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Editorial Team: Prakriti Rajbhandari and Rona Vaidya

For the 695th - 696th issues of Headlines Himalaya, we reviewed researches from 10 sources and selected 14 researches from four countries. We selected three researches from Nepal and 11 researches from other Himalayan Countries (India, China and Bhutan).

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Nepal-Himalaya

SEASONAL VARIATION AND CROP DIVERSITY SHAPE THE COMPOSITION OF BIRD COMMUNITIES IN AGRICULTURAL LANDSCAPES IN NEPAL

Hem Bahadur Katuwal, Jeevan Rai, Kyle Tomlinson, Bhagawat Rimal, Hari Prasad Sharma, Hem Sagar Baral, Alice C. Hughes, and Rui-Chang Quan

Agriculture, Ecosystems & Environment 333: 107973

Farmland birds are declining globally due to anthropogenic activities, with particularly few studies in Asian agricultural landscapes. Various studies have examined the impacts of landscape heterogeneity on farmland bird composition, but few have considered seasonal changes in bird diversity and examined functional feeding guild assemblages. Here, we disentangle the impact of seasonal variation (summer, monsoon, and winter), cropping practice (mixed crop, monocultural-crop, and fallow land), crop type (rice, wheat, maize, sugarcane, and other crops), landscape heterogeneity, and the number of houses and trees on the richness and abundance of farmland birds and their feeding guilds conducted within human-dominated agricultural landscapes of lowland Nepal. We established 116 transects (farmland = 100, forest = 8, and river = 8), and each transect was visited nine times from April 2018 to December 2019, with forests and river transect to test the dissimilarities in bird composition between those habitats and farmlands. We recorded 201 bird species in farmland, 133 in the forest, and 131 in river habitats. Bird composition on farmlands showed more dissimilarity with forest than river transects. We recorded nine globally, and 26 nationally threatened birds in farmlands. Seasonal variation and cropping practice significantly influenced the richness of all farmland birds and resident birds only, whereas species abundances vary by season only. We recorded higher species richness in the winter season and mixed crop fields but greater abundance in the monsoon and monoculture crop fields. Farmland bird richness increased with increasing tree numbers but decreased with increasing house numbers. Sugarcane fields had the highest bird richness within crop species, whereas rice fields had the greatest abundance. Seasons and cropping practice also shaped the assemblages of feeding guilds differently. In the context of increasing crop intensification globally, our study suggests that the governments in this region should encourage farmers to cultivate mixed crops and simultaneously restrict the urbanization of farmlands to protect bird diversity. Seasonality should be factored into analyses aimed at understanding bird diversity in agricultural landscapes.

For Further Reading: <https://doi.org/10.1016/j.agee.2022.107973>

LOCAL ECOLOGICAL KNOWLEDGE AND EDUCATION DRIVE FARMERS' CONTRASTING PERCEPTIONS OF SCAVENGERS AND THEIR FUNCTION IN NEPAL

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People and Nature 4: 1-18

There is a long-standing relationship between humans and vertebrate scavengers, as scavengers' contributions take on regulating (e.g. nutrient recycling and disease control), material (e.g. competition and livestock depredation) and non-material (e.g. sky burials and ecotourism) roles in society. A social–ecological approach to studying biodiversity is increasingly needed, since the inclusion of local perceptions and knowledge has proven critical for effective conservation programs and ecosystem management. We examine livestock farmers' perceptions and knowledge related to vertebrate scavengers in the highly diverse Chitwan-Annapurna Landscape (Nepal) and assess the socio-demographic traits that influence their perceived value of scavengers' ecosystem service provisioning (ESP) index, and function via scavenging services (SS). Farmers' perceptions of functional importance (SS) showed species-specific gradation, unlike ESP, where only avian scavengers were perceived as beneficial. Our results show that the perception of scavenging as a beneficial ecosystem service and its importance as a biological function are decoupled for facultative scavengers and coupled for obligate scavengers. Relatedly, we identify that affluence-related traits drove positive perceptions of ESP, and local ecological knowledge-based traits were linked to increased knowledge of function via SS. Thus, this increased awareness of functional importance based on close contact with nature does not guarantee positive valuations of scavengers' contributions, whereas formal education did influence positive perceptions despite reduced awareness of function. Additionally, our findings suggest that existing environmental education measures are targeting the right groups, as these respondents coincide with lower favourability of scavengers' ecosystem services, but may be unable to overcome existing human–wildlife conflict. For the first time in South Asia, we survey relevant community stakeholder's attitudes towards an entire scavenging guild and their associated benefits, detriments and functional importance. Our study illustrates the varied perceptions that exist for different scavenger species and closely examines a wide-ranging set of socio-demographic traits that show disparate influences on farmers' knowledge of ecological function and perceived ecosystem service benefits. Crucially, these findings can guide conservation and management priorities by considering the differences in public perception and awareness of scavenging, as well as the interpretation of nature's contribution to people.

For Further Reading: <https://doi.org/10.1002/pan3.10315>

EFFECTS ON ECOSYSTEM SERVICES VALUE DUE TO LAND USE AND LAND COVER CHANGE (1990-2020) IN THE TRANSBOUNDARY KARNALI RIVER BASIN, CENTRAL HIMALAYAS

Bhaskar Shrestha, Lifu Zhang, Shankar Sharma, Sanjeevan Shrestha, and Nitesh Khadka

SN Applied Sciences 4: 137

Valuation of ecosystem services based on land use and land cover changes (LUCC) offers an incentive to people for sustainable use of the natural resources and can encourage people to adjust the land use sustainably. In this study, we used “Object-based Image Analysis (OBIA),” a remote sensing technique to extract the land use and land cover (LULC) of the transboundary Karnali River Basin (KRB, China and Nepal) from 1990 to 2020, and ecosystem services value (ESV) coefficients derived for the Tibetan Plateau has been used to assess the ESV. The basin has highest percentage of forest (33.44%), followed by bare area (30.29%), shrub/grassland (18.5%), agriculture (13.12%), snow/ice (4.36%), waterbody (0.3%), and built-up (0.03%) as of 2020. Over 30 years, 4.07 km² of the forest has been converted to agricultural land, 3.31 km² of agricultural land has been encroached by built-up area, whereas

2.82 km² of snow/ice area has melted into the waterbody. Furthermore, 80.85 km² of bare area has been converted to snow/ice, and 2138.83 km² of snow/ice has been changed to bare area. The ESV of KRB has increased by nearly 2.7 million USD from 1990 to 2020, primarily due to the increase in ESV from the conversion of 133.09 km² of snow/ice to shrub/grassland. The ESV of forest, waterbody, and snow/ice has decreased, whereas it has increased for other LULC classes in the basin. Spatial distribution of LUCC and assessment of ESV can be a tool to facilitate for better provisioning and regulating the resources for the future.

For Further Reading: <https://doi.org/10.1007/s42452-022-05022-y>

India-Himalaya

ASSESSMENT OF DAILY STREAMFLOW, SEDIMENT FLUXES, AND EROSION RATE OF A PRO-GLACIAL STREAM BASIN, CENTRAL HIMALAYA, UTTARAKHAND

Kuldeep Singh Rautela, Jagdish Chandra Kuniyal, M. A. Alam, Ajay Singh Bhoj, and Nidhi Kanwar

Water, Air, & Soil Pollution 233: 136

Reliable information of hydrological processes within a river basin is essentially required for developing an appropriate strategy for achieving sustainable development goals. The present study assesses the streamflow of a pro-glacial stream and also intends to estimate the contribution of suspended sediments, erosion rate, and the headwater contribution of the Panchachuli glacier. A field study during ablation period was carried out to measure streamflow and suspended sediment concentration (SSC). Further, HBV model was used to estimate the snowmelt. The average seasonal streamflow and SSC during the gauging period (July to October) for the basin were measured to be 7.17 m³/s, and 1.52 g/l in 2018, and 6.84 m³/s, and 1.21 g/l in 2019, respectively. Snowmelt contribution in total streamflow was 54.75% in 2018 which is reduced to 49.16% in 2019. Similarly, glacier melt contributes to 32.62% of its total runoff share in 2018 which was reduced to 28.73% in 2019. The rainfall runoff in total runoff increased to 12.62% from 2018 to 2019. Rainfall-runoff in its total runoff contribution showed an increased share of 22.13% in 2019. The streamflow, SSC, and suspended sediment load (SSL) showed a strong positive correlation for both the years. The suspended sediment yield (SSY), SSL, and erosion rate of the basin were found as high as compared to the other Himalayan basins in Himachal Pradesh, Jammu and Kashmir, and Ladakh and non-Himalayan regions that was found low when compared to other glaciers in Uttarakhand.

For Further Reading: <https://doi.org/10.1007/s11270-022-05567-z>

ANALYSIS OF RAINFALL TREND USING NON-PARAMETRIC METHODS AND INNOVATIVE TREND ANALYSIS DURING 1901-2020 IN SEVEN STATES OF NORTH EAST INDIA

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Current Science 122: 801-811

In this study, we analysed the variability and trends in annual as well as seasonal rainfall in the seven states of North East India for the period 1901–2020, using non-parametric tests like Mann–Kendall, trend-free pre-whitening Mann–Kendall, modified Mann–Kendall (MMK), as well as using the innovative trend analysis (ITA). The study revealed the variabilities in annual and seasonal rainfall in these seven states. In most cases, the results of all the tests were identical. However, significant differences were observed in the case of post-monsoon rainfall of

Assam and Meghalaya, pre-monsoon rainfall of Arunachal Pradesh, Mizoram and Tripura, as well as in winter rainfall of Arunachal Pradesh and monsoon rainfall of Tripura. Compared to the other states of NE India and other tests, ITA detected no significant annual trend for Tripura; however, the winter season exhibited a decreasing trend. It was observed that only the MMK test could predict such changes in rainfall distribution across seasons to a certain extent at varying significance levels in comparison to the other three methods. Since these states are vulnerable to water-related disasters, this study could help policymakers arrive at valuable climatic and water resource management decisions.

For Further Reading: <https://doi.org/10.18520/cs%2Fv122%2Fi7%2F801-811>

AN ETHNOBOTANICAL STUDY ON THE WILD EDIBLE PLANTS USED BY FOREST DWELLERS IN YANGOUPOKPI LOKCHAO WILDLIFE SANCTUARY, MANIPUR, INDIA

Laishram Ricky Meitei, Aparajita De, and Ashiho Asoshii Mao

Ethnobotany Research and Applications 23: 1-22

The study documented the wild edible plants (WEPs) used by forest dwellers in the Yangoupokpi Lokchao Wildlife Sanctuary (YLWLS), Manipur, India. The inhabitants of YLWLS belong to the Thadou, Meitei, and Maring communities. An ethnobotanical survey was carried out from March 2018 to February 2020. The elderly local people, local healers, forest staff, and vendors in local markets participated in the survey. The respondents were selected through snowball sampling method. The ethnobotanical information was gathered from the respondents, especially the elderly people, local healers, forest staff, and vendors through interviews. The questionnaire used was a semi-structured type. The data was collected on parameters such as vernacular name, botanical name, family, the life form or habit of the species, information on flowering and fruiting, the plant part used, mode of consumption, medicinal use, marketability, and price. The voucher specimens of the wild edible plants were collected and identified with the help of literature. One hundred and eight taxa belonging to 86 genera and 50 families of WEPs were documented. Zingiberaceae was the most dominant family with seven species used as WEPs. Herbs were most dominant with 42 species. Nine species bore flowers and fruits all year round. Maximum species (49 species) were consumed after cooking. Forty-nine species out of the 108 WEP species were consumed for their medicinal values. Sixty six species (61%) of WEPs were marketed. The highest-priced species were *Asparagus racemosus* (INR 180-220/kg; USD 2.41-2.95) and *Cinnamomum verum* (INR 150-200/kg; USD 2.01-2.68). The use of the pseudostem of *Ensete glaucum* as food is a new report for Manipur. The forest dwellers depend on the WEPs for their food, medicine, traditional ceremonies, and source of livelihood. Some species of WEPs could be propagated for conservation, management, and sustainable utilization, which would help in generating additional income for the locals.

For Further Reading: <http://dx.doi.org/10.32859/era.23.15.1-25>

ASSESSMENT OF PM_{2.5} USING SATELLITE LIDAR OBSERVATIONS: EFFECTS OF BIO-MASS BURNING EMISSIONS OVER INDIA

N.B. Lakshmi, E.A. Resmi, and D. Padmalal

Science of the Total Environment 833: 155215

The present study estimates the particulate matter with aerodynamic diameters less than 2.5 μm (PM_{2.5}) over the Indian sub-continent using near-surface retrieval of aerosol extinction coefficient (2007–2021) of Cloud-Aerosol

Lidar with Orthogonal Polarization (CALIOP) onboard Cloud-Aerosol Lidar and Infrared Pathfinder Satellite Observation (CALIPSO) satellite. Climatology of wintertime $PM_{2.5}$ during the last 15 years shows the highest concentration over the middle Indo-Gangetic Plain (IGP) and northwest India with a 3 to 4 fold increase in magnitude compared to the peninsular India. Surface-level $PM_{2.5}$ mass concentration during winter (December to February) shows statistically significant positive trends over the Indian subcontinent. It increases at a rate of ~3% over the IGP and arid regions of northwest India, and ~4% over peninsular India during the last fifteen years (2006–2020). Interannual variability of average near-surface $PM_{2.5}$ concentration over the Indian sub-continent during the fog occurring season (December to February) shows a statistically significant correlation with the post-harvest agro-residue burning over the western IGP (Punjab and Haryana) during November. The wintertime near-surface $PM_{2.5}$ concentration shows a higher correlation with anthropogenic agro-residue burning activity compared to meteorological parameters. The influence of agro-residue burning during November over northern India extends up to peninsular India and might contribute to continental pollution outflow and associated aerosol plumes persisting over the Northern Indian Ocean during the winter season. Sustainable energy recovery solutions to the agro-residue burning need to be implemented to effectively reduce the far-reaching implications of the post-monsoon burning activity over the western IGP.

For Further Reading: <https://doi.org/10.1016/j.scitotenv.2022.155215>

China Himalaya

A NOVEL APPROACH FOR MONITORING THE ECOENVIRONMENT OF ALPINE WETLANDS USING BIG GEOSPATIAL DATA AND CLOUD COMPUTING

Haijun Wang , Xiangdong Kong , Ji Luo, Pengju Li, Tianhui Xie, Xiaobo Yi, Fang Wang, and Jie Xiao

Advances in Meteorology 2022: 7451173

Alpine wetlands in western Sichuan plateau (WSCP) are located on the eastern edge of the Qinghai-Tibet Plateau (QTP), where the ecological environment is very sensitive to global climate change. Being naturally driven coupled with unreasonable human development activities, alpine wetlands have experienced serious ecological and environmental issues such as drought, inversion, and desertification. However, due to the limitations of data sources and calculation models, it is impossible for us to deeply understand the change mechanism and spatial difference of the ecological environment of the alpine wetland (EEAW) in previous studies. In view of this, an innovative approach for monitoring the EEAW change has been proposed in this paper. We employ the approach to perform the EEAW change trend analysis, and some meaningful characteristics were founded. Specifically, it includes the following aspects. The air temperature increase is relatively significant, while the precipitation change has obvious spatial differentiation, and even some region's precipitation experienced a decrease especially in plot1. In Haizishan, Lugu Lake, and Bari Lake, we explored an interesting phenomenon that the precipitation increases first and then decrease, and the turning point occurred around 1999. Increases in air temperature and evaporation have aggravated the drought in high-latitude areas. The drought situation has been alleviated in high-altitude areas due to the acceleration of snow melt water. Wetland vegetation and biomass presented an overall increasing trend, but the degradation also occurs in some area, including Zoige and Lugu Lake area. The human activity disturbances of wetland degradation mainly include the settlements expansion, agricultural development, and the ecotourism prosperity. Among them, targeted poverty alleviation projects have accelerated the urbanization in WSCP, and the development of agriculture and tourism has increased the interference of wetlands.

Additionally, we have used Landsat images and national wetland survey data (1999, 2013, and 2020 year) from the past two decades to verify the EEAW trend and confirm the reliability of the analysis results using this approach.

For Further Reading: <https://doi.org/10.1155/2022/7451173>

EFFECTIVENESS OF PROTECTED AREAS EDGES ON VEGETATION GREENNESS, COVER AND PRODUCTIVITY ON THE TIBETAN PLATEAU, CHINA

Ting Hua, Wenwu Zhao, Francesco Cherubini, Xiangping Hu, and Paulo Pereira

Landscape and Urban Planning 224: 104421

Protected areas (PAs) are the cornerstones of global vegetation conservation efforts, but growing evidence showed the limited effectiveness of PAs in some regions. Recent attempts to quantify conservation efficiency were mainly focused on vegetation coverage, overlooking other vegetation characteristics, such as greenness and productivity. Here, using multiple indices of vegetation status from satellite observations and a windows search strategy, we measured the conservation efficiency of nature reserves (NRs, the primary category of PAs in China) edge on vegetation greenness, cover, and productivity on the Tibetan Plateau. The results showed that NRs' edges performed a weak, but significant role in vegetation growth. Over 40% of the areas showed a positive impact of NRs' edge on vegetation growth in different degrees. However, about 10% of the areas located on NRs' edge showed a noticeable opposite effect on greenness, cover, and productivity. Compared to some climatic and socio-economic factors (e.g., population density and air temperature), fragmented landscapes and landforms are more likely to inhibit conservation efficiency. The findings of this work can help better understand PAs' role in securing vegetation conservation and optimize the design of PAs for preventing vegetation losses.

For Further Reading: <https://doi.org/10.1016/j.landurbplan.2022.104421>

NOVEL EVIDNCE FROM *TAXUS FUANA* FORESTS FOR NICHE-NEUTRAL PROCESS ASSEMBLING COMMUNITY

Tianxiang Li, Li Xu, Feng Wang, Weijun Zhang, Junpeng Duan, Xiaolu Shen-Tu, Yaobin Song, Runguo Zang, and Ming Dong

Forest Ecosystems 9: 100035

Understanding the mechanisms underlying community assembly is helpful for conservation and restoration of communities, particularly those that contain rare and endangered species like *Taxus fuana*, which are endemic to the Western Himalayas. The niche (limiting similarity) vs. neutral (randomness) assembly of the *T. fuana* forest community in Gyirong County, Tibet, China, was investigated. The net relatedness index (*NRI*) was calculated using a phylogenetic tree. The phylogenetic characteristics of the community and its relationships with environment were analyzed. The value of the mean *NRI* at the community level was less than -1.96 , indicating that the phylogenetic structure was over dispersed; whereas majority of the *NRI*s at the tree, shrub, and herb layers were within -1.96 to 1.96 , indicating random dispersion. Environmental factors accounted for 44.38%, 46.52%, 24.04%, and 14.07% of the variation at the community level, tree, shrub, and herb layer, respectively. The phylogenetic structure at the community level and tree layer were significantly influenced by both topographic and soil factors, while shrub and herb layers tended to be affected by a single environmental factor. Community assembly of the *T. fuana* forest was simultaneously affected by niche and neutral processes, and their variations were closely related to the environment. Neutral process dominated community assembly in the shrub and herb layers. However, the

interaction of limiting similarity and randomness played a dominant role at the community level and tree layer; and contributed to maintenance of biodiversity stability. The synergy of multiple environmental factors had a more obvious influence on community assembly than individual environmental factors, especially at the community level. These findings would help to understand the conservation of rare and endangered tree species, such as *T. fuana*, in the native community; and highlight the importance of random and non-random processes in assembly and biodiversity maintenance of alpine plant communities.

For Further Reading: <https://doi.org/10.1016/j.fecs.2022.100035>

Bhutan-Himalaya

SEMI-AUTOMATIC CLASSIFICATION FOR RAPID DELINEATION OF THE GEOHAZARD-PRONE AREAS USING SENTINEL-2 SATELLITE IMAGERY

Karma Tempa and Komal Raj Aryal

SN Applied Sciences 4: 141

The study of land use land cover has become increasingly significant with the availability of remote sensing data. The main objective of this study is to delineate geohazard-prone areas using semi-automatic classification technique and Sentinel-2 satellite imagery in Bhutan. An open-source, semi-automatic classification plugin tools in QGIS software enabled efficient and rapid conduct of land cover classification. Band sets 2-8, 8A, and 11-12 are utilized and the virtual colour composites have been used for the clustering and creation of training samples or regions of interest. An iterative self-organizing data analysis technique is used for clustering and the image is classified by a minimum distance algorithm in the unsupervised classification. The Random Forest (RF) classifier is used for the supervised classification. The unsupervised classification shows an overall accuracy of 85.47% (Kappa coefficient = 0.71) and the RF classifier resulted in an accuracy of 92.62% (Kappa coefficient = 0.86). A comparison of the classification shows a higher overall accuracy of the RF classifier with an improvement of 7.15%. The study highlights 35.59% (512,100 m²) of the study area under the geohazard-prone area. The study also overlaid the major landslide polygons to roughly validate the landslide hazards.

For Further Reading: <https://doi.org/10.1007/s42452-022-05028-6>

IDENTIFYING THE POTENTIAL GLOBAL AND CONSERVATION AREAS FOR *TERMINALIA CHEBULA*, AN IMPORTANT MEDICINAL TREE SPECIES UNDER CHANGING CLIMATE SCENARIO

B. R. Kailash, Bipin Charles, G. Ravikanth, Siddappa Setty, and K. Kadirvelu

Tropical Ecology 63: 1-12

Terminalia chebula Retz. (Combretaceae), commonly-known as chebolic myrobalan is one of the important Non-Timber Forest Product (NTFP) species which is harvested for its fruits and galls. The species known as the “King of medicines” is used widely in Ayurveda, Sidda, Unani, and traditional Chinese medicines for curing a wide variety of diseases in Asia and Africa. *Terminalia chebula* is an important ingredient of Triphala (Ayurvedic medicine) along with *Terminalia bellirica* and *Phyllanthus emblica*. The fruits of the tree also yields a dye which is used as an organic dye in the textile industries. In recent years, there is an increasing demand for herbal remedies and organic dyes,

resulting in extensive extraction of fruits and galls from *T. chebula*. In this study, the major objective was to identify sites for the conservation of *T. chebula* and to identify important environmental variables determining its distribution. Based on the existing species distribution records (primary and secondary), along with a suite of climatic variables, the present and future distribution of the species were predicted. The study identified ecological niches that are suitable for the cultivation of the species; the species occurs in India, Pakistan, Sri Lanka, Cambodia, Myanmar, Vietnam, China, Laos, Thailand, Bhutan, Taiwan, Nepal and Bangladesh under the current climatic scenario. Within India, our results suggest that the central and south India are highly suitable in the current scenario. The mean annual temperature, temperature seasonality and isothermality seem to be the most important variables determining the distribution of the species which is directly influenced by climate change. Overall, the study indicated that under the future climate change scenarios the distribution of *T. chebula* is likely to decrease. The results indicate that *T. chebula* is highly vulnerable to climate change. Considering the economic importance of the species, it is important to understand how the species distribution will alter in the wake of climate change to develop effective conservation strategies. The study also provides important environment variables that determine the species distribution which could aid in identifying areas where the species could be cultivated.

For Further Reading: <https://doi.org/10.1007/s42965-022-00237-x>

FIRST CONFIRMED RECORD OF A WOOLLY FLYING SQUIRREL (*EUPETAURUS* SP.) IN BHUTAN

Yonten Jamtsho, Pema Dendup, Leki Wangdi, Rinzin Dorji, Rinzin Dorji, and Bep Tshering

Journal of Vertebrate Biology 71: 22007

The three species of woolly flying squirrels of the genus *Eupetaurus* are amongst the rarest and least studied mammals in the world. The different species are known to occur from only a few locations in the western, north-central and south-eastern margins of the Himalayas. Though the genus has been recorded in Bhutan, there has been no confirmed evidence until now. Here we confirm for the first time the presence of *Eupetaurus* in Bhutan and discuss some records of mammals and birds with which it co-exists. The woolly flying squirrel was photographed by camera trap during a rapid biodiversity survey in the north-eastern part of Jigme Dorji National Park. From the three widely disjunct populations of *Eupetaurus*, the external pelage and appearance of this specimen appears to most closely resemble *Eupetaurus nivamons*. This record warrants further study to confirm identification and better understand its morphology, habitat selection and distribution in Bhutan.

For Further Reading: <https://doi.org/10.25225/jvb.22007>

LOCAL KNOWLEDGE, PERCEPTIONS AND THE CULTURAL SIGNIFICANCE OF THE RED PANDA (*AILURUS FULGENS*) IN THE HIMALAYA KINGDOM OF BHUTAN

Sangay Dorji, Rajanathan Rajaratnam, Matthew Tighe, and Karl Vernes

Biodiversity 23: 11-20

Bhutan has an extensive protected area network and people living inside are integral partners with the conservation landscape. Despite this, little is known on local people's traditional knowledge, cultural beliefs, and perceptions on wildlife. We investigated drivers of local knowledge, threats and cultural significance of the red panda (*Ailurus fulgens*) through semi-structured questionnaire surveys (N= 664 participants) on local residents in Jigme Dorji and Phrumsengla National Parks. A conditional inference tree analysis explained that knowledge of the

red panda and encounters with the species varied by demography, occupation and locality. Although the majority of respondents were not knowledgeable of the species, residents living within the elevational range of red pandas exhibited greater knowledge. Civil servants, farmers, foresters, park staff, and teachers also had significantly greater knowledge of red pandas than monks, road workers, and students. Informally educated older (≥ 41 years) respondents placed higher cultural significance on the red panda relative to much younger respondents. Although past studies in Jigme Dorji National Park have identified habitat destruction and fragmentation due to linear infrastructural development – such as the construction of new power transmission lines – as significant anthropogenic threats to the red panda, respondents listed only non-timber forest products collection, forest fires, timber and firewood harvesting, climate change, livestock grazing, and kills by domestic dogs as some of the most prevailing threats to the red panda in our study area. Recognizing and incorporating the intrinsic value of wildlife within the protected area–people framework and utilizing traditional cultural perceptions of threatened species like the red panda, can be a valuable tool in strengthening public support for species conservation. This study further advocates an urgent need for educational programs to promote ecological and cultural values of the red panda in schools and the wider public.

For Further Reading: <https://doi.org/10.1080/14888386.2022.2055645>