Common Name: COLDWATER DARTER

Scientific Name: *Etheostoma ditrema*

Other Commonly Used Names: none

Previously Used Scientific Names: none

Family: Percidae

Rarity Ranks: G1G2/S1

State Legal Status: Endangered

Federal Legal Status: none

Description: The coldwater darter is small, reaching only 6.5 cm (2.6 in) maximum total length. It has an incomplete lateral line that forms a pale stripe on the anterior half of the body; this stripe arches slightly upward under the first dorsal fin. Body coloration is typically mottled brown, with brown banding on the median fins, a distinct vertical stripe below each eye, and three dark spots vertically aligned at the base of the caudal fin. Breeding males have a blue marginal and a red submarginal band on the first dorsal fin, and profuse orange ventral coloration from the belly to the caudal peduncle.

Similar Species: This species is not likely to be confused with any other darter in the Coosa basin. The Coosa darter (*Etheostoma coosae*) is often collected in the same habitat as the coldwater darter, but has a complete lateral line and prominent (vs. indistinct or absent) dorsal saddles.

Habitat: The primary habitat of the coldwater darter consists of limestone springs and spring runs in the Ridge and Valley physiographic province (see photo below). They are found in association with aquatic plants and organic debris in areas with slow or no water current. Aquatic plant species utilized include watercress, milfoil, eelgrass, and aquatic mosses. Many springs within the range of this species are unoccupied, probably because they are too small or don't have adequate aquatic plant coverage. Occasional coldwater

darter specimens have been collected in the Conasauga River near the Georgia-Tennessee boundary. It is unknown whether these individuals represent river-dwelling populations or strays from springs connected to the river.

Diet: Primarily small crustaceans (especially amphipods) and insect larvae.

Life History: Coldwater darters may normally live only two years; thus, successful spawning every year is essential to population persistence. Spawning may occur over a prolonged period, from March through September, in the relatively constant water temperatures provided by spring habitats. Females attach adhesive eggs to vegetation and there is apparently no-post spawning parental care.

Survey Recommendations: Seining and dip-netting are effective methods, especially in heavily vegetated areas.

Range: The coldwater darter is endemic to the Coosa River basin of Georgia, Tennessee, and Alabama. However, a recent phylogenetic analysis concluded that the coldwater darter comprises at least three valid species, one of which is largely restricted to Georgia (Mayden et al. 2005; Boschung and Mayden 2004). Within Georgia, this species is known from the Etowah, Conasauga, Coosa, Oostanaula, and Conasauga River systems, but is presumed extirpated from the Etowah. Check the Fishes of Georgia Webpage for a watershed-level distribution map.

Threats: The small number of extant populations is the greatest threat to the persistence of this species in Georgia. Almost all populations are isolated from each other by long distances, which limits opportunities for recolonization after local population loss. This species requires vegetated springs, which are extremely vulnerable to water supply development, recreational use and abuse, vegetation control practices (e.g., herbicides), and development. For example, conversion to a concrete-bottom swimming pool has probably eliminated the coldwater darter from one of the historic sites in Whitfield County (Conasauga River system). Another site has received extensive sedimentation from land clearing and cattle grazing around the spring and spring run. Without specific protection, the coldwater darter is clearly vulnerable to extirpation as a result of the loss of spring habitats.

Georgia Conservation Status: As of 2009, the coldwater darter has only been documented from thirteen locations in the state. Almost all of these sites, along with other springs with potentially suitable habitat for the coldwater darter, were surveyed by Bernie Kuhajda and Rick Mayden in the early 2000s. Their data, along with 2 recent collections from the Oostanaula system, documents persistence at seven of the thirteen collection locations since 2000. The species is either extirpated or extremely rare within the remaining sites. Based on the small number of extant populations and evidence of population loss, the state of Georgia changed the status of this species from Threatened to Endangered in 2006.

Conservation and Management Recommendations: A conservation strategy for the

coldwater darter should focus on protecting and monitoring remaining populations. Springs are vulnerable to contamination from runoff of sediment and pollutants, excessive water withdrawal, and destruction. However, the localized nature of springs also makes them relatively easy to protect. Large buffers of native vegetation should be left around occupied springs and downstream spring runs. Any land-disturbing activities occurring in the upstream watershed area should utilize best-management practices to reduce sedimentation, chemical and nutrient runoff, and hydrologic alteration. Occupied springs should not be stocked with predatory fishes. Although the range of this species has been well-surveyed, the small size of springs and their occurrence on private lands suggest the possibility of additional, undiscovered populations. The Nongame Conservation Section maintains a database of known coldwater darter sites and can provide guidance on when additional surveys should be carried out.

Selected References:

Boschung, H.T., and R.L. Mayden. 2004. Fishes of Alabama. Smithsonian Books.

Etnier, D. A., and W.C. Starnes. 1993. The fishes of Tennessee. Univ. Tennessee Press, Knoxville. 681pp.

Georgia Department of Natural Resources. 1999. Protected Animals of Georgia. Wild. Res. Div., Nongame Wildlife & Natural Heritage Section, Social Circle, GA. 247 pp.

Kuhajda, B.R., and R.L. Mayden. 2002. Status survey of the Coldwater Darter, *Etheostoma ditrema*, in Alabama, Georgia, and Tennessee. Final report to the United States Fish and Wildlife Service.

Mayden, R.L., K.E. Knott, J.P. Clabaugh, B.R. Kuhajda, and N. J. Lang. 2005. Systematics and population genetics of the coldwater (*Etheostoma ditrema*) and watercress (Etheostoma nuchale) darters, with comments on the Gulf darter (Etheostoma swaini) (Percidae: subgenus Oligocephalus) Biochemical Systematics and Ecology 33(5) : 455 –478.

Mettee, M. F., P. E. O'Neil, and J. M. Pierson. 1996. Fishes of Alabama and the Mobile Basin. Oxmoor House, Birmingham. 820pp.

Ramsey, J. S., and R. D. Suttkus. 1965. *Etheostoma ditrema*, a new darter of the subgenus *Oligocephalus* (Percidae) from springs of the Alabama River basin in Alabama and Georgia. Tulane Studies in Zoology 12(3):65-77.

Seesock, W. C. 1979. Some aspects of the life history and ecology of the coldwater darter, *Etheostoma ditrema*, from Glencoe Spring, Etowah County, Alabama. M.S. thesis, Auburn Univ., Auburn, Ala. 70pp.

Utter, P. S. 1984. A taxonomic review of the darters referred to *Etheostoma swaini* and *E. ditrema* (Pisces: Percidae) in the Coosa-Alabama River drainage. M.S. thesis, Auburn

Univ., Auburn, Alabama. 115pp.

Author of Account: Byron J. Freeman and Brett Albanese

Date Compiled or Updated:
B. Freeman-Original Account: 1999
K. Owers-Updates: January 23rd, 2009 Added picture, updated status and ranks, added fish atlas link, converted to new format
B. Albanese-Updates: Feb 11, 2009 general update of entire account.

An occupied coldwater darter spring in northwest Georgia. Photo by the Georgia Department of Natural Resources.