

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

**Animal Abstract**

**Element Code:** AFCJB20040

**Data Sensitivity:** Yes

**CLASSIFICATION, NOMENCLATURE, DESCRIPTION, RANGE**

**NAME:** *Lepidomeda vittata*

**COMMON NAME:** Little Colorado Spinedace

**SYNONYMS:** *Lepidomeda jarrovii*, *Lepidomeda jarrovi*

**FAMILY:** Cyprinidae

**AUTHOR, PLACE OF PUBLICATION:** Cope, 1874, Proc. Amer. Philosoph. Soc. 14:129-139.

**TYPE LOCALITY:** Little Colorado River, somewhere between the mouth of the Zuni River and Sierra Blanca, Apache County, Arizona.

**TYPE SPECIMEN:**

**TAXONOMIC UNIQUENESS:** One of six species in genus, three of which are found in Arizona. All species in genus occur in western North America.

**DESCRIPTION:** Small, generally less than 100.0 mm (3.9 in.) in length. Scales in lateral line usually more than 90. Second spine of dorsal fin strong. Dorsal fin moderately high, acute, its depressed length is 5.2 to 5.8 cm (2.05 to 2.3 in.) predorsal length. Eight anal fin rays, rarely nine. Pharyngeal teeth in two rows, 1 or 2, 4-4, 1 or 2 (Minckley 1973). Sides usually silvery, darker above and sometimes white below, rarely with lateral blotches. Upper side and back is olivaceous, bluish, or lead grey. Breeding males with bases of paired fins watery yellow to orange or red-orange, otherwise fins are clear, parts of belly watery-yellow.

**AIDS TO IDENTIFICATION:** Second spine of the dorsal fin strong compared to others in the genus. Identified with the combination of the 4-4 teeth in the main row, 8 anal rays, usually more than 90 lateral-line scales, and typically 41 or 42 total vertebrae distinguish it from the other species in the genus.

**ILLUSTRATIONS:** Photo (American Fisheries Society 1979:35).

B&W photo (Minckley 1973:109)

Color photo (Rinne and Minckley 1991:15)

B&W photo (Wildlife Habitat Management Staff Group 1975:14)

**TOTAL RANGE:** Endemic to the Little Colorado River and its north flowing tributaries, including the Arizona counties of Coconino, Navajo, and Apache. Historical distribution is similar to the current distribution but may have possibly occurred in the Zuni River watershed south of Gallup, New Mexico (Hill et al. 1989). Considered extirpated from Silver Creek and its tributaries (USFWS 2019).

**RANGE WITHIN ARIZONA:** Range comprised of disjunct populations in the Little Colorado River and several north-flowing tributaries in Eastern Arizona. Known to occur in various streams in the East Clear Creek watershed, Chevlon Creek watershed, and Little Colorado River headwaters (USFWS 2018). Occurs in Apache, Coconino, and Navajo counties.

### **SPECIES BIOLOGY AND POPULATION TRENDS**

**BIOLOGY** *L. vittata* appear to be quite capable of tolerating relatively harsh environments that undergo dramatic diel fluctuations in pH, dissolved gases, and water temperature. Predation occurs mainly from introduced *Oncorhynchus mykiss* (rainbow trout) and *Lepomis cyanellus* (green sunfish).

**REPRODUCTION:** Spawns prolifically in early summer and then sporadically throughout summer into early autumn. In males, bases of paired fins and parts of belly become watery-yellow during spawning season. Females lay 650 to 5000 eggs, and may spawn more than once a year. Engage in broadcast spawning over the bottom or on aquatic vegetation, and debris (Minckley 1973).

**FOOD HABITS:** Spinedace are omnivorous. Food items include chironomid larvae, other dipterans, filamentous green algae, and crustaceans (Runck and Blinn 1993). Laboratory studies and field collections revealed this species is opportunistic, and is able to switch diets with food availability (Blinn and Runck 1990).

**HABITAT:** Found in water ranging from 0.16-1.3 meters (0.5-4.3 feet) in depth, but most abundant in depths of around 0.6 meters (1.9 feet). Most common in slow to moderate water currents, over fine gravel bottoms. Avoids deep, heavily-shaded pools and shallow, open areas. Prefers unshaded pools with rocks or undercut banks for cover (Hill et al. 1989; Minckley 1984). Temperatures where populations exist generally range from 58-79F (14-26C). Young of the year are most abundant on uniformly turbulent riffles 10 to 25 cm (3.9 to 9.8) in depth (Minckley and Carufel 1967).

**ELEVATION:** 1,000 to 3,000 m (3,300 to 9,800 ft.).

**PLANT COMMUNITY:** Riparian vegetation includes *Alnus* (alder), *Salix* (willow), *Quercus* (oak), and mixed conifer species.

**POPULATION TRENDS:** Population trends are likely to decline in the long-term, due to extended drought and climate change. However, populations are likely to remain stable in the relatively near future (10-year timestep) (USFWS 2018).

**SPECIES PROTECTION AND CONSERVATION**

**ENDANGERED SPECIES ACT STATUS:** LT, with Critical Habitat (USDI, FWS 1987)  
[PT (USDI, FWS 1985)]  
[UR (USDI, FWS 1983)]  
[C1 (USDI, FWS 1982)]  
[PT (USDI, FWS 1967)]

**STATE STATUS:** 1 (AZGFD, AWCS 2022)  
[1A (AGFD SWAP 2012)]  
[WSC (AGFD, WSCA 1996 in prep)]  
[Threatened (AGFD, TNW 1988)]

**OTHER STATUS:** Bureau of Land Management Sensitive  
(USDI, BLM AZ 2017)  
Not Forest Service Sensitive (USDA, FS  
Region 3 2013)  
[Forest Service Sensitive (USDA, A-S  
National Forest 2000)]  
[Forest Service Sensitive (USDA, FS  
Region 3 1988)]

**MANAGEMENT FACTORS:** The limited, highly fragmented distribution and relatively low population numbers of this species make it highly vulnerable to stressors. Stressors effecting the Little Colorado Spinedace include drought, ground and surface water withdrawals, high-severity wildfires, and predation and competition with non-native warm water fishes, particularly Green Sunfish (*Lepomis cyanellus*) (USFWS 2018).

**Threats:** Natural events (habitat modification by ungulates in headwater meadows, high severity fires), environmental conditions (drought, climate change), and species characteristics (vulnerability of individuals and sites to non-native predators, competition with non-native crayfish).

**Management needs:** Delineate spinedace management areas; conserve existing populations and their watersheds; establish refugium sites within historical habitats; ameliorate effects of nonnative fishes in spinedace habitats.

**PROTECTIVE MEASURES TAKEN:** The Coconino and Apache-Sitgreaves National Forests have developed and implemented forest management projects intended to reduce the risk of high severity fires in drainages with either occupied or suitable habitat for *L. vittata* (USFWS 2018). The Coconino NF also has closed roads in sensitive portions of the East Clear Creek watershed (USFWS 2018). The lower reach of Chevelon Creek, the White Mountain Hereford Ranch (through which Rudd Creek flows), the Wenima property (through which the Little Colorado River flows), and the EC Bar Ranch (through with Nutrioso creek flows) are currently owned and managed by the Arizona Game and Fish Department (USFWS 2008, 2018). Little Colorado Spinedace were stocked into Willow Creek, Yeager Canyon, Kehl Canyon, and Barbershop canyon by AZGFD from 2013 to 2018. Additional sites have been identified for translocations by the Department and additional translocations are planned

(USFWS 2019). The Bureau of Reclamation, Forest Service, and USFWS are working to provide increased protection of headwater meadows in the East Clear Creek watershed (USFWS 2018).

**SUGGESTED PROJECTS:** Delisting recovery criteria includes the establishment and/or maintenance of a minimum of 5 viable populations for each of the 3 lineages (East Clear Creek, Chevelon Canyon, and Little Colorado lineages; 15 viable populations in total). There are currently 6-7 viable populations throughout the species range. Additional populations will be established through reintroduction. Populations must persist for five years to be considered viable (USFWS 2019).

Additional recovery criteria include maintenance of five core habitat and core recovery areas within each of the watersheds that support Little Colorado River spinedace, and establishment of at least one refugia for each of the Little Colorado River spinedace lineages (USFWS 2019). Non-recovery criteria suggested projects include protection of environmental flows in future water development plans, stream and riparian area restoration, development of watershed management plans, and control or non-native fish and aquatic organisms (USFWS 2018).

**LAND MANAGEMENT/OWNERSHIP:** BIA - Hopi Reservation; BLM; USFS - Apache-Sitgreaves and Coconino National Forests; AGFD - Sipe White Mountain Wildlife Area and Wenima Riparian Corridor; Private.

### **SOURCES OF FURTHER INFORMATION**

#### **REFERENCES:**

- Arizona Game and Fish Department. 1988. Threatened native wildlife in Arizona. Arizona Game and Fish Department Publication. Phoenix, Arizona. p.7.
- Arizona Game and Fish Department. 1996, in prep. Wildlife of special concern in Arizona. Arizona Game and Fish Department Publication. Phoenix, Arizona. p. 7.
- Arizona Game and Fish Department. 2012. Arizona's State Wildlife Action Plan 2012-2022. Arizona Game and Fish Department, Phoenix, Arizona. 233 pages.
- Arizona Game and Fish Department. 2022. Arizona Wildlife Conservation Strategy: 2022-2032. Arizona Game and Fish Department, Phoenix, Arizona. 378 pages.
- Arizona Game and Fish Department Native Fish Diversity Review. 1995. Tempe, Arizona.
- Blinn, D.W. and C. Runck. 1990. Importance of predation, diet and habitat on the distribution of *Lepidomeda vittata*: a federally listed species of fish. Department of Biological Sciences, Northern Arizona University, Flagstaff, Arizona. p. 47.
- Blinn, D.W., C. Runck, D.A. Clark and J.N. Rinne. 1993. Effects of rainbow trout predation on Little Colorado Spinedace. Transactions of the American Fisheries Society 122:139-143. [https://doi.org/10.1577/1548-8659\(1993\)122%3C0139:NEORTP%3E2.3.CO;2](https://doi.org/10.1577/1548-8659(1993)122%3C0139:NEORTP%3E2.3.CO;2)
- Davidson, T. and J. Ward, 1997. Spinedace stream study. AGFD Heritage Grant # I93025.
- Denova, B.P. and F.J. Arbarca, 1992. Distribution, abundance, and habitat for the Little Colorado Spinedace (*Lepidomida vittata*) in the Coconino and Apache-Sitgreaves

- National Forests along East Clear Creek and its tributaries. Final Report, AGFD Non-Game and Endangered Wildlife Program. 47 pages.
- Dorum, D.B., and K.L. Young, 1995. Little Colorado Spinedace project summary report. AGFD Non-Game Technical Report #88. 104 pages.
- Eakle, W.L. and E.L. Smith. 1989. Draft biological assessment of threatened and endangered species for the Springerville to Alpine highway realignment, Nutrioso section. Dames and Moore Environmental Services Group. pp. 5-8.
- Hill, J., O.E. Maughan and L. Thompson. 1989. Endangered species information system: Little Colorado River spinedace (*Lepidomeda vittata*). Arizona Cooperative Fish and Wildlife Unit, University of Arizona, Tucson, Arizona. p. 13.
- Minckley, C.O. 1984. Current distribution and status of *Lepidomeda vittata* (the Little Colorado spinedace) in Arizona. Department of Biological Sciences, Northern Arizona University, Flagstaff, Arizona. p. 43.
- Minckley, W.L. and L.H. Carufel. 1967. The Little Colorado River spinedace, *Lepidomeda vittata*, in Arizona. The Southwestern Naturalist 12(3):291-302.  
<https://doi.org/10.2307/3669115>
- Minckley, W.L. 1973. Fishes of Arizona. Arizona Game and fish Department, Phoenix, Arizona. pp. 109-111.
- Page, L.M., and B.M. Burr. 1991. A field guide to freshwater fishes: North America, north of Mexico. Houghton Mifflin Co., Boston, Massachusetts. p. 81.
- Rinne, J.N., and W.L. Minckley. 1991. Native fishes of arid lands: a dwindling resource of the desert southwest. General Technical Report RM-206. U.S. Department of Agriculture Forest Service, Rocky Mountain Forest and Range Experiment Station, Fort Collins, Colorado. pp. 15-16.
- USDA, Forest Service Region 3. 1988. Regional Forester's Sensitive Species List.
- USDA, Forest Service. 2000. Apache-Sitgreaves National Forests Sensitive Species List.
- USDA, Forest Service Region 3. 2013. Regional Forester's Sensitive Species List.
- USDI, Bureau of Land Management. 2017. Arizona BLM sensitive species list. Instruction memorandum No. AZ-IM-2017-009. Bureau of Land Management, Arizona State Office, Phoenix, Arizona.
- USDI, Fish and Wildlife Service. 1967. Native fish and wildlife; endangered species. Federal Register 32(48):4001.
- USDI, Fish and Wildlife Service. 1982. Endangered and threatened wildlife and plants; review of vertebrate wildlife for listing as endangered or threatened species; notice of review. Federal Register 47(251):58454-58460.
- USDI, Fish and Wildlife Service. 1983. Endangered and threatened wildlife and plants; findings on certain petitions; notice of findings on certain petitions. Federal Register 48(115):27273-27274.
- USDI, Fish and Wildlife Service. 1987. Endangered and threatened wildlife and plants; final rule to determine *Lepidomeda vittata* (Little Colorado Spinedace) to be a threatened species with critical habitat; final rule. Federal Register 52(179):35034-35040.
- USDI, Fish and Wildlife Service. 1998. Little Colorado River spinedace recovery plan. U.S. Fish and Wildlife Service, Albuquerque, New Mexico. 51 pages.
- USDI, Fish and Wildlife Service. 2008. Little Colorado River spinedace (*Lepidomeda vittata*) 5-year review: summary and evaluation. U.S. Fish and Wildlife Service, Arizona Ecological Services Office, Phoenix, Arizona. 28 pages.

- USDI, Fish and Wildlife Service. 2018. Little Colorado River spinedace (*Lepidomeda vittata*) 5-year review: summary and evaluation. U.S. Fish and Wildlife Service, Arizona Ecological Services Office, Phoenix, Arizona. 13 pages.
- USDI, Fish and Wildlife Service. 2019. Little Colorado River spinedace (*Lepidomeda vittata*) recovery plan draft amendment I. U.S. Fish and Wildlife Service, Albuquerque, New Mexico. 12 pages.
- Wildlife Habitat Management Staff Group. 1975. Endangered and unique fish and wildlife of the southwestern national forests. U.S. Department of Agriculture Forest Service, Southwestern Region. pp. 14-15.

**MAJOR KNOWLEDGEABLE INDIVIDUALS:**

Dean Blinn, Northern Arizona University (retired), Flagstaff, Arizona

**ADDITIONAL INFORMATION:**

**Revised:** 1994-07-19 (LOC)  
1994-07-22 (SMS)  
1994-09-07 (DBD)  
2001-10-15 (SMS)  
2020-07-07 (KSL)  
2022-05-12 (KSL)  
2023-01-09 (MBL)

To the user of this abstract: you may use this entire abstract or any part of it. We do request, however, that if you make use of this abstract in plans, reports, publications, etc. that you credit the Arizona Game and Fish Department. Please use the following citation:

Arizona Game and Fish Department. 20XX (= **year of last revision as indicated at end of abstract**). X...X (= **taxon of animal or plant**). Unpublished abstract compiled and edited by the Heritage Data Management System, Arizona Game and Fish Department, Phoenix, AZ. X pp.