ARIZONA GAME AND FISH DEPARTMENT
HERITAGE DATA MANAGEMENT SYSTEM

Invertebrate Abstract **Element Code: IIODO68100**
Data Sensitivity: No

CLASSIFICATION, NOMENCLATURE, DESCRIPTION, RANGE

NAME: *Argia sabino*
COMMON NAME: Sabino Canyon Damselfly, Sabino Dancer
SYNONYMS:
FAMILY: Coenagrionidae

AUTHOR, PLACE OF PUBLICATION: Garrison, R.W. 1994. Transaction of the American Entomological Society 120(4): 287-386.

TYPE LOCALITY: Sabino Canyon, Santa Catalina Mountains, Arizona.

TYPE SPECIMEN: Holotype and allotype of *A. sabino* will be deposited in the U.S. National Museum of Natural History, Washington, D.C. Paratypes deposited in the British Museum, London, University of Michigan, Ann Arbor and Universidad Nacional Autonoma Mexico, Mexico City.

TAXONOMIC UNIQUENESS: The genus *Argia* contains many species. *Argia sabino* is 1 of 10 species occurring in Sabino Canyon.

DESCRIPTION: Labium pale violet gray, remainder of face violaceous with following areas dark: narrow transverse stripe on vertex behind lateral ocelli, with median extension surrounding anterior ocellus, a small lateral offshoot from median ocellus, narrow mediodistal projection extending posteriorly, and spot at posterodistal part of occiput; antennae black, rear of head largely pale with smudge of black laterad to occipital foramen; narrow black line bordering large postocular spot not visible in dorsal view. (Prchal 2001)

AIDS TO IDENTIFICATION: Field identification of *A. sabino* is complicated by the presence of very similar congeners in the Southwest. At known *A. sabino* localities, adults can be field-identified by a combination of coloration and markings but this requires previous experience identifying preserved specimens of both *A. sabino* and similar congeners. Large larvae can be separated from other species in the field, but again only after initial work has been done to establish expertise with the genus and to determine which species are present at a particular locality. (Prchal 2001).

ILLUSTRATIONS: B&W drawing (Hoekstra, 1999 in Brock and Prchal 2001)
Color photos (Behrstock and Hoekstra in Brock and Prchal 2001)

TOTAL RANGE: Known in the U.S. only from the Santa Catalina Mountains. Two male paratypes are recorded from Jalisco, Mexico (collected north of Guadalajara from a rocky stream at 1494m, August 1966).

RANGE WITHIN ARIZONA: Occurs primarily in Sabino Canyon. A single male was collected at Molino Basin Forest Camp and a single female was collected 4.6 miles north of Molino Basin. This area is a small canyon with pines and may represent the highest elevation in the Santa Catalina Mts. that the species occurs. (Garrison, pers. comm.) in Sabino Creek, the range has constricted over the past 35 years, previously occurring in Lower and Upper Sabino Creek but now restricted to the latter area.

SPECIES BIOLOGY AND POPULATION TRENDS

BIOLOGY: Members of this genus (*Argia*) are chiefly stream species. Adults of this species likely emerge asynchronously from late June until the first frost, living only a few weeks during which time they typically occur on bare rocks near the water. Larvae inhabit perennial pools at Sabino Creek, and are generalist predators.

Size distribution from several larval collections taken over the course of 1997 indicate that *A. sabino* is univoltine. Oviposition occurs in autumn following monsoon rains. Larvae undergo a series of 11-15 molts. Growth rates and survivorship of larvae are likely influenced by factors such as temperature and seasonal fluctuations in food availability and predator density. Seasonal patterns in the incidence of larval wounding (loss of caudal lamellae, or "gills") and in mortality among small larvae suggest that biotic interactions (predation, conflicts among larvae) intensify as pools shrink in early summer. (Brock and Prchal 2001).

Early-emerging adults (those emerging in May and early June) may survive through an extended pre-productive period of up to 4 months. Pre-productive adults exhibit distinctive muted coloration patterns, occur in mixed-sex aggregations, and use habitats away from the stream that are not typically frequented by fully mature adults. The bulk of emergence occurs prior to monsoon rains. (Brock and Prchal 2001).

REPRODUCTION: Oviposition occurs in September-October (most oviposition occurs as monsoon floodwaters recede). In the morning, male *A. sabino* defend perches at boulder fields or rock outcrops away from the stream, where they encounter mates. Copulation occurs in shrubs or on rock surfaces and may last 30 minutes or more. Unpaired males frequently harass copulating pairs. Following copulation, pairs fly in tandem to bedrock outcrops or large boulders along the stream and alight within a meter of the water surface. As the pairs descends, females probe rock surfaces with the tips of their abdomens, pausing occasionally to deposit eggs. (Brock and Prchal 2001).

FOOD HABITS: Both larvae and adults are predaceous, feeding largely on other insects.

HABITAT: Populations of *Argia* spp. closely correlated with water flow, increasing in wet years and decreasing in dry years, or as stream volume changes due to groundwater conditions. This species is very "restricted geographically, possibly because of low vagility" (Pritchard 1982 as cited by Johnson 1992).

ELEVATION: 3,000 - 5,000 feet (915 - 1525 m).

PLANT COMMUNITY: Upper Sonoran Riparian; sycamore and ash.

POPULATION TRENDS: Known decrease in population size and geographic distribution which have been caused by reduced water flow in Sabino Creek over the past 35 years. Several other Odonate species that depend on sustained water flow have been progressively extirpated from Lower Sabino Creek over the past 35 years (Pers comm from R. Garrison to R. Johnson, cited by Johnson 1992). "Overall, these changes indicate declining health and integrity of the entire Sabino Creek ecosystem and particularly of the riparian and aquatic habitats" (Johnson 1992).

It is possible, even probable, that additional populations of *A. sabino* exist in southeastern Arizona and/or northern Mexico. The region's aquatic invertebrate fauna is poorly known. Access to remote, high-gradient streams is difficult, and many habitats have never been surveyed. Additional populations of *A. sabino*, if they exist, will most likely be discovered in high-gradient streams that are punctuated by large, open, rocky perennial pools. (Hoekstra in Brock and Prchal 2001).

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: Personal motor vehicles are not allowed in Upper Sabino Canyon and recreational access is limited to riding a tram. These restrictions should be maintained as they minimize recreational impacts to Upper Sabino Canyon.

Reduced pool persistence would have direct negative affects on *A. sabino* larvae, reducing the time available for larval development. Negative effects could also be transmitted through community interactions such as predation and intraspecific fighting, both of which probably intensify as pools contract. (Brock and Prchal 2001).

Both hydrological alteration and exotic species are potential threats to the *A. sabino* population at Sabino Creek. Green sunfish and exotic crayfish are present in the stream and have the potential to expand their ranges upward into the core of *A. sabino's* current range. (Brock and Prchal 2001).

PROTECTIVE MEASURES TAKEN:

SUGGESTED PROJECTS: Targeted surveys should be an element of any management effort directed at preserving *A. sabino* and its habitat. More importantly, research and conservation efforts are needed to assess and ameliorate the threats that exotic species and hydrological alteration pose to the Sabino Creek population. A critical spatial pattern should guide efforts to study and conserve *A. sabino* and other native invertebrates at Sabino Creek. (Brock and Prchal 2001).

Future studies of the *A. sabino* population at Sabino Creek must include sites within the fishless section of the stream, and thus will require foot travel to remote locations within the Pusch Ridge Wilderness Area. Studies conducted solely within the easily-accessed portion of the stream (within the Sabino Canyon Recreation Area) will not provide adequate information to guide the management and conservation of the species. (Brock and Prchal 2001).

LAND MANAGEMENT/OWNERSHIP: USFS - Coronado National Forest.

SOURCES OF FURTHER INFORMATION

LITERATURE CITATIONS:

Brock, J. and S. Prchal. 2001. Sensitive Insect Species of the Coronado National Forest: species abstract Sabino Canyon Damselfly (*Argia sabino*). A training project by Sonoran Arthropod Studies Institute.

Garrison, R.W. 1994. A synopsis of the genus *Argia* of the United States with keys and descriptions of new species, *Argia sabino*, *A. leonorae*, and *A. pima* (Odonata: Coenagrionidae). Transactions of the American Entomological Society, 120(4): 287-386.

Hoekstra, J.D. 1998. Conservation of aquatic insects in Arizona with special reference to *Argia sabino* (Odonata: Coenagrionidae). MS Thesis, Dept. of Entomology, University of Arizona, Tucson, Arizona, USA.

Hoekstra, J.D. and R.L. Smith. 1999. Descriptions of the final instar larvae of *Argia sabino* Garrison and *Argia pima* Garrison (Odonata: Coenagrionidae). Proc. Entomol. Soc. Wash. 101(4): 887-896.

Hoekstra, J.D. and R.L. Smith. 2000. Reproductive behavior of two *Argia* spp. (Odonata: Coenagrionidae) at an Arizona stream. International Journal of Odonatology 3(1): 85-94.

Johnson, R. 1992. Status survey report produced under contract to United States Fish and Wildlife Service.

USDA, Forest Service Region 3. 1999. Regional Forester's Sensitive Species List.

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):588243.

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):59010.

USDI, Fish and Wildlife Service. 1996. Endangered and Threatened Wildlife and Plants: Review of Plants and Animal Taxa that are Candidates for Listing as Endangered or Threatened Species. Federal Register 61(40):7596-7613.

MAJOR KNOWLEDGEABLE INDIVIDUALS:

Rosser W. Garrison, Office of the Los Angeles County Agricultural Commissioner, El Monte, CA (e-mail: rosser@acwm.co.la.ca.us).

Jon D. Hoekstra, Illinois Natural History Survey, Center for Aquatic Ecology, Champaign, IL (email: hoekstra@mail.inhs.uiuc.edu).

Robert Johnson - Biologist under contract to United States Fish and Wildlife Service.

Robert L. Smith, Dept. of Entimology, Univ. of Ariz., Tucson, AZ (email: bobsmith@ag.arizona.edu)

ADDITIONAL INFORMATION:

For additional information on *Argia* as a whole, listing of pertinent literature and listing of experts in this taxon, see the status survey report by Johnson, 1992.

Another species of *Argia*, previously identified as *A. lacrimans*, is also only known from Sabino Canyon and Molino Basin. However, these individuals appear to differ from the holotype *A. lacrimans* and may represent another undescribed species that is endemic to the area (Garrison 1992 as cited by Johnson 1992).

Revised: 1992-07-17 (DBI)
1997-03-02 (SMS)
2001-02 (SP)