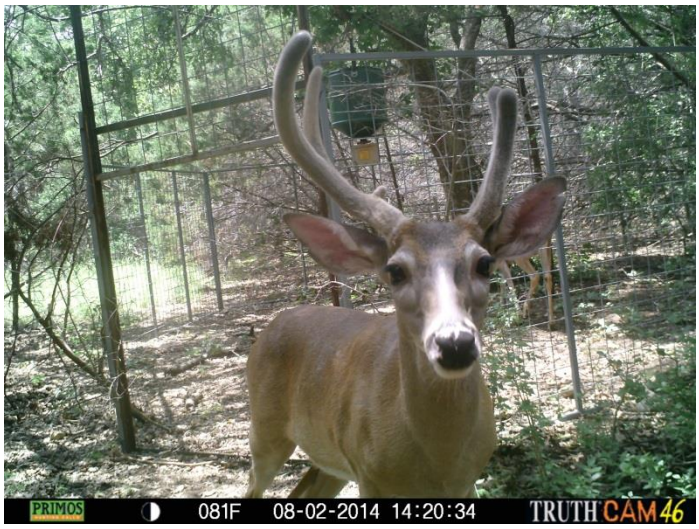
FY 2014 Summary of

Wildlife and Plant Management Activities on

Travis County's Balcones Canyonlands Preserve and Select Parks



Deer checking out the game camera on the Ribelin Tract

Travis County
Department of Transportation and Natural Resources
Natural Resources and Environmental Quality Division

1 October 2013 – 30 September 2014

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INTRODUCTION

On May 2, 1996, the City of Austin and Travis County were jointly issued a U.S. Fish and Wildlife Service (USFWS) regional permit (the Permit) referred to as the Balcones Canyonlands Conservation Plan (BCCP) that allows incidental "take" of eight locally occurring endangered species under Section 10(a)1(b) of the Endangered Species Act (U. S. Fish and Wildlife Service 1996a). The thirty-year permit covers Travis County outside of proposed Preserve boundaries identified in the Habitat Conservation Plan and Final Environmental Impact Statement (HCP/FEIS) (U. S. Fish and Wildlife Service, 1996b). The permit also covers incidental take of 27 species of concern should any become listed as threatened or endangered during the life of the Permit. The City of Austin and Travis County (the Permit Holders) are required by the terms of the Permit to assemble and manage a minimum of 30,428 acres of suitable habitat for the benefit of these species. This series of protected lands is known as the Balcones Canyonlands Preserve (BCP or Preserve).

The City of Austin and Travis County also agreed to protect and manage populations of unique or endemic plant species of concern found within preserve boundaries, as well as on other city- and county-managed properties. Plant species of concern listed in the permit include canyon mock-orange *(Philadelphus ernestii)* and Texabama croton (*Croton alabamensis var. texensis*). Bracted twistflower (*Streptanthus bracteatus*) and Texas amorpha *(Amorpha roemerana)* were discussed in the HCP/FEIS, but were not listed in the BCCP Permit (U. S. Fish and Wildlife Service 1996a and 1996b). However, because these two species are rare, they are afforded the same protection as plants listed under the permit.

The negative impacts of non-native, nuisance and invasive species have been well documented throughout Texas and around the world. The BCP Land Management Plan (2007), approved by the USFWS, directs management of the BCP, including control of non-native, nuisance and invasive species.

Beginning in 2002 and updated annually, a *Travis County Parks and Preserves Wildlife Management Permit* is drafted which serves as a general guideline for Travis County staff to direct management of nuisance wildlife in response to the potential human health and safety, economic, and environmental impacts. The purpose of this permit is to recognize that threats may be posed by these species, outline appropriate management strategies, and provide management authority to implement measures to minimize these threats. The guidelines in this permit are intended to provide direction to managers for lands throughout the County system and are anticipated to represent a continually updated and flexible set of directives that are able to meet the needs of a changing environment. As new species or conditions are discovered, this information

will be incorporated to provide current status of the conditions and challenges faced by County Park and Preserve land managers.

The Texas Parks and Wildlife Department (TPWD) define exotic animals as herbivorous single-hoofed or cloven-hoofed mammals (ungulates) that are not indigenous or native to Texas, including animals from the deer, antelope, and swine families. Ranch and game managers throughout Texas have introduced such animals for various reasons. Animals found on Travis County managed portions of the BCP meeting the definition of exotic include Russian boars, which freely interbreed with feral hogs and auodads.

Non-native animals are species not indigenous to Texas, but which fall outside of the TPWD definition of “exotic”. Examples of non-native animal species in Travis County include house sparrows, European starlings, red-imported fire ants, and rock doves.

Feral animals are wild populations of otherwise domesticated species that have through release or escape reverted to a wild condition. Feral species found in Travis County include house cats, dogs, goats, and hogs.

Nuisance animals are native species that present threats to human health and safety, County property, or other natural resources due to population densities, by providing a disease reservoir or other threat. Nuisance animals may include species such as brown-headed cowbirds, coyotes, opossum, and white-tailed deer.

The BCP Land Management Plan (2007) defines non-native plants as species that were introduced where they did not evolve and do not naturally occur. These introduced species often thrive in the absence of their natural predators, diseases, competitors, and parasites. Non-native plant species can be detrimental to BCP properties by overcrowding and outcompeting native species that are important components to endangered species habitat, as well as reducing overall plant diversity in infested areas.

In Fiscal Year 2014 (FY14, Oct. 1-Sept. 30), wildlife management activities on Travis County-managed portions of the BCP focused on five species: brown-headed cowbirds (*Molothrus ater*), feral hogs (*Sus scrofa*), white-tailed deer (*Odocoileus virginianus*), Tawny crazy ant (*Nylanderia fulva),* and red imported fire ants (*Solenopsis invicta*). Monitoring and control of cowbirds, hogs, and deer are described in their respective sections in this report. Fire ant and Tawny crazy ant control efforts are described in *Appendix H: Balcones Canyonlands Preserve Karst Monitoring and Management FY2014 Annual Report*.

In FY14, plant management activities focused on survey and control of eleven species of non-native plants, which are described in the *Plant Species of Concern Management* and *Non-Native Plant Management* sections of this report.

BROWN-HEADED COWBIRDS

Introduction

In addition to many other avian hosts, brown-headed cowbirds (cowbird) parasitize the nests of two Central Texas endangered avian species; the black-capped vireo (*Vireo atricapilla*) and golden-cheeked warbler (*Setophaga chrysoparia*). Cowbird trapping has been the subject of considerable research and management effort and is believed to be an important technique for the conservation of both species. At Fort Hood, cowbird trapping has been credited for drastically reducing parasitism rates of black-capped vireos from 91% before cowbird management to below 20% after a cowbird management program was implemented. Fort Hood currently meets local and regional recovery goals for the black-capped vireo and attributes this success to cowbird management (Kostecke et al. 2005).

This report summarizes the results of the FY14 Travis County cowbird trapping program. Four traps were operated within, or near, Travis County's BCP properties: the Hamilton Pool Preserve (HP), the Nootsie tract, and on private land adjacent to the Toops and Vireo Ridge tracts. A fifth trap was operated at Travis County's Milton Reimers Ranch County Park.

Background

Cowbird trapping was previously conducted in western Travis County by Espey Huston and Associates and DLS Associates in 1989 and Texas Animal and Damage Control from 1990-1996. In 1997, Travis County Natural Resources Department initiated its own cowbird trapping program. This program was co-managed with the City of Austin until 2001, at which time the City of Austin began operating a program independently. Since 1997, trap locations have been added or removed according to trap success or failure and access availability. Trapping did not occur in 1998 due to staff shortage.

Methods

Cowbird trapping in FY14 was conducted exclusively in the western half of the county. Travis County operated two mega traps (16'x16') and three metal hybrid traps (6'x 8'), two of which were on loan from TPWD. The mega traps were located at HP and on private property adjacent to the Vireo Ridge tract on FM 2769 (hereafter, FM 2769 trap). The three hybrid traps were operated at Milton Reimers Ranch County Park (hereafter, Reimers trap), within the Nootsie tract (hereafter, Nootsie trap), and on private property adjacent to the Toops tract (hereafter, Toops trap).

A group of decoy birds (11 males, 4 females) were acquired from the Balcones Canyonlands National Wildlife Refuge at the end of March allowing the Nootsie trap to

open on March 20, 2014. The remaining traps were opened on March 28th (Toops), March 31st (2769), and April 1st (HP and Reimers traps) once additional bait birds were captured in the Nootsie trap. Table 1 summarizes the FY14 cowbird trapping schedule and initial stocking numbers of decoy birds.

Table 1. FY14 Cowbird trap locations, trapping period dates, and initial cowbird stocking numbers.

Trap	Date Opened	Date Closed	Initial Stocking Numbers
Nootsie	March 20	June 10	11 Males, 4 Females
Toops	March 28	June 6	11 Males, 6 Female
FM 2769	March 31	May 29	7 Males, 5 Females
Reimers	April 1	June 7	4 Males, 2 Females
HP	April 1	June 7	8 Males, 3 Females

Traps were inspected and maintained at least three times per week throughout the season. Water and feed (whole milo mixed with wild bird seed) were refreshed on each visit. To offset the impact of rising air temperatures on bird health and survivability, plastic water baths and shade cloth were added to the traps. Some traps were reinforced with poultry fencing along the outer base edges to prevent digging by predators attempting to gain access. Non-target species found in traps were removed unharmed unless otherwise noted (Table 2). Cowbirds were euthanized by placing them in a container with carbon dioxide gas following TPWD protocol (TPWD No Date).

Table 2. FY14 Non-target species found in Travis County operated traps.

Common Name	Species Name	Trap(s)	Comments
Bronzed cowbird	*Moluthrus aeneus*	FM, NT, HP	2 males released, 2 females euthanized
Yellow-headed Blackbird	*Xanthocephalus xanthocephalus*	TP	1 released (female)
Northern Cardinal	*Cardinalis cardinalis*	NT, HP	1 deceased, 1 released

RR= Reimers HP= Hamilton Pool Preserve NT= Nootsie TP= Toops FM = FM 2769

Results and Discussion

In FY14, a total of 103 males, 44 female, and one juvenile cowbird were captured. The total of 148 cowbirds captured this year was slightly higher than the previous year when 136 cowbirds were trapped. Table 3 summarizes cowbird captures at each trap by class (male, female, and juvenile), month, and trap efficiency (or capture rate) during the 2014 trapping season. Trap efficiency is calculated by dividing the number of females captured by the number of days in operation (x 100).

Table 3. Results of the FY14 Travis County cowbird trapping season.

Trap	Month	Days in Operation	Males captured	Females captured	Juveniles Captured	Total Captured	Trap Efficiency %
FM 2769	March	1	0	0	0	0	0.00
	April	30	4	4	0	8	12.90
	May	29	4	0	0	4	0.00
	Total	60	8	4	0	12	**6.67**
Hamilton Pool	April	*	*	*	*	*	*
	May	23	6	4	0	10	17.39
	June	7	3	0	0	3	0.00
	Total	30	9	4	0	13	**13.33**
Nootsie	March	11	8	8	0	16	72.72
	April	30	24	9	0	33	21.95
	May	31	14	2	0	16	2.78
	June	10	2	2	0	4	2.44
	Total	82	48	21	0	69	**25.60**
Reimers	April	30	6	10	0	16	33.33
	May	31	3	1	0	4	1.64
	June	7	2	0	1	3	0.00
	Total	68	11	11	1	23	**16.18**
Toops	March	4	6	2	0	8	50.00
	April	30	10	1	0	11	2.94
	May	31	6	1	0	7	1.54
	June	6	5	0	0	5	0.00
	Total	71	27	4	0	31	**5.63**
	Grand Totals	**311**	**103**	**44**	**1**	**148**	**14.15**

**HP Trap was operated from April 1st through May 5th and 9 males and 16 females were captured during this time. However on May 5th there was a breach in the trap and all but 2 males and 1 female were lost.*

Travis County Natural Resources maintains a minimum goal of 20% trap efficiency for the program. In FY14 overall trapping efficiency was at 14.15%, which is the second lowest success rate since the inception of this program. The average efficiency rate from 2001-2013 was 35.81%. While most traps performed slightly better than FY13 numbers, they still were well below overall expectations and one (Toops) had its lowest trapping rate on record. The total amount of cowbirds removed (n=148) was far below the average over the last eight years (n=327.9). Only one trap met, or exceeded the goal of a 20% efficiency rate.

In general, Travis County-managed Preserve lands have few optimal trapping locations, particularly those adjacent to livestock or agricultural areas that serve as feeding and congregation sites for cowbirds. As the conversion of farms and ranches into subdivisions and other suburban development continues in much of western Travis County, easily accessible off-preserve areas that may concentrate cowbird numbers are becoming uncommon. With this change in land use, cowbird numbers generally have diminished on parts of the BCP, as was clearly seen in FY13 and again in FY14. It is worth noting that no instances of parasitism were noted on any avian species during the 2014 field season.

Trap sites in and around the other County-managed BCP properties are limited, but as new tracts are acquired, additional, more suitable trap sites may be made available. Staff will continue monitoring the presence of cowbirds in endangered avian species habitat each season and adjust trap placement when necessary.

FERAL HOGS

Introduction

The BCP Land Management Plan (2007) directs land managers to control populations of feral hogs in order to minimize negative impacts to the native wildlife protected within the preserve system. Feral hogs degrade wildlife habitat and compete directly with native wildlife for food. Hogs are omnivorous, primarily consuming vegetation, mast, roots and tubers, and to a lesser degree a wide range of animal species including invertebrates, reptiles, amphibians, small mammals and birds (Davis 1994, Hellgren 1997). Their rooting habits create severely disturbed areas, which may lead to a localized shift in plant succession and increase the potential for soil erosion (Davis 1994). Feral hogs also destabilize wetland areas, springs, creeks and other riparian areas through excessive rooting and wallowing. Their threat to humans and livestock through the spread of disease has also been documented (Miller 1997, U.S. Department of Agriculture 1992). Producing two litters a year, with an average litter size

of four to eight piglets, hog numbers can expand rapidly if left unmanaged (Texas Wildlife Damage Management Service 1998).

Background

Travis County Natural Resources is responsible for the management of non-native wildlife on County-owned and managed portions of the BCP. Staff uses the discovery of wallows, rooted areas, rubs, well-worn trails, tracks, and first-hand encounters in the field to identify where hog populations occur within the BCP. Travis County BCP tracts that often show signs of significant feral hog populations include the Canyon Vista, Ribelin, and Concordia tracts as well as several tracts within the Jollyville Unit. In 2008, feral hogs were also documented within Hamilton Pool Preserve for the first time since the property has been owned and managed by Travis County (since 1985), and have since caused considerable damage to habitat. In FY14 there was increased hog activity observed at the Ribelin, Sam Hamilton East, Concordia, and Woody Hollow tracts.

Some sections of the Steiner Ranch Preserve showed signs of feral hogs in previous years, but this area benefited from independent hog-trapping programs conducted by the managers of the Steiner Ranch neighborhood as well as the efforts by the City of Austin on the adjacent BCP Cortaña tract. Feral hog damage has not been evident in the County-managed portions of Steiner Ranch for several years.

In FY14, Travis County continued to coordinate efforts with surrounding landowners and the City of Austin to implement management actions on and adjacent to Travis County BCP tracts. In 2008, an Interlocal Cooperation Agreement was entered into between Travis County and Texas AgriLife Extension Service (AgriLife) to conduct an operational wildlife damage management program for the protection of property from damage caused by wildlife and for the protection of human health and safety from wildlife-related diseases in Travis County. Covering all the unincorporated areas of Travis County and the City of Austin, this agreement provides a way of addressing the occasional nuisance wildlife complaints (most commonly feral hogs and coyotes) from Preserve neighbors. In FY14, AgriLife continued to address nuisance wildlife complaints but was not actively managing hogs on Travis County properties.

In the fall/winter of FY14, Travis County contracted the services of Orion Research and Wildlife Management Services (Orion) to provide deer and feral hog management services on select Travis County properties. Travis County also utilized a contracted volunteer hog-trapper through FY14 to deal with extensive hog damage at Webberville Park. The trapper operated a personal trap on private land adjacent to the park, and served as a shooter for the Webberville Park hog trap. A hog trapping protocol was developed in December 2008 to facilitate any Travis County operated feral hog trapping efforts. It is updated regularly. This protocol is used to guide activities of both staff and

contracted hog trappers and addresses trapping guidelines as well as trapped animal management.

Methods

Although Travis County staff and Orion were authorized to shoot feral hogs while engaged in deer management actions, no hogs were taken during deer harvest activities in FY14. Travis County Natural Resources staff successfully baited areas of high hog activity on the Ribelin, Sam Hamilton East, and Woody Hollow tracts. Travis County Natural Resources staff operated one stock panel trap on the Ribelin tract from March-June 2014, one stock panel trap on the Sam Hamilton tract from May to October 2014, and one circular box trap on the Woody Hollow tract from April to August 2014. Travis County Park staff operated one stock panel trap at Milton Reimers Ranch County Park (Reimers Park) from October to December 2013 and in January and April of 2014. Park staff also operated a stock panel trap at Webberville Park off and on throughout FY14.

Standard operation for Travis County staff included setting and baiting stock panel traps with dry or soured corn and occasionally rotten fruit and vegetables. Traps were routinely baited and monitored with the aid of motion-sensing cameras. Utilizing cameras enabled managers to set the trap at the most beneficial time to maximize success. Trapped hogs were humanely dispatched and carcasses were taken to be composted. Traps were operated until signs of hog activity in the area subsided, at which point it was closed.

Results and Discussion

During FY14, Travis County staff successfully dispatched 39 hogs. Thirty-six of these hogs were trapped, while 3 were shot opportunistically by a Park Ranger. Harvested hogs included 20 adults (11 males and 9 females) and 19 juveniles (5 males, 7 females, and 7 unreported). Travis County was much more effective at trapping and dispatching hogs in FY14 compared to 0 hogs dispatched in FY13. New traps as well as increased overall trapping effort led to this increase. Trapping will carry on in FY15 with a hope of continued success.

WHITE-TAILED DEER

Introduction

The BCP Land Management Plan (2007) directs that white-tailed deer populations be monitored and maintained at a level that allows for successful recruitment of plant species which make up habitat supporting the species listed in the permit (e.g. the golden-cheeked warbler and the black-capped vireo). Central Texas currently has the

highest population density of white-tailed deer in the United States (Richards 2000). Recent research indicating that little or no regeneration of vital habitat components is occurring on some Preserve tracts (Russell and Fowler, 1999; Russell and Fowler 2002; Russell et. al. 2001) has generated an effort to design and implement a white-tailed deer population monitoring and control program for Travis County BCP properties.

Travis County staff operated a deer management program utilizing lethal harvest from the FY03 through the FY08 hunting seasons on the Jollyville Unit of the BCP. Beginning in FY09 and continuing through FY14, Travis County contracted the services of Orion to manage the population by lethal harvest on the Jollyville Unit and several other BCP tracts.

Under the terms and condition of the BCCP, Travis County is also charged with managing populations of GCWAs and Texabama croton (*Croton alabamensis var. texensis*) that occur at Pace Bend Park. Texabama croton is a plant that is commonly damaged from rubbing by deer. Under the guidance and assistance of TPWD and in cooperation with the Lower Colorado River Authority (LCRA), Travis County staff has collected deer population data at Pace Bend Park since FY97. TPWD permitted various Wildlife Co-ops, under Travis County guidance, to conduct trap-and-relocation programs (1997-2001) in an attempt to manage the population in the park. However, deer densities after five consecutive years of this strategy continued to exceed healthy and sustainable levels. From 2002 to the present, Travis County has utilized lethal harvest to manage deer at Pace Bend Park.

Methods

Travis County staff and volunteers conducted nighttime spot-light deer surveys during the fall of FY14 on the Jollyville Unit of the BCP, Hamilton Pool Preserve/Reimers Park/ Pogue Springs Preserve, and Pace Bend Park. Due to limitations in conducting reliable censuses on other less accessible BCP tracts, Travis County biologists also utilize data collected by neighboring partner agencies on their properties (City of Austin and LCRA) for other County tracts (Volente, Lucas, Ribelin, Webb) when available. Travis County staff, with assistance from a TPWD Technical Guidance Biologist, analyzed the survey data to determine deer population estimates and make harvest recommendations.

TPWD currently recommends population levels in the Texas Hill Country of one deer to 15-20 acres for effective songbird habitat management, and some research indicates population targets of one deer per 30 to 40 acres for successful hardwood forest regeneration. The goal on the BCP is to have a deer density of about one deer to 15-30 acres. At Pace Bend Park, the deer population goal is set at one deer to 12-15 acres in order to balance the needs of protecting habitat with the desire of the public to observe white-tailed deer in a park setting.

During FY14, deer management was supplied through the contracted services of Orion. This season marked the fifth year that Orion was contracted to harvest deer for Travis County. Orion harvested on the BCP, at Pace Bend Park and at Reimers Park. Orion operates under a TPWD Scientific Permit.

During the deer harvests, animal removal was as discreet and humane as possible. Any animals taken were dispatched in a swift, effective, and humane manner. The safety of the public and staff was Travis County's top priority as efforts focused on effective management of the deer population. Arrangements were made to donate all venison to a local charity, Caritas of Austin, for use in providing nutritious meals for needy Travis County citizens.

Results and Discussion

Survey data gathered in September and October 2013 were used to estimate deer densities and determine harvest recommendations for the FY14 harvest season (October 2013 to February 2014). Census results for Pace Bend Park estimated a deer density of one deer per 13.9 acres (Table 4). This density is lower than the average acres per deer (7.0) over the previous seven years (2007-2013) and represents an improvement from the 3.8 average observed from 1997-2006. Census results for the Jollyville Unit, which estimated one deer per 36.4 acres, indicate one of the lowest deer densities since the inception of the management program (Table 5). At Hamilton Pool Preserve/Reimers Ranch/Pogue Springs Preserve the deer density was 14.8 acres per deer.

A total of 32 deer were safely and humanely removed from Pace Bend Park by Orion (Table 4). A total of 12 deer were removed by Orion from the BCP Jollyville Unit and an additional 32 deer were removed off other preserve tracts (Table 5). Since implementing the lethal cull strategy on these tracts in FY03, the total population on the Jollyville Unit has been reduced and the number of acres per deer has improved dramatically (Table 5). Although the deer harvest has likely impacted the Jollyville Unit deer population, it should be noted that the current prolonged drought and increased habitat fragmentation are likely playing a role.

Overall population trends at Pace Bend Park and on the BCP have begun to reflect the harvest management strategies implemented by Travis County. The population trend data indicate that the lethal cull strategy has successfully increased the total acreage available per deer. The lethal harvest strategy currently in place since 2003 has been demonstrated to be an effective management option to control deer populations.

In addition to successfully managing the overpopulation of deer, this program has also generated significant public support for County management efforts. This support is

largely due to the donation of processed ground venison to Caritas of Austin. In FY14, about 4,520 pounds of venison was given to Caritas which provided meat for approximately 18,080 meals, bringing the total that Travis County has donated over the years to approximately 16.5 tons (32,920 lbs.) of meat. This meat provided high quality, low fat protein to needy local residents.

Travis County staff will continue to monitor deer populations on Travis County-managed land and work to implement TPWD recommendations concerning appropriate management strategies and harvest levels. Annual censuses allow managers to evaluate the effectiveness of management strategies, determine whether desired deer densities have been attained, and calculate future harvest recommendations. As long as census data indicate that deer herds exceed the carrying capacity of County preserve or parklands, deer management should continue on select Travis County Parks and the tracts of the BCP.

Table 4. White-tailed deer population trends at Pace Bend Park FY97 through FY14.

YEAR	AC/ DEER	ESTIMATED COMPOSITION (BUCK/DOE/FAWN)	ESTIMATED POPULATION	TOTAL REMOVED
FY1997	4.9	70/117/57	244	85
FY1998	3.7	40/167/63	270	80
FY1999	3.8	53/156/55	264	111
FY2000	4.5	61/119/45	225	92
FY2001	5.7	29/97/28	326	19
FY2002	3.6	61/86/43	519	0
FY2003	2.7	29/139/30	464	18
FY2004	3.6	110/232/83	425	74
FY2005	2.5	154/329/133	616	91
FY2006	3.4	183/181/79	443	96
FY2007	6.2	86/134/25	245	59
FY2008	8.9	61/91/20	172	34
FY2009	6.1	48/135/67	250	41
FY2010	5.0	56/188/65	307	61
FY2011	6.9	56/108/55	219	89
FY2012	6.6	44/150/37	231	65
FY2013	9.6	N/A	N/A	43
FY2014	13.9	23/74/12	109	32

Table 5. White-tailed deer population trends on the BCP Jollyville Unit FY03 through FY14.

YEAR	AC/ DEER	ESTIMATED COMPOSITION (BUCK/DOE/FAWN)	ESTIMATED POPULATION	TOTAL REMOVED
FY03	5.6	46/162/82	290	9
FY04	5.5	61/158/78	297	12
FY05	7.2	35/127/63	225	22
FY06	9.6	33/103/33	169	20
FY07	10.0	44/142/55	241	12
FY08	9.1	29/122/46	197	26
FY09*	10.9	37/111/37	185	20
FY10*	18.8	20/60/20	100	35
FY11*	21.9	22/43/22	86	9[a]
FY12*	27.3	31/36/33	90	22 [b]
FY13*	38.1	26/29/10	65	10[c]
FY14*	36.4	27/30/10	67	12[d]

*Population estimates were generated by Travis County staff. Previous years were generated by TPWD.

[a] An additional 13 deer were removed from the Volente tract and one deer from the Lucas tract.

[b] An additional 13 deer were removed from the Cypress Creek Unit and four deer from the Lucas tract in the Lake Austin Unit.

[c] An additional 8 deer were removed from the Cypress Creek Unit and 21 from the North Lake Austin Unit (Webb Tract).

[d] An additional 10 deer were removed from the Cypress Creek Unit and 22 from the North Lake Austin Unit (Webb Tract)

Table 6. Deer Harvested on Travis County Properties by Orion Research and Management Services, Inc. during FY14.

Location	Bucks	Does	Fawns	Total
BCP Jollyville Unit	4	6	2	**12**
BCP Volente Tract	3	2	0	**5**
BCP Lucas Tract	0	0	0	**0**
BCP Toops	0	0	0	**0**
BCP Webb Tract	7	13	2	**22**
BCP New Life Tract	1	1	0	**2**
Hamilton Pool Preserve	1	1	0	**2**
Reimers Park	7	16	15	**38**
Pace Bend Park	16	13	3	**32**
Total	**39**	**52**	**22**	**113**

NON-NATIVE PLANT MANAGEMENT

Introduction

In addition to managing for exotic, feral, and nuisance animal species, Travis County Natural Resources also manages non-native plant species in accordance with the BCP Land Management Plan (2007) and Travis County's Wildlife and Vegetation Management guidelines.

Non-native plants not at equilibrium outside their home range can become invasive (Keane and Crawley 2002). Non-native plants become invasive for a number of reasons, including release from native competitors and predators (Mitchell 2003), higher productivity in a new location (Thébaud and Simberloff 2001), direct chemical (allelopathic) interference with native plant performance (Callaway and Ridenour 2004), and variability in the responses and resistance of native systems to invasion (Hobbs and Huenneke 1992, Levine and D'Antonio1999).

A key driver of change in ecosystems is invasion by an alien species. Invasive, non-native plants have bottom-up impacts on higher trophic levels and reduce local plant species diversity of the invaded community. (Vilà 2011). Also, exotic plants can alter soil nutrient dynamics (Ehrenfeld 2003). Loss of native biodiversity decreases in the quality of food, cover, and breeding sites for wildlife (Cheater 1992, MacDonald 1985, Simberloff 1996). For example, non-native trees can compete with native oaks, impacting a major component of both golden-cheeked warbler and black-capped vireo habitat.

Invasive species control is an increasingly important component of the conservation and management of natural ecosystems, especially in urban areas like the BCP. Successful control can be achieved with large short-term investments and routine monitoring. (Zavaleta et al. 2001). Invasive species control combined with along with broader ecosystem restoration goals gives native biodiversity the best chance to recover (Hobbs 1999).

In order to maintain the integrity of natural ecosystems on the BCP and prevent a negative impact on endangered species habitats, non-native plants found on the BCP are targeted for removal.

Methods

In FY14, Travis County BCP properties were inventoried for the presence of non-native plant species by surveying tracts and documenting locations. When located, these species were assessed for potential impacts to native plant and wildlife populations. Non-native plant species constituting a threat were prioritized for management action based on invasiveness of species, amount of infestation, and threats to sensitive habitats.

Control methods employed to manage non-native species included manual removal (mechanical control) and application of approved site-appropriate herbicide by Texas Department of Agriculture-licensed staff (chemical control). Whenever possible, mechanical control of non-natives without the use of herbicides was selected, since this method has no risk of impact on surrounding vegetation. Hand-pulling was especially effective on young seedlings and saplings of many woody plants, such as heavenly bamboo (*Nandina domestica*), chinaberry (*Melia azedarach*), and tree of heaven (*Ailanthus altissima*), as well as ground-running plants such as periwinkle (*Vinca sp*.). Larger woody plants were removed through use of Weedwrenchs™, which ensured the removal of the entire root and eliminated the potential for re-sprouting.

When necessary, two chemical control techniques were used in conjunction to remove non-native plants. The “cut-treat” method was used on woody plants that could be completely removed using hand tools such as chainsaws, handsaws, or loppers. The cut stems were then treated with herbicide. The “hack-squirt” method was used on larger trees that could not be easily removed. These target plants were instead girdled around the circumference of the trunk at breast height using a hatchet or hand saw. The wounds were then sprayed with the appropriate herbicide. In FY14, 10% to 12% Arsenal AC/surfactant mix was applied on all treated woody plants. Malta star-thistle (*Centaurea melitensis*) was treated with foliar spray of 2% Ranger Pro. All chemical applications were made when no rain was forecasted for ≥ 24 hours and winds were < 10 mph. Also, staff avoided using chemical control near aquatic resources.

Results and Discussion

Staff targeted eleven species of non-native plants (eight woody and three herbaceous) for removal on BCP tracts during FY14 (Table 7, Figure 1). Management activities occurred at the following thirteen BCP tracts: Concordia, Cuevas, Grandview Hills, Lucas, New Life, Origer, Ribelin, Ribelin Mitigation, Sam Hamilton, Snowden, Stratton, Steiner Ranch, and Vireo Ridge. A majority of the plants removed were woody species (Figure 1). Baccharis neglecta is not normally targeted for removal, but plants were

removed to comply with the BMPs for fuel mitigation developed by Travis County to create a shaded fuel break at Steiner Ranch.

Table 7. Non-native plant species targeted for removal on Travis County Balcones Canyonlands Preserve tracts in FY14.

Species	Common Name	Location[1]	Amount Removed	Removal methods[2]
Ailanthus altissima	Tree of Heaven	RI, SN	39 stems	CT, HS
Baccharis neglecta	False Willow	SR	500 stems	CT, HS
Centaurea melitensis	Malta Star-thistle	RI, VR	9.6 m²	FS, HP
Cyrtomium falcatum	Japanese Holly Fern	RM	4 plants	HP
Ligustrum sp.	Privets	CO, CU, GV, NL, OR, RI, RM, SN	259 stems	HP, CT, HS, WW
Melia azedarach	Chinaberry	CO, CU, GV, LU, NL, RI, SH, ST, VR	754 stems	CT, HS, WW
Nandina domestica	Heavenly Bamboo	CO, GV, LU, NL, OR, RI, RM, SN, VR	890 stems	HP, CT, WW
Photinia sp.	Photinia	GV, RI	3 stems	CT
Sorghum halepense	Johnsongrass	SN	30 stems	HP
Vitex agnus-castus	Lilac Chastetree	LU	12 stems	CT, HS
Wisteria sp.	Wisteria	CO	37 stems	CT

[1] BCP tracts: CO=Concordia tract; CU=Cuevas; GV= Grandview Hills; LU= Lucas; NL=New Life; OR=Origer; RI=Ribelin; RM=Ribelin Mitigation; SH=Sam Hamilton; SN=Snowden; ST=Stratton; SR=Steiner Ranch; VR= Vireo Ridge

[2] Removal Methods: FS=Foliar Spray; HP=Hand Pull; CT=Cut and Treat; HS=Hack and Squirt; WW=Weed Wrench

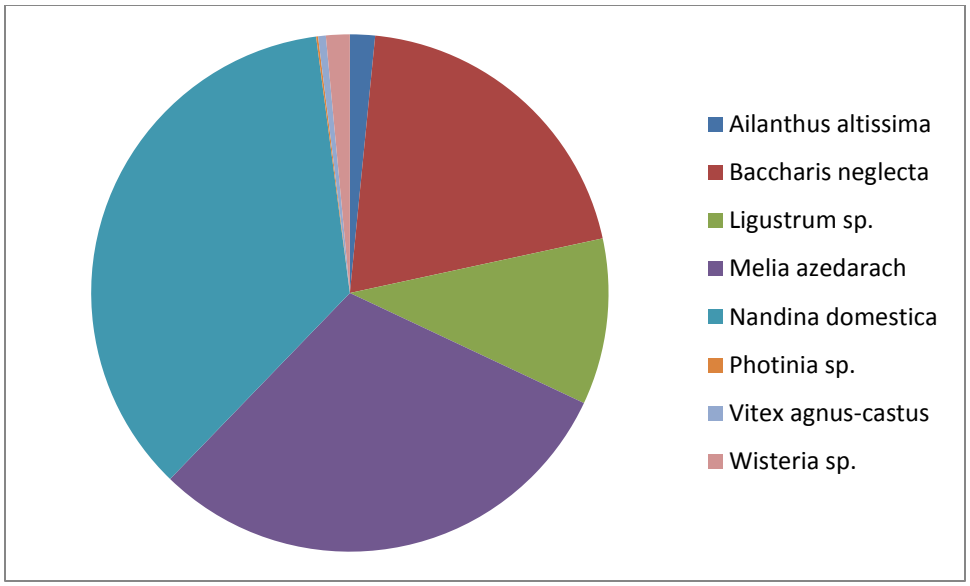

Figure 1. Percent of each non-native woody plant species targeted for removal on Travis County Balcones Canyonlands Preserve tracts in FY14.

In FY14, approximately 89 hours of staff time and 87 hours of volunteer time were devoted to non-native plant removal (Table 8). Five Natural Resources staff members already licensed for pesticide application attended the necessary Continuing Education course in order to comply with annual license requirements.

Table 8. Summary of invasive plant control efforts by Travis County Natural Resources from FY09 to FY14.

FY	STAFF HOURS	VOLUNTEER HOURS	NUMBER OF SPECIES	LOCATIONS	WOODY STEMS	WOODY (M^2)	HERBACEOUS STEMS	HERBACEOUS (M^2)
2009	25	0	11	5	422	9.3	50	4.6
2010	158	3495	12	12	2862	149	0	2960
2011	91	96	10	13	5883	0	300	46.5
2012	103	92	7	15	3510	0	0	245
2013	45	35	9	11	1954	0	0	171
2014	89	87	5	13	2491	0	4	9.7

Future plans include continuing to collect baseline data of non-native plant species on all current and newly acquired Travis County BCP properties, and prioritizing areas of non-native plant encroachment for mechanical and/or chemical control. Control efforts

for FY15 will include removal of the typical invasive plants (Chinaberry, Chinese Tallow, Heavenly Bamboo, Japanese Ligustrum) at Stark's North Mine, Woody Hollow, Collins, Grandview Hills, Webb, and Sam Hamilton tracts. Travis County Natural Resources staff is coordinating with Travis County Parks, the Lower Colorado River Authority, and the Texas Parks and Wildlife Department to determine the best course of action to treat *Tamarix* which has been identified along the shores of Lake Travis at Pace Bend Park and along the Pedernales River at Hamilton's Pool and Reimers Ranch. Natural Resources staff will continue coordinating volunteer projects with Concordia University staff and students to identify and control invasive plants within the Concordia's Preserve tract.

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