ARIZONA GAME AND FISH DEPARTMENT
HERITAGE DATA MANAGEMENT SYSTEM

Animal Abstract **Element Code:** ARADB21010

CLASSIFICATION, NOMENCLATURE, DESCRIPTION, RANGE

NAME: *Masticophis bilineatus* (Jan, 1863)
COMMON NAME: Sonoran Whipsnake

SYNONYMS: *Coluber bilineatus* (Jan, 1863)
Masticophis bilineatus bilineatus (Jan, 1863)
Masticophis bilineatus lineolatus (Hensley, 1950)
Masticophis lineolatus
OTHER COMMON NAMES: Ajo Mountain Whipsnake
Látigo de Sonora (Spanish)
FAMILY: Colubridae

AUTHOR, PLACE OF PUBLICATION: Jan, G. 1863. Elenco Sistematico degli Ofidi descriti e disegnati per l'Iconografia Generale. Milano, A. Lombardi. vii + 143 pp.

TYPE LOCALITY: "Messico occid. ?" (western Mexico) restricted to Guaymas, Sonora, Mexico by Smith and Taylor (1950) (Camper 1996).

TYPE SPECIMEN: Holotype: Staatliches Museum fuer Tierkunde (MTKD) 15523. Collector and date of collection unknown. **Syntype:** Smithsonian Institution, National Museum of Natural History (USNM) 8434, James M. Rutter, 1874-09-16 and 1981, Arthur C. V. Schott and Major Emory, date unknown.

TAXONOMIC UNIQUENESS: There are 7 species in the genus *Masticophis* that occur in the United States (Nicholson 2025), four of which occur in Arizona (Holycross et al. 2022a, Center for North American Herpetology 2025). There are no recognized subspecies for *M. bilineatus* (Nicholson 2025, Uetz 2026)

Crother (2008, 2012, 2017) previously treated the taxon as *Coluber bilineatus*. Several phylogenetic studies (e.g., Nagy et al. 2004; Utiger et al. 2005, Pyron et al. 2013) found *Masticophis* to be paraphyletic with respect to *Coluber*, with Utiger et al. (2005) recommending placing *Masticophis* in synonymy with *Coluber*. Using a broader taxon sampling than the previous studies, Myers et al. (2017) using nuclear and mitochondrial DNA, and O'Connell et al. (2017), using mitochondrial DNA, found *Masticophis* to be

monophyletic and sister to *Coluber*. Following guidance from Tom Jones (Arizona Game and Fish Department (AZGFD), Amphibians and Reptiles Program Manager; personal communication 2025), the Arizona Heritage Data Management System (HDMS) recognizes *Masticophis* as valid, consistent with Myers et al. (2017), Holycross and Mitchell (2020), Holycross et al. (2022b), and Nicholson (2025).

DESCRIPTION: The Sonoran whipsnake is a long, slender snake with the head wider than the forebody (Murphy 2019, Holycross et al. 2022a). Sonoran whipsnakes are olive-brown and bluish-gray in color, fading towards yellow and increasingly lighter toward the middle of the body and more gray towards the tail (Holycross et al. 2022a). Two lateral dark stripes extending down the sides of the body are separated by lighter stripes that are similar to the ventral color (Holycross and Mitchell 2020). The belly is cream with the underside of the tail being yellow. There is minimal pattern and color variation throughout their geographic range (Holycross and Mitchell 2020). Males are generally larger than females, with males having a snout-vent length (SVL) of 537–1,353 mm (21–53 in) and females measuring 356–1,155 mm (14–45 in) SVL (Camper and Dixon 1994). The tail is approximately 40% of total length (Murphy 2019), with a maximum reported total length of 1,800 mm (70.9 in) (Starrett and Holycross 2013). Both sexes have a similar number of scales; males have 182–221 ventral scales and 120–167 subcaudal scales while females have 183–216 ventral scales and 121–165 subcaudal scales (Camper 1996). Their scales are smooth, with 17 dorsal scale rows and the anal plate divided (Degenhardt 1996, Holycross et al. 2022a).

AIDS TO IDENTIFICATION: The Sonoran Whipsnake has 17 dorsal scale rows at midbody, distinguishing it from the similar Striped Whipsnake which has 15 rows (Stebbins and McGinnis 2018, Holycross et al. 2022a). Other features unique to this species are pairs of white spots on the dorsal scales and lateral stripes that end towards the mid-body (Holycross and Mitchell 2020).

ILLUSTRATIONS

Color photo (Behler and King 1979, Plate 517)
Black and white photo (Camper 1996, page 637.1)
Color photo (Stebbins and McGinnis 2018, plate 43)
Color photo (Murphy 2019, page 224)
Color photos (Holycross and Mitchell 2020, pages 240, 241, 243, 244 & 248)
Color photo (Holycross et al. 2022a, page 129)
Color photos (AZGFD 2023, https://live-reptilesofaz.pantheonsite.io/snakes-subpages/h-c-bilineatus/)
Color photos (AZGFD, Arizona Wildlife Conservation Strategy 2025, https://awcs.azgfd.com/species/reptiles/masticophis-bilineatus)
Color photos (Uetz 2026)

TOTAL RANGE: The Sonoran Whipsnake populations range from central Arizona to extreme southwestern New Mexico, south through western Mexico to Colima with an eastward extension onto the Mexican Plateau in Jalisco, Aguascalientes, and Zacatecas (Camper and Dixon 1994, Camper 1996). They have been documented in several desert mountains within the central region of the Basin and Range Province and all the major sky island mountain ranges except the Sierrita Mountains (Holycross and Mitchell 2020).

RANGE WITHIN ARIZONA: Southeastern to west-central Arizona in Cochise, Graham, Gila, Greenlee, Maricopa, Mohave, Pima, Pinal, Santa Cruz, and Yavapai counties (Holycross and Mitchell 2020).

SPECIES BIOLOGY AND POPULATION TRENDS

BIOLOGY: The Sonoran Whipsnake is diurnal and primarily active from March–October (Degenhardt et al 1996). They have been observed in Arizona in every month other than February (mostly in May and August) (Holycross and Mitchell 2020). The Sonoran Whipsnake is semi-arboreal and is a skilled climber (Stebbins and McGinnis 2018). They spend the majority of their time underground, but spend a substantial amount of time aboveground and are often found in trees when on the surface (Parizek et al. 1996), retreating into the high branches when pursued (Holycross et al. 2022a). When hunting, Sonoran Whipsnakes may elevate the head off the ground and scan the surrounding area for possible prey (Holycross and Mitchell 2020). Sonoran Whipsnakes will rest in shallow water, and will swim and dive to escape capture (Holycross and Mitchell 2020).

Sonoran Whipsnakes experience significant fluctuations in body temperature when moving between underground habitats and the surface. Body temperatures remain low and stable during winter hibernation (Parizek et al. 1996).

Parizek et al. (1996) implanted transmitters in seven Sonoran Whipsnakes at Organ Pipe Cactus National Monument, but, due to transmitter failures, were only able to record enough to analyze for two individuals. Home range estimates differed significantly between the two individuals with one estimated at 6.9 ha (17.0 ac) over 83 days and 18.6 ha (50 ac) over 316 days for the other. They made movements between 4 and 718 m (13 and 2,356 ft) , with each movement spanning 1–3 days. Parizek et al. (1996) suggested the longest movements were related to mate searching.

Predators of this species are predominantly hawks, including Black Hawks (*Buteogallus anthracinus*), Grey Hawks (*Buteo plagiatus*), and Red-tailed Hawks (*Buteo jamaicensis*) (Holycross and Mitchell 2020), but also includes carnivorous mammals (Murphy 2019) and

possibly Rock Squirrels (*Spermophilus variegatus* (Kamees and Holycross 2013). The striped pattern of the snake helps it avoid predators by breaking the broad figure into several narrow segments, making it difficult to follow during swift movements (Jackson et al. 1976, Holycross and Mitchell 2020).

REPRODUCTION: The Sonoran Whipsnake is oviporous (Holycross and Mitchell 2020). Females are reproductively active from April to July, with only a portion of the female population being reproductively active in any given year. Male sperm production patterns suggest that reproductive activity may occur in both spring and fall as they produce sperm in April through June (spring) and September through November (fall) (Goldberg 1998). Females lay 6–13 rough, leathery eggs in June or July (Stebbins and McGinnis 2018, Holycross et al. 2022). Eggs typically hatch in August–October (Holycross and Mitchell 2020). Females reach sexual maturity at about 725 mm (28.2 in) SVL and males at about 749 mm (29.5 in) SVL (Goldberg 1998). There has been at least one reported instance of two males that were observed in combat (Holycross and Mitchell 2020).

FOOD HABITS: Sonoran Whipsnakes primarily consume lizards and birds, but predation of frogs, small mammals, and other snakes has also been documented (Enderson 1999, Camper and Dixon 2000, Bezy and Enderson 2003, Stitt 2003, Jones et al. 2013, Cowles 2018, Holycross and Mitchell 2020). Although Sonoran Whipsnakes prey on multiple lizard species, over 50% of lizard prey taxa are *Aspidoscelis* spp. (whiptails) (Holycross and Mitchell 2020). This snake is not a constrictor, so its diet is limited by the size and strength of potential prey (Degenhardt et al. 1996). Substantial costs may be incurred by active pursuers such as Masticophis, but data to test this possibility is not available (Seigel and Collins 1993).

HABITAT: The Sonoran Whipsnake is a habitat generalist found in areas with low trees, rock outcrops, steep rocky hills associated with streambeds, and areas with moderate ground cover of grasses and substrate such as rocks, litter, and shrubs. They can be found in desert, scrub, grassland, chaparral, woodland, and riparian habitats (Holycross and Mitchell 2020). Snakes hibernate on north facing slopes but spend the warmest months primarily on the flats or southern exposures (Parizek et al. 1996). Sonoran Whipsnakes use a variety of cover as shelters, including pocket mouse (Heteromyidae) burrows, rock substrate, Foothill Palo Verde (*Parkinsonia microphylla*) trees, and debris. However, rock shelters are not used as resting shelters for extended periods of time (Parizek et al. 1996). Degenhardt et al. (1996) suggested they may use rodent burrows as shelter. Parizek et al. (1996) reported that individuals demonstrate shelter fidelity, with six of 40 known shelters being reused up to nine times.

ELEVATION: 7,545 ft (2,300 m) (Camper 1996).

PLANT COMMUNITY: Upland Sonoran Desertscrub, Chihuahuan Desertscrub, Semidesert Grassland, Plains Grassland, Interior Chaparral, Madrean Evergreen Woodland, Great Basin Conifer Woodland, and low-elevation Sonoran Riparian Deciduous Forest and Woodland. Whipsnakes have a strong association with *Parkinsonia microphylla* (Foothill Palo Verde) (Parizek et al. 1996).

POPULATION TRENDS: Although Sonoran Whipsnake population densities and abundance are generally unknown, population sizes are probably relatively stable and are unlikely to experience a significant population decline due to their generalist diet and habitat and wide geographic range (Frost et al. 2007, Holycross and Mitchell 2020). It has been reported to be among the most frequently observed snake species in several areas of southeastern Arizona (Holycross and Mitchell 2020).

SPECIES PROTECTION AND CONSERVATION

Status definitions: https://hdms.azgfd.com/species-list/columns
Heritage Network Conservation Status Rank definitions:
https://hdms.azgfd.com/species-list/columns/#SRANK

AGENCY STATUS

AZGFD:	2 (AZGFD, AWCS 2022)
UFWS (Endangered Species Act):	None
U.S. Forest Service:	None (USDA, Forest Service 2007)
Bureau of Land Management:	None
Navajo Nation:	None
Mexico:	None

OTHER STATUS

Heritage Network Status:	G5
	S4
IUCN:	LC (Frost et al. 2007)

PREVIOUS STATUS

AGENCY STATUS

AZGFD:	1B (AGFD SWAP 2012)
U.S. Forest Service:	Sensitive, as *M. bilineatus lineolatus* (USDA, Forest Service 1999)

MANAGEMENT FACTORS: There are no documented major threats to Sonoran Whipsnake populations, and its habitat is often unsuitable for anthropogenic use (Frost et al. 2007). Parizek et al. (1996) suggested Sonoran Whipsnakes have no substantial threats at the population level other than potential sensitivity to climatic change (Parizek et al. 1996). They also identified road morality and habitat destruction as minor management concerns.

PROTECTIVE MEASURES TAKEN:

SUGGESTED PROJECTS: Camper (1996) suggests a thorough ecological study is needed for this species.

LAND MANAGEMENT/OWNERSHIP[1]

BLM - Agua Fria, Ironwood Forest, Sonoran Desert, and Vermilion Cliffs National Monuments; Las Cienegas National Conservation Area; Hassayampa, Kingman, Lower Sonoran, Safford, and Tucson Field Offices

DOD - Fort Huachuca

NPS - Chiricahua, Coronado, Organ Pipe Cactus, and Tuzigoot National Monuments; Fort Bowie National Historic Site; Saguaro National Park

Regional - Phoenix Mountains Preserve, Tucson Mountain Park

State - Lost Dutchman and Patagonia Lake State Parks; Sonoita Creek Natural Area; Spur Cross Ranch Conservation Area; State Trust Land

USFS - Apache-Sitgreaves, Coconino, Coronado, Prescott, and Tonto National Forests

USFWS - Leslie Canyon National Wildlife Refuge

Tribal - Hopi Indian and San Carlos Indian Reservations, Tohono O'Odham Nation

Private

SOURCES OF FURTHER INFORMATION

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[1] The list is based on where HDMS has records for the species and potentially may not be complete.

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MAJOR KNOWLEDGEABLE INDIVIDUALS:

EXTERNAL LINKS:

Arizona Wildlife Conservation Strategy
NatureServe Explorer
iNaturalist

ADDITIONAL INFORMATION:

The genus name *Masticophus* originates from the combination of the Greek words *mastix*, meaning whip and *ophis*, meaning serpent, which represents the snake's whip-like body. The species *bilineatus* refers to the latin words *bi* meaning two and *lineatus* meaning line, referring to the two lateral stripes on the sidebody (Holycross and Mitchell 2020).

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2026-04-16 (AGE)

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