ARIZONA GAME AND FISH DEPARTMENT
HERITAGE DATA MANAGEMENT SYSTEM

Animal Abstract **Element Code:** ARADE02130
Data Sensitivity: No

CLASSIFICATION, NOMENCLATURE, DESCRIPTION, RANGE

NAME: *Crotalus willardi obscurus*
COMMON NAME: New Mexico Ridge-nosed Rattlesnake
SYNONYMS: *Crotalus willardi silus*
FAMILY: Serpentes: Viperidae

AUTHOR, PLACE OF PUBLICATION: *C. willardi* (Meek, S.E. 1905. Field Mus. Zool. Ser. 7(1):1-19); *C. w. obscurus* (Harris, H.S., Jr. and R.S. Simmons. 1976. Bull. Maryland Herp. Soc. 11(1):1-7).

TYPE LOCALITY: Indian Creek Canyon near Animas Mts., New Mexico (Bogert and Degenhardt 1961); originally referred to as *C. w. silus*, until formally renamed by Harris and Simmons (1976).

TYPE SPECIMEN: For the species it is FMNH 902, F.C. Willard.

TAXONOMIC UNIQUENESS: Approximately 30 species in genus *Crotalus*. Of the five subspecies of *willardi*, *C.w. willardi* and *C. w. obscurus* occur in Arizona.

DESCRIPTION: The New Mexico Ridge-nosed Rattlesnake is a small mountain rattlesnake, up to 668 mm (26.3 in) total length, but most specimens are smaller (Keegan et al. 1999). The color is generally grayish-brown, and a distinct ridge is present on the end of its snout. The upper surface has obscure, irregularly spaced white crossbars edged with brown in a dull pattern. The young are dark brown and have yellow-orange pigment on the labial scales (Degenhardt et al. 1996); they may have yellow or black tails (Holycross 2000).

C. willardi is typically gray in coloration with 18-45 dorsal blotches, but some individuals may be brownish or reddish (Degenhardt et al. 1996). *C. willardi* has 23-31 rows of keeled scales at mid-body (Degenhardt et al. 1996). Males have 140-156 ventrals and 24-36 subcaudals; females have 146-160 ventrals and 21-32 subcaudals (Barker 1991). Males have tails 9.1-11.5% of SVL; females only 7.9-9.8% of SVL (Degenhardt et al. 1996). There are 1-3 loreals, 2-3 preoculars, 3-4 postoculars, and 13-14 (12-17) upper and lower labials (Ernst 1992).

AIDS TO IDENTIFICATION: *C. willardi obscurus* lacks the vertical white stripe on the rostral and mental scales, and the lateral facial stripes are faded or absent, compared to *C. willardi willardi* (Ernst 1992). *C. w. obscurus* is gray to brownish compared to the brownish to reddish-brown *C. w. willardi* (Ernst 1992).

ILLUSTRATIONS:

Color photo (Ernst 1992: plate 55)
Color photo (Campbell and Lamar 1989: figure 435)
Color photo (Degenhardt et al. 1996: plate 122)
Color photo: http://www.reptilesofaz.org/Snakes-Subpages/h-c-willardi.html.
Color photo: http://www.californiaherps.com/noncal/southwest/swsnakes/pages/c.w.obscurus.html.

TOTAL RANGE: *C. willardi* occurs from south central Arizona and southwestern New Mexico south to Durango and Zacatecas (Lowe et al. 1986). *C. w. obscurus* is known only from the Animas and Peloncillo mountains of New Mexico (and the Peloncillos of Arizona; Holycross and Smith 1997) and the Sierra de San Luis of extreme northeastern Sonoran and western Chihuahua, Mexico (Ernst 1992).

RANGE WITHIN ARIZONA: *C. willardi* is found in most of the Sky Island mountain ranges throughout much of southeastern. The species is known from the Huachuca, Santa Rita, Patagoina, Canelo and Whetstone mountain ranges. (Brennan 2016). *C. w. obscurus* is known only from the Peloncillo Mountains in extreme SE Arizona (Holycross and Smith 1997).

SPECIES BIOLOGY AND POPULATION TRENDS

BIOLOGY: Ridge-nosed rattlesnakes are generally secretive and inconspicuous; when encountered they are more likely to rattle and attempt to escape rather than coil and strike (Degenhardt et al. 1996). Individuals from Sierra de San Luis were found hibernating 40-46 cm (16-18 in) deep in talus slopes, and observed basking at air temperatures of 6-9ºC (43-48ºF, shade) and 26ºC (79ºF, sun) (Degenhardt et al. 1996). The paleogeography and evolution of *C. willardi* complex were described by Harris and Simmons (1976). Morphology and biochemical characteristics of *C. willardi* complex, and specifically the acceptance of the *C. w. obscurus* taxon, were described by Barker (1992). It uses its venom by injecting it through long, hollow and retractable fangs. *C. willardi* is diurnal, can be crepuscular and is occasionally active during the night at lower elevations. This ground-dweller is occasionally found in tree trunks and on rock outcroppings. As with all other pit-vipers it uses heat sensing pits to detect warm-blooded prey and predators (Brennan 2016).

McAllister et al (1996) published the first report of two New Mexico ridge-nosed snakes passing oocycts and free sporocycts from the parasite Sarcocystis sp. in their feces.

REPRODUCTION: Mating occurs in midsummer to early fall. Brood size averages about 5.5 young (2-9), with the young born from late July through late August (Applegarth 1980; Holycross and Goldberg 2001). There is no maternal care, and the young disperse from the natal area within a few days of their birth. Female reproduction is typically biennial or longer (Holycross and Goldberg 2001). The shortest reproductively active specimens measured 402-406 mm (16 in) snout-vent length for females and males, respectively (Holycross and Goldberg 2001). An apparent natural hybrid between *C. w. obscurus* and *C. lepidus klauberi*

was reported from the Peloncillo Mountains, New Mexico (Campbell et al. 1989).

FOOD HABITS: Applegarth (1980) reported prey including various rodents, birds, lizards, snakes, and arthropods. Barker (1991) also found body parts of the large centipede, *Scolopendra*, in a fecal sample. The juvenile diet consists primarily of lizards and centipedes, while adults feed primarily on small mammals, lizards, and passerine birds (Holycross et al. in press). Its venom will kill and begin digesting its prey (Brennan 2016). In a study on *C.w. obscurus* (Holycross et al 2002), juvenile diets consisted of lizards (57%) and centipedes (33%), while adults preferred small mammals (62%), lizards (26%) and passerine birds (9%). The species is active during the day, and may use caudal or facial lures to attract prey. The juveniles have either black or yellow tail-tips, a feature that may assist in prey luring.

A recent diet study (Mocino-Deloya et al 2015) in two mountain ranges in northern Mexico found some different results from previous studies. Overall, prey items identified were 54.4% lizards, 13.6% scolopendromorph centipedes, birds 21.4% and mammals 10.7%. The diet of juvenile snakes (n = 32) consisted primarily of lizards (62.5%) and centipedes (25.8%), although large juveniles also consumed mammals (6.3%) and passerine birds (6.3%). Adult snakes (n = 71) fed primarily on lizards (50.7%) and passerine birds (28.2%) but also consumed mammals (12.7%) and centipedes (8.4%). *Crotalus willardi* in the Sierra San Luis and Sierra Pan Duro consumed more birds than has been reported from *C. willardi* in nearby populations and continued to consume centipedes as adults.

HABITAT: The New Mexico Ridge-nosed Rattlesnake occupies Madrean evergreen woodland and Petran montane forest communities (Holycross and Douglas 1997, and Brennan 2016). Most commonly found near drainages with plentiful leaf litter and canopy cover.

ELEVATION: *C. w. obscurus* occurs at elevations above 1525 m (5,000 ft) (Holycross and Douglas 1997).

PLANT COMMUNITY: The Ridge-nosed Rattlesnake is usually encountered within Madrean Evergreen Woodland or Petran Montane Conifer Forest (Brennan 2016). The species has been described as a montane generalist (Degenhardt et al. 1996; Lowe et al. 1986) but is primarily a denizen of pine-oak woodland. *C. w. obscurus* is found in habitat composed of various oaks, Apache and Chihuahua pines (*Pinus engelmannii* and *P. leiophylla*), alligator juniper (*Juniperus deppeana*), Arizona cypress (*Cupressus arizonica*), Arizona madrone (*Arbutus arizonica*), manzanita (*Arctostaphylos* sp.), and various grasses including *Sporobolus*, *Muhlenbergia*, and *Aristida* (Degenhardt 1972; Degenhardt et al. 1996).

POPULATION TRENDS: Population trends are unknown, but it is believed that the New Mexico population could be negatively impacted by habitat destruction or by overzealous and irresponsible collectors (Degenhardt et al. 1996). The subspecies was historically limited in range and never very common. The U.S. population was estimated at about 500 in the 1960s. Intensive collection (until 1974) may have reduced the population by one-fourth (NatureServe 2016). The USFWS listed the status as unknown in 1990. NatureServe considers the

subspecies to be critically imperiled due to its very small range, habitat disturbance and over-collecting.

SPECIES PROTECTION AND CONSERVATION

ENDANGERED SPECIES ACT STATUS: LT with Critical Habitat in New Mexico only (USDI, FWS 1978)

STATE STATUS: 1 (AZGFD, AWCS 2022)
[1A (AGFD SWAP 2012)]
State Endangered (New Mexico Game and Fish 1990)

OTHER STATUS: PR, Determined Subject to Special Protection in Mexico (NORMA Oficial Mexicana NOM-059-SEMARNAT-2010)
[Determined Subject to Special Protection Secretaria de Medio Ambiente 2000]
[Determined Subject to Special Protection, Secretaria de Desarrollo Social 1994]

MANAGEMENT FACTORS: Threats exist due to stand-replacing fire from years of fire suppression and overgrazing; fuel loads should be reduced before allowing or reintroducing large-scale summer fires (Smith et al. 2001).

Loss of habitat due to wildfire, improperly conducted prescribed fire, livestock grazing, and other land management actions that contribute to degraded watersheds have adverse effects to the rattlesnake. Human activity is also a threat, in part from illegal collection, but also from contacts between humans and snakes in the wild. The small size and limited habitat areas occupied by the extant populations increases the risks of extirpation due to loss of habitat or loss of individuals that come into contact with people.

A microsatellite DNA loci analysis conducted by Holycross and Douglas (2002) suggest that the populations occupying the three mountain ranges that comprise their total known range are genetically isolated and currently on independent evolutionary trajectories. Accordingly, it is recommended that each mountain population be managed as a distinct population segment (DPS). While data from the Animas Mountains suggests genetic cohesiveness and high levels of gene flow within the population, this may not apply to the Peloncillo Mountains. There, comparatively low levels of diversity suggest reductions in size of the Peloncillo population as well as a very small population. The possibility of a captive breeding program is raised, although several concerns are noted. Preservation of the limited woodland habitat remaining, and a conservative approach to the reintroduction of fire should be management priorities.

PROTECTIVE MEASURES TAKEN: This subspecies is listed as threatened, and critical habitat was designated in the Animas Mountains in Hidalgo County, New Mexico (FWS

1978). A recovery plan was completed in 1985. It is against Federal law and Arizona State law (Arizona Game and Fish Commission Order 43) to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect *Crotalus willardi obscurus* or to attempt to engage in any such conduct.

SUGGESTED PROJECTS: Determine presence/distribution within the Mule, Dragoon, and Chiricahua mountains (Holycross and Douglas 1997). Determine distribution within the Peloncillo Mountains. Population monitoring during the 10-year Peloncillo Programmatic Fire Plan. Habitat, population, and life history studies are needed.

LAND MANAGEMENT/OWNERSHIP: US Forest Service: Coronado National Forest.

SOURCES OF FURTHER INFORMATION

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ADDITIONAL INFORMATION: Venomous; mild mannered but will turn and bite if grasped; venom is of relatively low toxicity and snake can inject only a relatively small volume, so not especially dangerous to humans (Ernst 1992).

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2013-01-30 (CFP)
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