

Understanding the proximate cause of population declines on the population of Bearded Vulture (*Gypaetus barbatus*) in the Annapurna range of Nepal.



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SIGNIFICANCE OF THE STUDY

Bearded Vulture is nationally threatened in Nepal (BCN and DNPWC 2011) and globally near threatened species (BirdLife International 2015). In the last three generation, the global population of this species is declining by >25% and the distribution range and territory occupancy is declining (BirdLife International 2015). The exact cause of population decline is not known however habitat degradation, use of diclofenac and other NSAIDs, human persecution and collision with power lines are believed to be a reasons behind this decline (Xerouchakis et al. 2001, Margalida 2008, Barov and Derhe 2011).

Within the species' ranges especially Europe and Africa several studies have been conducted. A satellite telemetry study conducted in South Africa with spp. *G. b. meridionalis* shows that juvenile Bearded Vultures cover a vast range of 38,500 km² in mountainous areas of the Drakensberg with an average daily distance of 66 km (Urios et al. 2010). Similar studies conducted in Europe show the uneven movement patterns of Bearded Vulture in the Pyrenees, Alps and Andalusian mountains and a daily average distance of 53, 68 and 84 km respectively (Margalida et al. 2013). Such movement and ecological data would be crucial for the spatial statistical analysis to understand the species in relation to landscape however those are completely lacking for the Himalayan race (*G. b. barbatus*). Also in context of Himalaya there is a gap of knowledge on species ecology, movements, behaviour and social structure this project purposing to study. Given the myriads of growing economy of the world along the side the Himalayas what the threats facing by the species need to be conducted in relation to the landscape ecology. The economic growth leads to the climate changes, habitat degradation, in terrestrial animals that resulting decline and shift of the species range to the pole wards or elevational range shift (Rosales 2008). Therefore present study attempts to find out the exact cause of declines by focusing on the movement patterns via GPS telemetry and predictive ecological models that connects different environmental variables to determine and predict factors affecting the habitat/resources selection.

OBJECTIVES

Broad objectives of this research were:

- i. Study on movement ecology of Bearded Vulture in the Annapurna region of Nepal.
- ii. To study on population structure, trend and threats to Bearded Vulture in the Himalaya of Nepal.
- iii. Establish and train site support group for population monitoring and conduct educational activities in local level.

MATERIALS AND METHODS

Study area

We conducted this study in the Annapurna Himalayan Region of western Nepal that includes area inside Annapurna Conservation Area (ACA) as well as outside of it. Field survey of the species and questionnaires survey conducted in Mustang, Myagdi and Kaski district while trapping activities focused in Syanjha, Kaski and Mustang district.

Methods

Field survey and data collection

Field survey method included direct observation of birds across the range and also to its nesting sites as possible. We did distance sampling of the bird using line transects and point transects methods. Available walking trails are considered as line transects and the survey conducted from entire transect and opportunistic points on each line transects were taken as a point transects. We made consistency on the survey methods using standard survey protocol developed for this study. Although the points were opportunistic but all of them had 360° view of the surrounding landscape. From each point, all the birds observed within five minutes of time and approximate distance from point centre (observer place) and the bird location recorded. We surveyed each line transect through walking on the entire length. Throughout the survey, two observers scanned all the areas visible from the line transect. We marked geo-reference and local weather of transect start and endpoint using GPS and weather meter. Similarly, we marked bird location and other parameters related to habitat and bird, all recorded in the data sheet. These parameters were habitat type, direct radial distance and angle from the observed point, bird behaviour other than flight (perch, feeding, bone dropping, nest building, display, interaction with other individuals of same species and different species etc.), distance to the nearest settlement, road, river and cliff, direction of flight and slope aspect. In addition, we conducted structured questionnaires survey and interview with local peoples along the survey territory.

Trapping vultures

Trapping and catching of Bearded Vulture was purely opportunistic on any sex and age category. We used Pandam Noose traps with buffalo bones as a bait to trap them. Those traps are very easy to made, portable to handle, very effective and safe for the bird. We made Pandam Noose Trap attaching cloth line or > 70 lb monofilament with powerful nylon cord. Thick nylon cord staked firmly on the ground with wooden stick that we dig firmly on the ground and trap draped over the bait (fresh leg bone of buffalo). Once the vultures trapped we carefully

released out from the trap, covered eyes with blanket or hood to minimize the stress and bird placed on shade.

Individual bird data collection and fitting with telemetry unit

Prior to fitting the telemetry unit, we took morphometric data from each bird. We fitted wild-trackers WT-200 model GPS telemetry units as a back – pack using Teflon ribbon. WT - 200 are 70 grams telemetry units, powered by lithium ion battery with solar panel and developed by Korea Institute of Environment Ecology. They transmit data through mobile phone network system and have global roaming facility.

PRELIMINARY RESULTS

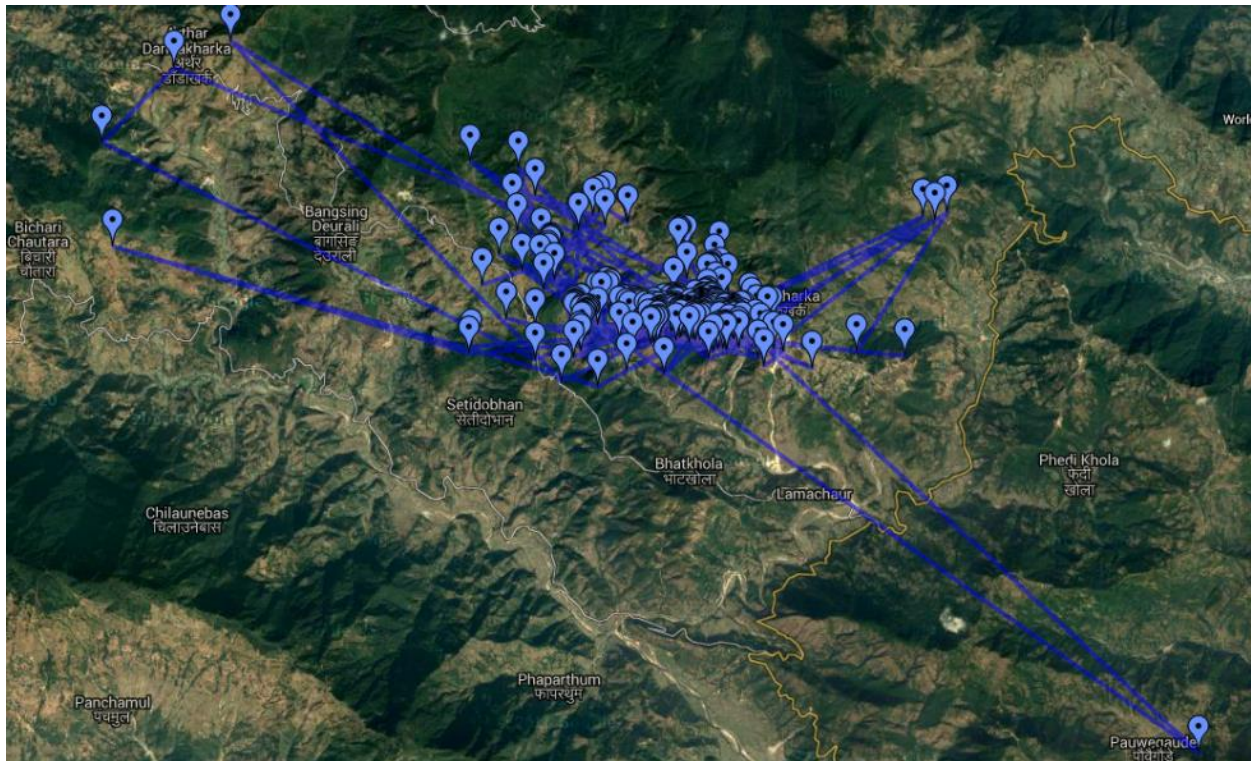
Field Survey: We surveyed total of 168.24 km of line transect in Mustang, Myagdi and Kaski districts and observed 2.14 Bearded Vultures per 10 km of transect. Of the total record 75% were adults, 11% sub-adults, 3% juvenile and 11% birds could not age. Lowest elevation of Bearded Vulture sightings was 1392m and highest elevation was 3861 m. Similarly we surveyed 37 point transects in between the line transects.

Questionnaire Survey: Results from the questionnaires survey shows that there are very few cases of livestock treatment with NSAID (approx. 20 cases/yr.) within Mustang district. In our survey area Tibetan Lama Community believe Bearded Vulture as a symbol of “GOD” therefore there is very less chance of human persecution and collection/destruction of nest site. Also the nest sites are not easy to access unless using high end climbing gears that is not possible. However, some respondents suggest there is a high chances of unintentional poisoning targeted to exterminate Snow Leopard and other high altitude carnivores.

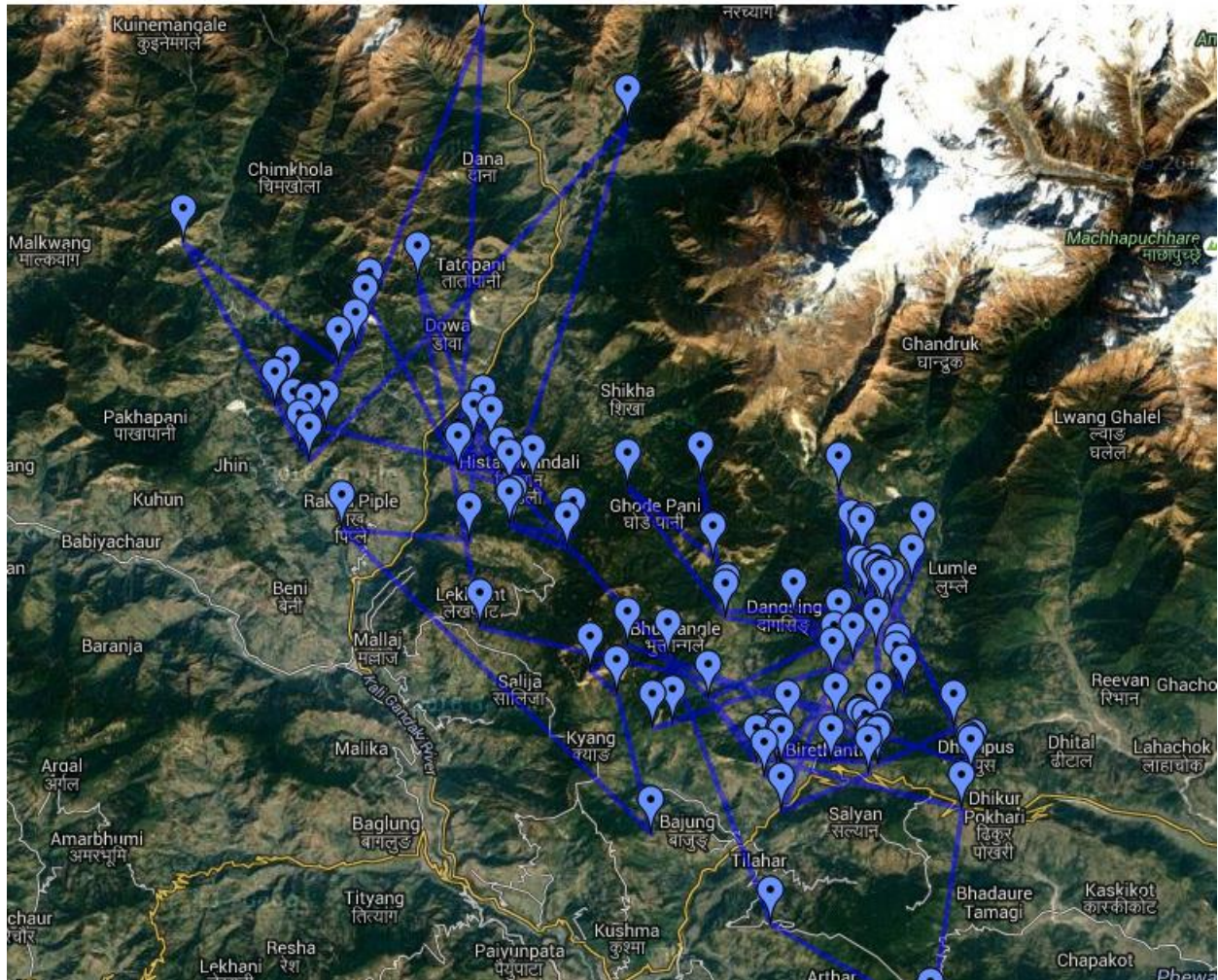
Local involvement: We select Janashakti Youth Club of Mustang district as a site support group and provided training to Mr. Alish Thakali to identify and monitor vulture population.

Trapping and tagging Bearded Vulture: We set up trap in Aarukharka Syanja, north of Dhampus along the border of ACA, Chhusang and Muktinath, however we succeed to trap birds only from two locations. We trapped three birds in Syanja and one in Dhampus. Among the birds trapped two birds were adult (17 and 18 May), one sub-adult (22 May) and one fully fledged juvenile (18 May). The juvenile bird was approximately 97 days old on the trapping date; we observed that bird first time flew from the nest on 12 May 2016. We equipped the telemetry unit nbv1601 on adult trapped on 17 May, nbv1604 on second adult, nbv1603 on juvenile and nbv1602 on sub-adult bird. Three birds trapped in Syanja are within their nesting territory and now we are observing progressive increase on the range of juvenile bird. For few days, movement of sub-adult bird observed around the

trapping location and west of it but later on the bird moved to northwest to Birethanti and then further north to Sikha and Tatopani. On 9 June 2016 at 1445 H NST the device sent the signal from Lete area at the altitude of 3217 m and the bird was heading to 339°. On the same day this bird roosted overnight on the cliff (1866 m elevation) at Aula village to the northwest of Ramche and last location received from unit nbv1602 at 2245 H NST. After that, the unit stopped sending the data. We presume now the bird is out of communication range because while we were in Mustang we did not received signals from the units that was with us. We hope once the bird comes to the communication zone it will send all the locations stored on the device.



Map 1. Movement map of juvenile Bearded Vulture equipped with WT – 200 wild tracker nbv1603.



Map 2. Movement map of Sub-adult Bearded Vulture equipped with WT – 200 wild tracker nbv1602.

PRELIMINARY CONCLUSION

From this initial analysis we concluded:

- Bearded Vulture are rare resident species in the high altitude.
- There is a less chance to exposing this species with the veterinary drug in the high altitude, however unintentional poisoning could be the main threats.
- There might be secondary threats including globalizations and climate changes – a topic for further investigation.
- Pandam noose trap is the best and safest method to trap Bearded Vulture.
- Among the breeding pair male has wider range than the female.
- Sub-adult birds wander in a huge range than all other age category.

REFERENCE

- Barov, B and Derhé, M. A. 2011. Lammergeier *Gypaetus barbatus* species action plan implementation review. In: Barov, B and Derhé, M. A. (Eds), Review of the Implementation of Species Action Plans for Threatened Birds in the European Union 2004-2010. Final report. BirdLife International for the European Commission.
- Bird Conservation Nepal and Department of National Parks and Wildlife Conservation 2011. *The State of Nepal's Birds 2010*. Bird Conservation Nepal and Department of National Parks and Wildlife Conservation, Kathmandu.
- BirdLife International. 2015. Species factsheet: *Gypaetus barbatus*. Downloaded from <http://www.BirdLife.org> on 18/10/2015
- Kruger, S.C., Allan, D.G., Jenkins, A.R. and Amar, A. 2014. Trends in territory occupancy, distribution and density of the Bearded Vulture *Gypaetus barbatus meridionalis* in southern Africa. *Bird Conservation International*, 24, pp 162-177 doi: 10.1017/S0959270913000440
- Margalida, A., Heredia, R., Razin, M. and Ndez, M.H. 2008. Sources of variation in mortality of the Bearded Vulture *Gypaetus barbatus* in Europe. *Bird Conservation International* 18: 1-8
- Margalida, A., Carrete, M., Hegglin, D., Serrano, D., Arenas, R. and Donazar, J.A. 2013. Uneven Large-Scale Movement Patterns in Wild and Reintroduced Pre-Adult Bearded Vultures: Conservation Implications. *PLoS ONE* 8(6): e65857. doi:10.1371/journal.pone.0065857
- Rosales, J. 2008. Economic Growth, Climate Change, Biodiversity Loss: Distributive Justice for the Global North and South. *Conservation Biology*. 22(6) 1409–1417
- Urios, V., López-López, P., Limiñana, R. and Godino, A. 2010. Ranging behaviour of a juvenile Bearded Vulture (*Gypaetus barbatus meridionalis*) in South Africa revealed by GPS satellite telemetry. *Ornis Fennica* 87:114–118.
- Xerouchakis, S., Sakoulis, A. and Andreou, G. 2001. The declines of the Bearded Vulture *Gypaetus barbatus* in Greece. *Ardeola* 48(2): 183-190