
Notes on the Distribution of the Ozark Logperch (*Percina fulvitaenia*) in the Lower Cimarron River

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Abstract: We document three new localities for Ozark logperch (*Percina fulvitaenia*) in the Lower Cimarron River of Oklahoma, including one population 166 river km upstream from any previously known collection of this species. We hypothesize that *P. fulvitaenia* may be more widely distributed in the Cimarron River than previously thought, but that it utilizes habitat that could make it difficult to detect during the non-breeding season. ©2015 Oklahoma Academy of Science

Introduction

The currently understood distribution of the Ozark logperch, *Percina fulvitaenia* (Morris and Page 1983) includes much of the Ozark Highlands in the Missouri, White, and Arkansas River systems and tributaries to the Arkansas River in the periphery of the Ozark Highlands, as well as isolated populations in Red River tributaries in the Arbuckle Mountains of south-central Oklahoma (Miller and Robson 2004, Page and Burr 2011). In Oklahoma, historical records have indicated that within the Arkansas River basin, the species is restricted to tributaries east of the main stem; however, Luttrell et al. (1994) and Luttrell (1996) documented its occurrence west of the main stem Arkansas River at a handful of scattered localities in the lower Cimarron River drainage. We document three new collection localities for this species, and develop a hypothesis addressing the apparently sporadic occurrence of Ozark logperch in the lower Cimarron River system.

Methods and Results

We collected Ozark logperch at three new localities, all 3rd order streams, during field collections from streams in the lower Cimarron

River drainage in April of 2009 (Figure 1). On 2 April, we collected ten specimens (OSUS 27838, SL 63 to 81 mm) from a site on Council Creek, Payne Co., Oklahoma, downstream from previously reported localities (36.101119 N, -96.852122 W). On 4 April, we collected a single specimen (OSUS 27824, SL 92 mm) near the outflow of the Deer Creek water treatment facility on Chisholm Creek, north of the city of Edmond, Oklahoma Co., Oklahoma (35.696451 N, -97.527083 W). On 5 April, we collected three more individuals (OSUS 27835, SL 83 to 104 mm) at a locality approximately 3 km downstream from the Deer Creek water treatment facility on Chisholm Creek (35.725624 N, -97.527512 W).

All individuals were captured during kicksets in riffles 0.1 to 0.5 m deep with 3.2 mm mesh seines. We found logperch in Council Creek over substrates of sand, gravel, and cobble. In Chisholm Creek, logperch utilized riffles created by collapsed bank-stabilizing rip-rap. Females appeared gravid, and laboratory examinations of gonads confirmed mature oocytes were present. Females in both populations ranged from mature (MA) to ripe (RE), and all males examined were ripe (RE), following Heins and Machado's (1993) index of visual gonad status. Larger individuals in all three collections had the orange band in the

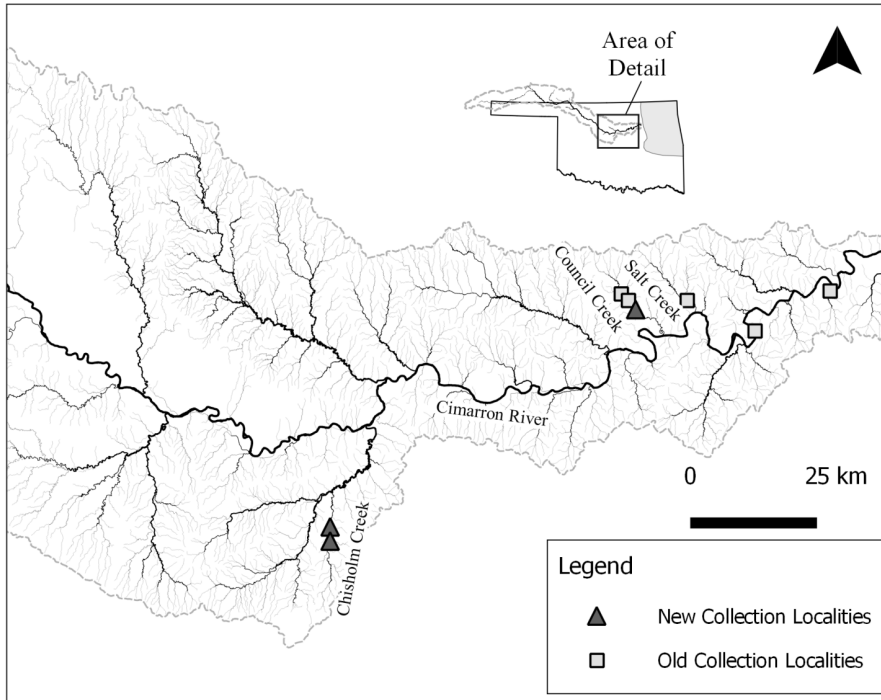


Figure 1. Map of the lower Cimarron River system showing previous collection localities from Luttrell et al. (1994) (squares) and localities from this report (triangles). Map inset: Lower Cimarron River system (dashed line) and historically accepted distribution of Ozark logperch within Oklahoma (grey).

first dorsal fin that distinguishes this species from logperch, *Percina caprodes* (Rafinesque 1818), which is found in Red River tributaries in the southeast portion of the state and has historically been treated as conspecific (Miller and Robison 2004). As part of a wider study examining the phylogeography of *P. fulvitaenia* in Oklahoma, fin-clips were taken from all individuals and used to sequence the mitochondrial gene ND2 (NADH dehydrogenase subunit 2; 1047 base pairs). The Council Creek population had moderately high haplotype diversity ($h=0.742 \pm 0.084$) while the Chisolm Creek collections consisted of four individuals sharing a single haplotype (Lynch 2010). Field samplings at the same localities on Council Creek in August 2008 and Chisholm Creek during August 2009 failed to yield additional individuals.

Discussion

The previous westernmost locality for Ozark

logperch in the Cimarron River system has been reported as Lake Optima, Beaver County, Oklahoma (Pigg 1987). However, Luttrell et al. (1994) suggest that the lone individual collected at this locality, nearly 500 river km upstream from any previous locality, probably represented a transient introduction. If the record from Lake Optima is indeed a transient introduction, then our record from Chisholm Creek may represent the westernmost known distribution of Ozark logperch in the Cimarron River system, 166 river km upstream from the next nearest collection locality on Council Creek.

Whether the distribution of Ozark logperch is actually highly sporadic in the lower Cimarron River, or such apparently sporadic occurrence is driven by seasonal vulnerability to sampling is an interesting question. Many of the pools in these streams are excessively deep ($> 2\text{m}$) for effective seining and excessively turbid for effective snorkel surveys (OK DEQ 2010).

Logperch may occupy deeper water following spawning during the spring in many areas (Winn 1958, Page 1983), and residence in deep, turbid pools would make them difficult to detect. Our own success of capturing gravid females during April in both Chisholm and Council Creek, and subsequent lack of success capturing individuals during August at these same sites suggests that individuals may have left shallower riffle habitat following reproduction. Similarly, the records reported by Luttrell et al. (1994) occurred from March to July. The only previous record of fish collections from Chisholm Creek that we were able to locate occurred during November and contained no logperch (Margraf and Plitt 1982). Unfortunately, Luttrell (1996) does not comment on the temporal variability in logperch abundance in Council Creek. While logperch are probably not abundant in the lower Cimarron River system, we hypothesize that sampling riffle habitat in larger tributary streams during the spring may reveal this species to be more widespread than previously thought.

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