

FINAL PERFORMANCE REPORT



Federal Aid Grant No. F11AP00701 (E-76-R-1)

Surveys of Listed and Candidate Aquatic Species in Oklahoma

Oklahoma Department of Wildlife Conservation

October 1, 2010 through September 30, 2013

FINAL REPORT

State: Oklahoma

Grant Number: F11AP00701 (E-76-R-1)

Grant Program: Endangered Species Act Section 6

Grant Name: Surveys of Listed and Candidate Aquatic Species in Oklahoma

Grant Period: October 1, 2010 – September 30, 2013

Principle Investigator: William “Buck” Ray, Oklahoma Department of Wildlife conservation

I. Need:

The purpose of this grant is to provide assistance to the Tulsa Field Office of the U.S. Fish and Wildlife Service in the monitoring of specific federally listed and candidate species for which there are established monitoring programs (e.g. Arkansas River Shiner, Leopard Darter, Neosho Madtom). Additionally, there are several opportunities for the Oklahoma Department of Wildlife Conservation to conduct surveys for or monitor known populations of candidate and listed species on state-owned wildlife management areas. The ODWC owns wildlife management areas that encompass habitat for the federally listed Arkansas River Shiner and the Interior Least Tern on Packsaddle, Cimarron Bluff and Cimarron Hills WMAs. Additionally, the Cimarron Hills and Cimarron Bluff WMAs support potential habitat for the Arkansas Darter, which is a federal candidate 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 federal candidate Arkansas Darter (*Etheostoma cragini*). The Arkansas Darter is restricted to the Cimarron River watershed and is found in heavily vegetated side channels and sloughs and in several tributary streams near vegetated seeps and springs. 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. This habitat also is used by the Snowy Plover (*Charadrius alexandrinus*), a rare migratory shorebird that nests on some of the larger sandbars that are used by nesting colonies of Least Terns. 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. As an additional consequence, several invasive species, especially the exotic saltcedar (*Tamarix* spp.), have encroached upon these river systems and further altered the habitat structure. The decline in sandbar habitat due to the reduction 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 (ODWC 2005). 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 lands such as the Packsaddle Wildlife Management Area, and the recently acquired Cimarron Bluff and Cimarron Hills WMAs. This project would provide funding to assist ODWC personnel in periodically surveying these areas to assess and monitor the populations of federally listed and candidate species. Additionally, the Tulsa Field Office for the U.S. Fish and Wildlife Service currently monitors Arkansas River Shiner populations at several bridge crossings on the Canadian and Cimarron Rivers. This proposed project would provide funding to ODWC to assist the Service with this monitoring effort.

The Little River system in southeastern Oklahoma and southwestern Arkansas supports all of the known populations of the federally threatened Leopard Darter (*Percina pantherina*). 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 reservoirs prevent the movement of Leopard Darters between the populations in each of the major tributaries of the Little River (e.g. Glover River and Mountain Fork River) and therefore isolate these populations and further endanger the species. 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. The U.S. Fish and Wildlife Service's Tulsa Field Office has 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 proposed project would provide funding to ODWC to assist that U.S. Fish and Wildlife Service in monitoring Leopard Darter populations and assessing their current distribution.

II. Project Objective:

To assist the U.S. Fish and Wildlife Service in monitoring populations of federally listed and candidate species in the Cimarron, Canadian and Little River watersheds.

III. Approach:

1) Arkansas River Shiner: Assist the personnel of the U.S. Fish and Wildlife Service's Tulsa Field Office 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 Tulsa Field Office and no shiner collections will be made independently from their staff to eliminate unnecessary take.

2) Arkansas Darter: As the opportunities arise, fish surveys will be conducted in the Cimarron River and its tributaries where potentially suitable habitat exists - vegetated seeps, springs and runs, especially those that support water cress. 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 area of emphasis will be the state-owned Cimarron Bluff and Cimarron Hills wildlife management areas, but neighboring private lands may be surveyed if landowner permission can be obtained.

3) Leopard Darter: Assist the personnel of the U.S. Fish and Wildlife Service's Tulsa Field Office with their annual summer monitoring of the Leopard Darter populations in the Little River and its major tributaries. 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) Least Tern: 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. Notes will be taken if Snowy Plovers or other shorebird species are located during the course of the tern surveys.

IV. Results:

During falls of 2010, 2011, and 2012 and the summer of 2013, the Oklahoma Department of Wildlife Division staff from the Wildlife Diversity, Streams Management Program, and Southeast Fisheries Region assisted the US Fish and Wildlife Service Ecological Service Office in Tulsa with surveys and monitoring for several species across the State. ODWC assisted with surveys for Arkansas River Shiners (*Notropis girardi*) during the annual 2 week survey and status monitoring trip in the Canadian River in western Oklahoma. Sampling during summer/fall of 2012 took place in October and was conducted at each bridge crossing over the South Canadian between the Texas state line east to the bridge on interstate 75 near Calvin. During 2012 and 2013, sampling was conducted during October in addition to previous sampling events that were conducted during July. This change was made to attempt to collect young of year *N. girardi* that may have been too small during July to accurately sample. During 2013, Water levels were quite high at many of the downstream sites east of US I-35 and these sites were not able to be sampled. Samples were collected and sent to the Oklahoma State University Cooperative Fish and Wildlife Unit for identification and enumeration.

Sampling for the Arkansas Darter (*Etheostoma cragini*) was conducted in West Anderson Creek on the Cimarron Hills Wildlife Management Area (WMA) in 2011 and 2012. Also in 2012, we searched an unnamed, spring-fed tributary of the Cimarron River on Cimarron Bluff WMA. In 2011, we used dip nets to search seven pools along West Anderson Creek. West Anderson Creek flows through stabilized sand dunes and much of its flow is subsurface, but this flow maintains a series of surface pools that are connected by surface flow following substantial rainfall events. We collected a total of six Arkansas Darters from two of the seven pools that we searched. All seven of the pools that were surveyed supported potential habitat for the Arkansas Darter, but the two pools in which they were netted were the two pools with the least amount of vegetation. We believe that the relatively sparse aquatic vegetation increased our ability to capture the fish, but these pools should not be interpreted as having the largest or healthiest populations. In 2012, we used dip nets to sample three pools in the farthest down-stream reach of West Anderson Creek on Cimarron Hills WMA. Eleven Arkansas Darters were collected from one of these pools; again it was the pool with the least amount of submerged aquatic vegetation (Figures 2 and 3). We did not capture and document any Arkansas Darters from the stream that we surveyed on Cimarron Bluff WMA. This stream is spring-fed but loses flow rapidly downstream from the spring. The stream supports an abundance of aquatic vegetation,

but the combination of this vegetation and fallen tree limbs from the elm trees within its narrow riparian zone created difficult sampling conditions. Our lack of success does not rule out the potential for an Arkansas Darter population to be present.

During 2011 and 2012, we attempted to monitor Least Tern (*Sternula antillarum*) nests on the Cimarron Hills Wildlife Management Area (WMA). The Cimarron Hills WMA occurs on the eastern side of the Cimarron River in Woods County, Oklahoma approximately four to six miles south of the Kansas state line. The 3,770-acre wildlife management area encompasses approximately the southern half of a large salt flat known as the Little Salt Plain. Because of its bare, sandy and salty terrain and its proximity to the Cimarron River, this salt flat has been a traditional nesting area for a colony of Interior Least Terns and for Snowy Plovers (*Charadrius alexandrinus*). Our goal was to monitor all Least Tern nests on the management area in order to determine their reproductive success, and to record incidental nesting observations for Snowy Plovers occurring with them. Typically, Least Terns in central and western Oklahoma begin nesting during the first week of June, but tern pairs may initiate their first nests any time during the first three weeks of June. If a first nesting attempt is unsuccessful due to flooding or predation, the adult terns are likely to re-nest during the last half of June or the first week of July. However, re-nesting is rarely attempted later than the 8th to 10th of July. The clutch size for Least Terns is two or three eggs that have an incubation period of 21 days that begins when the first egg is laid.

Our initial monitoring visit was conducted on June 26, 2011. This date is a few days later than the optimal survey date, but still sufficiently early in the nesting cycle to detect nests with eggs and nests with young chicks from the earliest anticipated nests of the season. When we arrived, we observed that the Cimarron River was completely dry around the perimeter of the wildlife management area and the salt flat. It is common for surface flow to cease in this reach of the Cimarron River in late summer (usually after the first of August), but it is extremely uncommon for the river's surface flow to cease in June. The region encompassing the upper watershed of the Cimarron River has experienced severe drought conditions since the summer of 2010. Because of this, inflow to the river has been severely limited and this accelerated the normal seasonal decline in flow that occurs every summer. We observed two single adult Least Terns during our survey. Both terns flew from an upstream location on the salt flat (north of the portion of the salt flat on the WMA) and flew downstream along the dry river channel. The birds were observed about 30 minutes apart and we saw no interaction between these birds and any others. We observed 10 Snowy Plovers on the dry river bed. These appeared to be six adults, two two-week old chicks and two nearly fledged chicks. Collectively, these birds appeared to represent three pairs, two of which had successfully hatched chicks on or near the salt flat and had moved their chicks to the river bed where pockets of moist soil may have provided better foraging opportunities. We did not make any additional survey visits in 2011 because the extreme heat and drought appeared to have precluded any successful nesting by the terns.

In 2012, we conducted one monitoring survey on June 29. As was the situation in 2011, the river bed was completely dry. Between 0745 and 1215 on June 29, 2012, we walked the entire portion of the salt flat that occurs within the wildlife management area as well as a portion of the salt flat immediately north of the WMA's boundary fence. We also walked along a one and a half-mile reach of the Cimarron River extending from the west side of the salt flat downstream to a location approximately half of a mile south of the salt flat. We observed only three small pools of water in this reach of the river and these appeared to support only small numbers of Red River

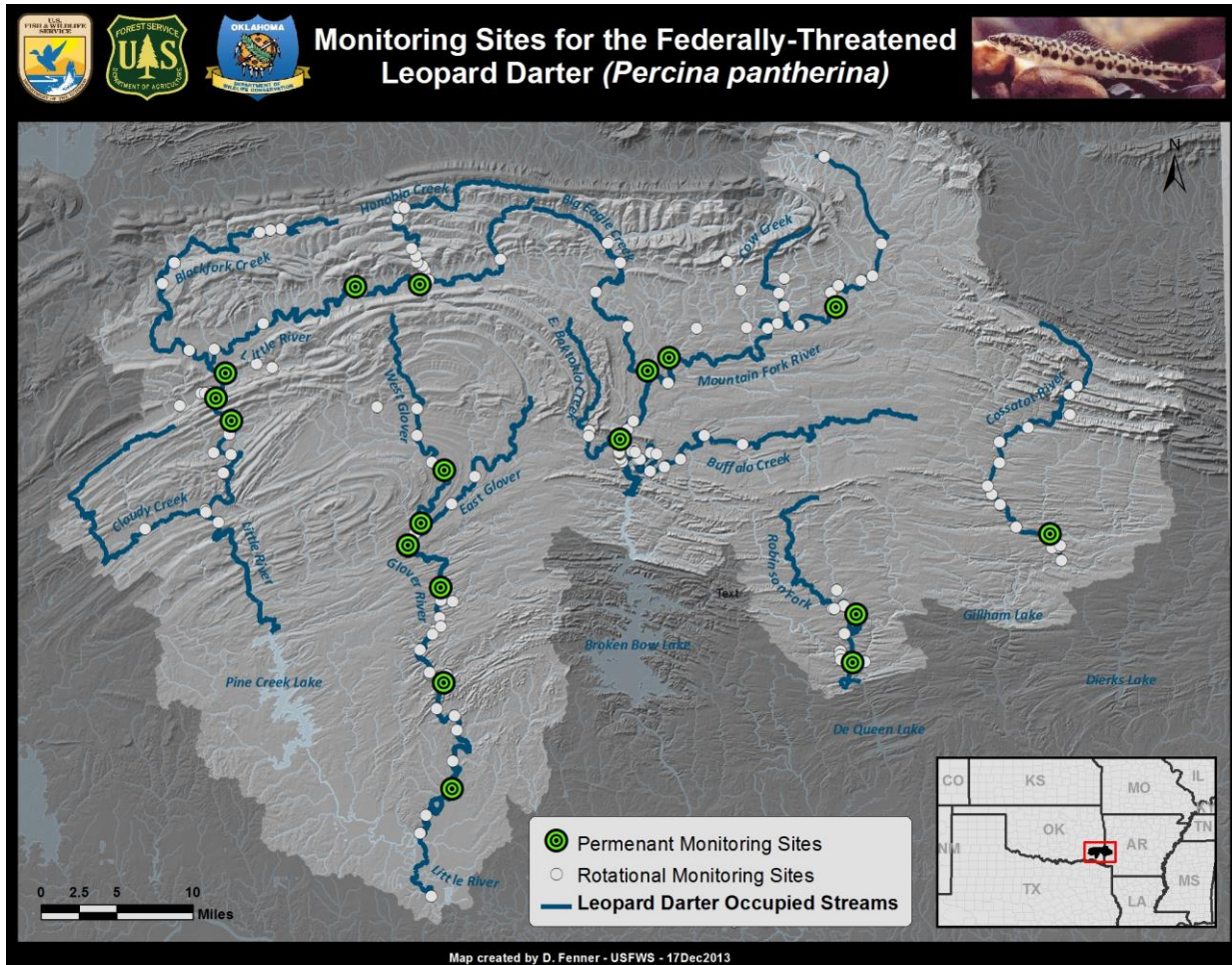
pupfish (*Cyprinodon rubrofluviatilis*). During approximately four and a half hours of search time, we observed only one Least Tern. This individual was an adult tern that we observed flying from north to south across the salt flat at approximately 0915 hours. We watched the tern as it flew south from the salt flat to the dry river bed and then continued to fly downstream out of view. We did not observe this tern again and we could not see any evidence of Least Tern activity north of the location from which we observed this bird. We did locate twelve Snowy Plovers during our survey (Figures 4 and 5). These birds consisted to six adults, three recently fledged juveniles and three nearly fledged chicks (these last three were nearly adult size but did not appear capable of flight). All twelve birds were located on the extreme southern edge of the salt flat and an adjacent quarter-mile reach of the Cimarron River bed. We surmised that the plovers nested on the salt flat and then moved their chicks to the drying river bed to forage for insects. The plovers appeared to be associated with patches of moist sand in the center of the river channel during our survey.

It appears that no Least Terns nested on the Little Salt Plain during either the 2011 or the 2012 nesting seasons because of the lack of available surface water and fish. Because the river's surface flow dried unusually early in the summer, we suspect that few terns, if any, attempted to nest on the salt flat this year. Any terns that had attempted to nest appear to have abandoned or lost their nests/clutches and departed from the area. Least Terns are a mobile and adaptable species and we believe that the birds which should have nested on the area moved farther downstream or to a different river system to nest. Snowy Plovers, which begin their nesting season approximately four to five weeks earlier than the terns, were able to successfully raise broods in May and June. We did not see any evidence of Snowy Plovers lingering on the main portion of the salt flat or attending nests, therefore we believe that there were no re-nesting attempts made in the summers of 2011 or 2012.

Least Terns (*Sterna antillarum*) were not monitored during 2013 because of the continued drought in the region. Only intermittent surface flow existed through the Cimarron Hills WMA between April and early June, and there was no surface flow in June. Because of the lack of flow, terns did not nest on at least the ODWC-owned portion of the salt flat.

ODWC staff assisted USFWS and US Forestry Service staff with the annual surveys in 2010-2013 for the Leopard Darter (*Percina pantherina*) in McCurtain, Le Flore, and Pushmataha counties in southeastern Oklahoma. These surveys occurred during late July or early October each year. ODWC staff assisted with depletion surveys at the fixed sites that are sampled every year as well as status surveys at several additional rotational sites which are surveyed on average every 3 years. These sites are located on the Little River, Glover River, and the upper Mountain Fork River shown in figure 1. ODWC staff also assisted with surveys of deeper pools through the use of SCUBA.

Figure 1.



Figures 2 and 3. Arkansas Darters Captured in West Anderson Creek, Cimarron Hills WMA, June 29, 2012; Pool in West Anderson Creek Inhabited by Arkansas Darters



Figures 4 and 5. Snowy Plover and Little Salt Plains on the Cimarron Hills WMA, June 29, 2012.



V. Significant Deviations: None.

Prepared By: William Ray
Oklahoma Department of Wildlife Conservation

Date: December 12, 2013

Approved by: _____
Fisheries Division Administration
Oklahoma Department of Wildlife conservation

Approved by: _____
Andrea Crews, Federal Aid Coordinator
Oklahoma Department of Wildlife Conservation