

# **FINAL PERFORMANCE REPORT**



**Federal Aid Grant No. F17AP00208 (E-88-R-1)**

**Reinstatement of Management and Monitoring Efforts for a Remnant  
Population of Black-capped Vireos in Blaine County, Oklahoma**

**Oklahoma Department of Wildlife Conservation**

**April 1, 2017 – March 31, 2018**

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**State:** Oklahoma

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**Grant Program:** Endangered Species Act Traditional Section 6

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**Reporting Period:** April 1, 2017 - March 31, 2018

**Principal Investigator:** Jeremy D. Ross, Oklahoma Biological Survey, University of Oklahoma

### A. ABSTRACT:

During the temperate breeding season of 2017, we conducted a mixture of directed conservation and survey activities focused on an outpost population of Black-capped Vireos (*Vireo atricapilla*; hereafter “BCVI”) in the Salt Creek canyons of Blaine County, Oklahoma (centered at 36°01'00"N, 98°27'00"W). We surveyed the Salt Creek Canyon area for audible and/or visual evidence of BCVI territorial males, paired females, and nesting attempts. We were able to locate 25 active territories in the area, with another group of 4 “roamer” males detected only once. Associated with territorial males were at least 15 females and 13 nests with at least six broods successfully fledged. We also concurrently employed an active removal campaign to control the number of Brown-headed Cowbirds (*Molothrus ater*; hereafter “cowbirds”) potentially entering the BCVI breeding areas and parasitizing nests. At minimum we removed 50 cowbirds (33M, 17F). Cowbirds did parasitize BCVI nests, but the observed rate (36.4%) was consistent with parasitism rates in other areas where cowbird removal had been implemented. We also examined the potential linkage between cedar removal efforts from the early 2000’s with current BCVI occupancy. A majority of previously-managed plots in the study area were occupied by territorial BCVI in 2017, suggesting a lasting benefit to the species, although more detailed study is needed to draw a direct linkage.

### B. BACKGROUND:

The Black-capped Vireo (*Vireo atricapillus*) is an at-risk songbird that was recently removed from the list of Endangered Wildlife and Plants by the U.S. Fish and Wildlife Service due to reaching rangewide population recovery goals. Up until 2018, the species was federally-endangered, having been listed in 1987. Major factors attributed to its decline included brood parasitism by cowbirds, alteration and loss of shrubland habitat through fire suppression and subsequent maturation, various forms of agricultural conversion, and development projects (Grzybowksi 1995).

Breeding populations of the Black-capped Vireos in the United States are distributed exclusively in Texas and Oklahoma (Grzybowski 1995). At the Northern extent of their range there exists an outpost population within the Salt Creek Canyons of Blaine County, Oklahoma (Fig. 1, Appendix). This first-discovered population of the species in Oklahoma was once locally abundant (Bunker 1910; Graber 1957), though it quickly declined to zero during the 1970s and early '80s (Grzybowski et al. 1986). In 1990, the Oklahoma Chapter of the Nature Conservancy, in conjunction with the Oklahoma Department of Wildlife Conservation and the Ecological Service office of the USFWS in Tulsa, initiated a recovery effort for the Blaine County BCVI population. As a part of this collaboration, strips of Eastern Redcedars were selectively removed throughout the property.

Despite intensive habitat restoration and monitoring efforts, the population peaked at between 17-19 territorial males and 12-14 females; therefore, the project was scaled back significantly and frequent monitoring was ceased in the mid-2000s. During the spring of 2015, Joe Grzybowski returned to the Salt Creek Canyon site and found at least 7 BCVI males on territory, some near historic territories. Therefore, monitoring efforts were relaunched through this project.

Our primary objective was to intensely survey the suitable habitats of this area in 2017 to determine if BCVI still occupied the sites and, if so, provide estimates about the approximate abundance of territorial males and their reproductive opportunities and successes.

### **C. OBJECTIVE:**

The objectives for this grant are to obtain estimates of the numbers and reproductive success of the Black-capped Vireos in the Salt Creek Canyon area, and to enhance vireo reproductive success through removal of cowbirds from the area, and removal of cowbird eggs from parasitized nests. Through this project, we plan to conduct the following:

- 1) Estimate the number of Black-capped Vireos in the Blaine County.
- 2) Monitor reproductive success of these vireos.
- 3) Remove cowbirds from vireo breeding sites during the reproductive season.

### **D. PROCEDURES:**

#### Black-capped Vireo Territorial Mapping

We focused our survey efforts in the main canyon and two tributary canyons at the headwaters of Salt Creek (see Fig. 2, Appendix). This represented the long-term core of the Blaine County BCVI breeding range. Starting on April 8<sup>th</sup>, we began opportunistic searches of locations known to previously hold BCVI territories. These were primarily associated with the main access road into Salt Creek Canyon, as well as the three cowbird traps deployed along that canyon (see Fig. 2.).

We also conducted at approximately weekly intervals a series of intense surveys of sections of the study area. These focused on the canyon slopes, consistent with the habitats that BCVI regularly occupy in the main canyon. That said, our walking survey paths regularly crossed habitats of likely unsuitability (e.g., riparian zones, plateau prairies) and were not biased by preconceptions of habitat suitability. These efforts provided us with repeated random-walk audiovisual surveys through each of the canyons within the study area and allowed for rough delineations of BCVI territories (Fig. B). At minimum, detections of singing BCVI were noted to the general area on a topographic map. Where GPS units were available and functional, we attempted to record the natural perch locations of each detected individual. For territorial males, this entailed lengthy observations of singing and movement behaviors that would indicate more sharply-defined territory boundaries.

### Reproductive Monitoring

Breeding efforts beyond territorial establishment are also of critical importance for this population, therefore we observed males for any indications of breeding status. This included associating with a possible mate, copulating with a female, nest building, incubation, feeding nestlings, or tending fledglings. If nests were located, we noted the likely stage of building, laying, or nestling development, as well as the species of tree in which it was built, the number of BCVI and cowbird eggs, and any other identifying characteristic. Nest locations were recorded using a GPS unit and its status was monitored every 3-7 days thereafter.

### Brown-headed Cowbird Control

We used a combination of baited cages and active shooting to target cowbirds for removal from the Salt Creek Canyons. The former consisted of metal structures approximately 5.66 m<sup>3</sup> (200 cu.ft.) in volume (see Fig. 3, Appendix). Two were trailer-mounted traps towed to roadside deployments in the Salt Creek Canyon and the remaining trap was constructed from an aluminum panel cage erected on-site deep within the main canyon (see Fig. 2 for deployment locations).

Traps were baited with a combination of seeds, water, and cowbirds of an optimal sex-ratio (3 female:2 male) which had been trapped and transported from another site (Fort Sill, OK). Wild cowbirds attracted to these traps were able to enter wire chutes at the top of the cages, but generally were unable to retrace this path to exit the cage. These live traps were run between April 30 to July 30 and checked at least every three days (weather permitting) to count the number of males and females held captive. We attempted to maintain sex-ratios within each trap at the optimal 3F:2M ratio. Excess cowbirds that were captured were euthanized by cervical dislocation upon the next visit.

Additional efforts to remove cowbirds from the canyon consisted of targeted shooting of individuals. These occurred either opportunistically or after luring cowbirds closer using a combination of conspecific male songs and female rattle calls broadcast through a portable

speaker. Where possible, we collected the carcasses of shot birds to deposit these at the Sam Noble Museum of Natural History at the University of Oklahoma.

## **E. RESULTS AND DISCUSSION:**

### Territorial Mapping and Reproductive Monitoring

Between April 8<sup>th</sup> and July 30<sup>th</sup>, 2017, we located 25 male BCVI that were singing, mate-guarding, nest building, or tending young (red polygons in Fig. 2). In another four cases we observed a “roamer” male singing around suitable habitat, but they were not subsequently detected (orange polygons in Fig. 2). We encountered 15 female BCVI with or nearby the territorial males. Each female was apparently paired and most displayed evidence that they were tending nests, broods, or fledglings. We were able to locate within 10 of the territories 13 nests that were active in 2017 (white triangles in Fig. 2). Another six nests were located that appeared to be remnants of the prior year’s reproductive output (dotted white circles in Fig. 2). Two nests active in 2017 were renesting attempts after the pair had previously abandoned a cowbird-parasitized nest. Six nests appeared to successfully fledge young as determined by one or more of the following observations: 1) the nest bottom was smooth and undisturbed upon re-inspection; 2) recently-fledged young were in the vicinity; or 3) a color-marked adult known to be associated with the nest was attending juveniles.

### Brown-headed Cowbird Control

A total of at least 50 cowbirds (33M, 17F) were removed from the Salt Creek Canyons throughout the BCVI breeding period (April through end of June). Live-trapping cowbirds into baited cages contributed 22 of the males and 10 of the females. In some cases, the captured cowbirds appeared to be removed from the traps by mesopredators (likely raccoons) reaching through the wire cage. This was most evident from feathers stuck in wire that were consistent with birds being pulled through the cage. We estimate that this resulted in the loss of at least 6 cowbirds from the traps. Mitigation techniques such as live-trapping and translocation of raccoons and buried wire mesh skirting is recommended for future cowbird trapping efforts. Active shooting efforts contributed the remaining 11 male and 7 female cowbirds to the removal total.

Although we did not conduct systematic surveys of cowbird density during 2017, our impression was that cowbird density in the canyons was much lower than in the pastures surrounding the Salt Creek Canyons. This is likely related to cattle grazing activity, as we rarely saw any cattle grazing in the canyons. There are few sources of fresh water in the main Salt Creek Canyon since all running water is extremely saline after percolating through the gypsum tops of the canyons. Of the cowbirds seen in the canyons, most were either near a reservoir in one of the minor canyons on the Viersen property or flew in from upland grazing areas and into the canyons. Few cowbirds were seen entering the canyons from lowland pastures one kilometer or more to the East

With respect to cowbird impacts on BCVI reproduction, we did observe multiple incidences of

parasitism despite our removal efforts. Of the 11 vireo nests found and/or revisited when they contained eggs or young, four had at least one cowbird egg (though none had cowbird chicks). In all four instances the nest was subsequently abandoned by the vireos. Fortunately, in at least two of these cases the BCVI pair re-nested and successfully fledged this second brood. The rate of brood parasitism we observed in the Salt Creek Canyon population in 2017 was comparable to rates previously reported for BCVI at other locations where cowbird removal was implemented (Barber and Martin 1997), especially during initial trapping efforts (Kostecke et al. 2005). Although we cannot definitively attribute the moderate rates of nest parasitism in 2017 to our cowbird removal efforts, there were noticeably few female cowbirds perching in the breeding habitats of BCVI within the vicinity of the traps relative to areas of higher cattle density.

## Discussion


This outpost population of BCVIs has persisted many years with only sporadic management. Understanding the factors that may be maintaining available habitats for this population may be critical to understanding how this population can be preserved over the long term. Furthermore, it may reveal insights into how to best manage surrounding areas to increase the suitability of habitats to allow expansion of this population beyond the Salt Creek canyons. Cedar removal along the canyon slopes appears to have a lasting impact for maintaining open grassland areas in the area. These clearings, made 12-17 years prior, seem to have remained open with only modest evidence of cedar regrowth. Whether these reverberating impacts are benefitting BCVI remains uncertain, although studies directed specifically at confirming this relationship could be readily answer this question. Cedar removal may be an effective, long-term conservation solution that is beneficial for both vireos (successional habitat) and landowners (increased forage production and reduced wildfire danger). And though such management may demand high up-front costs (e.g., equipment and labor), its potential for long-term habitat management reverberations could demonstrate its conservation utility.

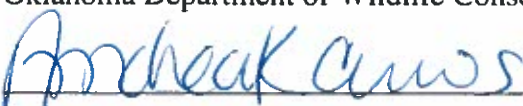
## **F. SIGNIFICANT DEVIATIONS:**

No significant deviations.

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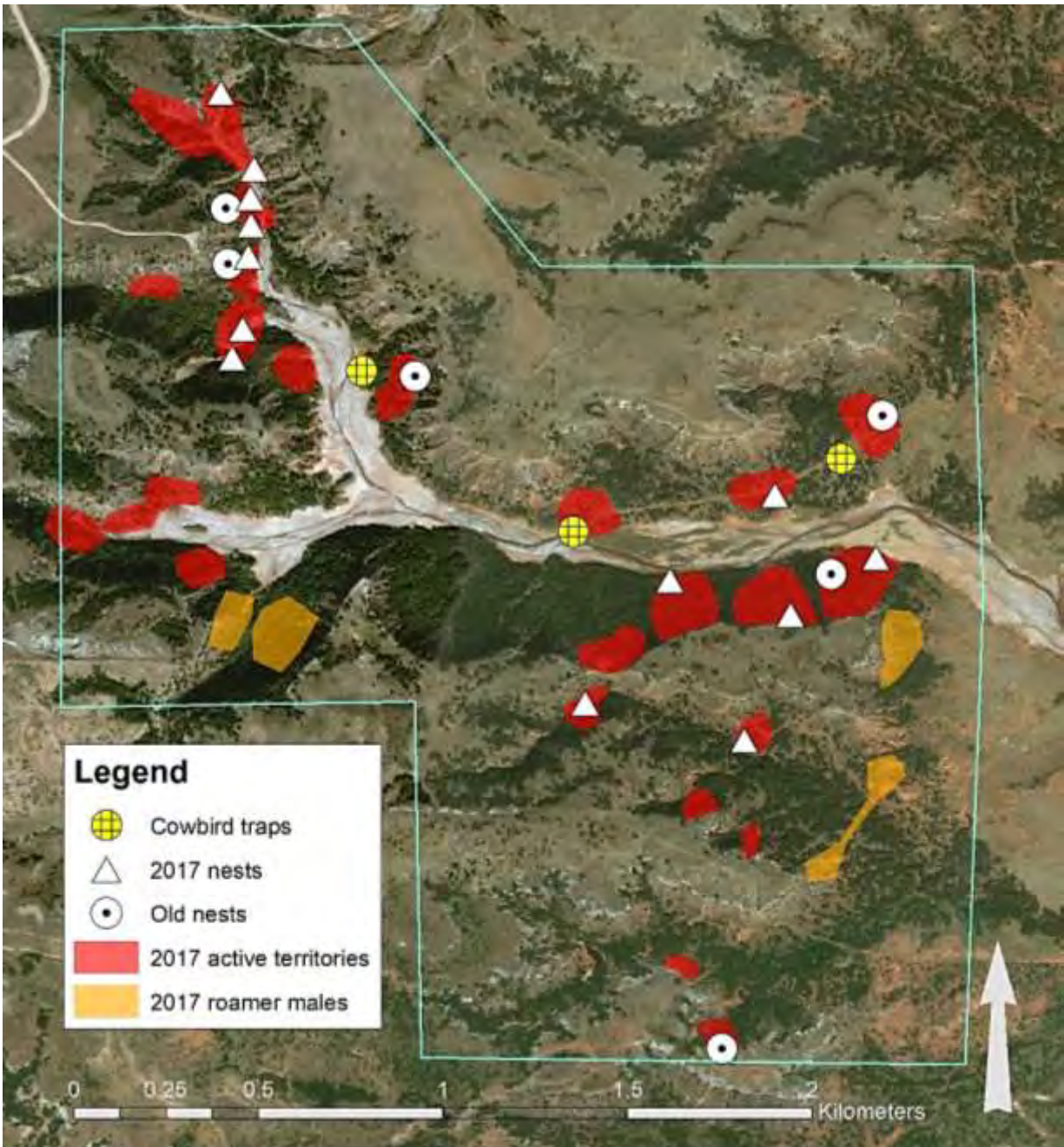
## APPENDIX

**Figure 1.** Map of Blaine County, OK, showing location of the Salt Creek Canyon site.





**Figure 2.** Map depicting entire study site and locations of BCVI territories, nests, and cowbird trap locations during the grant period.



**Figure 3.** Trailer-mounted cowbird traps used at roadside locations within the Salt Creek Canyon. Prior to commencing trapping activity, we refurbished rotted out floorboards, axel fittings, and tires and repaired cage material to prevent cowbirds from escaping. (J. Grzybowski pictured).

