

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

Invertebrate Abstract

Element Code: IICOL5B010

Data Sensitivity: No

CLASSIFICATION, NOMENCLATURE, DESCRIPTION, RANGE

NAME: *Heterelmis stephani* Brown
COMMON NAME: Stephan's Heterelmis Riffle Beetle
SYNONYMS:
FAMILY: Elmidae

AUTHOR, PLACE OF PUBLICATION: Brown, H.P. 1982: Entomological News, 83:229-238.

TYPE LOCALITY: Bog Springs, Pima County, Arizona

TYPE SPECIMEN: Holotype to be deposited at Canadian National Museum, Ottawa. K. Stephan. 16 May 1970.

TAXONOMIC UNIQUENESS:

DESCRIPTION: Male - Length 2.3-2.6 mm (0.09-0.10 in); breadth 1.05-1.20 mm (0.04-0.05 in). Body elongate ovoid, sides subparallel. Elytra barely wider than prothorax; moderately strongly convex. Surface inconspicuously pubescent clothed with fine, golden, recumbent hairs. Cuticle moderately shining, ranging in color from light brown to dark brown, elytra often lighter than pronotum, legs light brown to reddish brown, basal segment of each tarsus with 3 short stout spines; antennae and mouthparts testaceous to reddish brown. Body elongate, sides subparallel; elytra barely wider than thorax, 2.3-2.6 mm (0.09-0.1 in.) long, 1.04-1.2 mm (0.04-0.05 in.) wide.

Female - generally similar to male externally except for proportions; e.g. pronotum 0.93 mm (0.37 in.) broad and 0.875 mm (0.04 in.) long; 0.90 mm (0.04 in.) broad at base and 0.65 mm (0.03 in.) at apex; elytra more than twice as long as pronotum, being 1.85 mm (0.07 in.) long; prosternum proportionately broader, being 0.88 mm (.04 in.) wide and 0.62 mm (0.25 in.) long. Transverse sutural ridge between mesosternum and metasternum raised medially. Genitalia relatively elongate.

AIDS TO IDENTIFICATION: *H. stephani* considerably smaller than *H. longula* with which it could be confused. *H. stephani* is 2.3-2.6 mm (0.09-0.10 in) long compared with 3.5-4.0 mm (0.14-0.16 in.) for *H. longula*. *H. stephani* also lacks distinct transverse and longitudinal pronotal impressions.

ILLUSTRATIONS:

(Brown 1972:232)

B&W Drawing (Brock and Prchal 2001)

TOTAL RANGE: Bog, Kent and Sylvester Springs, all in Madera Canyon, in the Santa Rita Mountains, Pima and Santa Cruz counties, Arizona.

RANGE WITHIN ARIZONA: See "Total Range."

SPECIES BIOLOGY AND POPULATION TRENDS

BIOLOGY: As little is known of *H. stephani*, information is extrapolated from other members of the family Elmidae. Elmid larvae completely aquatic, generally detritivores, eating detritus, encrusting algae, and waterlogged wood. Pupation occurs in small cells in moist sand, beneath rocks, under loose bark, or in other protected sites near water. Adults commonly fly and may be taken at lights shortly after emergence. Once submerged, adults may never return to the surface and may live for more than one year. Adults occur in same habitats and have same food habits as larvae. Adults probably survive by receding up to several centimeters into moist pockets of soil when water flow decreases. Consequently population dynamics of *H. stephani* are probably closely linked to spring flow.

The genus *Heterelmis* is mostly neotropical in distribution with about 14 species scattered throughout most of South and Central America (Brown 1981, Bosse et al. 1988).

REPRODUCTION: Unknown

FOOD HABITS: Detritivores. See "**BIOLOGY:**"

HABITAT: Submerged wood. Adult *H. stephani* have been collected from waterlogged, decomposing wood, leaf litter and detritus in small seeps and springs.

ELEVATION: 5,000 - 7,000 ft. (1525 - 2135 m)

PLANT COMMUNITY: Oak Woodland

POPULATION TRENDS:

SPECIES PROTECTION AND CONSERVATION

ENDANGERED SPECIES ACT STATUS: C (USDI, FWS 2002)
[C USDI, FWS 2004-2011]
[SC USDI, FWS 1996]

[C2 USDI, FWS 1991, 1994]

[C2 USDI, FWS 1989]

STATE STATUS:

None

OTHER STATUS:Forest Service Sensitive (USDA, FS Region
3 1988, 1999, 2007)

MANAGEMENT FACTORS: Any development concerning Bog Springs or the water flow in surrounding areas should employ measures to mitigate all impacts to running water including erosion, siltation, pollution, and groundwater drawdown. Additionally, recreationists that visit Bog Springs Campground and surrounding areas should be required to bring in water rather than rely on Bog Springs flow. Consequently, the amount of water captured for domestic use could be decreased and runoff to local habitats and the amount of habitat suitable for *H. stephani* could be increased. These springs should be returned to a natural free-flowing state.

PROTECTIVE MEASURES TAKEN:

SUGGESTED PROJECTS: Concerted effort should be made to search for *H. stephani* in all springs in Madera Canyon and adjacent areas. Searches should only be considered verifiable if they are conducted by riffle beetle experts as members of Elmidae are typically disturbed patchily in various microhabitats and are very difficult to find.

LAND MANAGEMENT/OWNERSHIP: USFS - Coronado National Forest, Nogales Ranger District.

SOURCES OF FURTHER INFORMATION**REFERENCES:**

- Brock, J. and S. Prchal. 2001. Sensitive Insect Species of the Coronado National Forest. A Training Project by Sonoran Arthropod Studies Institute.
- Brown, H.P. 1972. Synopsis of the genus *Heterelmis* Sharp in the United States, with description of a new species from Arizona (Coleoptera, Dryopoidea, Elmidae). Entomological News 83:229-238.
- Johnson, R. 1992. Unpublished status report for United States Fish and Wildlife Service, Arizona Ecological Services, Phoenix, Arizona.
- Merritt, R.W. and K.W. Cummins. 1978. An introduction to the aquatic insects of North America. Kendall/Hunt Publishing Co. Dubuque, Iowa. 29, 228
- USDA, Forest Service Region 3. 1988. Regional Forester's Sensitive Species List.
- USDA, Forest Service Region 3. 1999. Regional Forester's Sensitive Species List.
- USDA, Forest Service Region 3. 2007. Regional Forester's Sensitive Species List.
- USDI, Fish and Wildlife Service. 1989. Endangered and Threatened Wildlife and Plants; Animal Notice of Review. Federal Register 54(4):570.

- USDI, Fish and Wildlife Service. 1991. Endangered and Threatened Wildlife and Plants; Animal Candidate Review for Listing as Endangered or Threatened Species, Proposed Rule. Federal Register 56(225):58826.
- USDI, Fish and Wildlife Service. 1994. Endangered and Threatened Wildlife and Plants; Animal Candidate Review for Listing as Endangered or Threatened Species, Proposed Rule. Federal Register 59(219):59015.
- 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.
- USDI, Fish and Wildlife Service. 2002. Endangered and Threatened Wildlife and Plants; Review of Species That Are Candidates or Proposed for Listing as Endangered or Threatened; Annual Notice of Findings on Recycled Petitions; Annual Description of Progress on Listing Actions; Notice of Review; Proposed Rules. Federal Register 67(114): 40657-40679.
- USDI, Fish and Wildlife Service. 2004. Endangered and Threatened Wildlife and Plants; Review of Species That Are Candidates or Proposed for Listing as Endangered or Threatened; Annual Notice of Findings on Resubmitted Petitions; Annual Description of Progress on Listing Actions; Notice of Review; Proposed Rules. Federal Register 69(86): 24876-24904.
- USDI, Fish and Wildlife Service. 2005. Endangered and Threatened Wildlife and Plants; Review of Native Species That Are Candidates or Proposed for Listing as Endangered or Threatened; Annual Notice of Findings on Resubmitted Petitions; Annual Description of Progress on Listing Actions; Notice of Review; Proposed Rules. Federal Register 70(90): 24870-24934.
- USDI, Fish and Wildlife Service. 2006. Endangered and Threatened Wildlife and Plants; Review of Native Species that are Candidates or Proposed for Listing as Endangered or Threatened; Annual Notice of Findings on Resubmitted Petitions; Annual Description of Progress on Listing Actions; Notice of Review. Federal Register 71(176): 53756-53835.
- USDI, Fish and Wildlife Service. 2007. Endangered and Threatened Wildlife and Plants; Review of Native Species That Are Candidates for Listing as Endangered or Threatened; Annual Notice of Findings on Resubmitted Petitions; Annual Description of Progress on Listing Actions; Notice of Review. Federal Register 72(234): 69034-69106.
- USDI, Fish and Wildlife Service. 2008. Endangered and Threatened Wildlife and Plants; Review of Native Species That Are Candidates for Listing as Endangered or Threatened; Annual Notice of Findings on Resubmitted Petitions; Annual Description of Progress on Listing Actions; Notice of Review. Federal Register 73(238): 75176-75244.
- USDI, Fish and Wildlife Service. 2009. Endangered and Threatened Wildlife and Plants; Review of Native Species That Are Candidates for Listing as Endangered or Threatened; Annual Notice of Findings on Resubmitted Petitions; Annual Description of Progress on Listing Actions; Notice of Review. Federal Register 74(215): 57804-57878.
- USDI, Fish and Wildlife Service. 2010. Endangered and Threatened Wildlife and Plants; Review of Native Species That Are Candidates for Listing as Endangered or Threatened; Annual Notice of Findings on Resubmitted Petitions; Annual Description of Progress on Listing Actions; Notice of Review. Federal Register 75(217):69289.

USDI, Fish and Wildlife Service. 2011. Endangered and Threatened Wildlife and Plants; Review of Native Species That Are Candidates for Listing as Endangered or Threatened; Annual Notice of Findings on Resubmitted Petitions; Annual Description of Progress on Listing Actions; Notice of Review. Federal Register 76(207):66435.

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ADDITIONAL INFORMATION:

H.stephani is apparently absent from the stream in Madera Canyon, probably because it almost completely dries up during portions of the year, whereas the springs provide continuous flow and moist pockets of soil throughout the year. Additionally, the stream consists of a different habitat as it is cold and fast-flowing compared to the spring/seep habitats in the area.

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