

# **FINAL PERFORMANCE REPORT**



**Federal Aid Grant Number F16AP00914 (E-76-R-4)**

**Cooperative Surveys of Federally-listed and Candidate Aquatic  
Species in Oklahoma**

**Oklahoma Department of Wildlife Conservation**

**Grant Period: October 1, 2016 - September 30, 2018**

**Report Period: October 1, 2016 - October 31, 2017 (Ended early)**

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**Principal Investigator:** Matt Fullerton, Oklahoma Department of Wildlife Conservation

### I. Abstract

Each year, biologists from the Oklahoma Department of Wildlife Conservation (ODWC) assist federal agencies with monitoring and recovery efforts for aquatic species that are federally-listed as threatened or endangered under the Endangered Species Act. Aquatic species that are periodically monitored by both the U.S. Fish and Wildlife Service (Service) and the Tulsa District of the U.S. Army Corps of Engineers (USACE) include the Interior Least Tern (*Sternula antillarum*), Arkansas River Shiner (*Notropis girardi*), Leopard Darter (*Percina pantherina*), and Arkansas Darter (*Etheostoma cragini*). ODWC staff assisted the U.S. Fish and Wildlife Service with monitoring for the Arkansas River Shiner and Leopard Darter during the months of October 2016 and June – July 2017.

### II. Background

Population monitoring is necessary to periodically assess the status of federally-listed species to evaluate the effectiveness of population management techniques and determine whether progress is being made toward recovery goals. Population monitoring is equally important for candidate species and those species that are under evaluation for potential federal listing because it provides information regarding population trends and overall stability. Riverine systems of Oklahoma support three federally-listed species of fish, five federally-listed freshwater mussels, and one federally-listed bird. Additionally, another eight species of fish and mussels have been petitioned recently for federal listings and will be evaluated by the U.S. Fish and Wildlife Service (Service) in the coming years. As a result of the number and diversity of species of shared conservation interest, there are many potential opportunities for cooperative monitoring efforts between the Service and the Oklahoma Department of Wildlife Conservation (ODWC). This grant provides financial assistance to the ODWC to foster cooperative monitoring efforts with the Service for selected aquatic species.

The Canadian and Cimarron rivers in central and northwest Oklahoma support breeding populations of the federally endangered Interior Least Tern (*Sterna antillarum*), the threatened Arkansas River Shiner (*Notropis girardi*), and the Arkansas Darter (*Etheostoma cragini*), a

species recently removed from the federal candidate list. The Arkansas Darter has a fragmented range in Oklahoma and only occurs in the Cimarron and Neosho drainages; its habitat consists of heavily vegetated side channels, seeps, springs, and sloughs. The Least Tern and the Arkansas River Shiner are found, or potentially present, in both the Cimarron and the Canadian Rivers where they require similar riverine habitat conditions that are maintained by periodic flooding events - long reaches of shallow, braided river channel with numerous barren sandbars and islands. The Least Tern also occurs throughout the Arkansas River, a system that likely supports the largest breeding population in the state. The riverine habitat used by all of these species has declined in quality as a result of the alteration of the historic flooding cycles in both river systems by human manipulations to the rivers, and their tributaries, such as reservoir construction, dredging, channel straightening and dewatering. These changes have resulted in a reduction in the frequency and magnitude of flooding events that scour the vegetation within the flood plain and redistribute sediments to form sandbars. Additional impacts include altered flow patterns from invasive plants such as the saltcedar (*Tamarix* spp.), a species that has encroached upon these river systems and further altered their habitat structure. The decline in sandbar habitat due to the reduced magnitude and frequency of flooding events and the alteration of river ecosystems by invasive species are two of the conservation issues identified for large river landscapes in the Oklahoma Comprehensive Wildlife Conservation Strategy. Our knowledge of the population sizes and trends for Arkansas River Shiners, Least Terns and Arkansas Darters are incomplete and limited in large part because of the poor access that biologists have to their habitat, most of which is privately owned and not easily reached by public roads or other access points. Several opportunities exist for accessing the Cimarron and Canadian rivers via state-owned wildlife management areas (WMAs) such as the Packsaddle WMA, Cimarron Bluff WMA, and Cimarron Hills WMA. This project allows ODWC staff to directly assist federal agency staff from both the Service and the Tulsa District of the U.S. Army Corps of Engineers (USACE) in conducting routine, annual monitoring for Arkansas River Shiners and Interior Least Terns in the Canadian and Arkansas River systems.

The Little River system in southeast Oklahoma and southwest Arkansas supports all of the known populations of the federally-threatened Leopard Darter (*Percina pantherina*). Within the Little River drainage, the Leopard Darter occurs in the Glover, Mountain Fork, and upper Little River. Throughout its range, the Leopard Darter has never been common, but its status has declined in recent decades as a result of habitat loss and habitat fragmentation due to the construction of reservoirs. These barriers prevent the movement of Leopard Darters between populations, causing genetic isolation and furthering the species' decline. Critical Habitat is designated for this species in portions of the Little River, Glover Creek, and the Mountain Fork River within McCurtain and Pushmataha counties, OK, and in Polk County, AR (50 CFR 17.95(e)). Among the priority tasks identified in the Leopard Darter Recovery Plan are the identification of important Leopard Darter habitat and monitoring of the remaining populations. Service biologists from the Oklahoma Ecological Services Field Office have monitored Leopard Darters for more than 20 years at traditional locations. It is important to continue this effort and to conduct surveys at other sites that potentially support this species. This project provides funding to ODWC to assist the Service in monitoring Leopard Darter populations and assessing their annual distribution.

### III. Objective:

- 1) ODWC anticipates ten field days of Leopard Darter surveys.
- 2) ODWC anticipates six field days of Arkansas Darter surveys.
- 3) ODWC anticipates two field days of Interior Least Tern surveys.
- 4) ODWC anticipates eight field days of Arkansas River Shiner surveys.

### IV. Approach:

- 1) Arkansas River Shiner (*Notropis girardi*): Assist the personnel of the U.S. Fish and Wildlife Service's Oklahoma Ecological Services Field Office (OESFO) with their annual monitoring survey of the Arkansas River Shiner in the Cimarron and Canadian rivers. All fish collections within these rivers will be made in coordination with the OESFO and no shiner collections will be made independently from their staff to eliminate unnecessary take. The survey schedule will be established by OESFO staff, and will likely take place in October 2016, June/July 2017, October 2017, and June/July 2018.
- 2) Arkansas Darter (*Etheostoma cragini*): As the opportunities arise, fish surveys will be conducted in the Cimarron, and Neosho River drainages where potentially suitable habitat exists - vegetated seeps, springs and runs, especially those that support water cress (*Nasturtium officinale*). These surveys will be conducted primarily by means of hand nets and seines with the intention of releasing the fish alive back at the survey location. The primary areas of emphasis will be access points (via roadway bridges and public/private lands) throughout the Cimarron and Neosho watersheds. These opportunities will most likely occur in July and August of 2017 and 2018
- 3) Leopard Darter (*Percina pantherina*): Assist the personnel of the U.S. Fish and Wildlife Service's OESFO with their annual summer monitoring of the Leopard Darter populations in the Little River and its major tributaries in July of 2017 and 2018. These surveys are primarily visual surveys conducted with the use of snorkeling equipment. All surveys will be conducted in conjunction with U.S. Fish and Wildlife Service personnel to eliminate unnecessary disturbance or take of Leopard Darters.
- 4) Interior Least Tern (*Sternula antillarum*): Assist the U.S. Army Corps of Engineers with Interior Least Tern surveys via airboat throughout the Arkansas River watershed. Periodically conduct surveys for Least Terns on the Canadian River at Packsaddle WMA and the Cimarron River at Cimarron Hills and Cimarron Bluffs WMAs. Tern surveys will be conducted each year, although all three WMAs may not be surveyed each year. These surveys will be visual and will consist of searching suitable nesting habitat for tern colonies, and counting or estimating the number of pairs, nests and/or chicks. Surveys and monitoring will take place in June, July and August of 2017 and 2018. Notes will be taken if Snowy Plovers or other shorebird species are located during the course of the tern surveys.
- 5) Prepare an annual report of each survey's results, and coordinate with other aquatic conservation partners on Species Status Assessments, annual meetings, etc.

## V. Results:

### Arkansas River Shiner

ODWC staff spent 8 field days conducting Arkansas River Shiner surveys.

ODWC staff from the Wildlife Diversity and Streams Programs assisted the U.S. Fish and Wildlife Service's Oklahoma Ecological Services Field Office (OESFO) with surveys and monitoring for Arkansas River Shiners (*Notropis girardi*) during the following periods:

- October 2016 – (3 survey days)
- June 2017 – (3 survey days)
- October 2017 – (2 survey days)

Between the Texas state line east (downstream) to the interstate 75 bridge near Calvin, OK, Fish & Wildlife Service biologists have designated at least 17 surveys sites along the Canadian river in Oklahoma, however not every site is surveyed each year (see Appendix I, Fig. 1). All collected samples from both spring and fall surveys were sent to the Oklahoma State University (OSU) Cooperative Fish and Wildlife Unit for identification and enumeration; actual enumeration and processing of the collected samples is conducted under a separate Section 6 grant on the campus of OSU.

Fall 2016 sampling took place from October 17<sup>th</sup> – 21<sup>st</sup> and summer 2017 sampling occurred from June 12<sup>th</sup> - 16<sup>th</sup>. During both periods, ODWC personnel assisted with seine-haul sampling at nine sites on the Canadian River.

Fall 2017 sampling took place from October 10<sup>th</sup> – 12<sup>th</sup>. ODWC personnel assisted at 4 sites between the Thomas, OK bridge upstream to the bridge north of Roll, OK. Due to high flows, the Canadian River could not be accessed for surveys further downstream of the Thomas, OK site during this time period.

As in previous years, Arkansas River Shiners were visually verified on-site in seine hauls at most locations except for the upper-most (e.g. sites near Durham and Roll, OK) and furthest downstream (e.g. Calvin, OK) sites; however they were not the numerically dominant species at any site. Actual numbers of Arkansas River Shiners captured are enumerated by Oklahoma State University outside of this grant. Other species captured in large numbers included Red Shiner (*Cyprinella lutrensis*), Sand Shiner (*Notropis stramineus*), Plains Killifish (*Fundulus zebrinus*), Red River Pupfish (*Cyprinodon rubrofluvatilis*), Bullhead Minnow (*Pimephales vigilax*) and Emerald Shiner (*Notropis atherinoides*). Captured in smaller numbers were Plains Minnow (*Hybognathus placitus*), Brook Silverside (*Labidesthes sicculus*), Suckermouth Minnow (*Phenacobius mirabilis*), River Carpsucker (*Carpiodes carpio*), Green Sunfish (*Lepomis cyanellus*), Orange-spotted Sunfish (*Lepomis humilis*), Largemouth Bass (*Micropterus salmoides*), Longnose Gar (*Lepisosteus osseus*), and Spotted Gar (*L. oculatus*).

Since the species is presumed to be extirpated in the Cimarron River, no surveys for Arkansas River Shiners were conducted in this watershed during the grant segment.

### Leopard Darter

ODWC staff spent 3 field days conducting Leopard Darter surveys.

ODWC staff from the Wildlife Diversity program assisted biologists from the Service's OESFO, the U.S. Forest Service, and the Arkansas Game and Fish Commission with annual Leopard Darter surveys from July 24<sup>th</sup> – 26<sup>th</sup>, 2017. Surveys occur at various locations throughout the Little River watershed (Mountain Fork, Glover, and upper Little Rivers) in southeast Oklahoma. ODWC staff assisted with snorkeling surveys at ~15 rotational (temporary) sites that are typically sampled every three years (see Appendix 1, Fig. 2). Leopard Darters were detected at two locations during the survey period.

### Interior Least Tern

ODWC staff spent 0 field days conducting Interior Least Tern surveys.

Due to time limitations, no Interior Least Tern (see Appendix 1, Fig. 3) surveys were conducted during the reporting period; this includes both surveys occasionally conducted by ODWC on wildlife management areas that border the Cimarron and Canadian Rivers (e.g. Cimarron Hills WMA, Packsaddle WMA) as well as cooperative surveys with the U.S. Army Corps of Engineers (USACE) along the Arkansas River. Due to habitat degradation, the number of terns that nest on the Cimarron River has decreased over the last few decades and it is unknown if the species experienced a successful nesting season in 2017. However, reports from USACE indicated that 178 chicks successfully fledged in the Arkansas River system during the reporting period.

### Arkansas Darter

ODWC staff spent 0 field days conducting Arkansas Darter surveys.

Due to time and personnel constraints, no surveys for Arkansas Darters (*Etheostoma cragini*) were conducted during the reporting period. Following a 12-month finding, the Service removed this species from the federal list of candidate species in 2016; therefore, sampling efforts for *E. cragini* will likely occur outside of the scope of this grant in future segments.

## **VI. Significant Deviations:**

Due to personnel changes within the U.S. Fish and Wildlife Service staff and increased assistance by Oklahoma Department of Wildlife Conservation biologists, grant funds were spent much earlier than anticipated. As such, this grant will be unable to cover funding for June and July 2018 surveys, and no further activity will be conducted under this grant.

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**Date:** November 16, 2017

**Approved by:** \_\_\_\_\_  
Wildlife Division Administration  
Oklahoma Department of Wildlife conservation

**Approved by:** \_\_\_\_\_  
Andrea Crews, Federal Aid Coordinator  
Oklahoma Department of Wildlife Conservation

## **Appendix I**

**Figure 1.** (a) Arkansas River Shiner (*Notropis girardi*) captured during a fall sampling period. (credit: Matt Fullerton/ODWC) (b) Biologists from ODWC and USFWS operating a seine for Arkansas River Shiner collections in the Canadian River. (credit: ODWC) (c) Map depicting sampling locations for *Notropis girardi* on the Canadian River. (Note: ODWC does not assist with Texas sampling sites, which are outside of the scope of this project)

(a)



(b)





(c)



# Presence/Absence of the Federally-Threatened Arkansas River Shiner

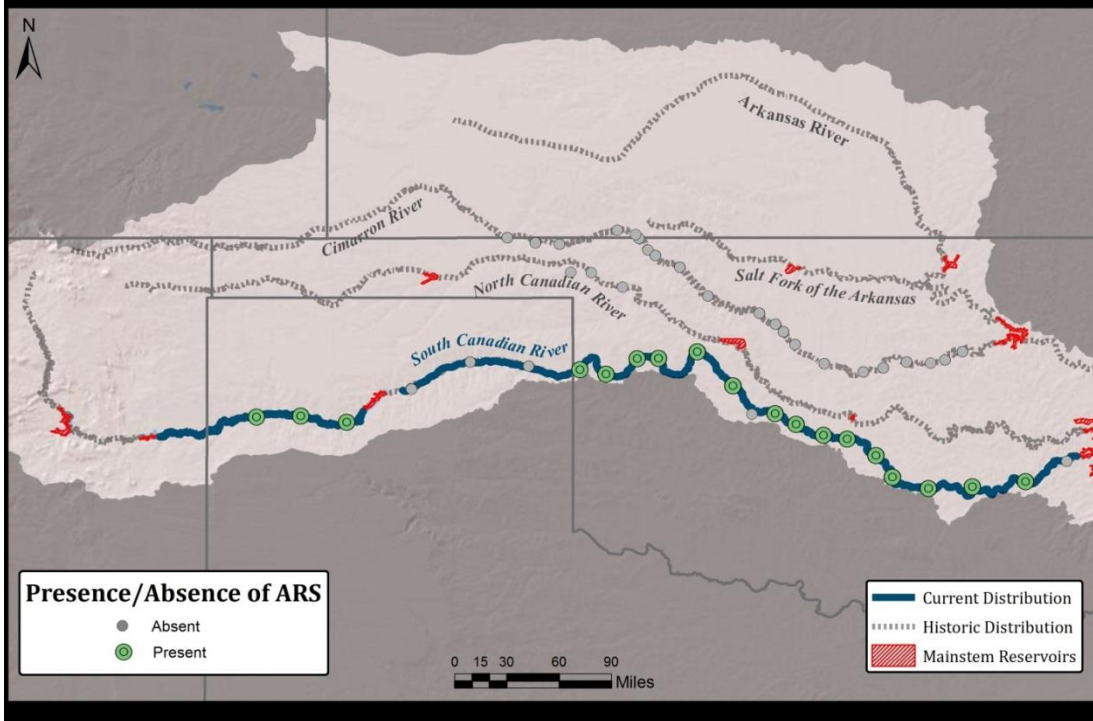
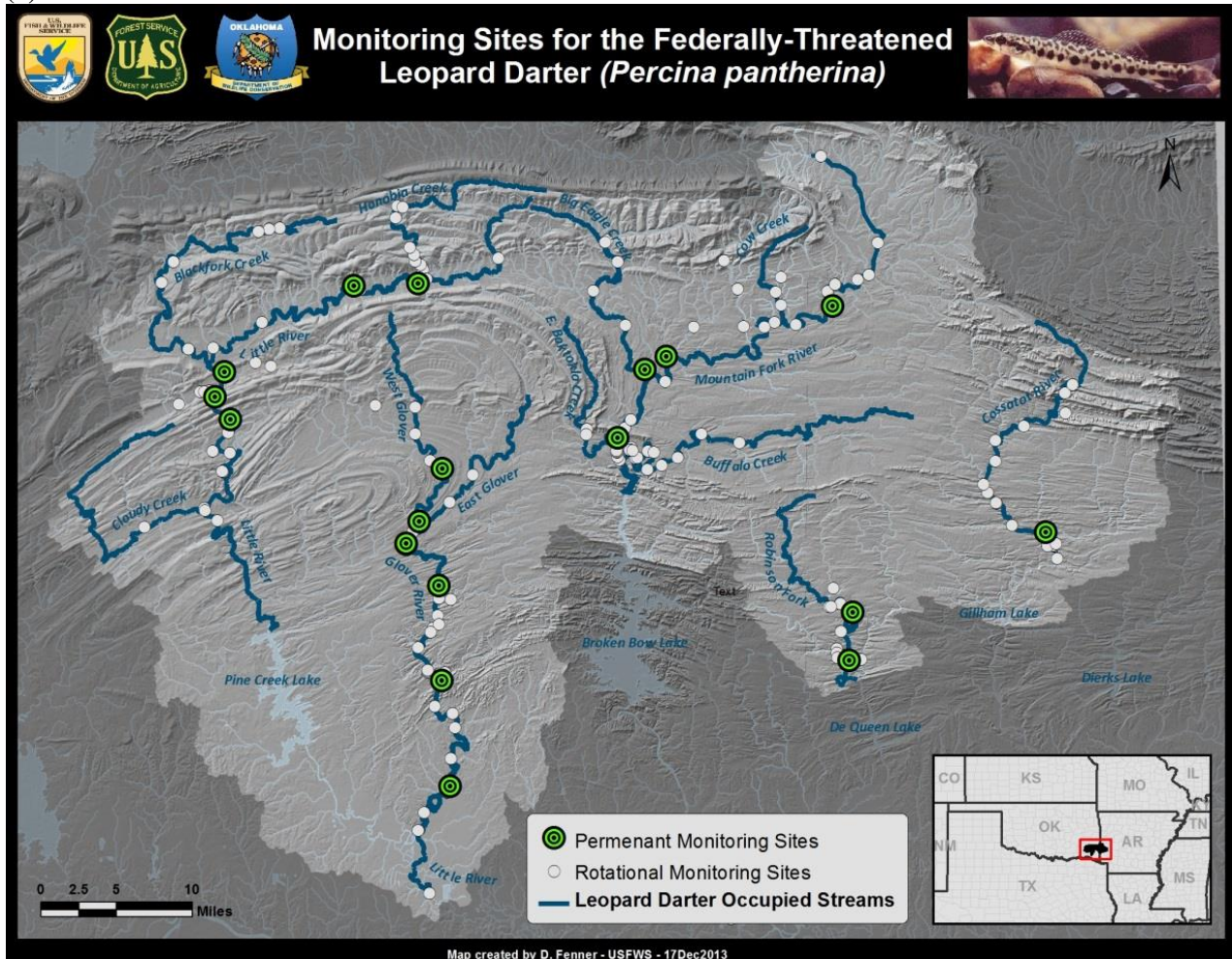


Figure 2. (a) Leopard Darter (*Percina pantherina*) captured during a sampling period in the Little River drainage (Credit: Richard Standage/U.S. Forest Service). (b) Map depicting monitoring sites for *Percina pantherina* in Southeast Oklahoma and Southwest Arkansas.

(a)



(b)





**Figure 3. Interior Least Tern (*Sternula antillarum*) on the Arkansas River (Credit: Jim Arterburn).**



## LITERATURE CITED

U.S. Fish and Wildlife Service. 2005. Endangered and Threatened Wildlife and Plants; Final Designation of Critical Habitat for the Arkansas River Basic Population of the Arkansas River Shiner (*Notropis girardi*). Federal Register Vol. 70, No. 197. 590808-59846.

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