

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

Invertebrate Abstract

Element Code: IMGASC9280

Data Sensitivity: No

CLASSIFICATION, NOMENCLATURE, DESCRIPTION, RANGE

NAME: *Sonorella grahamensis*

COMMON NAME: Pinaleno Talussnail

SYNONYMS:

FAMILY: Helminthoglyptidae

AUTHOR, PLACE OF PUBLICATION: H.A. Pilsbry & J.A. Ferriss. 1919. Mollusca of the southwestern states. IX. The Santa Catalina, Rincon, Tortillita and Galiuro mountains. X. the Mountains of the Gila headwaters. Proc. Acad. Nat. Sci. Philad. 70 (for 1918): 282-333.

TYPE LOCALITY: Mud Spring (?) on the summit of Mt. Graham, Graham Co., Arizona. (See "Additional Information").

TYPE SPECIMEN: Holotype: Academy of Natural Sciences of Philadelphia 109101. H.A. Pilsbry and J.A. Ferriss, 1919.

TAXONOMIC UNIQUENESS:

DESCRIPTION: A land snail with a globose shell with about 4.5 whorls. This shell has a tan to live tint and a chestnut-brown shoulder band, which has indistinctly pallid borders. It is approximately 19 mm in diameter. The five species of *Sonorella* in the Pinalenos cannot be distinguished from one another without dissection. For helminthoglyptidae, the buccal mass is small and spheroidal. The gastric caecum and the rectal caecum are absent. The radular teeth are endocones and ectocones retained in marginal teeth but these are serrated, on quadrate or rectangular basal plates or the central and lateral teeth may be lacking endocones and ectocones but with a broad mesocone. The prolonged cuspid head on radular teeth may or may not be present. The cephalic shield is reduced, defined only by vestigial grooves. The hyponotum is absent. Inferior tentacles are present. The eye position is at the tip of more or less elongate cephalic tentacle. The tentacular nerve is bifurcated. (Barker 2001).

AIDS TO IDENTIFICATION: "Differentiated from *S. christenseni* by shell characteristics. However, the two are still difficult to separate with casual examination. Comparisons of the genitalia of these two species will separate them easily." (Fairbanks and Reeder, 1980).

ILLUSTRATIONS: Photo of shell (Hoffman, undated: P. 15).
Photo of reproductive tract (Hoffman, undated: P. 23).

TOTAL RANGE: Rockslides from the northeast slope of Mt. Graham south to the vicinity of Arcadia Campground, Pinaleno Mountains, Graham County, Arizona.

RANGE WITHIN ARIZONA: See "Total Range."

SPECIES BIOLOGY AND POPULATION TRENDS

BIOLOGY: It is believed that most Pinaleno land snails mature in two to three years with a lifespan of approximately six years. According to Hoffman (undated), humidity can be very important, giving them enough moisture to support foraging, although there may be no rainfall for several weeks.

REPRODUCTION: Reproduction in *Sonorella* of the Pinaleno Mountains has not been studied. Hoffman believes that they are probably similar to other *Sonorella* species, which are hermaphroditic. "Each *Sonorella* lays a clutch of thirty to forty eggs once or, in particularly good years, twice during each summer" (Hoffman undated). For helminthoglyptidae, embryonic brooding may or may not be present and they can be oviviparous or viviparous. The eggs are single, not embedded in a jelloid/mucoid mass. The egg capsule could be partially calcified, with calcite crystals embedded in jelly layers but not forming a distinct shell or it could be calcified forming a distinct shell. The larval development has no trochophore or veliger stages, there is direct development in the egg. The larval operculum is absent. The genital orifices in the male and female are fused or nearly so in cephalic region, near right ocular tentacle. The extrapallial sperm duct is a closed duct, free in the body cavity. The lumen of the penis is lacking of spines. (Barker 2001).

FOOD HABITS: Hoffman (undated) states that *Sonorella* in the Pinaleno Mountains feed primarily on fungus and decaying plant matter, which is supplemented with young green shoots when available. For helminthoglyptidae, the openings of the digestive gland lobes are more or less adjacent, openings are intestinal. The stomach is greatly simplified, with very poorly developed musculature. The diagonal intestinal folds are absent. The intestinal valve is absent. (Barker 2001).

HABITAT: Rockslides within the Pinaleno Mountains, Graham County, Arizona.

ELEVATION: 6,000 - 10,000 ft. (1,830 - 3,050 m).

PLANT COMMUNITY: Hoffman (undated) states that "the plants associated with the land snails in the Pinaleno Mountains vary with elevation." He lists various plant species associated with these snails for "higher" and "lower" elevations, but does not define "higher" and "lower" by giving specific elevations or exact species of snails associated with various plant species.

POPULATION TRENDS: According to Hoffman (undated), it has been observed since 1954 that *S. imitator* is becoming more common over the range previously inhabited by *S.*

grahamensis. Reasons for this are unknown at this time. *S. grahamensis* habitat does not appear to be degraded. Because so little is known of the habitat requirements of this snail, changes in the environment could be detrimental as well as beneficial. Therefore, more research is required.

SPECIES PROTECTION AND CONSERVATION

ENDANGERED SPECIES ACT STATUS: None (USDI, FWS 1996)
[C2 USDI, FWS 1994]
[C2 USDI, FWS 1991]

STATE STATUS: None

OTHER STATUS: Forest Service Sensitive (USDA, FS Region 3 1999)

MANAGEMENT FACTORS: Land managed as a multiple use forest and is primarily used for recreation. The telescope complex on Mt. Graham and an increase of camping and recreational sites are not expected to impact these snails to a great extent. However, the phasing out by the Forest Service of the fire suppression policy, may have a greater impact. Because fires have been suppressed for a period of time, dead brush and decayed plant matter has built up on top of the talus slopes so that the heat of a large fire may be intense enough to kill the snails in the talus below.

Threats: restricted and declining distribution with associated potential for extinction due to chance events; replacement by Mimic Talussnail (*S. imitator*); potentially intense fires resulting from increased fuel loads. **Management needs:** research on effects of controlled burns; modification of fire suppression policy; periodic monitoring of snail populations and their habitats; research on ecology and systematics.

PROTECTIVE MEASURES TAKEN:

SUGGESTED PROJECTS: Research needed on the effect of natural fires on snail populations. More studies on general life history, reproduction, morphology and population status need to be performed.

LAND MANAGEMENT/OWNERSHIP: USFS - Coronado National Forest.

SOURCES OF FURTHER INFORMATION

REFERENCES:

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- Hoffman, J.E. Undated. Status survey of seven land snails in the Mineral Hills and the Pinaleno Mountains, Arizona. Prepared for USFWS.
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- USDI, Fish and Wildlife Service. 1996. Endangered and Threatened Wildlife and Plants; Review of Plant and Animal Taxa that are Candidates for Listing as Endangered or Threatened Species. Federal Register 61(40): 7596-7613.

MAJOR KNOWLEDGEABLE INDIVIDUALS:

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ADDITIONAL INFORMATION:

"There is no "Mud Spring" on modern maps of the Pinaleno Mountains. Pilsbry writes that camp was in Stockton Pass and they walked up to the summit of Mount Graham for a couple of hours of collecting, then; presumably, because no other camp was mentioned; returned to camp for the night (Pilsbry 1939). This is a round trip distance of something more than 24 miles with more than 4500 feet of elevation change. Because of this, though the type locality is considered to be the summit of Mt. Graham, I feel that it is actually more likely to be at Heliograph Peak or somewhere between Ladybug Saddle and Heliograph Peak." (Hoffman undated).

"*S. grahamensis* has been collected by W.B. Miller, W.O. Gregg, M.L. Walton, R.L. Reeder, H.L. Fairbanks, and C.C. Cristensen at rockslides near Plain View Peak, Heliograph Peak, Wet Canyon, and above Swift Trail (Hwy 366) above Ladybug Saddle. The species has been found most consistently on Heliograph Peak. During this study all areas above were searched for *S. grahamensis* without success. During the summer of 1989, likely *Sonorella* habitats were searched within the Pinaleno Range as well as those in all of the immediately surrounding mountain ranges. These mountain ranges include the Santa Teresa, Dos Cabezas, Galiuro, Winchester, and Peloncillo Mountains." (Hoffman undated).

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