


# 2010 ANNUAL REPORT

for the period 1 October 2009 – 30 September 2010
from Wild Basin Wilderness Preserve and St. Edwards University presented to

## TRAVIS COUNTY COMMISSIONERS COURT AND TRANSPORTATION and NATURAL RESOURCES

This annual report on the management and environmental education activities conducted for Wild Basin Wilderness Preserve is submitted in compliance with the contract between Wild Basin, St. Edwards University and Travis County.

# TABLE OF CONTENTS


## PRESERVE MANAGEMENT…3-4

*Building Infrastructure…3-4*
*Security…4-5*

## EDUCATIONAL & EDUCATIONAL OUTREACH PROGRAMS…6-7

*Environmental Education and Interpretation & Summer Programs…6*
*Family & Public Programs and Group Tours…6*
*Training Programs…6-7*
*Public Outreach…7*
*Affiliations & Publications…7-8*

## LAND MANAGEMENT PROGRAMS…9-15

*Land Management Vision and Charges…9*
*Habitat Mosaic Assessment…9*
*Biological and other Surveys…9-11*
*Public Outreach…11-12*
*Staff Training…12*
*Visitation…12*
*Habitat Maintenance & Restoration…12-14*
*Affiliations & Publications…14-15*

## STAFF AND COMMITTEES… 16

*Structure…16*
*Staff…16*
*Land Management Committee 16*
*Aerial View of Wild Basin Wilderness Preserve…17*

## APPENDIX…18

*Survey of Arthropods in Typical Golden-cheeked Warbler Breeding Habitat in the Wild Basin Wilderness Preserve, Austin, TX*
*Wild Basin Deer Census 2010*

# PRESERVE MANAGEMENT

The Wild Basin staff implements the policies and priorities as set forth by both the previous Committee for Wild Basin Wilderness, Inc., and St. Edwards University the current holder, while existing in accordance with Balcones Canyonlands Preserve (BCP) and Travis County rules and regulations. The Wild Basin Wilderness, having served the role as an interdisciplinary laboratory for St. Edwards University (SEU), was incorporated into the School of Natural Sciences of the said University in 2009. Through this fortunate and welcomed merger, the Basin continues to espouse the necessities of environmental education, research, conservation and preservation. This merger and growing collaboration has enabled the enhancement to and creation of novel and past programs for the preserve and the University.

Throughout FY10, staff devoted their time to daily management and enhancement of the preserve, including scheduling and supervising educational programs, land management activities, coordinating and training volunteers and trail guides, as well as promoting the Basin through various events in Austin's environmental community.

Wild Basin's education and land management programs are designed to promote preservation and environmental awareness, while encouraging and demonstrating land stewardship practices. Being situated at the periphery of the Texas Hill Country and in the growing conglomerate of commercial and residential development in west Austin, the Basin exists as a singular and significant property for Travis County, the BCP and the Hill Country Conservancy. Consequently, its urban proximity promotes invasive, non-native plants and serves as a conduit for pollution to the watershed and its biological framework. Less recognized pollution such as surrounding air, sound and light additionally impact the preserve's more sensitive components. Yet through the promising merger with St. Edwards and by continuing past efforts and promotion of conservation, research, and environmental awareness, Wild Basin aspires to become an exemplary model for urban preserves.

*Building Infrastructure*

1) Environmental Education Center (EEC)
   a) General – Under the direction of the staff, volunteers and Travis County community service restitution (CSR) clients regularly cleaned and maintained the EEC's interior, as well as performed exterior maintenance work on an as-needed basis. Over 2,000 hours were donated.
   b) Wild Basin Garden – Under the advice and financial assistance of the Native Plant Society of Texas (NPSOT), the native-plants garden on the EEC's western and south sides was refined, with several new plant installations and updated labeling, serving as interpretive knowledge for visitors. The ultimate aim is not a manicured display but a mélange of natives that appear as if naturally occurring, *i.e.*, without human intervention. Several invasive plants in the garden area, including non-native *Lantana sp.* and *Pyracantha sp.* have been removed. The project was and will continue to be coordinated by Yates Barreda, Wild Basin volunteer and local NPSOT chapter member. Several plants were transplanted this year including Dewberry - *Rubus trivialis, w*ood sorrel - *Oxalis drummondii*, snake herb - *Dyschoriste linearis*, Zexmenia daisy - *Zexmenia hispida* aka *Wedelia hispida*---Asteraceae, as well as seeds of Texas poinsettia - *Euphorbia cyathophora* and Lindheimer morning glory - *Ipomoea lindheimeri*.

i) By vote and advising of the Land Management Committee, introduction of future plants will be strictly governed by Wild Basin staff. In hopes of preserving intact genetics for research on populations of the preserve's native species, staff hopes to minimize introduction of foreign genetics by highly scrutinizing the acceptance of transplant individuals.

c) Shelving was added within the storage space underneath the EEC's northeastern porch for surplus lumber and scrap wood. Removing the wood off of the ground, the shelving further preserves the wood while reducing fire risks.

d) Building Accessibility – Several improvements were made to the accessibility of the EEC.
   i) Approach paths – Several new water bars and steps were added along the approach paths to the EEC's porch stairs, creating an easier gradient for accessing the building and diverting runoff from large storm events.
   ii) Porch railing – Through the enlisted help of CSR clients, the center hand railing along the EEC's porch stairs were replaced and caulked with weatherproof sealant.

2) Information Technology (IT)
   a) Record Keeping – Staff enlisted the volunteer services of Jim Letchworth to update and maintain our membership, visitor and volunteer databases. Mr. Letchworth donated over 70 hours of his time toward this effort in 2010.
   b) During the summer, St. Edward's IT staff removed and replaced several old computers and accessories which were no longer functioning or in use. The University's IT staff has now assumed all responsibility for Wild Basin's computer infrastructure, including the purchase of a Geographic Information System (GIS) computer dedicated machine.
      i) GIS – St. Edward's and Wild Basin purchased a license for ArcInfo 10 in October and hope to utilize an office in the EEC as a GIS workstation for University students and faculty, as well as Wild Basin staff and guest researchers of the BCP.

*Security*

1) Emergency Procedures – The Basin staff continued to follow the emergency policies and procedures manual throughout all emergencies during FY10.
   a) Incidents –
      i) Two separate auto break-ins occurred during the month of January. The staff immediately contacted local authorities, including the Travis Co. Sheriff's Dept. and City of Westlake Police, once alerted to the break-ins. Police reports were filed, though there were no suspects in either case.
      ii) During the summer, a visitor became lost on the trail without water, a map or proper hiking footwear. The out-of-season hiker was a novice and neglected staff encouragement to take a free map, as she claimed to only anticipate a short hike. Several hours later the individual called the EEC from her cell phone, making staff aware of her assumed whereabouts. Two volunteers quickly located the individual and were able to eventually assist her back to the EEC, where upon staff accessed her physical condition and concluded there was no need for emergency services.
2) Preserve Perimeter – Staff performed annual perimeter walks to check the integrity of fencing and boundary markers. Brush was cleared to provide easier patrolling on line-of-sight pathways along all boundaries.

a) The fence post existing along Bee Creek on the preserve's easternmost boundary was damaged during the subsequent flooding following Tropical Storm Hermine in September. This fencing project has been added to Travis County's priority list and is currently being assessed.
b) Rear Entrance – Throughout the year, plans progressed to install a fence and gate at the Preserve's rear entrance across Wild Basin Ledge Road. The fence is scheduled to be installed in January 2011. Due to the location of the access point, several issues were of concern:
    i) City of Austin Vireo Preserve – This fall, the City of Austin began an extensive fencing project along the Vireo Preserve's northern and easternmost perimeter, including the south-easternmost corner which abuts Wild Basin Ledge Road and the Wild Basin-Travis County property. The main focus for the city's fencing is to manage for white-tail deer and feral hogs. To ease future access and boundary queries, the land manager worked with City of Austin staff to coordinate a rear gate and fence which would adjoin the Vireo Preserve's new fencing. The proposed plan creates continuous fencing along the properties' border, reduces future fencing costs and reduces fragmentation between the two BCP preserves.
c) Wild Basin Boundaries – Following the proposal for the rear fence, Wild Basin and Travis County staff re-located and confirmed the survey points for the Travis County boundaries. All survey points were flagged, GPS'd and documented with physical location descriptions.
d) Tree-climbing Incident – One notable security incident happened this fall, when land manager Mitch Robinson encountered an individual tree-climbing a very large sycamore at the pond near the preserve's rear entrance. The individual, who parked at the Wild Basin Ledge Rd. turn around and entered through the rear entrance, stated he was unaware that he was on preserve property. Mitch informed the individual of his transgression and requested that he refrain from using the rear entrance and not return again to tree climb. This incident further evokes the necessity of a rear gate.

3) General – Since the SEU merger in 2009, after hours security has been provided by Securitas, who is contracted to unlock the gate at sunrise and return to close and lock the gate at sunset. Furthermore, Sonitrol, now known as Stanley Security, was contracted to provide alarm services and staff notification in the event of an attempted burglary. No serious emergencies were reported in 2010, though two automobiles were burglarized in the parking lot during the year.
4) Visitors – Signage and interpretive media were maintained to warn visitors of
    a) Fire danger
    b) Personal safety in extreme heat
    c) Potential threats to automobile security in the parking lot
    d) Potential encounters with wildlife and related precautions.

# EDUCATIONAL & OUTREACH PROGRAMS

Volunteers donated approximately 830 hours of their time to the preserve's Education and Outreach Programs. The following summarizes these programs:

1) *Environmental Education & Interpretation*
   a) School Tours – Approximately 1,250 students from public, private, & parochial schools, including local home-school groups, attended education programs at the preserve. Group size limits are restricted and capped at a maximum of 30 students per visit. Over 140 volunteer hours were donated in assisting with these education programs.
   b) Family & Public Programs – Local children and families attended public programs provided at the preserve; programs offered in 2010 included Moonlighting, Stargazing, Flintnapping, Indian Lore and Weekend Hikes. The Moonlighting and Stargazing tours were made possible through the volunteer efforts from members of the Austin Astronomical Society. Jewel Pollard, local Austin natural historian, led the Flintknapping and Indian Lore on as-requested scheduling basis.
   c) Wild Afternoons – The Wild Afternoons program enabled children to visit the preserve and participate in guided hikes to achieve youth-group-specific goals. Groups participating in the program included Girls Scouts, Boy Scouts, Communities in Schools, YMCA and Big Brothers, Big Sisters.
   d) Tiny Footprints – This year, the Tiny Footprints program hosted over 100 young children, ages 3-5, to experience age-specific, small-group hikes designed specifically for early learning. Part-time staff member Sally Scott led these programs and oversaw several volunteers who donated dozens of hours in assistance.

2) *Family & Public Programs and Group Tours*
   a) Moonlighting and Stargazing – In its 22$^{st}$ year, the Moonlighting and Stargazing program again provided two public tours each month, guided by volunteers from the Austin Astronomical Society. Over 16 hours were donated by volunteers to assist with these programs in 2010.
   b) BCP Hike & Lecture Series – On September 25$^{th}$, Wild Basin hosted two public hikes as part of the BCP Hike and Lecture Series. Though the weather was inclement, several families and individuals attended hikes.
   c) Sierra Club Night Hikes – During several full moons this year, Wild Basin hosted free night hikes which were open to the public and organized by the Austin chapter of the Sierra Club.

3) *Training Programs*
   a) Guide Training – Though staff was unable to host organized trainings sessions during FY10, several new trail guides were individually mentored and allowed to shadow tours to become acclimated as trail guides for Wild Basin's various education tours.
   b) Tiny Footprints Training – In FY10, two sessions of Tiny Footprints Training were offered for 5 new volunteer Tiny Footprints guides. 15 hours were donated for training.
   c) Other – CSR volunteers continued to receive educational training as part of their orientation to the preserve before proceeding with work assignments.

d) Wildlife Management – Twice this year, Wild Basin hosted information sessions for private land owners on wildlife management and conservation easements, presented by local consulting group Plateau Land Wildlife and Management.

4) *Public Outreach*

a) 'Green-Community' Events – Staff members attended the Williamson County Realtor's Green Expo to promote the Basin and education the public on environmental education and preservation.

b) Savvy Kids Conference – Wild Basin participated in the first Savvy Kids Conference, which focuses on kids financial, environmental, socio-economic and health 'fitness'. Wild Basin staffed an information booth at the June conference, as well as a children's workshop.

c) Waterloo Kid's Night – Again this spring, staff members Sally Scott and Mitch Robinson held several Tuesday night education sessions for Family Night at various Waterloo Ice House locations. This year, the sessions introduced the children to the basics of birding, with an identification game and a birdhouse building project. This program is hoped to continue in 2011.

d) Whole Foods Community Giving Day – Wild Basin was pleased to be part of Whole Food's annual Community Giving Day, where 5% of store profit goes to local non-profits. Staff was present at two store locations to educate the public about the BCP and Wild Basin, as well as representatives from fellow recipient the Hill Country Conservancy.

e) Austin Museum Day – Wild Basin participated in the city-wide free museum day. This year's main focus was a live insect display which was loaned from the Brackenridge Field Lab of the University of Texas by Dr. John Abbott, with additional specimens from Dr. Al Hook of St. Edwards. Several faculty and students from St. Edward's College of Natural Science volunteered assistance with the program. Wild Basin volunteer and Native Plant Society representative Yates Barreda led a native plant display, providing examples of invasive species, as well as gardening tips and information for the public. Diane Odegard from Bat Conservation International brought two bats, including a Mexican free-tail and a straw colored flying fox, with which she educated the public on bat conservation.

5) *Affiliations & Publication*

*Association of Nature Centers of America (ANCA)*
*Austin Astronomical Society*
*Austin Independent School District*
*Austin Museum Partnership*
*Bastrop Independent School District*
*Big Brothers Big Sisters*
*Boy Scouts*
*Camp Fire USA Balcones Council*
*Capital Area Council, Boy Scouts of America*

*Communities in Schools*
*Eanes Independent School District*
*Kids Are Kids*
*Lake Travis Independent School District*
*Lifetime Learning*
*Girl Scouts of Central Texas*
*Moody Foundation*
*Sammy's House*
*St. Edward's University*
*Tuktawa Foundation*

The preserve staff continued writing Wild Basin's column in our weekly local newspaper, the *Westlake Picayune*'s "Distinct" section. Each quarter, Wild Basin and St. Edwards Marketing staff produced the *Wild Ways* newsletter.

# LAND MANAGEMENT ACTIVITIES & PROGRAMS

*Land Management Vision and Charges* (a restatement for overview purposes)

Our vision is to preserve a piece of the Texas Hill country in its native condition and to educate students and the general public in Wild Basin's natural laboratory by:

- Managing and, where necessary, restoring a mosaic of habitats indigenous to Wild Basin, including, though not limited to: oak-juniper woodlands, riparian areas, semi-open grasslands and cedar breaks (please note that "juniper" and "cedar" both refer to the species: *Juniperus ashei*).
- Protecting native biodiversity
- Protecting habitat for the federally endangered Golden-cheeked warbler (GCWA)
- Protecting habitats to support threatened and rare plant and animal species
- Controlling non-native and invasive species
- Protecting soil profiles and unique geologic features
- Monitoring water quality relative to watershed inputs, runoff and erosion
- Protecting prehistoric and historic cultural sites
- Managing a trail system that presents a wild menagerie of flora and fauna, while impacting the preserve's biotic community and inherent beauty.

Charges to the Land Management Committee:

- Provide expert advice to the land management program. Review plans and recommend actions regarding proposed changes or projects that would result in alteration or possible adverse impacts to the preserve.
- Ensure that in all planning, decisions and implementation, the health and future of Wild Basin are held in the utmost consideration – ensure that we do no damage.

**Among the highlights of our 2010 Land Management activities and programs:**

Land Management volunteers donated over 700 hours of their time to the preserve's land management efforts in FY10, a great increase from FY09. The following summarizes these efforts as performed both by staff and volunteers:

*Habitat – Mosaic Assessment*
Since January 2007, the Land Management committee has assessed various habitat components to develop an overall preserve management plan for the future. So far, we have analyzed the following components: riparian zones/features, GCWA, Texas Madrone, vegetative communities, invasive/non-native plants, and several plant species of concern:

*Biological and other Surveys*

1. Golden-cheeked Warbler (Dendroica chrysoparia)
   Along with many missed efforts attributed to the disintegration of the preserve's staff during the

merger, we were unable to perform a census during the year, though a report from a 2009 presence/absence survey conducted by contract wildlife biologist Chris Masey is included. Between March 19th and April 26th 2009, he recorded sightings of eighty-nine (89) male GCWAs and 10 female GCWAs over thirty (30) hours, with 90% of the sightings within the preserve's bounds. Though territory level observations were not performed, based on observations and GPS points the potential exists for four territories within or near the preserve's bounds. Two of the four territories were located within the preserve, with the remaining two located within the City of Austin's adjacent Vireo Research Area.

2. Arthropods in GCWA Habitat

   Between May and August of 2010, Mike Quinn conducted an arthropod diversity survey at Wild Basin that followed up on his 2000 study of abundance and distribution of potential arthropod prey species in a typical GCWA habitat. They survey yielded some 162 species of arthropods, in 10 orders and in 58 families. All specimens were collected using a one-meter square beat sheet and a canvas sweep net, as well as one night of blacklighting. Specimens were taken alive to Quinn's home, where he photographed them before delivering to the Texas A&M University Insect Collection (TAMUIC) for curation. Due to a late start of the surveys and that the 167 species photographed only represent about 5% of the total entomofauna in western Travis County, Quinn considers this 2010's study a pilot project. His proposal for a 2011 BCP research permit has been approved by both Travis County and Wild Basin.
   For his full report, see Appendix.

3. Bee Creek Watershed
   a. Munson Project – In October, land manager Mitch Robinson noticed new fencing had been established along the Capital of TX Hwy entrance to the Munson Project building site, west of Wild Basin. Upon further inspection, it was made apparent that new activity had begun upon the property, and erosion control mechanisms were insufficient and non-existent. Paul Roberts, Environmental Inspector for the City of Austin, was made aware of the situation, and site inspection was later conducted, with representatives from both Wild Basin and Travis County, as well as the site owner Riverside Resources. Erosion compliance recommendations were issued to the property owner by the City, and a site visit by the land manager concluded that they were thoroughly met.
   b. Water Quality – After investigating the on-goings at the Munson Project site, Mitch Robinson was further compelled to enroll as a volunteer monitor for the Lower Colorado River Authority's (LCRA) Volunteer River Watch Network (VRWN). He has begun training and anticipates being certified by spring 2011.
      i. Student-Community Monitoring – St. Edward's aquatic invertebrate professor Dr. Osvaldo Hernandez has shown interest in working with Mitch and Land Management Committee member Sue Anderson, to help create a curriculum and monitoring schedule for St. Edward's students and local Austin school groups in 2011.

4. White-tailed Deer *(Odocoileus virginianus*)

   After missing a year due to internal staffing issues, Wild Basin completed its third deer survey in four years. The survey was conducted by land manager Mitch Robinson, and local wildlife biologist Kris Thorne. When comparing this year's data to 2007 and 2008, the coherent trend appears to be bucks increasing, does stable and fawns decreasing. In 2010, there were 3.67 acres

per deer; in 2008 there were 2.38 acres per deer, up from 2007 when there were 1.44 acres per deer. However, none of the years are close to the optimum carry capacity for deer in Travis County which is 15-20 acres per deer.

For the full white-tailed deer report, see Appendix.

a. Management – To date, Wild Basin has never performed population management for white-tailed deer. Yet, following the combined results of the 2007 and 2008 surveys, Texas Parks and Wildlife Dept. gave a permit for removal of deer from the preserve through Travis County's contract with Orion. In December, Travis County and Wild Basin received permission from the City of Austin to discharge firearms within city limits, and thus at Wild Basin. At the time of completing this report, Orion had plans to prepare for hunting in January 2011.

5. Texas Madrone (*Arbutus xalapensis*)
With the assistance of volunteers, we have continued GIS documentation on the population of eighteen (18) individual trees within the preserve. As the only Madrone species in Texas, it represents the easternmost population of the species within the U.S.
6. Shooting Star (*Dodecatheon meadia*)
In April 2007, Brad Oberle, a graduate student from Washington University in St. Louis, MO performed research on our Shooting Star population. He collected data and tissue samples under a BCP permit and preserve staff supervision. In January 2008, he reported to Rose Farmer at Travis County Natural Resources that his research had so far strongly indicated that our population may represent a new taxon/subspecies. A final determination will be forthcoming as the staff looks for future researchers.

*Public Outreach*

1. Balcones Canyonlands Preserve (BCP) – Again in FY10, Wild Basin preserve staff attended and participated in quarterly meetings of the BCP Land Managers informal group, and is furthermore scheduled to host the first meeting for 2011.
2. Bat Conservation International (BCI) – Wild Basin furthered its relationship with BCI, hosting their week long annual seminar at the EEC during August. Wild Basin has since offered and allowed meeting space for other BCI endeavors and requests. BCI similarly committed to assisting Wild Basin in a joint effort to inform the public about bat conservation, offering employees and resources for various education events, including Austin Museum Day.
3. Central Texas Trail Tamers (CTTT) – Due to reorganization within CTTT, there were no bi-monthly meetings held at Wild Basin, as in previous years. Yet, Wild Basin was happy to play host to CTTT holiday gathering this December and Mitch Robinson gave a brief recap of the preserve, where great support was evoked for 2011.
4. Bright Leaf Preserve – Wild Basin staff member Sally Scott currently serves as board president of the Friends of Bright Leaf Preserve.
5. Capital Area Master Naturalists (CAMN) – CAMN held their certification ceremony in January at Wild Basin, as well as part of their 2010 class's geology and soils section this February. Wild Basin staff member Sally Scott currently serves as program committee chair

for CAMN. Land manager Mitch Robinson also joined CAMN, graduated and completed his volunteer hours, and will become certified in February 2011.

6. Native Plant Society of Texas, Austin chapter – Again in FY10, Wild Basin hosted the regular monthly meetings of the Austin chapter of this statewide organization.
7. Boy Scouts of America, Austin council – Again in FY10, Scout leaders from the local Austin chapter held their monthly meetings at Wild Basin.

*Staff Training*

1. Texas Plant Conservation Conference – In September, director Monica Swartz and land manager Mitch Robinson attended the Texas Plant Conservation Conference held at the Ladybird Johnson Wildflower Center. Highlights included a presentation on *Streptanthusbracteatus* research ongoing at the Wild Basin's adjacent Vireo Preserve. There was talk of potentially reintroducing this species at Wild Basin for further research.

2. Black-capped Vireo Symposium – In October, director Monica Swartz and land manager Mitch Robinson attended the Black-capped Vireo Symposium hosted by Texas Parks and Wildlife.

3. Pesticide Applicator Licensing – In September, land manager Mitch Robinson passed the Texas Department of Agriculture's Commercial/Noncommercial General test and Laws and Regulations test to become a certified pesticide applicator in the state of Texas.
TDA Client No. 00447770, TDA License No. 0583001

Preserve staff and St. Edwards marketing wrote several articles for the local weekly newspaper, the *Westlake Picayune*. Land management staff members also wrote articles for the *Wild Ways* newsletter.

*Visitation*

In 2010, the preserve staff attempted to track the number of self-guided visitors, using two trailhead sign-in boxes located near the EEC and trailheads. While this is by no means a perfect record of every visitor that enters the preserve, it provides a baseline data for 3,322 recorded this year (2,349 adults and 973 children).

*Habitat Maintenance and Restoration*

Please note that land management activities use only native *Ashe juniper* for trail/erosion bars and native limestone for boulders, steps and gravel where needed on or off the preserve's trails. In necessary situations, crushed limestone is purchased and brought in from a rock yard. No old-growth junipers or other native hardwoods are cut down in the preserve for such uses. All trail maintenance and other land management activities avoid impact or disturbance of the preserve's cultural/archaeological resources.

1. Trail Maintenance
    a. General – Nearly all 3.2 miles of trails in the preserve received maintenance. (No trail maintenance was performed during the GCWA breeding season along trail sections where the warblers were sighted). Pruning was completed on all of the trails for accessibility, as well as around the building for fire prevention.

b. Signage – All trail signs and interpretive markers were improved or replaced as needed. The "Madrone Trail" was officially renamed "Yaupon Trail", as to dissuade the public from going off trail in search of the Madrone population. Maps and trail signs were correspondingly updated.
c. Arroyo Vista Trail – The Arroyo Vista trail was continually improved throughout the late winter and spring, as staff and volunteers made efforts to remove steep step-downs, reestablishing several gradients and allowing greater handicap accessibility. Large boulders were removed where feasible and mulch was added where needed.
d. Pond Trail remained closed for the fifth year due to silting problems at the retention pond.
e. Several visitor created paths were blocked with dead woody debris and/or cable-strings, including 'no entry' signage denoting habitat restoration areas. Most of these incursions occurred along and near Bee Creek, where trail demarcation had diminished due to stream flooding. As a result, staff and volunteers reestablished boundaries along Creek Trail by adding secured cedar trail-liners and large stones.
f. Trail Re-Routes – In September, work began on the long proposed re-route of Creek Trail from the upper creek crossing to Woodland Trail, due to erosive problems. Furthermore, a re-route was proposed for the western end of Yaupon Trail to avoid a dangerously steep stair-step gradient. At the suggestion of Travis County representatives, staff consulted Environmental Survey Consulting (ESC) and the Central Texas Trail Tamers (CTTT) for input. Representatives from ESC and CTTT approved both of the proposed re-routes. Each re-route included an additional educational overlook which will serve as a stop-over during lecture hikes and will also eventually posses a bench. Work on the Yaupon re-route was completed in December, opening the new trail and blocking off the old route. The Creek re-route is nearly complete, though the new trail has yet to open. Preserve staff and volunteers anticipate re-vegetating the old trails with native seed, preferably gathered on-site, and plan to seek further consultation as needed.

2. <u>Habitat Restoration</u>
   a. General – Preserve staff and volunteers continued to aggressively remove invasive, non-native species such as Japanese honeysuckle, bastard cabbage, Chinese tallow, chinaberry, *Pyracantha coccinea*, *Ligustrum sp.*, *Nandina domestica*, King Ranch bluestem, Johnson grass, *Vitex agnus-castur*, and Georgia cane, among others. Land manager Mitch Robinson became a certified pesticide applicator during FY10 and was able oversee volunteers and staff during pesticide application as they continued to suppress the few persistent invasive species. The Austin area NPSOT chapter also assisted in these efforts.
   b. Deer exclosures – In consultation with Texas Parks & Wildlife and Travis County biologists, preserve staff continued installing "deer exclosures" of hog wire/wire cages around stands of native trees and shrubs (such as shin oaks and Texas red oaks, excarpment black cherries, Texas persimmon, coralroot orchids and twisted-leaf yucca, among others) to prohibit excessive browse by deer and other animals.
      i. Proposed Large Exclosures – Land manager Mitch Robinson observed several large (greater than one acre) 8 ft. tall exclosures on City of Austin Water Quality Protection Lands, in anticipation of installing similar exclosures at Wild Basin.

Though the city exclosures are intended to protect sensitive springs, caves and recharge zones of the aquifer, they conversely have created pristine conditions for hardwood regeneration, and other vegetation excessively browsed by over-abundant deer populations. The Land Management Committee has approved installing similar 8' tall exclosures on the preserve to research how deer browse affects native trees and shrubs. Staff hopes to utilize Parkland Dedication Funds to pay for the endeavor.

c. Red Imported Fire Ants (*Solenopsis invicta*) – One nest of these invasive, non-native insects were found within the preserve's bounds this year. Typical of most infestations, the mound was in a well disturbed area along Woodland Trail. The mound was treated with β-Cyfluthrin, also known as Tempo-Ultra®, and marked with a flagged warning sign, informing hikers of the treated area.
d. Wildfire Defense – In consultation with Texas Forest Service Urban-Wild Lands Interface specialists and the Westlake Hills Fire Department, preserve staff continued performing recommended measures related to creating a defensible-space around the EEC and along the driveway perimeter by reducing nearby flammable vegetation. Curious as to what the regulations were for general fire prevention on preserve grounds, land manager Mitch Robinson contacted Cpt. Jeffery Solomon at the City of Austin Fire Department. Solomon stated that Austin currently had no regulations for managing wilderness areas and that discretion is left up to the private land owner.

*Affiliations and Publications*

Wild Basin Wilderness Preserve in FY10 continued to develop relationships and partnerships with like-minded groups and driven individuals. These relationships and partnerships were pursued to strengthen the preserve's land management and educational programs into perpetuity. They included, but are not limited to, the following:

*Austin Astronomical Society*
*Austin Butterfly Forum*
*Austin Gem & Mineral Society*
*Austin Geological Society*
*Balcones Canyonlands Conservation Project*
*Balcones Canyonlands Preserve Land Managers*
*Balcones Canyonlands National Wildlife Refuge*
*Capital Area Council, Boy Scouts of America*
*Capital Area Master Naturalists*
*City of Austin Water Utility Wildland Conservation Division*
*Girl Scouts of America, Lone Star Council*
*Native Plant Society of Texas, Austin Chapter*
*REI*
*Rob Roy Homeowners Association*
*Rob Roy on the Canyon Homeowners Association*
*Texas Commission for Environmental Quality*
*Texas Forest Service*

*Texas Ornithological Society*
*Texas Parks & Wildlife*
*Travis Audubon Society*
*Travis County Transportation & Natural Resources*
*Tuktawa Foundation*
*University of Texas Archaeological Research Laboratory*
*University of Texas Bureau of Economic Geology*
*University of Texas Nonvertebrate Paleontology Laboratory*
*Westlake Chamber of Commerce*
*Westlake Hills City Inspector*
*Westlake Hills Fire Department*
Westlake Picayune *newspaper*
*Whole Earth Provision Company*

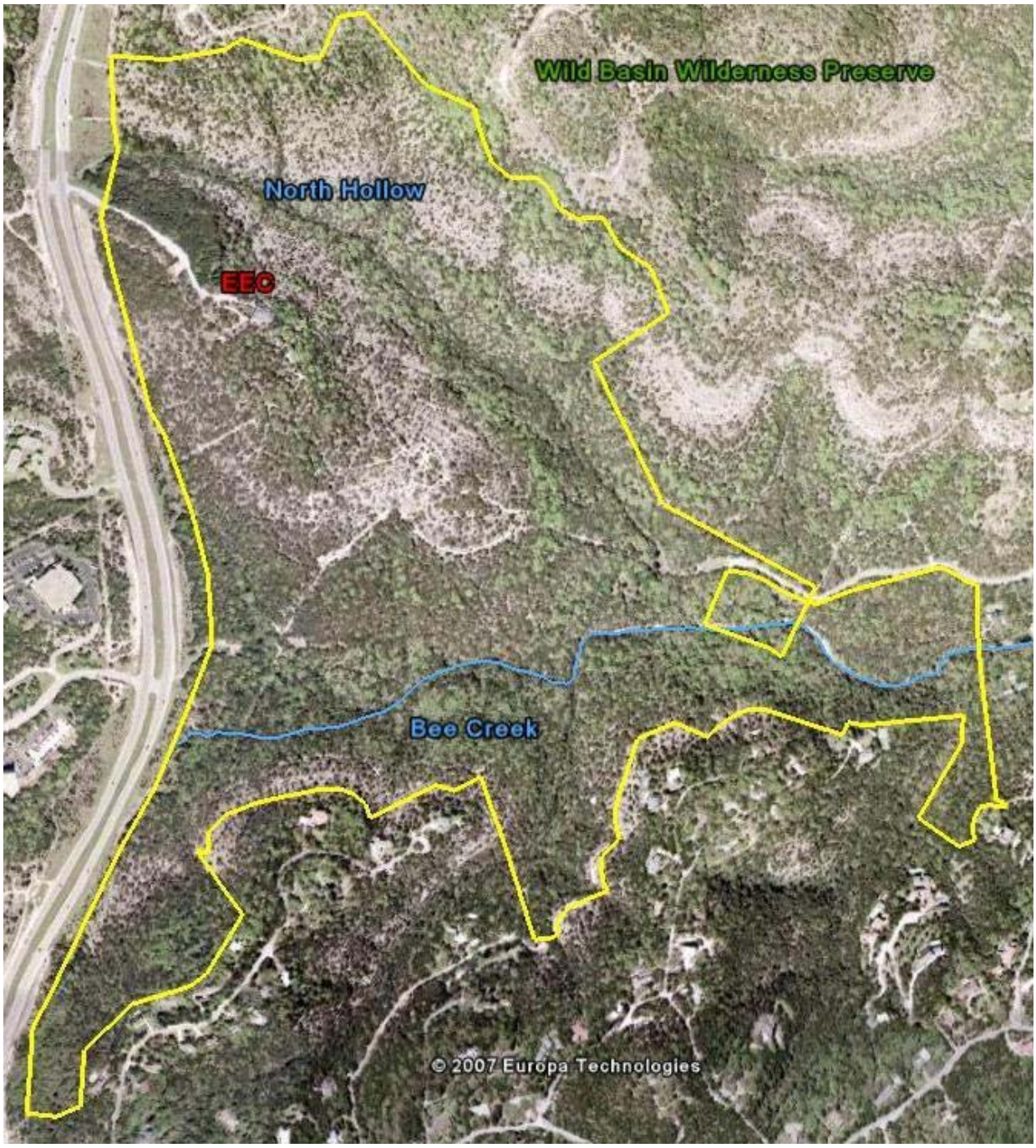
## STAFF AND COMMITTEES

Until the merger with St. Edwards University in October 2009, the Committee for Wild Basin Wilderness, Inc., was a registered, non-profit organization dedicated to promoting responsible environmental stewardship through education. At that time, St. Edwards obtained ownership of Wild Basin and assumed its duty to protect and maintain the Basin's urban wilderness, while promoting the importance of environmental education, research, conservation and preservation. The merger with St. Edwards has only further enabled and developed the opportunity for creating such programs and initiatives that will continue serving the fulfillment of this mission.

The Board of Directors of the Committee for Wild Basin Wilderness, Inc. dissolved in October 2009. Director Monica Swartz is currently assembling an advisory committee for Wild Basin through the University.

*Staff*
Dr. Monica Swartz – Executive Director
Mitch Robinson – Land Manager, Caretaker, Education Coordinator
Isabel Anheier – Administrative Coordinator
Sally Scott – Ranger (part-time)
Leslie Matthews – Ranger (part-time)
Genevieve Lung – Ranger (part-time)

*Land Management Committee*
Sally Davenport
Bill and Paula Kemp
Garry Child
Yates Barreda
Robert Hanson
Peggy Cochran
Sue Anderson
Dick Ward
Rose Farmer
Renee Fields
Monica Swartz
Mitch Robinson




**Aerial View of Wild Basin Wilderness Preserve**

# APPENDIX

*Survey of Arthropods in Typical Golden-cheeked Warbler Breeding Habitat in the Wild Basin Wilderness Preserve, Austin, TX*
*Wild Basin Deer Census 2010*

# Survey of arthropods in typical Golden-cheeked Warbler breeding habitat in the Wild Basin Wilderness Preserve, Austin, TX

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**November 24, 2010**

**Abstract –** Arthropod surveys conducted at Wild Basin Wilderness Preserve in 2010 yielded some 162 species of arthropods, in 10 Orders, and in 58 families. Primary Orders collected were Hemiptera (including Homoptera), Coleoptera and Lepidoptera. Images of all species were posted online (at BugGuide.net, Picasaweb.Google.com and TexasEnto.net). A master website (TexasEnto.net/Wild_Basin.html) was created with thumbnails of all species collected. The thumbnails link to BugGuide.net where each species' biological information (to the degree known to me) is posted.

**Introduction** – A recurring biological challenge is how to provide invertebrate identification resources that the general public as well as professional biologists can use in a self help manner given that there are nearly 30,000 insect species in Texas (E. Riley, pers. comm.), 24.7 mil people in Texas (U.S. Census Bureau, July 2009) but perhaps only 200 professional entomologists in Texas who have outreach as part of their job description. If one considers that insects are metamorphic, then the number of insect forms in Texas increases to well over 100,000.

There are complete field guides for the adult stages of only a few taxonomic groups of relatively low diversity in Texas such as butterflies, approximately 450 spp., and Odonates, 234 spp. as of 2009 (Abbott 2010). For some taxonomic groups such as Lepidoptera, it's actually the larval stage that is the most in terms of providing food for nestlings and herbivorous impact on the flora as most adults butterflies and moths only live for a few weeks and many species don't feed in the adult stage. Wagner's (2007) "Caterpillars of eastern North America" is reasonably complete for the larger caterpillars of eastern Texas, but it's a bit daunting for the uninitiated to page through over 1200 images for a caterpillar that may or may not be included therein.

Most wildlife biologists are trained in the identification and management of only a relatively small portion of the total biological diversity of the lands under their jurisdiction. Typically such training is limited to non-fish vertebrates and woody and herbaceous plants, yet invertebrates are the dominant primary and secondary consumers as well as the dominant pollinators of non-wind pollinated plants. Insects and other invertebrates also dominate the biota in terms of numbers of species, see Fig. 1.

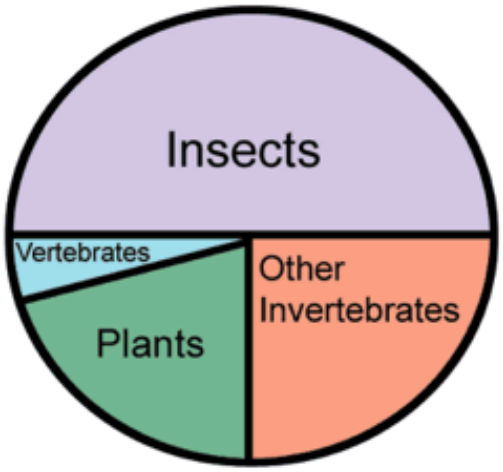



**Fig. 1**, Relative diversity of various taxonomic groups. (University of Sidney)

This conflict between biological training and conservation need is present even at Balcones Canyonlands Preserve which was established to protect two endangered insectivorous songbirds, seven federally-listed endangered karst invertebrates as well as approximately 25 other karst invertebrate species of concern (U.S. Fish and Wildlife Service 1996), yet neither Travis County Natural Resources nor the City of Austin has a single entomologist on staff.

Quinn's (2000) thesis was, in part, an attempt to close the gap between the knowledge of central Texas wildlife managers' and some of the entomofauna under their care, specifically the arthropods available as prey to the Golden-cheeked Warbler. Insects are in fact one of the primary driving forces of Neotropical songbird migration as their short-term seasonal spike in abundance, as exemplified by beetles in Fig. 2, provides fuel for increased activity necessitated by courtship, nest construction, egg production, nestling and fledgling feeding and territory defence.

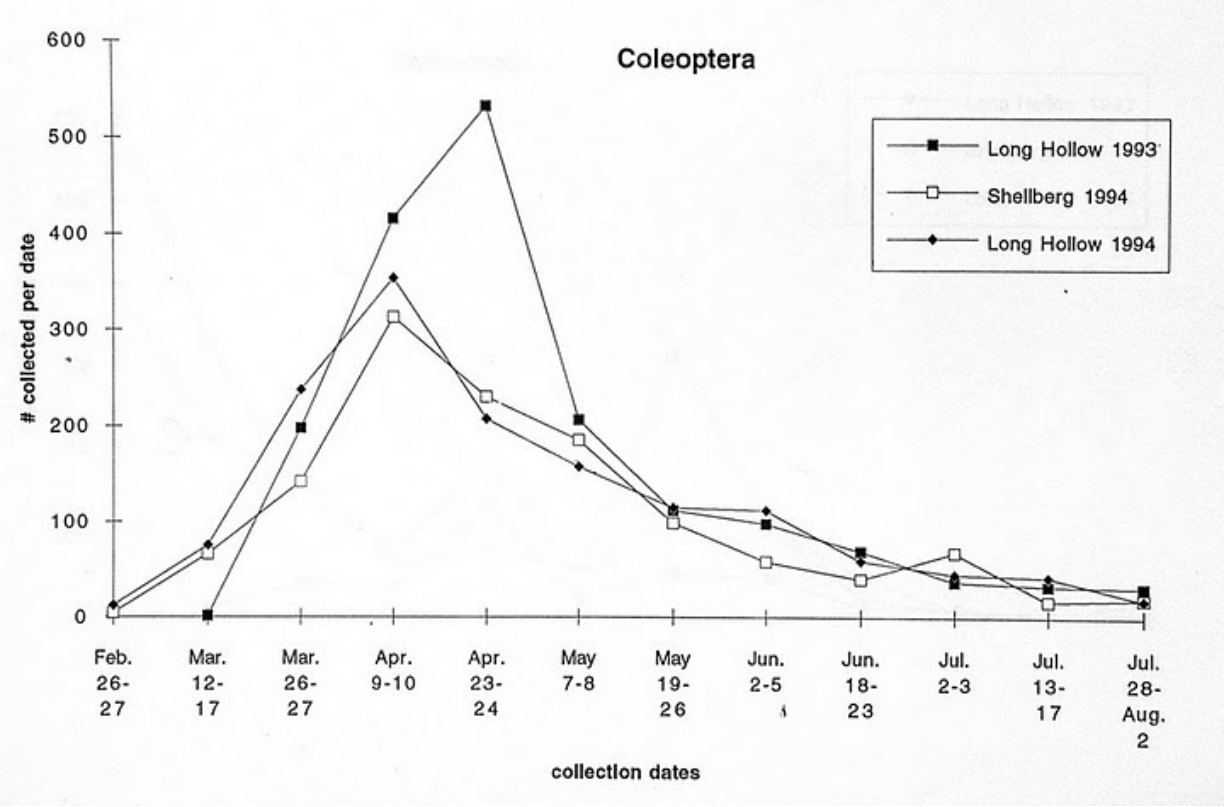



**Fig. 2**, Coleopteran abundance through time at two sites in western Travis Co., TX (Quinn 2000)

Over the course of two summers in western Travis County, Quinn (2000) collected some 50,000 specimens representing 1600 species that were quantitatively collected from trees in which Golden-cheeked Warblers preferentially forage (Beardmore 1994). Even though this required an *immense* amount of work, just providing the scientific names of 1600 species, their abundance through time and host preferences alone wasn't enough to provide the education needed.

Given the immense entomological diversity and the lack of suitable filed guides, what was required are identified photographs of the local entomofauna posted on-line in one place, something not practical before digital photography nor possible before the Internet.

**Materials and Methods** – Main collecting tools employed for surveys at Wild Basin Wilderness Preserve from May 6 to August 20 were a one-meter square beat sheet and a canvas sweep net. There was also one night of blacklighting.

The most common survey route consisted of sweeping the flowers at the Preserve entrance, including the Capital of Texas State Hwy 360 R.O.W. Then driving to the Environmental Education Center where I checked in. Form there I primarily employed the beat sheet in a loop along the outermost trails.

Specimens were brought home alive and photographed before being periodically delivered to

the Texas A&M University Insect Collection (TAMUIC) for curation. (The 50,000 specimens collected from western Travis Co. by Quinn (2000) are also curated at the TAMUIC.) Contact Ed Riley, Associate Curator, for access to all specimens: insects.tamu.edu/feature/museum/

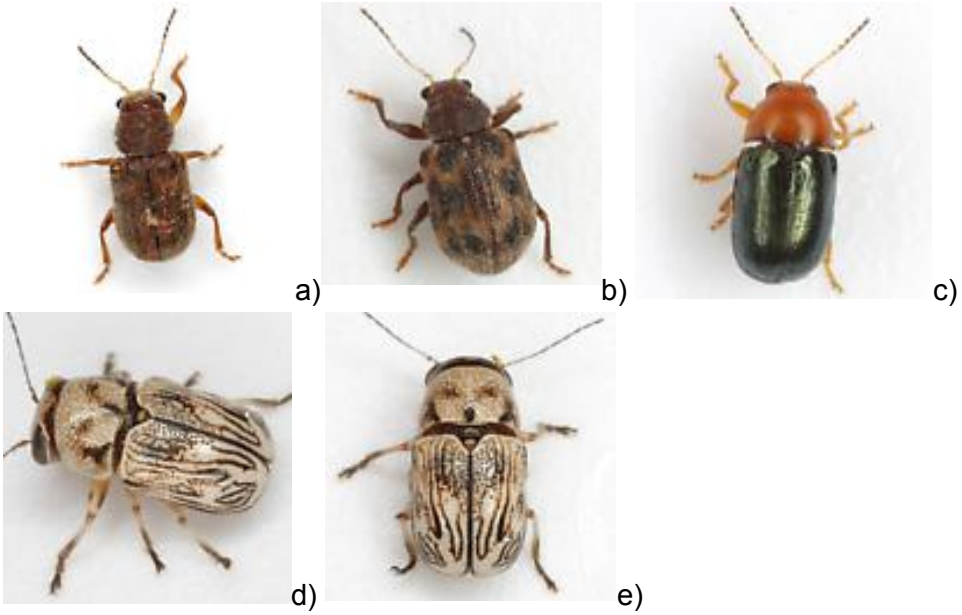
Photographs were almost exclusively shot using Canon's *seminal* MP-E 65mm f/2.8 1-5x Macro Lens (much of this project would not be practical without this unique lens), Canon's EOS 50D SLR Body, and Canon's Macro Ring Lite MR-14EX. For the occasional larger insect, Canon's EF 100mm f/2.8 Macro Lens was used.

The photographs were processed using Picasa photo editing software. The photographic techniques used here are discussed in greater detail in conjunction with intensive efforts to photograph the beetles of Texas: TexasEnto.net/Pic_Tech.html

My own expertise as well as that of experts from across the continent were utilized for the determinations of the photographs. The determiner should be acknowledged below each photo on Picasa and BugGuide. (In most cases, if no one is acknowledged, then I made the determination.)

**Results** - A total of 367 arthropod photographs of various life stages were posted on-line. Some 162 species of arthropods, in 10 orders, and in 58 families were collected primarily in the Orders of Hemiptera (*sensu lato*), Coleoptera and Lepidoptera. These orders were three of the five most abundant orders identified by Wharton et al. (1996) in 22 Golden-cheeked Warbler GI tracts that Pulich (1976) collected.

Species collected in 2010 at Wild Basin that are known to be, or thought to be undescribed species include the following chrysomelid beetles, Figs. 3-7:




**Figs. 3-7**, Undescribed species collected at Wild Basin, a) *Xanthonia* sp., b) *Xanthnia* sp., c) *Diachus* sp., d-e) *Pachybrachis* sp.

Photographs of every arthropod were posted in a Picasa folder labeled “Wild Basin” at Picasaweb.google.com/entomike/WildBasin. This site allows the thumbnail photos to be re-sized (larger or smaller) via a “slide bar” in the upper right.

The photos were also posted as thumbnails on my master site, Wild Basin Wilderness Preserve Invertebrate Survey: TexasEnto.net/Wild_Basin.html. Moving the mouse cursor (or “mousing”) over each thumbnail yields the scientific name of the invertebrate. Clicking on a thumbnail leads to a larger image on BugGuide.net. From there, one can access family-, genus- and species-level biological information.

In addition to the photographs, the other main product of this project were some 162 BugGuide web pages, or electronic fact sheets, that were created or enhanced for the species collected at Wild Basin. These pages can be accessed via the thumbnail photos posted at: TexasEnto.net/Wild_Basin.html. Once at a photo in BugGguide, click on the **Info**, **Images**, and **Data** tabs above the photo for more information.

Some of the more important data added to the Info pages on BugGuide is the species’ range, flight period, and plant associations. Depending on how entomologically well known a species is, the information accessed by clicking the **Info** tab can include some or all of the following: synonyms, etymology, number of species in the genus north of Mexico, size, identification tips, range, habitat, flight period, food, life cycle, remarks, similar species, references, and Internet links.

Flight periods and plant associations were added for many species from quantitative data previously collected in similar habitat in western Travis County by Quinn (2000). Other print references extensively consulted for the information posted to BugGuide are included in the primary literature section of this report.

**Discussion and Conclusions** – The numerous detailed close-up photographs and information pages produced by this project dovetail nicely with the Wild Basin Wilderness Preserve’s mission:

> “… to promote the importance of environmental education, research, conservation and preservation.”

This information is online where it can serve the needs of a wide range of scientists, wildlife managers, outreach specialists, as well as the general public.

Unfortunately, due to delays in getting permission to begin data collection until early May, the height of the collecting season was missed, see Fig. 2. I would like to carry out more research at Wild Basin Wilderness Preserve in the following yrs, but the amount of time available to volunteer towards this project in the future is unknown.

Future intended additions to this project include putting the 50,000 specimen database I compiled for my thesis (Quinn 2000) on-line and coupling it with images I shoot throughout central Texas.

Due to the late start, this project served as something of a pilot project as the 167 species photographed, in 10 Orders, and in 58 families, probably represent less than 5% of the total entomofauna in western Travis County. Quinn's (2000) thesis was the product of an small army of 20 student workers, tens of thousands of dollars of funding from TxDOT and the expertise of a significant portion of TAMU's Department of Entomology.

Given the late start, personal funding of several hundred dollars (not including camera and computer equipment) and the expertise of the on-line entomological community, I consider this project to be very successful, particularly as the results are on-line for all to access, unlike my thesis and database (Quinn 2000). If anyone knows of any potential funding sources, please let me know.

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# White-tailed Deer Census of Wild Basin Wilderness Area Using Modified Hahn Line Technique

Kirstine M. Thorne
December 2010

ABSTRACT

Census data for white-tailed deer (*Odocoileus virginianus*) utilizing Wild Basin Wilderness, Travis County, Texas was collected for three years (2007, 2008 and 2010). The estimated population density for the Wild Basin Wilderness herd has gone from 1 deer for every 1.44 acre in 2007 to 1 deer for every 3.67 acres. This calculations support the conclusion that the Wild Basin Preserve contains more deer than can be supported without degradation to the habitat and, which will negatively impact the health of the Wild Basin deer population.

## INTRODUCTION

The objective of the Deer Censuses of the Wild Basin Wilderness area is to evaluate the health of white-tailed deer (*Odocoileus virginianus*) herd that utilizes Wild Basin Wilderness in Travis County, Texas.

## METHOD

Before beginning a census, the number of acres along the census route upon which deer may be observed is calculated. The previously selected route is driven and at regular intervals (0.10 mile), the vehicle is stopped and the distances to the right and left at which a deer could be seen are measured in yards (line of sight or LOS). Line of sight is not measured across an open draw of gully and cannot exceed 250 yards.

The LOS distances are added together and then divided by the number of stops to provide an average width (in yards) of the census strip. Then, the average width is multiplied by the length of the census route (also in yards) giving the census area in square yards. This number is divided by 4,840 sq. yds per acre to arrive at a final number of acres censused.

There are three types of census methods that are recommended by Texas Parks and Wildlife: Hahn Line, Spotlight Census and Mobile Line (*Deer Census Techniques*, M Shult and B. Armstong, Texas Parks and Wildlife). A Modified Hahn Line was used:

1. The census route was laid out to follow the route used in 2007, with the exception of Wild Basin Road (east perimeter), which was omitted in order to concentrate on the central area of the wilderness area.
2. LOS measurements were taken at 0.10 mile intervals (as measured using the odometer on the research vehicle). An electronic rangefinder was used to measure the visibility distance. If a LOS was at a driveway or other non-habitat area, the vehicle rolled forward until a measurement could be taken.
3. The census route was surveyed five times by two researchers; the driver and the passenger.
4. Each of the censuses was conducted between August 9 and September 29.
5. A census was conducted only when winds were less than 20 miles per hour, relative humidity was less than 70 percent (as measured using a Kestrel® 3000 Pocket Weather ® Meter with Backlight) and cloud cover was less than 50 percent (as estimated by researchers).
6. The census began 30 minutes prior to official sunset.
7. The research vehicle did not exceed 10 miles per hour.
8. Whenever deer were spotted, the driver stopped the vehicle. The driver counted and identified the deer to the left of the vehicle and the passenger counted and identified the deer to the right of the vehicle.
9. All deer observed within the census area were recorded. Deer were not recorded if they were across a draw or gully.
10. Binoculars were used as necessary to identify sex and age. Spotlights were not used.
11. The Wild Basin Wilderness Land Manager notified local fire and police dispatch centers before each survey and provided the description and license plate of the research vehicle. The vehicle also had magnetic signs on the sides and back identifying it as a Wild Basin Wilderness survey vehicle.

## RESULTS

Wild Basin Wilderness totals 227 acres. The area surveyed in 2008 and 2010 totaled 69 acres. The linear distance covered added up to 3.5 miles with line of sight (LOS) measurements taken 35 times. The average LOS distance was 29 yards per side (for a total average LOS width of 58 yards).

In 2007, 13 census surveys were completed (August 9, 11, 13-15, 19-21, 24, 27, 30, September 5 and 7). A total of 540 deer were observed (50 bucks, 390 does, 100 fawns and no unknown.) Based on the first 100 deer that were counted, the buck : doe : fawn ratio in 2007 is 1 : 7.70 : 1.30.

In 2008, five census surveys were completed (September 4, 5, 6, 19 and 27, 2008). A total of 145 deer were observed (23 bucks, 96 does, 24 fawns and 2 unknown.) Based on the first 100 deer that were counted, the buck : doe : fawn ratio in 2008 is 1 : 3.76 : 1.12.

In 2010, five census surveys were completed (August 27 and September 12, 16, 28 and 29, 2010). A total of 94 deer were observed (17 bucks, 67 does, 10 fawns and no unknown.) Fewer than 100 deer were counted, so it was not possible to calculate a buck : doe : fawn ratio in 2010.

## DISCUSSION

The total number of deer observed in 2010 was less than that observed in 2007 and 2008 (94 in 2010, 145 in 2008 and 540 in 2007). The driven distance surveyed remained the same all three years (3.5 miles or 6160 yards), There were fewer survey days in 2008 and 2010 (5 in 2008 and 2010 versus 13 in 2007); there were fewer stops in 2008 (35 stops in 2008 and 2010 versus 43 stops in 2007); and the average line of sight measurement was significantly less in 2008 and 2010 that in 2007 (58 yards in 2008 and 2010 versus 122 yards in 2007). These changes lead to lower estimate of acres surveyed in 2008 and 2010 than in 2007 (69 acres in 2008 and 2010 versus 155 acres in 2007).

However, when the overall percent deer by sex is compared, the trend appears to be bucks increasing, does stable and fawns decreasing.

| **2010 Total** | Buck | Doe | Fawn | Unkn |
|---|---|---|---|---|
| **94** | 17 | 67 | 10 | 0 |
| Percent | 18% | 71% | 11% | 0% |

| **2008 Total** | Buck | Doe | Fawn | Unkn |
|---|---|---|---|---|
| **145** | 23 | 96 | 24 | 2 |
| Percent | 16% | 66% | 17% | 1% |

| 2007 Total | Buck | Doe | Fawn | Unkn |
|---|---|---|---|---|
| **540** | 50 | 390 | 100 | 0 |
| Percent | 9% | 72% | 19% | 0% |

Based on the first 100 deer recorded, sex ratios can be estimated for 2007 and 2008. Fewer than 100 deer were observed in 2010.

| 2008 | Buck | Doe | Fawn |
|---|---|---|---|
| **100** | 17 | 64 | 19 |
| Ratios | 1.00 | 3.76 | 1.12 |
| | 0.27 | 1.00 | 0.30 |
| | 0.89 | 3.37 | 1.00 |

| 2007 | Buck | Doe | Fawn |
|---|---|---|---|
| **100** | 10 | 77 | 13 |
| Ratios | 1.00 | 7.70 | 1.30 |
| | 0.13 | 1.00 | 0.17 |
| | 0.77 | 5.92 | 1.00 |

Based on the tables above, it appears that the number of does per buck decreased from 8 does per buck in 2007 to 4 does per buck in 2008 (number rounded) – a doubling in the number of bucks. At the same time, the number of fawns per doe has increased from 1 fawn for every 6 does to 1 fawn for every 3 does (number rounded) – also almost a doubling in the number of fawns.

In 2010, there were 3.67 acres per deer, in 2008 there were 2.38 acres per deer, up from 2007 when there were 1.44 acres per deer. However, none of the years are close to the optimum carry capacity for deer in Travis County which is 15 - 20 acres per deer (J. Kuhl in *Playing Whack-a-Deer at Pace Bend Park*, The Austin Chronicle, February 2, 2007).

## CONCLUSION

The preferred diet of white-tailed deer is forbs (broadleaf herbaceous plants) then browse (leaves and twigs of living woody plants). Grasses are less than 15% of a deer's diet (Armstrong, WE and EL Young; White-tailed Deer Management in the Texas Hill Country, Texas Parks and Wildlife, September 2000). When deer density is greater than one deer for every 10 to 20 acres, the habitat will be negatively impacted. The estimated density for the Wild Basin Wilderness herd has gone from 1 deer for every 1.44 acres in 2007 to 1 deer for every 3.67 acres in 2010.

A good ratio for a deer population is 1.2 - 1.5 does per buck. A healthy herd will have a ratio of 0.8 - 1.20 of fawns to does. (Armstrong, 2000) Based on 2007 and 2008 data, the ratio at Wild Basin is between 3.8 - 7.7 does per buck and between 0.2 - 0.3 fawns per doe. Both of these ratios support the conclusion that the Wild Basin Wilderness Area does not have a healthy white-tailed deer population.

WILD BASIN DEER CENSUS
TOTAL DEER OBSERVED
2010

Researchers: Kris Thorne and Mitch Robinson

| **Flintridge** | Buck | Doe | Fawn | Unkn |
|---|---|---|---|---|
| 0.0 - 0.1 | 0 | 0 | 0 | 0 |
| 0.1 - 0.2 | 6 | 16 | 6 | 0 |
| 0.2 - 0.3 | 0 | 0 | 0 | 0 |
| 0.3 - end | 0 | 3 | 0 | 0 |

| **Redbud between Flintridge and Yaupon Valley** | Buck | Doe | Fawn | Unkn |
|---|---|---|---|---|
| 0.0 - 0.1 | 0 | 2 | 0 | 0 |

| **Yaupon Valley** | Buck | Doe | Fawn | Unkn |
|---|---|---|---|---|
| 0.0 - 0.1 | 0 | 2 | 0 | 0 |
| 0.1 - 0.2 | 0 | 2 | 0 | 0 |
| 0.2 - 0.3 | 0 | 0 | 0 | 0 |
| 0.3 - 0.4 | 0 | 7 | 0 | 0 |
| 0.4 - end | 0 | 0 | 0 | 0 |

| **Old Wagon Road** | Buck | Doe | Fawn | Unkn |
|---|---|---|---|---|
| 0.0 - 0.1 | 0 | 0 | 0 | 0 |
| 0.1 - end | 0 | 2 | 0 | 0 |

| **Redbud between Old Wagon and Little Bend** | Buck | Doe | Fawn | Unkn |
|---|---|---|---|---|
| 0.0 - 0.1 | 0 | 23 | 4 | 0 |

| **Little Bend** | Buck | Doe | Fawn | Unkn |
|---|---|---|---|---|
| 0.0 - 0.1 | 0 | 0 | 0 | 0 |
| 0.1 - end | 0 | 0 | 0 | 0 |
| **Circle Ridge** (headed N from Little Bend intersection) | | | | |
| 0.0 - 0.1 | 0 | 3 | 0 | 0 |
| 0.1 - 0.2 | 0 | 4 | 0 | 0 |
| 0.2 - end | 0 | 0 | 0 | 0 |

| **Circle Ridge** (headed S from Little Bend intersection) | Buck | Doe | Fawn | Unkn |
|---|---|---|---|---|
| 0.0 - 0.1 | 0 | 0 | 0 | 0 |
| 0.1 - end | 0 | 0 | 0 | 0 |

| **Redbud between Little Bend and Wren Valley Cove** | Buck | Doe | Fawn | Unkn |
|---|---|---|---|---|
| 0.0 - 0.1 | 0 | 0 | 0 | 0 |
| 0.1 - end | 4 | 1 | 0 | 0 |

| **Wren Valley Cove** | Buck | Doe | Fawn | Unkn |
|---|---|---|---|---|
| 0.0 - 0.1 | 0 | 0 | 0 | 0 |
| 0.1 - end | 0 | 0 | 0 | 0 |

| **Kennan Drive** | Buck | Doe | Fawn | Unkn |
|---|---|---|---|---|
| 0.0 - 0.1 | 7 | 2 | 0 | 0 |
| 0.1 - end | 0 | 0 | 0 | 0 |

WILD BASIN DEER CENSUS
TOTAL DEER OBSERVED
2010

| **Loop 360** | Buck | Doe | Fawn | Unkn |
|---|---|---|---|---|
| 0.0 - 0.1 | 0 | 0 | 0 | 0 |
| 0.1 - 0.2 | 0 | 0 | 0 | 0 |
| 0.2 - 0.3 | 0 | 0 | 0 | 0 |
| 0.3 - 0.4 | 0 | 0 | 0 | 0 |
| 0.4 - 0.5 | 0 | 0 | 0 | 0 |
| 0.5 - 0.6 | 0 | 0 | 0 | 0 |
| 0.6 - 0.7 | 0 | 0 | 0 | 0 |
| 0.7 - 0.8 | 0 | 0 | 0 | 0 |
| 0.8 - end | 0 | 0 | 0 | 0 |

**SUMMARY**

| **Total** | Buck | Doe | Fawn | Unkn |
|---|---|---|---|---|
| **94** | 17 | 67 | 10 | 0 |
| Percent | 18% | 71% | 11% | 0% |

| **Average of 5 surveys** | Buck | Doe | Fawn | Unkn |
|---|---|---|---|---|
| **19** | 3 | 13 | 2 | 0 |

| **First 100** | Buck | Doe | Fawn |
|---|---|---|---|
| **NA** | | | |
| Ratios | | | |