

Habitat and acoustic survey and an action plan for bats conservation in the Kathmandu Valley, Nepal



Rufford Booster Grant
Third Phase Report
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A third phase report submitted to Rufford Small Grants, UK

Cover Photo: A young female of Common Short-nosed Fruit Bat (*Cynopterus brachyotis*) netted over a stream at the National Botanical Garden, Godawari (Photo by Sanjan Thapa).

Note: This species is a new record to Nepal.

Team.

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Debbie Bartlett, PhD

Team Members:

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All Photos by:

Sanjan Thapa, Tejab Pun, Bishnu Achhami

Acknowledgements

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Sanjan Thapa

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1. Background

After the second phase of the current project, two activities were remained; to draft a local bat conservation action plan for the long term conservation of bats in Kathmandu Valley and to organize a workshop to share the draft and finalize the action plan. During the second phase survey at Godawari, some different calls of the bats was observed at Godawari Botanical Garden (GBG) suggesting different species than we had ever captured or seen. Hence, a third phase survey was conducted within GBG during the third phase of the current project.



Photo 1: Serotine captured over a pond in National Botanical Garden, Godawari

2. Kathmandu valley

Kathmandu Valley (27°35'00"N 85°15'00"E, 27°50'00"N 85°37'30"E) is comprised of three districts namely Kathmandu, Lalitpur and Bhaktapur Districts. It is an oval shaped, flat bottomed basin valley with hills: Phulchowki, Chandragiri, Shivapuri and Nagarjuna at southern, south western, northern and north western corners, respectively. The study area occupies 395 square kilometers and is situated at an elevation of 1372 m to 2732 m.

Climate in Kathmandu Valley is characteristic temperate, influenced by the tropical monsoon. The average air temperature during summer season varies from 28–30 °C (82–86 °F) to 10.1 °C (50.2 °F) during the winter. The annual rainfall in Kathmandu city is about 1407 mm. The average humidity is 75%. Bagmati and Bishnumati are major rivers of this area with centripetal drainage system. The surrounding hilly area is covered with forest of *Alnus nipalensis*, *Pinus roxburghii*, *Prunus spp.*, *Quercus* sps. And bamboo as major vegetation while the fauna like Leopard (*Panthera pardus*), Wild boar (*Sus scrofa*), Common

langur (*Semnopithecus entellus*), Rhesus monkey (*Macaca mulata*) etc, numerous volant fauna (bats and birds) are present. It's a religious and tourist attraction centre of Nepal. The Kathmandu Valley is a cultural and political hub of Nepal

(https://en.wikipedia.org/wiki/Kathmandu_Valley). It was inscribed as a World Heritage Site by UNESCO in 1979. The project area comprises approximately 100 km² and is entirely within the Valley; it contains the Shivapuri Nagarjun National Park (https://en.wikipedia.org/wiki/Shivapuri_Nagarjun_National_Park), 15 community forests, urban and sub-urban areas and agricultural landscape.

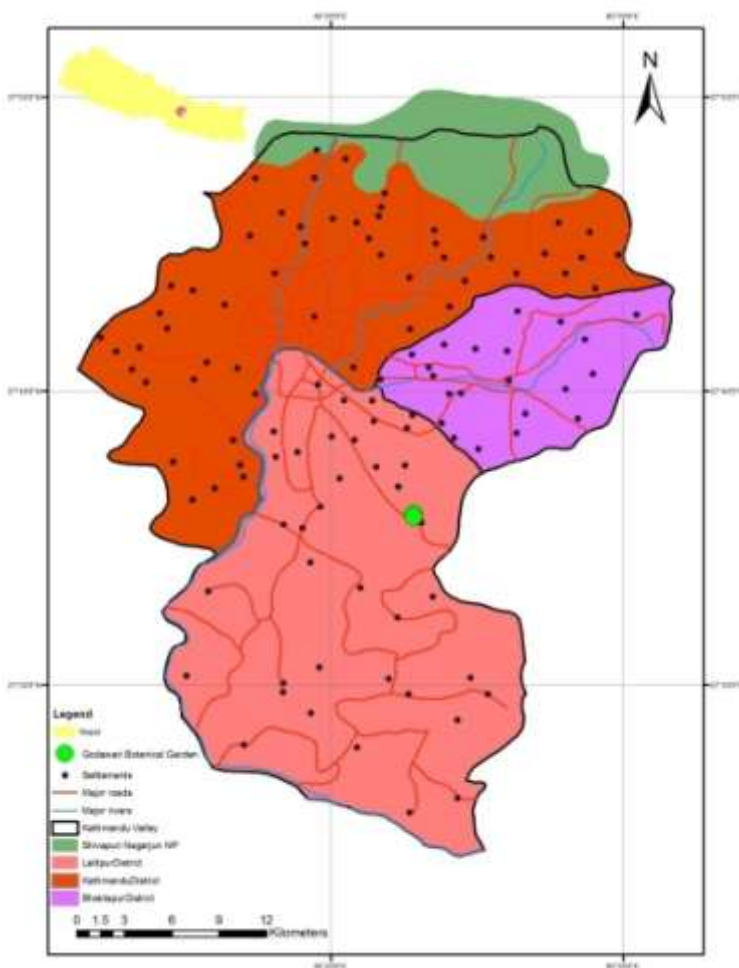
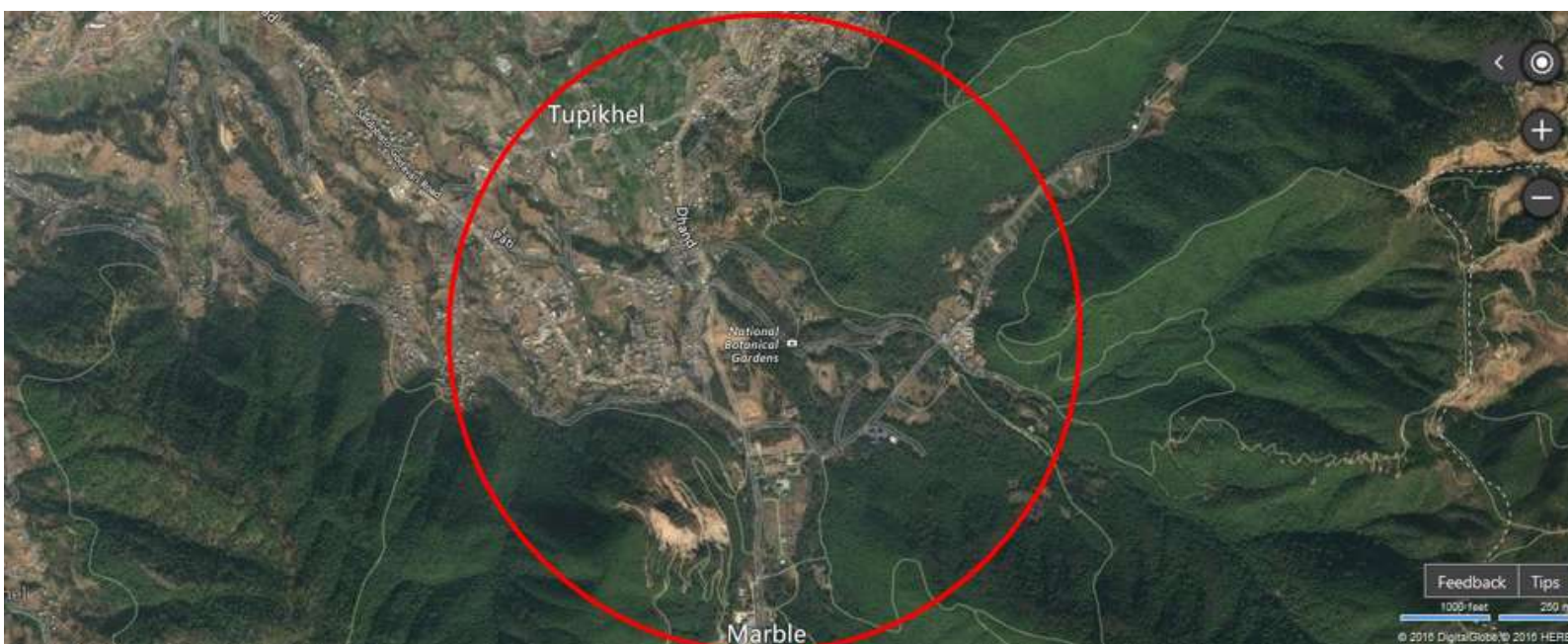
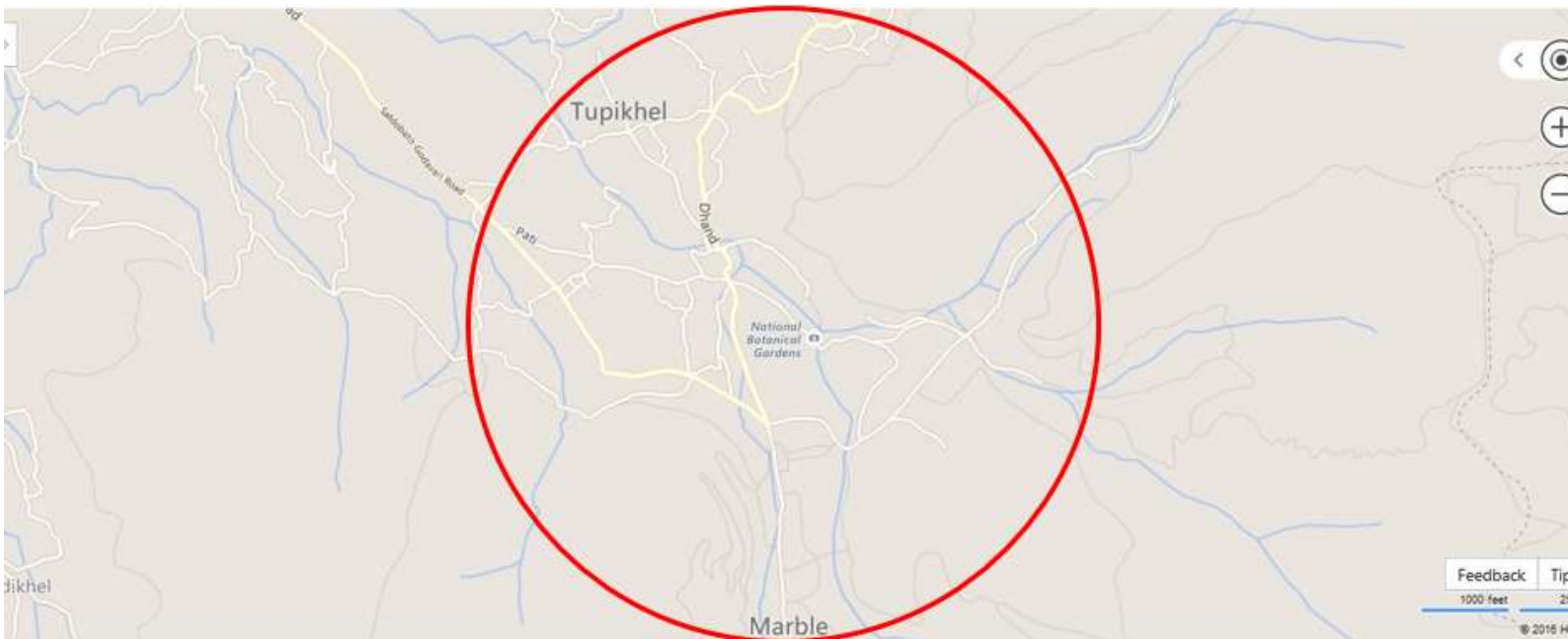


Figure 1: Map of Kathmandu Valley showing three districts and study site



2.1 Godawari

It is located in the vicinity at $27^{\circ}35'42.08''\text{N}$ $85^{\circ}22'40.81''\text{E}$, at an elevation of 1524m a.s.l. The area is moist, drained with water streams, lying in north facing slope. There is a botanical garden with amenity planting, pools and streams. Outside the garden are old temple sites with water tanks. The site is surrounded by mature community forests which used to be *Pinus roxburghii* and mixed forest, was reported to have been cleared 100 years ago. The community forests have dense vegetation of Chestnut *Castanopsis indica* (Katus), Box Myrtle *Myrica esculenta* (Kafal), Plum *Prunus cersoides* (Paiyun), Alder *Alnus nipalensis* (Utis), *Schima walichii* (Chilaune), Oak *Quercus sp.*, Rhododendron *Rhododendron spp.* (Gurans), Walnut *Juglans regia* (Okhar), *Michelia champaca* (Chaanp) etc. Common Leopard *Panthera pardus* (Chituwa), Indian Crested Porcupine *Hystrix indica*



Photo 2: A view of Coronation pond at National Botanical Garden, Godawari

(Dumsi), Squirrels, Bats are mammals sited frequently in the jungle. There is a cave on the upper level west to the botanical garden in the vicinity of Jungle and the site is noted for butterflies (and so likely to have good moth fauna).

2.1.1 National Botanical Garden, Godawari

The National Botanical Garden is located in the base of Mount Phulchoki (2715m.) at Godawari (1515m.) at the south east corner of Kathmandu valley. The area of the garden is 82 hectare. It is surrounded by evergreen natural forests. The temperature ranges between 20°C and 30°C during summer and -5°C to 20°C during winter. This Garden was graciously inaugurated by His Majesty the King Late Mahendra Bir Bikram Shah Dev on the 20th October 1962.

Ever since its establishment much of its activities have been centered in enriching the garden with indigenous plants as to integrate its collection with scientific investigation, conservation, education and demonstration. Herbarium specimens include c. 5,000 indigenous spp. (<http://www.bgci.org/garden.php?id=534>).



Photo 3: Glimpses of National Botanical Grden, Godawari



Photo 4: A stream flowing near the main gate of National Botanical Garden, Godawari

3. Methods

1. Baseline monitoring field survey: An additional survey was conducted in spring season at Godawari including National Botanical Garden, Godawari during April 5–8, 2018. Hygrometer 6000 and Lux meter was deployed to record average temperature and relative humidity at the time of opening and closing the mist nets. All the data was noted in a data collection format.
 - 1.1 Mist netting: Two Ecotone monofilament mist nets of different sizes 7m*3m and 6m*3m and/or 3m*3m at each site were administered. Mist nets were opened during the sunset (normally at 17:30 hr) just before the time of flight emergence of bats and closed after the bat activity was absent or lowered. Mistnetting were executed on ponds and over the stream (nearly from the level of water).

- 1.2 Bat capture: The mist netted bats were captured by gloved and bare hands carefully and with ease to the bats.
- 1.3 Mist netting: Two Ecotone monofilament mist nets of different sizes 7m*3m and 6m*3m and/or 3m*3m at each site were administered. Mist nets were opened during the sunset (normally at 17:30 hr) just before the time of flight emergence of bats and closed after the bat activity was absent or lowered. Mistnetting were executed on ponds and over the stream (nearly from the level of water).
- 1.4 Bat capture: The mist netted bats were captured by gloved and bare hands carefully and with ease to the bats.
- 1.5 Measurements: Bat was put into a cloth bag and its body mass were measured using a Pesola spring balance. Generally Fore Arm (FA) was measured and for some species

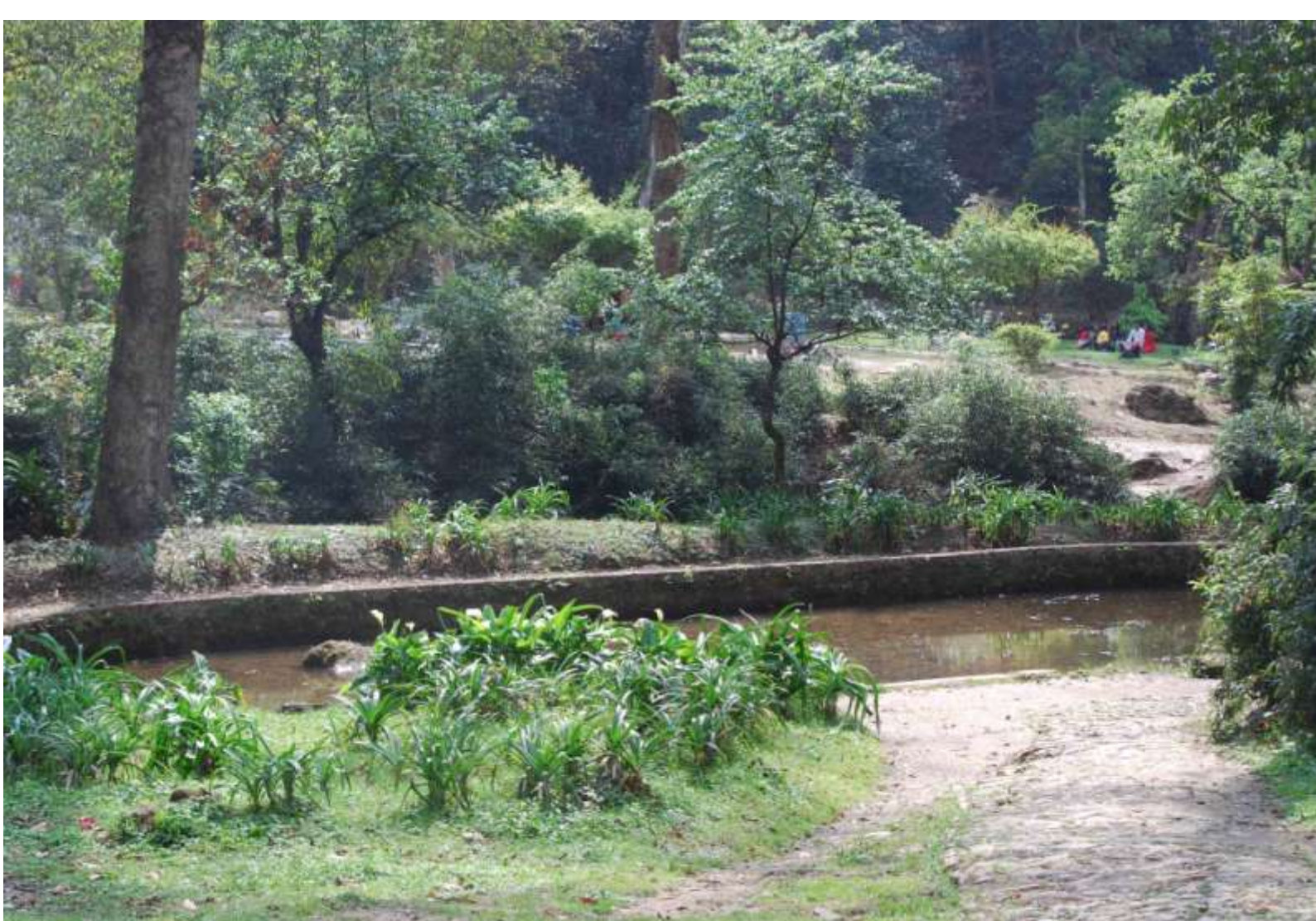


Photo 5: A pond at National Botanical Garden, Godawari



Photo 6: Mistnetting over a bridge on a coronation pond at National Botanical Garden, Godawari



Ear length (E), Tragus (Tg), Tibia (TIB)

- 1.6 Photography: Captured bats were photographed from dorsal, ventral and lateral view. Important morphological characteristics such as Nose Leaf, Mental groove, TIB, E and Tg were also focused. Nikon D40X DSLR camera with 18–55mm Lens was deployed for the photography.
- 1.7 Release: The bats were kept in palm and/or in arms of the releasing person and calmly let it go. During the “Bat Acoustics and Handling Training”, a light tag was attached to the neck or back of captured individual bats using Coloplast as an adhesive at the time of release and bats was followed after release to get more normal echolocation calls and perhaps see a bit about foraging behavior. However, the light tags fall down within minutes and it was causing uneasy to bats as they were trying to remove it out. So, the light tags were not used after the training. Bat echolocation calls of the species were recorded deploying a Wildlife Acoustics SM4BAT ZC ultrasound detector during hand held and at the time of release and also followed the bat during its flight for a short while and for a short distance.

1.8 Field Identification: Based upon the morphological characteristics and measurements, bats were identified in the field.

2. Bat acoustics call library development and call analysis:

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2.1 Bat echolocation call recording: Two Wildlife Acoustics Song Meter SM4BAT ZC (Zero crossing) Ultrasonic Recorder was operated hand held. One detector was used to record bat echolocation calls while the bats were handheld, on release and in flight following the release for a short while. While the other detector was used for passive recordings. The passive detector was operated just before the mist nets were opened and was taken out after the mist nets were closed due to the risk of being lost or theft or damaged.

2.2 Analysis: SD card data from both recorders were downloaded and echolocation calls recorded were analyzed using software Kaleidoscope Stand-Alone Viewer version 4.3.2. The recorded echolocation calls from the handheld detector was taken as reference calls. Recorded calls from the passively used detector were analyzed tallying the reference calls.



Photo 7: removing entangled bat from a mistnet administered over a stream at National Botanical Garden, Godawari



Photo 8: A mistnet administered in the edge of a pond at National Botanical Garden, Godawari

3. Data collection and analysis: Data collected from the field was entered into a MS-Excel worksheet and analyzed.

4. Mapping: GARMIN Etrex 10 GPS was used to record the geographical co-ordinates in the field. The coordinates was plotted using Arc GIS 10.2 to prepare the maps including distribution maps.

5. Bat Action Plan drafting: Based on the findings from the baseline survey, status of bat species was reviewed. Vision, goals, goal targets, objectives, objective targets and actions was developed

(http://cmsdata.iucn.org/downloads/scshandbook_2_12_08_compressed.pdf). Informal consultation meetings with local people, citizen forum, community forest users groups, land owners and school teachers were organized. Communication on the action plan draft with

national and international experts and organizations working on environment and wildlife conservation was established. Based on the information gathered from these events, a draft of action plan for conservation of bats in Kathmandu valley was prepared.

6. Sharing workshop: A workshop was organized on July 20, 2018 to share and discuss on the prepared draft of action plan for conservation of bats in Kathmandu valley.



Photo 9: Presentation at sharing workshop on bat action plan

4. Results

4.1 Baseline

4.1.1 Species Diversity

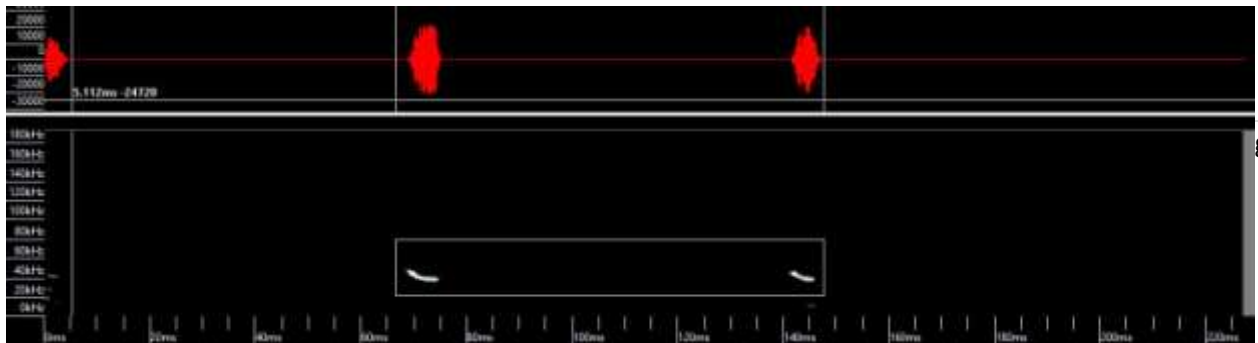
Altogether five species were identified in the field. A fruit bat was recorded. A young fully volant female Common Short-nosed Fruit Bat *Cynopterus brachyotis* was mistnetted over a stream. This is a first record to the country. Also, a male individual of Serotine *Eptesicus serotinus* was captured over a pond. This is a second record of the species after Tumlingtar from Nepal and a first record to the Kathmandu valley. Three individuals of *Miniopterus fuliginosus* were captured. This is a new locality record to the valley after second phase baseline survey during November 2017. Csorba's Mouse-eared Bat *Myotis csorbai* and *Rhinolophus affinis* has been reported earlier during first and second phases of the project and even before during previous surveys. The former species is an endemic species to Nepal.

Table 1: List of species recorded during the third phase survey

Species	# individuals
<i>Cynopterus brachyotis</i> *	1
<i>Rhinolophus affinis</i>	5
<i>Myotis csorbai</i>	1
<i>Eptesicus serotinus</i> **	1
<i>Miniopterus fuliginosus</i>	3

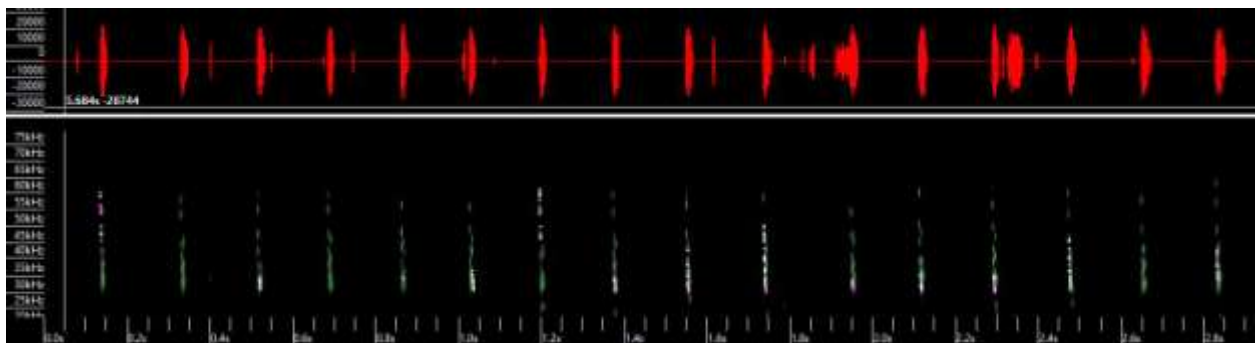
* First record to Nepal **First record to Kathmandu valley

4.1.2 Echolocation calls

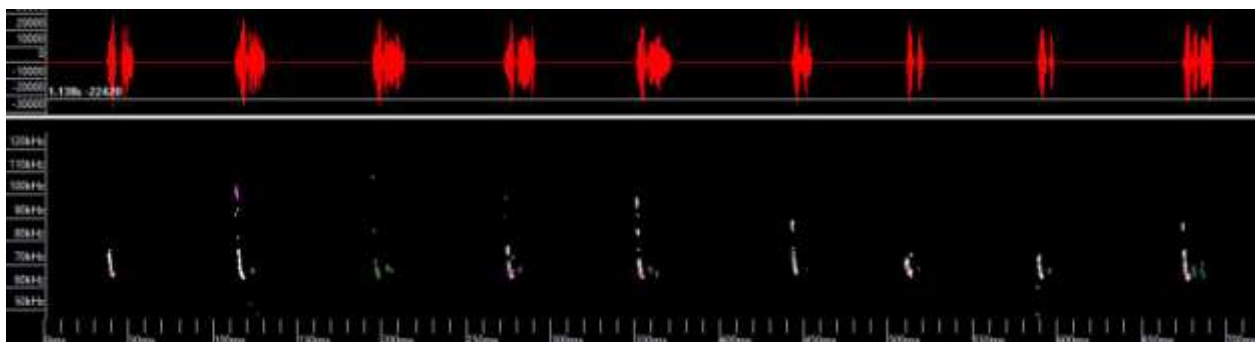


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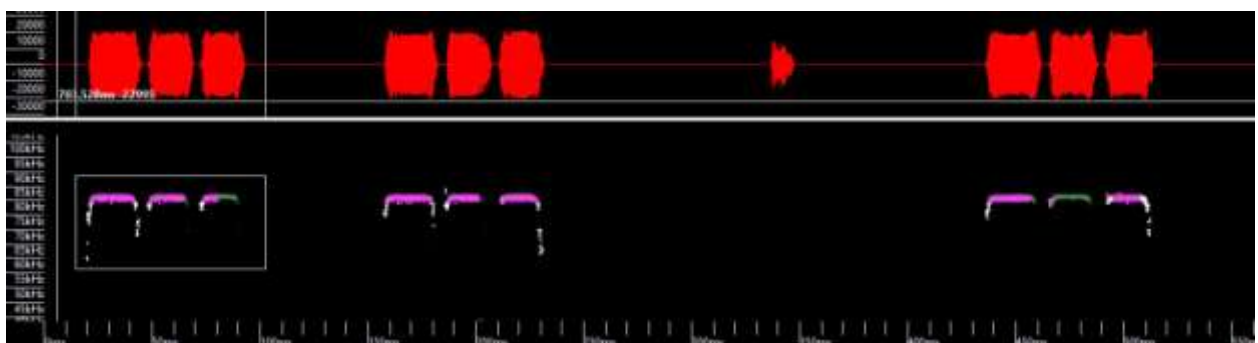
Eptesicus serotinus



Miniopterus fuliginosus



Myotis csorbai



Rhinolophus affinis

Table 2: Spectrogram values of echolocation calls of different species

		<i>Rhinolophus affinis</i>	<i>Miniopterus fuliginosus</i>	<i>Myotis csorbai</i>	<i>Eptesicus serotinus</i>
Full spectrum	Unit				
Tstart:	(s)	0.71215	6.787043	1.479159	0.066632
Tend:	(s)	0.800953	7.436316	1.506173	0.147718
Fstart:	(kHz)	61.104	23.7888	52.8	20.16
Fend:	(kHz)	93.264	68.8176	109.824	79.68
Fpmin:	(kHz)	84	29.25	0	0
Fpmax:	(kHz)	0	35.25	69	41.25
Fpmean:	(kHz)	85.66032	36.592695	69.245242	40.188422
Fppeak:	(kHz)	85.929992	31.573344	65.206613	39.577148
Zero crossing					
Tstart:	(s)	0.71215	6.787043	1.479159	0.066632
Tend:	(s)	0.800953	7.436316	1.506173	0.147718
Fstart:	(kHz)	61.104	23.7888	52.8	20.16
Fend:	(kHz)	93.264	68.8176	109.824	79.68
N:		3	4	1	2
Dur:	(ms)	16.004995	3.119994	3.772001	4.813001
TBC:	(ms)	26.30499	180.32138	0	72.700001
Fmax:	(kHz)	86.956523	47.30282	98.780484	47.338938
Fmin:	(kHz)	76.67032	34.336395	64.516129	38.834953
Fmean:	(kHz)	85.309617	39.00166	75.291609	41.134297
Fc:	(kHz)	85.723094	37.04641	64.516129	39.02532
Tc:	(ms)	15.432327	2.800494	3.711001	4.813001
Sc:	(OPS)	-1.155052	3.974667	41.247471	5.810912
Fk:	(kHz)	85.106383	37.116266	66.120219	39.122391
Tk:	(ms)	1.601994	2.245494	2.852001	3.531001
S1:	(OPS)	374.425232	544.089661	-640.359863	12.179279



Photo 12: *Rhinolophus affinis*



Photo 11: *Myotis csorbai*



Photo 10: *Eptesicus serotinus*



Photo 14: *Miniopterus fuliginosus*



Photo 13: *Cynopterus brachyotis*

4.2 Drafting bat conservation action plan for Kathmandu valley

During phase I habitat survey and baseline surveys, possible impacts to assemblage of bats, its habitat and the species were assessed. Desk review was undertaken for the species richness, habitat, conservation status, overall threats, legal protection and conservation activities of bat species in the Kathmandu valley. Vision, goals, goal targets, objectives, objective targets and actions was developed

(http://cmsdata.iucn.org/downloads/scshandbook_2_12_08_compressed.pdf). Informal consultation meetings with local people, citizen forum, community forest users groups, land owners and school teachers were organized. Communication on the action plan draft with national and international experts and organizations working on environment and wildlife conservation was established for the review, feedback comments and suggestion. Based on the information gathered from these events, a final draft of action plan for conservation of bats in Kathmandu valley was prepared for the sharing.

4.3 Sharing workshop on draft of bat conservation action plan

Altogether 36 participants from several institutions such as NARI, Tribhuvan University, Kathmandu Forestry College; local authorities such as municipalities, Metropolitan city; government agencies such as DNPWC, DoF, DoPR; conservation partners (ZSL, Hariyo Ban Program, NTNC, IUCN Nepal, Himalayan Nature etc.); media persons etc. participated in the sharing workshop on the draft of the action plan for the conservation of bats in the Kathmandu valley. The event was held on July 20, 2018 for four hours (8:00–12:00) including lunch at Indreni Foodland and Banquet, New Baneshwor, Kathmandu, Nepal. The program was conducted informally.

Table 3: Programme schedule of the sharing workshop on draft of the bat action plan

Time	Activities	
8:00–8:15	Registration and Tea/ Coffee	Ankur Shrestha
8:15 –8:30	Welcome	Tulshi Laxmi Suwal
8:30–9:30	Presentation on Bat Action Plan	Sanjan Thapa
9:30–10:30	Feedback and discussion	Guests
10:30–10:40	Closing Remarks	
10:40–12:00	Photo Session and lunch	Hari Basnet

Programme narrative in brief

08:20 Welcome speech by Mrs. TulshiLaxmiSuwal, President of SMCRF

Mrs. TulshiLaxmiSuwal briefly shared about the background of SMCRF's establishment, its objectives, aims, and goals. She shared about number of researches on small mammals conducted and ongoing at SMCRF, the achievement of PhD by core people, and such accomplishments by SMCRF till date in brief. She expressed esteem acknowledgement for the role of all stakeholders and partners including government agencies for their whole hearted support to SMCRF. She requested the experts at the workshop for their support, constructive comments and way forward on the draft of Bat Conservation Action Plan for Kathmandu Valley being present going to be present and invited Mr. SanjanThapa, Director at SMCRF to present on the draft of the action plan.

Table 4: List of participant in the sharing workshop

S.N.	Name	Position	Affiliation
1	Prof. Karan B. Shah	Chief Scientific Advisor	Himalayan Nature, Lazimpat, Kathmandu
2	Mr. Jeetendra Mahat	Assistant Forest Officer	District Forest Office Lalitpur, Hattiban, Lalitpur
3	Ms. Sarita Jnawali	Director of Programs	National Trust for Nature Conservation, Khumaltar, Lalitpur
4	Dr. Shanta Raj Jnawali	Chief of the party	Hariyo Ban Program, WWF Nepal, Baluwatar, Kathmandu
5	Mr. Sudeep Kumar Upodhyay	Research Scientist	Entomology Division, National Agricultural Research Institute, Khumaltar, Lalitpur
6	Mr. Ramesh Ghimire	Planning Officer	Kathmandu Metropolitan City, Baghdurbar, Sundhara, Kathmandu
7	Dr. Arjun Thapa	PhD Scholar	Chinese Acadsemy of Science, China
8	Mr. Hem Bdr katuwal	PhD Scholar	Xishuangbanna Tropical Botanical Garden, China
9	Ms. Meena Nareshwar		Centre for Environmental Education, India
10	Mr. Anil Kumar Sah		Department of Forests, Babarmahal, Kathmandu, Nepal
11	Dr. Narendra Pradhan	Programme Coordinator	International Union for Conservation of Nature –Nepal, Kupandole, Lalitpur
12	Dr. Hem Sagar Baral	Country Manager	Zoological Society of London, Bishalnagar, Kathmandu
13	Mr. Ram Chandra Kandel	Deputy Director General	Department of National Parks and Wildlife Conservation, Babarmahal, Kathmandu
14	Mr. Nabin Luitel	Reporter	Radio Sagarmatha
15	Mr. Yam Bam	Reporter	Hakahaki online
16	Mr. Milan Khadka	User	Jalabinayak Community Forest User Group, Chobhar, Kathmandu
17	Mr. Sagar dahal	Teaching Assistant	

18	Ms. Kalpana Sharma Dhakal		Department of Plant Resources, Thapathali, Kathmandu
19	Mr. Laxman Dangol	Reporter	Revo Science
20	Dr. Tej B Thapa	Professor	Central Department of Zoology, Tribhuvan University
21	Dr. Jhamak B Karki	Vice-Principal	Kathmandu Forestry College
22	Ms.Srijana Shah		National Botanical Garden, Godawari
23	Ms. Tulshi Laxmi Suwal	President	Small Mammals Conservation and Research Foundation (SMCRF), Kathmandu
24	Ms. Ankur Shrestha	Finance officer	SMCRF
25	Mr. Tejab Pun	Student	Central Department of Zoology, Tribhuvan University
26	Mukesh Pokhrel	Reporter	Himal Media
27	Bishnu Achhami	Research Assistant	SMCRF
28	Sabita Gurung	Program Officer	SMCRF
29	Dipendra Adhikari	Research Officer	SMCRF
30	Hari Basnet	Consultant	International Union for Conservation of Nature –Nepal, Kupandole, Lalitpur
31	Mohan KC	Reporter	Nefej
32	Shahila Tamang	Personal Assistant of Mayor	Godawari Municipality
33	Muna Adhikari	Deputy Mayor	Godawari Municipality
34	Jay Mangal Prasad	District Forest Officer	District Forest Office Lalitpur, Hattiban, Lalitpur
35	Saroj Koirala	Reporter	Nefej Aankhijhyal
36	Sanjan Thapa	Director	SMCRF

8:30 Mr. SanjanThapa's presentation on "Bat Conservation Action Plan (2018–2023) for Kathmandu Valley"

(Based on presentation information– please add)

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- Requirement of need of Bat Conservation Action Plan
 - Rapidly changing LULC
 - Impact of earthquake 2015
 - History of bat survey since 1887
 - SMCRF involved in bat survey since 2008– 34 % bat documentation since 2011 in Nepal
- Regular survey sites since 2008– since this year we entered the baseline and established the monitoring sites.
- Site specific threats and suggested actions– for different survey sites
 - Use of pesticide extreme almost everywhere
 - Impacts by infrastructures such as cave entry, channel gates
 - Possibilities of corridor development
- Status of bats in Kathmandu valley
 - Most species are assessed globally an nationally Least Concern, except *M. sicarius*,
 - *M. csorbai*– endemic to Nepal
 - Some of the sites were considered good habitat for bats assemblage such as Bajrabarahi, Chobhar, Godawari, Sundarijal etc.
- Discussion on species wise threats and actions
- Bat Box– not successful, but addressed the awareness
- Threats– pesticides, LULC change, lack of awareness
- Vision, goals, targets, actions of Bat Conservation Action Plan

The presentation ended at 9:36 am with the floor open for discussion and feedback on the draft of the Bat Conservation Action Plan.

Glimpses from the sharing workshop





Mrs. Sarita Jnawali-Director of Programs- National Trust for Nature Conservation

- Excellent work on bats and excellent presentation
- Possibility to install new bat house at Central zoo?
- How to include Friends of Zoo members in bat conservation as a routine, and the Bat Talk programs?
- Bats need more concern from the perspective of conservation

Sudeep Kumar Upadhyay- Entomology Division, National Agricultural Research Institute

- Our target is also how to minimize the use of pesticides, addressing the need of farmers for pesticides, suggesting the appropriate dose and time of use?
- We are interested to take your findings to the farmers group.
- I realized water plays important role for bats. How about the water quality tests? This may strengthen the data to support bat conservation, also the study on the pesticides, chemical fertilizers, drugs and their dumping.
- What about the pesticide poisoning case in bats? Which pesticide and which species of bat are affected? Specific type of pesticide can be proceed for banning if there is support from research data regarding this fact.
- There is water resource problem in Godawari. Also there has been proposal for cricket stadium construction in the area. These may pose threats.
- IPM- Integrated Pest Management- we can incorporate these sectors with the bat conservation plans
- Pesticides Hazard can be controlled in joint venture with farmer and stake holders

Meena Nareshwar- Centre for Environmental Education, India

- How are you going to convince plantation of conifers forest?
- How about the forest policy?
- What predators are there for bats?
- Myths on bats in India is wide prevalent which is a challenge in bat conservation.
- How to address these things?; these may help



Photo 16: Guests participating in discussion



Photo 15: Ms. Sarita Jnawali, Director of Programs, NTNC providing suggestions during discussion



Photo 17: Mr. Ram Chandra Knadel, Deputy Director General, DNPWC making remarks during discussion

SanjanThapa, Director, SMCRF

- So far there has been no research on bat predators. Owls, snakes and bats themselves are some to name.
- In order to convince the local authority and government agencies such as DoF, DNPWC etc. and include the conservation priorities to bats, their role in ecosystem services such as pollination, pest control, seed dispersal, disease control etc should be focused.

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Hem SagarBaral, Country Manager, ZSL Nepal

- Thanks to SMCRF
- Bats are yet less known field
- Regarding the bat nest- we see the bird nest boxes are taken by the birds. But in case of the bats, the case of bats house not being utilized by the bats may not solve just by the replacement by the pine wood. There has been big struggle in UK as well for better bat house that are accepted by the bats. And they have come up with the complex structures there for bats.
- Bats- Small but not less important
- As a whole what can we do? A summarized version would be helpful.
- I didn't see habitat loss discussion though I saw points on disturbance, LULC change
- My request- do approach to check the criteria to meet the Species Conservation Sites (SCS) for the bats
- My personal experience; the Short nosed bats were mobbed by crows, Rufous Tree Pie, and the monkeys may also be their predator.
- Gokarna is also a site for the Flying Fox.
- Gahana Pokhari- the other site for bats
- Bat watching could be popularized through use of bat detectors that identify the species at the very moment and it could be useful to the local people as well to participate them as citizen scientists.
- How to address the participatory knowledge and the concept of citizen science regarding the bat conservation?
- Broad Guideline in summarised version of Action Plan is best.
- Reality of Habitat loss need to be addressed

- All focus is on large mammals mostly.
- SMCRF has been giving good wave regarding the small mammal's research in scientific sector and at policy level.
- I am very interested for my collaboration in the research, conservation and management.
- How can bat conservation contribute in the socio-economic sector?
- Bring forward the Bat Conservation Action Plan in Nepali version as well with profile pictures, also addressing the socio-economic aspect; better distribute them for knowledge sharing
- We can't say policy undermines conservation of bats– even the law doesn't permit killing of any insects. This is to be taken symbolically that we have strong policy.
- Say, regarding the issue of primate conflict, it is increasing. Rather than approaching for controlling its population the compensation schemes are being effective at some level, yet till when and how well the scheme can be helpful is the next matter.
- Give weightage and highlight about the important sites of bats, VU, EN, CR, and endemic bats, their importance, coin the opportunities to incorporate these importance with the National acts/laws/bylaws; and that can strike the policy.
- Since many bats are outside the Protected Areas, the Department of Forest and the related bodies need to be enforced to address the bat conservation issues along with cooperation with the communities.
- Prey Predator Research study is most & will go ahead in consultation with experts, researchers and academicians
- Issue with development and infrastructure construction is serious--- important to address them with the community.
- If the ecological values are undermined, there is no value of such development. An example from India where the case filed against the construction reached the Supreme Court. Let the cases not reach to that level and rather the organizations like SMCRF implement the BAP to check such improper constructions.
- Our participated in this workshop is also a base in the process for Government endorsement of Bat Conservation Action Plan; there needs the ownership from the government and the local bodies.



Photo 18: Sharing workshop participants during discussion and feedback

Prof. Karan Shah, Chief Scientific Advisor, Himalayan Nature

- Musahar also consume bats.
- The statement about “Chepang, Musahar may not be affected by viruses due to their habit of boiling the bats before consumption” is not reasonable to tell and spread. Be careful before mentioning such ideas as bats infected anywhere by any virus is to be considered risks.
- The pollution may also be seriously impacting specially the flying fox. Incorporate about the pollution impact as well in the Action Plan.
- The Government of Nepal updated the protected list of mammals. The bat is included in the annex- *Csorba*
- Check the formats of Action Plan and Management Plans available, follow them
- Issue of keeping *M. csorbai* in Appendix III

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Dr. TejBahadur Thapa, Professor, Central Department of Zoology

- There is no knowledge on population, occupancy and such specific information to suggest better management intervention
- There are different penalty level for annex I, II, III, IV. There may be problem when animals are all dumped into these annexes and that may raise issue with strict regulations regarding the permissions for animal research, handling and collection permission issues for researchers and students. This may affect the accessibility and opportunity in the research sector. On the otherhand penalty level and enforcement strategies are still known for persecution and killing of bats and other unprioritized species.
- I suggest focusing on knowledge generation.
- Action Plan to be in brief size and summarized

Mr. Ramesh Ghimirey, Planning Officer- Kathmandu Metropolitan City

- I realize from the presentation that the bat population is decreasing.
- I too realized there is need of conserving the bats.

- We are ready collaboration with SMCRF and to support for enforcement from local level and we will include the possibilities of bats conservation priorities during planning for the metropolitan city construction activities.

Ms. Muna Adhikari- Deputy Mayor, Godawari Municipality

- Proposal for stadium construction is closed now.
- Dam and such construction for water preservation has also been initiated.
- SMCRF has support from Godawari Municipality for any programs on bat research and conservation.
- We can input in collaborating with the farmers for the bat conservation programs in the area.

Ms. Kalpana Sarma Dhakal- Research Scientist, Department of Plant Resources

- We had received proposal for bat research from SMCRF
- Now we are aware that there is endemic bat in the botanical garden which is exciting for us to know.
- Please submit your report on bat research including your finding plus recommendations about the endemic bat in the area including such other information. This will be strong form of information to initiate bat conservation plans and programs.

Dr. Jhamak Karki, Vice-Principal, Kathmandu Forestry College

- The Action Plan needs collaboration from the Department of Forests, Protected Areas and the local level bodies.
- Now, please move in the process of finalizing the action plan with proper format.
- Though Annex IV provides protection to every wildlife including the insects. It does not reflect proper protection regulation specifically for the bats. We need to check the sub-categories, and properly define.

- I suggest you to quickly submit important notes of the Bat Action Plan for revision in the government document in preparation, and provide recommendation for addition/improvement.
- Make correction in the names of the ministry.
- Myself working with policy and interested by it, if you can provide the soft copy of the Bat Action Plan, I am ready to provide my further input on it.

Jay Mangal Prasad Gupta- District Forest Officer (Chief), District Forest Office, Lalitpur

- The forests- both public and private contribute to bat habitat.
- What is the cause of decrease in population of bat?- needs to be identified.
- As my experience from being at Terai, it seems some bats prefer specific plants/trees. How about plantation of better preferred plants (choice of species) in the habitat of bats in Kathmandu?