ARIZONA GAME AND FISH DEPARTMENT
HERITAGE DATA MANAGEMENT SYSTEM

Animal Abstract **Element Code:** AFCJB37152
Data Sensitivity: No

CLASSIFICATION, NOMENCLATURE, DESCRIPTION, RANGE

NAME: *Agosia chrysogaster* sp. 1
COMMON NAME: Yaqui Longfin Dace
SYNONYMS:
FAMILY: Cyprinidae

AUTHOR, PLACE OF PUBLICATION: *Agosia chrysogaster* Girard. 1856: 187 [23], Proc. Acad. Nat. Sci. Phila. V. 8; ref. 1810.

TYPE LOCALITY: North America, Mexico, state of Sonora, Río Santa Cruz.

TYPE SPECIMEN: Full Species: Type - USNM-00000081. J.H. Clark (no date). Syntype MCZ 1957.

TAXONOMIC UNIQUENESS: Only *Agosia* species in Arizona. Two forms occur in Arizona, the Gila form (*A. c. chrysogaster*) and the Rio Yaqui form (*A. chrysogaster* sp. 1).

DESCRIPTION: For the species: Body is "fusiform; with small scales. Adults rarely exceed 65 mm (2.6 in.) standard length. Scales in lateral line 70-90" (Sublette et al. 1990). Head is "thick and blunt. Mouth small, subterminal, oblique; overhung by a bluntly rounded snout; mouth terminates posteriorly at a point under the nares. Back and upper sides silvery gray to olive, sides sometimes with golden flecks; lower sides and abdomen whitish; peritoneum black. Diffuse dusky lateral stripe originates at upper corner of opercle, terminating in a black spot at base of caudal fin." (Sublette et al. 1990).

AIDS TO IDENTIFICATION: The longfin dace can be distinguished from other cyprinids by their small subterminal mouth, small barbells, and the lack of a dark spot on the anterior part of its triangular dorsal fin (Sublette et al. 1990).

ILLUSTRATIONS:
Black & White photos of full species (Minckley 1973:126)
Color photo of full species (Rinne and Minckley 1991: 17)
Line drawing of full species (Sublette et al. 1990:89)
Black & White photos of full species (Sublette et al. 1990:89-90)
Color photo of full species (USGS web site)
Color photo of full species (John N. Rinne, *in* http://www.fishbase.org/Photos/PicturesSummary.cfm?ID=2742&what=species)

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Color photos of full species: female and male (Dean A. Hendrickson, *in* http://www.utexas.edu/tmm/sponsored_sites/dfc//na/cyprinid/rhinicht/rchrysog/i_rchrys.shtml)

TOTAL RANGE: Cochise County Arizona, south into Mexico.

RANGE WITHIN ARIZONA: Occurs in Cochise County in the Yaqui River on San Bernardino National Wildlife Refuge (NWR), Leslie Creek NWR, and the Willcox Playa and its tributaries including West Turkey Creek and Rucker Canyon (2005 Fish Diversity Review Team).

SPECIES BIOLOGY AND POPULATION TRENDS

BIOLOGY: For the species: In response to the onset of a flooding event, the fish will move directly into the margins of the current and move back into the channel as discharge declines: they are rarely caught in flood pools or backwaters (Minckley and Barber 1971: Rinne 1975). During drought, they may be found in algal mats or under logs and stones. Maximum life span is three years. This species is highly susceptible to predation, thus removal of non-native species including crayfish from their habitat, is important to the long-term survival of this species in the state (2005 Fish Diversity Review Team).

REPRODUCTION: For the species: They may spawn throughout the year but primarily in spring from December to July, and perhaps to September, in low-desert habitats. Most individuals are sexually mature in their first year. The Colorado River longfin dace create saucer-shaped depressions where the eggs are deposited and newly hatched young remain for a brief time, however, these spawning behaviors have not been observed in the Rio Yaqui populations (Rinne and Minckley 1991). Eggs are buried in sandy bottoms by the spawning act, in shallow water 2-4 inches (5-20 cm) deep with a slight current and over sandy bottoms. Hatching occurs within 4 days. Fry stay in nest until the yolk sac is mostly absorbed before dispersing to shorelines areas. For the species: "Fecundity is positively correlated with fish length, weight, ovary weight, and maturity index and therefore is a function of size" (Kepner 1982).

FOOD HABITS: Their diet can be highly variable among populations in different areas. They are omnivorous and opportunistic, feeding primarily on detritus (Minckley 1973, Sublette et al. 1990), but will also consume various aquatic invertebrates, zooplankton, and algae depending upon availability. They prefer to feed during daylight when resources are abundant.

HABITAT: Longfin dace tend to occupy relatively small or medium size streams, with sandy or gravely bottoms; eddies, pools near overhanging banks or other cover. Usually in water less than 0.6 ft (0.2 m) deep with moderate velocities of around 1.1f/s (0.3m/s). The species is rarely abundant in large streams or above 5,000 ft (1524 m). Generally found in water less than 75° F (24° C), but are tolerant of high temperatures and low dissolved oxygen. During low water, they may take refuge in moist detritus and algal mats (Sublette et al. 1990).

ELEVATION: Generally less than 4,900 feet (1500 meters), but have been recorded ranging to 6,700 ft (2050 m).

PLANT COMMUNITY: Varied, from desert scrub to the lower end of conifer woodlands.

POPULATION TRENDS: Trends are unclear. The Willcox Playa population (Rio Yaqui form) has decreased and may be extinct per personal communication with W. L. Minckley, 1995.

For the species: According to the 2005 Fish Diversity Review Team, the trend is declining; populations are losing connection due to the loss of the main-stem populations. They are gone from the main-stem of the upper Gila River, are hard to find in the San Pedro River, and are declining in the upper Verde River. It is felt that the Longfin Dace will probably wink out in many sites including the San Pedro River in the next ten years. The species needs to be re-evaluated in 5 years due to the downward trend.

NatureServe (2005) reports population trends for the species are unclear, apparently naturally expanding in some areas while stable or declining in other locations; threats are widespread and ongoing. Individual populations may be moved due to changes in water flow. This species can suffer massive mortalities but has the ability to recover numbers rapidly.

SPECIES PROTECTION AND CONSERVATION

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

STATE STATUS: None

OTHER STATUS: None, USDA FS Region 3, 2013
Full species: Bureau of Land Management Sensitive (USDI, BLM 2000, 2005, 2008, 2010)
[Forest Service Sensitive USDA, FS Region 3 2007]
Listed Threatened – full species (Secretaría de Medio Ambiente 2000)
[Listed Threatened – full species, Secretaría de Desarrollo Social 1994]

MANAGEMENT FACTORS: For the species: Threats include human activities that alter the quality or flow of water. Flood control, groundwater pumping, and irrigation practices, particularly threatens this species. Non-native species (e.g. Red Shiner, crayfish, etc.) are another major threat to Longfin Dace. Removal of non-native species including crayfish, is important to their health and long-term survival.

According to Rinne (2004), the effects of fire need to be considered when managing for this species. Specifically, the "Study of the effects of wildfire on fishes and their habitats in the Southwest by the USDA Forest Service, Rocky Mountain Research Station escalated in 2002—

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one of the worst years for wildfire on record…. Because the fish fauna of this region is 1) low in diversity (Rinne and Minckley 1991), 2) dispersed in isolated reaches of streams (Rinne 1995), 3) rapidly declining due to multiple effects (Rinne 2002, 2003c), and 4) largely comprised of threatened and endangered species of fishes, (Rinne 2003b) forest managers and researchers must collaboratively study and manage this rapidly emerging forest issue."

PROTECTIVE MEASURES TAKEN: Re-introduced onto the San Bernardino NWR, and introduced into Leslie Creek on the Leslie Creek NWR, and into Turkey Creek on the El Coronado Ranch HCP.

SUGGESTED PROJECTS: Taxonomy and basic life history studies, additional investigation of reproductive activities (especially in the Rio Yaqui basin), and work to determine the best removal methods of non-native species, are needed. In addition, need new and continuing inventory of their range to determine the status of this species, especially in smaller streams.

LAND MANAGEMENT/OWNERSHIP: FWS – Leslie Creek and San Bernardino National Wildlife Refuges; USFS - Coronado National Forest; Private – El Coronado Ranch (under HCP).

SOURCES OF FURTHER INFORMATION

REFERENCES:

Arizona Game and Fish Department Native Fish Diversity Review Team. 1995. Comments from Diversity Review meeting. Arizona State University, Tempe, Arizona.

Arizona Game and Fish Department Native Fish Diversity Review Team. 2005. Comments from Diversity Review meeting. Arizona Game and Fish Department, Phoenix, Arizona.

BISON-M, Biota Information System of New Mexico, web site. http://nmnhp.unm.edu/bisonm/bisonquery.php.

Hendrickson, D.A., W.L. Minckley, R.R. Miller, et al. 1980. Fishes of the Rio Yaqui Basin, Mexico and United States. Journal of the Arizona-Nevada Academy of Science 159(3): 73.

Kepner, W.G. 1982. Reproductive biology of longfin dace (*Agosia chrysogaster*) in a Sonoran desert stream, Arizona. Arizona State University masters thesis. pp. 72.

Minckley, W.L. 1973. Fishes of Arizona. Arizona Game and Fish Department, Phoenix. pp. 126-128.

Minckley, W.L. and W.E. Barber. 1971. Some aspects of biology of the longfin dace, a cyprinid fish characteristic of steams in the Sonoran Desert. Southwest Naturalist 15(4): 459-564.

NatureServe Explorer: An online encyclopedia of life [web application]. 2001. Version 1.6. Arlington Virginia, USA: NatureServe. Available: http://natureserve.org/explorer. Accessed: November 20, 2002.

NatureServe. 2005. NatureServe Explorer: An online encyclopedia of life [web application]. Version 4.6. NatureServe, Arlington, Virginia. Available http://www.natureserve.org/explorer. (Accessed: December 5, 2005).

Page, L.M. and B.M. Burr. 1991. A field guide to freshwater fishes: North America, north of Mexico. Houghton Mifflin Company. Boston, Massachusetts. p. 79.

Pima County Arizona, Priority Vulnerable Species, web site. (http://www.co.pima.az.us/cmo/sdcp/sdcp2/pvs.pdfs.s29_fld.pdf)

Rinne, J.N. 1975. Changes in minnow populations in a small desert stream resulting from naturally and artificially induced factors. Southwestern Naturalist 20(2): 185-195.

Rinne, J.L. and W.L. Minckley. 1991. Native fishes of arid lands: a dwindling resource of the desert southwest. U.S. Department of Agriculture, Forest Service, General Technical Report RM-206. Rocky Mountain Forest and Range Experiment Station, Fort Collins, Colorado. pp. 17-18.

Rinne, J.N. 2004. Forests, Fish and Fire: Relationships and Management Implications for Fishes in the Southwestern USA. Pages 151-156 *in* G.J. Scrimgrour, G. Eisler, B. McCulloch, U. Silins and M. Monita. Editors. Forest Land-Fish Conference II – Ecosystem Stewardship through Collaboration. Proc. Forest-Land-Fish Conf. II, April 26-28, 2004, Edmonton, Alberta.

Secretaría de Desarrollo Social. 1994. Diario Oficial de la Federacion. p. 50.

Secretaría de Medio Ambiente. 2000. Diario Oficial de la Federacion. p. 44.

Sublette, J.E., M.D. Hatch, and M. Sublette. 1990. The fishes of New Mexico. University of New Mexico Press. Albuquerque, New Mexico. pp. 89-91.

USDA, Forest Service Region 3. 2013. Regional Forester's Sensitive Species List.

USDA, Forest Service Region 3. 2007. Regional Forester's Sensitive Species List.

USDI, Bureau of Land Management. 2000. Arizona BLM Sensitive Species List. Instruction Memorandum No. AZ-2000-018.

USDI, Bureau of Land Management. 2005. Arizona BLM Sensitive Species List.

USDI, Bureau of Land Management Region 2. 2008. Arizona BLM Sensitive Species List.

USDI, Bureau of Land Management Region 2. 2010. Arizona BLM Sensitive Species List.

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): 58996.

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.

USGS, Species Fact Sheet, web site. http://nas.er.usgs.gov/queries/SpFactSheet.asp?speciesID=639.

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Bill Radke – San Bernardino Refuge Manager, US Fish & Wildlife Service.

ADDITIONAL INFORMATION:

Was placed in the genus *Rhinichthys* by Woodman (1992).

"Because the majority of southwestern native fishes are threatened, endangered, or Forest Service sensitive and state-listed species, managers must be vigilant of opportunities to remove fishes from streams whose watersheds are affected by wildfire. There are often very brief (2-3 weeks or less) windows of opportunity to salvage stocks before toxic ash or flood flows result. … Because most populations of rare, southwestern fishes are isolated and unique genetically

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they are evolutionary significant units. As such, they cannot be replaced once lost." (Rinne, 2004).

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