foot, which proved to be extremely useful as we started encountering species.



A road block due to a smallish landslide on our way to the Great Himalayan National Park

At each of the different survey locations, alongside field work, we conducted a series of community awareness and training programs. The most successful of these were the ones conducted for school children. The main topics of discussion were snakes they

encountered around their homes and identifying which are venomous and which are not. This was followed by discussing and discrediting common myths and beliefs involving snakes and snakebite in India. We then distributed stickers displaying colour photographs of the common venomous and non venomous snakes of the region. Posters that depicted simple steps on how to avoid conflict with snakes were distributed. The depictions were illustrated pictures that described simple actions and practices that can keep snakes away and keep them safe.



Distributing educational posters and stickers to villagers, community leaders and school students.





Posters and stickers being put up at different places within a community. Villagers have put them on the walls of local shops, government run schools and Post office walls.



One of the priorities for the project was to train and build capacity of the local Forest Department at the different locations we were surveying for reptiles. The Department officials and staff were extremely interested in the training program and afforded every help they could to arrange for it. Most of the trainees were Forest Guards and Range Officers, the foot soldiers and first responders to every wildlife related crisis. Training them was of utmost importance as they had absolutely no idea on how to deal with snakes and snakebite management.

The training consisted of two phases. The first was classroom presentations and the second involved hands-on training.

Phase I – In phase one we conducted class room sessions. These included various aspects of snakes' morphology, basic sensory organs, biology, venom, myths & facts, snakebite, first aid, conservation, public awareness and introduction to rescue methods.



[Above photos are from the training program conducted in Mandi Forest Division and the photos below are from training programs conducted in Chamba Forest Division]

Phase II – The second phase involved hands-on training and familiarizing the participants with the equipments of the trade and how to use them. The trainees were introduced to live snakes and were instructed on their biology and behavior. They were very excited and amazed to have handled live snakes for the first time in their lives. It was an eye opener for them as their understanding of snake behaviour was entirely different from what they experienced. Willing and confident candidates were trained to handle and bag venomous snakes with the use of proper equipments. It was a significant and required learning for them. The officers agreed that they never thought that managing a venomous snake could be so safe and efficient.



We also trained a few local snake rescuers who had been rescuing snakes for some years without any proper training and know how. One of them had been bitten by a cobra once and survived even after going into respiratory paralysis.



Training Mr. Puran Das, a local snake rescuer who was bitten by a cobra while rescuing it.

We also distributed proper snake rescue equipments (snake hooks, snake baggers and snake bags), along with the awareness and identification materials to all the groups that we trained during this period.

Some of the most interesting and fruitful events were the awareness programs conducted in schools, involving the children and teachers. Class monitors were given the task of distributing and arranging all the educational materials (posters, stickers of both venomous and non-venomous snakes); they used the stickers to create display boards of the snake species in an easily accessible place in the school. All the students from the same class were involved and they all loved the activity.



Talking to school children at a very remote village in Kullu district of Himachal Pradesh

With help of the local community leaders we put up educational posters depicting how to avoid conflicts with snake inside and outside local shops. This is very strategic as most of villagers visit these shops daily for their supplies. Another important aspect of the awareness program involved visiting houses in remote areas to talk to them about snakes and snakebite. Stress was given on how to avoid conflict situations by just changing a few things in the regular lifestyle and incorporating simple strategies such as the use of a flash light and a mosquito net.



Another important aspect of the project was to train volunteers in safe and humane snake handling, and the fine techniques of collecting biological samples. We also instructed them on the ethics and laws that needed to be maintained while working with wildlife in India. The participants from the United States of America and the United Kingdom thoroughly enjoyed the sessions and learned the basic techniques of snake handling.



Participants assisting in sampling and documenting specimens. Also seen releasing specimens.

The participants had a wonderful and productive time learning field techniques. They learned humane snake restraint techniques and night survey techniques.

We have had quite some success amidst tricky weather conditions, landslides and washed away roads. The night surveys with the help of flash lights and slow road-cruises (7kmph) along forested paths yielded good results. This was quite useful on rainy nights. We noticed that on full moon nights we had absolutely no success.

We have till now documented 19 species of snakes, 10 species of lizards and 8 species of amphibians.

Sl. No.	Snakes	Lizards	Amphibians
1.	<i>Bungarus caeruleus</i>	<i>Eurylepis taeniolatus</i>	<i>Amolops cf. formosus</i>
2.	<i>Trimeresurus septentrionalis</i>	<i>Cyrtodactylus lawderanus</i>	<i>Euphlyctis sp</i>
3.	<i>Lycodon aulicus</i>	<i>Cyrtodactylus chamba</i>	<i>Duttaphrynus himalayanus</i>
4.	<i>Daboia russelii</i>	<i>Laudakia tuberculata</i>	<i>Duttaphrynus melananostrictus</i>
5.	<i>Ptyas mucosa</i>	<i>Asymblepharus ladacensis</i>	<i>Duttaphrynus stomaticus</i>
6.	<i>Amphiesma stolatum</i>	<i>Calotes versicolor</i>	<i>Microhyla ornata</i>
7.	<i>Coelognathus helena (DOR)</i>	<i>Hemidactylus cf. brookii</i>	<i>Spaerotheca sp</i>
8.	<i>Argyrophis diardii</i>	<i>Hemidactylus flaviviridis</i>	<i>Hoplobatrachus tigrinus</i>
9.	<i>Boiga trigonata</i>	<i>Ophisops sp</i>	
10.	<i>Boiga multifasciata</i>	<i>Varanus bengalensis</i>	
11.	<i>Gloydius himalayanus</i>		
12.	<i>Naja oxiana</i>		
13.	<i>Orthriophis hodgsoni</i>		
14.	<i>Lycodon mackinnoni</i>		
15.	<i>Oligodon arnensis</i>		
16.	<i>Oligodon sp</i>		
17.	<i>Xenochrophis piscator</i>		
18.	<i>Liopeltis sp</i>		
19.	<i>Naja naja</i>		

There is in all likelihood a rediscovery in the region after 148 years and also solves a long mystery regarding a species' distribution in the Western Himalayas. We are currently working on the manuscript and we hope to publish it in a peer reviewed journal with all due credit to Rufford Small Grants for funding this work. We are looking forward to a few more very interesting publications from this year's work with due credit to Rufford Small Grants.

One of the biggest challenges was to manage time for sampling and carry out detailed morphological studies of the animals we have caught. It always is a difficult job when you work with a live animal as it involves humane handling and following ethics. But we did manage to pull it off well. With leading experts from the collaborating University and

volunteering zoo staff from San Antonio Zoo we made sure that we maintain high standards while handling all the animals we caught for sampling.



Some of the species documented during the survey:

