

**FY 2011 Summary of  
Wildlife and Non-native Plant Management Activities  
on Travis County's Balcones Canyonlands Preserve and Select Parks**



**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 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.

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 2011 (FY11), wildlife management activities on Travis County-managed portions of the BCP focused on four species: brown-headed cowbirds (*Molothrus ater*), feral hogs (*Sus scrofa*), white-tailed deer (*Odocoileus virginianus*), and red imported fire ants (*Solenopsis invicta*). Control of cowbirds, hogs, and deer are described in the sections below. Fire ant control efforts are described in Appendix H: Balcones Canyonlands Preserve Karst Monitoring and Management FY2011 Annual Report. Non-native plant management activities in FY11 focused on 10 species, which are discussed in the last section 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 FY11 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. Trapping did not occur in 1998 due to staff shortage. See Exhibit A for a complete trapping history of the Travis County program.

### **Methods**

Cowbird trapping in FY11 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).

Two groups of decoy birds (totaling 52 males, 7 females) were obtained from TPWD. An initial group of decoys (11 males, 4 females) were acquired in early March allowing three traps to open relatively early. The Nootsie, Toops and FM 2769 traps were initially put into operation. The remaining traps were opened once additional bait birds were acquired. Table 1 summarizes the FY11 cowbird trapping schedule and initial stocking numbers of decoy birds.

Table 1. FY11 Cowbird trap locations, trapping period dates, and initial cowbird stocking numbers.

Trap	Date Opened	Date Closed	Initial Stocking Numbers
Nootsie	March 6	June 16	11 Males, 4 Female
FM 2769	March 8	June 2	5 Males, 1 Females
Toops	March 10	June 9	7 Males, 1 Females
Reimers	March 17	June 6	7 Males, 0 Females
HP	March 21	June 8	22 Males, 1 Females

Traps were inspected and maintained at least three times per week throughout the season. 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). Cowbirds were euthanized by placing them in a bucket with Carbon dioxide gas following TPWD protocol (TPWD No Date).

Table 2. Non-target species found in Travis County operated traps in FY11.

Common Name	Species Name	Trap(s)	Comments
Red-winged blackbird	<i>Agelaius phoeniceus</i>	FM 2769, TP	4 released
Bronzed cowbird	<i>Moluthrus aeneus</i>	HP, NT, TP	4 (males) released
Northern mockingbird	<i>Mimus polyglottos</i>	NT	5 released
House sparrow	<i>Passer domesticus</i>	TP	2 released, 1 deceased
Yellow-headed blackbird	<i>X. xanthocephalus</i>	TP	19 released*

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

\*many of these were recaptured individuals

## Results and Discussion

In FY11, a total of 226 males and 223 females were captured (449 total). This is an increase of 202 cowbirds removed from the previous season. No juvenile cowbirds were captured. Table 3 summarizes cowbird captures at each trap by class (male, female, and juvenile), month, and trap efficiency (or capture rate) during the FY11 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 FY11 were identical to the previous year. Overall trap efficiency rate in 2011 (51.14%) was slightly higher than that of

2010 (49.16%). Travis County Natural Resources maintains a minimum goal of 20% trap efficiency for the program.

Table 3. Results of the FY11 Travis County cowbird trapping season.

Trap	Month	Days in Operation	Males captured	Females captured	Juveniles Captured	Total Captured	Trap Efficiency %
FM 2769	March	24	13	2	0	15	8.33
	April	30	8	13	0	21	43.33
	May	31	7	2	0	9	6.45
	June	1	0	1	0	1	100.00
	Total	86	28	18	0	46	20.93
Hamilton Pool	March	11	8	3	0	11	27.27
	April	30	12	12	0	24	40.00
	May	31	8	4	0	12	12.90
	June	5	3	2	0	5	40.00
	Total	77	31	21	0	52	27.27
Nootsie	March	25	22	9	0	31	36.00
	April	30	6	15	0	21	50.00
	May	31	9	10	0	19	32.25
	June	15	2	2	0	4	13.33
	Total	101	39	36	0	75	35.64
Reimers	March	15	3	5	0	8	33.33
	April	30	21	28	0	49	93.33
	May	31	3	4	0	7	12.90
	June	6	1	2	0	3	33.33
	Total	81	28	39	0	67	48.14
Toops	March	22	1	0	0	1	0
	April	30	88	53	0	141	176.66
	May	31	9	56	0	65	180.64
	June	8	2	0	0	2	0.00
	Total	91	100	109	0	113	73.97
<b>Grand Totals</b>		<b>436</b>	<b>226</b>	<b>223</b>	<b>0</b>	<b>449</b>	<b>51.14</b>

As in 2010, 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 from 2003-2009 (156). The Reimers trap did considerably better than in 2010 (+47 cowbirds) but still remained below pre-2010 numbers. These traps were in operation for a longer total period as compared to 2010 and both improved in efficiency compared to 2010. 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 most of the proximate livestock was removed. From 2007 to 2010 the yearly trap average has dropped to 30, possibly due to this land-use change, however the total in 2011 increased modestly to 46 individuals trapped.

The Toops trap was again the most successful trap in the program in FY11. The 209 cowbirds trapped were the second highest total from a single trap in the program's history (Exhibit A) and an efficiency rate of nearly 74%. Most of these cowbirds (180) were trapped in a span of 10 days in late April and early May. Of these, 99 were females marking the most impressive span in this program's history. 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 had its most successful trapping season since that trap was placed in operation in 2006. From 2006-2010, this trapped an average of 28 cowbirds per year. In 2011, that number increased to 75 cowbirds trapped. This trap is generally not expected to be very efficient and mainly serves as a buffer to the nearby black-capped vireo colony.

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.

However, during the 2011 breeding season, there was not only a general increase in cowbirds trapped, but observations of cowbirds within endangered species habitat noticeably

increased. There was one confirmed observation of a female golden-cheeked warbler (GCWA) tending to a cowbird young. There was also a second strongly suspected, but not confirmed, GCWA parasitism event where a fledged cowbird was observed begging with only a GCWA in the immediate area. Nest parasitism was also noted on two black-capped vireo (BCVI) nests causing both to be abandoned. Additionally, three BCVI nests were discovered torn down upon the ground, possibly the result of cowbird activity. Parasitism on BCVI nests have only been documented a few times on Travis County managed lands over the last decade. Having two confirmed events in one year is highly unusual.

The cowbird trapping program for FY11 was a success, greatly exceeding the internal 20% overall trapping efficiency goal with a rate of 51.14%. For the first time, all traps operated individually at over 20% efficiency as well. 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, the overall increase in cowbirds trapped and to the generally shorter duration that some traps were operated.

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. A new metal hybrid trap that was donated to the program in the winter 2011 will be added to the program in 2012. 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 staff 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.

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 FY11, 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 the fall/winter of FY11, 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 FY11 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 and Orion was authorized to shoot feral hogs while engaged in deer management actions, no hogs were taken during deer harvest activities in FY11. Trapping did occur under the management of Travis County Natural Resources and operated by Travis County Park staff at Milton Reimers Ranch County Park (Reimers) and the neighboring Pogue Springs Preserve (Pogue). Neither of these properties are part of the BCP.

Standard operation for Travis County staff 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.

Travis County began utilizing a more successful form of larger pen traps with a drop-down style trap door and shifted away from using smaller box-style traps. This new system, utilizing a portable gate and trigger mechanism, can be easily transported and deployed to various pre-constructed/pre-baited pen traps. In FY10 two more sets of pen traps and drop-down trap doors were ordered for Travis County Parks and were put into operation in FY11 primarily at Reimers and Pogue.

### **Results and Discussion**

During FY11, Travis County staff did not operate any traps on BCP properties and no feral hogs were removed from the BCP. Overall signs of hog activity fell dramatically as in the previous two years with the prolonged drought impacting feral hog numbers and movements. The low incidence of hog activity made trapping a lower priority. Orion staff did not see any hogs while conducting deer management activities and did not remove any hogs from Travis County property during FY11.

A total of 21 hogs were removed from Travis County Parks, including Reimers Park and Pogue Preserve. AgriLife was able to lethally remove two sows using neck snares, and the

additional 19 hogs (one boar, five sows and 13 piglets) were trapped and lethally removed by Travis County staff.

## **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 FY11, 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 subject to over-browsing and physical damage 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.

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 most of the past decade (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.

Due to limitations in conducting reliable censuses on other less accessible preserve tracts, Travis County biologists utilized either the Jollyville census data or data collected by neighboring partner agencies (City of Austin and LCRA) to derive harvest recommendations for other preserve tracts (Volente, Lucas, Ribelin) that were targeted for harvests.

Blake Hendon, Technical Guidance Biologist with TPWD, provided harvest recommendations for Pace Bend Park based upon the County's population census data. Hendon 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 deer on preserve lands, 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. In FY11, about 4,500 pounds of venison was given to Caritas which provided meat for approximately 18,000 meals.

## **Results and Discussion**

Surveys conducted in September and October 2010 were used to estimate deer densities and determine harvest recommendations for the FY11 harvest season (October 2010 to February 2011). Census results for Pace Bend Park estimated a deer density of one deer per 6.9 acres. Census results for the Jollyville Unit, which estimated one deer per 21.9 acres, indicated that this unit still hosted a population exceeding the carrying capacity for songbird habitats, although it was improved from previous years. The Ribelin tract had densities of 26.4 acres per deer and a less desirable population of 8.2 acres per deer was indicated at the Volente tract.

White-tailed deer management activities were performed under the terms and conditions of the MLDP and the constraints related to weather variables in FY11. A total of 89 deer were safely and humanely removed from Pace Bend Park by Travis County personnel (n=29) and Orion (n=60) (Table 4).

A total of nine deer were removed by Orion from the BCP Jollyville Unit in FY11. An additional 14 deer were removed off other preserve tracts. 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 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 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 donation over the years of approximately 10.5 tons of processed ground venison to Caritas of Austin. 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 Pace Bend Park and the tracts of the BCP.

Table 4. White-tailed deer population trends at Pace Bend Park FY97 through FY11.

<b>YEAR</b>	<b>AC/ DEER</b>	<b>ESTIMATED COMPOSITION (BUCK/DOE/FAWN)</b>	<b>ESTIMATED POPULATION</b>	<b>TOTAL REMOVED</b>
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

Table 5. White-tailed deer population trends on the BCP Jollyville Unit FY03 through FY11.

<b>YEAR</b>	<b>AC/ DEER</b>	<b>ESTIMATED COMPOSITION (BUCK/DOE/FAWN)</b>	<b>ESTIMATED POPULATION</b>	<b>TOTAL REMOVED</b>
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
FY11*	21.9	22/43/22	86	9 <sup>a</sup>

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

<sup>a</sup>An additional 13 deer were removed from the Volente tract and one deer from the Lucas tract

## **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). 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 FY11, 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 Travis County 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 Weedwrenches™, 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 FY11, a 10% Arsenal AC/surfactant mix was applied on all treated plants, with the exception Chinese wisteria (*Wisteria sinensis*; 100% Remedy RTU). All chemical applications were made when no rain was forecasted for  $\geq 24$  hours and winds were  $< 10$  mph. Also, areas within creek drainages were avoided for this control method.

### **Results and Discussion**

Staff targeted ten species of non-native plants for removal on BCP tracts during FY11 (Table 6). Management activities occurred at Mary Quinlan Park, a Travis County Park on Lake Austin, and the following twelve BCP tracts: Concordia, Cuevas East, Greenshores, Lake Travis Bluffs, Lucas, New Life, Origer, Ribelin, Richards, Sam Hamilton Memorial East, Vireo Ridge, and Wendland. In FY11, approximately 91 hours of staff time and 96 hours of volunteer time were devoted to non-native plant removal.

Eleven students from Concordia University volunteered 44 hours of time removing the following number of stems: 693 Chinese wisteria, 980 Japanese privet, 10 heavenly bamboo, 2 Japanese honeysuckle, 3 Chinese tallow, and 21 bunches of Johnsongrass from the University campus and an adjacent creek drainage on the BCP.

In FY11, five Natural Resources staff members already licensed attended the necessary Continuing Education course in order to comply with annual license requirements.

Table 6. Non-native plant species targeted for removal on Travis County Balcones Canyonlands Preserve tracts in FY11.

Species	Location <sup>1</sup>	Quantity	Removal methods
Chinaberry ( <i>Melia azedarach</i> )	GS, LT, LU, MQ, NL, RI, RC, SH, VR, WE	513	Cut-treat, hack-squirt, hand-pull
Chinese Tallow ( <i>Tradica sebifera</i> )	CO, SH	183	Cut-treat, hack-squirt
Chinese Wisteria ( <i>Wisteria sinensis</i> )	CO	693	Cut-treat
Common Fig ( <i>Ficus carica</i> )	LU, SH	50	Cut-treat, hack-squirt
Heavenly Bamboo ( <i>Nandina domestica</i> )	CO, GS, LU, MQ, NL, RI, VR, WE	339	Cut-treat, hand-pull
Japanese Privet ( <i>Ligustrum japonicum</i> )	CO, GS, OR, RI, SH, VR, WE	1042	Hack-squirt, hand-pull
Japanese Honeysuckle ( <i>Lonicera japonica</i> )	CO, SH	4	Cut-treat
Johnsongrass ( <i>Sorghum halepense</i> )	CO	21	Hand-pull
Red-tipped Photinia ( <i>Photinia fraseri</i> )	GS, SH	7	Cut-treat
Tree of Heaven ( <i>Ailanthus altissima</i> )	GS, RI, RC, WE	31	Cut-treat, hack-squirt, hand-pull

<sup>1</sup> CO= Concordia tract; GS= Greenshores tract; LT= Lake Travis Bluffs; LU= Lucas tract; MQ= Mary Quinlan Park; NL= New Life; OR= Origer tract; RI= Ribelin; RC= Richards tract; SH= Sam Hamilton Memorial tract; VR= Vireo Ridge tract; WE= Wendland tract.

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 FY12 will include removal of tree of heaven on the Canyon Vista and the Crossings tracts. Staff and volunteers will continue to remove target species such as *Vinca major* and multiflora rose (*Rosa multiflora*) on the Bunten tract. In addition, 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, Japanese privet, Chinese tallow, and chinaberry within the creek area of Concordia's campus. Finally, a Malta star thistle (*Centaurea melitensis*) control plan will be developed and implemented in heavily infested areas on the Ribelin, Lucas, and Volente tracts.

## LITERATURE CITED

- Balcones Canyonlands Preserve Land Management Plan. 2007. Unpublished document.  
Travis County, Texas, USA.
- Cheater, M. 1992. Alien Invasion. Nature Conservancy. September/October.
- Davis, W. B., and D. B. Schmidley. 1994. The mammals of Texas. Texas Parks and Wildlife Press, Austin, Texas, USA.
- Hellgren, E. C., 1997. Biology of feral hogs (*Sus scrofa*) in Texas. Proceedings of feral swine symposium.
- Kostecke, R.M, S.G. Summers, G.H. Eckrich and D.A. Cimprich. 2005. Effects of Brown-headed Cowbird (*Molothrus ater*) removal on Black-capped Vireo (*Vireo atricapilla*) nest success and population growth at Fort Hood, Texas. Ornithological Monographs 57:28-37.
- MacDonald, C. 1985. Trouble in Paradise: Weeds in Nature Preserves. J. of Pesticide Reform, Fall 1985.
- Miller, J. E., 1997. A national perspective on feral swine. Proceedings of feral swine symposium.
- Richards, B. 2000. The deer dilemma: to fence or not to fence? Conference sponsored by Texas Parks and Wildlife Department. Reicher Ranch. June 15, 2001.
- Russell, F. Leland and Norma L. Fowler, 1999. Rarity of Oak Saplings in Savannas and Woodlands of the Eastern Edwards Plateau, Texas. The Southwestern Naturalist. 44(1): 31-41.
- Russell, F. Leland and Norma L. Fowler, 2002. Failure of Adult Recruitment in *Quercus buckleyi* Populations on the Eastern Edwards Plateau, Texas. American Midland Naturalist. 148: 201-217.
- Russell, F. Leland, David B. Zippen and Norma L. Fowler, 2001. Effects of White-tailed Deer (*Odocoileus virginianus*) on Plants, Plant Populations and Communities: A Review. American Midland Naturalist. 146: 1-26.
- Simberloff, D. 1996. Impacts of Introduced Species in the United States. Internet:  
<http://cgrio.ciesin.org/CONSEQUENCES/vol2no2/article2.html>
- Texas Parks and Wildlife Department. No Date. Trapping brown-headed cowbirds to control songbird nest parasitism.  
[www.tpwd.state.tx.us/publications/pwdpubs/media/pwd\\_bk\\_w7000\\_1148.pdf](http://www.tpwd.state.tx.us/publications/pwdpubs/media/pwd_bk_w7000_1148.pdf)

- Texas Wildlife Damage Management Service. 1998. Controlling feral hog damage. Pamphlet No. L-1925. TX. Wildlife Damage Mgmt. Serv., San Antonio, TX.
- U.S. Department of Agriculture. 1992. Wild pigs, hidden dangers for farmers and hunters. Agriculture Information Bulletin No. 620. U.S. Dept. of Agriculture. Hyattsville, MD.
- U. S. Fish and Wildlife Service. 1996a. Federal Fish and Wildlife Permit No. PRT-788841.
- U. S. Fish and Wildlife Service. 1996b. Final Environmental Impact Statement/Habitat Conservation Plan for Proposed Issuance of a Permit to Allow Incidental Take of the Golden-cheeked Warbler, Black-capped Vireo, and six karst invertebrates in Travis County, Texas.

## EXHIBIT A. Travis County Natural Resources Cowbird Trapping Program History

### Travis County Natural Resources Cowbird Trapping Program History, 1997-2011

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
<b>1997 Total</b>			<b>164*</b>
1998	trapping did not occur in 1998		
<b>1998 Total</b>		0	<b>0</b>
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
<b>1999 Total</b>			<b>275*</b>
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
<b>2000 Total</b>			<b>284*</b>
2001	Hamilton Pool Preserve	1, 3, 0	4
	Lake Perspectives tract	4, 0, 0	4
	FM2769	37, 41, 8	86
<b>2001 Total</b>			<b>94</b>

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
<b>2002 Total</b>			<b>284</b>
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
<b>2003 Total</b>			<b>375</b>
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
<b>2004 Total</b>			<b>387</b>
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
<b>2005 Total</b>			<b>200</b>
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
<b>2006 Total</b>			<b>416</b>
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
<b>2007 Total</b>			<b>357</b>

Year	Trap location/name	Cowbirds trapped (M, F, HY)	Total trapped
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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**

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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**

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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**

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2011	Hamilton Pool Preserve mega	31, 21, 0	52
	FM2769 mega	28, 18, 0	46
	Milton Reimers Ranch County Park	28, 39, 0	67
	Nootsie tract	39, 36, 0	75
	Toops tract	100, 109, 0	209

**2011 Total** **449**

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\* Total adjusted to exclude cowbirds that escaped.

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