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ORIGINAL PAPER

Prey and tigers on the forgotten trail: high prey occupancy and tiger habitat use reveal the importance of the understudied Churia habitat of Nepal

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Abstract Tigers are globally threatened and their conservation relies on intact habitat that supports key large prey. The Churia habitat is relatively unknown even though it occupies a significant portion of the forested landscape of the Terai Arc, which stretches over 1000 km in a narrow band across Nepal and India, parallel to the Himalayas. To address this lack of detailed information relevant to tiger conservation, we used sign surveys to estimate occupancy probability for 5 focal prey species of tigers (gaur, sambar, chital, wild pig, and barking deer), and assess tiger habitat use within 537 km^2 of the understudied Churia habitat in Chitwan National Park (CNP), Nepal. Multi-season occupancy models allowed us to make seasonal (winter vs. summer) inferences regarding changes in occupancy or habitat use based on covariates influencing occupancy and detection. We found that sambar had the largest spatial distribution occupying 431–437 km^2, while chital had the smallest at 100–158 km^2 across both seasons. The gaur population showed the most seasonal variation occupying from 413 to 318 km^2, suggesting their migration out of the Churia in summer and moving in during winter. Wild pigs showed the opposite trend occupying from 444 to 383 km^2; suggesting moving into Churia in summer and out in winter. Barking deer were widespread in both seasons (329–349 km^2). Tiger habitat use ($\hat{\Psi}$(SE)) was higher in winter 0.63 (0.11) than in summer 0.54 (0.21), but confidence intervals overlapped and area used was similar across seasons, 337 km^2 (winter) to 291 km^2 (summer). Available habitat, distribution of water sources, and human disturbance were the most common variables influencing spatial distribution of prey and habitat

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