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# Terrestrial Gartersnake (*Thamnophis elegans*) consuming a Western Meadow Vole (*Microtus drummondii*) in the Sangre de Cristo Mountains of New Mexico

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## Abstract

The Terrestrial Gartersnake (*Thamnophis elegans*) is a dietary generalist occurring in the western half of the United States, southwestern Canada, and northern Mexico. Terrestrial Gartersnakes are known to consume a variety of small mammals, including voles (*Microtus*). Herein we report on an observation of the Terrestrial Gartersnake consuming a Western Meadow Vole (*Microtus drummondii*). On 27 June 2025, we captured a large adult Terrestrial Gartersnake underneath a log just upstream of a North American Beaver (*Castor canadensis*) dam on the Vermejo River, Colfax County, New Mexico that regurgitated a partially digested adult Western Meadow Vole. Trapping in the immediate vicinity earlier that morning and elsewhere in the same watershed indicated high populations of Western Meadow Voles. Our observation of a large adult Terrestrial Gartersnake consuming an adult Western Meadow Vole likely reflects an ontogenetic diet shift toward mammals, particularly voles, observed in other studies for adult snakes of this species.

**Keywords:** diet, *Microtus drummondii*, *Microtus pennsylvanicus*, New Mexico, Sangre de Cristo Mountains, Terrestrial Gartersnake, *Thamnophis elegans*, Western Meadow Vole

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The Terrestrial Gartersnake (*Thamnophis elegans*) is a dietary generalist that occurs across the western half of the United States, southwestern Canada, and northern Mexico. Diet items vary by location but include soft-bodied invertebrates, fish, amphibians, reptiles, birds, and mammals (Rossman *et al.* 1996, Ernst and Ernst 2003; Holycross and Mitchell 2020). Small mammals, particularly rodents, but also shrews and bats, are known diet items (Ernst and Ernst 2003). Voles (*Microtus*) are well known from the diet of this species (Fitch 1941, Tanner 1949, Gregory *et al.* 1980, Farr 1988, Finley *et al.* 1994, Rombough and Leppin 2008, Blais *et al.* 2021). Herein we report on an observation of the Terrestrial Gartersnake consuming a Western Meadow Vole (*Microtus drummondii*). Due to changing taxonomy, the Western Meadow

Vole (*M. drummondii*) now represents the western taxa of the formerly known widespread “Meadow Vole” (*Microtus pennsylvanicus sensu lato*; Jackson and Cook 2020).

On 27 June 2025 at 09:40 h, we captured a large adult Terrestrial Gartersnake (**Fig. 1**) that regurgitated a partially digested Western Meadow Vole (**Fig. 2**). The individual was captured under a log in a mountain valley, just upstream of a North American Beaver (*Castor canadensis*) dam on the Vermejo River, Colfax County, New Mexico (36.90200, -105.03782; WGS 84; 2,338 m), on the east side of Sangre de Cristo Mountains. Based on size, the vole appeared to be an adult. Trapping in the immediate vicinity the same morning indicated a large population of Western Meadow Voles. In 40 Sherman live traps, we captured 20 Western Meadow Voles at



**Figure 1.** Photograph of a large adult Terrestrial Gartersnake (*Thamnophis elegans*) with a prominent bolus at midbody from along the Vermejo River, Colfax County, New Mexico, 27 June 2025 (GBIF.org 2025).

the site. Western Meadow Voles were also commonly captured at trap sites upstream and downstream of this site on the Vermejo River (K. Geluso, unpublished data). Habitat at this site was predominately herbaceous with emergent vegetation including buttercups (*Ranunculus* spp.), cattails (*Typha* spp.), rushes, sedges (*Carex* spp.), and grasses. Sandbar Willow (*Salix exigua*) and rose (*Rosa* sp.) were present in places as dense thickets near the edge of the water. Small rocks and logs were occasional on the landscape in the immediate area of our observation.

The Western Meadow Vole has only been reported once previously in the diet of the Terrestrial Gartersnake (reported as *M. pennsylvanicus*) but results of that thesis



**Figure 2.** A partially digested Western Meadow Vole (*Microtus drummondii*) regurgitated from a large adult Terrestrial Gartersnake (*Thamnophis elegans*) from along the Vermejo River, Colfax County, New Mexico, 27 June 2025 (GBIF.org 2025).

from British Columbia remain otherwise unpublished (Farr 1988). Additionally, although Ernst and Ernst (2003) amassed dietary items consumed by Terrestrial Gartersnakes in their published work, those authors failed to mention Meadow Voles in their lists of prey items for the species despite citing Farr (1988) elsewhere in the publication. Other voles consumed by Terrestrial Gartersnakes include the Long-tailed Vole (*M. longicaudus*; Blais *et al.* 2021), Mogollon Vole (*M. mogollonensis*; Finley *et al.* 1994; reported as *M. mexicanus*), Montane Vole (*M. montanus*; Fitch 1941), Creeping Vole (*M. oregoni*; Rombough and Leppin 2008), Townsend's Vole (*M. townsendii*; Gregory *et al.* 1980), and "voles" (*Microtus* sp. [might represent Western Meadow Vole, although other species of voles also coexist in the region]; Tanner 1949).

Based on our previous experiences with Terrestrial Gartersnakes, this individual was a relatively large adult, although we did not measure the individual upon capture. Our observation of this Terrestrial Gartersnake consuming an adult vole likely reflects the ontogenetic

diet shift toward mammals in the species as adults (Farr 1988, Rossman *et al.* 1996). Farr (1988) observed that smaller (< 300 mm snout vent length) Terrestrial Gartersnakes primarily consumed slugs and shifted toward mammalian prey as adults, dominated by Western Meadow Voles and other mammals (e.g., Vagrant Shrew [*Sorex vagrans*]) in western Canada. Likewise, Rossman *et al.* (1996) noted juvenile Terrestrial Gartersnakes ate slugs whereas adults ate voles in northern California. Further study of the diet in this population of Terrestrial Gartersnakes in northern New Mexico will be required to determine if the same ontogenetic diet shift occurs.

Both the Terrestrial Gartersnake and Western Meadow Vole are widespread species in western parts of North America, and their distributions mainly overlap in the Rocky Mountains and surrounding areas in the northwestern United States and southwestern Canada (Rossman *et al.* 1996, Jackson and Cook 2020). Thus, the predator-prey relationship between these species is likely more widespread than currently documented. To better understand the ecological niches of species and the flow of energy in food webs, we promote that more researchers report similar natural history observations in appropriate scientific outlets.

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