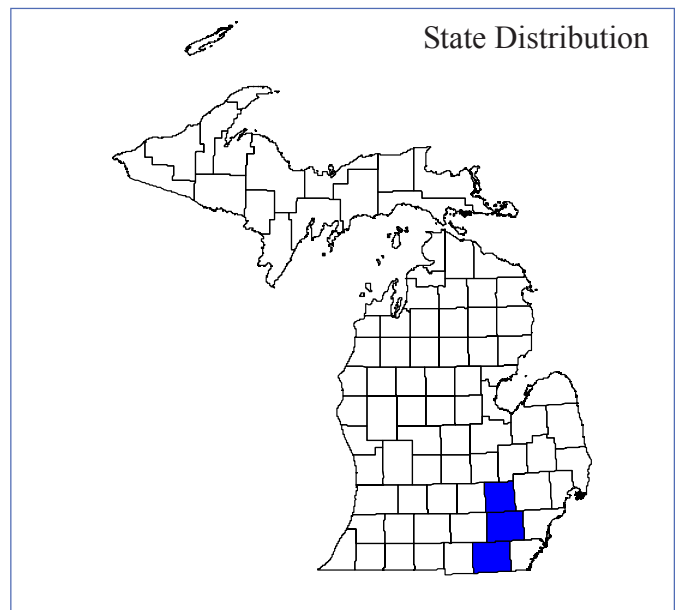
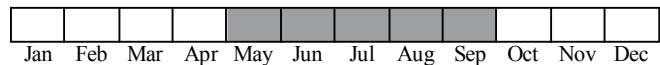




Photo by Konrad Schmidt, Minnesota Department of Natural Resources



Best Survey Period



Status: State endangered

Global and state rank: G5/S1

Family: Cyprinidae (Minnow family)

Synonyms: Previously known taxonomically as *Chrosomus erythrogaster* Rafinesque.

Total Range: The southern redbelly dace's range is generally discontinuous in the Great Lakes Region (Lake Erie and Lake Michigan drainages) including southwestern Pennsylvania, Ohio, southeastern Michigan and mid-Wisconsin. It is most widespread in the upper Mississippi River basin of Wisconsin and Minnesota; the Missouri and Ohio River drainages; the Tennessee River drainage (Alabama), and White-Arkansas river drainage (Arkansas and Oklahoma). Isolated populations exist on the former Mississippi Embayment (Mississippi), in the Kansas River system (Kansas), and in the upper-Arkansas River drainage (Colorado and New Mexico) (Page and Burr 1991). These isolated populations suggest that this species was once more widespread across its range and may have been fragmented by degraded stream conditions. This species' evolutionary distribution was centered in the Ozarks from which it radiated out to form a much wider

distribution historically (Phillips et al. 1982).

State distribution: This species reaches the northern limits of its range in the southeastern corner of Michigan, where it is restricted to two Lake Erie drainages, the River Raisin and the Huron River (Washtenaw and Lenawee Counties) (Evers 1994). This species was thought to have been abundant in this section of the state historically (Trautman 1981), but it has been reconfirmed only as recently as 1973 since the 1930's collections (Evers 1994).

Recognition: The southern redbelly dace is a relatively small minnow (females up to 4 inches in length, males 3 inches), with small scales and an incomplete lateral line. A series of small black blotches are present on the upper-back in front of the dorsal fin. The coloration of this olive-green species is distinctive. A complete reddish or yellow band extends from the edge of the operculum to the tail and separates two dark lateral bands. On breeding males the fins become bright yellow and the lateral colors brighten. The mouth is small compared to other fishes, horizontal and terminal. The southern redbelly dace can be confused with the northern redbelly dace (*Phoxinus eos*) and the finescale dace (*Phoxinus neogaeus*), neither of which occur in the River Raisin basin. Where these conspecifics have been found in the same basin (Huron River), general



habitat differences usually separate the species. Morphologically, the finescale dace has a single dusky lateral band, while the northern and southern redbelly dace both have two lateral bands. The northern and southern redbelly dace have smaller mouths than most minnows, but the southern redbelly dace has a mouth that is more horizontal, whereas the northern has an upturned mouth (usually more than 45°).

Best survey time/phenology: Southern redbelly dace are best surveyed during the late spring, summer and early fall months during periods of low discharge, baseflow conditions and low turbidity. Late spring samples will often yield the brilliantly colored breeding males.

Habitat: Southern redbelly dace typically occur in clear, cool permanent headwaters of river systems. Preferred habitats are spring-fed brooks and clear, wooded streams intermixed with small pools (Settles and Hoyt 1978). Streams inhabited by this species are generally small with moderate gradients and adequate overhanging vegetation to provide ample shading of the stream. Undercut vegetated banks were reported to be crucial habitat during low water periods (Trautman 1981). Pools that contain mud bottoms are frequently inhabited by this species and provide feeding habitat for southern redbelly dace during the nonbreeding season. Riffles with clean gravelly substrates are necessary for spawning.

Biology: The life history of the southern rebelly dace has been studied more extensively in the southern portions of its range (Settles and Hoyt 1976, Settles and Hoyt 1978), although Phillips (1969) studied a population in southern Minnesota. Southern populations spawn April-June and sexual maturity is reached in the first year at a little over one and a half inches in length. Two and three year-old individuals were also reported spawning (Settles and Hoyt 1978). Spawning generally occurs in May-June in the northern portion of the range (Phillips 1969, Eddy and Underhill 1974). Spawning fish move from pools to gravelly riffles where two males usually attend to one female over nests built by other cyprinids (Hankinson 1932). With the males pressuring the sides of the female, she broadcasts from 700 to 1,000 eggs, which are immediately fertilized by the males (Settles and Hoyt 1978). Phillips (1969) reported

that 7,000 to 19,000 eggs (including undeveloped ova) could be produced in the lifetime of the female. Females are typically larger than males. Southern redbelly dace are listed as herbivores (Phillips 1969, Settles and Hoyt 1976, Barbour et al. 1999) feeding primarily on filamentous algae, diatoms and detritus in the drift, or gathered off benthic stones by nibbling. Gut contents from larger individuals were reported to contain chironomid and mayfly larvae as well as other small invertebrates (Settles and Hoyt 1976). Southern redbelly dace are listed as intolerant to disturbance in the Midwest and of intermediate tolerance elsewhere (Barbour et al 1999).

Conservation/management: Southern redbelly dace are naturally distributed discontinuously throughout the landscape because of their habitat preference for cool, spring-fed streams, usually in headwater areas. This isolation makes local populations highly susceptible to extinction because losses due to local natural or human-induced perturbation cannot be replaced by neighboring populations. Land clearing for human land uses, such as agriculture, urbanization and industrialization, have converted many cool, shaded and clear streams to warm, unshaded and turbid systems. An isolated population in Mississippi was extirpated due to riparian tree cutting and the subsequent warming of the water temperature (Phillips et al. 1982). Trautman (1981) reported that populations of dace in streams sampled prior to 1950 were extirpated due to channelization, tree-cutting and increased turbidity. Changes in the shade, temperature and oxygen regimes of these small streams as a result of land cover changes have converted them to unsuitable habitat for the southern redbelly dace. On a positive management note, a meta-population of southern redbelly dace in Kansas that disappeared in a stream reach due to siltation, returned relatively quickly (within 2 months) once spring floods removed excessive silt (Stagliano 2001). Thus, restored habitat can be recolonized by this species provided that nearby source populations exist.

Continued surveys of small streams in the River Raisin and Huron River basins of Michigan are needed to identify additional occurrences of this species. Suitable habitats should be protected and monitored, and modified streams that still have occurrences of this species should be targeted for riparian and perhaps instream habitat restoration.



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