

# Camera trap surveys provide new insights into two threatened Annamite endemics in Viet Nam and Laos

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Annamite dark muntjac. Credit: Leibniz-IZW & WWF-Viet Nam & Song Thanh National Park

Effective conservation strategies are required to address accelerating extinction rates across the globe. In order to be effective, these strategies need to rely on scientific knowledge about ecology, distribution and population status of threatened species. Using wildlife cameras, a team of scientists from the Leibniz Institute for Zoo and Wildlife Research (Leibniz-IZW), WWF-Viet Nam, Save Vietnam's Wildlife, Re:wild and FFI Vietnam have provided new insights through a large-scale assessment of the occurrence and distribution of the Annamite striped rabbit and two Annamite dark muntjacs in six sites in Viet Nam and Laos. The team identified factors that influence the occurrence of these threatened endemics, and provided prediction maps for these sites. The data and maps for all species are published in the scientific journal *Conservation Science and Practice*.

The Annamite striped rabbit *Nesolagus timminsi* and the Annamite dark muntjac species complex with a minimum of two species currently known as Roosevelt's muntjac *Muntiacus rooseveltorum* and the Annamite muntjac *Muntiacus truongsongensis* are only known from the Annamite Mountains along the Viet Nam-Laos border. Scientists know little about the ecology, behavior and distribution of these species—but they do know that they are threatened across their range. The primary threat to both the striped rabbit and the two dark muntjacs is widespread poaching through the setting of indiscriminate wire snares. Understanding more about their populations across the Annamites and the factors that influence their occurrence is an important first step towards developing more effective conservation strategies to protect them.

To learn more about these species, the team of scientists conducted systematic landscape-scale camera surveys in six sites in the northern and central Annamites. The results showed that the occurrence of the dark muntjac and the Annamite striped rabbit are influenced by different landscape factors, including elevation and two proxies for

hunting pressure, the degree of seclusion and the proximity to human settlements around the protected areas. The degree of seclusion was calculated as the average travel time from major roads to a place inside protected areas. The proximity to human settlements around the [protected areas](#) was quantified by measuring the village density outside the protected area boundary. Importantly, the scientists used a mathematical modeling technique to show that these factors influenced species occurrence in different ways in different sites.



Annamite striped rabbit. Credit: Leibniz-IZW & WWF-Viet Nam & Song Thanh National Park

"The factors influencing species distribution in the Annamite Mountains are complex," says Thanh Van Nguyen, Ph.D. student at the Leibniz-IZW. "Through this study, we could assess how these factors influenced the occurrence of Annamite striped rabbit and the dark muntjac species across several study sites, and thus improve our understanding of this complexity. Our results show that the Annamite striped rabbit is found in higher elevation areas in some sites and lower elevation areas in some others, and surprisingly there were no clear effects of proxies for hunting pressure on their occurrence. On the other hand, the dark muntjac species were more likely to occur at higher elevations and at some sites had higher occupancies in more remote areas. It was only by taking into account site-specific differences that we could begin to unravel the factors that influence species distribution in the Annamites."

Although the scientists found no clear effect of the hunting proxies on the occurrence of the Annamite striped rabbit, they found the highest occupancies for this species in the Saola Nature Reserves in Viet Nam, where WWF-Viet Nam has conducted intensive snare removal patrols for more than 10 years. Mr. Anh Quang Hoa Nguyen, Central Annamite Landscape species Coordinator and Project Manager at WWF-Viet Nam, adds "We have been proud to be involved in this project and look forward to using this information to help protect these species as well as other key species that make the biodiversity in this part of the world so unique. The results on the Annamite striped rabbit are a promising first sign that our intensive conservation effort in the Saola Nature Reserves can have a positive benefit for the long term conservation of Annamite endemics."

Mr. Cuong Xuan Tran, Director of Pu Mat National Park (Viet Nam), also sees the usefulness of this work for conservation. "The results from this work are a major step forward in protecting these Annamite species," says Mr. Cuong Xuan Tran.

"With this baseline data, we will be able to monitor population trends of both species in the sites where we are engaged, thus measuring the impact of conservation efforts," says Dr. Andrew Tilker, Asian Species Officer at Re:wild and postdoc at the Leibniz-IZW. Tilker is also a member of the International Union for Conservation of Nature's (IUCN) SSC Deer and Lagomorph Specialist Groups, with a focus on muntjacs and Annamite striped rabbit, respectively. "Studies such as this are a first step towards implementing evidence-driven conservation initiatives to make sure that these species survive—and thrive—in the Annamite Mountains."

The Annamite striped rabbit (*Nesolagus timminsi*) is a forest-dwelling lagomorph native to the Annamite Mountains along the Viet Nam-Laos border. It was first described by science recently in the year 2000, and knowledge of its ecology or behavior is still scarce. The species is threatened by habitat loss and indiscriminate snaring and is classified as "Endangered" on The Red List of Threatened Species by the IUCN. The Annamite dark muntjacs are a complex group of two known—and possibly more unknown—[species](#), including *Muntiacus rooseveltorum* and *Muntiacus truongsongensis*. The dark muntjacs are small deer with dark fur, tiny fangs and a beautiful tuft of hair on their forehead. As so little is known about them, including their taxonomy, the dark muntjacs are currently listed as "Data Deficient" by the IUCN, though there is a general agreement among scientists and conservationists that their populations have declined across the Annamite mountains through unsustainable hunting.

**More information:** Thanh V. Nguyen et al, Getting the big picture: Landscape-scale occupancy patterns of two Annamite endemics among multiple protected areas, *Conservation Science and Practice* (2022). [DOI: 10.1111/csp2.620](https://doi.org/10.1111/csp2.620)

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