

The lowest altitudinal records of Himalayan Serow in India

The Mainland Serow *Capricornis sumatraensis* is a member of the order Cetartiodactyla, belonging to the family Bovidae and the subfamily Caprinae (Phan et al. 2020). The global distribution of Mainland Serow spans 11 countries, including China, southeastern Asia, and the Himalayan range (Phan et al. 2020). There are five known subspecies of *Capricornis sumatraensis*: *maritimus* & *mildneedwardsi* restricted to much of China, Myanmar, & southeastern Asia; *rubidus* restricted to the hilly tracts south of Brahmaputra, southwards from Nagaland into Bangladesh; *sumatraensis* restricted to Indonesia, Malaysia, & Thailand; and *thar* restricted to the Himalayan range (Phan et al. 2020).

Apart from India, the Himalayan Serow *C.s. thar* is also distributed in Nepal, Bhutan, Bangladesh, China (Tibet), and probably into western Myanmar (Grubb 2005). Its distribution in India is relatively continuous



Himalayan Serow *Capricornis sumatraensis thar* in VTR. © VTR/WWF-India.

throughout the Himalaya, ranging from Jammu & Kashmir through Nepal and Bhutan to the eastern side of Arunachal Pradesh (Phan et al. 2020). The Himalayan Serow usually inhabits steep, rugged, inaccessible, and densely forested areas of the Himalaya (Aryal 2008; Menon 2014). It also prefers moist and thickly wooded gorges, broadleaved valleys and subalpine scrub situated at 1,500–4,000 m. In addition, it is seen on open cliffs and rocky slopes (Aryal 2008).

The distribution of Himalayan Serow in India and Nepal's Himalaya was previously reported to span a broad elevation range. The upper limit of its altitudinal distribution is documented to be at 3,000–3,500 m (Aryal 2008; Giri et al. 2011). Recent surveys conducted by WWF-India indicate occurrences as low as 500m in sal-dominated *Shorea robusta* habitats in the Uttarakhand Himalayas (Johnsingh & Manjrekar 2015). The species has been observed at its lowest altitude in the northeastern Himalaya

in India, with a recorded altitude of <200 m (Sathyakumar 1994; Duckworth & MacKinnon 2008). However, records below 300 m in the western Himalaya are very rare.

We photo-captured Himalayan Serow (~50 photo-capture) at an elevation ranging between 186 m and 372 m (Average = 273 m) in Valmiki Tiger Reserve (VTR), India during the camera trapping exercises performed between 2013 and 2016–17.

At three instances, the species was photo-captured below 200 m. It was first photo-captured on 19 March 2013, at an elevation of 188 m in the Raghia Range. The capture site was characterized by a slow-moving perennial water stream, with undulating terrain dominated by *Sal Shorea robusta*. The nearest human habitation from the capture site was approximately 4 km away (aerial distance).

Subsequently, it was again photo-captured at altitudes of 195 m and 186 m on 20 November 2016 and 14 December 2016, respectively, in the Gobardhana Range. These locations are part of the Shivalik Hill Chain, known for its rugged terrain within the VTR. Numerous small water streams crisscrossing the habitats flow from north to south. The surrounding vegetation comprises a typical of bhabhar dun sal forest dominated by *Shorea robusta*, *Terminalia elliptica*, *T. bellirica*, and *Lannea coromandalica* in the top canopy. In the middle and understory, species such as *Dillenia pentagyna*, *Miliusa tomentosa*, and *Mallotus philippensis* are prevalent. The ground cover is dominated by *Clerodendrum infortunatum* and *Indigofera tinctoria* (Maurya & Borah 2013).

The Himalayan Serow is legally protected as a Schedule-I species under the Indian Wildlife (Protection) Act 1972, and is also classified as 'Vulnerable' on the IUCN Red List of Threatened Species (Phan et al. 2020). Accurate knowledge of a species' geographical distribution and altitudinal range is crucial for preparing effective conservation strategies. Species with wider variation in altitudinal range may better exploit available resources. Obtaining current altitudinal records of the Himalayan Serow from VTR can contribute to improving our understanding of its distribution pattern across its range. This study significantly expands our understanding of its altitudinal distribution, marking the lowest recorded altitudinal instances of the species in its range. The documented occurrences at altitudes as low as 186–195 m in the VTR underscores the adaptability of the Himalayan Serow. Notably, most records of Serow were restricted to the central part of VTR which is part of the Shivalik hill chain, this highlights the ecological significance of this region and urges further study to comprehend inter and intraspecific interactions among herbivores.

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