

AVIAN NESTLING PREDATION BY ENDANGERED MOUNT GRAHAM RED SQUIRREL

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ABSTRACT—Studies using artificial nests or remote cameras have documented avian predation by red squirrels (*Tamiasciurus hudsonicus*). Although several direct observations of avian predation events are known in the northern range of the red squirrel distribution, no accounts have been reported in the southern portion. We observed predation upon a hermit thrush (*Catharus guttatus*) nestling by the Mount Graham red squirrel (*T. h. grahamensis*), an endangered subspecies living at the southern terminus of the distribution of the red squirrel.

RESUMEN—Estudios utilizando nidos artificiales o cámaras remotas han documentado la depredación de aves por ardillas rojas (*Tamiasciurus hudsonicus*). Aunque se sabe de varias observaciones directas de casos de depredación en aves en la parte norte de la distribución de la ardilla roja, no se han reportado casos en la parte sur. Observamos una cría del tordo ermita (*Catharus guttatus*) depredada por la ardilla roja del monte Graham (*T. h. grahamensis*), una subespecie en peligro de extinción que habita en el extremo sur de la distribución de la ardilla roja.

Red squirrels (*Tamiasciurus hudsonicus*) are reported to prey upon bird eggs, juveniles, and occasionally adult birds (Banfield, 1974; Steele, 1998). Artificial nest experiments and studies using remote cameras implicate and confirm

red squirrels as nest predators (Sieving and Wilson, 1998; Bayne and Hobson, 2002). Direct observations of avian predation events and nest searching behavior by red squirrels include predation on western kingbirds (*Tyrannus verti-*

calis), American robins (*Turdus migratorius*), white-throated sparrows (*Zonotrichia albicollis*), and yellow warblers (*Dendroica petechia*) (Dobos, 1986; Nero, 1993; Sealy, 1994; Underwood, 2003). All of these observations occur in the northern extent of the distribution of the red squirrel. Here we report an observation of predation of a hermit thrush (*Catharus guttatus*) nestling by the federally endangered Mount Graham red squirrel (*T. h. grahamensis*), a subspecies living in the high-elevation, coniferous forests of the Pinaleno Mountains of southeastern Arizona, the southern terminus of red squirrel distribution.

As part of a long-term study on the ecology of the Mount Graham red squirrel, individuals are uniquely marked and radiocollared (Koprowski, 2005). On 5 August 2005 at 1548 h, we located a radiocollared adult female, at least one year old and known to be nursing a litter of 4 offspring, feeding on an unknown food item at 3,182 m. Upon our approach, the squirrel retreated and cached the partially eaten item on a branch of an adjacent tree. As the squirrel traveled down the tree and into the forest, we observed a moist smear of blood on her left cheek. We detected feathers attached to the branch where the female had initially been feeding. Additionally, we noted a feather protruding from the cached item. We attempted to extract the cached food item from the tree, but were unsuccessful. At 1609 h, we relocated the female traveling on the ground 8 m from the tree of our initial observation. The squirrel climbed a nearby tree and investigated a bird nest 1 m above the ground. An adult hermit thrush (*Catharus guttatus*) mobbed her and called out frequently. After a few seconds, the squirrel descended the tree and departed. The bird continued to call and fly about the nest, which no longer contained eggs, in a distressed manner. Hermit thrushes have a typical clutch size of 3 to 4 eggs (Ehrlich et al., 1988); therefore, an empty nest suggests the potential loss of multiple nestlings.

Red squirrels are thought to be opportunistic predators (Sullivan, 1991). Documented cases of avian predation around bird feeders suggest defense of resources as a possible cause (Nero, 1993). We observed predation away from human-made food sources, suggesting this attack was opportunistic. However, our red squirrel was nursing a large litter of 4 offspring. Although no

evidence of sex differences in nest predation exists (Wilson et al., 2003), the increased nutritional demands of lactation (Steele, 1998) might result in females actively searching for bird nests, as we observed. Furthermore, limited food resources might result in increased avian predation. Insect infestation has severely damaged the forest in which this predation event occurred, reducing the amount of quality food available (Koprowski et al., 2005). Future studies should examine the frequency and circumstances in which avian predation by red squirrels occurs in the southern extent of their range.

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LITERATURE CITED

- BANFIELD, A. W. F. 1974. The mammals of Canada. University of Toronto Press, Toronto, Canada.
- BAYNE, E. M., AND K. A. HOBSON. 2002. Effects of red squirrel (*Tamiasciurus hudsonicus*) removal on survival of artificial songbird nests in boreal forest fragments. *American Midland Naturalist* 147:72-79.
- DOBOS, R. 1986. American robin nestling predation by an American red squirrel. *Ontario Birds* 4:119.
- EHRlich, P. R., D. DOBKIN, AND D. WHEYE. 1988. The birder's handbook: a field guide to the natural history of North American birds. Simon and Schuster Inc., New York.
- KOPROWSKI, J. L. 2005. Annual cycles in body mass and reproduction of endangered Mt. Graham red squirrels. *Journal of Mammalogy* 86:309-313.
- KOPROWSKI, J. L., M. I. ALANEN, AND A. M. LYNCH. 2005. Nowhere to run and nowhere to hide: response of endemic Mt. Graham red squirrels to catastrophic forest damage. *Biological Conservation* 126:491-498.
- NERO, R. W. 1993. Another red squirrel bird kill. *Blue Jay* 51:217-218.
- SEALY, S. 1994. Observed acts of egg destruction, egg removal, and predation on nests of passerine birds at Delta Marsh, Manitoba. *Canadian Field-Naturalist* 108:41-51.
- SIEVING, K. E., AND M. F. WILSON. 1998. Nest predation and avian species diversity in northwestern forest understory. *Ecology* 79:2391-2402.

- STEELE, M. A. 1998. *Tamiasciurus hudsonicus*. Mammalian Species 586:1–9.
- SULLIVAN, B. D. 1991. Additional vertebrate prey items of the red squirrel, *Tamiasciurus hudsonicus*. Canadian Field-Naturalist 105:398–399.
- UNDERWOOD, T. 2003. Red squirrel predation on warbling vireo and yellow warbler nests. Blue Jay 4:199–200.
- WILSON, M. F., T. L. DE SANTO, AND K. E. SIEVING. 2003. Red squirrels and predation risk to bird nests in northern forests. Canadian Journal of Zoology 81:1202–1208.

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