



Timber Rattlesnake (*Crotalus horridus* Linnaeus 1758) Record New Jersey Litter Size

Jason A. Fantuzzi, Daniel Brill, and Kevin Pollack

EcolSciences, Inc., 75 Fleetwood Ave., Rockaway, New Jersey 07866, USA (JFantuzzi@ecolsciences.com)

The average litter size of Timber Rattlesnakes (*Crotalus horridus*) varies by elevation between populations historically inhabiting the eastern mountains through the western highlands of the Ozark Plateau (6–9) and those of the lowland form “*atricaudatus*,” a former subspecies found throughout most of the southern states and the Atlantic Coastal Plain (10–14) (Breisch et al. 2021) (Table 1). On 29 August 2022, while conducting surveys for *C. horridus* and Northern Pinesnakes (*Pituophis m. melanoleucus*) in the coastal plain pinelands of Burlington County, New Jersey (geographic locus withheld due to habitat sensitivity), we observed a post-parturient *C. horridus* (SVL = 107 cm, TL = 118 cm) brooding 18 pre-shed neonates (TL = 30.5–34.0 cm) (Fig. 1). To the best of our knowledge, this is the largest litter size recorded for *C. horridus* in New Jersey, surpassing the previous record of 16 (Robert T. Zappalorti, pers. comm.).

As females remain with the young until the neonates shed and disperse (Ernst and Ernst 2003; Brown 2016), we assumed that this litter belonged to this one female as no other adult females were observed nearby. Further, in 2021, each

of three post-parturient females within this subpopulation were associated with sites for gestation and parturition, never wandering more than about 1 m to bask, and no shelters were shared by neonates from other litters. However, we cannot completely rule out the possibility that the litter comprised neonates of different females. Conversely, litter sizes could be somewhat conservative, as some studies have suggested that “... observations of wild born litters may fail to detect all neonates from a litter...” given the potential rapid dispersal of post-shed or otherwise disturbed neonates (Bauder et al. 2011: 56).

Acknowledgements

This work was conducted under Scientific Collecting Permit (SCP#2022114) issued by the New Jersey Department of Environmental Protection, Endangered and Non-game Species Program. We thank Alex Figueroa for valuable comments on an earlier draft of this note and dedicate these observations to the late William H. “Marty” Martin and the late Kathy Michell, for their decades-long efforts toward the conservation of *Crotalus horridus*.



Figure 1. A post-parturient female Timber Rattlesnake (*Crotalus horridus*) prior to PIT-tagging and rattle-painting for future identification (left) and processed neonates in a bin prior to reintroduction with the adult female (right). Photographs by Jason A. Fantuzzi.

Table 1. Litter sizes of Timber Rattlesnakes (*Crotalus horridus*) (averages and ranges) across a broad elevational range. States are listed alphabetically by postal abbreviations. * = data limited to where *C. horridus* occurs in that state; ** = data are deficient; *** = data are based on counts of oviductal embryos.

State	Elevation	Litter size Avg. (range)	Source
AL	Mostly low	12	Guyer et al. 2019
AR	High*	7.3	Lind et al. 2016
CT	High	9, 8	Klemens 2000
		6, 10, 14	Petersen and Fritsch 1986
FL	Low	12	Neill 1948
		6–15	Berish 1998
GA	Mostly low to mid ¹	23	Howze et al. 2012
		30	Breisch et al. 2021 (“David Martin, pers. comm.”)
IA	High	**	—
IL	Mid to high	5.6 (1–11)	Ballard and Bielema (in Breisch et al. 2021)
IN	Mostly high	6–13	Minton 2001
KS	High	5.5	Lind et al. 2016
KY	High to mid	**	—
LA	Low	7–11***	Clark 1949
		5–17	Boundy and Carr 2017
MA	Mostly high ²	(5–9)	MDFW 2015
		7 (5–14) (n = 30)	J. Condon, pers. comm.
MD	High*	6–14	Kelly et al. 1936
MN	High	4–9	Keyler and Oldfield 1997
MO	Mostly high	8 or 9 (7–19 ³)	Briggler and Johnson 2021
NC	High to low	1–9 (montane)	Palmer and Braswell 1995
		11–20 (lowland)	
NH	High	**	—
NJ	High to low	9 (4–16)	R.T. Zappalorti, pers. comm.
		12 (7–18) (n = 7)	This study (lowland population only)
NY	High	7.7 (2–14)	Brown 2016
OH	High	**	—
PA	High	5–9	Hulse et al. 2001
SC	Mostly low	12 (10–16)	Gibbons 1972
TN	High to low	5–14	TWRA 2023
TX	Low to mid*	7–17	Werler and Dixon 2000
VA	High to low	3–16 (montane)	Mitchell 1994
		7–18 (lowland)	
VT	High	5.75***	Bauder et al. 2011
WI	High	7.7	Keenlyne 1978
		6–15	Vogt 1981
WV	High	8–10	Green and Pauley 1987
		2–18	Martin 2002

¹High in the northern fourth of the state.

²The eastern subpopulation occurs chiefly below 150 m asl.

³This very large litter was from the Mississippi River lowlands.

Literature Cited

- Ballard, S.R. and B.J. Bielema. 2021. *Part II. Status and Conservation Needs by State and Province: Illinois*, p. 149. In: A.R. Breisch, W.H. Martin, J.B. Sealy, C.E. Petersen, E. Possardt (eds.), *The Timber Rattlesnake: Life History, Distribution, Status, and Conservation Action Plan*. Partners in Amphibian and Reptile Conservation Technical Publication CAP-1, Amphibian and Reptile Conservancy, Inc., Nashville, Tennessee, USA.
- Bauder, J.M., D. Blodgett, K.V. Briggs, and C.L. Jenkins. 2011. The Ecology of Timber Rattlesnakes (*Crotalus horridus*) in Vermont: A First Year Progress Report Submitted to the Vermont Department of Fish and Wildlife. The Orianne Society, Tiger, Georgia, USA.
- Berish, J.E.D. 1998. Characterization of rattlesnake harvest in Florida. *Journal of Herpetology* 32: 551–557. <https://doi.org/10.2307/1565209>.
- Boundy, J. and J.L. Carr. 2017. *Amphibians and Reptiles of Louisiana. An Identification and Reference Guide*. The Louisiana State University Press, Baton Rouge, Louisiana, USA.
- Breisch, A.R., W.H. Martin, J.B. Sealy, C.E. Petersen, E. Possardt. (eds.). 2021. *The Timber Rattlesnake: Life History, Distribution, Status, and Conservation Action Plan*. Partners in Amphibian and Reptile Conservation Technical Publication CAP-1. Amphibian and Reptile Conservancy, Inc. Nashville, Tennessee USA.
- Briggler, J.T. and T.R. Johnson. 2021. *The Amphibians and Reptiles of Missouri*. Third edition. Missouri Department of Conservation, Jefferson City, Missouri, USA.
- Brown, W.S. 2016. Lifetime reproduction in a northern metapopulation of timber rattlesnakes (*Crotalus horridus*). *Herpetologica* 72: 331–342. <https://doi.org/10.1655/Herpetologica-D-16-00019.1>.
- Clark, R.E. 1949. Snakes of the hill parishes of Louisiana. *Journal of the Tennessee Academy of Science* 24: 244–261.
- Ernst, C.H. and E.M. Ernst. 2003. *Snakes of the United States and Canada*. Smithsonian Institution Press, Washington, D.C., USA.
- Gibbons, J.W. 1972. Reproduction, growth, and sexual dimorphism in the canebrake rattlesnake (*Crotalus horridus atricaudatus*). *Copeia* 1972: 222–226. <https://doi.org/10.2307/1442480>.
- Green, N.B. and T.K. Pauley. 1987. *Amphibians and Reptiles in West Virginia*. University of Pittsburgh Press, Pittsburgh, Pennsylvania, USA.
- Guyer, C., M.A. Bailey, and R.H. Mount. 2019. *Lizards and Snakes of Alabama*. University of Alabama Press, Tuscaloosa, Alabama, USA.
- Howze, J.M., K.M. Stohlgren, E.M. Schlimm, and L.L. Smith. 2012. Dispersal of neonate Timber Rattlesnakes (*Crotalus horridus*) in the Southeastern Coastal Plain. *Journal of Herpetology* 46: 417–422. <https://doi.org/10.1670/10-126>.
- Hulse, A.C., C.J. McCoy, and E.J. Censky. 2001. *Amphibians and Reptiles of Pennsylvania and the Northeast*. Cornell University Press, Ithaca, New York, USA.
- Keenlyne, K.D. 1978. Reproductive cycles in two species of rattlesnakes. *American Midland Naturalist* 100: 368–375. <https://doi.org/10.2307/2424836>.
- Kelly, H.A., A.W. Davis, and H.C. Robertson. 1936. *Snakes of Maryland*. Natural History Society of Maryland, Baltimore, Maryland, USA.
- Keyler, D.E. and B.L. Oldfield. 1992. Timber Rattlesnake *Crotalus horridus* Field Survey on Southeastern Minnesota State Lands. Unpublished report submitted to the Minnesota Department of Natural Resources Nongame Wildlife Program, St. Paul, Minnesota, USA.
- Klemens, M.W. 2000. *Amphibians & Reptiles in Connecticut*. Connecticut Department of Environmental Conservation, Hartford, Connecticut, USA.
- Lind, C.M., B. Flack, D.D. Rhoads, and S.J. Beaupre. 2016. The mating system and reproductive life history of female Timber Rattlesnakes in northwestern Arkansas. *Copeia* 2016: 518–528. <https://doi.org/10.1643/CE-15-254>.
- Martin, W.H. 2002. Life history constraints on the Timber Rattlesnake (*Crotalus horridus*) at its climatic limits, pp. 285–306. In: G.W. Schuett, M. Hoggren, M.E. Dorcas, and H.W. Greene (eds.), *Biology of the Vipers*. Eagle Mountain Publishing, Eagle Mountain, Utah, USA.
- MDFW (Massachusetts Division of Fisheries & Wildlife). 2015. Timber Rattlesnake. *Crotalus horridus*. Natural Heritage & Endangered Species Program, Westborough, Massachusetts, USA.
- Minton, S.A. 2001. *Amphibians and Reptiles of Indiana*. Indiana Academy of Science, Indianapolis, Indiana, USA.
- Mitchell, J.C. 1994. *Reptiles of Virginia*. Smithsonian Institution Press, Washington, D.C., USA.
- Neill, W.T. 1948. Hibernation of amphibians and reptiles in Richmond County, Georgia. *Herpetologica* 4: 107–114.
- Palmer, W.M. and A. Braswell. 1995. *Reptiles of North Carolina*. University of North Carolina Press, Chapel Hill, North Carolina, USA.
- Petersen, R.C. and R.W. Fritsch, II. 1986. *Connecticut's Venomous Snakes: The Timber Rattlesnake and Northern Copperhead*. Second Edition. State Geological and Natural History Survey of Connecticut, Department of Environmental Protection, Storrs, Connecticut, USA.
- TWRA (Tennessee Wildlife Resources Agency). 2023. Timber Rattlesnake *VENOMOUS, *Crotalus horridus*. Tennessee Wildlife Resources Agency, Nashville, Tennessee, USA. <<https://www.tn.gov/twra/wildlife/reptiles/snakes/timber-rattlesnake.html>>.
- Vogt, R.C. 1981. *Natural History of Amphibians and Reptiles in Wisconsin*. Milwaukee Public Museum, Milwaukee, Wisconsin, USA.
- Werler, J. and J.R. Dixon. 2000. *Texas Snakes: Identification, Distribution, and Natural History*. University of Texas Press, Austin, Texas, USA.