



Baker Sanctuary

2010 - 2011 Annual Report

(October 1st, 2010 - September 30th, 2011)

prepared for the

Balcones Canyonlands Preserve

By

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Introduction

Baker Sanctuary is owned by Travis Audubon Society with approximately 682 acres managed as part of the Balcones Canyonlands Preserve (BCP). Approximately nine additional acres along the northwest boundary (Ruth Frederickson Tract) were purchased by Travis Audubon in 2007 and have not been added to the BCP. Straddling Lime Creek Road, the sanctuary is within the Cypress Creek Macrosite and adjacent to several other BCP tracts including: the City of Austin's Austin Simon and Lime Creek tracts to the northeast; and the Lower Colorado River Authority's Wheless tract, The Nature Conservancy's Lehmann tract, and the City of Cedar Park's waterline tract to the south (**Appendix A**). A recent BCP purchase by Travis County touches the sanctuary's southwestern boundary. The sanctuary features densely wooded uplands, slopes and canyons dominated by mature oak-juniper woodlands with occasional pockets of open and semi-open grasslands that are being encroached by juniper.

Golden-cheeked Warbler Surveys

The annual 100-acre survey saw several significant changes in methodology beginning in 2011 as Baker Sanctuary collaborated with the City of Austin as part of an ambitious five year study to determine Golden-cheeked Warbler (GCWA) population viability and habitat suitability in the Balcones Canyonlands Preserve, for details see the complete report in **Appendix B**. Based on compiled observations, including patterns of movement, re-sighting of color banded individuals, counter-singing and the presence of females and fledglings, we estimate that six Golden-cheeked Warbler males established territories substantially within plot boundaries (full), nine males occupied territories partially within the plot (edge), and four males held territories directly adjacent to the plot (out) for a total of 10.5 territories in the 100-acre plot. Due to changes in methodology, it is difficult to compare 2011 results with prior 100-acre surveys but the data seems to suggest the population is recovering from the droughts of 2008 and 2009 but has not yet reached pre-drought densities.

In addition to the traditional 100-acre survey, the Baker Headquarters Plot, located roughly 100 meters north of the Baker steward's trailer and encompasses open areas to the north and south of Lime Creek Road, was surveyed using USFWS presence/absence methodology, a less-intensive survey than was performed the year prior. The goal of this survey was to collect more data on the patterns of Golden-cheeked Warbler use associated with the open areas to the north of Lime Creek Road as well as the smaller clearings to the south of Lime Creek Road where the steward's residence and parking lot are currently located. Results from the presence/absence survey seem to corroborate

landscape use that was documented the prior season, for details see the complete report in **Appendix C**.

Deer Management

The Sanctuary was closed from October 23rd, 2010 – January 6th, 2011 for the annual White-tailed Deer management hunt. Eight primary hunters hunting at sites 2, 3, 5, 10, 11, 12, 13, and 14 (**Figure 1**) harvested a total of one deer (a spike buck) during 151 hours of hunt effort, a record low take and considerably less than the average harvest of fourteen deer per season over the prior nine recorded seasons; **Figure 2** summarizes yearly take data. Due to the large amount of mast on the ground, few deer were coming regularly to the corn feeders, a significant hurdle to overcome when hunting from a blind. The Sanctuary will be closed for the 2011-2012 season from October 23rd, 2010 – January 15th, 2011.

The Hatfield Tract is a 50 acre parcel deeded to the Travis Audubon in 1986 with the following stipulation: “it will never lease any portion of the property for hunting or trapping purposes”; as a result, no hunting took place on this tract during the 2009 – 2010 hunting season.

Vegetation Management

Ashe Juniper (*Juniperus ashei*) was trimmed from all trails when it impeded the movement of hikers or posed a safety hazard. In addition to the routine maintenance of the trail system, an access lane was cut down the entire length of the southeast fence line to accommodate regular fence integrity checks and to monitor for invasive species infiltration on the sanctuary/urban interface. In an effort to keep the canopy intact as possible, vegetation was removed sparingly and consisted mostly of trimming branches rather than removing trees. Work also commenced on clearing a new trail that will connect the Hatfield and Baker Point trails, two trails in the southern portion of the sanctuary that terminate in dead-ends.

A pallet of various native plant species was delivered in November 2010 from the City of Austin’s greenhouse and was out-planted around the Jackie Arnold Education Center (JAEC) and the steward’s trailer during the months of November and December. Of the 28 individuals of 13 species planted, only a handful marginally survived the subsequent drought. The survivors included two Rusty Blackhaws (*Viburnum rufidulum*), three Black Cherries (*Prunus serotina*), two Inland Sea-oats (*Chasmanthium latifolium*), one Red Oak (*Quercus buckleyi*), one Cedar Elm (*Ulmus crassifolia*), one Mexican Buckeye (*Ungnadia speciosa*), and one Red Bud (*Cercis canadensis*).

Beginning in April, Ashe Juniper were the first species to show signs of stress due to the drought with a slight browning of leaves as well as an increased incidence of an unknown arthropod parasite, possibly some type of spider mite and/or bagworm, that was becoming prevalent in struggling individuals. As the drought progressed through the spring and summer, more Ashe Juniper browned as well as scattered individuals of Plateau Live Oak (*Quercus fusiformis*), Cedar Elm, Red Oak, and others. Many of the affected individuals are near forest openings, especially along Lime Creek Road. While it remains to be seen if the affected deciduous species will revive in the spring, it is clear there will be a substantial increase in the amount of standing dead Ashe Juniper for 2012.

Baker Sanctuary is composed mainly of dense mature oak-juniper woodlands interspersed with pockets of open and semi-open grasslands; there are nine Fire Behavior Prediction System (FBPS) fuel models that correspond with the habitats within Balcones Canyonland Preserve and a fire management plan based upon these prediction systems is located in the Baker Sanctuary headquarters and available to assist the steward in monitoring for fire safety and response readiness. The Baker Sanctuary is also equipped with a wildfire calldown list and basic wildfire response tools to help better expedite early response to wildfires.

Cowbird Trapping

Travis Audubon operated two Brown-headed Cowbird traps from March 31st through June 15th of the 2011 season; TAS1 is located on the south side of Lime Creek Road near the steward's trailer and TAS2 in the open area near hunt site 11. TAS1 captured six adult females, six adult males, and one female Painted Bunting which was released unharmed. TAS2 captured two adult females, one adult male, and a Northern Mockingbird which was also released unharmed. Captured Brown-headed Cowbirds were euthanized via suffocation provided by dry ice and an air-tight bucket.

Exotics Control

Malta Star-thistle (*Centaurea melitensis*) was hand-pulled from the Baker Cabin area, a location where a significant population had taken root. All encountered plants were pulled over the course of several weeks and the area will be monitored this spring to determine the effectiveness of the eradication effort. With the exception of a few scattered individuals, the Malta Star-thistle that had been hand-pulled in the parking lot near the steward's trailer did not re-occur.

The Tree-of-heaven (*Ailanthus altissima*) grove discovered last year in a drainage on the northern end of the sanctuary that feeds into Harris Creek was treated over the course of several months and is still being actively monitored. From December 2010 to September 2011, 706 Tree-of-heaven saplings were hand pulled, 87 stump-cut, and 30 girdled. All but the hand-pulled saplings were treated with a 10% solution of Arsenal herbicide. In the same area, two large Chinaberrys (*Melia azedarach*) were girdled and also treated with the Arsenal solution. The treatment, while effective with the Chinaberry, has had mixed results with the Tree-of-heaven with some re-sprouting from the base of the treated trees. The area will continue to be monitored and a second treatment of the Arsenal solution will be applied to trees that exhibit new growth.

Other invasive plants were removed when encountered throughout the sanctuary, including many Common Mullein (*Verbascum thapsus*), three *Ligustrum* species, one Heavenly Bamboo (*Nandina domestica*), 18 Jujube (*Ziziphus zizyphus*), and two Chaste Tree (*Vitex agnus-castus*).

Research

During the spring of 2011, volunteers installed and collected data on 33 long-term vegetation monitoring plots scattered throughout the entire sanctuary (**Figure 3**). The survey was performed to collect information on the presence of plant species and their abundance, the ages of certain woody vegetation, and the physical environment. By developing a baseline assessment as well as a long-term monitoring protocol, the effects of restoration and land management activities will be more clearly discernable. Information from these surveys can also be used to determine the success of exotic species removal, provide information regarding Golden-cheeked Warbler habitat, and locate both endangered species and non-native invasives which may occur on the property. Currently, the monitoring protocol (**Appendix D**) is in the process of being revised as well as the location of several of the vegetation monitoring plots. Data from this year's pilot survey has not yet been analyzed.

In an effort to achieve a more complete understanding of the composition, distribution, and density of all avian species found on the sanctuary, the fixed-radius point count methodology proposed by Hutto *et al.* (1986) has been adopted. On May 15th, the first count was performed (**Table 1**) and utilized extant vegetation monitoring plots (**Figure 3**) as point count stations, with the exception of points 11 and 12, which were excluded, and the addition of point 34 (UTM 14R0607422, 3374263) in the Ruth Frederickson Tract. Eventually the monitoring plan will expand to encompass at least two counts, one each in the spring and winter, with the possibility of performing as many as four counts per year.

In July, two new springs were discovered on the Hatfield Tract- tentatively named the Hatfield (UTM 14R0609638, 3371920) and Kyle Springs (UTM 14R0609747, 3372355) respectively. A sizeable new cave was also discovered on the Hatfield Tract (UTM 14R0609713, 3372197), fairly close to Kyle Spring, which will need an official name for state documentation, until then, it will be referred to as the Hatfield Cave. Nate Bendik and Mark Sanders of the City of Austin collected data on the water quality at Hatfield Spring as well as conducting a preliminary survey of the karst fauna of Hatfield Cave (**Appendix E**).

Education and Outreach

Not including the Youth Nature Camp or volunteer workdays, Baker Sanctuary experienced a total of 181 visitations. Of those visitations, 104 were by members and 77 were by non-members. A total of 356.5 volunteer hours were logged at Baker on a variety of activities (see below).

October: Activity from this month was mistakenly presented in last year's BCP report. Volunteer hours for this month were not counted in the above total for the year.

November: Old West Trail in North Loop mapped and flagged.

January: Ashe Juniper removed from the Lime Creek fence line was chipped.

February: Vegetation monitoring plots installed, trail scouted for Baker Point/Hatfield Trail connection, eBird trail system survey (see **Appendix F** for current bird list).

March: Guided hikes for Hill Country Conservancy and Hill Country Outdoors, JAEC native plant garden weeded and mulched, booth hosted at Goddard School's EnviroFair, archeological sites scouted, vegetation monitoring protocol field tested, vegetation monitoring data collected.

April: Guided hikes for Sierra Club and Deer Creek Elementary Cub Scout troop, Baker Open House, Breakfast with the Birds event, vegetation monitoring data collected, Malta Star-thistle pulled.

May: Guided Hikes for Sierra Club and BCP Hike and Lecture series, avifauna point counts, Malta Star-thistle pulled, vegetation monitoring data collected.

June: Trail scouted for Baker Point/Hatfield Trail connection.

July: Meeting for future archeological survey, eBird trail system survey.

August: Vegetation trimmed on SE fence line.

September: No activity.

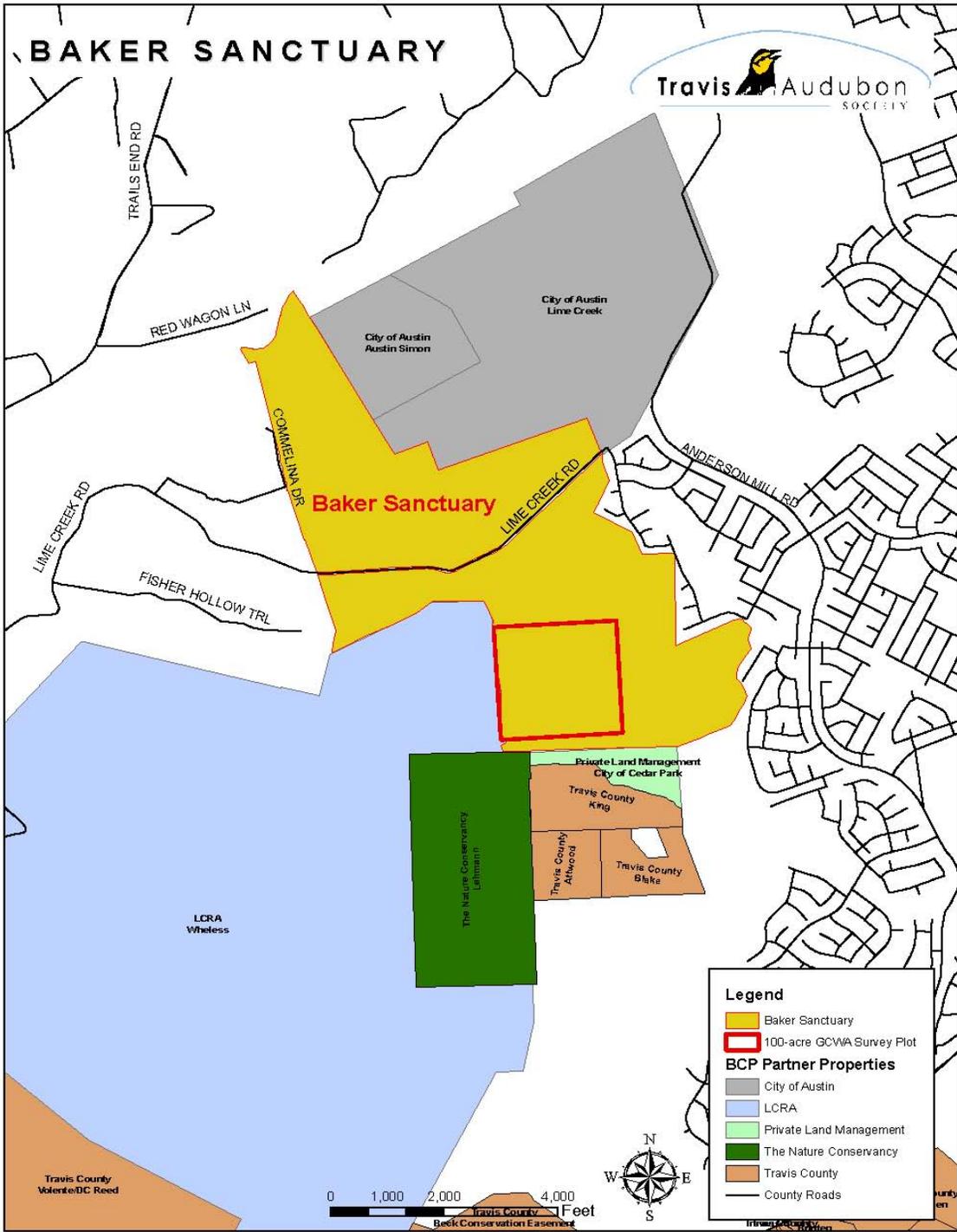
In March, Baker hosted 25 students from various elementary schools in the Leander ISD (LISD) for the first Youth Nature Camp (YNC). From 9 AM to 4 PM students learned

about migration, native habitats, binoculars, Golden-cheeked Warblers, and birding. Each student took home a pair of binoculars and a field guide to the birds. While this was the first YNC for Baker, it is expected such camps will increase and occur on an annual basis in the future.

In an effort to develop connections with the local community and better utilize the educational aspect of the sanctuary, the elementary science core team for LISD was given a guided tour of Baker in February. During June and July, two in-service trainings were hosted at Baker for LISD teachers desiring a better understanding of the local flora and fauna.

Appendix A

Map of Baker Sanctuary and BCP partner properties



Travis Audubon Properties, Baker Sanctuary, C. Masey 11-18-09

Appendix B

**RESULTS OF THE GOLDEN-CHEEKED WARBLER SURVEY
FOR THE BAKER SANCTUARY 100-ACRE PLOT
SPRING 2011
TRAVIS COUNTY, TEXAS**

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September 2011

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Results of the Golden-cheeked Warbler Survey for the Baker Sanctuary 100-acre Plot Spring 2011

The annual 100-acre survey saw several significant changes in methodology beginning in 2011 as Baker Sanctuary collaborated with the City of Austin as part of an ambitious five year study to determine Golden-cheeked Warbler (GCWA) population viability and habitat suitability in the Balcones Canyonlands Preserve. The most significant change was an intensive effort to mist-net and color band all GCWA males on the study plot. Small crews captured the territorial males by luring them into a mist-net with the aid of a recording of a singing GCWA. When captured, the male's legs were outfitted with a unique color combination comprised of three color bands as well as an aluminum USFWS band stamped with a unique serial number. Captured birds were also aged into one of two categories based on plumage characteristics, second year (SY) or after second year (ASY). Second year birds fledged the previous breeding season whereas ASY birds are on their third season, at the least. While not specifically targeted, if females or juvenile GCWAs were netted they were also given the same banding treatment. During the 2011 season, 11 males and 2 females were captured and banded for a total of 13 banded individuals (**Table 1**).

In addition to banding, another important change in survey methodology was the addition of another observer. Cindy Sperry and I split survey duties during the season, allowing for an increase in overall survey time to better document re-sighted individuals as well as to allow additional time to determine breeding productivity. To accommodate two observers, each week the plot was split in half with each observer responsible for their assigned section. The assigned section was rotated every week, effectively allowing each observer to survey the entire plot throughout the course of a month. For example, the first week I surveyed the northern section and Cindy the southern. The following week I would survey the eastern section and Cindy the western, and so on, rotating through the plot in a clockwise fashion. When splitting the plot in half, no hard line was set as the middle point, rather each observer estimated where the halfway mark was located and used discretion if a GCWA needed to be pursued over the imaginary boundary.

In an effort to consistently document GCWA edge males as well as potentially locate banded males that may have shifted their territory to outside the 100-acre boundaries as the season progressed, a buffer zone was added to the study plot. The buffer zone extended 100 meters beyond the historical boundary on all sides of the 100-acre plot and it was searched for GCWAs as routinely as the main plot. GCWAs detected in the buffer zone were considered to be outside the study plot, only birds within the traditional 100-acre boundaries were designated as occurring within the plot.

Beginning on March 18th and continuing through May 21st, one half of the study plot was surveyed by Murray and the other half by Sperry each week for a total survey time of 137 hours and 30 minutes. All surveys were conducted following the protocol outlined in the Balcones Canyonland Preserve (BCP) Land Manager's Handbook. In addition to the 10 visits each by Murray and Sperry during the regular survey, 14 hours and 45 minutes were spent by Sperry and Chris Warren in an attempt to locate fledglings after May 25th. Locations of individual Golden-cheeked Warblers were mapped by hand in the field and GPS coordinates

obtained for all detections. Due to the presence of color banded individuals, visual confirmation of GCWAs was attempted whenever possible. Movements, counter-singing by males, and color bands were documented and used to distinguish individuals and identify territory boundaries. Observations of females, nests, and fledglings were also documented. All survey observations were compiled and analyzed to obtain an estimate of established male territories within the plot as well as the buffer zone.

In an effort to consistently analyze the number of territories present in the 100-acre plot regardless of season or observer, a method to enumerate territories was adopted. To be classified as an ‘edge’ territory a GCWA must have a minimum of three observations points inside and outside the plot during at least two survey sessions. Otherwise, the GCWA will be designated as ‘full’ or ‘out’ depending on where the majority of the observations occur. Full territories will be enumerated as 1.0, edge territories 0.5, and out territories as zero. Based on compiled observations, including patterns of movement, re-sighting of color banded individuals, counter-singing and the presence of females and fledglings, we estimate that six Golden-cheeked Warbler males established territories substantially within plot boundaries (full), nine males occupied territories partially within the plot (edge), and four males held territories directly adjacent to the plot (out) for a total of 10.5 territories in the 100-acre plot (**Table 2**). While the presence of color banded males has eliminated some of the guesswork involved with attributing territories to individuals, a substantial number of males remain unbanded. In the instances where males were not banded, territories were assigned in a conservative fashion to avoid overstating the number of territories associated with the plot.

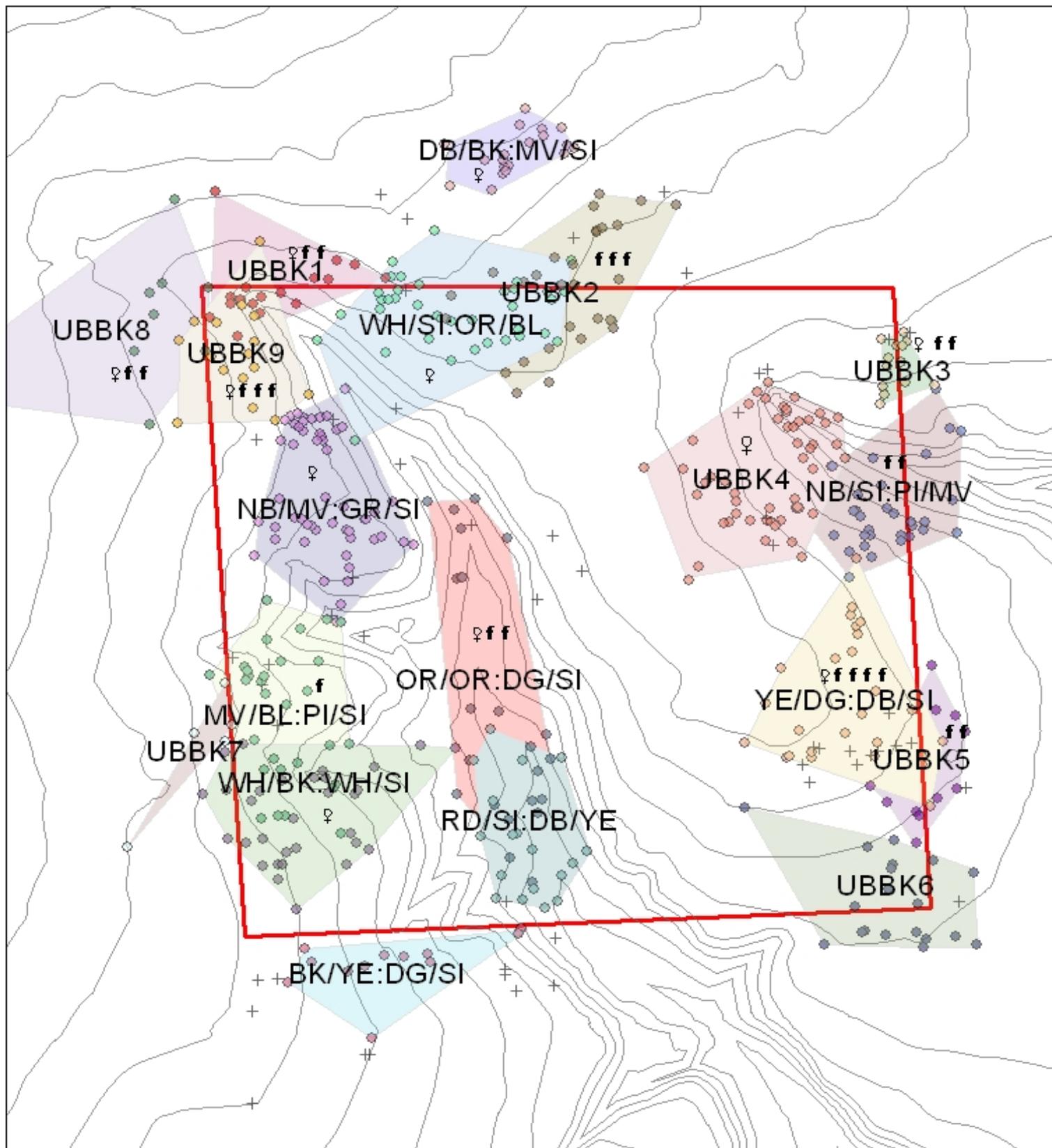
Comparing the 2011 data with surveys of the five previous seasons (**Table 3**), at first glance it would appear the number of territories is decreasing; especially considering in 2006 it was estimated 26 full and edge territories were present compared to only 15 for the 2011 season. However, the 2011 survey had the distinct advantage of color banded individuals to remove some of the guesswork inherent in surveys of this type. In addition to banded individuals, previous 100-acre surveys received approximately 60 hours of observer time compared to the roughly 150 hours witnessed for the 2011 survey. In addition to banding and observer time, designation of ‘full’ and ‘edge’ territories was not formalized and was more subjective, dependent on the assessment of the particular observer. While it is difficult to compare the 2011 survey results with those of previous seasons, it is interesting to note that the number of fledglings detected for 2011 was higher than the previous five years, even for 2006 when 26 territories were estimated for the plot. Due to the severe drought of 2011, it would seem fewer fledglings would be detected, especially considering only 15 territories were estimated for the plot. Reasons for this apparent discrepancy are many but it will hopefully be answered as color banding is continued and additional data collected to paint a more accurate picture of territory density.

The map on page 4 displays locations of all Golden-cheeked Warbler observations and estimated territory boundaries for 2011. Polygons surrounding the observations represent approximate boundaries of male territories, with each territory identified by color band combinations or an unbanded designation. Presence of a female Golden-cheeked Warbler and number of fledglings (**f**) observed is noted within each territory.

Table 4 lists the 57 bird species detected in or near the 100-acre plot during 2011 surveys. In addition to Golden-cheeked Warblers, species detected on most surveys included

Turkey Vulture, Carolina Chickadee, Black-crested Titmouse, Northern Cardinal, Mourning Dove, Blue-gray Gnatcatcher, White-eyed Vireo, Bewick's Wren, and Black-and-white Warbler. Passing migrants included Nashville Warbler, Blackburnian Warbler, Chestnut-sided Warbler, Magnolia Warbler, and Hutton's Vireo. Commonly seen birds presumed to be nesting in or near the plot included Painted Bunting, Lesser Goldfinch, Yellow-billed Cuckoo, Western Scrub-jay, and Ladder-backed Woodpecker. Brown-headed Cowbirds were detected on two separate instances during the surveys.

Other animals detected during the survey include Eastern Fox Squirrel and Coral Snake.



**Baker Sanctuary
GCWA 100-acre Plot 2011**

- GCWA territorial male observation
- ♀ GCWA female observed in territory
- f GCWA fledgling observed in territory
- + GCWA male observation, territory not determined

- GCWA territory
- ▭ 100-acre plot boundary
- Contour = 10 ft.
- Scale 1:5000

0 125 250 500 Feet

Surveyors:
C. Murray and C. Sperry



Table 1. GCWA individuals banded during the 2011 Baker Sanctuary 100-acre survey.

Date Banded	Combo	UTM-easting	UTM-northing	Sex	Age
3/21/2011	MV/SI:NB/YE	608592	3372177	M	SY
3/21/2011	MV/BL:PI/SI	608562	3372050	M	ASY
3/21/2011	OR/OR:DG/SI	608782	3372118	M	SY
3/21/2011	BK/YE:DG/SI	608662	3371918	M	SY
3/21/2011	YE/DG:DB/SI	609077	3372089	M	ASY
3/21/2011	DB/BK:MV/SI	608949	3372688	M	ASY
3/21/2011	RD/SI:BK/DG	608949	3372688	F	ASY
3/30/2011	NB/SI:PI/MV	609134	3372328	M	ASY
4/27/2011	WH/SI:OR/BL	608699	3372373	M	SY
5/9/2011	NB/MV:GR/SI	608606	3372329	M	SY
5/9/2011	WH/BK:WH/SI	608582	3372040	M	SY
5/9/2011	OR/SI:MV/DG	608582	3372040	F	ASY
5/9/2011	RD/SI:DB/YE	608842	3371939	M	ASY

Table 2. Designation of Golden-cheeked Warbler territory status and number of females and fledglings detected per territory for the 2011 Baker Sanctuary 100-acre survey.

GCWA Designation	Territory Status	Female Detected	Number of Fledglings Detected
NB/MV:GR/SI	Full	Yes	0
OR/OR:DG/SI	Full	Yes	2
MV/BL:PI/SI	Full	No	1
UBBK4	Full	Yes	0
YE/DK:DB/SI	Full	Yes	4
RD/SI:DB/YE	Full	No	0
WH/BK:WH/SI	Edge	Yes	0
WH/SI:OR/BL	Edge	Yes	0
UBBK2	Edge	No	3
UBBK1	Edge	Yes	2
UBBK9	Edge	Yes	3
UBBK3	Edge	Yes	2
NB/SI:PI/MV	Edge	No	2
UBBK5	Edge	No	0
UBBK6	Edge	No	0
UBBK8	Out	Yes	2
DB/BK:MV/SI	Out	Yes	0
BK/YE:DG/SI	Out	No	0
UBBK7	Out	No	0

Table 3. Numbers of territorial Golden-cheeked Warbler males, females and fledglings detected during Baker Sanctuary 100-acre plot surveys, 2006 - 2011.

Survey Date	Males (full/edge/out)	Females	Fledglings
2006	26 (22/4/-)	18	17
2007	27 (20/7/-)	8	17
2008	21 (14/7/-)	10	16
2009	18 (14/4/-)	6	7
2010	11 (9/2/-)	6	11
2011	19 (6/9/4)	11	21

Table 4. Bird species detected in Baker Sanctuary 100-acre plot during Golden-cheeked Warbler surveys, Spring 2011.

SPECIES	Week of:										WEEKS COUNTED
	3/14	3/21	3/28	4/4	4/11	4/18	4/25	5/2	5/9	5/16	
Northern Bobwhite				X	X				X	X	4
Black Vulture					X		X		X		3
Turkey Vulture	X	X	X	X	X	X	X		X	X	9
Mississippi Kite						X	X				2
Sharp-shinned Hawk	X		X								2
Red-shouldered Hawk	X						X				2
Wild Turkey	X	X	X	X	X	X					6
White-winged Dove		X	X		X						3
Mourning Dove	X	X	X	X	X				X	X	7
Yellow-billed Cuckoo							X	X	X	X	4
Greater Roadrunner	X				X		X				3
Great Horned Owl	X								X		2
Chuck-will's-widow						X					1
Chimney Swift							X		X	X	3

SPECIES	Week of:										WEEKS COUNTED
	3/14	3/21	3/28	4/4	4/11	4/18	4/25	5/2	5/9	5/16	
Black-chinned Hummingbird					X						1
Ladder-backed Woodpecker								X			1
Yellow-bellied Flycatcher										X	1
Empidonax sp.				X			X	X	X	X	5
Western Kingbird								X		X	2
White-eyed Vireo	X		X		X	X	X	X	X	X	8
Blue-headed Vireo									X		1
Hutton's Vireo										X	1
Red-eyed Vireo									X	X	2
Blue Jay							X				1
Western Scrub-Jay	X	X	X	X	X	X	X	X	X	X	10
Purple Martin					X			X		X	3
Barn Swallow								X	X	X	3
Carolina Chickadee	X	X	X	X	X		X	X	X	X	9
Black-crested Titmouse	X	X	X	X	X	X		X	X	X	9
Carolina Wren	X		X	X	X	X				X	6
Bewick's Wren	X	X	X	X	X	X	X	X	X	X	10
Blue-gray Gnatcatcher	X	X	X	X	X	X	X	X	X	X	10
Golden-crowned Kinglet	X										1
Ruby-crowned Kinglet	X	X	X	X	X						5
Cedar Waxwing		X	X	X	X						4
American Robin	X										1
Northern Mockingbird					X						1
Orange-crowned Warbler		X	X		X	X					4
Nashville Warbler				X	X	X	X	X	X		6
Yellow Warbler							X			X	2

SPECIES	Week of:										WEEKS COUNTED
	3/14	3/21	3/28	4/4	4/11	4/18	4/25	5/2	5/9	5/16	
Chestnut-sided Warber								X			1
Magnolia Warbler										X	1
Yellow-rumped Warbler (Myrtle)	X			X							2
Golden-cheeked Warbler	X	X	X	X	X	X	X	X	X	X	10
Black-throated Green Warbler							X		X	X	3
Blackburnian Warbler									X	X	2
Black-and-white Warbler	X	X	X	X	X	X	X	X	X	X	10
American Redstart								X			1
Mourning Warbler									X		1
Summer Tanager							X	X	X	X	4
Northern Cardinal	X	X	X	X	X	X	X	X	X	X	10
Painted Bunting							X	X	X	X	4
grackle sp.		X									1
Brown-headed Cowbird				X			X				2
Baltimore Oriole										X	1
House Finch							X				1
Lesser Goldfinch				X		X		X		X	4
TOTAL SPECIES	21	16	18	20	24	16	24	21	26	30	57

Appendix C

Golden-cheeked Warbler Survey
Baker Headquarters Plot
Spring 2011

Prepared for Travis Audubon Society

by

Christopher Murray, Baker Steward

Summary: Utilizing the U.S. Fish and Wildlife Service (FWS) minimum procedures for determining the presence or absence of Golden-cheeked Warblers (*Dendroica chrysoparia*), the 100-acre Baker Headquarters plot was surveyed in the spring of 2011 for the Travis Audubon Society. Golden-cheeked Warblers were detected on every visit to the site with the greatest concentration of detections occurring in the northeast portion of the plot.

Background: The Golden-cheeked Warbler (GCWA) is a medium-sized wood warbler whose winter range encompasses southern Mexico through Central America. During breeding season (early March through mid-July), this neo-tropical migrant nests exclusively in central Texas, giving it the distinction of being the only endemic nesting bird known for the state (Ladd and Gass 1999). Preferred habitat for GCWA is old-growth or mature regrowth juniper-oak woodlands associated with the canyons and hills typical of the Hill Country (Ladd and Gass 1999). Shredded bark from mature Ashe Juniper (*Juniperus ashei*) is bound together with cobwebs and used as a scaffold to support the construction of the remainder of the nest. Breeding season typically lasts from March through early July with the occasional second brood (Ladd and Gass 1999). Trees commonly found in nesting habitat include Ashe Juniper, Plateau Live Oak (*Quercus fusiformis*), Spanish Oak (*Q. buckleyi*), and Shin Oak (*Q. sinuata*) among others. Foraging primarily in the upper canopy of the dominant tree species, GCWA capture a variety of arthropod prey, including soft-bodied caterpillars, insects, and spiders (Ladd and Gass 1999). Departing early for their wintering grounds, most GCWA are gone by the end of July with typically all gone by early to mid-August. FWS listed this species as endangered in 1990 (Ladd and Gass 1999).

Methodology: Adhering to the FWS standards for determining presence or absence of GCWA, the following conditions were met for the Baker Headquarters Plot survey.

1. Surveys were conducted between March 15 and June 1st with 60% of the surveys being conducted prior to May 15th.
2. All surveys were completed within seven hours of sunrise.
3. Surveys were not conducted in unfavorable weather conditions.
4. The site was visited five times with no more than one visit in any five day period.
5. Since the site consisted of 100 acres, four hours were spent on site for each survey.

During each site visit, the entire 100 acres were hiked, systematically working from north to south or vice versa depending on the start location. Since the site is split in half by Lime Creek Road which is fenced with barbed wire on either side, one half of the site was surveyed for two hours and the other half for the remaining two hours. To minimize detection rates that could be influenced by the time of the day, the start location was rotated for each visit. When a GCWA was detected an effort was made to follow the individual for several locations to more accurately represent GCWA utilization of the site.

Results: Located in northern Travis County, the Baker Headquarters Plot is approximately 100 acres and straddles Lime Creek Road. On the north side of Lime Creek Road, approximately 20 acres consist of grassland with the northeast portion hosting Baker Cabin, Jackie Arnold Education Center, a historic cemetery, and a parking lot. On the south side of Lime Creek Road, approximately 5 acres of forest opening hosts a residential area, parking lot, and an old stone barn. The parking lot on the south side is the primary parking area for Travis Audubon members who frequent the sanctuary to hike and bird watch. Extensive hiking trails are found running throughout both sides of the site.

The forest community is dominated by mature Ashe Juniper with Plateau Live Oak the next most common species. Spanish Oak, Shin Oak, and the occasional Cedar Elm (*Ulmus crassifolia*) also contribute to the overstory. The understory is fairly sparse and typically composed of Agarita (*Berberis trifoliata*), Texas Persimmon (*Diospyros texana*), Twist Leaf Yucca (*Yucca rupicola*), and the occasional Pink Mimosa (*Mimosa borealis*).

The grassland areas have a clumped distribution of Ashe Juniper, Plateau Live Oak, and Cedar Elm interspersed primarily by invasive King Ranch Bluestem (*Bothriochloa ischaemum*) with smaller pockets of introduced Bermudagrass (*Cynodon dactylon*) and native Little Bluestem (*Schizachyrium scoparium*). Agarita, Texas Persimmon, Prickly Pear (*Opuntia* sp.), and Tasajillo (*Opuntia leptocaulis*) can also be found in the grassland areas.

Golden-cheeked Warblers were detected on all the surveys throughout the study period (Table 1) and their locations marked with a Garmin GPS 76 (Figure 1). When a GCWA was detected, an effort was made to record several locations for each bird to develop a more accurate understanding of their use of the landscape. Therefore, the map in Figure 1 is a compilation of multiple sightings for individual birds. Due to the nature of the survey, it is difficult to say much regarding GCWA distribution but it is interesting to note the northeast corner had the greatest number of detections yet the forest community does not appear to be significantly different than that found in the rest of the study site. Two observations were made of GCWA in the grassland using a Plateau Live Oak as a singing perch and forage site and one observation of a GCWA fledgling was made on the last survey, 20 April (Figure 1). Judging by plumage characteristics, the GCWA fledgling was approximately two to three days out of the nest when it was detected and was actively being fed by a male GCWA.

Table 2 is a list of all birds detected during the survey.

Literature Cited:

Ladd, C. and L. Gass. 1999. Golden-cheeked Warbler (*Dendroica chrysoparia*).
In The Birds of North America, No. 420 (A. Poole and F. Gill, eds.). The
Birds of North America, Inc., Philadelphia, Pennsylvania, USA.

Table 1. Survey conditions and GCWA detections.

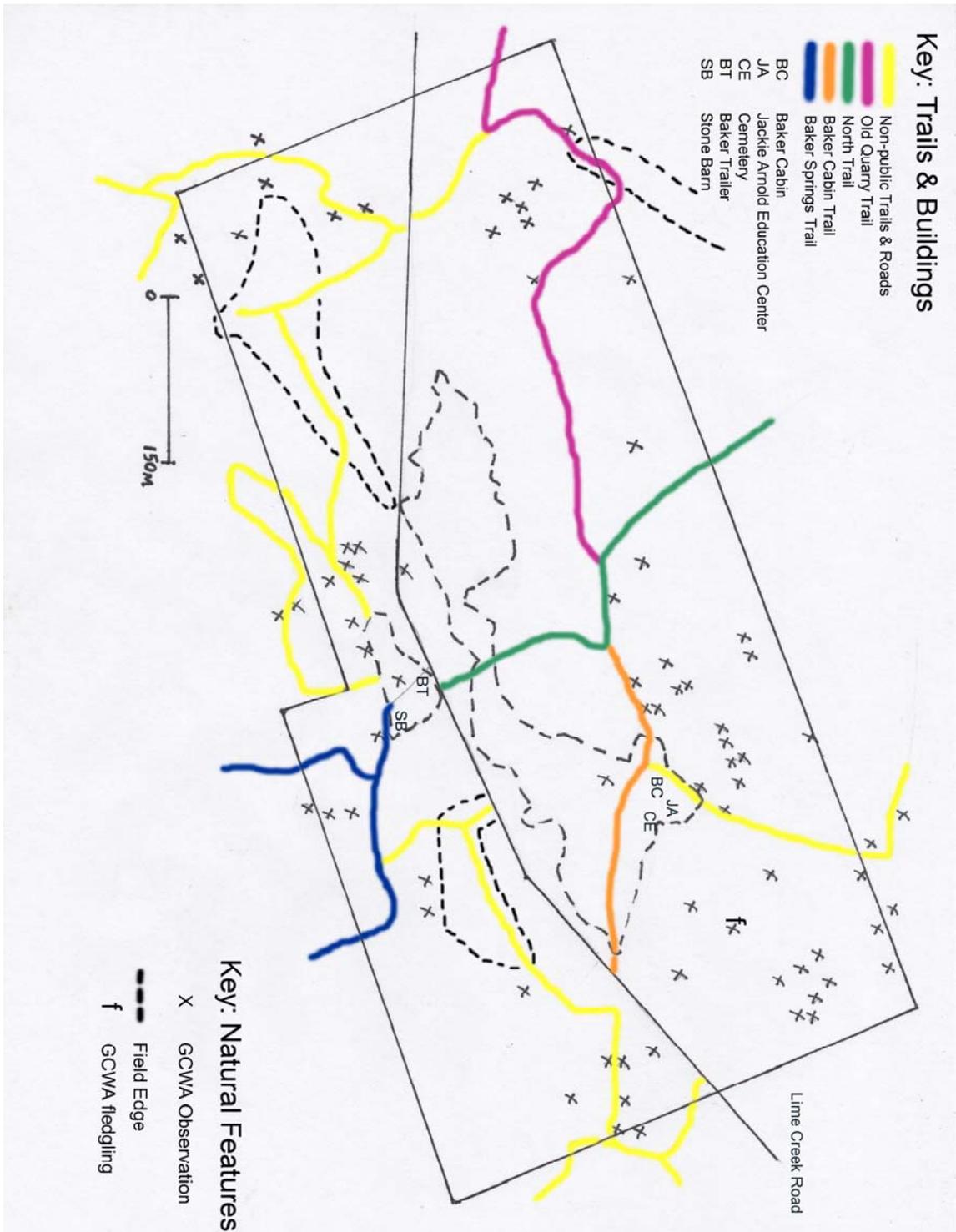
Date	Start/End	Average Temperature (°F)	Average Wind Speed (mph)	Average % Cloud Cover	GCWA Detections
16 March 2011	9:20 AM/1:20 PM	64	8	100	14
23 March 2011	9:00 AM/1:00 PM	65	1	15	18
30 March 2011	9:00 AM/1:00 PM	53	9	15	17
11 April 2011	9:00 AM/1:00 PM	67	11	10	17
20 April 2011	9:00 AM/1:00 PM	75	5	100	13

Table 2. Bird detections per survey.

SPECIES	16 March	23 March	30 March	11 April	20 April	DAYS COUNTED
Turkey Vulture	X	X	-	X	-	3
Wild Turkey	X	-	-	-	-	1
Mourning Dove	X	X	-	-	X	3
White-winged Dove	-	X	-	X	-	2
Greater Roadrunner	X	X	-	-	-	2
Chimney Swift	-	-	-	X	X	2
Eastern Phoebe	-	X	-	-	-	1
Ash-throated Flycatcher	-	-	-	X	-	1
White-eyed Vireo	-	X	X	-	-	2
Red-eyed Vireo	-	-	-	X	-	1
Western Scrub-jay	X	-	-	-	X	2
Black-crested	X	X	X	X	X	5

SPECIES	16 March	23 March	30 March	11 April	20 April	DAYS COUNTED
Titmouse						
Carolina Chickadee	X	X	-	X	-	3
Bewick's Wren	X	X	-	X	X	4
Blue-gray Gnatcatcher	X	X	X	X	X	5
Northern Mockingbird	-	X	-	-	X	2
Orange- crowned Warbler	-	X	-	-	-	1
Nashville Warbler	-	-	-	X	-	1
Yellow-rumped Warbler	X	-	-	-	-	1
Black-and- white Warbler	-	-	-	X	-	1
Golden- cheeked Warbler	X	X	X	X	X	5
Yellow Warbler	-	X	-	-	-	1
Field Sparrow	-	-	-	X	-	1
Northern Cardinal	X	X	-	X	X	4
House Finch	-	X	-	-	X	2
TOTAL SPECIES	12	16	4	14	10	25

Figure 1. GCWA detections during the Baker Headquarters Survey.



Appendix D

Terrestrial Vegetation Monitoring Permanent Long-Term Monitoring Plots

Goals and Objectives:

For the Baker Management Team to be able to make sensible management decisions, they will need to know how plant communities change over time, as well as information on the presence of plant species and their abundance, the ages of certain woody vegetation, and the physical environment. These monitoring efforts should also help discover natural indicators which will assist with providing warning signs of declines in ecosystem quality. Indicators may include the detection of new invasive species or the decline of certain native species. Early detection from long term monitoring will allow managers to respond with timely and appropriate action before resolutions are economically or ecologically arduous.

Questions:

- How is plant community diversity changing over time?
- How are plant communities responding to anthropogenic (land management) and natural disturbances (invasive species)?

Variables to be monitored:

Species distribution, abundance, and size structure of certain plant species as well as disturbance (presence or absence) and cover.

Supply list:

6 – m² quadrats

GPS

Data Sheets

Conduit (rebar)

Mallet

Compass

Hand lens

Map

Clipboards

Pencils

Dbh tape

100ft or 30m measuring tape (6)

Meter sticks (12-16)

Clippers

Pin flags

Flagging

Protocol

Guidelines for taking dbh

Plant ID guides

Sunscreen

Bug spray

Site Selection:

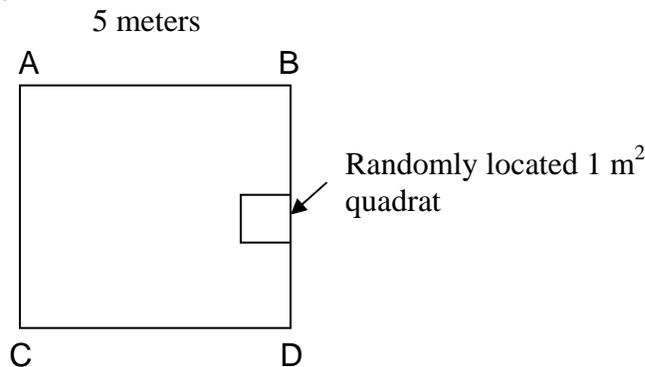
Monitoring sites will be stratified based on land cover (i.e., grassland, evergreen shrubland, cold deciduous forest, broadleaf evergreen forest, coniferous).

Method:

Similar in design to the FIA data collection method.

5 m² quadrats with one 1m² quadrat nested within.

Shrub and tree species dbh only is collected within the entire 5 meter plot. Species and abundance data for all species is collected within the smaller 1 m² quadrats.



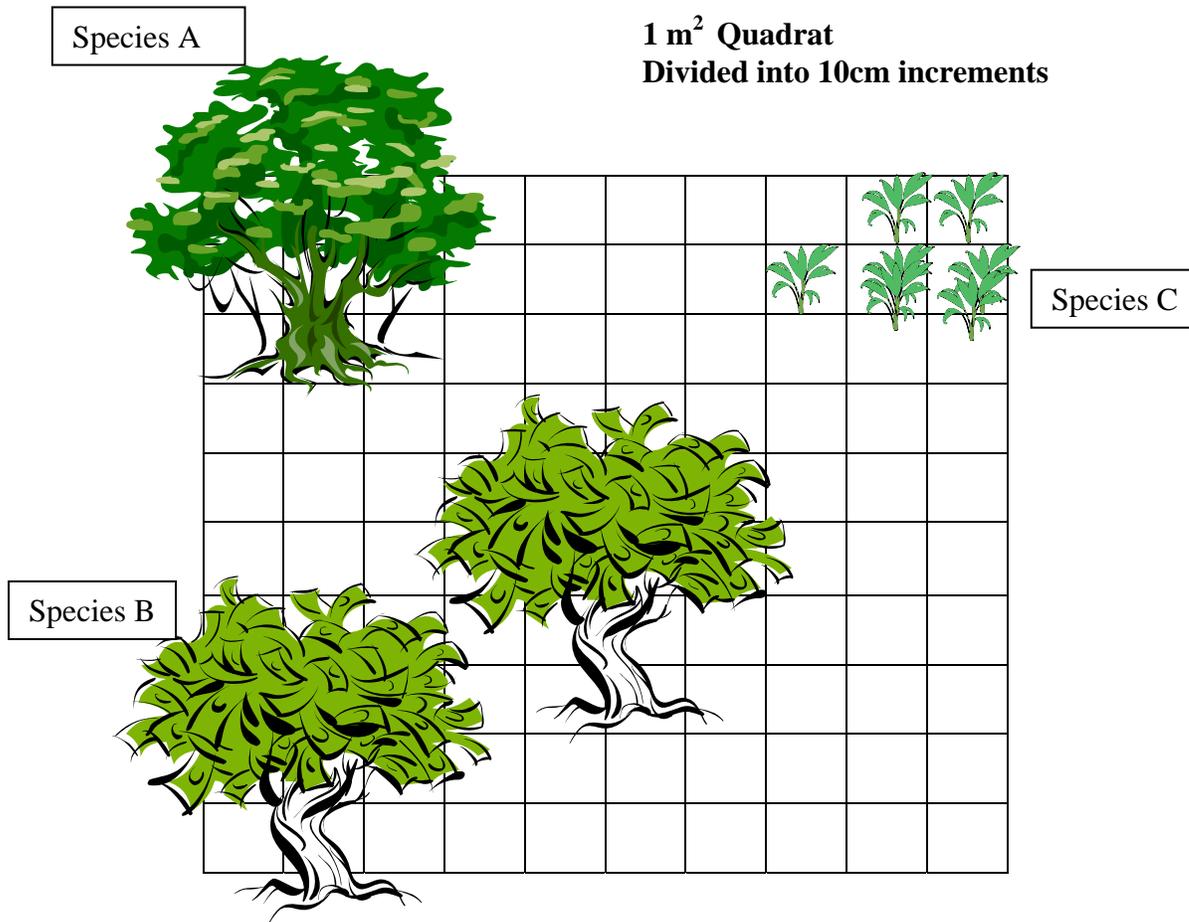
A. Data Collection Protocol- 5 m² Quadrats

1. Record the date, study area, plot number, and GPS coordinates of the monument(s)
2. Identify each woody species above knee height located in the canopy (data on seedlings and subshrubs will be collected in the subplots) list these species in the species column on the data sheet.
3. Collect DBH data on all woody species over 5 cm DBH and record the data. On the spread sheet. Note living or dead in the notes column for each individual.
4. Count the number of stems for each species under 5cm DBH. Only count those above 10cm in height.
5. Record observations of disturbance or herbivory within plot.

B. Data Collection Protocol -1 m²

1. Subplot locations should be indicated with pin flags at all 4 corners. Place pvc quadrat over subplot. Record the date, study area, and subplot # on the subplot data sheet.
2. Identify all species located within the plot. List any unknown species and describe them in the notes field.

3. Visually estimate abundance/cover for each plant species to the nearest 1%. Species with foliar cover <1% were recorded by first dividing each 10 cm x 10 cm square in which they occurred in quarters, and then counting the number of quarters occupied. Species with cover <0.25% were arbitrarily recorded as 0.1%.
4. Visually estimate the amount of litter and bare ground located within each plot and list on data sheet.
5. Record observations of disturbance or herbivory within subplot in the notes row.



Site/Species	001_1N	001_2E		
Species A	10%			
Species B	24%			
Species C	3%			
Litter	0%			
Bare ground	17%			
Notes	No disturbance			

Appendix E

Faunal Survey of Hatfield Cave

Name: M Sanders

Agency: COA

Date: 7/15/2011

Location: Travis Audubon's Hatfield Sanctuary

scientific permit # TE798920-0

Surface Temperature (Celsius) N/A RH N/A reading taken at: N/A

Humidity was measured with a Psychrodyne analog psychrometer.

Weather conditions during the past week: extreme drought

FAUNAL SURVEY

Species		Comments <small>(if specimen was collected state where it was sent to)</small>
Start/stop time, each zone	1408/1430	
Observations (zones)	Cursory survey of entire cave	
Observer	M Sanders	
<i>Achaeearanea porteri</i>	2	
<i>Agyneta llanoensis</i>	8???	Not positive on ID, collected 3 for species verification, deposited with TMM (James Reddell)
<i>Cicurina varians</i>	4	Collected (2) to be deposited with TMM (James Reddell)
<i>Leiobunum townsendii</i>	~1000	
<i>Speodesmus</i>	1	
<i>Cambala speobia</i>	1	Collected, to be deposited with TMM (James Reddell)
Symphylan	2	Collected (1) to be deposited with TMM (James Reddell)
<i>Pseudosinella violenta</i>	~100	
Mycetophilidae (fungus gnats)	8	
<i>Solenopsis invicta</i>	15	Foraging on dead <i>Leiobunum townsendii</i>
<i>Camponotus sp</i>	2	
<i>Pheidole sp</i>	22	
<i>Ceuthophilus cunicularis</i>	8	
<i>Ceuthophilus secretus</i>	~200	
<i>Ceuthophilus</i> (nymphs)	~25	
Lepidoptera	1	

I did observe a possible ground beetle, (*Rhadine sp*), near the end of the accessible portion of the cave, however, this was not confirmed.

It appears that during wetter conditions this cave is actually a spring so there's a potential that this may harbor salamanders (*Eurycea tonkawae*).

Appendix F

Baker Sanctuary Bird List Current as of 10/16/2011

Baker Sanctuary Bird List:

Pelecanidae

1. American White Pelican (*Pelecanus erythrorhynchos*): Fly over

Phalacrocoracidae

2. Double-crested Cormorant (*Phalacrocorax auritus*): Fly over

Ardeidae

3. Yellow-crowned Night-heron (*Nyctanassa violacea*): pond
4. Green Heron (*Butorides virescens*): Fly over & pond
5. Great Blue Heron (*Ardea Herodias*): Fly over & pond

Threskiornithidae

6. White-faced Ibis (*Plegadis chihi*): Fly over

Cathartidae

7. Turkey Vulture (*Cathartes aura*)
8. Black Vulture (*Coragyps atratus*)

Accipitridae

9. Osprey (*Pandion haliaetus*): Fly over
10. Mississippi Kite (*Ictinia mississippiensis*)
11. Bald Eagle (*Haliaeetus leucocephalus*)
12. Sharp-shinned Hawk (*Accipter striatus*)
13. Cooper's Hawk (*Accipter cooperii*)
14. Red-shouldered Hawk (*Buteo lineatus*)
15. Broad-winged Hawk (*Buteo platypterus*)
16. Swainson's Hawk (*Buteo swainsoni*)
17. Red-tailed Hawk (*Buteo jamaicensis*)

Falconidae

18. Crested Caracara (*Caracara plancus*)

19. American Kestrel (*Falco sparverius*)

Phasianidae

20. Wild Turkey (*Meleagris gallopavo*)

Odontophoridae

21. Northern Bobwhite (*Colinus virginianus*)

Gruidae

22. Sandhill Crane (*Grus canadensis*): Fly over

Charadriidae

23. Killdeer (*Charadrius vociferous*)

Scolopacidae

24. Upland Sandpiper (*Bartramia longicauda*)

Laridae

25. Ring-billed Gull (*Larus delawarensis*)

Columbidae

26. Rock Dove (*Columba livia*)

27. White-winged Dove (*Zenaida asiatica*)

28. Mourning Dove (*Zenaida macroura*)

29. Inca Dove (*Columbina inca*)

Cuculidae

30. Yellow-billed Cuckoo (*Coccyzus americanus*)

31. Greater Roadrunner (*Geococcyx californianus*)

Tytonidae

32. Barn Owl (*Tyto alba*)

Strigidae

33. Eastern Screech-owl (*Megascops asio*)

34. Great Horned Owl (*Bubo virginianus*)

Caprimulgidae

35. Common Nighthawk (*Chordeiles minor*)

36. Common Poorwill (*Phalaenoptilus nuttallii*)

37. Chuck-will's-widow (*Caprimulgus carolinensis*)

Apodidae

38. Chimney Swift (*Chaetura pelagic*)

Trochilidae

39. Ruby-throated Hummingbird (*Archilochus colubris*)

40. Black-chinned Hummingbird (*Archilochus alexandri*)

41. Rufous Hummingbird (*Selasphorus rufus*)

Picidae

42. Golden-fronted Woodpecker (*Melanerpes aurifrons*)

43. Northern Flicker (*Colaptes auratus*)

44. Red-bellied Woodpecker (*Melanerpes carolinus*)

45. Ladder-backed Woodpecker (*Picoides scalaris*)

46. Downy Woodpecker (*Picoides pubescens*)

Tyrannidae

47. Eastern Wood-pewee (*Contopus virens*)

48. Eastern Phoebe (*Sayornis phoebe*)

49. Ash-throated Flycatcher (*Myiarchus cinerascens*)

50. Great Crested Flycatcher (*Myiarchus crinitus*)

51. Western Kingbird (*Tyrannus verticalis*)

52. Scissor-tailed Flycatcher (*Tyrannus forficatus*)

Laniidae

53. Loggerhead Shrike (*Lanius ludovicianus*)

Vireonidae

54. White-eyed Vireo (*Vireo griseus*)

55. Hutton's Vireo (*Vireo huttoni*)

56. Blue-headed Vireo (*Vireo solitaries*)

57. Red-eyed Vireo (*Vireo olivaceus*)

Corvidae

- 58. Blue Jay (*Cyanocitta cristata*)
- 59. Western Scrub-jay (*Aphelocoma californica*)
- 60. American Crow (*Corvus brachyrhynchos*)
- 61. Common Raven (*Corvus corax*)

Hirundinidae

- 62. Purple Martin (*Progne subis*): Fly over
- 63. Cliff Swallow (*Petrochelidon pyrrhonota*)
- 64. Barn Swallow (*Hirundo rustica*): Fly over

Paridae

- 65. Carolina Chickadee (*Poecile carolinensis*)
- 66. Tufted Titmouse (*Baeolophus bicolor*)
- 67. Black-crested Titmouse (*Baeolophus atricristatus*)

Aegithalidae

- 68. Bushtit (*Psaltriparus minimus*)

Sittidae

- 69. Red-breasted Nuthatch (*Sitta canadensis*)
- 70. White-breasted Nuthatch (*Sitta carolinensis*)

Certhiidae

- 71. Brown Creeper (*Certhia americana*)

Troglodytidae

- 72. Carolina Wren (*Thryothorus ludovicianus*)
- 73. House Wren (*Troglodytes aedon*)
- 74. Bewick's Wren (*Thryomanes bewickii*)
- 75. Canyon Wren (*Catherpes mexicanus*)

Regulidae

- 76. Golden-crowned Kinglet (*Regulus satrapa*)
- 77. Ruby-crowned Kinglet (*Regulus calendula*)

Sylviidae

78. Blue-gray Gnatcatcher (*Polioptila caerulea*)

Turdidae

79. Eastern Bluebird (*Sialia sialis*)

80. Hermit Thrush (*Catharus guttatus*)

81. American Robin (*Turdus migratorius*)

82. European Starling (*Sturnus vulgaris*): Fly over

Mimidae

83. Gray Catbird (*Dumetella carolinensis*)

84. Northern Mockingbird (*Mimus polyglottos*)

Bombycillidae

85. Cedar Waxwing (*Bombycilla cedrorum*)

Parulidae

86. Tennessee Warbler (*Vermivora peregrina*)

87. Orange-crowned Warbler (*Vermivora celata*)

88. Nashville Warbler (*Vermivora ruficapilla*)

89. Chestnut-sided Warbler (*Dendroica pensylvanica*)

90. Magnolia Warbler (*Dendroica magnolia*)

91. Yellow-rumped Warbler (*Dendroica coronata*)

92. Golden-cheeked Warbler (*Dendroica chrysoparia*)

93. Black-throated Green Warbler (*Dendroica virens*)

94. Pine Warbler (*Dendroica pinus*)

95. Blackburnian Warbler (*Dendroica fusca*)

96. Black-and-white Warbler (*Mniotilta varia*)

97. American Redstart (*Setophaga ruticilla*)

98. Wilson's Warbler (*Wilsonia pusilla*)

99. Canada Warbler (*Wilsonia canadensis*)

100. Yellow-breasted Chat (*Icteria virens*)

Thraupidae

101. Summer Tanager (*Piranga rubra*)

Emberizidae

102. Green-tailed Towhee (*Pipilo chlorurus*)

103. Spotted Towhee (*Pipilo maculatus*)

104. Rufous-crowned Sparrow (*Aimophila carpalis*)

105. Chipping Sparrow (*Spizella passerina*)

106. Lark Sparrow (*Chondestes grammacus*)

107. Field Sparrow (*Spizella pusilla*)

108. Fox Sparrow (*Passerella iliaca*)

109. Savannah Sparrow (*Passerculus sandwichensis*)

110. Lincoln's Sparrow (*Melospiza lincolni*)

111. White-throated Sparrow (*Zonotrichia albicollis*)

112. White-crowned Sparrow (*Zonotrichia leucophrys*)

113. Dark-eyed Junco (*Junco hyemalis*)

Cardinalidae

114. Northern Cardinal (*Cardinalis cardinalis*)

115. Pyrrhuloxia (*Cardinalis sinuatus*)

116. Blue Grosbeak (*Passerina caerulea*)

117. Lazuli Bunting (*Passerina amoena*)

118. Indigo Bunting (*Passerina cyanea*)

119. Painted Bunting (*Passerina ciris*)

120. Dickcissel (*Spiza americana*)

Icteridae

121. Eastern Meadowlark (*Sturnella magna*)

122. Red-winged Blackbird (*Agelaius phoeniceus*)

- 123. Common Grackle (*Quiscalus quiscula*)
- 124. Great-tailed Grackle (*Quiscalus mexicanus*)
- 125. Bronzed Cowbird (*Molothrus aeneus*)
- 126. Brown-headed Cowbird (*Molothrus ater*)
- 127. Orchard Oriole (*Icterus spurius*)
- 128. Baltimore Oriole (*Icterus galbula*)

Fringillidae

- 129. House Finch (*Carpodacus mexicanus*)
- 130. Pine Siskin (*Carduelis pinus*)
- 131. Lesser Goldfinch (*Carduelis psaltria*)
- 132. American Goldfinch (*Carduelis tristis*)

Passeridae

- 133. House Sparrow (*Passer domesticus*)

Figure 2. Summary of White-tailed Deer Harvest from 2000-2011. Juvenile deer are a year or less in age.

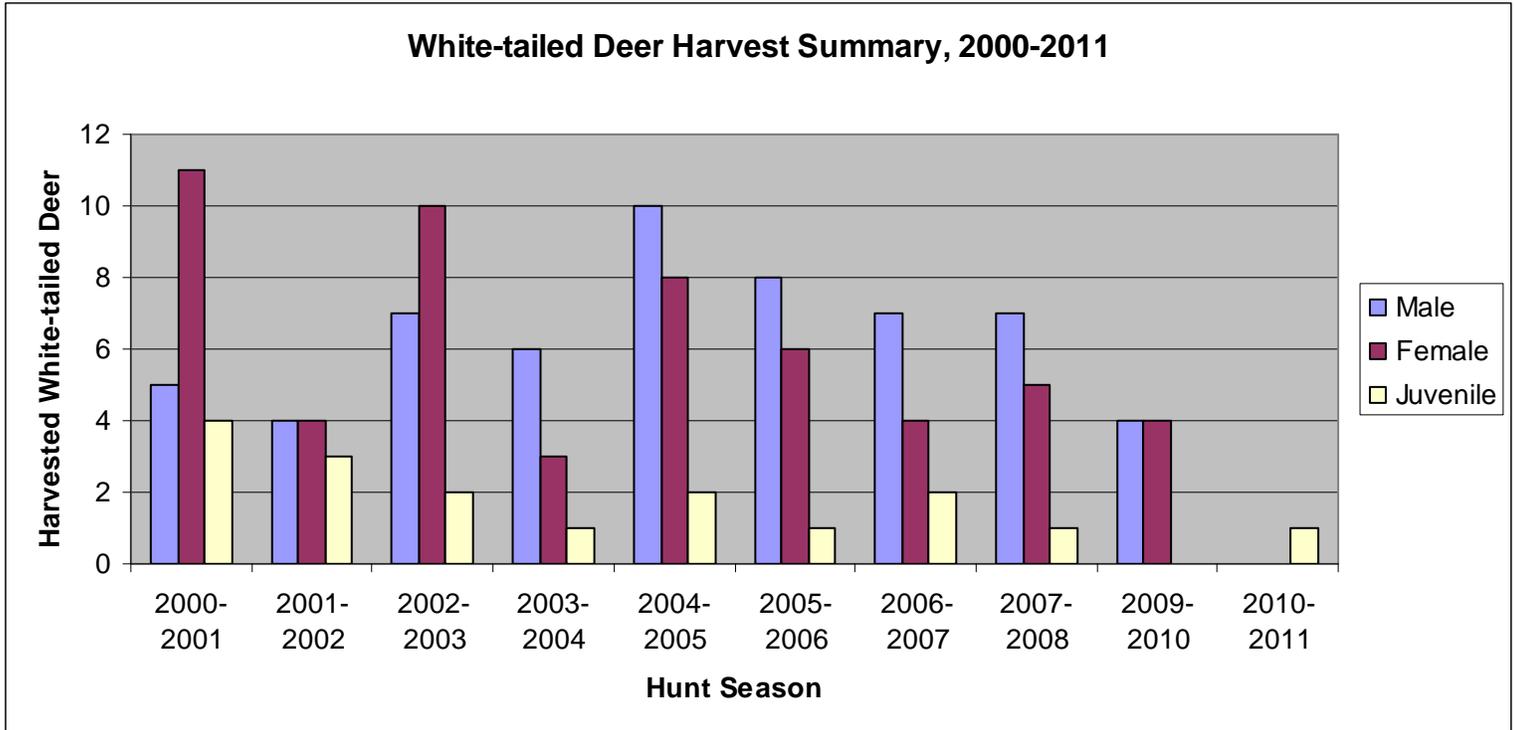


Figure 3. Map of long-term monitoring plots for vegetation communities at Baker Sanctuary.

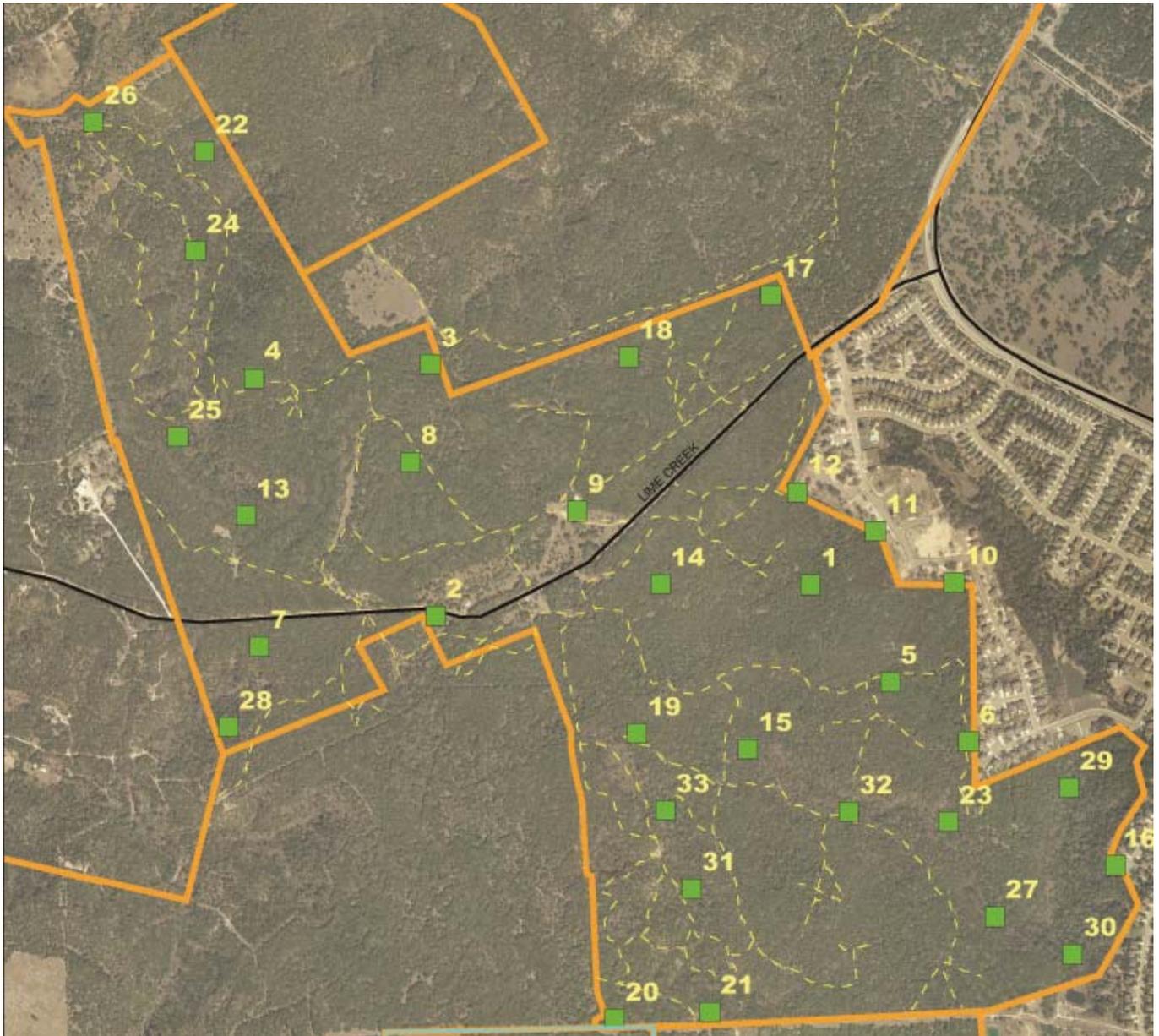


Table 1. Results of the May 15th, 2011 Baker Sanctuary point count survey.

Common Name	Scientific Name	Number Observed	Mean¹	Frequency (%)² (25 yd radius)	Frequency (%)³ (unlimited radius)
Northern Cardinal	<i>Cardinalis cardinalis</i>	20	0.63	44	91
Carolina Chickadee	<i>Poecile carolinensis</i>	18	0.56	34	56
Black-crested Titmouse	<i>Baeolophus atricristatus</i>	14	0.44	28	94
Blue-gray Gnatcatcher	<i>Poliopitla caerulea</i>	7	0.22	19	22
White-eyed Vireo	<i>Vireo griseus</i>	6	0.19	16	19
Golden-cheeked Warbler	<i>Dendroica chrysoparia</i>	5	0.16	16	38
Carolina Wren	<i>Thryothorus ludovicianus</i>	5	0.16	16	28
Bewick's Wren	<i>Thryomanes bewickii</i>	5	0.16	13	22
Yellow-billed Cuckoo	<i>Coccyzus americanus</i>	4	0.13	13	47
Black-chinned Hummingbird	<i>Archilochus alexandri</i>	4	0.13	13	13
Black-and-white Warbler	<i>Mniotilta varia</i>	4	0.13	9	9
Painted Bunting	<i>Passerina ciris</i>	4	0.13	13	38
Summer Tanager	<i>Piranga rubra</i>	3	0.09	9	22
Western Scrub-jay	<i>Aphelocoma californica</i>	3	0.09	9	22
Northern Mockingbird	<i>Mimus polyglottos</i>	3	0.09	9	25
Mourning Dove	<i>Zenaida macroura</i>	2	0.06	6	47
Ash-throated Flycatcher	<i>Myiarchus cinerascens</i>	2	0.06	6	13
Eastern Phoebe	<i>Sayornis phoebe</i>	1	0.03	3	13
House Finch	<i>Carpodacus mexicanus</i>	1	0.03	3	6
Hairy Woodpecker	<i>Picoides villosus</i>	1	0.03	3	3
Rufous-crowned Sparrow	<i>Aimophila ruficeps</i>	1	0.03	3	3
Indigo Bunting	<i>Passerina cyanea</i>	1	0.03	3	3
White-winged Dove	<i>Zenaida asiatica</i>	0	0.00	0	19
American Crow	<i>Corvus brachyrhynchos</i>	0	0.00	0	3
Turkey Vulture	<i>Cathartes aura</i>	0	0.00	0	13
Purple Martin	<i>Progne subis</i>	0	0.00	0	16
Lesser Goldfinch	<i>Carduelis psaltria</i>	0	0.00	0	9
Red-tailed Hawk	<i>Buteo jamaicensis</i>	0	0.00	0	6

Common Grackle	<i>Quiscalus quiscula</i>	0	0.00	0	3
Great-tailed Grackle	<i>Quiscalus mexicanus</i>	0	0.00	0	3
Chimney Swift	<i>Chaetura pelagica</i>	0	0.00	0	6
Northern Bobwhite	<i>Colinus virginianus</i>	0	0.00	0	6
Barn Swallow	<i>Hirundo rustica</i>	0	0.00	0	9
Black Vulture	<i>Coragyps atratus</i>	0	0.00	0	3
Green Heron	<i>Butorides virescens</i>	0	0.00	0	3
Field Sparrow	<i>Spizella pusilla</i>	0	0.00	0	6
Greater Roadrunner	<i>Geococcyx californianus</i>	0	0.00	0	6
Red-eyed Vireo	<i>Vireo olivaceus</i>	0	0.00	0	6
Common Raven	<i>Corvus corax</i>	0	0.00	0	3
Total		114			
Total Number of Points	32				
¹ Mean number of individuals observed within the survey radius of each point.					
² Percentage of total points where species was observed within the survey radius.					
³ Percentage of total points where species was observed regardless of radius.					