

FINAL PERFORMANCE REPORT



Federal Aid Grant No. F13AP00776 (E-81-R-2)

**Processing and Vouchering of Large-River Fish Samples Collected for
Monitoring Listed and At-Risk Fish**

Oklahoma Department of Wildlife Conservation

May 1, 2014 through October 31, 2015

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State: Oklahoma

Grant Number: F13AP00776 (E-81-R-2)

Grant Program: Endangered Species Act Section 6

Grant Title: Processing and Vouchering of Large-River Fish Samples Collected for Monitoring Listed and At-Risk Fish

Grant Period: May 1, 2014 – October 31, 2015

Report Period: May 1, 2014 – October 31, 2015

Project Leader: Shannon Brewer, PhD.

I. BACKGROUND:

The Arkansas River Shiner (*Notropis girardi*) is a pelagic-spawning cyprinid fish that historically occurred throughout the shallow and braided prairie rivers of the Arkansas River watershed and has been federally-listed as a threatened species since 1998. Within Oklahoma, it was found in both the Cimarron and Canadian Rivers. The species is thought to be extirpated in the Cimarron River, most likely due to displacement by the introduced Red River Shiner (*Notropis bairdi*). The U.S. Fish and Wildlife Service (USFWS) and the Oklahoma Department of Wildlife Conservation (ODWC) have conducted biannual surveys since 2000 at approximately 12-15 sites along the Canadian River, from north of Durham, OK to west of Lake Eufaula Reservoir. Surveys in the Cimarron River ceased in 2010 due to the lack of finding any Arkansas River Shiner individuals. While Arkansas River Shiner distribution and abundance is the main focus, information on several other species is gathered during sampling efforts. Since 2012, the Oklahoma Cooperative Fish and Wildlife Research Unit has been processing and enumerating the large volume of fish samples collected from these cooperative survey efforts. In addition, fish samples from the Red River watershed have been processed, with a focus on the Prairie Speckled Chub (*Macrhybopsis australis*), an at-risk fish species.

II. OBJECTIVE:

Enumerate and analyze all of the fish collections that are made by the U.S. Fish and Wildlife Service and the Oklahoma Department of Wildlife Conservation as part of their cooperative efforts to monitor the geographic distribution and relative abundances of the Arkansas River Shiner and associated cyprinid fish species in the Canadian and Cimarron river systems and the Prairie Speckled Chub and associated cyprinid species in the Red River system.

III. SUMMARY OF PROGRESS

A. APPROACH

Fish samples were brought to OSU for identification. Samples that were still in formalin were rinsed in water and transferred to 70% ethanol. Fish were identified using published keys and several other keys developed at the OSU lab.

We developed an Access database that included fish count data and the physical attributes of each study site. We also provided directions to ODWC and USFWS on how to link the tables together in Access (see Appendix A). The sample ID indicates the year within the sample code

(the first two numbers). For example, BAB1127 is a 2011 sample whereas BAB1406 is a 2014 sample.

B. RESULTS

We identified 49 fish species from 2011-2014 samples (Figure 1). We also included seven additional groups: 1) unknown, which generally contained cyprinids too small to identify with confidence, 2) *Pimephales* spp, 3) *Carpoides* Spp, 4) *Lepisosteus* Spp, 5) *Lepomis* Spp, 6) Cyprinidae Spp, and 7) *Micropterus* Spp. The Red Shiner (*Cyprinella lutrensis*) was the most numerous species captured. Abundance of Arkansas River Shiner is summarized by location in Table 1. Site descriptions, with a common linking identifier, are provided in Table 2. Some data sheets were entered but did not have corresponding fish samples; consequently, these were left blank (no zeros were entered in these instances as the values are unknown).

IV. RECOMMENDATIONS

The project is completed for the current year. All fish samples have been identified and the databases are completed. Within the next few weeks, technicians at the OCFWRU will be disposing of the samples that will not be retained at OSU and cleaning out sample bottles, as appropriate.

V. SIGNIFICANT DEVIATIONS

No significant deviations.

VI. EQUIPMENT

No equipment purchased during this period.

VII. PREPARED BY: Shannon Brewer
Oklahoma Cooperative Fish and Wildlife Research Unit,
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APPROVED BY:

Wildlife Division Administration
Oklahoma Department of Wildlife Conservation

Andrea Crews, Federal Aid Coordinator
Oklahoma Department of Wildlife Conservation

VIII. REFERENCES

No references

Table 1.- Summary of collections identified by OSU in 2013-2015 that contained the federally-threatened Arkansas River Shiner (ARS). The ID links back to a database that we created for the USFWS and ODWC that contains all identified fishes from these collections. These results include data collected from 2011, 2012, 2013 and 2014.

ID	State	County	Locality	ARS
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BAB0701			South Canadian	1
BAB0702			South Canadian	47
BAB0703			South Canadian	35
BAB0704			South Canadian	12
BAB0705			South Canadian	21
BAB0706			South Canadian	51
BAB0707			South Canadian	23
BAB0708			South Canadian	104
BAB0709			South Canadian	89
BAB0710			South Canadian	161
BAB0711			North Canadian	0
BAB0712			North Canadian	0
BAB0713			South Canadian	68
BAB0714			South Canadian	45
BAB0715			South Canadian	0
BAB0716			South Canadian	0
BAB0717			South Canadian	491
BAB0718			South Canadian	733
BAB0719			Cimarron	0
BAB0720			Cimarron	0
BAB0721			Cimarron	0
BAB0722			Cimarron	0
BAB0723			Cimarron	0
BAB0724			Cimarron	0
BAB0725			Cimarron	0
BAB0726			Cimarron	0
BAB0727			Cimarron	0
BAB0728			Cimarron	0
BAB0729			Cimarron	0
BAB0730			Cimarron	0
BAB0731			Cimarron	0
BAB0732			Cimarron	0
BAB0733			Cimarron	0
BAB0734			Cimarron	0
BAB0801			South Canadian	4
BAB0802			South Canadian	50
BAB0803			South Canadian	14
BAB0804			South Canadian	92
BAB0805			South Canadian	44
BAB0806			South Canadian	29
BAB0807			South Canadian	168

BAB0808			South Canadian	175
BAB0809			South Canadian	27
BAB0810			South Canadian	3
BAB0811			South Canadian	13
BAB0812			South Canadian	29
BAB0813			South Canadian	0
BAB0814			South Canadian	0
BAB0815			Cimarron	0
BAB0816			Cimarron	0
BAB0817			Cimarron	0
BAB0818			Cimarron	0
BAB0819			Cimarron	0
BAB0820			Cimarron	0
BAB0821			Cimarron	0
BAB0822			Cimarron	0
BAB0823			Cimarron	0
BAB0824			Cimarron	0
BAB0825			Cimarron	0
BAB0826			Cimarron	0
BAB0827			Cimarron	0
BAB0901			South Canadian	0
BAB0902			South Canadian	0
BAB0903			South Canadian	6
BAB0904			South Canadian	16
BAB0905			South Canadian	13
BAB0906			South Canadian	14
BAB0907			South Canadian	48
BAB0908			South Canadian	93
BAB0909			South Canadian	98
BAB0910			South Canadian	53
BAB0911			South Canadian	51
BAB0912			South Canadian	6
BAB0913			South Canadian	65
BAB0914			South Canadian	6
BAB0915			Cimarron	0
BAB0916			Cimarron	0
BAB0917			Cimarron	0
BAB0918			Cimarron	0
BAB0919			Cimarron	0
BAB0920			Cimarron	0
BAB0921			Cimarron	0

BAB0922			Cimarron	0
BAB0923			Cimarron	0
BAB0924			Cimarron	0
BAB0925			Cimarron	0
BAB0926			Cimarron	0
BAB0927			Cimarron	0
BAB0928			Cimarron	0
BAB0929			Cimarron	0
BAB1001			Canadian @ U.S. 83, 1/2 mile N. of Canadian, TX	0
BAB1002			Canadian @ SH 70, 30 miles N. of Pampa, TX	0
BAB1003			Canadian @ U.S. 283, near Roll	49
BAB1006			Canadian @ U.S. 183, near Taloga	288
BAB1008		Caddo	Canadian @ OK/281 and Bridgeport	230
BAB1009			Canadian @ County Rd 2720 Caddo Jake Bridge, N of Cogar	109
BAB1010			Canadian @ Hwy 81, near Union City	96
BAB1011			Canadian @ I 35, near Norman	226
BAB1013			Canadian @ SH 102, 3 miles S. of Wanette	151
BAB1014			Canadian @ U.S. 377, near Byng	1
BAB1017			Cimarron @ N. 1510	0
BAB1018			Cimarron @ N. 1610, 8 miles NE of Knowles	0
BAB1020			Cimarron @ U.S. 64, 17 miles E of Buffalo	0
BAB1022			Cimarron @ 281, 4 miles S. of Waynoka	0
BAB1023			Cimarron @ U.S. 60, 1 mile S. of Cleo Springs	0
BAB1025			Cimarron @ County Rd near, Ames, OK	0
BAB1026			Cimarron @SH 51, 9 miles E. of Okeene	0
BAB1027			Cimarron @ Hwy 81, S. of Dover, OK	0
BAB1028			Cimarron @ Hwy 74, S. of Crescent	0
BAB1029			Cimarron @ Hwy 77, N. of Guthrie	0
BAB1030			Cimarron @ Hwy 33, near Coyle, OK	0
BAB1032			Cimarron @ Hwy 18, N. of Cushing	0
BAB1101	TX	Oldham	Canadian @ US 385, near Boys Ranch	
BAB1102	TX	Potter	Canadian @ US 287, N of Amarillo	

BAB1103	TX	Roberts	Canadian @ SH 70, 30 miles N of Pampa, TX	0
BAB1104	TX	Hemphill	Canadian @ Canadian TX, Hwy 83 1/2 mile N of Canadian, TX	39
BAB1105	OK	Ellis	Canadian off Co. Rd. 4 miles N, 1 mile W of Durham, OK	40
BAB1106	OK	Ellis	Canadian @ US 283, near Roll	
BAB1107	OK	Dewey	Canadian @ Ok 34, near Camargo	459
BAB1109	OK	Custer	Canadian @ OK 33, near Thomas	89
BAB1111	OK	Canadian	Canadian @ Co. Rd. N 2720 Caddo Jake Br., N of Cogar	44
BAB1113	OK	Grady	Canadian @ Ok 4, near Mustang	141
BAB1117	OK	Pontotoc	Canadian @ US 377, 7 miles N of Byng	
BAB1118	OK	Hughes	Canadian @ US 75, 1 mile N of Calvin	
BAB1119	OK	Pittsburgh	Canadian @ Indian Nation Turnpike, 2 miles N of Ulan	
BAB1120	OK	Beaver	Cimarron @ Co. Rd. N 1380, 5 miles N of Forgan (Stateline)	0
BAB1121	OK	Beaver	Cimarron @ Co. Rd. N 1510, N of Knowles	0
BAB1126	OK	Harper	Cimarron @ Hwy 64, 17 mi E of Buffalo, OK	0
BAB1127	OK	Woods	Cimarron @ Hwy 50, 1 mile S of Freedom, OK	0
BAB1128	OK	Woods	Cimarron @ Hwy 281, 4 miles S of Waynoka, OK	0
BAB1130	OK	Major	Cimarron @ Hwy 58/8, S of Ringwood, OK	0
BAB1131	OK	Major	Cimarron @ Co Rd. 0550, 3 miles SW of Ames	0
BAB1132	OK	Kingfisher	Cimarron @ Hwy 51, E of Okeene	
BAB1133	OK	Kingfisher	Cimarron @ Co. Rd. N 2830, W of Dover, OK	
BAB1134	OK	Logan	Cimarron @ Hwy 74, S of Crescent, OK	
BAB1135	OK	Caddo	Deer Creek @ Co Rd. N 2520, 2 miles E of Hydro	
BAB1136	NM	Quay	Canadian, 4 miles E of Logan, NM	
BAB1137	TX	Oldham	Canadian, 24 miles N of Adrian on Canadian River Ranch	

BAB1138	OK	Greer	Elm Fork of the Red River @ OK 6, 6 miles S of Granite, OK	
BAB1139	OK	Jefferson	Red @ OK 79, 6 miles SW of Waurika	
BAB1140	OK	Love	Red @ I-35	
BAB1141	OK	Dewey	Canadian @ US 183	
BAB1142	OK	Caddo	Canadian @ US 281, near Bridgeport	
BAB1143	OK	Cleveland	Canadian @ I-35	
BAB1144	OK	Pontotoc	Canadian @ US 377, N of Ada	
BAB1146	OK	Hughes	Holdenville Lake	
BAB1201	OK	Roger Mills	Canadian @ US 283, near Roll	
BAB1202	OK	Caddo	Canadian @ US 281, near Bridge Port	
BAB1203	OK	Grady	Canadian @ US 81, near Union City	
BAB1204	OK	Cleveland	Canadian @ I-35, near Norman	
BAB1205	TX	Oldham	Canadian @ US 385, near Boys Ranch	1
BAB1206	TX	Potter	Canadian @ US 287, N of Amarillo	0
BAB1207	TX	Hutchinson	Canadian @ FM 2277, N of Borger	0
BAB1208	TX	Hutchinson	Dickson Creek (trib to Canadian) @ FM 2277, N of Borger	0
BAB1209	TX	Hutchinson	Dickson Creek (trib to Canadian) @ Hwy 152, E. of Borger, TX	
BAB1210	TX	Roberts	Canadian, 30 miles N Pampa, TX	
BAB1211	OK	Hemphill	Canadian @ US 83, Canadian, TX	0
BAB1212	OK	Ellis	Canadian @ Co. Rd., N of Durham, OK	
BAB1213	OK	Ellis	Canadian @ US 283, near Roll	0
BAB1214	OK	Dewey	Canadian @ OK 34, near Camargo	0
BAB1215	OK	Dewey	Canadian @ Hwy 183, N of Taloga, OK	
BAB1216	OK	Custer	Canadian @ SH 33, near Thomas, OK	0
BAB1217	OK	Caddo	Canadian @ Bridgeport, Hwy 281	
BAB1218	OK	Canadian	Canadian @ Caddo Jake Bridge	
BAB1219	OK	Hughes	Canadian @ US 75, 1 mile N of Calvin	4
BAB1220	OK	Pontotoc	Canadian, N of Ada Hwy 99, US 377	5
BAB1221	OK	Grady	Canadian @ US 81-Union City	
BAB1222	OK	Grady	Canadian @ SH 4, near Mustang	
BAB1223	OK	Cleveland	Canadian @ I-35, near Norman	
BAB1224	OK	Cleveland	Canadian @ SH 102, S of Wanette	
BAB1301	TX	Oldham	Canadian @ US 385, near Boys Ranch	0
BAB1302	TX	Potter	Canadian @ US 287	4
BAB1303	TX	Hemphill	Canadian @ US 83, near Canadian, TX	0

BAB1304	OK	Ellis	Canadian @ Co Rd N1710, 4 miles N of Durham	0
BAB1305	OK	Ellis	Canadian @ US 283, N of Roll	0
BAB1306	OK	Dewey	Canadian @ OK 34, near Camargo	2
BAB1307	OK	Dewey	Canadian @ US 183, near Taloga	0
BAB1308	OK	Custer	Canadian @ OK 33, near Thomas	0
BAB1309	OK	Caddo	Canadian @ US 281, near Bridgeport	0
BAB1310	OK	Grady	Canadian @ US 81, near Union City	1
BAB1311	OK	Cleveland	Canadian @ I-35, near Norman	7
BAB1312	OK	Pontotoc	Canadian @ US 377, near Ada	2
BAB1313	OK	Hughes	Canadian @ US 75, near Calvin	0
BAB1314	OK	Ellis	Canadian @ CR1710, 4 miles N of Durham	0
BAB1315	OK	Ellis	Canadian @ US 283, N of Roll	0
BAB1316	OK	Dewey	Canadian @ OK 34 near Camargo	0
BAB1317	OK	Dewey	Canadian @ US 183 near Taloga	28
BAB1318	OK	Custer	Canadian @ OK 33 near Thomas	0
BAB1319	OK	Caddo	Canadian @ US 281 near Bridgeport	0
BAB1320	OK	Canadian	Canadian @ CR 2720 Caddo Jake Bridge	0
BAB1321				12
BAB1322	OK	Pottawatomie	Canadian @ SH 102 S. of Wanette, Ok	5
BAB1323	OK	Cleveland	Canadian @ I 35	52
BAB1324	OK	Pontotoc	Canadian @ Hwy 377, 7 miles N of Ada	20
BAB1325			Canadian @ Calvin US 75	14
BAB1401			Canadian @ Hwy 83 at Boys Ranch	122
BAB1402	TX		Canadian @ Hwy 87, 20 miles N of Amarillo, TX	15
BAB1403	TX		Canadian @ US 83 near Canadian, TX	0
BAB1404	OK/TX		Canadian @ Co Rd 4 mi. E of OK/TX state line near Durham, OK	0
BAB1405	OK		Canadian @ Hwy 283, 7 mi. N of Roll, OK	6
BAB1406	OK		Canadian @ Hwy 34 near Camargo, OK	0
BAB1407	OK		Canadian @ Co Rd E0730, approx 7 mi. NNW of Oakwood, OK	0
BAB1408	OK		Canadian @ Hwy 33, 6 mi N of Thomas, OK	0

BAB1409	OK		Canadian @ Hwy 281, 3 miles N of Bridgeport, OK	9
BAB1410	OK		Canadian @ County Rd N2720 (Caddo Jake Bridge), 7 mi N of Cogar, OK	4
BAB1411	OK		Canadian @ Hwy 81, 3 mi S of Union City, OK	10
BAB1412	OK		Canadian @ I-35, 1 mi S of Norman, OK - Access from church parking lot east of I-35	18
BAB1413	OK		Canadian @ Hwy 377/99, 4 mi N of Ada, OK	11

Table 2.- Location of field-survey locations based on USFWS survey notes. Habitat at location of sample is provided as a binary response in the database but was omitted from the table for simplicity: true indicates the sample was taken in that habitat whereas false indicates it was not.

ID	State	County	Locality	Lat	Long
BAB0701			South Canadian		
BAB0702			South Canadian		
BAB0703			South Canadian		
BAB0704			South Canadian		
BAB0705			South Canadian		
BAB0706			South Canadian		
BAB0707			South Canadian		
BAB0708			South Canadian		
BAB0709			South Canadian		
BAB0710			South Canadian		
BAB0711			North Canadian		
BAB0712			North Canadian		
BAB0713			South Canadian		
BAB0714			South Canadian		
BAB0715			South Canadian		
BAB0716			South Canadian		
BAB0717			South Canadian		
BAB0718			South Canadian		
BAB0719			Cimarron		
BAB0720			Cimarron		
BAB0721			Cimarron		
BAB0722			Cimarron		
BAB0723			Cimarron		
BAB0724			Cimarron		
BAB0725			Cimarron		
BAB0726			Cimarron		
BAB0727			Cimarron		
BAB0728			Cimarron		
BAB0729			Cimarron		
BAB0730			Cimarron		
BAB0731			Cimarron		
BAB0732			Cimarron		
BAB0733			Cimarron		
BAB0734			Cimarron		
BAB0801			South Canadian		
BAB0802			South Canadian		
BAB0803			South Canadian		

BAB0804			South Canadian		
BAB0805			South Canadian		
BAB0806			South Canadian		
BAB0807			South Canadian		
BAB0808			South Canadian		
BAB0809			South Canadian		
BAB0810			South Canadian		
BAB0811			South Canadian		
BAB0812			South Canadian		
BAB0813			South Canadian		
BAB0814			South Canadian		
BAB0815			Cimarron		
BAB0816			Cimarron		
BAB0817			Cimarron		
BAB0818			Cimarron		
BAB0819			Cimarron		
BAB0820			Cimarron		
BAB0821			Cimarron		
BAB0822			Cimarron		
BAB0823			Cimarron		
BAB0824			Cimarron		
BAB0825			Cimarron		
BAB0826			Cimarron		
BAB0827			Cimarron		
BAB0901			South Canadian		
BAB0902			South Canadian		
BAB0903			South Canadian		
BAB0904			South Canadian		
BAB0905			South Canadian		
BAB0906			South Canadian		
BAB0907			South Canadian		
BAB0908			South Canadian		
BAB0909			South Canadian		
BAB0910			South Canadian		
BAB0911			South Canadian		
BAB0912			South Canadian		
BAB0913			South Canadian		
BAB0914			South Canadian		
BAB0915			Cimarron		
BAB0916			Cimarron		
BAB0917			Cimarron		

BAB0918			Cimarron		
BAB0919			Cimarron		
BAB0920			Cimarron		
BAB0921			Cimarron		
BAB0922			Cimarron		
BAB0923			Cimarron		
BAB0924			Cimarron		
BAB0925			Cimarron		
BAB0926			Cimarron		
BAB0927			Cimarron		
BAB0928			Cimarron		
BAB0929			Cimarron		
BAB1001			Canadian @ U.S. 83, 1/2 mile N. of Canadian, TX		
BAB1002			Canadian @ SH 70, 30 miles N. of Pampa, TX		
BAB1003			Canadian @ U.S. 283, near Roll		
BAB1006			Canadian @ U.S. 183, near Taloga		
BAB1008		Caddo	Canadian @ OK/281 and Bridgeport	35, 32'37",	98, 99' 03"
BAB1009			Canadian @ County Rd 2720 Caddo Jake Bridge, N of Cogar		
BAB1010			Canadian @ Hwy 81, near Union City		
BAB1011			Canadian @ I 35, near Norman		
BAB1013			Canadian @ SH 102, 3 miles S. of Wanette		
BAB1014			Canadian @ U.S. 377, near Byng		
BAB1017			Cimarron @ N. 1510		
BAB1018			Cimarron @ N. 1610, 8 miles NE of Knowles		

BAB1020			Cimarron @ U.S. 64, 17 miles E of Buffalo		
BAB1022			Cimarron @ 281, 4 miles S. of Waynoka		
BAB1023			Cimarron @ U.S. 60, 1 mile S. of Cleo Springs		
BAB1025			Cimarron @ County Rd near, Ames, OK		
BAB1026			Cimarron @SH 51, 9 miles E. of Okeene		
BAB1027			Cimarron @ Hwy 81, S. of Dover, OK		
BAB1028			Cimarron @ Hwy 74, S. of Crescent		
BAB1029			Cimarron @ Hwy 77, N. of Guthrie		
BAB1030			Cimarron @ Hwy 33, near Coyle, OK		
BAB1032			Cimarron @ Hwy 18, N. of Cushing		
BAB1101	TX	Oldham	Canadian @ US 385, near Boys Ranch		
BAB1102	TX	Potter	Canadian @ US 287, N of Amarillo		
BAB1103	TX	Roberts	Canadian @ SH 70, 30 miles N of Pampa, TX	35, 58' 11"	110, 51' 22"
BAB1104	TX	Hemphill	Canadian @ Canadian TX, Hwy 83 1/2 mile N of Canadian, TX		
BAB1105	OK	Ellis	Canadian off Co. Rd. 4 miles N, 1 mile W of Durham, OK	35, 54' 25"	99, 56' 33"
BAB1106	OK	Ellis	Canadian @ US 283, near Roll	35, 52' 09"	99, 43' 40"
BAB1107	OK	Dewey	Canadian @ Ok 34, near Camargo	36, 00' 06"	97, 17' 26"
BAB1109	OK	Custer	Canadian @ OK 33, near Thomas	35, 46' 17"	98, 40' 27"

BAB1111	OK	Canadian	Canadian @ Co. Rd. N 2720 Caddo Jake Br., N of Cogar	35, 27' 14"	98, 08' 57"
BAB1113	OK	Grady	Canadian @ Ok 4, near Mustang	35, 19' 32"	97, 43' 27"
BAB1117	OK	Pontotoc	Canadian @ US 377, 7 miles N of Byng	34, 56' 50"	96, 41' 00"
BAB1118	OK	Hughes	Canadian @ US 75, 1 mile N of Calvin	34, 58' 30"	96, 14' 28"
BAB1119	OK	Pittsburgh	Canadian @ Indian Nation Turnpike, 2 miles N of Ulan	35,	95,
BAB1120	OK	Beaver	Cimarron @ Co. Rd. N 1380, 5 miles N of Forgan (Stateline)	37, 00' 20"	100, 32' 06"
BAB1121	OK	Beaver	Cimarron @ Co. Rd. N 1510, N of Knowles	36, 58' 32"	100, 18' 51"
BAB1126	OK	Harper	Cimarron @ Hwy 64, 17 mi E of Buffalo, OK	36, 51' 07"	99, 18' 55"
BAB1127	OK	Woods	Cimarron @ Hwy 50, 1 mile S of Freedom, OK		
BAB1128	OK	Woods	Cimarron @ Hwy 281, 4 miles S of Waynoka, OK		
BAB1130	OK	Major	Cimarron @ Hwy 58/8, S of Ringwood, OK	36, 16' 59"	98, 19' 09"
BAB1131	OK	Major	Cimarron @ Co Rd. 0550, 3 miles SW of Ames	36, 13' 11"	98, 15' 10"
BAB1132	OK	Kingfisher	Cimarron @ Hwy 51, E of Okeene		
BAB1133	OK	Kingfisher	Cimarron @ Co. Rd. N 2830, W of Dover, OK	35, 58' 34"	97, 57' 40"
BAB1134	OK	Logan	Cimarron @ Hwy 74, S of Crescent, OK	33, 53' 08"	97, 35' 24"

BAB1135	OK	Caddo	Deer Creek @ Co Rd. N 2520, 2 miles E of Hydro	35, 32' 03"	98, 41' 42"
BAB1136	NM	Quay	Canadian, 4 miles E of Logan, NM		
BAB1137	TX	Oldham	Canadian, 24 miles N of Adrian on Canadian River Ranch		
BAB1138	OK	Greer	Elm Fork of the Red River @ OK 6, 6 miles S of Granite, Ok		
BAB1139	OK	Jefferson	Red @ OK 79, 6 miles SW of Waurika		
BAB1140	OK	Love	Red @ I-35	33, 43.601'	97, 09' 57.7"
BAB1141	OK	Dewey	Canadian @ US 183	36, 03' 15"	95, 58' 08"
BAB1142	OK	Caddo	Canadian @ US 281, near Bridgeport	35, 32' 37"	98, 99' 03"
BAB1143	OK	Cleveland	Canadian @ I-35	35, 11' 40"	97, 29' 05"
BAB1144	OK	Pontotoc	Canadian @ US 377, N of Ada	34, 56' 80"	96, 41' 00"
BAB1146	OK	Hughes	Holdenville Lake		
BAB1201	OK	Roger Mills	Canadian @ US 283, near Roll	35, 52' 09"	99, 43' 40"
BAB1202	OK	Caddo	Canadian @ US 281, near Bridge Port	35, 32' 37"	98, 99' 03"
BAB1203	OK	Grady	Canadian @ US 81, near Union City	35, 21' 59"	97, 55' 45"
BAB1204	OK	Cleveland	Canadian @ I-35, near Norman	35, 11' 40"	97, 29' 05"
BAB1205	TX	Oldham	Canadian @ US 385, near Boys Ranch	35, 31' 13"	102, 15' 40"
BAB1206	TX	Potter	Canadian @ US 287, N of Amarillo	35, 28' 11"	101, 52' 47"
BAB1207	TX	Hutchinson	Canadian @ FM 2277, N of Borger	35, 44' 49.9"	101, 20' 49.0"

BAB1208	TX	Hutchinson	Dickson Creek (trib to Canadian) @ FM 2277, N of Borger	35, 44' 36"	101, 20' 31"
BAB1209	TX	Hutchinson	Dickson Creek (trib to Canadian) @ Hwy 152, E. of Borger, TX	35, 39' 55.3"	101, 21' 8.6"
BAB1210	TX	Roberts	Canadian, 30 miles N Pampa, TX	35, 58' 11"	100, 51' 22"
BAB1211	OK	Hemphill	Canadian @ US 83, Canadian, TX	35, 56' 34"	100, 22' 39"
BAB1212	OK	Ellis	Canadian @ Co. Rd., N of Durham, OK	35, 54' 39.8"	99, 56' 57.3"
BAB1213	OK	Ellis	Canadian @ US 283, near Roll	35, 52' 09"	99, 43' 40"
BAB1214	OK	Dewey	Canadian @ OK 34, near Camargo	36, 00' 06"	99, 17' 26"
BAB1215	OK	Dewey	Canadian @ Hwy 183, N of Taloga, OK	36, 03' 15"	98, 58' 08"
BAB1216	OK	Custer	Canadian @ SH 33, near Thomas, OK	35, 46' 17"	98, 40' 27"
BAB1217	OK	Caddo	Canadian @ Bridgeport, Hwy 281	35, 32' 37"	98, 99' 03"
BAB1218	OK	Canadian	Canadian @ Caddo Jake Bridge	35, 27' 14"	98, 08' 57"
BAB1219	OK	Hughes	Canadian @ US 75, 1 mile N of Calvin	34, 58' 30"	96, 14' 28"
BAB1220	OK	Pontotoc	Canadian, N of Ada Hwy 99, US 377	34, 56' 80"	96, 41' 00"
BAB1221	OK	Grady	Canadian @ US 81-Union City	35, 21' 59"	97, 55' 45"
BAB1222	OK	Grady	Canadian @ SH 4, near Mustang	35, 19' 32"	97, 43' 27"
BAB1223	OK	Cleveland	Canadian @ I-35, near Norman	35, 11' 40"	97, 29' 05"
BAB1224	OK	Cleveland	Canadian @ SH 102, S of Wanette	34, 55' 12"	97, 02' 58"
BAB1301	TX	Oldham	Canadian @ US 385, near Boys Ranch		

BAB1302	TX	Potter	Canadian @ US 287		
BAB1303	TX	Hemphill	Canadian @ US 83, near Canadian, TX		
BAB1304	OK	Ellis	Canadian @ Co Rd N1710, 4 miles N of Durham	35, 54' 25"	99, 56' 30"
BAB1305	OK	Ellis	Canadian @ US 283, N of Roll		
BAB1306	OK	Dewey	Canadian @ OK 34, near Camargo	36, 00' 06"	97, 17' 26"
BAB1307	OK	Dewey	Canadian @ US 183, near Taloga	36, 03' 15"	95, 58' 08"
BAB1308	OK	Custer	Canadian @ OK 33, near Thomas		
BAB1309	OK	Caddo	Canadian @ US 281, near Bridgeport		
BAB1310	OK	Grady	Canadian @ US 581, near Union City		
BAB1311	OK	Cleveland	Canadian @ I-35, near Norman		
BAB1312	OK	Pontotoc	Canadian @ US 377, near Ada		
BAB1313	OK	Hughes	Canadian @ US 75, near Calvin		
BAB1314	OK	Ellis	Canadian @ CR1710, 4 miles N of Durham	35, 54' 25"	99, 56' 33"
BAB1315	OK	Ellis	Canadian @ US 283, N of Roll		
BAB1316	OK	Dewey	Canadian @ OK 34 near Camargo	36, 00' 06"	97, 17' 26"
BAB1317	OK	Dewey	Canadian @ US 183 near Taloga	36, 03' 15"	95, 58' 08"
BAB1318	OK	Custer	Canadian @ OK 33 near Thomas		
BAB1319	OK	Caddo	Canadian @ US 28 near Bridgeport		
BAB1320	OK	Canadian	Canadian @ CR 2720 Caddo Jake Bridge	35, 27' 14"	98, 08' 57"
BAB1321					
BAB1322	OK	Pottawatomie	Canadian @ SH 102 S. of Wanette,		

			Ok		
BAB1323	OK	Cleveland	Canadian @ I 35		
BAB1324	OK	Pontotoc	Canadian @ Hwy 377, 7 miles N of Ada		
BAB1325			Canadian @ Calvin US 75		
BAB1401			Canadian @ Hwy 385 at Boys Ranch		
BAB1402	TX		Canadian @ Hwy 287, 20 miles N of Amarillo, TX		
BAB1403	TX		Canadian @ US 83 near Canadian, TX		
BAB1404	OK/TX		Canadian @ Co Rd 4 mi. E of OK/TX state line near Durham, OK		
BAB1405	OK		Canadian @ Hwy 283, 7 mi. N of Roll, OK		
BAB1406	OK		Canadian @ Hwy 34 near Camargo, OK		
BAB1407	OK		Canadian @ Co Rd E0730, approx 7 mi. NNW of Oakwood, OK		
BAB1408	OK		Canadian @ Hwy 33, 6 mi N of Thomas, OK		
BAB1409	OK		Canadian @ Hwy 281, 3 miles N of Bridgeport, OK		
BAB1410	OK		Canadian @ County Rd N2720 (Caddo Jake Bridge), 7 mi N of Cogar, OK		
BAB1411	OK		Canadian @ Hwy 81, 3 mi S of Union City, OK		
BAB1412	OK		Canadian @ I-35, 1 mi S of Norman, OK - Access from church parking lot		

			east of I-35		
BAB1413	OK		Canadian @ Hwy 377/99, 4 mi N of Ada, OK		
BAB1414			Canadian @ US 75 near Calvin		

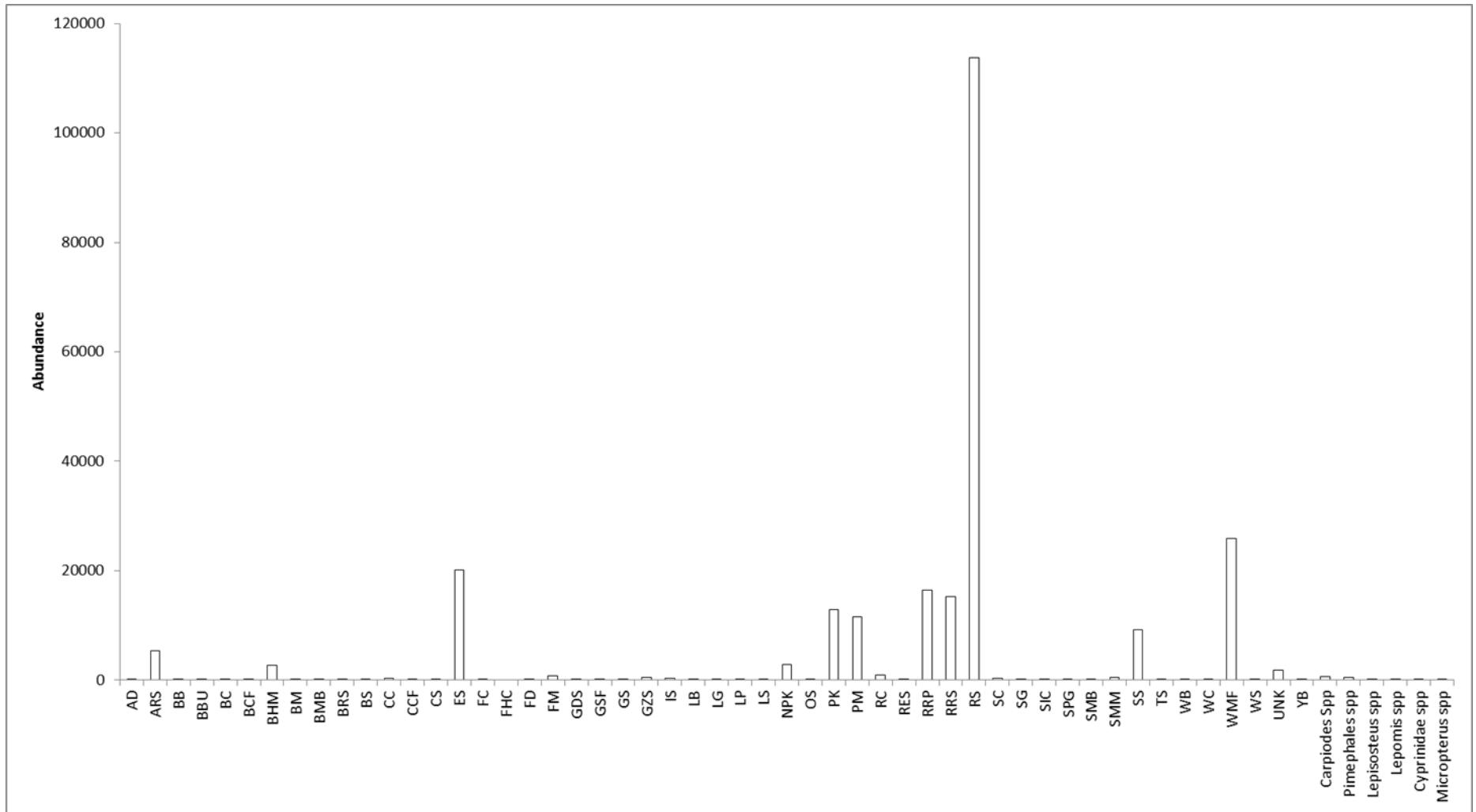


Figure 1.- Abundance of fish species identified from USFWS and ODWC sample collections. This figure only reflects samples identified in the OSU lab (2011- 2014 samples). Fish species abbreviations are defined in 'design view' of the Access Database (see instructions in Appendix A).

Appendix A. Directions for linking the tables of fish samples and data in Microsoft Access. These data have been provided to USFWS and ODWC.

Using Microsoft Access

1. After you have opened the database double click either field info or fish counts to open whichever table you would like to view (located on the left-hand side of the page) To close the table you are viewing right click the tab above the table (it has the table name on it) and click close.
2. To obtain further information about either the field info or the fish counts, open the table you wish to view and click the picture of a pencil and ruler above where it says view (located in the top left-hand corner under file).
 - a. This is where the abbreviations on the fish count table are defined.
3. If there is any need to change the column headers that can be done by right clicking on the header and choosing whatever option you like.
 - a. This should bring up options such as sorting the field, field width, renaming the field, etc.
4. Linking tables will allow you to take some or all of the data from either table and put it together in a single table.
 - a. To link the tables click database tools (located on the top of the page by file, home, etc.) and then click relationships, a pop-up box will appear.
 - b. Click field info, then click add. Do the same for fish counts, then click close.
 - c. There will be a box for field info and a box for fish counts.
 - i. In those boxes field no. should have a key by it, click on field no. in one box and drag it to field no. in the other box, a pop-up box will appear.
 - ii. Choose the option that says join type, select option three, then click create.
5. To use the information from both tables to make a new table choose the create option (located at the top of the page by file, home, etc.).
 - a. Click query wizard, a pop-up box will appear to guide you through the wizard.
 - b. Select simple query wizard, then click ok.
 - c. There will be an option that says tables/queries and under that should be a drop-down box.
 - i. If you click the down arrow that is on the box under that it will allow you to select which information you want to pull from each table.
 - d. As an example I will create a table with the field no, arkansas river shiner counts, the longitude and the latitude.
 - i. Choose field info in the drop-down box.
 - ii. Select field no. in the options under available fields.
 - iii. Click the top button located between available fields and selected fields. (a single angle bracket pointing toward the right of the screen)
 - iv. Choose latitude and do the same thing.
 - v. Same for longitude. (The button located under the one we are using allows you to select all the data from whichever table you are using.)

- e. Now go back to the drop-down box and select fish counts.
 - i. Choose ARS (Arkansas River Shiner)
 - f. Select finish.
6. Now you have a new table with the field number, latitude, longitude, and the count for Arkansas River Shiner. You can make tables using any combination of information you like; you can even import other tables made in access or excel, link those to the already linked tables, and use information from them.