

2018 Golden-cheeked Warbler Report

Westcave Preserve
Travis County, Texas

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Introduction

Westcave Preserve is a 76-acre preserve owned by the Lower Colorado River Authority (LCRA) and operated by the non-profit Westcave Outdoor Discovery Center. A portion of Westcave Preserve is part of the greater Balcones Canyonlands Preserve System, which was established and is operated by the Balcones Canyonlands Conservation Plan (BCCP), a regional multispecies habitat conservation plan, involving multiple governing entities, including LCRA. The BCCP also serves as a vehicle for U.S. Fish and Wildlife Service (USFWS) to issue permits to these entities under Section 10(a)(1)(B) of the Endangered Species Act.

Westcave Preserve is located near the western boundary of Travis County on Hamilton Pool Road, along the western bank of the Pedernales River. Originally, the preserve consisted of the 28.85 acres of high quality breeding habitat for the endangered Golden-cheeked Warbler (*Setophaga chrysoparia*) (GCWA). In 2008 and 2011, additional acreage surrounding the original property was purchased to serve as a buffer to protect water quality and expand the area of the preserve.

Purpose

The purpose of this report is to present the findings of the 2018 Golden-cheeked Warbler survey at Westcave Preserve. The overall goal of this effort is to track the status of GCWA over time with specific goals to determine density and productivity for each survey year.

Territory mapping surveys were conducted encompassing the entire preserve as one survey unit, allowing a continuum of habitat use designation. LCRA previously conducted presence/absence surveys, dividing the original portion of the property, designated as the “preserve” and the recently acquired tract, designated as the “uplands”.

Survey methodology followed territory mapping protocol (Williamson 1964; Marchant 1983; Bibby, et al. 2000) where all breeding GCWA males were identified and territory boundaries were determined. This survey methodology adheres to and surpasses the USFWS recommended minimum procedures for determining the presence/absence of Golden-cheeked Warblers outlined in LCRAs federal Fish and Wildlife permit (Permit No. TE800900-0, issued 5 April 2011) and USFWS Section 10(a)(1)(A) Scientific Permit Requirements for Conducting Presence/Absence Surveys and Habitat Assessments for Endangered Golden-cheeked Warblers (FWS 2010). Territory mapping will enable Westcave Preserve to monitor populations long-term and provide guidance for future land management decisions.

Golden-cheeked Warbler Life History Summary

Description: The GCWA is a medium-sized (approx. 12-13 centimeters [cm] length) insectivorous passerine. Breeding adult males have black on the forehead, crown, nape, and back. The cheeks are a bright golden yellow, interrupted by a black eyeline. The throat and upper breast are black, which continues as streaking along the sides and flanks. The remaining underparts are white. The wings are black with two distinct white wing-bars. Adult females are similar in coloration, but are comparatively duller; the crown and back are olive-green with some black streaking (Oberholser 1974, Pulich 1976, Ladd and Gass 1999).

Range: The GCWA is the only bird species with a breeding range confined to Texas, specifically isolated to south-central areas of the state. Historically, this species nested in approximately 41 of Texas' 254 counties; however, current confirmed breeding records are restricted to 33 Texas counties (Pulich 1976, USFWS 1995, Ladd and Gass 1999, Lockwood and Freeman 2014). Currently, the species is found from Young and Palo Pinto counties, south through the eastern and south-central parts of the Edwards Plateau to Edwards and Kinney counties, and Val Verde County (Lockwood and Freeman 2014, USFWS 2013). GCWAs winter in pine and pine-oak woodlands in the highlands of southern Mexico, Guatemala, Honduras, Nicaragua and is a rare visitor to Costa Rica, Panama, and the western edge of Belize (Ladd and Gass 1999, James and Komar 2006, Avibase 2016).

Habitat: GCWA habitat consists of old-growth and mature regrowth juniper-oak woodlands with a high percentage of canopy cover in limestone hills and canyons on Central Texas (Pulich 1976, Ladd 1985, Wahlet al. 1990, USFWS 1992).

An essential component for GCWA breeding habitat, however, is Ashe Juniper. When mature, Ashe Junipers develop shredding strips of bark used by GCWA's as the primary nesting substrate (Pulich 1976, Kroll 1980 and Gass 1999).

The woodlands also consist of various species of oaks (*Quercus* spp.), such as Texas red oak (*Quercus buckleyi*) and plateau live oak (*Quercus fusiformis*). Other common tree species throughout nesting range include cedar elm (*Ulmus crassifolia*), walnut (*Juglans* spp.), hackberry (*Celtis* spp.), and Texas ash (*Fraxinus texensis*); less common tree species are escarpment black cherry (*Prunus serotina*), sycamore (*Platanus occidentalis*), American elm (*U. americana*), coma (*Bumelia lanuginosa*), redbud (*Cercis canadensis*), and rough-leaf dogwood (*Cornus drummondii*). Common undergrowth shrubs are Texas persimmon (*Diospyros texana*), agarito (*Berberis trifoliolata*), elbow bush (*Forestiera pubescens*), Texas mountain laurel (*Sophora secundiflora*), possum-haw (*Ilex decidua*), evergreen sumac (*Rhus virens*), and polecat bush (*R. aromatic* (Ladd 1985, Sexton 1987, Bearmore 1994).

On wintering grounds, GCWAs select for pine-oak woodlands that are ≥1,100 m in

elevation. (Monroe 1968, Rappole et al. 2000).

Status: On 4 May 1990, USFWS published an emergency listing of the GCWA as endangered (55 FR 18844), as well as a proposed rule to formally list the GCWA as endangered. On 27 December 1990, the USFWS published the final rule for listing as endangered (55 FR 53153). In 2015 a petition was submitted to USFWS to delist the GCWA from the Endangered Species Act. USFWS found the petition did not present substantial information that warranted delisting the GCWA and declared it would take no further action on the petition. The Texas Parks and Wildlife Department (TPWD) also lists the species as endangered. No critical habitat has been designated for the species.

Threats: Species endemism and habitat loss due to agricultural use, brush control and land development are the primary threats to GCWA viability and have been the major factors attributed to population declines (Wahl et al. 1990, FWS 1992, Ladd and Gass 1999). Indirect effects of habitat disturbance, such as Brown-headed Cowbird parasitism and increased predator populations, have further negatively impacted populations (Wahl et al 1990). Environmental factors such as climate change and drought may contribute to Ashe juniper die-off effecting essential breeding habitat components.

Study Area

Due to the relatively small size of Westcave Preserve, the survey area includes the entire preserve with emphasize placed on breeding habitat along canyon slopes, adjacent woodlands and the abutting uplands.

Description: Westcave Preserve is comprised of a unique matrix of habitats found on the Edwards Plateau, supporting a diversity of native and endemic plant and animal species. The Preserve contains native grass and forb prairie, live oak savannah and old growth Ashe juniper-live oak woodlands and features a spring fed creek with a grotto and cave.

Riparian habitat is found surrounding the grotto and along the Heinz Branch Canyon creek bottom with mesic woodlands on adjacent slopes leading to the Pedernales River and following along the river edge. Mature hardwoods such as Bald cypress (*Taxodium distichum*), Sycamore (*Platanus occidentalis*), cedar elm (*Ulmus crassifolia*) and a various oak sp. (*Quercus sp*.) are found in this area while midstory species consists of Ashe Juniper (*Juniper ashei*), Mountain Laurel (*Sophora secundiflora*), Mexican buckeye (*Ungnadia speciosa)* and oak species. Understory species consists of a diverse plant community, which include, silk tassel (*Garrya ovate)*, American beautyberry (*Callicarpa Americana*) spicebush (*Lindera* benzoin) and redbay (*Persea borbonia*). Extending out from the canyon rims toward the upland area, dense stands of woodlands dominate with mature Ashe Juniper and Escarpment live oak.

The upland portion of the preserve consists of grassland savannah and native grassland/forb prairie. In the grassland savannah areas, Escarpment live oaks (*Quercus fuisformis*) are interspersed with native grasses such as little blue stem (*Schizachyrium scoparium*) and grama species (*Bouteloua sp*). Wildflowers, forbs, yucca species and prickly pear (*Opuntia sp.*) are also found in the open grassy areas. Prairie restoration efforts are currently underway in the upland grassland area south of the creek to promote a diverse growth of native grasses and forbs. In winter of 2016, brush management, prescribed fire and reseeding measures were employed for this project.

Methods

Territory mapping surveys for GCWAs were performed by avian researcher, Dawn Houston (Federal permit for GCWA surveys: TE42737A), following the protocol as described in Bibby *et. al*. 2000. All surveys were completed within the GCWA survey season, 15 March to 1 June, adhering to USFWS survey guidelines. Ten site visits were completed to designate GCWA territories and determine nest success. All areas of the preserve were surveyed with an emphasis placed on canyon slopes and adjacent woodlands in the uplands area. All GCWA detections were recorded and corresponding behavior was noted.

In conjunction with territory mapping, the preserve began collaborating with the City of Austin in 2017 in adherence to the long-term monitoring plan to obtain the most accurate estimate of return rates, dispersal and survival of GCWAs on the BCP by color banding territorial males. Audio records of GCWA songs were strategically projected adjacent to mist nets within a specific warbler territory and were used to lure males toward an "intruder" entering the given territory. Upon capture, GCWAs were banded and were visually detected to confirm banding status, color combinations and geographical positioning on a weekly basis. Initial banding took place 8 April, 2018 and resighting continued until the final survey was complete on 17 May 2018.

Results

Observations: Forty nine observations were recorded during 10 site visits from 16 March to 17 May 2018. Additional data were collected with each observation including, date/time of detection, type of observation, sex and coordinates. Survey efforts hours totaled approximately 34 hours.

Table 1: Number of Detections per Site Visit

Site Visit Date	16 March	21 March	26 March	13 April	18 April	23 April	30 April	3 May	8 May	17 May
Number of Detections	1	3	12	4	6	9	10	10	5	6

Territories: Three territories were established within the study area during the 2018 breeding season. Two territories were detected in areas previously occupied during prior monitoring seasons; along the Pedernales River (T-A and T-B). An additional territory was detected within the Heinz Branch Canyon (T-C).

Successful pairing with females was confirmed for T-A and T-B.

Color Banding/Resighting: No previously color banded GCWAs returned from the 2017 breeding season, however, banding efforts continued in 2018 to band newly arrived birds. On 8 April, 2018, City of Austin biologist, John Chenoweth color banded three GCWAs; two males and one female. Attempts were made to color band all territorial males within the preserve, however, only the T-B female was successfully captured and banded for that territory.

Table 2: Band Color Combinations

Territory	**Band Color Combination** **Left leg : Right leg**	**Sex**
T-A	Green/green : Red/silver	Male
T-B	Orange/silver: Yellow/light blue	Female
T-C	Dark blue/green : White/silver	Male

Nest/Fledglings: Six fledglings were detected within the study area during the 2018 breeding season. On 26 March 2018, T-B female was observed constructing a nest within 7 meters of the upland portion of the canyon trail. The nest was located in an Ashe Juniper tree (5 meters) at a height of 3 meters along a bare portion of a lateral branch. The nest was easily observable from the trail without directly approaching the Ashe Juniper and was monitored until the nestlings fledged. Although foot traffic for weekend tours commenced during the nesting stage, Westcave staff ensured noise levels were kept at a minimum and visitors did not stop along a designated stretch of the trail within the nesting territory. There were no observed incidents of disturbance (agitated behavior) or flushing of a brooding adult.

T-B nest successfully produced four fledglings on 25 April. Both adults were observed tending to four fledglings until the last survey date of 18 May.

Although a female GCWA was never visually detected within T-C, two young fledglings were observed with the T-C male on 22 May.



Figure 1. Golden-cheeked Warbler Territories in 2018

Summary

Although suitable GCWA habitat is restricted to a small patch within Westcave Preserve, it continues to provide essential components for successful breeding GCWAs. During the 2018, GCWA breeding season, three territories were established within the study area adding an additional territory from the 2017 breeding season.

Although T-A's territory was initially situated within the preserve's boundary, as the season progressed, the territory shifted primarily off the study area. T-A was still monitored after the shift with both male and female detected until the end of the survey season. Neither nest nor fledglings were identified with T-A.

T-B territory boundaries remained consistent throughout the breeding season and successfully produced four fledglings. In spite of multiple attempts to color band the male, only the female responded to audio recordings and was captured. Incidentally, the color banded T-B female exhibited a strong black bib, associated with male GCWA plumage.

T-C territory occupied the Heinz Branch Canyon extending from the grotto to Pedernales River. The vegetation within the canyon is comprised of a more biodiverse, and mesic vegetative community than found along the river slope. Vegetation is also structurally diverse, providing ample cover for GCWAs. A female was not visually detected within T-C, however, two fledglings were observed with the male on 22 May by Westcave conservation staff confirming a successful nest.

Although high quality habitat is limited to canyon slopes along the creek and Pedernales River and is a low abundance area, Westcave Preserve continues to successfully supports breeding GCWAs within the Pedernales River riparian corridor and provide foraging and dispersal habitat to young GCWAs on their summer grounds.

Land management efforts are currently allowing regrowth of woody vegetation to expand from the upland woodlands around the canyon into a portion of the upland savannah to allow for more GCWA habitat.

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Appendix A: Avian Species Observed During 2017 Survey

Common Name	Scientific Name
Great Blue Heron	*Ardea Herodias*
Black Vulture	*Coragyps atratus*
Turkey Vulture	*Cathartes aura*
Mississippi Kite	*Ictinia mississippiensis*
Cooper's Hawk	*Accipiter cooperii*
Red-tailed Hawk	*Buteo jamaicensis*
Red-shouldered Hawk	*Buteo lineatus*
Swainson's Hawk	*Buteo swainsoni*
Broad-winged Hawk	*Buteo platypterus*
Wild Turkey	*Meleagris gallopavo*
White-winged Dove	*Zenaida asiatica*
Mourning Dove	*Zenaida macroura*
Yellow-billed Cuckoo	*Coccyzus americanus*
Eastern Screech-Owl	*Megascops asio*
Barred Owl	*Strix varia*
Great-horned Owl	*Bubo virginianus*
Greater Roadrunner	*Geococcyx californianus*
Chimney Swift	*Chaetura pelagica*
Black-chinned Hummingbird	*Archilochus alexandri*
Ruby-throated Hummingbird	*Archilochus colubris*
Downy Woodpecker	*Picoides pubescens*
Ladder-backed Woodpecker	*Picoides scalaris*
Golden-fronted Woodpecker	*Melanerpes aurifrons*
Scissor-tailed Flycatcher	*Tyrannus forficatus*
Acadian Flycatcher	*Empidonax virescens*
Eastern Phoebe	*Sayornis phoebe*
Great-crested Flycatcher	*Myiarchus crinitus*
Ash-throated Flycatcher	*Myiarchus cinerascens*
Yellow-throated Vireo	*Vireo flavifrons*
Blue-headed Vireo	*Vireo solitarius*
White-eyed Vireo	*Vireo griseus*
Red-eyed Vireo	*Vireo olivaceus*
Woodhouse's Scrub-Jay	*Aphelocoma woodhouseii*
Common Raven	*Corus corax*
Barn Swallow	*Hirundo rustica*
Purple Martin	*Progne subis*
Carolina Chickadee	*Poecile carolinensis*
Black-crested Titmouse	*Baeolophus atricristatus*
Canyon Wren	*Catherpes mexicanus*
Carolina Wren	*Thryothorus ludovicianus*
Bewick's Wren	*Thryomanes bewickii*
Ruby-crowned Kinglet	*Regulus calendula*
Blue-gray Gnatcatcher	*Poliopila caerulea*
Eastern Bluebird	*Sialia sialis*
Hermit Thrush	*Catharus guttatus*
Northern Mockingbird	*Mimus polyglottos*
Cedar Waxwing	*Bombycilla cedrorum*
Wilson's Warbler	*Cardellina pusilla*

Common Yellowthroat	*Geothlypis trichas*
Black-and-white Warbler	*Mniotilta varia*
Louisiana Waterthrush	*Paresia motacilla*
Nashville Warbler	*Oreothlypis ruficapilla*
Tennessee Warbler	*Oreothlypis peregrina*
Northern Parula	*Setophaga americana*
MagnoliaWarbler	*Setophaga magnolia*
Yellow Warbler	*Setophaga petechia*
Golden-cheeked Warbler	*Setophaga chrysoparia*
Yellow-rumped Warbler	*Setophaga coronata*
Lark Sparrow	*Chondestes grammacus*
Rufous-crowned Sparrow	*Aimophila ruficeps*
Chipping Sparrow	*Spizella passerina*
Field Sparrow	*Spizella pusilla*
Lincoln Sparrow	*Melospiza lincolnii*
Spotted Towhee	*Pipilo maculatus*
Summer Tanager	*Piranga rubra*
Northern Cardinal	*Cardinalis cardinalis*
Indigo Bunting	*Passerina cyanea*
Painted Bunting	*Passerina ciris*
Brown-headed Cowbird	*Molothrus ater*
House Finch	*Haemorhous mexicanus*
Lesser Goldfinch	*Spinus psaltria*