

# Baker Sanctuary

## 2013 - 2014 Annual Report

(October 1, 2013 - September 30, 2014)

*prepared for the*

## Balcones Canyonlands Preserve

By

Christopher Murray, Baker Sanctuary Steward



**TRAVIS  
AUDUBON**

*Listen. Look. And Learn.*

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## Introduction

Baker Sanctuary is owned by Travis Audubon Society (TAS) with approximately 682 acres managed as part of the Balcones Canyonlands Preserve (BCP). Approximately nine additional acres along the northeast boundary, the Ruth Fredericksen Tract, were purchased by TAS in 2007 and have not yet 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 Lime Creek and Austin Simon tracts to the northeast, the Lower Colorado River Authority's Wheless tract to the southwest, the City of Cedar Park's waterline tract to the south, and several recent additions to Travis County's Lime Creek Unit along the western boundary (**Appendix A**). The Sanctuary features densely wooded uplands, slopes, and canyons dominated by mature oak-juniper woodlands with occasional pockets of open and semi-open savannah which are being encroached by Ashe juniper (*Juniperus ashei*).

## Golden-cheeked Warbler Survey

This season, the annual 100-acre survey saw its fourth year of participation with the City of Austin as a partner in a five year study to determine golden-cheeked warbler (*Setophaga chrysoparia*) population viability and habitat suitability in the BCP, 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, it is estimated that five golden-cheeked warbler males established territories substantially within plot boundaries (full) and seven males occupied territories partially within the plot (edge), yielding an adjusted total of 8.5 territories for the 100-acre intensive study plot.

The 2014 season yielded an adjusted total of 8.5 territories present in and around the 100-acre plot. This result is less than the average of 10 territories observed annually since the 2010 season, a pattern that was beginning to suggest that ten territories may be the norm for this 100-acre patch of habitat. There is no one obvious reason why the total adjusted territory number was depressed for 2014 compared to previous seasons. One possible factor may have been the severe cold snap experienced on March 2 when overnight temperatures dropped to 20° F, possibly adversely affecting arthropod prey items. Another factor may have been low productivity in the previous breeding season. During the 2013 survey a total of 17 fledglings were observed, the fewest detected since the initiation of the population viability study in 2011. If productivity were depressed in 2013 there would likewise have been fewer individuals available to return for the 2014 season. Another explanation may simply be observer bias since the designation of 'full' or 'edge' status depends solely on the males' location when he is discovered and recorded by the observer. If the total number of territories is considered regardless of status designation, the 100-acre plot supported twelve territories in 2014, a number

similar to the fourteen, twelve, and fifteen territories documented in 2013, 2012, and 2011 respectively. More importantly, with 22 fledglings reported for the 2014 season, productivity was the second highest amount documented over the past nine years, surpassed only by the 38 fledglings recorded for the 2012 breeding season.

## **Deer Management**

Baker Sanctuary was closed from October 26, 2013 – January 19, 2014 for the annual whitetail deer (*Odocoileus virginianus*) management hunt. Seven primary hunters hunting at sites 3, 5, 10, 11, 12, 13, and 14 (**Figure 1**) harvested a total of nine deer, eight bucks and one doe, during 391 hours of hunt effort, a decrease from the average harvest of twelve deer per season over the prior 12 recorded seasons; **Figure 2** summarizes take data from 2000 - 2014. The Sanctuary will be closed for the 2014-2015 season from October 27, 2014 – January 18, 2015.

The Hatfield Tract is a 50-acre parcel deeded to TAS 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 2013 – 2014 whitetail deer season.

## **Vegetation Management**

Approximately 124 cubic yards of vegetation was trimmed from trails, roads, shooting lanes, and structures when it impeded the movement of hikers, posed a safety or structural hazard, or compromised hunting efforts. Unless it posed an immediate safety threat, trimming was restricted to the golden-cheeked warbler non-breeding season (September – February) and was performed so that canopy fragmentation, if it occurred, was kept to a minimum. When oaks (*Quercus spp.*) were trimmed, precautionary techniques such as disinfecting saws and painting wounds were utilized to prevent the spread of oak wilt fungus (*Ceratocystis fagacearum*).

In addition to the routine maintenance of the trail system, roads, shooting lanes and structures, approximately 118 cubic yards were removed from an extensive patch of drought-killed juniper located adjacent to Lime Creek Road near Gate 12424. The area near Gate 12424 is considered a high ignition risk for wildfire due to its location adjacent to Lime Creek Road and proximity to the Pedernales Electric Cooperative transmission line. To date approximately 20% of the drought-killed juniper from that area have been removed, a process that will continue over the next several cutting seasons.

Slash from cut vegetation was chipped prior to the onset of the golden-cheeked warbler-breeding season and was used primarily to mulch the Jackie Arnold

Education Center (JAEC) educational garden as well as planters located near the Steward's residence.

During the fall of 2013, due to generous donations by the City of Austin as well as Paul and Georgean Kyle, 44 individuals of 19 different plant species were planted in the JAEC and Steward's residence areas. The following lists the species planted with the number in parenthesis indicated the total number planted: (2) Arizona walnut (*Juglans major*), (3) canyon mock orange (*Philadelphus ernestii*), (4) cardinal flower (*Lobelia cardinalis*), (2) Carolina buckthorn (*Rhamnus caroliniana*), (2) cedar elm (*Ulmus crassifolia*), (1) escarpment black cherry (*Prunus serotina*), (1) golden groundsel (*Senecio obovatus*), (1) Lindheimer's silktassel (*Garrya ovata*), (2) Mexican buckeye (*Ungnadia speciosa*), (2) Mexican plum (*Prunus rivularis*), (2) netleaf hackberry (*Celtis laevigata*), (6) shrubby boneset (*Eupatorium havanense*), (7) Spanish oak (*Quercus texana*), (1) Texas aster (*Aster texanus*), (1) Texas madrone (*Arbutus xalapensis*), (3) Texas mulberry (*Morus microphylla*), (2) Texas redbud (*Cercis canadensis*), (1) Turk's cap (*Malvaviscus drummondii*), and (1) white boneset (*Eupatorium serotinum*).

Baker Sanctuary supports scattered populations of Heller's marble-seed (*Onosmodium helleri*), an uncommon species listed as a conservation target for the BCP. Unfortunately, some individuals had become established in the middle section of the North Trail Loop, resulting in unintentional damage to the plants by hikers. As a result, 43 at-risk individuals were transplanted from Baker to Chaetura Canyon, another TAS sanctuary near Mansfield Dam, where a population will attempt to be established under the watchful eyes of the Chaetura Canyon stewards, Paul and Georgean Kyle.

To create a less hazardous environment for outdoor educational activities, approximately 0.56 cubic yards of prickly pear (*Opuntia spp.*), an invasive native, was removed from the JAEC semi-open savannah and disposed off-site.

Baker Sanctuary is composed mainly of dense mature oak-juniper woodlands interspersed with pockets of open and semi-open savannah; there are nine Fire Behavior Prediction System (FBPS) fuel models that correspond with the habitats within the BCP 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 Sanctuary is also equipped with a wildfire calldown list and basic wildfire response tools to help better expedite early response to wildfires.

## Brown-headed Cowbird Trapping

TAS operated two brown-headed cowbird (*Molothrus ater*) traps from March 25 through May 30 of the 2014 season; trap TAS1 is located on the south side of Lime Creek Road in a field near the Steward's residence and trap TAS2 in the semi-open savannah near hunt site 11. Traps were checked every other day and non-target species were released when discovered. This season trap TAS1 captured a total of 4 individuals (3 males and 1 female) while TAS2 did not trap any brown-headed cowbirds, results significantly lower than the average of 22 per season captured over the prior ten seasons (**Figure 3**). Non-targets captured were two northern mockingbirds (*Mimus polyglottos*), and one male northern cardinal (*Cardinalis cardinalis*). All non-targets were released unharmed.

## Exotics Control

Two extensive, distinct populations of Malta star-thistle (*Centaurea melitensis*) are known to occur at the Sanctuary, one centered near Baker Cabin to the north of Lime Creek Road (LCR) and another centered at the Steward's residence to the south of LCR. While both populations occur in heavily disturbed, semi-open savannah habitat, the northern population is more established and extensive, typically forming a dense monoculture where it occurs. Due to vigorous growth triggered by the wet, mild fall, Malta star-thistle management began on October 2013 and continued through July 2014.

Malta star-thistle that occurred in the Baker Cabin area was treated with two different strategies. In areas where herbicide had been applied the previous season, star-thistle emerged in a much more patchy distribution compared to areas whose only treatment had been mowing prior to distal seed head maturation. The patchy distribution of star-thistle in the areas previously treated with herbicide allowed primarily hand-removal techniques to be utilized this year. In areas whose only treatment had been mowing, approximately 32 gallons of herbicide (50% glyphosate at five ounces/gallon) were applied to what was essentially a monoculture of star-thistle, working outward from the treated core centered on Baker Cabin.

Star-thistle that occurred at the Steward's residence and parking lot to the south of LCR was less extensive and was effectively managed solely with the utilization of hand-removal techniques. All removed plants from both populations were disposed off-site.

The extensive tree-of-heaven (*Ailanthus altissima*) grove discovered in December 2010 in a northern drainage of the Sanctuary is still being actively monitored and treated. Over the last year, 788 tree-of-heaven saplings were hand pulled, many of which were root sprouts from trees previously treated with Arsenal. In the same area, 11 chinaberry (*Melia azedarach*), some root sprouts from trees treated in 2010, were manually removed. Since the grove was

discovered in 2010, a total of 4635 tree-of-heaven and 40 chinaberry seedlings have been removed from the area.

The less extensive population of tree-of-heaven discovered in May 2012 approximately 1000 feet downstream from the original population is also being actively monitored and treated. Over the last year, 1875 saplings were manually removed and 12 larger individuals were treated with a total of 50 ml of 10% Arsenal solution. Since the grove was discovered in 2012, a total of 2212 saplings have been removed from the area. Both populations will be actively monitored and managed until eradicated.

Various invasive plants were removed when encountered throughout the Sanctuary, including 1040 common mullein (*Verbascum thapsus*) and 96 common horehound (*Marrubium vulgare*) in the Baker Cabin area, 710 ornamental *Allium* species near the Steward's residence, and nine heavenly bamboo (*Nandina domestica*) and 26 chinaberry encountered throughout the Sanctuary.

The 18 figs (*Ficus carica*) cut down July 2013 near Walnut Spring were monitored over the course of the year and re-sprouts were removed when encountered. Approximately 80% of the figs continue to re-sprout requiring continued monitoring of the site.

Over the past fiscal year, 142 boiling water treatments were applied to visible red imported fire ant (*Solenopsis invicta*) mounds which occurred in high traffic, disturbed areas such as the JAEC, Steward's residence, and the parking lot.

## Research

In an effort to achieve a more complete understanding of the composition, distribution, and density of avian species found throughout the Sanctuary, the fixed-radius point count methodology proposed by Hutto *et al.* (1986) has been employed in an annual breeding bird survey. From May 18 through May 27, the fourth annual count was performed which utilized a combination of vegetation and bird monitoring plots (**Figure 4**) for a total of 37 point count stations. In the past, the count had been performed over the course of one morning but due to a lack of volunteers, the count was extended over several weeks while the Steward performed the majority of the point counts. Of the 40 species recorded, the top three detected were northern cardinal, black-crested titmouse (*Baeolophus bicolor*), and Carolina chickadee (*Poecile carolinensis*). Golden-cheeked warblers were detected at 46% of the point count stations (**Table 1**) compared to 49% for the previous year.

From 2011 – 2014, 15 nest boxes were installed throughout the Sanctuary (**Figure 5**) to provide additional nesting opportunities for cavity nesting birds. Of

the 15 nest boxes, four were occupied during the 2014 breeding season by Carolina chickadee and three by Bewick's wren (*Thryothorus bewickii*), judging by nest construction and egg shell fragments. In addition to the nest boxes, the chimney swift (*Chaetura pelagica*) tower adjacent to the Steward's residence (**Figure 5**) appears to have fledged three young, judging by analysis of nesting detritus accumulated on the bottom plate of the tower.

Travis Audubon Society has obtained federal banding permits (aluminum and color bands) for golden-cheeked warblers occurring at Baker Sanctuary's 100-acre intensive study plot. It is anticipated the permits will allow TAS to support the City of Austin in their final year of banding for the population viability and habitat suitability study and possibly to continue banding on Baker's 100-acre intensive study plot for the near future.

To enhance survivorship and encourage recruitment of seedling oaks, an oak caging project was initiated in December 2013. As a result, one post oak (*Quercus stellata*), 17 shin oak (*Quercus sinuate*), 19 plateau live oak (*Quercus fusiformis*), and 31 Spanish oak (*Quercus texana*) were caged throughout the Sanctuary (**Figure 6**) to provide protection from deer browsing. In addition to the caging effort, data such as habitat type, stem diameter, seedling height, percent cover, and distance to nearest mature individual were collected to better understand factors affecting seedling survival. The caged seedlings will be visited annually to collect data and, if necessary, determine and document causes of mortality. Data were also collected from the surviving five shin oaks and eight Spanish oaks that were caged as early as March 2001 by the former Baker Sanctuary Steward, John Wilcox.

Beginning on April 5, 2013, water quality tests were initiated for Baker Spring on a monthly basis and for Audubon Spring on a quarterly basis, flow permitting. Both sites have been known to support a population of the threatened Jollyville plateau salamander (*Eurycea tonkawae*) with Baker Spring regularly surveyed for salamanders by the City of Austin. As a participating member of the Colorado River Watch Network (CRWN), water quality data collection followed CRWN protocols. During FY 2013-2014, seven water quality tests were performed, two at Audubon Spring and five at Baker Spring. Data were collected for water depth, water temperature, dissolved oxygen, specific conductance, pH, and nitrate nitrogen with all results falling well within expected values (**Table 2**).

## **Education and Outreach**

From October 2013 through September 2014 the Sanctuary experienced a total of 314 visitations from day hikers. Of those visitations, 275 were by TAS members and 39 were by non-members. An additional 766 visitations occurred during organized activities such as educational programs, TAS events, and guided hikes. A total of 392.75 volunteer hours were logged at Baker Sanctuary on a variety of activities (see below).

**October:** Hiking Club and trail maintenance.  
**November:** Grounds and trail maintenance.  
**December:** No volunteer activity.  
**January:** Grounds maintenance, administrative support, and trail maintenance.  
**February:** Invasive species removal, grounds maintenance, and nest box installation.  
**March:** Hiking Club and grounds maintenance.  
**April:** Hiking Club, Baker Open House, invasive species removal, grounds maintenance, and field trip preparation.  
**May:** Hiking Club, trail maintenance, annual point counts (see **Appendix C** for current vertebrate list), and grounds maintenance.  
**June:** Cool House Tour participation.  
**July:** Oak caging project, windmill restoration, and grounds maintenance.  
**August:** Grounds maintenance, windmill restoration, and residence improvements.  
**September:** Grounds maintenance, invasive species removal, trail maintenance, and windmill restoration.

The Hiking Club with Whitestone Elementary convened for sessions in both the spring and fall. For six consecutive weeks per session, approximately 20 fifth grade English Language Learner students spent two hours per session hiking the Sanctuary, learning about central Texas flora, fauna, and habitats. The program was developed with support from Linda Lippe, the Leander Independent School District (LISD) elementary science curriculum coordinator, and Charlie Ciernia, an educator at Deer Creek Elementary, to emphasize grade-appropriate science concepts as outlined in the Texas Essentials Skills and Knowledge.

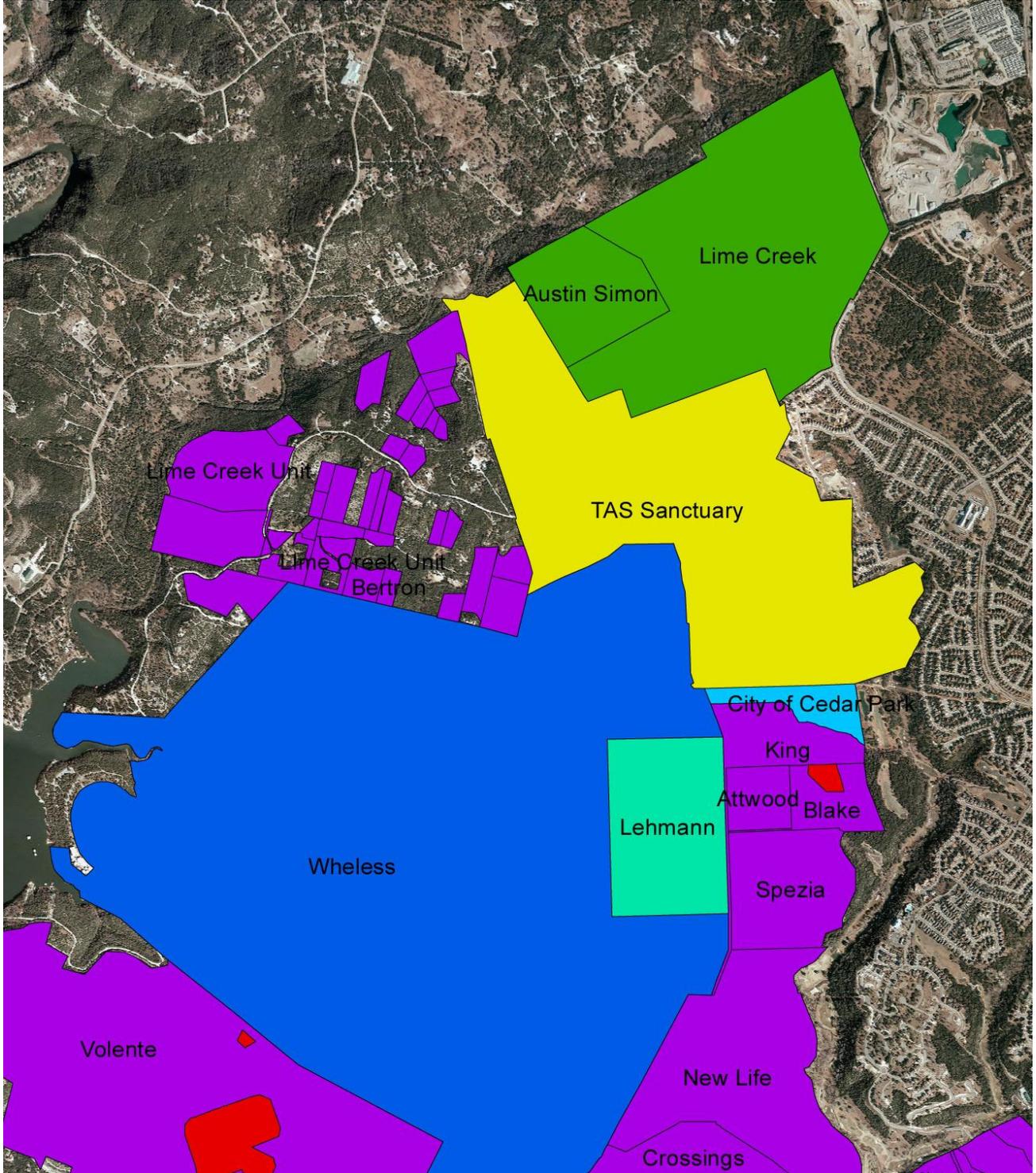
Other activities to enhance community involvement and knowledge of Baker Sanctuary and the BCP mission included Baker Open House, nine guided hikes for various community groups, two BCP sponsored guided hikes, eight field trips for LISD and Round Rock Intermediate School District elementary students, five LISD golden-cheeked warbler presentations to a total of 550 fifth grade students, three adult-centered birding and GCWA presentations, and participation in three off-site field trips.

### **Literature Cited**

Hutto, R.L., Pletschet, S.M., and Hendricks, P. 1986. A fixed-radius point count for nonbreeding and breeding season use. *Auk* 103: 593-602.

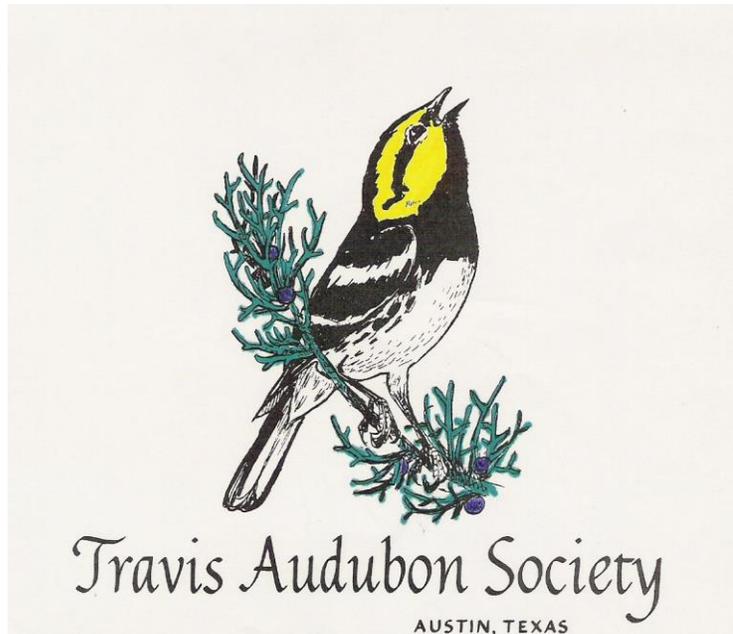
Appendix A

Map of Baker Sanctuary and BCP partner properties



Appendix B

**RESULTS OF THE GOLDEN-CHEEKED WARBLER SURVEY  
FOR THE BAKER SANCTUARY 100-ACRE PLOT  
SPRING 2014  
TRAVIS COUNTY, TEXAS**



Prepared for:

Travis Audubon Society  
3710 Cedar St., Box 5  
Austin, Texas 78705

Prepared by:

Christopher Murray  
Baker Sanctuary Steward  
12219 Lime Creek Road  
Leander, TX 78641

September 2014

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**Results of the Golden-cheeked Warbler Survey  
for the Baker Sanctuary 100-acre Plot  
Spring 2014**

This season, the annual 100-acre survey saw its fourth year of participation with the City of Austin as a partner in a five year study to determine Golden-cheeked Warbler (*Setophaga chrysoparia*) population viability and habitat suitability in the Balcones Canyonlands Preserve (BCP). In accordance with the protocol adopted by BCP partners at the beginning of the viability and habitat suitability study in 2011, small crews continued to mist net and band males in addition to spot-mapping territories and searching for and monitoring nests. Captured birds were again 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 Golden-cheeked Warblers (GCWA) were netted they were also banded. During the 2014 season, three males and one female were captured and banded for a total of 30 banded individuals over the last four seasons (**Table 1**).

Similar to previous seasons, during the 2014 survey City of Austin wildlife biologist Cindy Sperry and I split survey duties, allowing us to more accurately document territories and locate nests as well as to determine breeding productivity. To accommodate two observers, each week the plot was split in half with each observer responsible for their assigned portion. The assigned portion was rotated on a weekly basis, effectively allowing each observer to survey the entire plot every three week cycle. For example, if the first week I surveyed the northern section, Cindy would cover the southern section. 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 a boundary, rather each observer estimated where the halfway mark was located and used discretion if a GCWA needed to be pursued over the imaginary division. By splitting coverage in this fashion, observer bias should be lessened and a more accurate picture of territory distribution realized. In addition to covering the traditional 100-acres, the 100 meter buffer zone surrounding the plot was again routinely searched in an effort to detect additional banded males.

Beginning on March 21 and continuing through May 23 one half of the study plot was formally surveyed by Murray and the other half by Sperry each week with additional visits by Sperry to specifically search for and monitor nests and fledglings, of which the final visit was in June. In total, 241 hours were invested in monitoring the Baker 100-acre plot for the 2014 season, a 10% increase from the 234 survey hours logged last year and still well above the 60 hours spent surveying annually prior to the population viability study. All surveys were conducted following the protocol outlined in the BCP Land Manager's Handbook. 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. 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 plot, year, or observer, beginning in the 2013 season the BCP partners adopted a method to enumerate territories based on observed patterns of occupation. Males found displaying territorial behavior (e.g. singing, carrying food, feeding fledglings) on at least 3 survey dates at least a week apart are considered to have established territories. To be classified as holding an ‘edge’ territory, a GCWA male must have been observed displaying territorial behavior on at least two surveys both inside and outside the plot. Otherwise, the territory will be designated as ‘full’ or ‘out’ depending on where the majority of the observations occur. To arrive at the ‘adjusted total’ of territories on the 100-acre plot, full territories were enumerated as 1.0, edge territories as 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, it is estimated that five Golden-cheeked Warbler males established territories primarily within plot boundaries (full) and seven males occupied territories partially within the plot (edge), yielding an adjusted total of 8.5 territories for the 100-acre plot area (**Table 2**). While the presence of color banded GCWAs has eliminated some of the guesswork involved with attributing territories to males, some individuals remain unbanded. In the instances where males were not banded, territories were estimated in a conservative fashion to avoid overstating the number of territories associated with the plot.

Pairing success for 2014 was similar to that of prior seasons with all but one territory-holding male observed with a female; 22 fledglings were detected throughout the breeding season (**Table 4**). Prior to 2011 and the launch of the viability and habitat suitability project, surveyors documented females and fledglings, but the focus was on determining the density and distribution of territorial males. With the addition of the banding program, more personnel, and a substantial increase in the time spent in the field, a more accurate picture of fecundity has begun to emerge along with valuable data illuminating nest site preferences. For the six nests discovered during the 2014 survey, average nest tree height was 6.8 meters, average nest tree diameter at breast height was 25.2 cm, and average nest height was 5.7 meters. Four nests were placed in Plateau Live Oak (*Quercus fusiformis*) and two in Ashe Juniper (*Juniperus ashei*) (**Table 3**).

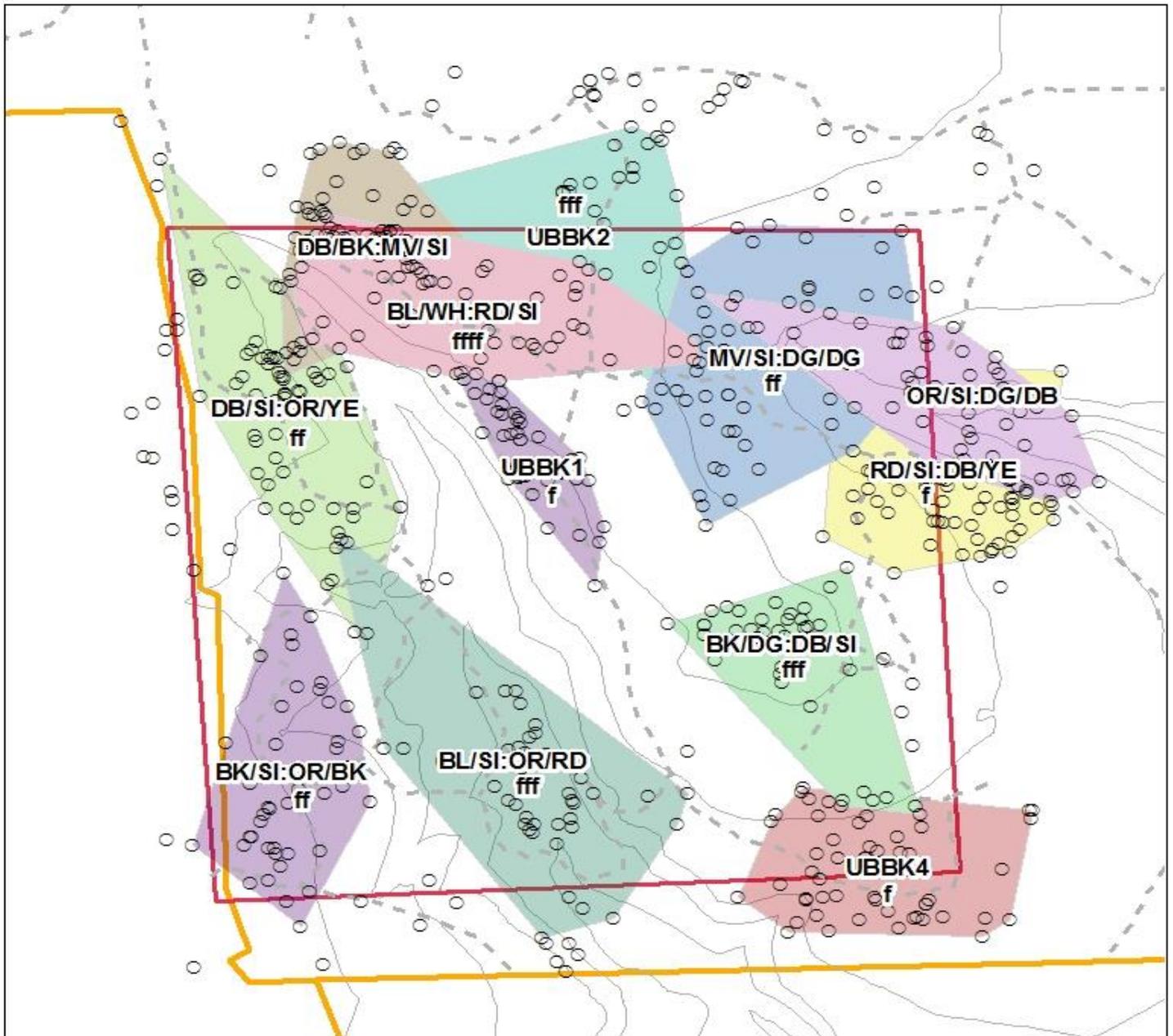
The 2014 season yielded an adjusted total of 8.5 territories present in and around the 100-acre plot. This total is a bit lower than the approximately 10 territories observed since the 2010 season (**Table 4**), a pattern that was beginning to suggest that ten territories may be the norm for this 100-acre patch of habitat. With a total of 22 fledglings observed in and around the 100-acre plot, observed fecundity was actually a bit higher than the previous season. Nest searching efforts were more successful for the 2014 season with a 50% discovery rate versus 38% for 2013. There is no obvious reason why the total adjusted territory number was depressed for 2014 compared to previous seasons. One possible factor may have been the severe cold snap experienced on March 2 when overnight

temperatures dropped to 20° F, possibly adversely affecting arthropod prey items. Another factor may have been low productivity in the previous breeding season. During the 2013 survey a total of 17 fledglings were observed, the fewest detected since the initiation of the population viability study in 2011 (**Table 4**). If productivity were depressed in 2013 there would likewise have been fewer individuals available to return for the 2014 season. Another explanation may simply be observer bias since the designation of ‘full’ or ‘edge’ status depends solely on the males’ position when he is discovered and recorded by the observer. If the total number of territories is considered regardless of status designation, the 100-acre plot supported twelve territories in 2014, a number quite similar to the fourteen, twelve, and fifteen territories documented in 2013, 2012, and 2011 respectively (**Table 4**). More importantly, the observed productivity of 22 fledglings for the 2014 season was the second highest amount documented in the past nine years, surpassed only by the 38 fledglings recorded for the 2012 breeding season (**Table 4**).

The map on page four displays locations of all Golden-cheeked Warbler observations and estimated territory boundaries for 2014. Polygons surrounding the observations represent approximate boundaries of male territories, with each territory identified by color band combinations or an unbanded designation. The number of fledglings (**f**) detected are also indicated within each territory. Unlike previous seasons, no territories are known to have produced two broods in 2014. In addition to clarifying territory and fecundity data, the presence of color-banded individuals also allows recognition of males returning to the plot from previous seasons. The 2014 survey saw two banded individuals (DB/SI:OR/YE and MV/SI:DG/DG) return to the 100-acre plot area from the 2013 season as well as two individuals banded during the 2012 season (BK/DG:DB/SI and BL/WH:RD/SI) and two from the 2011 season (RD/SI:DB/YE and DB/BK:MV/SI).

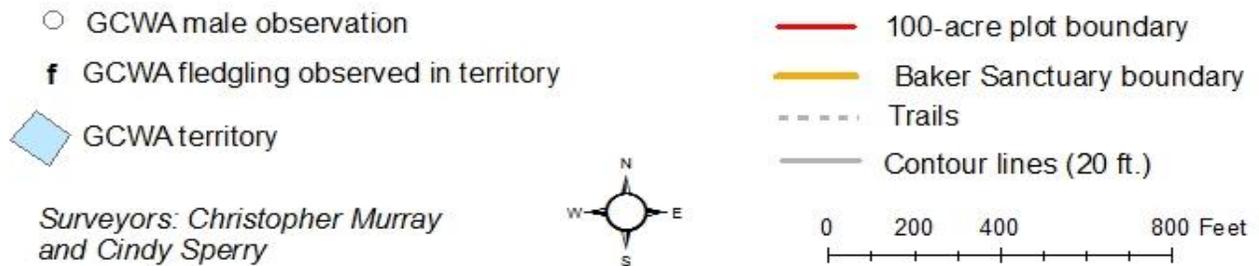
**Table 5** lists the 52 bird species detected in or near the 100-acre plot during the 2014 surveys. In addition to Golden-cheeked Warblers, species detected on most surveys included Turkey Vulture, Mourning Dove, Ladder-backed Woodpecker, Western Scrub-jay, Carolina Chickadee, Black-crested Titmouse, Bewick’s Wren, Blue-gray Gnatcatcher, Black-and-white Warbler, and Northern Cardinal. Passing migrants included Nashville Warbler and Blackburnian Warbler. Commonly seen birds presumed to be nesting in or near the plot included Painted Bunting, Yellow-billed Cuckoo, Summer Tanager, Northern Mockingbird, White-eyed Vireo, and White-winged Dove. Brown-headed Cowbirds were detected once during the surveys.

Other vertebrates detected during the survey include Eastern Fox Squirrel (*Sciurus niger*), Rock Squirrel (*Citellus variegatus*), and Blacktail Jackrabbit (*Lepus californicus*).



## Baker Sanctuary

### Golden-cheeked Warbler 100-Acre Plot Survey 2014



**Table 1.** GCWA individuals banded during the 2011- 2014 Baker Sanctuary 100-acre surveys.

<b>Date Banded</b>	<b>Combo</b>	<b>UTM-easting</b>	<b>UTM-northing</b>	<b>Sex</b>	<b>Age</b>
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
3/14/2012	BL/DB:RD/SI	608600	3372362	M	ASY
3/14/2012	BK/SI:OR/PI	608549	3372107	M	ASY
3/14/2012	BL/WH:RD/SI	609212	3372594	M	SY
3/23/2012	BK/DG:DB/SI	609128	3372113	M	SY
3/23/2012	WH/SI:DG/YE	609044	3372468	M	SY
3/23/2012	RD/SI:BL/PI	608907	3372627	F	ASY
3/30/2012	WH/DG:BK/SI	608541	3372481	M	SY
4/7/2012	OR/SI:WH/RD	608907	337056	M	SY
4/7/2012	PI/SI:GR/YE	608535	3372162	M	SY
4/11/2012	PI/SI:NB/DG	608774	3372341	M	ASY
3/14/2013	MV/SI:BL/MV	608522	3371966	M	SY
3/14/2013	DB/SI:OR/YE	608708	3372450	M	ASY
4/20/2013	MV/SI:DG/DG	609055	3372590	M	SY
3/30/2014	BK/SI:OR/BK	608551	3371990	M	ASY
3/30/2014	BL/SI:OR/RD	608801	3371973	M	ASY
4/11/2014	OR/SI:DG/DB	609179	3372422	M	ASY
4/11/2014	PI/DG:NB/SI	609177	3372422	F	ASY

**Table 2.** Designation of Golden-cheeked Warbler territory status and number of females and fledglings detected per territory for the 2014 Baker Sanctuary 100-acre survey.

<b>GCWA Designation</b>	<b>Territory Status</b>	<b>Female Detected</b>	<b>Number of Fledglings Detected</b>
<b>BL/WH:RD/SI</b>	<b>Full</b>	<b>Yes</b>	<b>4</b>
<b>DB/SI:OR/YE</b>	<b>Full</b>	<b>Yes</b>	<b>2</b>
<b>MV/SI:DG/DG</b>	<b>Full</b>	<b>Yes</b>	<b>2</b>
<b>BK/DG:DB/SI</b>	<b>Full</b>	<b>Yes</b>	<b>3</b>
<b>UBBK1</b>	<b>Full</b>	<b>Yes</b>	<b>1</b>
<b>DB/BK:MV/SI</b>	<b>Edge</b>	<b>No</b>	<b>0</b>
<b>BK/SI:OR/BK</b>	<b>Edge</b>	<b>Yes</b>	<b>2</b>
<b>BL/SI:OR/RD</b>	<b>Edge</b>	<b>Yes</b>	<b>3</b>
<b>OR/SI:DG/DB</b>	<b>Edge</b>	<b>Yes</b>	<b>0</b>
<b>RD/SI:DB/YE</b>	<b>Edge</b>	<b>Yes</b>	<b>1</b>
<b>UBBK2</b>	<b>Edge</b>	<b>Yes</b>	<b>3</b>
<b>UBBK4</b>	<b>Edge</b>	<b>Yes</b>	<b>1</b>

**Table 3.** Nest tree data for Golden-cheeked Warbler nests discovered during the Baker Sanctuary 100-acre survey, 2014.

<b>Nest ID</b>	<b>Nest Tree Height (m)</b>	<b>Nest Height (m)</b>	<b>Nest Tree DBH (cm)</b>	<b>Nest Tree Species</b>
<b>01CS14</b>	<b>7.6</b>	<b>4.8</b>	<b>17.0</b>	<b>Plateau Live Oak</b>
<b>02CS14</b>	<b>6.2</b>	<b>5.3</b>	<b>18.0</b>	<b>Plateau Live Oak</b>
<b>03CS14</b>	<b>8.0</b>	<b>7.3</b>	<b>40.0</b>	<b>Plateau Live Oak</b>
<b>05CS14</b>	<b>4.8</b>	<b>4.1</b>	<b>16.0</b>	<b>Plateau Live Oak</b>
<b>08CS14</b>	<b>7.6</b>	<b>7.2</b>	<b>19.9</b>	<b>Ashe Juniper</b>
<b>09CS14</b>	<b>6.8</b>	<b>5.5</b>	<b>40.0</b>	<b>Ashe Juniper</b>

**Table 4.** Adjusted total of Golden-cheeked Warbler territories, females and fledglings detected during Baker Sanctuary 100-acre plot surveys, 2006 - 2014.

Survey Date	Territories (full/edge)	Females	Fledglings
2006	24 (22/4)	18	17
2007	23.5 (20/7)	8	17
2008	17.5 (14/7)	10	16
2009	16 (14/4)	6	7
2010	10 (9/2)	6	11
2011	10.5 (6/9)	9	21
2012	10 (8/4)	12	38
2013	10 (6/8)	12	17
2014	8.5 (5/7)	11	22

**Table 5.** Bird species detected in the Baker Sanctuary 100-acre plot during the 2014 Golden-cheeked Warbler surveys.

SPECIES	WEEKS COUNTED										Weeks Detected
	3/16	3/23	3/30	4/06	4/13	4/20	4/27	5/04	5/11	5/18	
Northern Bobwhite								X	X	X	3
Turkey Vulture		X	X	X		X	X	X	X	X	8
Black Vulture			X					X			2
Red-shouldered Hawk		X	X				X				3
Killdeer					X						1
Wild Turkey	X							X	X		3
White-winged Dove		X				X	X				3
Mourning Dove	X	X	X	X	X	X	X	X	X	X	10
Yellow-billed Cuckoo							X	X	X	X	4
Greater Roadrunner	X	X		X		X	X	X	X	X	8
Great Horned Owl							X				1
Chuck-will's-widow				X							1
Chimney Swift				X			X	X		X	4

SPECIES	WEEKS COUNTED										Weeks Detected
	3/16	3/23	3/30	4/06	4/13	4/20	4/27	5/04	5/11	5/18	
Black-chinned Hummingbird		X	X	X		X	X	X			6
Ladder-backed Woodpecker	X	X				X		X	X	X	6
Great Crested Flycatcher								X			1
Ash-throated Flycatcher								X			1
White-eyed Vireo		X	X	X	X	X		X	X		7
Blue-headed Vireo					X	X	X	X			4
Red-eyed Vireo							X				1
Blue Jay		X				X					2
Western Scrub-Jay	X	X	X	X	X	X	X	X	X	X	10
American Crow			X								1
Common Raven		X									1
Purple Martin				X	X	X	X	X	X	X	7
Barn Swallow								X			1
Carolina Chickadee	X	X	X	X	X	X	X		X	X	9
Black-crested Titmouse	X	X	X	X	X	X	X	X	X	X	10
Carolina Wren	X	X		X	X	X		X		X	7
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	9
Ruby-crowned Kinglet	X	X	X	X	X	X	X				7
Swainson's Thrush							X				1
American Robin	X	X									2
Northern Mockingbird					X	X			X		3
Orange-crowned Warbler		X				X					2
Nashville Warbler		X	X	X	X	X					5
Magnolia Warbler								X			1
Yellow-rumped Warbler (Myrtle)				X							1
Golden-cheeked Warbler	X	X	X	X	X	X	X	X	X	X	10
Black-throated Green Warbler						X					1
Blackburnian Warbler									X		1
Black-and-white Warbler	X	X	X	X	X	X	X	X	X	X	10

SPECIES	WEEKS COUNTED										Weeks Detected
	3/16	3/23	3/30	4/06	4/13	4/20	4/27	5/04	5/11	5/18	
Field Sparrow					X		X			X	3
Chipping Sparrow							X				1
Summer Tanager						X					1
Northern Cardinal	X	X	X	X	X	X	X	X	X	X	10
Dickcissel							X				1
Painted Bunting						X	X	X	X	X	5
Common Grackle		X			X		X				3
Brown-headed Cowbird				X							1
Lesser Goldfinch	X	X		X	X	X	X	X	X	X	9
<b>TOTAL SPECIES</b>	15	24	16	21	21	30	27	27	21	20	<b>52</b>

**Acknowledgements:** Once again, special thanks to Cindy Sperry for helping to collect data, verify data, and assisting in creating the final 2014 GCWA survey map. Cindy was always available to answer questions and her expertise and professionalism was a great help in the completion of this report.

## Appendix C

### Baker Sanctuary Vertebrates List

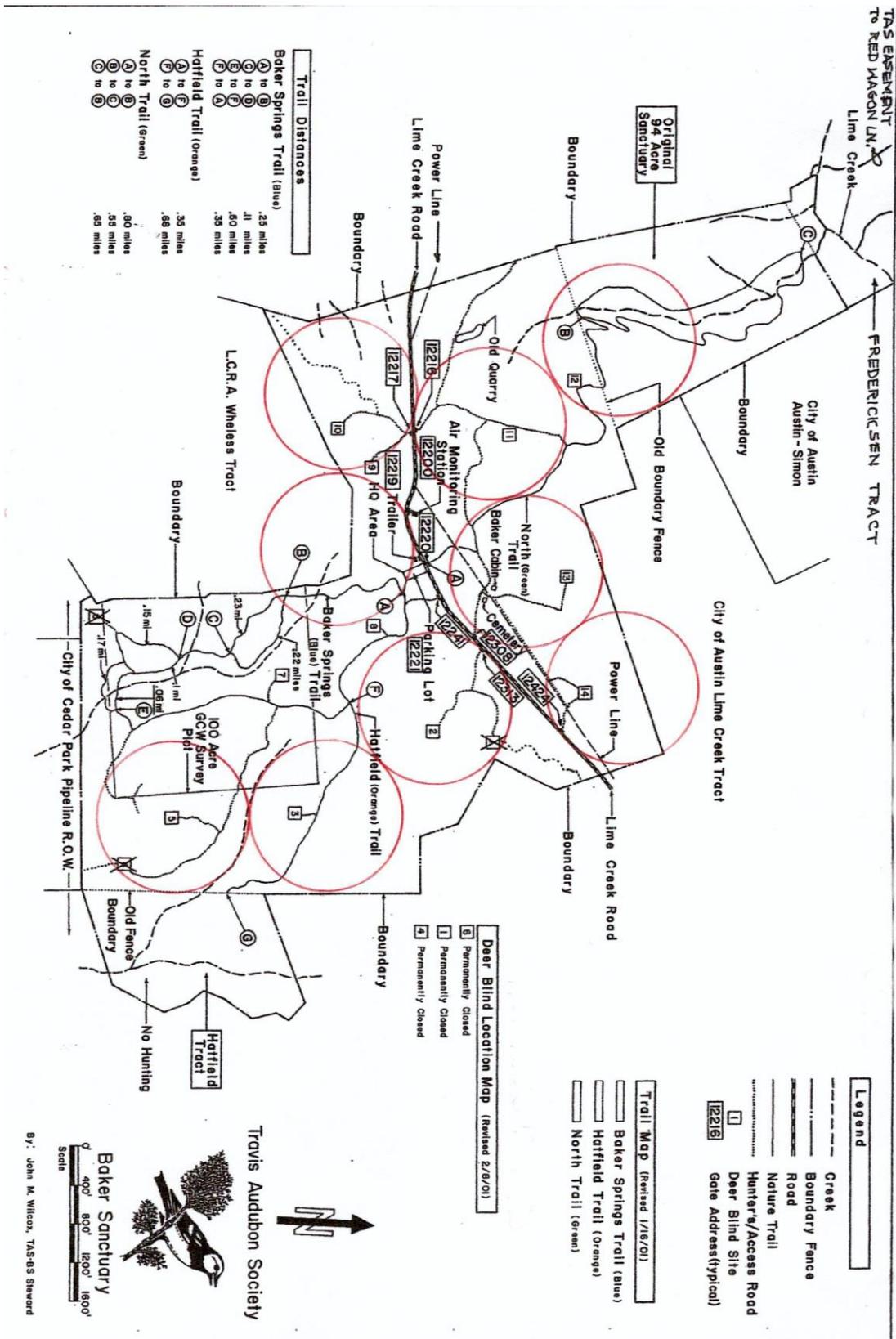
Family	Common Name	Scientific Name
<b>Birds</b>		
Pelecanidae	American White Pelican	<i>Pelecanus erythrorhynchos</i>
Phalacrocoracidae	Double-crested Cormorant	<i>Phalacrocorax auritus</i>
Ardeidae	Great Blue Heron	<i>Ardea herodias</i>
Ardeidae	Great Egret	<i>Casmerodius albus</i>
Ardeidae	Green Heron	<i>Butorides striatus</i>
Ardeidae	Yellow-crowned Night-Heron	<i>Nyctanassa violacea</i>
Threskiornithidae	White-faced Ibis	<i>Plegadis chihi</i>
Cathartidae	Black Vulture	<i>Coragyps atratus</i>
Cathartidae	Turkey Vulture	<i>Cathartes aura</i>
Anatidae	American Wigeon	<i>Anas americana</i>
Anatidae	Mallard	<i>Anas platyrhynchos</i>
Accipitridae	Osprey	<i>Pandion haliaetus</i>
Accipitridae	Mississippi Kite	<i>Ictinia mississippiensis</i>
Accipitridae	Bald Eagle	<i>Haliaeetus leucocephalus</i>
Accipitridae	Sharp-shinned Hawk	<i>Accipter striatus</i>
Accipitridae	Cooper's Hawk	<i>Accipiter cooperii</i>
Accipitridae	Red-shouldered Hawk	<i>Buteo lineatus</i>
Accipitridae	Broad-winged Hawk	<i>Buteo platypterus</i>
Accipitridae	Swainson's Hawk	<i>Buteo swainsoni</i>
Accipitridae	Red-tailed Hawk	<i>Buteo jamaicensis</i>
Falconidae	Crested Caracara	<i>Polyborus plancus</i>
Falconidae	American Kestrel	<i>Falco sparverius</i>
Phasianidae	Wild Turkey	<i>Meleagris gallopavo</i>
Odontophoridae	Northern Bobwhite	<i>Colinus virginianus</i>
Gruidae	Sandhill Crane	<i>Grus canadensis</i>
Charadriidae	Killdeer	<i>Charadrius vociferus</i>
Scolopacidae	Upland Sandpiper	<i>Bartramia longicauda</i>
Laridae	Ring-billed Gull	<i>Larus delawarensis</i>
Columbidae	Rock Dove	<i>Columba livia</i>
Columbidae	White-winged Dove	<i>Zenaida asiatica</i>
Columbidae	Mourning Dove	<i>Zenaida macroura</i>
Columbidae	Eurasian Collared-dove	<i>Zenaida chinensis</i>
Columbidae	Inca Dove	<i>Columbina inca</i>
Columbidae	Common Ground-Dove	<i>Columbina passerina</i>
Cuculidae	Yellow-billed Cuckoo	<i>Coccyzus americanus</i>
Cuculidae	Greater Roadrunner	<i>Geococcyx californianus</i>
Tytonidae	Barn Owl	<i>Tyto alba</i>
Strigidae	Eastern Screech-Owl	<i>Otus asio</i>
Strigidae	Great Horned Owl	<i>Bubo virginianus</i>
Strigidae	Long-eared Owl	<i>Asio otus</i>
Caprimulgidae	Common Nighthawk	<i>Chordeiles minor</i>
Caprimulgidae	Common Poorwill	<i>Phalaenoptilus nuttallii</i>
Caprimulgidae	Chuck-will's-widow	<i>Caprimulgus carolinensis</i>

Caprimulgidae	Whip-poor-will	Caprimulgus vociferus
Apodidae	Chimney Swift	Chaetura pelagica
Trochilidae	Ruby-throated Hummingbird	Archilochus colubris
Trochilidae	Black-chinned Hummingbird	Archilochus alexandri
Trochilidae	Rufous Hummingbird	Selasphorus rufus
Alcedinidae	Belted Kingfisher	Ceryle alcyon
Picidae	Golden-fronted Woodpecker	Melanerpes aurifrons
Picidae	Red-bellied Woodpecker	Melanerpes carolinus
Picidae	Ladder-backed Woodpecker	Picoides nuttallii
Picidae	Downy Woodpecker	Picoides pubescens
Picidae	Northern Flicker	Colaptes auratus
Tyrannidae	Eastern Wood-Pewee	Contopus virens
Tyrannidae	Least Flycatcher	Empidonax minimus
Tyrannidae	Eastern Phoebe	Sayornis phoebe
Tyrannidae	Ash-throated Flycatcher	Myiarchus cinerascens
Tyrannidae	Great Crested Flycatcher	Myiarchus crinitus
Tyrannidae	Western Kingbird	Tyrannus verticalis
Tyrannidae	Scissor-tailed Flycatcher	Tyrannus forficatus
Laniidae	Loggerhead Shrike	Lanius ludovicianus
Vireonidae	White-eyed Vireo	Vireo griseus
Vireonidae	Blue-headed Vireo	Vireo solitarius
Vireonidae	Hutton's Vireo	Vireo huttoni
Vireonidae	Red-eyed Vireo	Vireo olivaceus
Corvidae	Blue Jay	Cyanocitta cristata
Corvidae	Western Scrub Jay	Aphelocoma californica
Corvidae	American Crow	Corvus brachyrhynchos
Corvidae	Common Raven	Corvus corax
Hirundinidae	Purple Martin	Progne subis
Hirundinidae	Cliff Swallow	Hirundo fulva
Hirundinidae	Barn Swallow	Hirundo rustica
Paridae	Carolina Chickadee	Poecile carolinensis
Paridae	Tufted Titmouse	Baeolophus bicolor
Paridae	Black-crested Titmouse	Baeolophus atricristatus
Aegithalidae	Bushtit	Psaltriparus minimus
Sittidae	Red-breasted Nuthatch	Sitta canadensis
Sittidae	White-breasted Nuthatch	Sitta carolinensis
Certhiidae	Brown Creeper	Certhia americana
Troglodytidae	Canyon Wren	Catherpes mexicanus
Troglodytidae	Carolina Wren	Thryothorus ludovicianus
Troglodytidae	Bewick's Wren	Thryomanes bewickii
Troglodytidae	House Wren	Troglodytes aedon
Regulidae	Golden-crowned Kinglet	Regulus satrapa
Regulidae	Ruby-crowned Kinglet	Regulus calendula
Sylviidae	Blue-gray Gnatcatcher	Polioptila caerulea
Turdidae	Eastern Bluebird	Sialia sialis
Turdidae	Swainson's Thrush	Catharus ustulatus
Turdidae	Hermit Thrush	Catharus guttatus
Turdidae	American Robin	Turdus migratorius

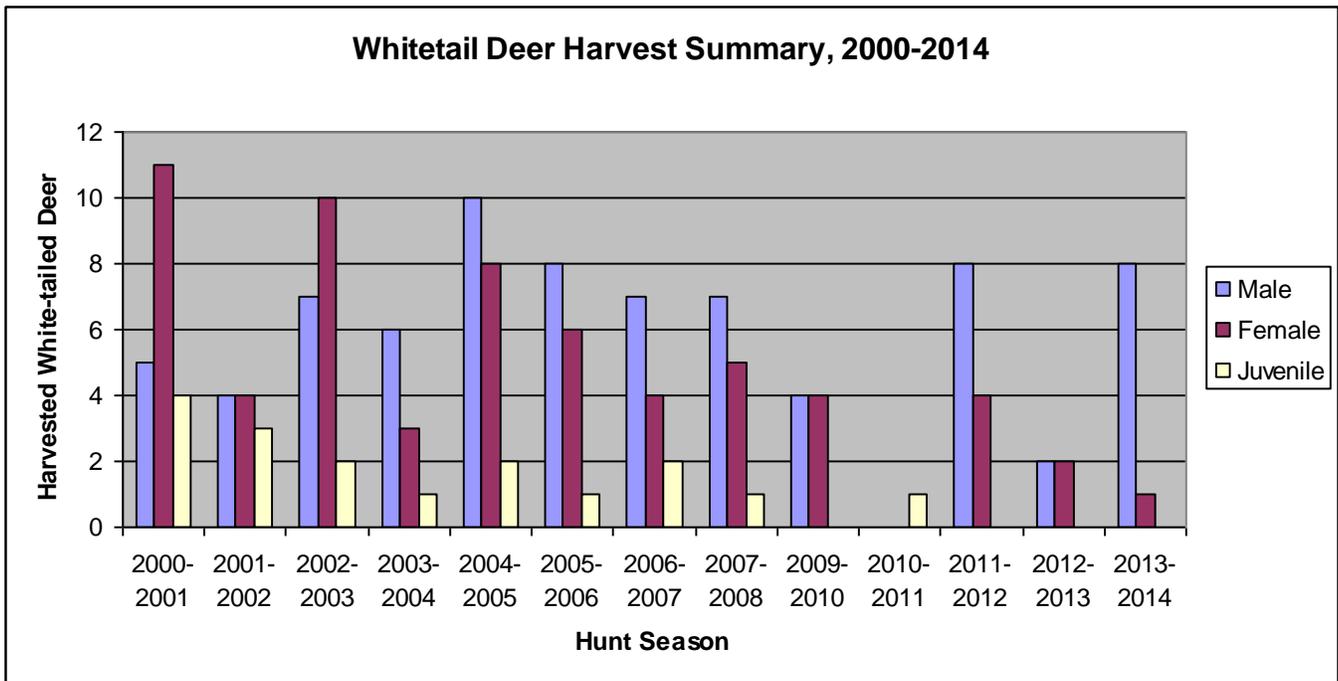
Mimidae	Gray Catbird	<i>Dumetella carolinensis</i>
Mimidae	Northern Mockingbird	<i>Mimus polyglottos</i>
Sturnidae	European Starling	<i>Sturnus vulgaris</i>
Bombycillidae	Cedar Waxwing	<i>Bombycilla cedrorum</i>
Parulidae	Tennessee Warbler	<i>Vermivora peregrina</i>
Parulidae	Orange-crowned Warbler	<i>Vermivora celata</i>
Parulidae	Nashville Warbler	<i>Vermivora ruficapilla</i>
Parulidae	Yellow Warbler	<i>Dendroica petechia</i>
Parulidae	Chestnut-sided Warbler	<i>Dendroica pensylvanica</i>
Parulidae	Magnolia Warbler	<i>Dendroica magnolia</i>
Parulidae	Yellow-rumped Warbler	<i>Dendroica coronata</i>
Parulidae	Golden-cheeked Warbler	<i>Setophaga chrysoparia</i>
Parulidae	Black-throated Green Warbler	<i>Dendroica virens</i>
Parulidae	Pine Warbler	<i>Dendroica pinus</i>
Parulidae	Black-and-white Warbler	<i>Mniotilta varia</i>
Parulidae	Blackburnian Warbler	<i>Dendroica fusca</i>
Parulidae	American Redstart	<i>Setophaga ruticilla</i>
Parulidae	MacGillivray's Warbler	<i>Oporornis tolmiei</i>
Parulidae	Wilson's Warbler	<i>Wilsonia pusilla</i>
Parulidae	Canada Warbler	<i>Wilsonia canadensis</i>
Parulidae	Yellow breasted Chat	<i>Icteria virens</i>
Thraupidae	Summer Tanager	<i>Piranga rubra</i>
Emberizidae	Green-tailed Towhee	<i>Pipilio chlorurus</i>
Emberizidae	Spotted Towhee	<i>Pipilo maculatus</i>
Emberizidae	Eastern Towhee	<i>Pipilo erythrophthalmus</i>
Emberizidae	Rufous-crowned Sparrow	<i>Aimophila ruficeps</i>
Emberizidae	Chipping Sparrow	<i>Spizella passerina</i>
Emberizidae	Clay-colored Sparrow	<i>Spizella pallida</i>
Emberizidae	Field Sparrow	<i>Spizella pusilla</i>
Emberizidae	Lark Sparrow	<i>Chondestes grammacus</i>
Emberizidae	Savannah Sparrow	<i>Passerculus sandwichensis</i>
Emberizidae	Fox Sparrow	<i>Passerella iliaca</i>
Emberizidae	Song Sparrow	<i>Melospiza melodia</i>
Emberizidae	Lincoln's Sparrow	<i>Melospiza lincolni</i>
Emberizidae	White-throated Sparrow	<i>Zonotrichia albicollis</i>
Emberizidae	White-crowned Sparrow	<i>Zonotrichia leucophrys</i>
Emberizidae	Dark-eyed Junco	<i>Junco hyemalis</i>
Cardinalidae	Northern Cardinal	<i>Cardinalis cardinalis</i>
Cardinalidae	Pyrrhuloxia	<i>Cardinalis sinuatus</i>
Cardinalidae	Rose-breasted Grosbeak	<i>Pheucticus ludovicianus</i>
Cardinalidae	Blue Grosbeak	<i>Guiraca caerulea</i>
Cardinalidae	Lazuli Bunting	<i>Passerina amoena</i>
Cardinalidae	Indigo Bunting	<i>Passerina cyanea</i>
Cardinalidae	Painted Bunting	<i>Passerina ciris</i>
Cardinalidae	Dickcissel	<i>Spiza americana</i>
Icteridae	Red-winged Blackbird	<i>Aegialius phoeniceus</i>
Icteridae	Eastern Meadowlark	<i>Sturnella magna</i>
Icteridae	Common Grackle	<i>Quiscalus quiscula</i>

Icteridae	Great-tailed Grackle	Quiscalus mexicanus
Icteridae	Bronzed Cowbird	Molothrus aenus
Icteridae	Brown-headed Cowbird	Molothrus ater
Icteridae	Orchard Oriole	Icterus spurius
Icteridae	Baltimore Oriole	Icterus galbula
Fringillidae	House Finch	Carpodacus mexicanus
Fringillidae	Pine Siskin	Carduelis pinus
Fringillidae	Lesser Goldfinch	Carduelis psaltria
Fringillidae	American Goldfinch	Carduelis tristis
Passeridae	House Sparrow	Passer domesticus
<b>Amphibians</b>		
Plethodontidae	Jollyville Plateau Salamander	Eurecea tonkawae
Hylidae	Strecker's Chorus Frog	Pseudacris streckeri streckeri
Bufo	Gulf Coast Toad	Bufo valliceps velliceps
<b>Reptiles</b>		
Emydidae	Three-toed Box Turtle	Terrapene carolina triunguis
Emydidae	Red-eared slider	Trachemys scripta elegans
Gekkonidae	Mediterranean Gecko	Hemidactylus turcicus
Phrynosomatidae	Texas Spiny Lizard	Sceloporus olivaceous
Teiidae	Six-lined Racerunner	Cnemidophorus sexlineatus sexlineatus
Anguidae	Texas Alligator Lizard	Gerrhonotus liocephalus infernales
Colubridae	Eastern Yellowbelly Racer	Coluber constrictor flaviventris
Colubridae	Rough Green Snake	Opheodrys aestivus
Colubridae	Texas Patchnose Snake	Salvadora grahamiae lineata
Colubridae	Eastern Blackneck Garter Snake	Thamnophis cyrtopsis ocellatus
Elaphidae	Texas Coral Snake	Micrurus fulvius tener
Viperidae	Broad-banded Copperhead	Agkistrodon contortrix laticinctus
Viperidae	Western Diamondback Rattlesnake	Crotalus atrox
<b>Mammals</b>		
Didelphidae	Virginia Opossum	Didelphis virginiana
Dasyopodidae	Nine-banded Armadillo	Dasyopus novemcinctus
Leporidae	Eastern Cottontail	Sylvilagus floridanus
Leporidae	Black-tailed Jackrabbit	Lepus californicus
Sciuridae	Rock Squirrel	Spermophilus variegatus
Sciuridae	Eastern Fox Squirrel	Sciurus niger
Muridae	Hispid Cotton Rat	Sigmodon hispidus
Muridae	House Mouse	Mus musculus
Canidae	Feral Dog	Canis familiaris
Canidae	Coyote	Canis latrans
Canidae	Common Gray Fox	Urocyon cinereoargenteus
Procyonidae	Ringtail	Bassariscus astutus
Procyonidae	Common Raccoon	Procyon lotor
Felidae	Feral Cat	Felis catus
Felidae	Bobcat	Felis rufus
Suidae	Feral pig	Sus scrofa
Cervidae	Whitetail Deer	Odocoileus virginianus

Figure 1. Whitetail deer hunt sites at Baker Sanctuary.



**Figure 2.** Summary of whitetail deer harvest, 2000-2014. Juvenile deer are a year or less in age.



**Figure 3.** Summary of brown-headed cowbird trapping results, 2001-2014.

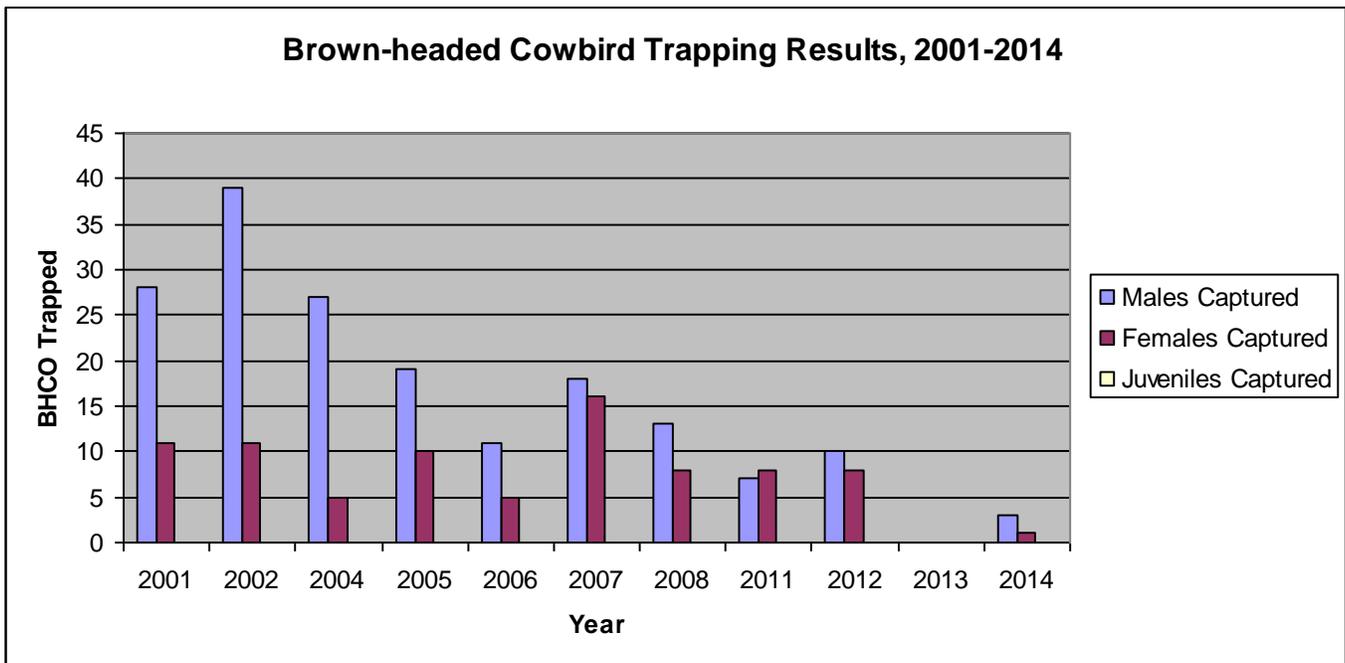
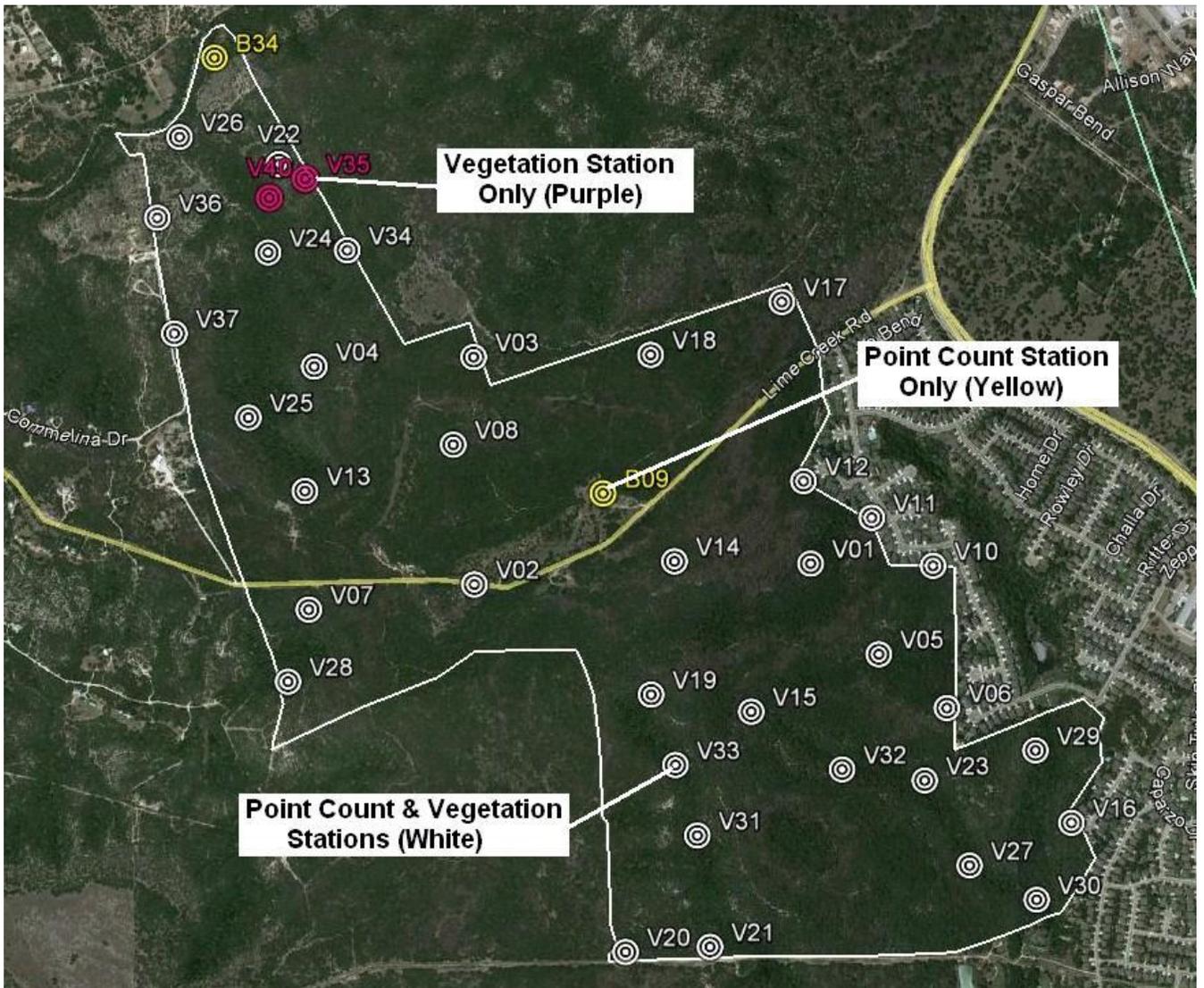


Figure 4. Avian point count stations at Baker Sanctuary.



**Figure 5.** Nest box locations at Baker Sanctuary.

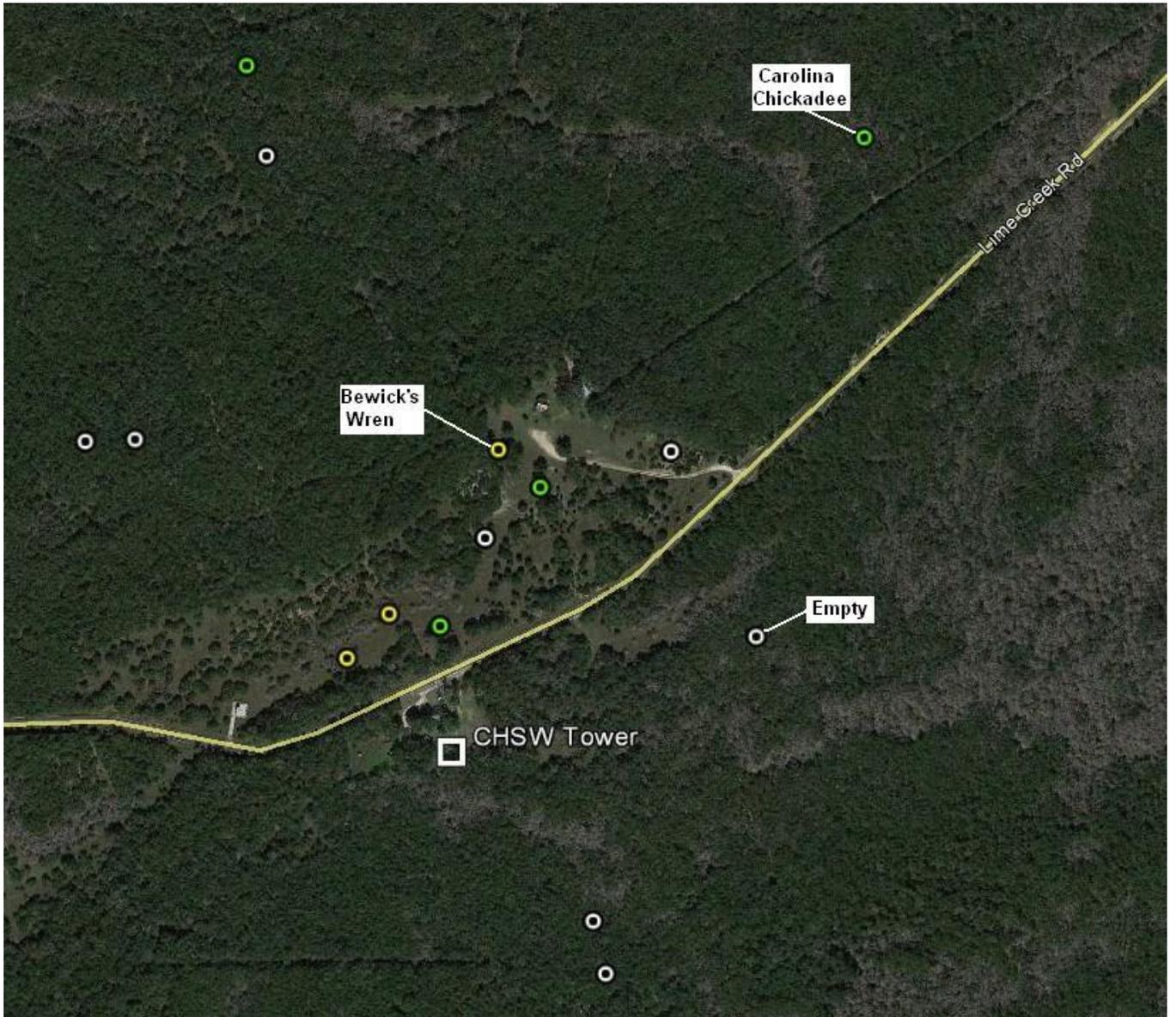
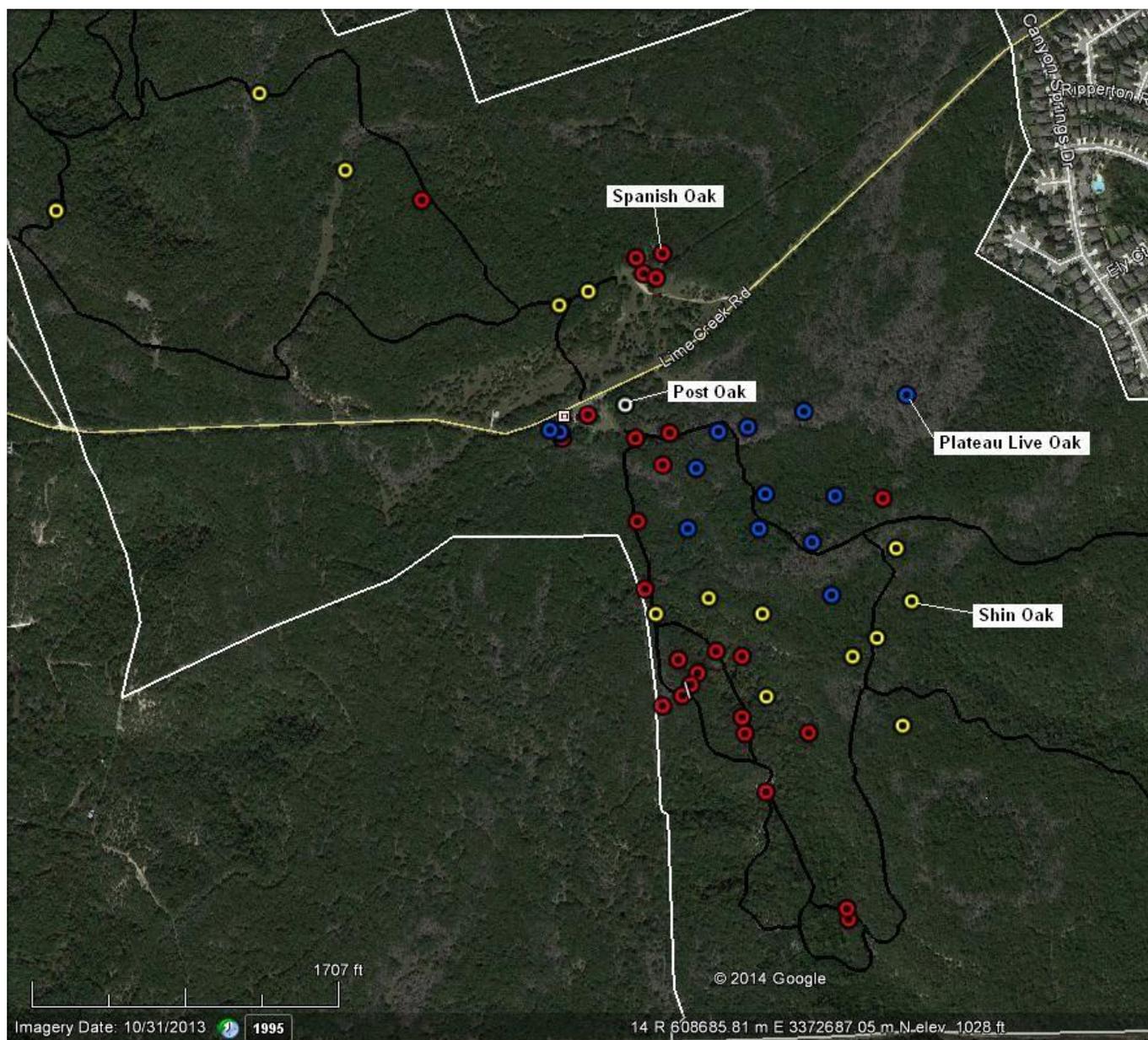


Figure 6. Caged oak locations at Baker Sanctuary.



**Table 1.** Baker Sanctuary 2014 avian point count survey.

Common Name	Scientific Name	Number Observed	Mean <sup>1</sup>	Frequency (%) <sup>2</sup> (25 yd radius)	Frequency (%) <sup>3</sup> (unlimited radius)
Northern Cardinal	<i>Cardinalis cardinalis</i>	30	0.81	62	89
Black-crested Titmouse	<i>Baeolophus atricristatus</i>	20	0.54	46	78
Carolina Chickadee	<i>Poecile carolinensis</i>	20	0.54	35	46
Golden-cheeked Warbler	<i>Setophaga chrysoparia</i>	14	0.38	35	46
Painted Bunting	<i>Passerina ciris</i>	13	0.35	27	43
Yellow-billed Cuckoo	<i>Coccyzus americanus</i>	8	0.22	16	38
Lesser Goldfinch	<i>Carduelis psaltria</i>	2	0.05	5	35
Bewick's Wren	<i>Thryomanes bewickii</i>	5	0.14	14	32
Blue-gray Gnatcatcher	<i>Poliophtila caerulea</i>	18	0.49	30	32
Carolina Wren	<i>Thryothorus ludovicianus</i>	9	0.24	22	32
Mourning Dove	<i>Zenaida macroura</i>	2	0.05	5	27
Northern Mockingbird	<i>Mimus polyglottos</i>	4	0.11	8	22
Purple Martin	<i>Progne subis</i>	0	0.00	0	22
White-eyed Vireo	<i>Vireo griseus</i>	8	0.22	22	22
White-winged Dove	<i>Zenaida asiatica</i>	1	0.03	3	22
Northern Bobwhite	<i>Colinus virginianus</i>	0	0.00	0	16
Black-and-white Warbler	<i>Mniotilta varia</i>	4	0.11	11	14
Western Scrub-jay	<i>Aphelocoma californica</i>	2	0.05	5	14
Greater Roadrunner	<i>Geococcyx californianus</i>	1	0.03	3	11
Wild Turkey	<i>Meleagris gallopavo</i>	0	0.00	0	11
American Robin	<i>Turdus migratorius</i>	2	0.05	5	8
Eastern Phoebe	<i>Sayornis phoebe</i>	1	0.03	3	8
Red-shouldered Hawk	<i>Buteo lineatus</i>	0	0.00	0	8
Rufous-crowned Sparrow	<i>Aimophila ruficeps</i>	1	0.03	3	8
Summer Tanager	<i>Piranga rubra</i>	2	0.05	5	8
Turkey Vulture	<i>Cathartes aura</i>	0	0.00	0	8
Black-chinned Hummingbird	<i>Archilochus alexandri</i>	2	0.05	5	5
Blue Jay	<i>Cyanocitta cristata</i>	0	0.00	0	5
Chimney Swift	<i>Chaetura pelagica</i>	0	0.00	0	5
Common Grackle	<i>Quiscalus quiscula</i>	0	0.00	0	5
Ladder-backed Woodpecker	<i>Picoides scalaris</i>	0	0.00	0	5
Ash-throated Flycatcher	<i>Myiarchus cinerascens</i>	0	0.00	0	3
Barn Swallow	<i>Hirundo rustica</i>	0	0.00	0	3
Eastern Bluebird	<i>Sialia sialis</i>	0	0.00	0	3
Field Sparrow	<i>Spizella pusilla</i>	0	0.00	0	3
Great Crested Flycatcher	<i>Myiarchus crinitus</i>	1	0.03	3	3
House Finch	<i>Carpodacus mexicanus</i>	1	0.03	3	3
Indigo Bunting	<i>Passerina cyanea</i>	0	0.00	0	3
Red-eyed Vireo	<i>Vireo olivaceus</i>	1	0.03	3	3
Yellow-breasted Chat	<i>Icteria virens</i>	1	0.03	3	3
Total Number Observed		172			

**Table 2.** Water quality test results.

<b>Site</b>	<b>Test Date (mdy)</b>	<b>Water Depth (cm)</b>	<b>Water Temperature (°C)</b>	<b>Dissolved Oxygen</b>	<b>Specific Conductance</b>	<b>pH</b>	<b>Nitrate Nitrogen (mg/L)</b>
Audubon Spring	4/5/2014	28	15.0	5.65	620	7.0	< 0.50
Audubon Spring	9/18/2014	28	21.0	4.30	600	7.0	0.25
Baker Spring	4/7/2014	23	14.5	5.45	680	7.5	0.25
Baker Spring	5/14/2014	40	17.5	7.1	630	7.0	0.25
Baker Spring	6/10/2014	19	19.0	5.0	650	7.0	< 0.25
Baker Spring	7/20/2014	40	21.0	6.6	650	7.0	0.50
Baker Spring	9/18/2014	35	22.0	5.9	660	7.0	0.50