

### Final Evaluation Report

Your Details	
Full Name	Tulsi Ram Subedi
Project Title	Identification and mitigation of the main threats impacting threatened Bearded Vultures in their core range of Nepal
Application ID	28993-D
Date of this Report	7 July 2023



#### 1. Indicate the level of achievement of the project's original objectives and include any relevant comments on factors affecting this.

Objective	Not achieved	Partially achieved	Fully achieved	Comments
Conduct powerlines surveys for birds' carcasses and questionnaires with local communities within the home ranges of Bearded Vulture to determine the locations of the risky powerlines and the drivers of poisoning for Bearded Vulture and other raptors				
Conduct conservation programs to mitigate threats to Bearded Vulture and other raptors				The proposed piloting of retrofitting the riskiest power poles couldn't be conducted. We discussed with Nepal Electricity Authority and for the retrofitting, switching off the power grid is needed which could make a substantial loss to the company. On the other hand, the retrofitting of power poles was not conducted before so suitable materials are not available to do so. Our discussion was very positive, and NEA realised the severe impacts of powerlines on birds, so they provided positive notes to use the insulated wires in the future while constructing electricity distribution lines.

#### 2. Describe the three most important outcomes of your project.

#### a). Powerlines Survey

A powerline survey was conducted within the home range areas of bearded vulture and mountain hawk eagle. The surveyed places were Kaski (Thoolakharka, Dhampus, Ghandruk, Tolka, Bhadaurey, Panchase, Dipang, Puranchaur), Parbat (Deupur, Chitre) and northern belt of Syanja (Khamaley, Rapu) district that lies in and around the periphery of Annapurna Conservation Area. The selected areas were within the home range of bearded vulture and mountain hawk eagle as shown by the satellite telemetry-based study.



The survey was conducted by walking under the power lines during the whole survey period and inspecting each pole and ground around it (approximately 7 m radius around each pole) to record the mortalities that may occur due to electrocution and collision (Harness and Wilson 2001, Dwyer and Mannan 2007). Opportunistic records of avian and raptors mortalities were recorded during the study period through oral communication/interviews with the farmers, herders and local electricians. Due to the difficult terrain of the mountain topography of the survey area, only the poles and pole segments on accessible lands were surveyed. Thus, the scope of inference applies only to these types of poles, and our tally of carcasses may be biased toward human-tolerant species. The survey was conducted twice (first in February and second in April and May).

A total of 782 power poles (757 distribution poles and 25 transmission poles) were surveyed (Dhampus – 132, Deupur – 103, Ghandruk + Tolka – 70, Bhadaurey – 63, Chitre – 56, Panchase – 59, Rapu – 56, Dipang – 150, Puranchaur – 68). A total 94% (n=734) poles were metal, 4% (n=32) were concrete and 2% (n=16) were wooden.

Out of 782 power poles and high transmission poles, 464 poles had metal cross arms while 318 poles did not have any cross-arm, electric lines were connected to the poles with the help of short pin insulators (vertical arrangement). All the crossarms of the poles were made up of metal. We found six types of arrangements of wires in poles; the most common power poles were placed vertically followed by cross-sectional triangular types while the least was mixing configuration of cross-sectional + horizontal (Table 1). All the cross-sectional triangular configuration has a "Simple I" type. Out of 78 horizontal power poles, 52.7% were" Simple I" types of horizontal configuration and 42.3% were "Simple H" configurations. The vertical cross arm-types have a "double circuit, angled struts - 7.5%" and a "the three phases on one side, single circuit – 92.5%" configuration.

Most of the insulating materials used between the poles and electric lines were made up of ceramics (85.96%) followed by glass (7.02%) and polymer (7.02%). Most of the insulators were arranged in a "simple pin-type" arrangement while few were in a "strain-insulators" arrangement pattern. We found seven anti-electrocution devices (perch deterrent insulators) in seven vertical arrangements of "double circuit, angled struts".

SN	Cross arm types	Number	Percentage (%)
1	Cross-sectional Triangular	286	36.6
2	Horizontal Configuration	78	10
3	Cross-sectional Triangular + Horizontal	4	0.5
4	Cross-sectional Triangular + vertical	32	4
5	Horizontal + Vertical	64	8.2
6	Vertical	318	40.7
	Total	782	100

### Table 1: Cross-arm types of configurations of power lines and high transmission lines in the study areas



In the first survey, a total of 45 electrocution and collision cases of birds (39 nonraptors and six raptors) and one mammal were recorded (Table 2). Most of the electrocuted avian families were Corvidae followed by Sturnidae, Accipitridae, Ardeidae, Muscicapidae and Anatidae. Yellow-throated marten (a mammal) was found electrocuted in Deupur village in Parbat district. The mortality rate of all birds (raptors + non-raptors) was found to be 6.32 birds/ 100 poles, which was 0.70/100 poles for only raptors.

## Table 2: Records of birds and mammals that got electrocution and collision in the powerlines during the first survey.

SN	Species	No. of	Family	Status
Rapto		deams		
1	Himalayan yulture	2	Accinitridae	Near-Threatened
2	Peregrine falcon	1	Accipitridae	
2	Plack kite	1	Accipilidae	Least Concern
3	DIUCK KITE	1	Accipillidde	Leasi Concern
4	Mountain hawk eagle	1	Accipitridae	Near-Threatened
5	Unidentified vulture	1	Accipitridae	
Non-I	raptors			
6	Large-billed crow	18	Corvidae	Least Concern
7	Red-billed blue magpie	3	Corvidae	Least Concern
8	Oriole species	1	Corvidae	Least Concern
9	Jungle myna	6	Sturnidae	Least Concern
10	Common myna	3	Sturnidae	Least Concern
11	Blue whistling-thrush	2	Muscicapidae	Least Concern
12	Intermediate egret	2	Ardeidae	Least Concern
13	Indian pond heron	2	Ardeidae	Least Concern
14	Black-crowned night heron	1	Ardeidae	Least Concern
15	Lesser whistling duck	1	Anatidae	Least Concern
Mam	mals			
16	Yellow-throated marten	1	Mustelidae	Least Concern

#### Table 3: Record of electrocuted birds and mammals in the second survey

SN	Species	No. of	Family	Status	
Raptors		ueums			
1	Himalayan vulture	1	Accipitridae	Near-Threatened	
Non-raptors					
2	Large-billed crow	4	Corvidae	Least Concern	
3	Jungle myna	2	Sturnidae	Least Concern	
4	Barn swallow	1	Hirundinidae	Least Concern	
5	Sparrow species	1	Passeridae	Least Concern	
6	Unidentified bird	1			



Mammals					
1	Rhesus monkey	1	Cercopithecidae	Least Concern	

#### b). Questionnaire Survey

A total of 146 structured questionnaires survey with key informants (farmers and herders) was conducted to understand the people's perception towards bearded vulture and other raptors, human-wildlife conflict and threatened hotspots for the raptors. All of the respondents were found to be traditional farmers, however, 78.08% (n=114) were full-time farmers, while 21.92% (n=32) were part-time. On a gender basis, 57.53% were female (n=84) while 42.47% were male (n=62). 68.49% of respondents were Khas/Aryas, 30.82%% were Mongol tribal people (Gurung, Magar, Tamang) and 0.68% were Janajati (Newar). Most of the respondents were between the age of 46 – 60 and the least was of 61+ aged (Figure 1).



### Figure 1: Categorization of the age group of key informants and numbers of respondents

A total of 88.36% (n=129) of the farmers generate less than 10% of their total income from livestock farming, 6.85% (n=10) generate between 10% - 20%, 3.42% (n=5) generate between 20% - 40% and 0.68% (n=1) generate between 40% - 60% respectively. Out of 146 respondents, 126 key informants tamed livestock. The average goat/sheep tamed by the farmers were  $6.51 \pm 13.16$  SD and  $2.33 \pm 1.58$  SD for large animals (buffalo/cow/horse/mule). The study showed 69% (n=101) of respondents lost their livestock in the last 12 months. Among 101 respondents who lost their livestock 32% (n=32) lost their livestock due to predator attacks.

Regarding the killing of predator mammals, only one respondent stated that he killed predatory mammals without a permit in the last 12 months period. Regarding the use of poison bait on animal carcasses four respondents shared the experience



they lost their dogs to poisoned carcasses and one respondent informed he has purposefully used poison on the carcass to kill predator mammals.

Among all, only 6.16% of respondents have seen the electrocuted bearded vulture (n=5), Himalayan vulture (n=2) and unidentified vultures (n=2) in the last year in Dhampus and Ghandruk area. None of the respondents has killed or seen bearded vulture being killed or persecuted in that area in contrast one individual stated that he has killed other raptors in the last year.

#### c). Supporting communities to prevent livestock from predators.

In the Annapurna region of Nepal, especially in Mustang and Manang livestock keeping is the main occupation of local people. Livestock keepers have a conflict with wild carnivores such as snow leopards, wolves and common leopards as these animals commonly predate their livestock. The study has shown herders use poison baits for the retaliatory killing of wild predators (Subedi et al 2018), as a result, it increases the chances vultures get poisoned. To protect the livestock of local people, this project supported four households (Shuk Bahadur Bishwokarma, Kul Bahadur Thapa and Sonu Pal Thakuri) of Gharapjhong rural municipality ward no. 5 at Bhrabso to construct predator-proof corals (Plate 1-4). The households were selected based on their poor financial status and vulnerability to predators. From the project, we provided NPR 25,000.00 to each household and the rest amount to complete the corals was generated themselves.

### d). Meeting with the local government, power companies, communities and local stakeholders

Meetings were conducted with the local communities, district level stakeholders including local government, division forest office, district-level infrastructure development office, agriculture knowledge centre, the Federation of Nepali Journalists, Mid-Hill Highway construction project, rural road network project, soil and watershed conservation, the federation of community forest user network, community forest user groups, Kali Gandaki corridor project, Annapurna Conservation Area Project, district police office, powerlines companies (Modi Energy Limited, United Modi Hydropower Limited, Nilgiri Hydropower limited, Modi Hydropower Project and Thapakhola Hydropower Project), Nepal Electricity Authority (NEA) Khurkot Substation, NEA distribution centres and local governments (including deputy Mayor of Kushma Municipality, Parbat). In the meetings results of the powerlines survey were shared and suggested effective mitigation measures to protect birds from electrocution and collision with powerlines. After the presentation in each meeting group discussion was conducted to collect feedback on the activity. None of the participants were found aware that the impact of powerlines is killing threatened species of raptors. Local government committed that they would consider making environment-friendly power lines structures while extending the new distribution lines. A total of 155 participants actively participated in our meetings.

### 3. Explain any unforeseen difficulties that arose during the project and how these were tackled.

The project activities were delayed due to the outbreak of COVID-19, which was followed by Dengue fever in Nepal.



## 4. Describe the involvement of local communities and how they have benefitted from the project.

Local people were actively involved in questionnaires surveys and community meetings. Four households also benefitted from project support to construct predator-proof cattle shelters.

#### 5. Are there any plans to continue this work?

Yes, we plan to continue our survey to obtain more robust information on the impacts of powerlines on birds. Also, the report and appeal will be submitted to NEA and other relevant government authorities requesting to use appropriate mitigation measures while constructing powerlines to prevent bird electrocution.

#### 6. How do you plan to share the results of your work with others?

The results of this project will be published in scientific journals. Our first paper has been already accepted in the Bird Conservation International journal. We also plan to submit a report to NEA and the Ministry of Forest and Environment Nepal.

#### 7. Looking ahead, what do you feel are the important next steps?

It is required to start policy-level intervention to mitigate powerlines-related threats to birds.

# 8. Did you use The Rufford Foundation logo in any materials produced in relation to this project? Did the Foundation receive any publicity during the course of your work?

The Rufford Foundation logo was used in all the presentations during the community meeting and meetings with local stakeholders/powerlines companies, etc. We prepared small signposts to use in the supported predator-proof corals. Also, we acknowledged The Rufford Foundation in the scientific publication we prepared.

#### 9. Provide a full list of all the members of your team and their role in the project.

**Tulsi Subedi:** Overall execution of the project that includes project planning and field implementation, team mobilisation.

**Sandesh Gurung:** Supported powerlines survey, questionnaire survey, community and stakeholders' meetings.

**Ralph Buij:** Guided the field activities including powerlines survey designs and designing questionnaires.





Plate 1: Annapurna Conservation Area Project (ACAP) field officer (Ashok Subedi in middle) and project leader (Tulsi Subedi, Left) handover cash to Mr. Shuk Bahadur Bishwokarma (right) to support the construction of predator-proof cattle shelters in Mustang.



Plate 2: Predator Proof cattle shelter supported by the project, such structures support livestock keepers to protect their livestock from predators.





Plate 3: Local beneficiaries of the project (right) and project team and ACAP staff (left four people), on the background predator-proof cattle shelter supported by this project.



Plate 4: Goats and Sheep inside a predator-proof shelter.





Plate 5: Meeting with powerline companies and district-level stakeholders at Mustang.



Plate 6: Meeting with powerline companies and district-level stakeholders at Kushma.





Plate 7: Community meeting at Deupur Parbat.