

PREDATORY ATTACK BY A WESTERN TERRESTRIAL GARTER SNAKE  
ON A NESTLING DARK-EYED JUNCO

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ABSTRACT—I observed a Western Terrestrial Garter Snake (*Thamnophis elegans*) attacking a large (approximately 9-d-old) nestling Dark-eyed Junco (*Junco hyemalis*) on 7 July 2018 near Rattlesnake Creek, Missoula County, Montana. The snake held the still-living nestling by its head (the head was mostly enveloped by the snake's jaws) and continued to do so for 3 min before it released the now-dead nestling when disturbed by my presence. The dead nestling exhibited skin wounds on the neck but no other superficial injury. Predation on birds by Western Terrestrial Garter Snakes is infrequently reported, and I found only 2 other reports of predation on juncos by this snake species.

Key words: Dark-eyed Junco, *Junco hyemalis*, Montana, predation, *Thamnophis elegans*, Western Terrestrial Garter Snake

The Western Terrestrial Garter Snake (*Thamnophis elegans*) is a versatile predator on a diverse spectrum of animal species, including aquatic and terrestrial mollusks (snails, slugs) and annelids (polychaete worms, leeches, earthworms), intertidal marine crustaceans (small crabs), terrestrial arthropods (insects, spiders), and members of every vertebrate class, especially amphibians and fish, less often reptiles, small mammals, and birds (Cunningham 1955; Campbell 1969; White and Kolb 1974; Anderson 1977; Gregory 1978; Kephart and Arnold 1982).

At some localities, birds appear relatively frequently in the diet of Western Terrestrial Garter Snakes. On Mitlenatch Island, British Columbia, Campbell (1969) reported that this garter snake species readily preyed on nestling Glaucous-winged Gulls (*Larus glaucescens*) and the eggs and nestlings of Northwestern Crows (*Corvus caurinus*). James and others (1983) reported recovering 15 nestling White-crowned Sparrows (*Zonotrichia leucophrys*) from 9 of 39 Western Terrestrial Garter Snakes they examined near San Francisco, California. In general, however, birds and their eggs appear to be a minor dietary component for this garter snake species (Fitch 1941; Cunningham 1955; Anderson 1977).

On 7 July 2018 at 11:48 MDT, while walking in the Rattlesnake Creek drainage near the north end of Missoula, Missoula County, Montana, my attention was drawn to a pair of Dark-eyed Juncos (*Junco hyemalis*) about 20 m distant emitting a series of “tik” calls (Hostetter 1961; Nolan and others 2002) as they fluttered and perched low to the ground; they were accompanied by a pair of Chipping Sparrows (*Spizella passerina*), which also were vocalizing and acting agitated, but the sparrows did not fly to the ground with the juncos. The location (46.92226°N, 113.96020°W; 1090 m elevation) was under an open canopy of Douglas-fir (*Pseudotsuga menziesii*) and Ponderosa Pine (*Pinus ponderosa*) with very little shrub understory, about 40 m from a water-filled irrigation ditch and <100 m from Rattlesnake Creek and associated riparian habitat. When I approached the site where the juncos were directing their attention I found a nest on the ground, containing a junco nestling grasped around the head by a Western Terrestrial Garter Snake approximately 45 cm SVL in size (Fig. 1A). The nestling was still alive, and struggled weakly, but never escaped the snake. The snake switched positions in the nest once during the next 3 min as it continued to grasp the nestling in its mouth. I never saw the snake attempt to coil around the nestling, a behavior sometimes used by this garter snake species to hold prey (Gregory and others 1980). The snake released the now-dead nestling only when I reached toward the nest to move some grass that partly obstructed my view. The snake then slowly crawled away, leaving the dead nestling on the rim of the nest.

The dead nestling was mostly feathered and about 9-d-old, based on the stubby tail feathers and the flight feathers still mostly sheathed (wing chord = 42 mm); the only visible wound on the dead nestling was a patch of torn skin on the neck near the base of the mandible (Fig. 1B). No other junco nestlings were present in or near the nest, and I did not notice any irregularities along the snake's body that would suggest it had

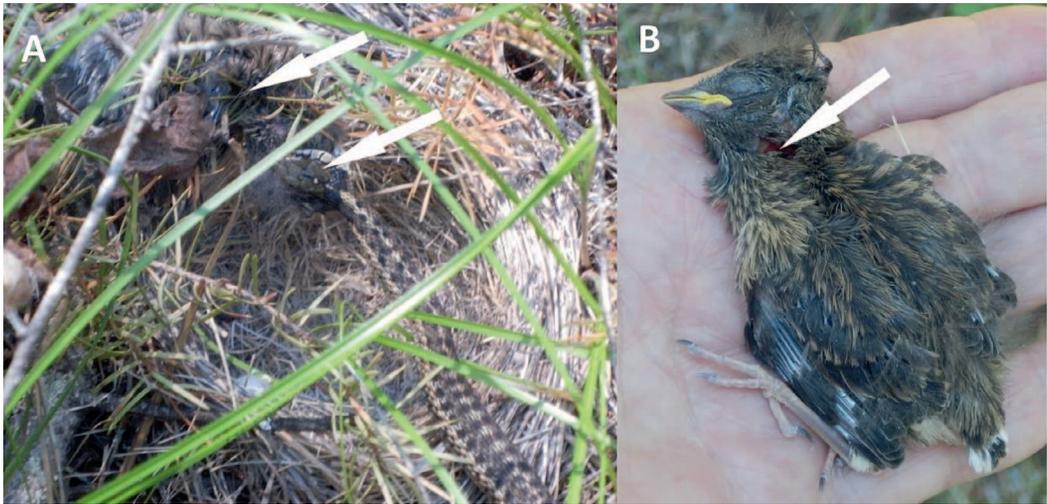


FIGURE 1. Predatory attack by a Western Terrestrial Garter Snake (*Thamnophis elegans*) on a nestling Dark-eyed Junco (*Junco hyemalis*) near Missoula, Missoula County, Montana, on 7 July 2018. (A) garter snake (about 45 cm SVL) stretched across the nest cup on the ground and holding a live nestling junco by its head, which is mostly enveloped in the snake's mouth. The upper arrow marks the neck and shoulders of the nestling junco on the rim of the nest, the lower arrow marks the snake grasping the nestling's head in its jaws; (B) The dead nestling junco (approximately 9-d-old), showing flight feathers still largely sheathed and the stubby tail. The arrow points to torn skin on the neck near the base of the mandible

already consumed other nestlings. Other nestlings that may have been present when the snake appeared probably abandoned the nest, something juncos of this age may do when disturbed by a potential predator (Hostetter 1961; Nolan and others 2002). The dead nestling was still present in the nest when I checked 2.5 h later.

Dark-eyed Juncos are rarely noted as prey for garter snakes. Hostetter (1961) reported 3 cases of predation by the Common Garter Snake (*T. sirtalis*) for 72 junco nests in Virginia; additional instances for Virginia and Ontario are noted by Nolan and others (2002), but without including the number of cases or additional details. For juncos nesting within the range of the Western Terrestrial Garter Snake, the incidence of nest predation by this snake species also appears to be low (Phelps 1968; Smith and Andersen 1982; Nolan and others 2002; Robertson 2009). I found only 2 prior accounts of predation by Western Terrestrial Garter Snakes on Dark-eyed Juncos. Fitch (1941) listed *Junco* among 4 birds found in 70 stomachs of garter snake specimens collected across the range of this species outside of California, but provided no additional details regarding age of the bird or collection location of

the snake in which it was found. Thatcher (1968) found a garter snake with a live fledgling junco a few days out of the nest at 2896 m elevation in Colorado; the elevation of the incident eliminates all but Western Terrestrial Garter Snake as the species observed.

Although predation of Dark-eyed Juncos by garter snakes is rarely reported, juncos are exposed throughout much of their breeding range to 1 or more garter snake species (Nolan and others 2002; Stebbins 2003). In western North America, juncos nest on or near the ground in montane regions from valley bottoms to at least upper tree line (>3000 m elevation), often near water and in more mesic habitats, such as Aspen (*Populus tremuloides*) stands and spruce (*Picea* spp.) woodlands (Phelps 1968; Thatcher 1968; Nolan and others 2002). Similar habitats are also favored by Western Terrestrial Garter Snakes, which range into mountains near streams and wetlands over a similar elevation gradient (Hendricks 1996; Hammerson 1999; Werner and others 2004). With more intensive study of both species it may be shown that predation by Western Terrestrial Garter Snakes on Dark-eyed Juncos occurs with greater frequency than currently appears to be the case.

## LITERATURE CITED

- ANDERSON ME. 1977. Aspects of the ecology of two sympatric species of *Thamnophis* and heavy metal accumulation within the species [thesis]. Missoula, MT: University of Montana. 147 p.
- CAMPBELL RW. 1969. Notes on some foods of the Wandering Garter Snake on Mitlenatch Island, British Columbia. *Syesis* 2:183–187.
- CUNNINGHAM JD. 1955. Notes on the ecology of *Thamnophis e. elegans* (Baird and Girard). *Herpetologica* 11:152.
- FITCH HS. 1941. The feeding habits of California garter snakes. *California Fish and Game* 27(2):3–32.
- GREGORY PT. 1978. Feeding habits and diet overlap of three species of garter snakes (*Thamnophis*) on Vancouver Island. *Canadian Journal of Zoology* 56:1967–1974.
- GREGORY PT, MACARTNEY JM, RIVARD DH. 1980. Small mammal predation and prey handling behavior by the garter snake *Thamnophis elegans*. *Herpetologica* 36:87–93.
- HAMMERSON GA. 1999. Amphibians and reptiles in Colorado, 2nd edition. Niwot, CO: University Press of Colorado. 484 p.
- HENDRICKS P. 1996. Geographic distribution: *Thamnophis elegans vagrans*. *Herpetological Review* 27(2):89.
- HOSTETTER DR. 1961. Life history of the Carolina Junco *Junco hyemalis carolinensis* Brewster. *Raven* 32:97–170.
- JAMES DK, PETRINOVICH L, PATTERSON TL, JAMES AH. 1983. Predation of White-crowned Sparrow nestlings by the Western Terrestrial Garter Snake in San Francisco, California. *Copeia* 1983:511–513.
- KEPHART DG, ARNOLD SJ. 1982. Garter snake diets in a fluctuating environment: A seven-year study. *Ecology* 63:1232–1236.
- NOLAN V JR, KETTERSON ED, CRISTOL DA, ROGERS CM, CLOTFELTER ED, TITUS RC, SCHOECH SJ, SNAJDR E. 2002. Dark-eyed Junco (*Junco hyemalis*). In: Poole A, Gill F, editors. The birds of North America, No. 716. Philadelphia, PA: The Birds of North America, Inc.
- PHELPS JH JR. 1968. Oregon Junco. In: Austin OL, editor. Life histories of North American cardinals, grosbeaks, buntings, towhees, finches, sparrows, and allies. US National Museum Bulletin 237, Part 2. Washington, DC: Smithsonian Institution. p 1050–1071.
- ROBERTSON BA. 2009. The influence of spatio-temporal variation in food availability and nest-predation risk on clutch-size decisions. *The Condor* 111:523–533.
- SMITH KG, ANDERSEN DC. 1982. Food, predation, and reproductive ecology of the Dark-eyed Junco in northern Utah. *The Auk* 99:650–661.
- STEBBINS RC. 2003. A field guide to western reptiles and amphibians, 3rd edition. New York, NY: Houghton Mifflin Company. 533 p.
- THATCHER DM. 1968. Gray-headed Junco. In: Austin OL, editor. Life histories of North American cardinals, grosbeaks, buntings, towhees, finches, sparrows, and allies. US National Museum Bulletin 237, Part 2. Washington, DC: Smithsonian Institution. p 1098–1126.
- WERNER JK, MAXELL BA, HENDRICKS P, FLATH DL. 2004. Amphibians and reptiles of Montana. Missoula, MT: Mountain Press. 262 p.
- WHITE M, KOLB JA. 1974. A preliminary study of *Thamnophis* near Sagehen Creek, California. *Copeia* 1974:126–134.

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