

**ARIZONA GAME AND FISH DEPARTMENT
HERITAGE DATA MANAGEMENT SYSTEM**

Animal Abstract

Element Code: ARADE02128

Data Sensitivity: No

CLASSIFICATION, NOMENCLATURE, DESCRIPTION, RANGE

NAME: *Crotalus viridis viridis* (Rafinesque, 1818)

COMMON NAME: Green Prairie Rattlesnake; Prairie Rattlesnake

SYNONYMS: *Crotalinus viridis* Rafinesque (1818)

FAMILY: Viperidae

AUTHOR, PLACE OF PUBLICATION: *Crotalus viridis viridis* (Rafinesque, 1818), Amer. Month. Mag. Crit. Rev., Vol. 4, No. 1, Nov. p. 41.

TYPE LOCALITY: “The type locality was stated as “the Upper Missouri [Valley]” although it was later restricted to “Gross, Boyd County, Nebraska” by Smith and Taylor (1950).” (Degenhardt et al. 1996).

TYPE SPECIMEN: No type specimen was designated.

TAXONOMIC UNIQUENESS: The family Viperidae, commonly known as pit vipers, is a medium to large sized group. Only one of the three subfamilies, Crotalinae, actually penetrates into North America and it contains approximately 140 constituents. In Arizona, 2 subspecies of *Crotalus viridis* occur including *C. v. viridis* and *C. v. nuntius* (Brennan 2006). According to NatureServe (2006), “Douglas et al. (2002) examined mtDNA variation in *C. viridis*, with emphasis on the populations on the Colorado Plateau. As did Pool et al. (2000) and Ashton and de Queiroz (2001), they identified eastern and western clades, with the former including the nominal subspecies *viridis* and *nuntius* and the latter encompassing all of the other subspecies. Douglas et al. (2002) argued that all of the western subspecies should be recognized as species, but they did not effectively indicate details of distributional relationships in the contact zones among the proposed species. Douglas et al. (2002) concluded that the taxon *nuntius* should be regarded as a synonym of *viridis*.” On the other hand, “Crother et al. (2003) considered all of the foregoing evidence and adopted the two-species taxonomy (*Crotalus oreganus*, *Crotalus viridis*) that is supported by the congruence among the three studies cited above. Campbell and Lamar (2004) also recognized only the two species. However, further clarification of the distribution of *C. viridis* and *C. oreganus* is needed, particularly in the contact zones in northern Arizona, southwestern and northwestern Colorado, and southeastern Utah.”

DESCRIPTION: The snout-vent length of *C. v. viridis* is commonly greater than 84 cm (33 in) and may reach up to 162 cm (64 in). *C. v. viridis* may present highly variable ground color throughout its range spanning from greenish-gray to yellow, tan or brown (Brennan

2006; Degenhardt et al. 1996; IMNH 1997; Stebbins 2003); more often is tan with brown dorsal blotches. Their bodies are patterned with 35-55 dark brown blotches on the body (excluding the tail) that are bordered by white, with two rows of smaller spots on their sides. The belly is white and contains no spots (Degenhardt et al. 1996). Typically 27 or 25 dorsal scale rows at midbody; the dorsal scales are keeled. A light stripe extends from behind the eye to the corner of the mouth (Stebbins 2003) and two diagonal white lines can be seen on the side of the head (Degenhardt et al. 1996). The pupils are vertically elliptical. The head is broad and triangular and the neck is slender. It has four or more internasals scales in contact with the rostral; and the anal plate is entire. As with other members of the genus, a rattle composed of a series of loosely interlocking keratinous sections sits on the end of the tail. A new section is added each time the snake sheds its skin. (Brennan 2006).

AIDS TO IDENTIFICATION: *C. v. viridis* can be distinguished from similar species by the presence of more than 2 internasals touching the rostral (Ashton & de Queiroz; Brennan & Holycross 2006; Degenhardt et al. 1996; Stebbins, 2003). Similar to *C. v. nuntius* (Hopi Rattlesnake), which is smaller (up to 60 cm) and usually pinker in coloration. Also may resemble *Sistrurus catenatus* (Massasauga Rattlesnake) which has nine symmetrical plates on the top of its head instead of many more and smaller scales (Degenhardt et al. 1996; TMM@UTA 2000). In addition, *S. catenatus* is smaller (47-76 cm [18-30 in]) than *C. viridis*.

ILLUSTRATIONS:

Color photo (Gary Nafis, CaliforniaHerps.com, Accessed 01/02/2007)

Color illustration (Stebbins 2003: Plate 51)

Color photo (Degenhardt et al. 1996: Plate 121)

Color photo (Bill Sloan, in Arizona Herpetological Association,

<http://www.sloanmonster.com/images/PrarieRtlr.jpg>, Accessed 01/02/2007)

Color photo (Roger A. Repp, in Tucson Herpetological Society

<http://www.arts.arizona.edu/herp/CRVI.html>, Accessed 01/02/2007)

Color photos (Randy Babb, in Brennan 2006 at <http://www.reptilesfaz.com/Snakes-Subpages/h-c-viridis.html>, Accessed 01/02/2007)

Color photo (Suzanne L. Collins 2001, in CNAH <http://www.cnah.org/detail.asp?id=96>)

Color photo (Frank C. Johnson, Accessed 3/28/2007 from

<http://dwrcdc.nr.utah.gov/rsgis2/Search/Display.asp?F1Nm=crotvivi>)

TOTAL RANGE: *C. v. viridis* has a large distribution from southern Canada to Mexico, east throughout Nebraska, and much of Kansas, and west as far as Idaho in the north, and extreme eastern Arizona in the south.

RANGE WITHIN ARIZONA: *C. v. viridis* occurs in extreme eastern portion of the state in the south half of Apache County (Brennan 2006). Brennan and Holycross (2006) report this snake from the Springerville area. Based on collection record from the University of Arizona Museum of Natural History (2006), this snake occurs in the vicinity of Springerville and Saint Johns in Apache County.

SPECIES BIOLOGY AND POPULATION TRENDS

BIOLOGY: Active during the months of March through November, *C. v. viridis* is primarily a nocturnal ground dweller, but is crepuscular during cooler seasons; they will occasionally climb into trees and shrubs. They are diurnal in the spring and on mild or overcast summer days. In late fall and winter, *C. v. viridis* hibernates alone or in a group den in such structures as rodent burrows (e.g. prairie dog towns), slumped blocks and rock escarpments (Watson & Russell 1997); they may form dens with other snakes including *Coluber constrictor* (Racer), *Pituophis melanoleucus* (Gopher Snake), *Lampropeltis triangulum* (Milk Snake), and *Thamnophis elegans* (Western Terrestrial Garter Snake) (BISON-M 2007). (Degenhardt et al. 1996; Brennan 2006; Brennan & Holycross 2006). In Utah, the species has been observed to move in the summer up to about 1.5 km from the winter den (Hirth et al. 1969, in NatureServe 2006).

Like the other “pit-vipers” (members of subfamily Crotalinae) this snake uses heat sensing pits (one on each side of the face between the eye and nostril) to detect warm-blooded predators and prey (Brennan 2006). Predators include *C. constrictor* (Eastern Racer), *Aquila chrysaetos* (Golden eagle) (BISON-M 2007), various mammalian carnivores, raptors, whipsnakes and Kingsnakes (NatureServe 2006). The rattle is a series of horny rings formed of keratin. These grate against each other in pulses to cause the rattle, the rate depending on temperature and humidity. The pulsing cycle may be 21 per second at 50 °F, 99 per second at 104 °F. The rattle begins with a soundless button on a young snake and grows with age. (BISON-M 2007).

REPRODUCTION: Sexual maturity of male *C. v. viridis* usually occurs at the age of 3-4 years, while females mature at the age of 5-7 years (Watson & Russell 1997): females are live-bearing. In New Mexico, spermatogenesis is known to occur during mid to late summer, from June through August or into September (Degenhardt et al. 1996). In Arizona, *C. viridis* mate in June and July (Brennan 2006) and in southern Alberta, Canada *C. v. viridis* are also known to mate during mid to late summer and into early fall (Watson & Russell 1997). However, it has been found in Nebraska that *C. v. viridis* may undergo two periods of mating—the first in early spring and the second in mid to late summer (Degenhardt et al. 1996). Females will store sperm over the winter and give birth the following year. Spring migrations are known to take place in the northern populations of *C. v. viridis*, where pregnant females may form rookeries a short distance from the hibernacula (Graves & Duvall 1993), while males have been known to migrate long distances in search of foraging areas that contain abundant supplies of food (Duvall, et al. 1985; Duvall, et al. 1989). In Arizona, birthing occurs in the summer months (Brennan 2006), while in Canada females will give birth from late August through mid October. Litter size has been found to be highly correlated with body size and each female may produce 5-14 offspring per clutch (Degenhardt et al. 1996). Young average 24 cm (9.5 in) in length. Females may not produce young each year, although it can occur, rather it is thought that *C. v. viridis* follow a biennial or triennial reproductive cycle (Degenhardt et al. 1996; Watson & Russell 1997).

FOOD HABITS: *C. viridis* will consume birds and their eggs, lizards, and amphibians, but adults appear to prefer small mammals such as mice and other rodents (Brennan 2006; Degenhardt et al. 1996). Members of the family Viperidae are known as pit vipers because they have a bladder in the back of their head that contains venom, which they use to paralyze prey, but it can also serve as a defense mechanism. The venom is delivered by small grooves in retractable fangs that act as a syringe to inject the neurotoxin into its victim.

HABITAT: As their common name suggests, *C. v. viridis* choose to inhabit remnant or short-grass prairie grasslands, but may also occur in open desert or shrublands, rocky slopes, and montane ponderosa pine forests (Ashton & de Queiroz 2001; Degenhardt et al. 1996; Watson & Russell 1997).

ELEVATION: In Arizona, *C. viridis* can be found from 5,000 feet to at least 9,000 feet (Brennan 2006; Degenhardt et al. 1996). Based on UAZ collection records (UAMNH 2006), *C. v. viridis* ranges from 5,660 to 7,100 feet (1725-2164 m).

PLANT COMMUNITY: Various, but generally with a grassland component as the common name of this snake would imply.

POPULATION TRENDS: Unknown. The subspecies *viridis* is restricted to eastern portion of state in the vicinity of Springerville and Saint Johns. Little work has been done on current distribution, thus trend information is lacking.

SPECIES PROTECTION AND CONSERVATION

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| ENDANGERED SPECIES ACT STATUS: | None |
| STATE STATUS: | None |
| OTHER STATUS: | PR (Mexican Federal Endangered Species List, 2000) |

MANAGEMENT FACTORS: Unknown.

PROTECTIVE MEASURES TAKEN:

SUGGESTED PROJECTS: Distribution, trend, and habitat use information is lacking in Arizona.

LAND MANAGEMENT/OWNERSHIP: State Land Department; Private.

SOURCES OF FURTHER INFORMATION

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MAJOR KNOWLEDGEABLE INDIVIDUALS:

ADDITIONAL INFORMATION:

The taxonomic structure of *Crotalus* and *Sistrurus* has been called into question by various researchers claiming that *Sistrurus* may or may not be monophyletic, and that *Crotalus* is actually paraphyletic (Crother 2001). Molecular research was performed by Ashton & de Queiroz (2001) on the species *C. viridis* in which they propose *C. viridis* and *C. oreganus* be considered two evolutionarily distinct species. Their research found that *C. viridis* should contain only the subspecies *viridis* and *nuntius* with the remaining subspecies falling under *C. oreganus*. The current accepted taxonomy of these groups is that *Crotalus* and *Sistrurus* are sister taxa and are monophyletic.

Origin of Scientific Name (Beltz 2006):

Crotalus: Greek – krotalon, a rattle – ref. rattle on tail, typical of all but one member of the genus.

viridis: Latin – green – some adults on Great Plains have light greenish-gray dorsal coloration.

** As Brennan (2006) reports, “This rattlesnake is capable of delivering large amounts of potent venom. If encountered it should be left alone. Most envenomations occur when the victim attempts to capture or kill the animal.”

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