

Headlines Himalaya

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Editorial Team: Shankar Bhandari and Adarsha Subedi

For the 569-570th issues of Headlines Himalaya, we reviewed journal articles from four sources and selected nine happenings from four countries. We selected five happenings from Nepal and four happenings from other Himalayan countries (India, China and Pakistan). The overall coverage of this issue is biodiversity, wildlife, invasive species, climate change, and environment.

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HABITAT USE BY ASIAN ELEPHANTS: CONTEXT MATTERS

Dinesh Neupane, Youngsang Kwon, Thomas S.Risch, A. Christy Williams, and Ronald L. Johnson

Global Ecology and Conservation 17 (2019): e00570.

Asian elephants are isolated in fragmented habitat in and around Bardia National Park (BNP), Nepal. To describe habitat use patterns and Eco geographical variables (EGVs) that determine an elephant's niche in BNP, researchers used a General Niche-Environment System Factor Analysis (GNESFA) modelling framework. Study illustrated that elephants' habitat use was positively influenced by presence of grasslands, mixed forest, and landscape heterogeneity, whereas restricted by the topographic variables of slope and elevation. Results also demonstrated differential habitat preferences in the core and corridor. Researcher suggested separate management approaches for core and corridor habitats in and around BNP.

For further details: <https://doi.org/10.1016/j.gecco.2019.e00570>

SPATIALLY VARIABLE GLACIER CHANGES IN THE ANNAPURNA CONSERVATION AREA, NEPAL, 2000 TO 2016

Arminel M.Lovell, J. Rachel Carr, and Chris R. Stokes

Remote Sensing 11.12(2019): 1452.

Himalayan glaciers have shrunk rapidly in recent decades, but the spatial pattern of ice loss is highly varied and appears to be modulated by factors relating to individual glacier characteristics. This study demonstrated the changes in glacier area, surface elevation, and ice flow velocity on a large sample of glaciers (n = 162) in the Annapurna Conservation Area (ACA) between 2000 and 2016. It was found that total glacier area decreased by 8.5% between 2000 and 2014/15. Ice surface velocity changes between 2002 and 2016 were varied, with no clear trend of acceleration or deceleration. This study has showed that glaciers in the ACA have been losing their area and mass at different rates, however the influence of local controls is complex resulting into large uncertainties when predicting their future evolution.

For further details: <https://doi.org/10.3390/rs11121452>

ESTIMATING SNOW LEOPARD DENSITY USING FECAL DNA IN A LARGE LANDSCAPE IN NORTH-CENTRAL NEPAL

Madhu Chetri , Morten Odden , Koustubh Sharma, Øystein Flagstad, and PerWegge

Global Ecology and Conservation 17 (2019): e00548.

Although abundance estimates have a strong bearing on the conservation status of a species, less than 2% of the global snow leopard distribution range has been sampled systematically, mostly in small survey areas. In order to estimate snow leopard density across a large landscape, this study collected 347 putative snow leopard scats from 246 transects (490 km) in twenty-six 5km × 5km sized sampling grid cells within 4393 km² in Annapurna-Manaslu, Nepal. From 182 confirmed snow leopard scats, 81 were identified as belonging to 34 individuals; the remaining were discarded for their low (<0.625) quality index. Results highlighted the need for a large-scale approach in snow leopard monitoring, and also recommended to account methodological problems related spatial scale in future research.

For further details: <https://doi.org/10.1016/j.gecco.2019.e00548>

PHYTOPLANKTON NUTRIENT DEFICIENCIES VARY WITH SEASON IN SUB-TROPICAL LAKES OF NEPAL

Freya E. Rowland, Rebecca L. North, Preston McEachern, Daniel V. Obrecht, Tek Bahadur Gurung, Susan B. Jones, and John R. Jones

Hydrobiologia 833.1 (2019): 157-172.

This research comprehensively examines seasonality and phytoplankton nutrient deficiency in sub-tropical lakes over multiple years. Phytoplankton communities in two sub-tropical impoundments in the mid-hills of Nepal were tested for nitrogen (N)-, phosphorus (P)-, or co-deficient in N and P across pre-monsoon, monsoon, and post-monsoon seasons. Nutrient limitation to phytoplankton growth was assessed via in situ stoichiometry of N and P ratios and nutrient stimulation experiments (NSEs). The experiments indicated co-deficiency of N and P in 97–100% of NSEs in all seasons. N-deficiency was common (> 60% of N:P ratios and ~ 90% of NSEs) during the rainy monsoon, but P-deficiency occurred twice as often as N-deficiency during drier seasons (pre- and post-monsoon).

For further details: <https://doi.org/10.1007/s10750-019-3897-8>

EFFECTS OF LAND USE AND LAND COVER CHANGE ON ECOSYSTEM SERVICES IN THE KOSHI RIVER BASIN, EASTERN NEPAL

Bhagawat Rimal, Roshan Sharma, Ripu Kunwar, Hamidreza Keshtkar, Nigel E. Stork, Sushila Rijal, Syed Aijur Rahman, and Himlal Baral

Ecosystem Services 38 (2019): 100963.

Changes in land use and land cover (LULC) can alter the supply of ecosystem services and affect the well-being of both humanity and nature. This study analyses the spatio-temporal variations of LULC and quantifies the change in three important ecosystem services in the Koshi River Basin, Nepal during 1996–2016 by using Landsat satellite images and the Integrated Valuation of Ecosystem Services and Trade-offs (InVEST) model. During the observed time period, there was an overall gain in urban areas, forests and grassland; loss of cultivated land and shrub lands, mostly occurring in the lowlands. As a result of the land cover changes, food production and carbon storage showed a declining trend, however overall habitat quality in the basin was increased.

For further details: <https://doi.org/10.1016/j.ecoser.2019.100963>

India-Himalaya

IDENTIFYING CONSERVATION PRIORITIES FOR PLANT SPECIES IN THE HIMALAYA IN CURRENT AND FUTURE CLIMATES: A CASE STUDY FROM SIKKIM HIMALAYA, INDIA

Manish Kumar and Maharaj K. Pandit

Biological Conservation 233 (2019): 176-184.

Under the circumstances of climate change, scientific study shows that the protected areas are great to conserve biodiversity as well as to sustain the functional ecosystem. Species distribution modelling (SDM) and spatial hierarchical systematic conservation planning technique were used to delineate and prioritize areas for endemic plant species conservation under current and future (2050s, 2070s) climate conditions in Sikkim Himalaya. This study suggests that existing protected area network could be extended to another 896 sq km and three new protected areas could be declared to ensure the conservation goal in Sikkim. In existing area of protected areas were inadequate to conserve the endemic plant diversity in current and future climate change scenario. This study shows that a single large PA with wide geographic and elevational extents instead of several smaller PAs would be a more prudent strategy for conserving the plant diversity in the Himalaya in the context of climate change.

For further details: <https://doi.org/10.1016/j.biocon.2019.02.036>

China Himalaya

RAPID CHANGES IN EASTERN HIMALAYAN ALPINE FLORA WITH CLIMATE CHANGE

Salick Jan, Zhendong Fang, and Robbie Hart

American journal of botany 106.4 (2019): 520-530.

The rate of climate change and high biodiversity's interaction is critical to be understood in the eastern Himalayas. Inadequate longitudinal datasets makes difficult to address the impact of climate change on alpine biodiversity. Permanent alpine vegetation monitoring plot in three mountain chains of the Hengduan Mountains were studied to measure changes in vegetation after 7 years. Warmer temperature, southerly aspects and higher elevation helped to increase in species number (+8 species/summit), in frequency (+47.8 plants/m²), and in diversity (+1.6 effective species/m²). However, Himalayan endemic species also increased in higher elevation but the non-alpine plants were greater in low elevation; which is the indication of climate change.

For further details: <https://doi.org/10.1002/ajb2.1263>

SOCIO-CULTURAL VALUES OF ECOSYSTEM SERVICES FROM OAK FORESTS IN THE EASTERN HIMALAYA

Tshewang Dorji, Justin D. Brookes, José M. Facelli, Robin R. Sears, Tshewang Norbu, Kuenzang Dorji, Yog Raj Chhetri, and Himlal Baral

Sustainability 11.8 (2019): 2250.

Realizing the importance of ecosystem services provided by the forest is crucial for planning and management of forest resources. Participatory approaches were used to assess the socio-cultural values of ecosystem services of high-altitude oak forests in Western Bhutan. This study identified 22 ecosystem services were served by these forests. Local communities' priorities were provisioning and cultural services while forest experts prioritize the provisioning, regulating and supporting services. Bridging local interest with national forestry goals with local's participation in decision making is important for suite of ecosystem services.

For further details: <https://doi.org/10.3390/su11082250>

Pakistan- Himalaya

DIVERSITY AND DISTRIBUTION OF INVASIVE PLANT SPECIES IN SUBURBAN VEGETATION OF KASHMIR HIMALAYAS

Hamayun Shaheen, Ammara Batool, Syeda Fatima Gillani, Muhammad Ejaz Ul Islam Dar, Tariq Habib, and Shamshad Aziz

Polish Journal of Environmental Studies 28.4 (2019): 2823-2833.

Biological invasion leads to the loss of biodiversity and possess serious threat to the existence of native and endemic species. Random quadrat methods were used for sampling in Muzaffarabad city to study the diversity and distribution of invasive alien species (IAS) of plants and assess the factors responsible for their spread. A total of 43 species out of 121 species recorded to be invasive alien species and the dominant species were *Parthenium hysterophorus*, *Lantana camara*, *Xanthium strumarium*, *Ailanthus altissima*, *Cannabis sativa*, *Broussonetia papyrifera*, *Arundo donax* and *Sorghum halepense*. Landslide and road construction were the major factors to

promote invasion in the area. Integrated management was recommended for the early detection and management of invasive alien species.

For further details: <https://doi.org/10.15244/pjoes/92550>