
Rapid Early Growth in Northeastern Kansas Timber Rattlesnakes

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Fitch and Pisani (2006) summarized the rapid early growth and maturation of Timber Rattlesnakes (*Crotalus horridus*) in northeastern Kansas. Snakes make significant gains in length, with concomitant gains in mass, through their 6th shed. Fitch (1999) presented evidence that *C. horridus* females from northeastern Kansas mature generally in their third year, and breed biennially or perhaps even annually—far more frequently than documented for the species in the cooler habitats utilized through the eastern parts of its range. Since the publication of Fitch and Pisani (2006), two additional specimens of *C. horridus* from our study area provide added illustration of this rapid growth.

On 8 September 2006, a young male was killed on property adjacent to the Nelson Environmental Study Area. He measured 775 mm total length and 699 mm SVL, and bore a button plus three rattles, and we estimate his age as 2 years. Our longest male with 3 rattles + button measured 720 mm SVL and total length of 799 mm; the longest female of that age class measured 655 mm SVL and 711 mm total length. Martin (2006, Pers. comm.) indicated

that a typical male Timber Rattlesnake from the central Appalachian populations measuring ca 775 mm total length would be 3-4 years old, and one from the High Allegheny populations would be 4-5 years old.

On 22 September 2006, a mature female from our study population was accidentally killed by field station personnel. She had first been captured on 21 April 2003, newly emergent from hibernation, with just a button; she was 403 mm SVL with a mass of 42 g, and evidently had been born the previous Fall. When killed, she carried 9 + button rattles, measured 890 mm SVL, weighed 616 g, and contained 4 enlarged and well-yolked ovarian follicles averaging 35.5 mm x 24.0 mm. Her stomach contained an unidentified and well-digested rodent and anterior to that an adult Prairie Vole (*Microtus ochrogaster*). Thus, in 41 months (short of four growing seasons) she had more than doubled her length, and increased in mass by a factor of 14.6, and she reached sexual maturity. Two other females from this population (collected 19 September 1990 and 31 March 2006) with comparable

rattle strings (both with 9 segments and button missing) measured 883 mm SVL (mass 370 g) and 880 mm SVL (mass 550 g).

Prairie voles constituted 33% of the identified prey animals taken by *C. horridus* in our study population (Fitch and Pisani 2006), and from May through August of each activity season snakes typically forage in open fields with vegetation consisting of grass (largely brome), mixed grasses/forbs, or the prairie tracts maintained on nearby KBS land. Timber Rattlesnakes in a southern Iowa population utilize similar habitats in summer (Frese, 2006, Pers. comm.). Prairie voles are likely to be the most abundant small mammal species in these habitats (KBS/KSR unpublished data), and density can reach 200/acre in suitable habitat (Bee, et al. 1981; Timm et al. 2002). Populations of *C. horridus* from forested eastern parts of the species' range feed predominantly upon four species of small mammals (Klauber 1972): Chipmunks (*Tamias striatus*), White-footed and Deer Mice (*Peromyscus* sp.), and Meadow Voles (*Microtus pennsylvanicus*). Wolff (1996) presented evidence that population densities of chipmunks and mice (*Peromyscus* sp.) in eastern deciduous forest are considerably lower and more variable (depending largely upon annual mast production) than densities cited for northeast Kansas *Microtus*, which are grazers on abundant low-growing grasses. Our study area is not within the range of chipmunks. Eastern *Microtus* populations in favorable habitat do cycle annually (see discussion in Taitt and Krebs 1985), but *Microtus* may not be as large a diet component for montane Timber Rattlesnakes as for northeast Kansas ones. An added factor affecting chipmunk population density involves their home range size, which varies between 0.5-1.0 acre and is actively defended (Elliott, 1978).

Other factors may operate to provide snakes from our study area with a sustained food resource favorable to rapid early growth and maturation. Our study area is a mosaic of small mammal habitats, and overall density of prey may in part be attributable to that. Kirkland (1977) documented increased small mammal abundance and diversity in disturbed (clear-cut) northern Appalachian forests.

Snakes from our study population have a longer activity season than many populations resident in eastern USA montane habitats. Martin (2002) studied montane West Virginia dens having a median activity season of 4.7-5.0 months. Snakes in our study area are active for approximately 174 days per year (typically April 15th – October 6th). However, more study plainly is needed, since Adams (2005) recorded activity seasons for her study dens in West Virginia that are similar to that shown by snakes in ours.

In conclusion, we believe that greater prey abundance, combined with the relatively long foraging season available to Timber Rattlesnakes in Kansas, explain the rapid growth. Early female maturation, and more frequent reproduction observed in snakes from our study population vs. those of east-

ern mountain habitats.

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