

## PEER-EDITED NOTES

NORTH AMERICAN DEERMOUSE (*PEROMYSCUS MANICULATUS*)  
PREDATION BY A STELLER'S JAY (*CYANOCITTA STELLERI*)JEFFERY T. WILCOX<sup>1</sup> AND NDUMISO COLLEN SIBANDA

Sonoma Mountain Ranch Preservation, Foundation, 3124 Sonoma Mountain Road, Petaluma, California 94954

<sup>1</sup>Corresponding author; e-mail: jtwilcox@comcast.net

**Abstract.**—Predation events are uncommonly witnessed, but the increasing deployment of camera trap arrays has resulted in incidental capturing of predation events. Here we describe a Steller's Jay (*Cyanocitta stelleri*) preying upon a juvenile North American Deermouse (*Peromyscus maniculatus*) captured incidentally on a camera trap intended to record the movements of Mountain Lions (*Puma concolor*) in Sonoma County, California.

**Key Words.**—arboreal; camera traps; diet; digital capture, foraging, Sonoma County.

Predation events are necessarily frequent because they are the occurrences by which predators achieve successful foraging, yet directly witnessing predation is uncommon (Major 1991; Van Vuren 2001). The increasing use of camera traps, however, along with their improving technologies (Smith et al. 2020), has facilitated the number of predation events witnessed, albeit remotely. In addition, because camera traps are triggered either by motion, or by thermal signals, they often capture unintended targets and thus reveal incident events. For example, Linnell and Lesmeister (2020) deployed a camera trap array on artificial nest platforms placed high in young coniferous forests to assess the predation and non-lethal avoidance behaviors of Red Tree Voles (*Arborimus longicaudus*) in response to two known predators. Incidentally, a camera trap captured a Steller's Jay (*Cyanocitta stelleri*) preying on one of the tree voles in what may be the first report of Steller's Jays preying upon small mammals. Here, we report an incidental digital capture of a Steller's Jay preying on a North American Deermouse (*Peromyscus maniculatus*).

Steller's Jays are generalist predators primarily inhabiting coniferous, mixed coniferous forests, and open woodlands from Alaska to Guatemala (Walker et al. 2020). Their diet consists of plant matter (nuts, berries, seeds, and mast) and insects (Bent 1946; Walker et al. 2020), but seasonal availability strongly influences their individual foraging habits (Vigallon and Marzluff 2005; Walker et al. 2020). Steller's Jays are known bird nest predators (Sieving and Willson 1999; Marzluff et al. 2000; Vigallon and Marzluff 2005; Linnell and Lesmeister 2020) but are also opportunistic predators of vertebrate prey (Carothers et al. 1972; Walker et al. 2020; Linnell and Lesmeister 2020).

An incidental digital capture event occurred on a camera within an existing trap array (Dellinger et al. 2020) designed to track the movements of Mountain Lions (*Puma concolor*) through the Mitsui Ranch on Sonoma

Mountain; Sonoma County, 8 km east of Petaluma, California. The Mitsui Ranch is comprised of primarily of open Oak Savannah, where stands of California Bay-Laurel (*Umbellularia californica*) and Oregon White Oak (*Quercus garryana*) are confined to dense copse formations by the surrounding mosaic of Vertisol soils, which limit the growth of deep-rooted plants (Belsky 1990). The clustered trees create fragmented pockets of forest, creating the abundant edge habitat preferred by Steller's Jays (Walker et al. 2020).

Within the camera array, we mounted a High Knolls camera (Browning BTC-5HDPX; Browning Trail Cameras, Birmingham, Alabama, USA) to the bole of a small oak tree, approximately 60 cm from the ground, set to record 20 sec of digital video when triggered. We directed the camera toward a prominent game trail along a narrow ridge line under dense canopy, 10 m from the edge of the copse. The forest floor was characterized by a carpet of leaf litter, fallen branches, and large, moss-covered rocks forced from the substrate by the growing roots of the surrounding trees. At 1015 on 3 June 2021, the camera trap was actuated by a Steller's Jay landing on a rock in front of the camera. In its mouth was a live juvenile North American Deermouse (Fig. 1). We determined the age of the mouse by its uniform gray dorsal pelage, and small size (Ingles 1965). The jay, immediately after landing, beat the deer mouse on either side of the rock it stood upon, bending to rapidly slam the mouse, head exposed, on the flattish side of the rock. The jay then jumped down to a smaller rock (Fig. 1) and adjusted its hold on the mouse before disappearing by flying out of the camera view. The entire incident consumed only the first 5 sec of the 20-sec recording. Although we did not directly witness the Steller's Jay capture the mouse, the struggling mouse (legs flailing in the air) showed that this was a live capture and not scavenging by the jay. The subsequent repeated beating of the head of the mouse against the rock indicates the intent to subdue, therefore predate.



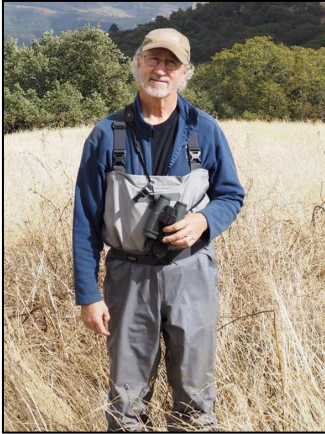
**FIGURE 1.** A trail camera photograph of a Steller's Jay (*Cyanocitta stelleri*) adjusting its hold on a Deer Mouse (*Peromyscus maniculatus*) before flying off with the mouse.

North American Deermice build nests of vegetative materials that may be located in trees, under rocks, or underground (Wolff and Durr 1986). Because the mouse was a juvenile, it may have only recently made a first venture from a nest site, and a lack of developed senses may have contributed to its vulnerability to predation. The increased deployment of camera traps may reveal that Steller's Jays are as adept at locating a concealed mouse nest as they are the arboreal nests of birds. This event occurred when Steller's Jays are likely to be raising young, and a high protein meal of that size would be an especially rewarding find for parents. Predation by Steller's Jays on rodents may occur more frequently than we realize and further targeted investigation is warranted.

*Acknowledgements.*—We thank our collaborators at Living with Lions, and the Sonoma Mountain Ranch Preservation Foundation for supporting our research efforts.

#### LITERATURE CITED

- Belsky, A.J. 1990. Tree/grass ratios in East African savannas: a comparison of existing models. *Journal of Biogeography* 17:483–489.
- Bent, A.C. 1946. Life histories of North American jays, crows and titmice, Part I. United States National Museum Bulletin 191, Smithsonian Institution, Washington, D.C., USA.
- Carothers, S.W., N.J. Sharber, and R.P. Balda. 1972. Steller's Jays prey on Gray-headed Juncos and a Pigmy Nuthatch during periods of heavy snow. *Wilson Bulletin* 84:204–205.
- Dellinger, J.A., B. Cristescu, J. Ewanyk, D.J. Gammons, D. Garcelon, P. Johnston, Q. Martins Dellinger, C. Thompson, T.W. Vickers, et al. 2020. Using Mountain Lion habitat selection in management. *Journal of Wildlife Management* 84:359–371.
- Ingles, L.G. 1965. Mammals of the Pacific States, California, Oregon, Washington. Stanford University Press, Stanford, California.
- Linnell, M.A., and D.B. Lesmeister. 2020. Predator-prey interactions in the canopy. *Ecology and Evolution* 10:8610–8622.
- Major, R.E. 1991. Identification of nest predators by photography, dummy eggs, and adhesive tape. *Auk* 108:190–195.
- Marzluff, J.M., M.G. Raphael, and R. Sallabanks. 2000. Understanding the effects of forest management on avian species. *Wildlife Society Bulletin* 28:1132–1143.
- Sieving, K.E., and M.F. Willson. 1999. A temporal shift in Steller's Jay predation on bird eggs. *Canadian Journal of Zoology* 77:1829–1834.
- Smith, J.A., J.P. Suraci, J.S. Hunter, K.M. Gaynor, C.B. Keller, M.S. Palmer, J.L. Atkins, I. Castañeda, M.J. Cherry, P.M. Garvey, and S.E. Huebner. 2020. Zooming in on mechanistic predator-prey ecology: integrating camera traps with experimental methods to reveal the drivers of ecological interactions. *Journal of Animal Ecology* 89:1997–2012.
- Van Vuren, D.H. 2001. Predation on Yellow-bellied Marmots (*Marmota flaviventris*). *American Midland Naturalist* 145:94–100.
- Vigallon, S.M., and J.M. Marzluff. 2005. Is nest predation by Steller's Jays (*Cyanocitta stelleri*) incidental or the result of a specialized search strategy? *Auk* 122:36–49.
- Walker, L.E., P. Pyle, M.A. Patten, E. Greene, W. Davison, and V.R. Muehter. 2020. Steller's Jay (*Cyanocitta stelleri*). Version 1.0. In *Birds of the World*. Rodewald, P.G. (Ed.). Cornell Lab of Ornithology, Ithaca, New York. <https://doi.org/10.2173/bow.stejay.01>.
- Wolff, J.O., and D.S. Durr. 1986. Winter nesting behavior of *Peromyscus leucopus* and *Peromyscus maniculatus*. *Journal of Mammalogy* 67:409–412.



**JEFF WILCOX** is the Managing Ecologist for the Mitsui Ranch Preserve near Petaluma County, California. He has worked with landscape-scale parcels to manage sites for endangered species, native grasses, and compatible uses such as organic cattle grazing, education, and research. Jeff has decades of experience working collaboratively on projects that include pond management and construction, native grasses restoration, and species-level projects with California Red-legged Frogs (*Rana draytonii*), Wild Pigs (*Sus scrofa*), American Bullfrogs (*Lithobates catesbeianus*), California Tiger Salamanders (*Ambystoma californiense*), and Foothill Yellow-legged Frogs (*Rana boylei*). (Photographed by Lou Silva).



**COLLEN SIBANDA** spent his childhood in Bulawayo Province, Zimbabwe, where he learned cattle ranching and stockmanship from his grandfather, and where he provisioned wild game to the family kitchen. After graduating high school, he followed his dream of becoming a professional photographer, emigrating to Johannesburg, South Africa, to apprentice as a commercial photographer. There, he met and fell in love with an American traveler and soon after, came to the United States. After earning a college degree, he pursued a career in motion graphic design, but yearning for a better quality of life, he sought out ranching again. Collen joined the staff of the Mitsui Ranch Preserve in 2018. In addition to invasive weed management, welding and fabrication, woodworking, and stockmanship, Collen ran the camera trap program on the Mitsui Ranch Preserve. When not on the ranch, you will find Collen on the soccer pitch, guiding the youth of America to be better at this world game. (Photographed by Jeff Wilcox).