BALCONES CANYONLANDS PRESERVE
LAND MANAGEMENT PLAN

TIER III

THE NATURE CONSERVANCY OF TEXAS
BARTON CREEK HABITAT PRESERVE
BARTON CREEK MACROSITE

August 2007

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1.0 BACKGROUND INFORMATION ON TRACT

The Barton Creek Habitat Preserve is a 4,084 acre tract of land managed as a preserve for the Balcones Canyonlands Preserve (BCP) system. Barton Creek Habitat Preserve is located within the Barton Creek watershed, along four miles of Barton Creek, and is owned and managed by The Nature Conservancy of Texas.

1.1 Description of Tract

1.1.1 Location of Tract

Barton Creek Habitat is located approximately 10 miles west of the city of Austin off of Farm Road (FM) 2244 (see Map 1). The entrance to the preserve is located on the south side of FM 2244, about 1 mile east of the point where FM 2244 intersects State Highway 71 in the village of Bee Cave. Interior roads are largely unimproved.

1.1.2 Tract Features

The preserve has four miles of creek frontage, three ravine systems, a visitor's center, a small parking area, several miles of unimproved road, and barb-wire fencing on all sides. Some barb-wire fencing remains within the tract from previous owners. The southern half of the Preserve is split by Southwest Parkway and by Highway 71, separating the Preserve in three contiguous tracts: the Uplands, Old Bee Caves, and Sweetwater tracts. These tracts are managed as one unit. The Lower Colorado River Authority has a small in-holding for a water tower in the Uplands portion of the preserve. The Uplands also contains water lines and hydrants as part of the development work prior to preserve acquisition.

1.1.3 Land Status

Rights-of-Way and Easements

Lower Colorado River Authority has an easement within the Barton Creek Habitat Preserve for various water lines within the preserve.

In-Holdings

There is one small in holding within the preserve that belongs to the Lower Colorado River Authority.

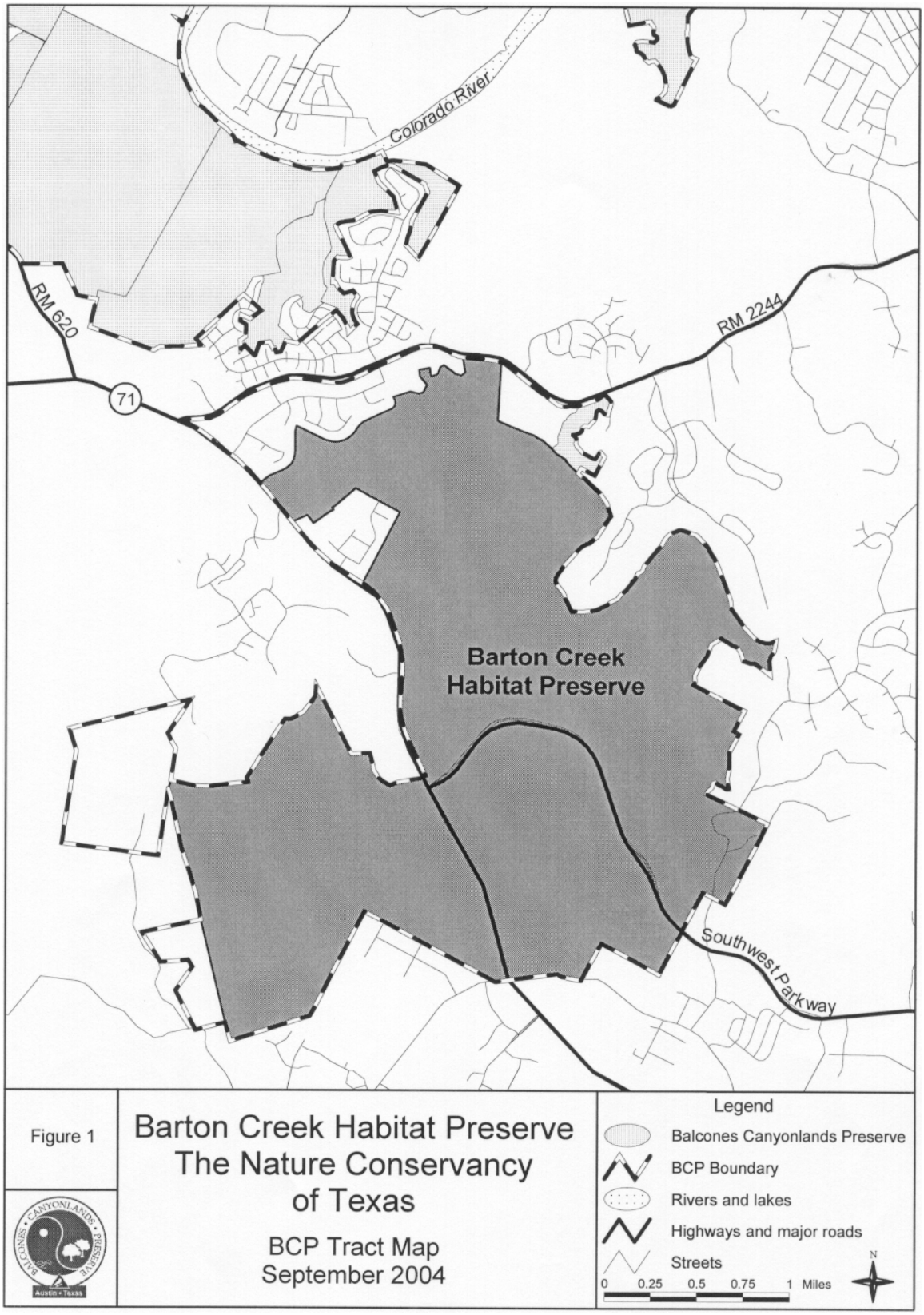

Figure 1: The Nature Conservancy of Texas' Barton Creek Habitat Preserve.

Boundary Disputes
There are no known boundary disputes on the preserve.

Regulatory Requirements
Compliance with the federal Endangered Species Act of 1973, and subsequent amendments, is necessary due to the presence of the Golden-cheeked warbler (GCWA) and the Black-capped vireo (BCVI). This property is included in the BCP and must meet the requirements and conditions outlined in The Nature Conservancy's 10(a) permit (Permit PRT-788841). These requirements are covered in Tier fl-B, Plan Administration.

Compliance with the federal endangered species regulation necessitates compliance with all relevant sections of the Texas Parks and Wildlife Department Code and amendments and the rules adopted by the Parks and Wildlife Commission.

Deed Restrictions
Several deed restrictions exist on the preserve. The primary restriction is that the preserve must be managed as endangered species habitat for the GCWA and BCVI. In addition, the City of Austin and LCRA retain several blanket utility easements for the preserve. There is a telephone line and repeater hut easement on the Preserve.

Special Agreements
Barton Creek Habitat Preserve must be managed as preserve land for the GCWA and BCVI. The conditions of the agreement are defined in the agreement between The Nature Conservancy and the U.S. Fish and Wildlife Service.

Mineral Rights
Mineral rights for Barton Creek Habitat Preserve are outstanding, as part of the original transfer deed into The Nature Conservancy of Texas. Reservations for oil, gas, and other minerals are recorded in the Travis County Real Property Records.

Legal Issues
Legal issues for this site include endangered species regulation compliance covered under section 1.1.3.4.

Financial Issues
No debts or other financial encumbrances remain on this property.

1.2 Physical Characteristics

1.2.1 Geology

Barton Creek Habitat Preserve consists of a series of short hills that are dissected by small canyons from streams flowing into Barton Creek, which forms the boundary of the Preserve on one side. The entire preserve is underlain by Glen Rose Limestone, a Cretaceous formation consisting of alternating layers of hard limestone and softer marls. These layers typically erode into a stair step topography, and this feature is evident throughout the Preserve. Slopes are gentle to moderate except in a few areas in close proximity to Barton Creek, where a few stretches of steep undercut bluffs add some topographic diversity. Elevation ranges from 1150 feet above mean sea level on a hilltop near the southern edge of the Sweetwater Tract down to between 660 and 680 feet along Barton Creek at the eastern edge of the Preserve. No karst features have been detected at the Preserve, but small caves have been found on neighboring land.

1.2.2 Hydrology

The Barton Creek Habitat Preserve lies within the Barton Creek watershed. Surface runoff from the canyons and surrounding uplands flows directly into Barton Creek. There are two small ponds that hold some rain and surface runoff.

Numerous springs, mini-springs, and seeps are found along Barton Creek. Though some of the larger springs may not be flowing during dry periods, the creek maintains flow long year-round due to watershed drainage and these mini-springs and seeps.

No tract-specific information is available on sub-surface hydrology.

1.2.3 Soils

Soils of the preserve are mapped on sheets 51 and 60 of the soil survey of Travis County (Werchan et al., 1974). Nine mapping units representing four soils series, plus Mixed Alluvial Land, are present (Figure 2 and Table 1, therein). The most widespread types are shallow, gravelly to stony, well drained, calcareous, moderately alkaline clays and clay loams. Deeper soils are found in limited area on alluvial terraces and colluvial slopes.

1.2.4 Caves and Subsurface Features

No information regarding karst features is known at this time.

1.3 Biological Characteristics

1.3.1 Vegetation

The hills of the uplands are covered primarily by woodlands composed of plateau live oaks (*Quercus fusiformi*s) and little bluestem (*Schizachyrium scoparium*); this community grades into mature oak/Ashe juniper (*Quercus* spp./*Juniperus ashei*) woodlands on the rocky slopes and also covers most of the Sweetwater tract. Interspersed with the forest communities on the uplands of the preserve are some grassland areas, many of which are dominated by an exotic, King Ranch Bluestem (*Bothriochloa ischaemum* var. *songarica*), which was seeded for pastures in the past. Other grasslands are composed primarily of little bluestem and Indiangrass (*Sorghastrum nutans*).

Along the crest and sloping down the canyon walls to the creek bottom the oaks and junipers transition into riparian forest communities composed variously of sycamore (*Platanus occidentalis*), pecan (*Carya illinoiensis*), black willow (*Salix nigra*), and sugarberry (*Celtis laevigata*). In a few area, the valley of Barton Creek includes rather broad, high terraces with relatively deep, fertile soils. Most of these areas were probably cultivated in the distant past, and recently converted to pasture. King Ranch Bluestem is often the dominant species in these areas. The more mesic canyons on the site are home to hardwood-dominated forests composed of Texas oaks (*Q. buckleyi*), Texas ash (*Fraxinus texensis*) and elm (*Ulmus crassifolia*). There is a small community of water-willow (*Justicia americana*) and water-hyssop (*Bacopa monnieri*) in the bed of Barton Creek as well.

On the uplands on the north side of Southwest Parkway, a small population of Heller's False-Gromwell (*Onosmodium helleri*, G3S3, also known as Heller's Marbleseed) was found in 1995. Heller's False-Gromwell is one of at least twenty-two species of plants endemic to the Edwards Plateau that are known to occur on the preserve. The shrublands on either side of Southwest Parkway also represent the last known occupied habitat of Black-capped Vireos on the preserve; these areas are characterized by shrubs such as shin oak (*Q. sinuata* var. *breviloba*), Texas persimmon (*Diospyros texana*), mountain laurel (*Sophora secundiflora*) and agarita (*Berberis trifoliata*).

1.3.2 Animal Species

White-tailed deer surveys conducted by TNC staff from 1999-2003 indicate an average of one deer per 14.5 acre.

A fish endemic to the waterways of the Edwards Plateau, the Guadalupe Bass (*Micropterus treculi,* G3S3), has been found within the stretch of Barton Creek on the preserve lands. No other non-endangered species list has been compiled for this site.

1.3.3 Endangered Species and Species of Concern

The Barton Creek Habitat Preserve supports a significant population of the endangered GCWA and a small population of the endangered BCVI.

Golden-cheeked Warbler

Available habitat at the preserve currently supports between 50 and occasionally as many as 60 breeding pairs of Golden-cheeked Warblers. Extensive clearing and removal of juniper "posts" since the 1950's has eliminated approximately 80% of their breeding habitat. There are 3070 acres of potential golden-cheeked warbler habitat in the Preserve. If fully restored, it is estimated that this site could support as many as 200 breeding pairs of warblers (assuming 15 territories per 100 ha) (Keddy-Hector pers comm).

Black-capped Vireo

There is currently (as of June 2004) one possible pair (one male confirmed) of BCVI on the preserve. In 2002, one lone bird was sighted, and in 2003, one breeding pair was found. The Conservancy hopes to eventually see between 41 and 80 nesting pairs on the preserve, by restoring 400 acres of habitat. There were between 5 and 8 BCVI territories on the Preserve within the last ten years. The year of acquisition, 1996, was the last year that vireos were known to breed at this site, in the area known as "Vireo Hill." The Preserve population of vireos may have been a remnant of a larger complex of territories that formerly occupied mid-successional shrub lands and oak mottes and which colonized flatter portions of the Uplands after removal of juniper in the 1940's and 1950's (Keddy-Hector pers comm). Nature Conservancy staff began active restoration of vireo habitat via prescribed fire and mechanical manipulation on Vireo Hill in early 1999. There are several upland ridges which have the geological characteristics capable of supporting BCVI habitat.

Karst Species
No comprehensive invertebrate surveys have been conducted to date, as no caves have been found on the property.

Plants
No endangered plant species were observed during site investigations.

Other Species of Concern
None.

1.4 Land Uses

1.4.1 Pre-Historical

One comprehensive pre-historical cultural survey has been conducted to date at the preserve, on the Uplands tract. The preserve contains several pre-historical archaeological sites, which are best protected by anonymity.

1.4.2 Historical

Several areas on the preserve supported small farms and ranches of settlers. The preserve's main office is housed in a restored stone cabin built in 1877 by the Bohls family. The preserve was used for ranching, farming, and cedar-cutting by various owners until quite recently. The most recent landowners included a family of cedar choppers in the 1940's and 1950's, and a rancher who cleared several pastures for use as a homemade golf course.

The preserve was established in 1996 with mitigation monies provided by Davenport, Ltd., *a.k.a.* FM Properties, under a Section 10(a)(1)(B) permit of the Endangered Species Act. Agreements between FM Properties, The Nature Conservancy and the U.S. Fish and Wildlife Service require that Barton Creek Habitat Preserve be managed to provide golden-cheeked warbler and black-capped vireo habitat.

1.4.3 Current

• On-Site Usage
The Nature Conservancy limits the current use of the tract to management, maintenance, and wildlife survey personnel only for the purpose of conserving the native vegetation and endangered species habitat. Public access is not allowed, and there are limited private tours. LCRA staff accesses the site to maintain the water line.

• Adjacent Land Usage

The City of Austin owns a 750 acre tract adjacent to the Conservancy's property. Along with the Conservancy, the City also owns a conservation easement on a portion of the upstream Shield Ranch for protection of water quality and quantity in the Edwards Aquifer. Otherwise, the Preserve is almost completely surrounded by medium-density suburban development. Limited areas along Barton Creek and to the west of the Preserve remain open.

2.0 MANAGEMENT PROGRAM

2.1 Plan Administration

2.1.1 Description of Managing Entity

The management plan for the Barton Creek Habitat Preserve will be implemented by the staff of The Nature Conservancy of Texas or its representatives. Since 1951, The Nature Conservancy, a national non-profit conservation group, has worked to protect more than 117 million acres around the world. With a commitment to conserving Texas' native animals, plants and landscapes that began in 1964, The Nature Conservancy now owns 34 Texas nature preserves and manages an additional 34 conservation projects.

It is The Nature Conservancy's mission to preserve the plants, animals and natural communities that represent the diversity of life on Earth by protecting the lands and waters they need to survive.

2.1.2 Staffing

Management and maintenance of this preserve are the responsibility of the Nature Conservancy of Texas staff. A full-time Land Steward who is supported by the Conservancy's large stewardship and science staff manages the Preserve.

2.1.3 Inventory of Major Equipment

The Nature Conservancy has all major equipment needed to manage the Barton Creek Habitat Preserve. Equipment includes but is not limited to an ATV, Type 6 Fire Engine, trailers, mechanics tools, tractor and implements, and other equipment.

2.1.4 Current Budget

The Nature Conservancy of Texas will annually budget for management and maintenance activities within the Barton Creek Habitat Preserve. Funding levels will reflect the activities planned for the next fiscal year (July 1 – June 30).

2.1.5 Interagency Cooperation, Management Contracts & Agreements

See attached BCP Managing Partner Agreement (Appendix I).

2.1.6 Annual Reports

The Conservancy provides annual reports on management and maintenance activities to the USFWS, FM Properties, and the BCP Coordinating Committee.

2.2 Management Goals

2.2.1 Primary Management Goals

- Maintain or improve vegetation quality and coverage to provide habitat area for the GCWA.
- Where feasible, develop new habitat for the BCVI.
- Participate in the development and implementation of the BCP long-term biological monitoring program in conjunction with other preserves within the macrosite.
- Manage the preserve in accordance with the BCCP Managing Partner Agreement.

  • Golden-cheeked Warbler

  The Conservancy will limit human disturbance of GCWA, maintain or improve existing habitat, restore riparian forest habitat, and monitor GCWA populations in order to identify the success of these activities. Success will be achieved by maintaining or increasing current numbers of GCWA.

  • Black-capped Vireo

  Presently, about 100 acres of BCVI habitat exist within the Barton Creek Habitat Preserve, on two hill tops. There are several upland ridges with soils conducive to establishing BCVI habitat that may be managed for vireos, creating up to 300 more acres of habitat. However, GCWA habitat will not be removed to create habitat for BCVI.

2.2.2 Secondary Management Goals

- Protect and enhance water quality of Barton Creek.
- Restore 45 acres of riparian forest along Barton Creek.

- Engage children and adults in education and volunteer activities to help enhance their awareness of biodiversity, natural systems, and humans' place within them.
- Provide research opportunities for college students and scientists both as an educational tool and to inform and aid management at the preserve.

2.3 Management Objectives

The main objectives for this site are, in order of priority:
1. Protection of endangered species and species of concern, the land, and water;
2. Management of endangered species and species of concern and their habitats;
3. Enhancement of the habitats for endangered species and species of concern
4. Monitoring of the habitats for endangered species and species of concern; and
5. Public education and outreach about endangered species and species of concern and their habitats.

Vegetation:
Manage grasslands using mechanical methods or prescribed burning.
Implement fire management plan for preventing and/or controlling wild fires.
Identify rare plant species and communities.

Wildlife/Animals:
Conduct deer censuses and manage the population of this species.
Monitor, protect, and aid in the recovery of endangered species and species of concern.
Perform habitat restoration projects.

Natural/Cultural:
Control erosion, especially along gravel roads and bare, steep slopes.
Inventory, evaluate, and protect cultural resources.
Perform karst survey.
Remove interior fences.

Visitor Issues & Projects:
Monitor perimeter fencing to control access.
Plan and develop trail system and parking area.
Offer a limited number of guided tours.

2.4 Specific Implementation Strategies

All implementation strategies will follow the applicable guidelines as set forth in the BCP Tier I document. Where specified, implementation strategies will also follow guidelines set by other regional, state, and/or federal agencies.

2.4.1 Vegetation Management Procedures

Control Methods (mechanical/physical)

• Oak Wilt

All regular users of the property will be instructed to report any oak wilt observed and oak wilt will be included as an item of concern for the regular monitoring program. Persons conducting biological surveys on the property will be instructed to be alert for indications of oak wilt and to promptly report any occurrences.

Oak wilt prevention and suppression guidelines will follow established Texas Forest Service (TFS) procedures stated in the "Texas Forest Service Cooperative Oak Wilt Suppression Project Operation Procedures and Technical Guidelines." Suppression project plans will be developed in cooperation with the TFS. Control of oak wilt will be designed around resource management objectives and managed with consideration of wildlife needs.

• Prescribed Fire & Wildfires

All prescribed fires will be conducted under the supervision of trained TNC staff. All prescribed fires are conducted under a prescription written, and approved by TNC personnel. TNC follows the National Wildfire Coordinating Group safety and training standards.

A wildfire management plan has been written for the Barton Creek Habitat Preserve and has been given to the appropriate responding fire departments.

• Restoration & Protection Efforts

Several areas for potential BCVI habitat restoration have been identified on the upland ridges of Barton Creek Habitat Preserve (300 additional acres). Riparian pastures will be restored to riparian forest to improve GCWA habitat and improve water quality (45 additional acres).

• Species of Concern
Any rare or sensitive plant communities found will be protected from browsing pressure, human impact, and other disturbances.

2.4.2 Animal Management Procedures

• Endangered Species
Guidelines for activities on lands inhabited by endangered species will follow the Balcones Canyonlands Conservation Plan (BCCP) Environmental Impact Statement's Management Standards and Guidelines. The Conservancy will develop specific wildlife conservation plans using biological survey data by specialized personnel.

Habitat restoration, along with management and control of browsing animals, fire ants, oak wilt, cowbirds, nest predation, and wild fire will be detailed in the fiscal year management plans.

Vegetation on the site will be co-managed for the warbler and vireo. Any vegetation management directed toward the benefit of the vireo will be done in such a way as to avoid possible harm to warbler habitat and with the possible future benefit of the warbler in mind should efforts to attract BCVI to the site not prove successful.

(A) Golden-checked Warbler
Baseline data: GCWA surveys were performed on part or all of this property from 1996 through 2004, and will be continued annually. Additionally, vegetation mapping was done in 1996 and the GCWA habitat defined. Baseline data for the GCWA for this property are considered adequate for planning purposes.

Habitat improvement: Opportunities for habitat improvements exist where cedar post removal, fence building activities, and vehicle trails have broken canopy cover in warbler habitat. The property will be surveyed to identify those areas where trail closure and revegetation can improve habitat quality and a habitat improvement program will be designed and implemented for these areas.

(B) Black-capped Vireo
Habitat development: A preliminary evaluation based on aerial photography and field experience indicates approximately 300 additional acres of the Barton Creek Habitat Preserve has good potential for development of BCVI habitat. The preliminary

evaluation concluded that it is not likely that a large block of vireo habitat could be developed without possible harm to existing or potential GCWA habitat. A BCVI habitat development program will be established to further define areas for potential development and to design and implement vegetation management programs to encourage the growth of vireo habitat without compromising existing or potential GCWA habitat.

• Problem Animal Control

(A) Browsing Animals

There is evidence that browsing pressure from white-tailed deer may inhibit regeneration of desirable woody species in existing or developing GCWA habitat. Browsing pressure could also impede efforts to improve GCWA habitat and develop BCVI habitat. A program will be implemented to monitor regeneration of desirable woody species. Future action with regard to this concern will depend upon the findings of this program.

Where necessary, hunting and trapping will be used to reduce wildlife populations which are deemed harmful to any protected species and/or their habitat. Fencing or enclosures may be used to protect sensitive plants or habitats. Individual animals that are destructive, diseased or otherwise harmful to property may be destroyed by the Land Steward or other licensed person.

(B) Feral Domestic Animals

Feral domestic animals are not presently perceived to be a significant problem on the Barton Creek Habitat Preserve. Only a few observations of feral domestics have been reported from the biological surveys conducted in the last five years. However, as development proceeds adjacent to the preserve, feral pet animals could become a problem. All regular users of the property will be instructed to report any feral animals observed. Persons conducting biological surveys on the property will be instructed to be alert for indications of feral animals and to promptly report any occurrences. If it becomes evident that feral domestic animals pose a significant threat to the protected species on the preserve, appropriate measures to control the threat will be implemented.

Where necessary, trapping and other means may be used to reduce feral animal populations. Feral domestic animals will be turned over to local animal control authorities. Individual animals that are destructive, diseased or otherwise harmful to

property may be trapped and relocated or, if necessary, destroyed by the Land Steward or other licensed person.

(C) Predation and Parasitism
Nest parasitism by the brown-beaded cowbird is the most important consideration in this category. While cowbirds have been reported on the property, the population is considered to be moderate. This is as would be expected for a large tract with a minimum of nearby livestock husbandry. The Nature Conservancy has committed to controlling the cowbird population, especially in potential BCVI habitat. Cowbirds will be shot and trapped out of BCVI habitat and other appropriate areas in the Preserve.

Predation by wild animals is perceived as normal for the vicinity. While predation from wild animals such as scrub jays, raccoons, opossums and snakes may be expected, no effective means of controlling this type of predation are known. The perceived level of the problem will not justify extraordinary means to control predation from these sources and no action is planned.

The Conservancy will control fire ants and other insect pests where needed. No chemical control methods will be used if other alternatives are effective, and none will be used in the Barton Creek floodplain or endangered species habitat. Fire ant and insect pest control methods will be based on their efficiency and the impact they have on other natural resources and visitors. The most specific and least environmentally damaging alternative will be tried first unless there are economic or safety reasons for not doing so.

2.4.3 Physical and Cultural Management Procedures

• Hydrology and Water Quality
Conservation land treatment practices will be carried out to control erosion and NPS pollution problems. All practices will, where possible, be in accordance with all applicable parts of the USDA NRCS's Conservation Practice Standards, TAES's publications on erosion/NPS pollution control, and state, federal and local laws and regulations.

Roads, parking areas, and selected problem areas, such as steep road banks, will require permanent erosion/NPS pollution controls and monitoring.

• Geology

Areas containing significant karst formations will be kept in their natural state and any access routes found in close proximity to these features will be re-routed. The Conservancy will periodically survey for new karst features as necessary. The Conservancy will treat fire ant infestations near identified karst openings with boiling water only unless other methods are approved by the BCP Management Committee. Disturbance of soil and vegetation is prohibited in the drainage areas surrounding significant karst features.

• Soils

In order to control erosion and NPS pollution problems, the Conservancy will perform appropriate conservation land treatment practices. Areas surrounding trail or road maintenance will use temporary erosion NPS controls as needed. The Conservancy will periodically monitor and maintain service roads, parking areas, and selected problem areas such as steep road banks with permanent erosion/NPS controls.

• Cultural Resource Protection

Where significant cultural resources have been identified or are found in further investigations within the Barton Creek Habitat Preserve, their protection and preservation will be maintained by the Land Steward.

2.4.4 Visitor Management Procedures

• Access Control

The Conservancy will control visitor access to the site. Law enforcement will be performed by commissioned law enforcement officers. Access points into the preserve will be signed, gated, and locked. Preserve boundaries will be fenced, with a goal of five-strand barbed wire. Motor vehicle access will be limited to established roads except for equipment and vehicles used to maintain or inspect the preserve.

• Individual or Independent Group Use

Non-Commercial Use: Currently, non-commercial use either by individuals or private groups is not permitted on Nature Conservancy preserve lands. However, the Conservancy plans to develop programs to promote educational, research, and wildlife viewing activities. These programs will be developed so that they do not interfere with the nesting season.

Commercial Use: No commercial use of this site is anticipated. Should The Nature Conservancy receive a request for commercial use such as film making, the request will be reviewed by management on a case-by-case basis. Under no circumstances will commercial activities take place in or near GCWA or BCVI habitat during the BCVI and GCWA nesting season.

• User/Resource Conflicts

All applicable state, federal and local laws and regulations concerning litter, dumping, general sanitation, and solid waste disposal will be strictly enforced.

3.0 MANAGEMENT PROGRAM MONITORING

The Nature Conservancy will monitor and evaluate habitat management using applicable biological monitoring procedures (as defined in the Tier 11-A Management Handbook) as guidelines.