FY 2010 Summary of

Wildlife and Non-native Plant Management Activities

on Travis County's Balcones Canyonlands Preserve



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

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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).

The negative impacts of non-native, nuisance and invasive species have been well documented throughout Texas and around the world. The 2007 BCP Land Management Plan, 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 and Vegetation Management Permit* is drafted and serves as a general guideline for Travis County staff to direct management of these species 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.

Wildlife management activities approved under the permit guidelines may include reducing, relocating, or eliminating individuals or populations of specifically identified species. Also included in the permit guidelines are methods for removal of non-native plant species that cause a threat to native plant populations. Management objectives or other constraints for each property may dictate different actions for the same species on different tracts.

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 and antelope 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. 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 2010 (FY10), wildlife management activities on Travis County-managed portions of the BCP focused on three species: brown-headed cowbirds (*Molothrus ater*), feral hogs (*Sus scrofa*), and white-tailed deer (*Odocoileus virginianus*), which are described in sections below. Non-native plant management activities in FY10 focused on 12 species, which are discussed in the last section of this report.

BROWN-HEADED COWBIRDS

Introduction

In addition to many other avian biological 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 (*Dendroica chrysoparia*). Cowbird trapping has been the subject of considerable research and management activities 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 FY10 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 (1989) and Texas Animal and Damage Control (1990-1996). In 1997, Travis County Natural Resources Department initiated its own cowbird trapping program (Travis County, 1998). 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 (Exhibit A). Trapping did not occur in 1998 due to staff shortage.

Methods

Cowbird trapping in FY10 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 are 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).

Decoy birds (32 males, 5 females) were obtained from TPWD. Decoy birds were difficult to obtain for the FY10 trapping season and subsequently, traps were opened later than usual. The Nootsie, Toops and FM 2769 traps were initially put into operation and cowbirds captured in these traps were eventually transferred to the HP trap. Cowbirds captured in the HP trap were later used as bait birds in the Reimers trap. Table 1 summarizes the FY10 cowbird trapping schedule and initial stocking numbers of decoy birds.

Table 1. FY10 Cowbird trap locations, trapping period dates, and initial cowbird stocking numbers.

Trap	Date Opened	Date Closed	Initial Stocking Numbers
Nootsie	March 23	June 4	4 Males, 1 Female
Toops	March 23	June 4	10 Males, 0 Females
FM 2769	March 23	June 6	18 Males, 4 Females
HP	March 29	June 12	5 Males, 4 Females
Reimers	April 8	June 12	7 Males, 5 Females

Traps were inspected and maintained at least three times per week throughout the season until juvenile cowbirds began appearing in traps. Traps were then checked more frequently. Juveniles, if trapped, were immediately euthanized to deter any further care by the host species.

Water and feed (whole milo) 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).

Table 2. Non-target species found in Travis County operated traps in FY10.

Common Name	Species Name	Trap(s)	Comments
red-winged blackbird	*Agelaius phoeniceus*	FM 2769	1 released
cedar waxwing	*Bombycilla cedrorum*	NT	1 released
northern mockingbird	*Mimus polyglottos*	TP	1 found dead
house sparrow	*Passer domesticus*	TP	1 released
carolina wren	*Thryothorus ludovicianus*	RR	1 released
yellow-headed blackbird	*X. xanthocephalus*	NT	1 released

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

Results and Discussion

In FY10, a total of 134 male, 112 female and one juvenile cowbird were captured (247 total). Table 3 summarizes cowbird captures at each trap by class (male, female, and juvenile), month, and trap efficiency (or capture rate) during the FY10 trapping season. Trap efficiency is calculated by dividing the number of females captured by the number of days in operation (x 100). The number of traps in operation and their locations in FY10 were identical to the previous year. Overall trap efficiency rate in 2010 (49.16%) was higher than that of 2009

Table 3. Results of the FY10 Travis County cowbird trapping season.

Trap	Month	Days in Operation	Males captured	Females captured	Juveniles Captured	Total Captured	Trap Efficiency %
FM 2769	March	9	1	1	0	2	11.11
	April	30	7	11	0	18	36.66
	May	31	2	6	0	8	19.35
	June	1	2	1	0	3	100.00
	Total	71	12	19	0	31	26.76
Hamilton Pool	March	3	0	0	0	0	0
	April	30	23	13	0	36	43.33
	May	31	5	1	0	6	3.22
	June	15	2	1	1	0	0.00
	Total	79	30	15	1	46	18.98
Nootsie	March	9	4	2	0	6	22.22
	April	30	12	10	0	21	33.33
	May	31	10	4	0	14	12.90
	June	3	1	0	0	1	0.00
	Total	73	24*	13*	0	37	17.81
Reimers	April	23	7	9	0	17	39.13
	May	31	4	2	0	6	6.45
	June	8	0	0	0	0	0.00
	Total	62	9	11	0	20	17.74
Toops	March	9	6	2	0	8	22.22
	April	30	34	34	0	68	50.00
	May	31	18	18	0	36	22.58
	June	3	1	0	0	1	0.00
	Total	73	59	54	0	113	73.97
Grand Totals		**358**	**172**	**176**	**1**	**348**	**49.16**

*numbers adjusted to reflect escaped cowbirds

(42.21%). Travis County Natural Resources maintains a minimum goal of 20% trap efficiency for the program.

The two traps located in far western Travis County (HP and Reimers traps) performed below expectations. The 46 cowbirds captured at HP was markedly less than the average trapped over the previous seven years (156). Similarly, the Reimers trap total (20) was well below the previous four year's average of 120. Not having the traps in operation throughout March most likely played a part in the low capture rates for these traps, although capture rates were generally lower in 2010 compared to similar months in previous years. The overall efficiency rate (18.98) for the HP trap was its lowest since 2003. It should be noted that the cowbirds in this trap were regularly predated upon by a small mammal (possibly *Bassariscus* or *Mustela*) and thus an accurate efficiency rate was impossible to reflect and was underrepresented. The Reimers traps also recorded its lowest efficiency rate (17.74) since this trap was put in operation (2006), although predation within this trap was not apparent. Regardless, these traps should continue to perform well in the future, primarily due to the proximity of livestock and the Pedernales River corridor.

From 2001 to 2006, the FM 2769 trap had a yearly trap average of 91 cowbirds trapped. Beginning in 2006, nearby pastures were converted into neighborhoods and a golf course, and much of the nearby livestock was removed. From 2007 to 2010 the yearly trap average has dropped to 30, possibly due to this land-use change. Due to the nearby presence of a black-capped vireo colony, this trap may serve as a buffer for this colony and is often left in operation for longer durations, despite low female cowbird trap rates.

The Toops trap was the most successful trap in the program in FY10 with 113 cowbirds trapped and an efficiency rate of nearly 74%. This trap exceeded expectations over the previous three years when the yearly average was 58 cowbirds trapped. This trap benefits from the presence of horses and goats on the property where it is operated and should continue to be successful as long as livestock is present.

The Nootsie trap was not as successful as it had been the previous two seasons but still removed 37 cowbirds. This trap is generally not expected to be very efficient and mainly serves as a buffer to the nearby black-capped vireo colony. This trap unfortunately was breached by a rock squirrel (*Spermophilus variegatus*) towards the end of operation allowing a few cowbirds to escape.

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. Regardless, cowbirds continue to disperse into the BCP in smaller numbers along power-line corridors that crisscross the preserve system, searching for optimal breeding sites. As a result, traps are routinely placed along or near these corridors as well as in endangered species habitat (particularly near the small population of black-capped vireos) with the understanding that these locations might not trap many cowbirds, but could serve as a buffer for endangered birds breeding in the area.

The cowbird trapping program for FY10 was a success, greatly exceeding the internal 20% overall trapping efficiency goal with a rate of 49.16%. In previous years, this was largely due to the highly efficient traps located at Hamilton Pool Preserve and Milton Reimers Ranch Park. However, this year's overall success can be attributed to the success of the Toops trap and to the generally shorter duration that traps were operated. To lessen the amount of predation on trapped cowbirds in the future, an increased effort to deter predators will occur.

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 ensure minimal negative impacts to the native wildlife protected by 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. The discovery of wallows, rooted areas, rubs, well-worn trails, tracks, and first-hand staff encounters in the field verified the significant hog population 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. 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 caused considerable damage to habitat.

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 County-managed portions of Steiner Ranch for several years.

In FY10, 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.

The City of Austin also independently contracted with AgriLife to target the substantial feral hog population in the Bull Creek area of the BCP. Although this area (Bull Creek Macrosite) is primarily composed of City of Austin preserve tracts, Travis County tracts (Ribelin, Canyon Vista and Concordia) have continued to be included as target areas under this contract.

In the fall/winter of FY10, 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 has also utilized contracted, volunteer hog-trappers in past years with varying degrees of success. Generally these trappers make casual attempts at trapping primarily in the late fall to early spring. The County's regular contracted

trapper was not active in FY10 primarily due to the decrease in the available amount of time to devote to trapping and to limited options for effective hog removal.

In December 2008, and updated regularly, a hog trapping protocol was developed to facilitate any Travis County operated feral hog trapping efforts. 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 was authorized to shoot feral hogs while engaged in deer management actions, staff did not participate in harvests where feral hogs were known to exist in FY10. All harvest actions were performed by Orion on County-managed BCP lands. Although some traps were operated by Orion, most activities were based from stationary blinds located near feeders.

Generally, most trapping efforts occur in milder parts of the year. Unless temperatures dictate otherwise, no trapping is attempted during the hottest summer months (June-September) to avoid unnecessary heat stress to trapped animals. All removal efforts in FY10 were focused in areas showing significant hog damage at the Canyon Vista and Ribelin tracts, throughout the Jollyville Unit, and at Hamilton Pool Preserve.

Standard operation for both Travis County staff and contracted trapping efforts included setting and baiting cage traps or larger stock panel traps with dry or soured corn and occasionally rotten fruit and vegetables. Traps were routinely baited and checked late at night or early the following morning. Trapped hogs were humanely dispatched and any non-target animals were safely released. Traps were operated in a given location until signs of hog activity in the area subsided, at which point they were relocated and re-set in new trapping sites or closed.

In an effort to begin utilizing a more successful form of larger pen traps with a guillotine style trap door, Travis County worked with a private contractor to construct a portable gate and trigger mechanism that could be easily transported and deployed to various pre-constructed/pre-baited pen traps. In FY10 two more sets of pen traps and guillotine trap doors were ordered and will be put into operation in FY11 primarily at Hamilton Pool Preserve and several Travis County Parks.

Results and Discussion

During FY10, Travis County staff did not operate any traps. Overall signs of hog activity fell dramatically, as in the previous two years, possibly as the result of the continuing drought. The low incidence of hog activity made trapping a lower priority for a significant portion of the year. A total of 19 hogs were lethally removed from Travis County preserves during FY10 by either AgriLife or Orion.

AgriLife staff continued to have success removing hogs from the Ribelin tract although their access became very limited by January 2010 to avoid conflict with management activities initiated by Orion within this tract. Following the removal of 17 hogs from County BCP properties in FY09, AgriLife staff removed an additional four hogs from the Ribelin tract and six hogs from the Canyon Vista tract using pen traps and snares in FY10. For the remainder of FY10, AgriLife did not have access to Travis County BCP tracts due to contractual obligations with the City of Austin and access conflicts due the endangered songbird breeding season.

A total of six hogs were removed incidental to white-tailed deer management activities performed by Orion. Three of these hogs were taken from the Jollyville Unit and three additional hogs were removed from Hamilton Pool Preserve. Three additional hogs were also removed from Hamilton Pool during an approved demonstration of thermal and night-vision equipment by a potential contracted hog trapper.

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. For FY09 and

FY10, 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 Texabama croton (*Croton alabamensis var. texensis*) that occur at Pace Bend Park. This plant is subject to over-browsing 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.

According to TPWD biologists, release sites are becoming scarce and the effectiveness of these highly labor intensive control methods are minimal. Although the public may have a positive perception of trap and release efforts, TPWD scientists indicate that deer mortality rate within the first year of release may be considerably high (up to 80%). The trap and relocation efforts previously employed at Pace Bend Park are no longer considered a viable option. For the past few years (2002 to the present), Travis County has utilized lethal harvest to manage deer at Pace Bend Park.

Methods

Travis County staff collected annual population census data to estimate white-tailed deer populations on select tracts in accordance with TPWD guidelines. TPWD currently recommends population levels 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. Fall 2009 census results indicated that the Jollyville Unit hosted a population exceeding the carrying capacity for songbird habitats. These surveys estimated deer densities on the Jollyville Unit of one deer per approximately 19 acres. Census results for Pace Bend Park estimate deer densities of one deer per five acres.

Mike Reagan, Technical Guidance Biologist with TPWD, provided harvest recommendations for Pace Bend Park based upon the County's population census data. Reagan advised that large-scale management harvests would be necessary for several years to prevent additional habitat destruction due to the current deer overpopulation. Overall quality and health of the deer herd, wildlife habitats, and other wildlife species on the preserve should begin to recover once these management actions are successfully implemented.

For management of the Jollyville Unit deer herd, Travis County utilized the services of Orion, which operates under a TPWD Scientific Permit. Because Orion operates under this permit, harvest recommendations could be made by Travis County staff utilizing the same methods TPWD biologists use. For Pace Bend Park deer management, Travis County obtained a TPWD Managed Lands Deer Control Permit (MLDP). This permit allowed Travis County to implement a lethal cull of specified numbers of both male and female deer by approved harvesters. For this permit, harvest recommendations are made by TPWD staff.

In both cases, animal removal was discreet and as 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

White-tailed deer management activities were performed under the terms and conditions of the MLDP and the constraints related to weather variables in FY10. A total of 61 deer were safely and humanely removed from Pace Bend Park by Travis County personnel (Table 4).

A total of 35 deer were removed by Orion from the BCP Jollyville Unit in FY10. Since implementing the lethal cull strategy on these tracts in FY03, the total population on the Jollyville Unit has been reduced and the numbers of acres per deer has nearly doubled (Table 5). Additionally, seven deer were removed off of Hamilton Pool Preserve.

Overall population trends at Pace Bend Park and on the BCP Preserve 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 approximately 8.5 tons of processed ground venison that has been directed to Caritas of Austin to provide high quality low fat protein to needy local residents in cooperation with the Texas Association of Community Action Agencies' Hunters for the Hungry program.

Table 4. White-tailed deer population trends at Pace Bend Park FY97 through FY10.

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

Table 5. White-tailed deer population trends on the BCP Jollyville Unit FY03 through FY10.

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
F006	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

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

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 Pace Bend Park and the tracts of the BCP.

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 can cause habitat degradation by out-competing and replacing native plants, which ultimately causes a decrease 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. Therefore, 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 FY10, 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 resprouting.

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 FY10, a 10% Arsenal AC/surfactant mix was applied on all treated plants, with the exception of golden bamboo (*Phyllostachys aurea*; 6% Arsenal AC/surfactant) and Chinese wisteria (*Wisteria sinensis*; 100% Remedy RTU). All chemical applications were made when no rain was forecasted for ≥ 24 hours and winds were < 10 mph. Also, areas within creek drainages were avoided for this control method.

Results and Discussion

Staff targeted twelve species of non-native plants for removal on BCP tracts during FY10 (Table 6). Management activities occurred on the following twelve tracts: Attwood, Bunten, Concordia, Greenshores, Hamilton Pool, Lucas, New Life, Nootsie, Snowden, Vireo Ridge, Volente, and Woody Hollow. Approximately 157.5 hours of staff time and 3495 hours of volunteer time were devoted to non-native plant removal.

In addition to Travis County staff efforts, volunteers had a huge impact on the success of non-native plant management objectives in FY10. Twelve volunteers became citizen scientists with the *Invaders of Texas* program, where they were trained to identify and map non-native plant species on the BCP. Volunteers devoted 72 hours to mapping areas of non-native plants on the following BCP tracts: Bunten, Canyon Vista, Concordia, Grandview Hills North, Vireo Ridge, and Volente. The Sheriff's Alternative Weekend Program and volunteers from Dell provided 3,405 hours of time helping to remove non-native plants from the Bunten, Concordia, Snowden, and Vireo Ridge tracts. These volunteers were especially helpful in the time and labor demanding tasks of hand-pulling large areas of periwinkle and heavenly bamboo. Finally, student volunteers with Concordia University gave 18 hours of time removing 1500 Chinese wisteria plants from a creek drainage on BCP lands adjacent to the university.

In FY10, two Natural Resources staff obtained their Noncommercial Political Pesticide Applicator licenses through the Texas Department of Agriculture. Three Natural Resources

Table 6. Non-native plant species targeted for removal on Travis County Balcones Canyonlands Preserve tracts in FY10.

Species	Location[1]	Quantity or Size of Area	Removal methods
Chinaberry (*Melia azedarach)*	CO,GS,LU,NL, VO	76	Cut-treat, hack-squirt, hand-pull
Chinese Tallow (*Tradica sebifera*)	LU	16	Cut-treat, hack-squirt
Chinese Wisteria (*Wisteria sinensis*)	CO	1500	Cut-treat
Crape Myrtle (*Lagerstroemia indica*)	VO	2	Hack-squirt
Golden Bamboo (*Phyllostachys aurea*)	AT	800 ft^2	Cut-treat
Heavenly Bamboo (*Nandina domestica)*	BU,VR,VO	728	Cut-treat, hand-pull
Japanese Privet (*Ligustrum japonicum*)	LU	86	Hack-squirt, hand-pull
Malta star thistle (*Centaurea melitensis*)	HP	2580	Hand-pull
Multiflora Rose (*Rosa multiflora*)	BU	1600 ft^2	Hand-pull
Tree of Heaven *(Ailanthus altissima)*	CO,GS,NT,VO	269	Cut-treat, hack-squirt, hand-pull
Periwinkle (*Vinca major*)	BU, VR	261,250 ft^2	Hand-pull
Periwinkle (*Vinca minor*)	SN, VR	340 ft^2	Hand-pull

[1] AT= Atwood tract; CO= Concordia tract; GS= Greenshores tract; HP= Hamilton Pool tract; LU= Lucas tract; NL= New Life Tract; NT= Nootsie tract; SN= Snowden Tract; VR= Vireo Ridge tract; VO=Volente Tract; WH=Woody Hollow tract.

staff members already licensed attended the necessary Continuing Education course in order to comply with annual license requirements. Natural Resources staff also conducted a Pesticide Applicator CEU presentation on non-native plant identification and control for Travis County Parks staff. Other accomplishments in FY10 included creating a comprehensive database system for documenting all non-native plant locations and tracking of control efforts. Procedures for mixing herbicides and cleanup of spills were also enhanced, and effective control methods researched for the most efficient response to existing and newly discovered threats.

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 FY11 will include removal of tree of heaven along Connor's Creek in the Greenshores tract, as well as select areas on the Canyon Vista and Crossings tracts. Target species such as *Vinca major* and multiflora rose will continue to be targeted on the Bunten tract, and past control efforts will be evaluated for effectiveness. Natural Resources staff will continue coordinating volunteer projects with Concordia University staff and students to identify and control exotic

wisteria, ligustrum, Chinese tallow, and chinaberry within the creek area of Concordia's campus. Finally, a Malta star thistle control plan will be developed and implemented in heavily infested areas on the Ribelin, Lucas, and Volente tracts.

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EXHIBIT A. Travis County Natural Resources Cowbird Trapping Program History

Travis County Natural Resources Cowbird Trapping Program History, 1997-2007

Year	Trap location/name	Cowbirds trapped (M, F, HY)	Total trapped
1997	Vireo Preserve	14, 6, 3	23
	Riverplace	26, 7, 9	42
	Steiner Ranch 1	6, 4, 4	14
	Steiner Ranch 2	7, 2, 0	9
	Canyon Creek mega	26, 13, 6	45
	Satellite 2	17, 17, 0	34
	McGregor	0	0
1997 Total			**164***
1998	trapping did not occur this year		
1998 Total		0	**0**
1999	3M	13, 3, 3	19
	Riverplace	28, 11, 6	45
	Steiner Ranch	16, 4, 0	20
	Canyon Creek mega	57, 25, 21	103
	Ivanhoe mega	39, 13, 6	58
	Mansfield Dam	15, 11, 0	26
	Satellite 2	2, 0, 2	4
1999 Total			**275***
2000	Cortaña	24, 11, 2	37
	Riverplace	17, 10, 2	29
	Steiner Ranch	0	0
	Canyon Creek mega	48, 57, 13	118
	Ivanhoe mega	10, 5, 0	20
	Mansfield Dam	8, 8, 0	16
	Hamilton Pool Preserve	18, 8, 1	27
	3M #1	0	0
	3M #2	19, 23, 0	42
2000 Total			**284***
2001	Hamilton Pool Preserve	1, 3, 0	4
	Lake Perspectives tract	4, 0, 0	4
	FM2769	37, 41, 8	86
2001 Total			**94**

Year	Trap location/name	Cowbirds trapped (M, F, HY)	Total trapped
2002	Hamilton Pool Preserve mega	33, 7, 1	41
	FM2769 mega	60, 39, 12	111
	Grandview Hills North tract	24, 36, 15	75
	Vireo Ridge tract	27, 23, 7	57
2002 Total			**284**
2003	Hamilton Pool Preserve mega	115, 82, 0	197
	FM2769 mega	31, 58, 3	92
	Grandview Hills North tract	13, 24, 0	37
	Vireo Ridge tract #1	8, 4, 4	16
	Vireo Ridge tract #2	19, 12, 2	33
2003 Total			**375**
2004	Hamilton Pool Preserve mega	89, 128, 0	217
	FM2769 mega	56, 63, 4	123
	Grandview Hills North tract	11, 12, 0	23
	Vireo Ridge tract #1	10, 7, 3	20
	Steiner Ranch**	n/a	n/a
	Cuevas tract	1, 3, 0	4
2004 Total			**387**
2005	Hamilton Pool Preserve mega	38, 44, 0	82
	FM2769 mega	26, 45, 0	71
	Vireo Ridge tract #1	12, 4, 0	16
	Ribelin tract	13, 11, 7	31
2005 Total			**200**
2006	Hamilton Pool Preserve mega	83, 65, 0	148
	FM2769 mega	49, 45, 1	95
	Milton Reimers Ranch County Park	63, 49, 0	112
	Ribelin tract	20, 29, 1	50
	Nootsie tract	8, 3, 0	11
2006 Total			**416**
2007	Hamilton Pool Preserve mega	86, 73, 0	159
	FM2769 mega	14, 15, 1	30
	Milton Reimers Ranch County Park	90, 50, 3	143
	Nootsie tract	14, 6, 0	20
	Toops tract	3, 2, 0	5
2007 Total			**357**

Year	Trap location/name	Cowbirds trapped (M, F, HY)	Total trapped
2008	Hamilton Pool Preserve mega	71, 94, 0	165
	FM2769 mega	13, 12, 0	25
	Milton Reimers Ranch County Park	71, 67, 1	139
	Nootsie tract	14, 18, 0	32
	Toops tract	49, 60, 0	109
2008 Total			**470**
2009	Hamilton Pool Preserve mega	43, 81, 0	124
	FM2769 mega	23, 12, 0	35
	Milton Reimers Ranch County Park	48, 39, 0	87
	Nootsie tract	19, 22, 0	41
	Toops tract	39, 22, 0	61
2009 Total			**348**
2010	Hamilton Pool Preserve mega	30, 15, 1	46
	FM2769 mega	12, 19, 0	31
	Milton Reimers Ranch County Park	9, 11, 0	20
	Nootsie tract	24, 13, 0	37
	Toops tract	59, 54, 0	113
2010 Total			**247**

* Total adjusted to exclude cowbirds that escaped.

** This trap was vandalized and all cowbirds were released.