

Distribution of the Red River Pupfish, *Cyprinodon rubrofluviatilis* Fowler, in the South Canadian River in Texas and Oklahoma

Jimmie Pigg, Robert Gibbs¹, and Geffery R. Luttrell²

¹ Oklahoma State Environmental Laboratory, Oklahoma Department of Environmental Quality, Oklahoma City, OK 73117-1212

² Oklahoma Cooperative Fish and Wildlife Research Unit, Department of Zoology, Oklahoma State University, Stillwater, OK 74078.

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The Red River (RR) pupfish, *Cyprinodon rubrofluviatilis* Fowler, is endemic to the Brazos and Red River drainages of Texas and southwestern Oklahoma (1, 2). The species has been introduced into the South Canadian River of the Arkansas River System (3), possibly by transport as bait. Ashbaugh et al. (4) suggested that the South Canadian River population was derived from Red River parent stock. The RR pupfish was first collected from the South Canadian River in Texas in 1972 (4). Pigg et al. (5) collected the species from the South Canadian River in Oklahoma in 1982. Apparently, the species was present in the South Canadian River drainage of Oklahoma as early as 1969. The late B. B. Moser (pers. comm. with J. Pigg) indicated that he collected the RR pupfish from a small tributary of the South Canadian River in Pontotoc County (T5N R4E S5); however, the number and disposition of those specimens is unknown. Attempts by us to locate this site and verify the existence of this population were unsuccessful. However, D. Martinez and R. Suttles (pers. comm., unpubl. data) collected 28 specimens of RR pupfish from Buckhorn Creek, N of Oil Center, Pontotoc Co. (T5N R5E S27) in September of 1984 (specimens retained by D. Martinez of U.S. Fish and Wildlife Service).

Since the publication by Pigg et al. (5), several hundred additional collections have been made in the South Canadian River by OK Department of Environmental Quality (ODEQ) personnel (J. Pigg, unpubl. data), Larson et al. (6), Luttrell et al. (7), and Polivka (unpubl. data). These collections have expanded the known distribution and documented the continued occurrence of the species in the South Canadian River drainage of Oklahoma and Texas. Pigg et al. (5) reported collecting the RR pupfish at a monitoring site near Wanette, Pottawatomie Co. (T5N R2E S12). No specimens of the species have been taken from the South Canadian River mainstem downstream of this site, despite numerous efforts (Pigg, unpubl. data, 6,7). During 55 collections from 1976-1994 no RR pupfish were found in Hughes County near Calvin (Table 1).

Collections at an ODEQ site near Bridgeport, Blaine Co. (T13N R11W S28) suggest that the RR pupfish may be increasing in abundance (Table 1; see also Table 2). In 1983 ODEQ personnel (J. Pigg and party) surveyed the South Canadian River from the OK-TX border to Lake Eufaula. RR pupfish were abundant at two sites: N of Roll, Ellis Co. and S of Camargo, Dewey Co. (Table 2). In 1989 they failed to find the species at six localities between the OK-TX border and Bridgeport, Caddo Co., Oklahoma (J. Pigg, unpubl. data). Subsequently, in 1993 they collected the RR pupfish at four sites between the OK-TX border and Bridgeport (Table 2). Recently, Larson et al. (6) reported the species from Hemphill, Roberts, and Hutchinson counties in the Texas portions of the South Canadian River drainage (Table 2); they did not find the RR pupfish upstream of Sanford Dam (Hutchinson Co., TX).

On 21 May 1991, ODEQ personnel captured a single specimen of the RR pupfish (OSUS, 23607) from the Cimarron River south of Cleo Springs, Major Co. (T22N R12W S23). This is the first record of the RR pupfish from the Cimarron River drainage. No additional specimens have been obtained; this introduction may have been transient.

Collections made since Pigg's report (5) indicate that the known range of the RR pupfish has expanded to include the South Canadian River from the Sanford Dam

(Hutchinson Co., TX) to at least Wanette (Pottawatomie Co., OK). Reduced intensity of high stream flows in recent years (6) may explain recent expansions in the range of the RR pupfish.

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REFERENCES

1. Moore, G.A., Fishes, in *Vertebrates of the United States* (Blair, W.F., Blair, A.P., Brodkorb, P., Cagle, F.R., and Moore, G.A., Eds.) McGraw-Hill Book Co., New York (1957) pp. 31-210.
2. Miller, R.J. and Robison, H.W., *The Fishes of Oklahoma*, Okla. State Univ. Press, Stillwater, OK (1973).
3. Echelle, A.A., Echelle, A.F., and Cross, F.B., First records of *Cyprinodon rubrofluviatilis* (Cyprinodontidae) from the Colorado and Arkansas River Systems, Texas. *Southwestern Nat.* **22**, 142-143 (1977).
4. Ashbaugh, N.A., Echelle, A.A., and Echelle, A.F., Genic diversity in Red River pupfish *Cyprinodon rubrofluviatilis* (Atheriniformes : Cyprinodontidae) and its implications for conservation genetics of the species. *Fish Biol.* **45**, 291-302 (1994).
5. Pigg, J., Harrison, W., and Gibbs, R., The Red River pupfish, *Cyprinodon rubrofluviatilis* (Fowler), in the Arkansas River Drainage in western Oklahoma. *Proc. Okla. Acad. Sci.* **64**, 48 (1984).
6. Larson, R.D., Echelle, A.A., and Zale, A.V., *Life history and distribution of the Arkansas River shiner in Oklahoma*. Project Final Report. Oklahoma Dept of Wildlife Conserv. Project No. E-8 Job No. 1 (1991). 94 pp.
7. Luttrell, G.R., Echelle, A.A., and Zale, A.V., *Status of the Speckled Chub in the Arkansas River Basin*. Project Final Report. Oklahoma Dept. Wildlife Conserv. Project No. E-8 Job No. 3 (1993) 36 pp.

TABLE 1. Occurrence of the Red River pupfish at three South Canadian River ODEQ Biotrend monitoring sites between 1976 and 1994. C=No. of collections, P=No. of RR pupfish specimens, --=no sample.

Year	Bridgeport Blaine Co.		Wanette Pottaw. Co.		Calvin Hughes Co.	
	C	P	C	P	C	P
1976	1	0	--	--	1	0
1977	2	0	--	--	2	0
1978	2	0	2	0	2	0
1979	2	0	3	0	3	0
1980	3	0	2	0	3	0
1981	3	0	2	2	3	0
1982	3	1	2	0	3	0
1983	3	0	3	0	3	0
1984	3	0	2	0	3	0
1985	3	1	2	0	5	0
1986	3	5	2	1	3	0
1987	3	4	2	0	3	0
1988	3	2	2	0	3	0
1989	3	0	2	1	3	0
1990	3	0	2	0	3	0
1991	2	11	2	0	3	0
1992	3	10	2	0	3	0
1993	3	3	2	0	3	0

TABLE 2. Collection records for the RR pupfish in the South Canadian River in Texas and Oklahoma. Data compiled from Pigg (unpub. data), Polivka (unpub. data), Larson et al. (6), and Luttrell et al. (7).

Texas:

Roberts (N. Pampa HW 70): 1988/2
 Hemphill (N. of Canadian): 1990/34
 Hutchinson (Sanford Dam): 1990/61
 Hutchinson (Stinnett): 1990/76

Oklahoma:

Blaine (NW Bridgeport): 1982/1; 1983/0;
 1985/1; 1986/5; 1987/4; 1988/2; 1990/0;
 1991/11; 1992/10; 1993/3; 1994/16
 Caddo (SE Bridgeport): 1992/1; 1994/10
 Cleveland (Norman Vic.): 1994/7
 Cleveland (Lex./Purcell): 1994/2
 Custer (N Thomas): 1994/16
 Dewey (near Camargo): 1983/38; 1990/3; 1993/48
 Dewey (near Oakwood): 1993/10
 Dewey (near Taloga): 1990/11; 1992/4; 1993/61
 McClain (near Newcastle): 1992/3
 Pottawatomie (near Wanette): 1981/2; 1986/1
 Roger Mills (near Roll): 1983/43; 1990/22; 1993/32

Vouchers include the following catalogued records (see Table 1): county: OSUS No(s). Texas: Roberts: 18710; Hemphill: 18692; Hutchinson: 18730, 18733, 18825. Oklahoma: Caddo: 25346, 26835, 26836, 26838, 26861; Cleveland/McClain: 23434, 25656, 26803, 26862; Dewey: 18804, 18869, 25330; Pottawatomie: 26705.