

Public Display



DRUID ENVIRONMENTAL
DE Job No. 196

Botanical and Ecological Inventory of the Sunset Valley Creekbelts, Preserves and Conservation Areas

Prepared for:

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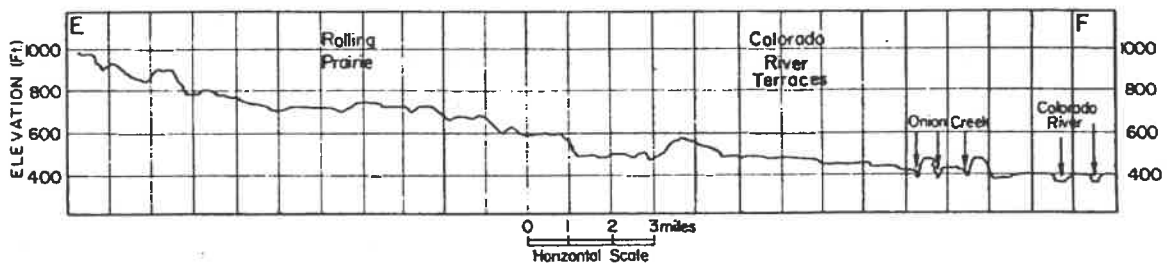
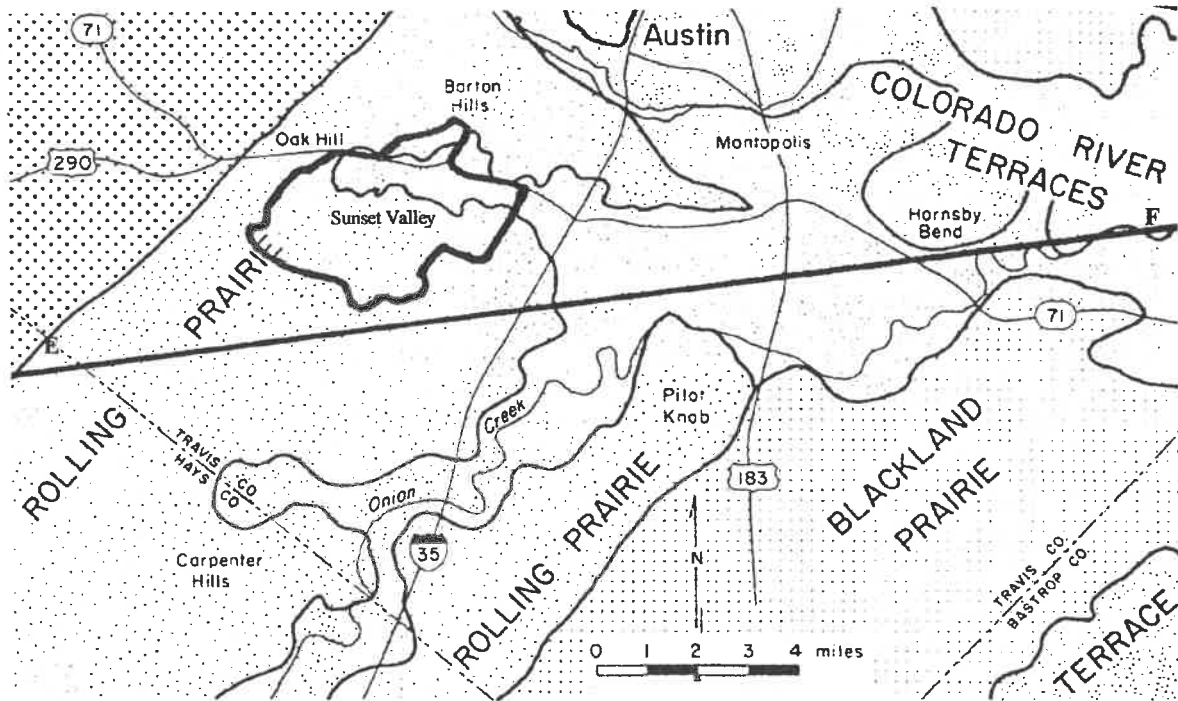
Botanical and Ecological Inventory of the Sunset Valley Creekbelts, Preserves and Conservation Areas

1.0 INTRODUCTION

The City of Sunset Valley is located east of the Edwards Plateau and west of the Blackland Prairie within the Rolling Prairie (Figure 1) (Bureau of Economic Geology (Garner and Young), 1976). The Rolling Prairie was developed within the Balcones fault zone, and may, in some respects, be viewed as a transitional physiographic unit between the Edwards Plateau and the Blackland Prairie. For example, within the Rolling Prairie hard limestone outcrops characteristic of the Edwards Plateau diminish eastward to be replaced by soft limestone. Hard limestones of the Rolling Prairie are principally of the Edwards formation, with some local outcrops of Georgetown limestone. The soft limestones of the area include Austin chalk and Buda limestone. Buda limestone outcrops, consisting mostly of rock fragments and rubble can be identified on the east and south quadrants of Sunset Valley above outcrops of the highly fossiliferous Del Rio clay. Also, on a west to east gradient, the thin soils of the Edwards Plateau are gradually replaced by deeper soils developed under prairie grassland. Soils identified by Garner and Young for the Rolling Prairie and also by the Soil Conservation Service (SCS), and confirmed by Druid Environmental (DE) for sites within the conservation areas were mainly Speck and Tarrant soils. Additionally, Ferris-Heiden complex soils, a soil type typical of the Blackland Prairie was identified within the South Hills Conservation Area. The plant assemblage described for the Rolling Prairie by Garner and Young is live oak-grassland, and this botanical assessment was generally confirmed by DE. Many plant species of the Edwards Plateau and the Blackland Prairie are found within the Rolling Prairie and species diversity can be quite high at locations exhibiting combined characters of these physiographic regions. On the other hand, no plant species is unique to the Rolling Prairie.

The City of Sunset Valley currently maintains five undeveloped parcels of land as creekbelts, preserves and conservation areas (Figure 2) . These, listed in order of geographic occurrence from north to south, are the Gaines Creekbelt, the Cougar Creekbelt, the Prairieland Preserve, the Sunset Valley Creekbelt and the South Hills Conservation Area. On January 25, 1998 , the City of Sunset Valley contracted with DE to prepare a botanical inventory of these sites. Objectives were to identify plant communities, provide lists of plant species, identify sensitive natural communities and rare plant species, identify invasive and pest plant species and identify interesting natural features and disturbance features. A report on findings to include site-specific map and photographic documentation and management recommendations was completed in April 1999. The following sections of this report provide methods and site-specific results.

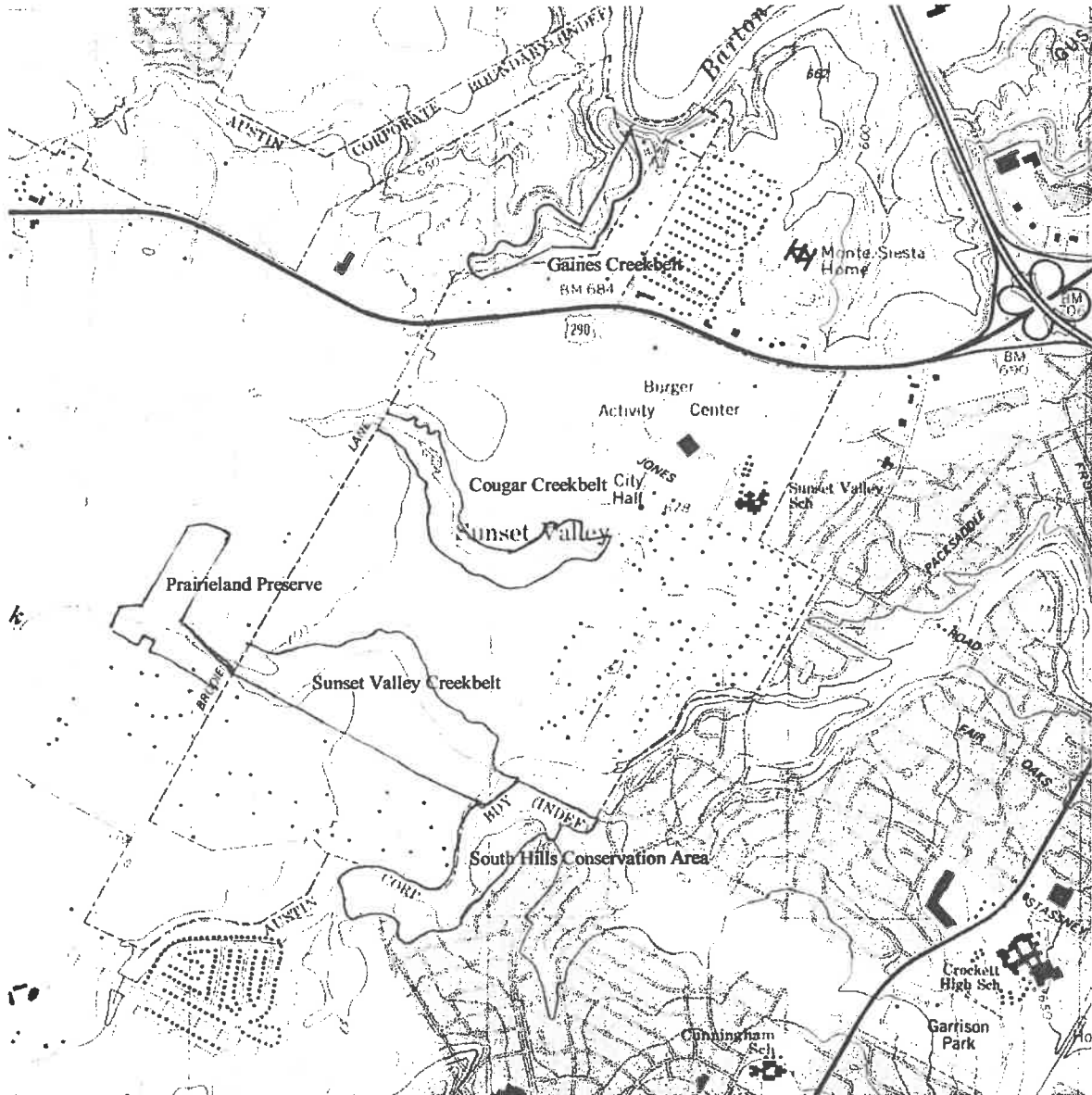
Each of the five sites was addressed separately in this report and the resulting plant lists, may be viewed as stand-alone documents. This approach resulted in considerable redundancy in the plant tables because relatively few plant species were identified as specific to a particular site. DE has attempted to point out, with textual references, these site-unique species, and also to



Source: BEG (1976)

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Figure 1 Physiographic Site Map for the City of Sunset Valley, Travis County, Texas



Source: Oak Hill 7.5' USGS
Topographic Map



Scale: 1" = 2000"

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Figure 2 Location Map: City of Sunset Valley
Conservation Lands, Travis County, Texas
Gaines Creekbelt, Cougar Creekbelt, Prairieland Preserve,
Sunset Valley Creekbelt, South Hills Conservation Area

indicate variations among dominant species from site to site. Because field work to date was conducted mainly in winter through April 16, 1999, an unknown number of species, mostly summer flowering annual and perennial herbs were probably not identified. Also, in some instances DE has fudged the tabular lists of plants. Very common species that should occur on all the sites, for example, the annual winter weed, henbit (*Lamium amplexicaule*), may have been included in tables without site-specific field verification. In general, it is probably safe to assume that a weedy annual species identified at one site occurs on all the sites. On the other hand, species with specific microhabitat requirements, for example, some of the ferns which were found only on cliffs at the Gaines Creekbelt, and some of the wetland plant species identified at ponded areas of the Cougar Creekbelt, are site-specific in occurrence. DE has agreed to provide updates to the site-specific plant tables as field investigations conducted during the growing season result in the identification of additional plant species. Floppy discs or other requested media containing updates to the plant lists will be provided to the City of Sunset Valley at no additional charge.

Site descriptions include these sections: **Physical Characteristics, Man-Made Features, Disturbance Features, Potential Climax Plant Species Identified by the Natural Resources Conservation Service, Plant Communities Characterized by the Texas Natural Heritage Program, Observed Vegetation Structure and Dominant and Interesting Plant Species**, and each site description includes a table listing the scientific and common names and habits of all species found at the site. The Physical Characteristics sections include information on site topography, surface water resources, geology and soils. The Man-Made Features sections identify buildings, roads and other works on the sites. The Disturbance Features sections describe areas impacted by human activities and attempt an interpretation of these activities related to extant vegetation communities and introduced plant species. The Potential Climax Plant Species Identified by the Natural Resources Conservation Service sections summarize data on important plant species listed for the range sites appropriate to the specified Sunset Valley property. The Plant Communities Characterized by the Texas Natural Heritage Program (TNHP) sections indicate DE's application of the Texas Natural Heritage Program's community classifications system to the sites. Plant species listed by the SCS and TNHP are probably the most appropriate for use in any contemplated native vegetation restoration projects. The Observed Vegetation Structure, Dominant and Interesting Plant Species sections provide an overview of community structures, the visually common species and miscellaneous comments on other interesting plant species including the presence or potential presence of endemic and/or rare plant species.

Only one introduced plant species, hedge parsley (*Torilis arvensis*), sometimes called beggar's lice in deference to its fruits, was found to be so pervasive on all the sites, and so obnoxious in its personal habits that it is deemed worthy of an eradication effort. This cool season annual produces white flowers in the spring and numerous barbed fruits in early summer. It is typically ubiquitous on disturbed wood margins and shrubby areas throughout Sunset Valley. It is also found on any trail where wild animals, pets and humans serve as vectors for seed dispersion. DE recommends that populations of this species be systematically hunted down and annihilated. Populations may be removed by vigorous use of swing-hoes in late spring, prior to fruit

production.

Finally, local naturalists W.R. (Bill) Carr, John Maresh, Pat McNeal and Burford Westlund assisted with field work, plant identifications, management recommendations and site physical and botanical characterizations. Helen Besse also assisted with a meticulous edit of the first draft of the report.

2.0 METHODS

Standard reference material was reviewed to provide baseline environmental data including geology, topography and soils maps, soil surveys and aerial photography. Botanical references relied upon for plant identifications and distributional information were Diggs et al. (1999), Carr (1996), Correll and Johnston (1970), Gould (1975), Correll (1956) and Hitchcock (1935). All sites were accessed by walking and subject information was noted during each site visit on the following dates:

Gaines Creekbelt - July 3 and 11, December 18, 1998 and January 5, 9 and 15, February 23, March 10 and 31, April 6 and 17, 1999

Cougar Creekbelt - July 11, November 8, November 29, December 5 and 12, 1998 and almost daily during January, February, March and April 1999

Prairieland Preserve - November 14, December 3, December 5, 1998 and January 9, 17, February 16 and 28, March 22, and April 11 and 16, 1999.

Sunset Valley Creekbelt - October 31, November 14, November 24, December 9, 1998 and January 23 and 30, March 3 and 7 and April 4 and 12, 1999

South Hills Conservation Area - November 24, December 9, 1998 and January 15, 24, 31 and February 16, 21 and 27, March 13 and April 5 and 15, 1999

In addition, field notes and herbarium records generated by DE prior to the contract date and pertinent to these sites were reviewed.

Plant names used in this report follow Hatch et. al (1990). Updated versions of this checklist can be accessed on the internet at www.csdl.tamu.edu/FLORA/taes/tracy/regeconf.html.

However, Hatch et al. do not provide common names for some of the plant species identified. In such cases the common name is abstracted from Carr (1996) or, where Carr does not provide a common name, no common name is included in this report. Several plant specimens were collected during the course of the field work and are noted in the text below as, for example, *Allowissadula holoserica*, indicating the scientific name, DE for Druid Environmental, and a

collection number. All specimens collected are on file at 3 Lone Oak Trail, Sunset Valley, Texas 78745. A photo log was generated during the course of site visits. Facsimiles of photos accompany the following text. For reference purposes, photographs were dated in the lower right hand corner.

3.0 RESULTS

3.1 Gaines Creekbelt

3.1.1 Physical Characteristics

The Gaines Creekbelt (Figure 3) is 21.869 acres, mostly comprised of steep to very steep north and west facing slopes above Gaines Creek. No permanent surface water features were noted at the site. Creek flow is apparently ephemeral and regulated by man-made detention basins constructed above channel headwaters. Gaines Creek is tributary to Barton Creek with the confluence located east northeast of the site northeast boundary.

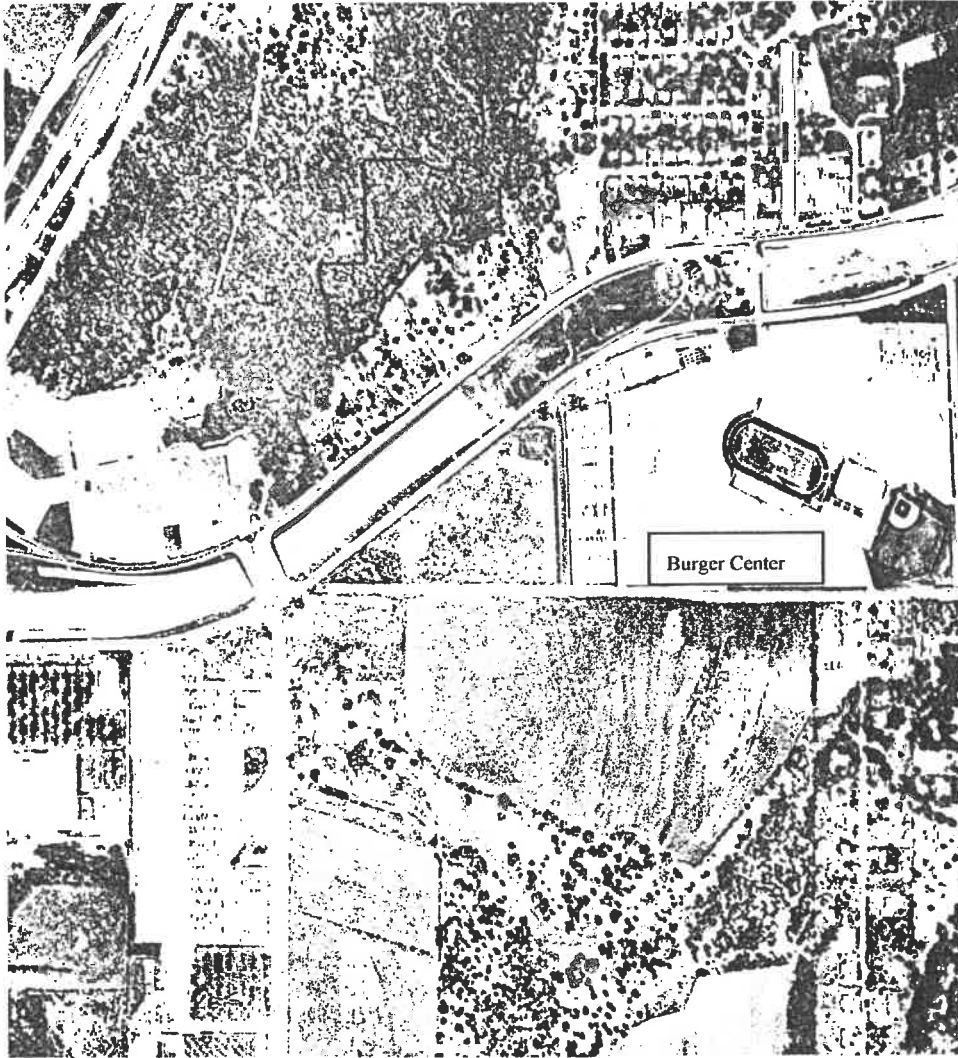
Elevation of the Gaines Creekbelt varies from about 660 feet along the plateau top east boundary to about 570 feet within the Gaines Creek floodplain, a precipitous 90 foot drop. Exposed geologic formations are according to Garner and Young: a) high terrace deposits of the Colorado River of sand gravel and clay adjacent to developed areas south and west of the tract, b) a Georgetown limestone cap on the high plateau extending south toward Ben White Boulevard and c) Edwards limestone exposed on steep hillsides, ravines and lower slopes (Garner and Young, 1974). A small cave that accommodated a black vulture nest during March and April 1999, and a rock shelter are among the interesting geologic features located at the site.

The Colorado River terrace deposits located primarily south of the creekbelt currently support grassy fields, parking lots and a presumptive Academy Surplus. The Georgetown top, as mapped by Garner and Young, was evident only from a few scattered areas of mainly dislodged rock containing fossils indicative of Georgetown limestone. Perhaps the Georgetown cap on the site has been rendered unrecognizable by construction activities. Thus, rock outcrops at the site were mainly identified as Edwards limestone.

The soil map unit for the tract is Tarrant soils and rock outcrops. Tarrant soils and rock outcrops are dark grayish brown clays or clay loams mixed with limestone fragments of variable sizes. These soils are shallow and depth to bedrock is typically only 4-14 inches (SCS, 1974).

3.1.2 Man-Made Features

The two main up-slope water channels on the tract have large runoff detention basins constructed at their heads. Presumably these basins prevent runoff containing large amounts of suspended material from entering Barton Creek and/or the Edwards Aquifer. These basins have probably altered site hydrology appreciably. An approximately 10-inch diameter pipe of unknown function leading from the detention basin located on the south side and at the approximate center of the Gaines Tract was noted as broken during the January 8, 1999 site visit. The break was at



Burger Center



N

Source: Aerial Photography

Scale: 1" = 500'

Boundaries are closely approximate.

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Figure 3 Gaines Creekbelt, City of
Sunset Valley, Travis County

the pipe's entrance point to the top of a very steep ravine that bisects the Gaines Tract.

3.1.3 Disturbance Features

Apart from evidence of past logging of Ashe juniper, a creek-side trail and the presence of numerous old and more recent rubbish heaps along the south and east boundary, the site appears relatively undisturbed by human activities. The rubbish heaps include metal cans, old barbed wire, appliances and various other articles that area residents have, over the years, heaved over the back fences of their properties.

Due to the steepness of the terrain, pedestrian traffic has generally been limited to the lower reaches of the site. Game trails were, however, common on the slopes and plateau tops and these allow some access, by the intrepid, to cliff tops and upper slopes.

3.1.4 Management Recommendations

The rubbish heaps are unsightly and dangerous and should be cleaned up. Existing trails and dry creek branches provide good access to most of the site. Additional trail construction is not recommended. Hikers should probably be warned by signs against climbing on the precipitous cliff faces.

Ashe juniper may be increasing on the site at the expense of deciduous tree and shrub species. However, manipulation of the present site vegetation, for example, selective removal of Ashe juniper, is not advised. Due to the steepness of most of the site terrain, selective clearing would be labor intensive and fairly dangerous. Vegetation seeded or planted to replace cut over juniper areas would be very difficult to establish considering the likelihood of drought and the highly erodible soils. In addition, the site is, based on DE's opinion, golden-cheeked warbler (*Dendroica chrysoparia*) habitat, and individuals of this species may, despite adjacent development, persist at the site or in the immediate site vicinity. (In fact, a golden-cheeked warbler was identified on the Gaines site by DE during March 31 and April 6, 1999 site visits. No manipulation of golden-cheeked warbler habitat should occur prior to ascertaining the status of this species at the site.

3.1.5 Gaines Creekbelt Flora - Potential Climax Plant Species Identified by NRCS

SCS, now enjoying a reincarnation as the Natural Resources Conservation Service (NRCS), has, for many years, provided plant lists for ranchers indicating plant species that provide palatable forage for cows, sheep and goats, but primarily for cows. These lists are included in range site descriptions. The Gaines Tract is identified by NRCS as a Steep Rocky Range Site. The decreaser plant list for this range site is reproduced below as Table 1. Decreaser plant species are those species, as identified by SCS, that decrease in response to grazing and browsing. These

decreasers are generally assumed to comprise the dominant plant species at a site that is, more or less, approaching a pristine condition. The scientific names (not included in the Soil Survey of Travis County) are provided in Table 1 as an editorial addition. Whether these plant species actually ever constituted the main components of a natural community on what is now called the Gaines Tract, is anybody's guess. However, all of the species in Table 1 with the exceptions of awnless bush sunflower (*Simsia calva*) and Maximilian sunflower (*Helianthus maximiliana*) were present on the site during DE site visits and probably provide some indication of important pre-settlement plant species at the site. Additionally, the list of species in Table 1 should be included in any restoration scenario promulgated for the site, should the notion that vegetation restoration is in order, arise.

Table 1
Decreaser Plant Species for the Steep Rocky Range Site

Trees

Common Name	Scientific Name
live oak	<i>Quercus virginiana</i>
Texas oak	<i>Quercus buckleyi</i>

Shrubs

Texas persimmon	<i>Diospyros texana</i>
Texas kidneywood	<i>Eysenhardtia texana</i>
Lindheimer's silktassel	<i>Garrya ovata</i> ssp. <i>lindheimeri</i>
skunkbush sumac	<i>Rhus aromatica</i>
evergreen sumac	<i>Rhus virens</i>

Herbs

Illinois bundleflower	<i>Desmanthus illinoensis</i>
Engelmann daisy	<i>Engelmannia pinnatifida</i>
Maximilian sunflower	<i>Helianthus maximiliana</i>
awnless bush sunflower	<i>Simsia calva</i>
orange zexmenia	<i>Wedelia hispida</i> , formerly <i>Zexmenia hispida</i>

Grasses

side-oats grama	<i>Bouteloua curtipendula</i>
green spangletop	<i>Leptochloa dubia</i>
little bluestem	<i>Schizachyrium scoparium</i>
Indiangrass	<i>Sorghastum nutans</i>

3.1.6 The Gaines Creekbelt Plant Community as Characterized by the Texas Natural Heritage Program

The now-defunct Texas Natural Heritage Program, a casualty of property right's politics and delusions of grandeur, promulgated characterizations of Texas plant communities, listing dominant and characteristic species for each community (TNHP, 1993). (I am informed that this effort has now been resumed under the auspices of The Nature Conservancy of Texas, and that revised community characterizations will be made available to interested parties at some future date). The TNHP community characterization for the Ashe Juniper - Oak Series which occurs at the Gaines Creekbelt is as follows:

Ashe Juniper-Oak Series (G4S4) (*Juniperus ashei*-*Quercus* spp.) This evergreen shrubland or woodland primarily inhabits shallow-soiled, sloping sites over limestone in the Edwards Plateau. Disturbed areas over deeper soils on flat uplands may also support this community. It circumscribes a fairly wide degree of variation, and on dry sites may form an open shrubland with midgrasses and xeromorphic shrubs or may form closed canopy woodlands or low forest on more favorable sites. Texas, scalybark, scrub, and plateau live oaks (*Quercus buckleyi*, *Q. sinuata* var. *breviloba*, *Q. pungens*, and *Q. fusiformis*) along with evergreen sumac (*Rhus virens*) and agarito (*Berberis trifoliolata*) are components. To the west and north this type may grade into the redberry (Pinchot) juniper (*Juniperus pinchotii*)-midgrass series. This community type forms landscape mosaics with plateau live oak woodland and grasslands on uplands and deciduous oak woodlands on adjacent mesic slopes.

Note that TNHP used the scientific name *Quercus sinuata* for *Quercus durandii*, and *Quercus fusiformis* for *Quercus virginiana*. G4S4 refers to the global (G) and state (S) rank of the community. TNHP ranked natural communities from 1- 4 based on rarity and threats to the community. A rank of G1S1 indicated a community that was imperiled globally and within Texas. G4S4 indicated a community that was "apparently" secure globally and within the state. A rank of G5S5 indicates "demonstrable" security.

3.1.7 Observed Vegetation Structure, Dominant and Interesting Plant Species

The Gaines Tract was mostly wooded although a few grassy clearings were present along the ephemeral stream basin comprising the lowest elevations of the tract. Ashe juniper (*Juniperus ashei*) "cedar" was the most common tree species in the canopy and mid-story. Recruitment was high for this species as indicated by many small saplings in the herbaceous vegetation layer.

Judging from the numerous 4 to 10 inch diameter juniper stumps, the site has been cut for posts and lumber on several occasions. Most of the live juniper falls within the 2 to 6 inch diameter-at-breast height (dbh) range, although many 8-12 inch dbh trees were also noted. In general, smaller junipers increased in abundance on the drier slopes while larger junipers were more common in areas that catch more runoff, e.g., ravines and flats along ephemeral stream channels.

Other common tree species identified were live oak (*Quercus virginiana*), shin oak (*Quercus durandii* var. *breviloba*), Texas oak (*Quercus buckleyi*) cedar elm (*Ulmus crassifolia*), sugar

hackberry (*Celtis laevigata*) and escarpment black cherry (*Prunus serotina*). Live oak at the site was mainly associated with flatter areas such as the plateau top. Shin oak was common on flats and slopes. Texas oak, cedar elm, sugar hackberry and escarpment black cherry appeared more numerous on relatively mesic ravine and creek margins.

Shrubs and small trees, in addition to Ashe juniper and other saplings of the over story, were common at the site. The relatively high diversity of shrub and small tree species was possibly a function of the low canopy as well as tree fall on the steep slopes creating openings in the canopy. The most visually common shrub at the Gaines Tract was Texas persimmon (*Diospyros texana*), which, with Ashe juniper saplings, comprised the most common mid-story species. Several other shrub and small tree species were common along mesic ravines and stream bottoms. Noteworthy among these were Carolina buckthorn (*Rhamnus caroliniana*) and red buckeye (*Aesculus pavia*). The numerous red buckeyes on the site should produce a beautiful floristic display in early spring. One small chinkapin oak (*Quercus muhlenbergia*) was found in Gaines Creek alluvium.

Because the site is primarily closed canopy woodland, grasses were most common on wood margins and in a few clearings along tributary creeks. Common species identified in these areas were silver bluestem (*Bothriochloa laguroides*), curly mesquite (*Hilaria belangeri*) and Texas wintergrass (*Stipa leucotricha*).

The steep cliff walls and slopes of the Gaines Tract provide habitat for several fern species, all of which are epipetric, or nearly so, on limestone rock outcrops. Most common among the species identified were blackstem (*Asplenium resiliens*) and Alabama lipfern (*Cheilanthes alabamensis*). The Asian holly-fern (*Cyrtomium falcatum*) was common on upper terraces in the main ravine dissecting the center of the site, south to north. This species is often planted as an ornamental in the Austin area, but the population at the Gaines Tract is the only documented instance of a naturalized population occurring in Travis County.

A rock shelter was found at the base of a west-facing cliff located near the northeast corner of the site boundary. Fiddleleaf tobacco (*Nicotiana repanda*) was found growing within the rock shelter. Other noteworthy plants found on this cliff face were cockscomb (*Celosia nitida*), Brazos rockcress (*Arabis petiolaris*) and Mormon tea (*Euphorbia antisyphilitica*). All these plants are rare in the Austin area. Brazos rockcress was once considered for listing as an endangered species.

The most interesting grass identified at the site was Buckley tridens (*Tridens buckleyanus*). This species was a very common understory component on partially shaded areas of less steep slopes. Buckley tridens was formerly proposed for listing as an endangered species, but subsequent field work on the Edwards Plateau and on Austin chalk substrates has determined that this species, though restricted in range, is very common in juniper-oak woodlands within its limited range. Buckley tridens is endemic, or nearly so, to the Edwards Plateau

As is usual on limestone substrates in central Texas, the most common sedge at the Gaines Tract

was cedar sedge (*Carex planostachys*). Cedar sedge is a dominant and characteristic under story component of juniper-oak woodland throughout Travis County. Other common sedges at the site were canyon sedge (*Carex edwardsiana*) Bridges & Orzell (1989) and (*Carex perdentata*) Jones (1994). These species were only recently described in the botanical literature. Canyon sedge is endemic to the Edwards Plateau with records from only six Texas counties. No common name accrues to *Carex perdentata*. One clump of Cherokee sedge (*Carex cherokeensis*) was also found in a channel of Gaines Creek.

In addition to Buckley tridens and canyon sedge, species endemic, or nearly so, to the Edwards Plateau that were found at the site were plateau spiderwort (*Tradescantia edwardsiana*), Texas yucca (*Yucca rupicola*) and canyon anemone (*Anemone edwardsiana*). A rare species that was not found at the site, but which may occur, is shining hexalectris (*Hexalectris nitida*). This orchid usually occurs in closed canopy juniper-oak woodland on sparsely vegetated flats with a dense covering of old juniper leaves (duff).

Several introduced weeds were identified at the site. These were most common on the plateau top adjacent to developed areas. None of these annual weeds are obnoxious and no management issues obtain to them. However, (*Cyperus entrerianus*) a robust (clumps can be 4 feet high and 5 feet across) and aggressive introduced sedge was found in a channel leading from a small water detention basin located between Home Improvement and Gaines Creek. The channel drains into Gaines Creek. The plant in question was found in early spring and had set seed the previous fall. As a result, DE predicts that this species, now the most common sedge in Harris and surrounding counties will become established in the Barton Creek watershed, potentially to the detriment of native grasses and sedges. Other introduced weeds, previously unreported, or rarely reported for Travis County and found between Home Improvement and the Gaines Creekbelt were turnips (*Brassica rapa*), common flax (*Linum usitatissimum*) and white hypochaeris (*Hypochaeris microcephala*).

Introduced shrub species that were fairly common at the site were heavenly bamboo (*Nandina domestica*) and Japanese privet (*Ligustrum japonicum*). The former of these species was heavily browsed by the white-tailed deer.

Table 2, Plant Species Identified at the Gaines Creekbelt, lists the scientific name, common name(s) and habit of plant species identified at the Gaines Creekbelt. Plant species are grouped by family and listed in phylogenetic order following Hatch et al. (1990). Habit, Column 3, provides information on the primary season in which the species fruits and flowers, whether the species is annual or perennial and the growth form of the species. Warm season refers to species that reproduce sexually during summer and fall. Cool season refers to species that reproduce sexually during late winter and spring. An asterisk (*) following the scientific name of a plant in the tables indicates the plant is an introduced species. DE and a number after a scientific name indicate that a specimen is on file at DE.

Table 2
Plant Species and their Habits at the Gaines Creekbelt

Polypodiaceae	Fern Family	Habit
Asplenium resiliens	blackstem, little ebony spleenwort	warm season perennial
Cheilanthes alabamensis	Alabama lipfern	warm season perennial
Cheilanthes horridula	rough lipfern	warm season perennial
Cyrtomium falcatum*	Asian holly-fern	warm season perennial
Pellaea atropurpurea	purple cliffbrake	warm season perennial
Thelypteris kunthii	southern shield fern	warm season perennial
Cupressaceae	Cypress Family	Habit
Juniperus ashei	Ashe juniper	tree, warm season perennial
Ephedraceae	Jointfir Family	Habit
Ephedra antisiphilitica DE 3101	Mormon tea	shrub, warm season perennial
Poaceae	Grass Family	Habit
Aristida purpurea var. purpurea	purple threeawn	warm season perennial
Bothriochloa barbinodos	cane bluestem	warm season perennial
Bothriochloa ischaemum*	King Ranch bluestem	warm season perennial
Bothriochloa laguroides	silver bluestem	warm season perennial
Bouteloua curtipendula	side-oats grama	warm season perennial
Bouteloua rigidiseta	Texas grama	warm season perennial
Bromus japonicus*	Japanese brome	cool season annual
Bromus uniloides*	rescuegrass	cool season annual
Cynodon dactylon*	bermudagrass	warm season perennial
Elymus virginicus	Virginia wildrye	cool season perennial
Festuca arundinacea*	tall fescue	cool season perennial
Hilaria belangeri	curly mesquite	warm season perennial
Hordeum pusillum	little barley	cool season annual
Leptochloa dubia	green spangletop	warm season perennial
Limnodea arkansana	ozarkgrass	cool season annual
Melica nitens DE 3104	threeflower melic	cool season perennial
Panicum hallii	Hall panicum	warm season perennial
Panicum virgatum	switchgrass	warm season perennial
Schizachryium scoparium	little bluestem	warm season perennial
Setaria scheelei	southwestern bristlegrass	warm season perennial
Sorghum halapense*	Johnsongrass	warm season perennial
Sporobolous asper	tall dropseed	warm season perennial
Stipa leucotricha	Texas wintergrass, speargrass	cool season perennial
Tridens buckleyanus	Buckley tridens	warm season perennial
Vulpia octoflora	common sixweekgrass	cool season annual

Cyperaceae	Sedge Family	Habit
Carex brittonia	Britton sedge	cool season perennial
Carex cherokeensis	Cherokee sedge	cool season perennial
Carex edwardsiana DE 3178	canyon sedge	cool season perennial
Carex microdonta	little-tooth sedge	cool season perennial
Carex muhlenbergia var. enermis	Muhlenberg sedge	cool season perennial
Carex perdentata		cool season perennial
Carex planostachys	cedar sedge	cool season perennial
Cyperus entrerianus*		warm season perennial
Cyperus retroflexus	oneflower flatsedge	cool season perennial
Araceae	Arum Family	Habit
Arisaema dracontium	dragonroot, green dragon	herb, cool season perennial
Bromeliaceae	Pineapple Family	Habit
Tillandsia recurvata	ballmoss	epiphyte, warm season perennial
Commelinaceae	Spiderwort Family	Habit
Tinantia anomala	false dayflower	herb, cool season annual
Tradescantia edwardsiana	plateau spiderwort	herb, cool season perennial
Liliaceae	Lily Family	Habit
Allium canadense	Canada garlic	herb, cool season perennial
Allium drummondii	Drummond onion	herb, cool season perennial
Smilax bona-nox	saw greenbrier	vine, cool season perennial
Yucca rupicola	Texas yucca	shrub, cool season perennial
Amaryllidaceae	Amaryllis Family	Habit
Cooperia pedunculata	giant rain lily	herb, cool season perennial
Juglandaceae	Walnut Family	Habit
Juglans major	Arizona walnut	tree, cool season perennial
Fagaceae	Beech Family	Habit
Quercus buckleyi	Texas oak	tree, cool season perennial
Quercus durandii var. breviloba	shin oak	tree, cool season perennial
Quercus muhlenbergia	chinkapin oak	tree, cool season perennial
Quercus virginiana	live oak	tree, cool season perennial
Ulmaceae	Elm Family	Habit
Celtis laevigata	sugar hackberry	tree, cool season perennial
Celtis reticulata	netleaf hackberry	tree, cool season perennial
Ulmus crassifolia	cedar elm	tree, cool season perennial

Moraceae	Mulberry Family	Habit
Morus alba*	white mulberry	small tree, cool season perennial
Urticaceae	Nettle Family	Habit
Parietaria pensylvanica	rock pellitory	herb, warm season annual
Urtica chamaedryoides	heart-leaf nettle	herb, cool season annual
Viscaceae	Mistletoe Family	Habit
Phoradendron tomentosum	mistletoe	epiphytic, parasitic, cool season shrub
Aristolochiaceae	Birthwort Family	Habit
Aristolochia serpentaria	Virginia pipevine	herbaceous vine, cool season perennial
Polygonaceae	Knotweed Family	Habit
Rumex crispus*	curly dock	herb, warm season perennial
Rumex pulcher*	Fiddle dock	herb, cool season perennial
Amaranthaceae	Amaranth Family	Habit
Celosia nitida DE 3181	albahaca, cockscomb	subshrub, warm season perennial
Phytolaccaceae	Pokeweed Family	Habit
Rivina humilis	pigeonberry, bloodberry	herb, warm season perennial
Caryophyllaceae	Pink Family	Habit
Arenaria benthamii	hilly sandwort	herb, cool season annual
Stellaria media*	chickweed starwort	herb, cool season annual
Ranunculaceae	Buttercup Family	Habit
Anemone berlandieri	tenpetal naemone	herb, cool season perennial
Anemone edwardsiana DE 3015	canyon anemone	herb, cool season perennial
Clematis drummondii	Texas virgin's bower	subshrub, warm season perennial
	old man's beard	
Berberidaceae	Barberry Family	Habit
Mahonia trifoliata	agarito	shrub, cool season perennial
Nandina domestica*	heavenly bamboo	warm, cool season perennial
Menispermaceae	Moonseed Family	Habit
Cocculus carolinus	Carolina snailseed	vine, cool season perennial

Brassicaceae

Arabis petiolaris DE 3182
*Brassica rapa**
Lesquerella recurvata

Rosaceae

Geum canadense
*Photinia sp.**
Prunus mexicana
Prunus serotina
Rubus trivialis

Fabaceae

Cercis canadensis
Desmodium psilophyllum

Desmodium paniculatum
Eysenhardtia texana
Lespedeza sp.
Lupinus texensis
*Medicago mimima**
*Melilotus indicus**
Mimosa borealis
Lupinus texensis
Prosopis glandulosa
Rhynchosia senna var. texana
Senna lindheimeriana
Sophora affinis
Sophora secundiflora
Vicia leavenworthii

Geraniaceae

Erodium cicutarium
Erodium texanum
Geranium carolinanum

Oxalidaceae

Oxalis dillennii
Oxalis drummondii

Linaceae

*Linum usitatissimum**

Mustard Family

Brazos rockcress
 turnip
 slender bladderpod

Rose Family

white avens
 Mexican plum
 escarpment black cherry
 southern dewberry

Legume Family

redbud
 Wright tickclover
 simple-leaf tickclover
 panicked tickclover
 Texas kidneywood
 bushclover
 Texas bluebonnet
 small bur-clover
 annual yellow sweetclover
 fragrant borealis
 Texas bluebonnet
 honey mesquite
 Texas snoutbean
 Lindheimer senna
 Eve's necklace
 Texas mountain laurel
 Leavenworth vetch

Geranium Family

alfilaria, stork's bill
 Texas filaree, heron bill
 Carolina geranium

Wood-Sorrel Family

yellow sour-clover
 Dillen's wood-sorrell
 Drummond wood-sorrell

Flax Family

common flax

Habit

herb, cool season biennial
 herb, cool season annual
 herb, cool season perennial

Habit

herb, cool season perennial
 introduced shrub
 tree, cool season perennial
 tree, cool season perennial
 vine, cool season perennial

Habit

small tree, cool season perennial
 herb, warm season perennial

herb, warm season perennial
 shrub, warm season perennial
 herb, warm season perennial
 herb, cool season annual
 herbs, cool season annuals
 herb, cool season annual
 shrub, warm season perennial
 herb, cool season annual
 tree, warm season perennial
 herb, warm season perennial
 herb, warm season perennial
 tree, cool season perennial
 shrub, cool season perennial
 herb, cool season annual

Habit

herb, cool season annual
 herb, warm season perennial
 herb, cool season annual

Habit

herb, warm season perennial
 herb, warm season perennial

Habit

herb, all season annual

Rutaceae	Citrus Family	Habit
<i>Ptelea trifoliata</i>	skunkbush, hoptree	small tree, cool season perennial
Simaroubaceae	Quassia Family	Habit
<i>Ailanthus altissima*</i>	tree of heaven	small tree, cool season perennial
Polygalaceae	Milkwort Family	Habit
<i>Polygala lindheimeri</i>	Lindheimer milkwort	subshrub, warm season perennial
Euphorbiaceae	Spurge Family	Habit
<i>Argythamnia simulans</i>	plateau wild mercury	herb, warm season perennial
<i>Bernardia myricifolia</i>	brush myrtlecroton	evergreen shrub, warm season perrenail
<i>Euphorbia roemeriana</i> DE 3016	Roemer spurge	herb, cool season annual
<i>Euphorbia villifera</i>	hairy spurge	herb, warm season perennial
<i>Croton fruticosus</i>	bush croton	shrub, warm season perennial
<i>Croton monanthogynous</i>	one-seed croton	herb, warm season annual
<i>Phyllanthus polygonoides</i>	knotweed	subshrub, warm season annual
<i>Tragia brevispica</i>	shortspike noseburn	weak vine, all season perennial
<i>Tragia ramosa</i>	catnip noseburn	herb, warm season perennial
Anacardiaceae	Sumac Family	Habit
<i>Rhus aromatica</i>	fragrant sumac	shrub, cool season perennial
<i>Rhus virens</i>	evergreen sumac	shrub, warm season perennial
<i>Toxicodendron radicans</i>	poison ivy	vine, cool season perennial
Aquifoliaceae	Holly Family	Habit
<i>Ilex decidua</i>	possum-haw	shrub, cool season perennial
<i>Ilex vomitoria</i>	yaupon	shrub, cool season perennial
Hippocastanaceae	Buckeye Family	Habit
<i>Aesculus pavia</i>	red buckeye	shrub, cool season perennial
Sapindaceae	Soapberry Family	Habit
<i>Sapindus saponaria</i>	western soapberry	tree, cool season perennial
<i>Ungnadia speciosa</i>	Mexican buckeye	shrub, cool season perennial
Rhamnaceae	Buckthorn Family	Habit
<i>Condalia hookeri</i>	Brasil	shrub, warm season perennial
<i>Rhamnus caroliniana</i>	Carolina buckthorn	small tree, cool season perennial
<i>Zizyphus obtusifolia</i>	lotebush	shrub, cool season perennial
Vitaceae	Grape Family	Habit

Ampelopsis arborea	peppervine	vine, warm season perennial
Parthenocissus hepatophylla	sevenleaf creeper	vine, warm season perennial
Parthenocissus quinquefolia	Virginia creeper	vine, warm season perennial
Vitis berlandieri	winter grape	vine, cool season perennial
Vitis mustangensis	mustang grape	vine, cool season perennial
Malvaceae		
Abutilon fruticosum	Texas Indian mallow, pelotazo	herb, warm season perennial
Allowissadula holosericea	velvetleaf mallow	herb, warm season perennial
Malvaviscus arboreus	Drummond wax-mallow	subshrub, all season perennial
	Turk's cap	
Malvastrum coromandelianum	threelobe false mallow	herb, warm season perennial
Modiola caroliniana	Carolina modiola	herb, cool season annual
Sida abutifolia	spreading sida	herb, warm season perennial
Violaceae		
	Violet Family	Habit
Viola missouriensis	Missouri violet	herb, cool season perennial
Passifloraceae		
	Passion Flower Family	Habit
Passiflora lutea	yellow passion flower	herbaceous vine, warm season perennial
Cactaceae		
	Cactus Family	Habit
Echinocereus reichenbachii	lace hedgehog cactus	shrub, cool season perennial
Opuntia leptocaulis	pencil cactus	shrub, warm season perennial
Opuntia lindheimeri	Texas prickly pear	shrub, cool season perennial
Apiaceae		
	Carrot Family	Habit
Chaerophyllum tainturei	chervil	herb, cool season annual
Ciclospermum leptophyllum	slimlobe celery	herb, cool season annual
Sanicula canadensis	Canada sanicle	herb, cool season perennial
Torilis arvensis*	hedge parsley	herb, cool season annual
Cornaceae		
	Dogwood Family	Habit
Cornus drummondii	roughleaf dogwood	shrub, cool season perennial
Garrya ovata ssp. lindheimeri	Lindheimer's silk-tassel	small tree, cool season perennial
Sapotaceae		
	Sapodilla Family	Habit
Bumelia lanuginosa	gum bumelia, coma	small tree, warm season perennial
Ebenaceae		
	Ebony Family	Habit
Diospyros texana	Texas persimmon	shrub, cool season perennial

Oleaceae

Foresteria pubescens
 Ligustrum japonicum*
 Ligustrum sinense
 Fraxinus texensis
 Fraxinus sp.

Apocyanaceae

Vinca major*

Convolvulaceae

Dichondra carolinensis

Hydrophyllaceae

Nama jamaicense
 Nemophila phacelioides
 Phacelia congesta

Boraginaceae

Heliotropium tenellum
 Myosotis macrosperma

Nama jamaicense
 Onosmodium helleri

Verbenaceae

Callicarpa americana
 Phyla nodiflora
 Lantana horrida

Lamiaceae (Labiatae)

Lamium amplexicaule*
 Hedeoma acinioides
 Hedeoma drummondii
 Marrubium vulgare*
 Salvia roemeriana
 Scutellaria ovata
 Stachys crenata

Solanaceae

Bouchetia erecta
 Capsicum annuum
 Nicotiana repanda
 Physalis heterophylla

Olive Family

elbow-bush
 Japanese privet
 Chinese privet, deciduous privet
 Texas ash
 ash

Dogbane Family

large periwinkle

Morning-Glory Family

grass ponyfoot

Waterleaf Family

fiddleleaf nama
 large-flower baby blue-eyes
 blue curls

Borage Family

pasture heliotrope
 spring forget-me-not,
 scorpiongrass
 fiddleleaf nama
 Heller marbledseed

Vervain Family

American beautyberry
 fogfruit, frogfruit
 common lantana

Mint Family

henbit deadnettle
 slender mock pennyroyal
 Drummond mock pennyroyal
 common horehound
 cedar sage
 tuber skullcap
 shade betony

Potato Family

erect bouchetia
 chilli-pequin
 fiddleleaf tobacco
 clammy groundcherry

Habit

shrub, cool season perennial
 small tree, warm season perennial
 shrub, cool season perennial
 tree, cool season perennial
 tree

Habit

herb, cool season perennial

Habit

herb, warm season annual

Habit

herb, all season annual
 herb, cool season annual
 herb, warm season annual

Habit

herb, warm season annual
 herb, cool season annual
 herb, all season annual
 herb, cool season perennial

Habit

shrub, warm season perennial
 herb, warm season perennial
 shrub, warm season perennial

Habit

herb, cool season annual
 herb, cool season annual
 herb, warm season perennial
 herb, warm season perennial
 herb, warm season perennial
 herb, warm season perennial
 herb, cool season annual

Habit

herb, all season perennial
 herb, warm season annual?
 herb, cool season annual
 herb, warm season perennial

Solanum elaeagnifolium silverleaf nightshade herb, warm season perennial

Scrophulariaceae

Snapdragon Family

Habit

Maurandya antirrhiniflora snapdragon maurandya vine, warm season perennial

Acanthaceae

Acanthus Family

Habit

Ruellia humilis low ruellia herb, warm season annual

Rubiaceae

Madder Family

Habit

Galium aparine catchweed bedstraw herb, cool season annual
Galium texense Texas bedstraw herb, cool season perennial
Galium virgatum southwest bedstraw herb, cool season annual
Hedyotis nigricans bluet herb, warm season perennial

Caprifoliaceae

Honeysuckle Family

Habit

*Lonicera japonica** Japanese honeysuckle vine, cool season perennial
Symphoricarpos orbiculatus coral-berry shrub, warm season perennial
Viburnum rufidulum downy viburnum, rusty blackhaw shrub, cool season perennial

Valerianaceae

Valerian Family

Habit

Valerianella radiata beaked cornsalad herb, cool season perennial

Asteraceae

Sunflower Family

Habit

Achillea millefolium western yarrow herb, cool season perennial
Ambrosia cumanensis western ragweed herb, warm season perennial
Ambrosia trifida giant ragweed herb, warm season annual
Aster drummondii ssp. *texanus* Texas aster herb, warm season perennial
Baccharis neglecta Roosevelt weed shrub, warm season perennial
Brickellia cylindracea gravelbar bricklebrush herb, warm season perennial
Calyptocarpus vialis prostrate lawnflower herb, warm season annual
Chaptalia nutans silverpuff herb, warm season annual
Engelmannia pinnatifida Engelmann daisy herb, cool season perennial
Erigeron modestus plains fleabane herb, all season perennial
Eupatorium havanense shrubby boneset subshrub, warm season perennial
Eupatorium serotinum late-flowering boneset herb, warm season perennial
Gaillardia pulchella Indian blanket, firewheel herb, warm season annual
Heterotheca canescens gray camphorweed herb, warm season perennial
Lactuca ludoviciana Louisiana wild-lettuce herb, warm season annual
Melampodium leucanthum plains blackfoot daisy herb, warm season perennial
Pyrrhopappus multicaulis manystem flase dandelion herb, cool season annaul
Ratibida columnifera upright prairie coneflower herb, warm season perennial
Senecio obovatus golden groundsel herb, cool season perennial
Senecio tampicanus Tampico groundsel herb, cool season annual
Solidago canadensis common goldenrod herb, warm season perennial
*Sonchus asper** prickly sowthistle herb, all season annual

Taraxacum officinale*	common dandelion	herb, cool season perennial
Verbesina virginica	frostweed	herb, warm season perennial
Viguera dentata	sunflower golden-eye	herb, warm season perennial
Wedelia hispida	orange zexmenia	subshrub, warm season perennial

An * terminating a scientific name indicates the species is introduced to the Austin area.
 DE and a number following the scientific name indicates a specimen on file at DE.

3.2 Cougar Creekbelt

3.2.1 Physical Characteristics

The Cougar Creekbelt (Figure 4) is 21.5 acres extending along Cougar Creek from Brodie Lane to just southwest of the City Hall. The site slopes gently from west to east. At Brodie Lane the elevation is about 700 feet while the elevation at the east end of the site is about 680 feet. Surficial geology of the Cougar Creekbelt is mapped as high river terrace deposits of gravel, sand, silt and clay on the approximate western half of the site and Buda formation limestone on the eastern half (Garner and Young, 1976).

Soils identified by SCS at the site are, along a west to east transect, Crawford clay, Speck stony clay loam, Tarrant and Speck soils, Crawford clay, again, and Tarrant soils along the east boundary. All these soils are supposed to have developed over limestone or hard limestone with Buda and Edwards limestone and Del Rio clay as the usual parent materials. Conspicuous amounts of limestone turned up by bull dozer activity north and west of the site, and used in berm construction, indicated a combination of Buda and Edwards limestone substrate. The presence of Tarrant, Speck and to some extent Crawford soils, as mapped by SCS, also seemed to indicate older limestone derived soils rather than soils derived from more recent alluvial material. Several soil test pits dug at the site confirmed the presence of Crawford clay, mainly north of the site creek drainage, and Tarrant soils south of the drainage.

Cougar Creek, sometimes known as the Sunset Valley Branch of Williamson Creek, bisects the site east-west. Berms on either side of the creek have served to constrain the passage of ground water across the site so that a series of ponded areas have developed in the approximate center of the site. The semi-permanence of standing water was indicated by several dead live oaks and junipers and some obligate wetland herbaceous species present in these areas. Obligate wetland plant species are those species that have a >99% probability of occurring in wetlands (Reed, 1988). Ponds retained water throughout the DE field investigation from November 9, 1998 through April 1999, except for a brief during the March 1999 drought.

3.2.2 Man-Made Features

Earthen berms have been constructed on either side of the creek to constrain flow. The berms average about 6 feet high with height increasing gradually to the east. They are apparently constructed from soil and limestone fragments obtained from construction sites along Brodie Lane. During early DE site visits, these berms were sparsely vegetated with annual weeds and grasses which increased in abundance and cover by April. After the berms were constructed, they were evidently hydromulched, sprayed with a mixture of plant seeds in a water solution. By April 1999 the composition of seeds contained in the hydromulch was evidenced by a profusion of annual plants found on the berms. A brief list of suspected hydromulch species is contained in



Source: Aerial Photograph
Scale 1" = 500'
Boundaries are closely
approximate.



DE DRUID ENVIRONMENTAL

Figure 4 Cougar Creekbelt
Travis County, Texas

Section 3.2.7, below. An impressively large concrete dike forms the east terminus of the berm system. A sewer line also was constructed through most of the site.

3.2.3 Disturbance Features

The Cougar Creekbelt, prior to recent construction activities, was used as pasturage for cattle. Areas adjacent to the site, north and south were cropped. These factors, in combination with the recent construction, have left the site in a less than pristine condition. These disturbances were reflected in plant species composition at the site, and make characterization of plant communities tenuous.

3.2.4 Management Recommendations

No environmental constraints are indicated by the general Cougar Creek Trail placement on maps provided to DE traversing the site from the new municipal lot to the Roadway Council Approved Trail. It is recommended, however, that placement of the branch of the trail leading to the 10.35 acre buffer should consider issues associated with flooding along the creek. Several depressional areas in the vicinity of the indicated branch trail appear to retain standing water for several days following a moderate rainfall.

Surprisingly, the berms did not erode extensively during the period of heavy rains the area experienced during the fall of 1998. However, some effort to induce vegetation to grow on the berms is probably dictated by erosional and aesthetic concerns. DE suspects that vegetation cover on the berms will inevitably succeed to bermudagrass and annual weeds. As of February, 1999 the berms were sparsely vegetated with annual bluegrass (*Poa annua*), brome grasses (*Bromus* species) and weedy annual herbs. By April of 1999 the most prominent species were wheat (*Triticum aestivum*), and oat (*Avena fatua*) was beginning to fruit. Apparently the hydromulch sprayed at the site consisted mainly of these introduced species. Seeding the berms with native perennial grasses and wildflowers might eventually produce a cover of these more desirable plants, but poor soil conditions on the berms at present, make this option a long term management goal.

Removal of invasive woody species at the site, mainly mesquite and Ashe juniper, is recommended. However, only trees small enough to be cut with lopping shears (\leq one inch at base) are recommended for removal. Rigorous prosecution of this strategy should limit the thicket forming propensities of these species and retain areas of grassland with live-oak-juniper dominated woodlots interspersed.

Most of the site has the potential to support native perennial tall grasses. It is recommended that little bluestem and Indiangrass be seeded on the site in conjunction with the removal of brush species. Big bluestem (*Andropogon gerardii*) is another tallgrass species option, but this species, which does not readily reproduce from seed, should be planted only in areas where midgrasses are already established. Eastern gammagrass (*Tripsacum dactloides*) is highly recommended for

planting between the berms and on creek margins if flood water retention is a goal for this area. Switchgrass, a possibly cheaper alternative, can also be planted and will serve similarly.

The wooded area to the east of the berm system has a dense shrub understory. Many of the understory species in this area sport spines or prickles. However, the vegetation does provide a screening effect for residences located along Lone Oak Trail and DE does not recommend manipulation of this area to a more open scenario.

3.2.5 Cougar Creek Belt Flora - Potential Climax Plant Species Identified by NRCS

The soil map units cited above as occurring at the Cougar Creek Belt were placed by SCS in either the Redland (Crawford and Speck soils) or Rocky Upland (Tarrant soils) range sites. Table 3 indicates decreaser plant species for these very similar range sites. Some taxa included in the SCS account listed in Table 3, have obsolescent common names. If the reader is confused by the common names, please refer to the scientific names in Column 2 of Table 3. A question mark in Column 2 indicates that the author of this report was not able to determine the scientific name of the plant indicated by the SCS common name. With the exceptions of Indiangrass (*Sorghastrum nutans*) and sagewort, all the plants listed in Table 3 were identified by DE as occurring in the Cougar Creekbelt.

Table 3
Decreaser Plant Species for the Redland and Rocky Upland Range Sites

Trees

Common Name	Scientific Name
live oak	<i>Quercus virginiana</i>
Texas oak	<i>Quercus buckleyi</i>

Shrubs

Texas kidneywood	<i>Eysenhardtia texana</i>
skunkbush sumac	<i>Rhus aromatica</i>

Herbs and Subshrubs

velvet bundleflower	<i>Desmanthus velutinus</i>
orange zexmenia	<i>Wedelia hispida</i> , formerly <i>Zexmenia hispida</i>
sunflower	?
sagewort	<i>Artemesia</i> ?

Grasses

big bluestem	<i>Andropogon gerardii</i>
purple three-awn	<i>Aristida purpurea</i>
Wright's three awn	<i>Aristida purpurea</i> var. <i>wrightii</i>
pinhole bluestem	<i>Bothriochloa barbinodos</i>
silver bluestem	<i>Bothriochloa laguroides</i>
side-oats grama	<i>Bouteloua curtipendula</i>
Canada wildrye	<i>Elymus canadensis</i>
green spangletop	<i>Leptochloa dubia</i>
little bluestem	<i>Schizachyrium scoparium</i>
tall dropseed	<i>Sporobolus asper</i>
hairy dropseed	<i>Sporobolus</i> ?
Indiangrass	<i>Sorghastum nutans</i>
Texas wintergrass	<i>Stipa leucotricha</i>

3.2.6 The Cougar Creek Belt Plant Community as Characterized by the Texas Natural Heritage Program

The TNHP characterization most closely approximating extant vegetation at the Cougar Creekbelt is the live oak-midgrass community. The TNHP description follows below.

Plateau Live Oak-Midgrass series (G3S3)

This mainly evergreen woodland occupies uplands of the Edwards Plateau, where it is often intermixed with midgrass grassland on flats and on gentle slopes. Composition varies with substrate (i.e. between the limestone derived soils of the Plateau proper and the generally sandier soils of the Llano Uplift) and precipitation. Canopy cover ranges from open to closed, with mottes of monoculture live oak present in some areas. Texas oak (*Quercus bucklevi*), cedar elm (*Ulmus crassifolia*), post oak (*Quercus stellata*), Ashe juniper (*Juniperus ashei*), scalybark oak (*Quercus sinuata* var. *breviloba*), *Quercus* spp., and shrubs such as *Rhus* spp. and *Condalia* spp. are variously present. Shallow soils or disturbed areas often support Ashe juniper or mesquite (*Prosopis glandulosa*) dominated woodlands or shrublands, while openings in good condition are mid-grass grasslands with species such as little bluestem (*Schizachyrium scoparium*), sideoats grama (*Bouteloua curtipendula*), and curly mesquite (*Hilaria belangeri*).

3.2.7 Observed Vegetation Structure, Dominant and Interesting Plant Species

The vegetation in relatively undisturbed parts of the Cougar Creekbelt, approximately the center of the site, approximates the description of the TNHP live oak-midgrass series described above, in that live oak and cedar elm are the dominant canopy tree species and side-oats grama and curly mesquite are common, if not exactly dominant, grass species. In addition, the overall site perspective is one of oak mottes with grass patches interspersed. Noteworthy for its absence, however, was little bluestem, the usual dominant grass species of live oak-midgrass

communities.

Other common plants identified, in addition to the species cited above, were Ashe juniper as a very important canopy and mid-story tree, sugar hackberry, especially in the vicinity of fencerows, and Texas wintergrass as the matrix grass species. Common shrubs were agarito (*Mahonia trifoliata*), Lindheimer prickly pear (*Opuntia lindheimeri*), pencil cactus (*Opuntia leptocaulis*) and elbow bush (*Forestiera pubescens*). Frostweed (*Verbesina virginica*) was a common herb of the live oak understory. This herb, which is not palatable to cattle, tends to increase in partially shaded areas on range sites.

A variety of plant species adapted to more mesic environments were identified in and on the margins of shallow water ponds east of Roadway B. Some of these were hooked pepperwort (*Marsilea vestita* ssp. *vestita*), jungle-rice (*Echinochloa colonum*), Britton sedge (*Carex brittoniana*), (*Cyperus ochraceus*), Reverchon spikerush (*Eleocharis acicularis*), Drummond rattlebush (*Sesbania drummondii*) smooth seedbox (*Ludwigia peploides*) and roundleaf seedbox (*Ludwigia repens*). Annual sumpweed (*Iva annua*) and spiny cocklebur (*Xanthium strumarium*) were common up slope from areas of standing water.

A system of shallow water ponds was noted in the creek channel west of Roadway B. The dominant species in these ponds were narrowleaf cattail (*Typha domingensis*), sand spikerush (*Eleocharis montevidensis*) and large-spike spikerush (*Eleocharis palustris*). An obligate wetland herb that was common in these ponds was purple ammannia (*Ammannia coccinea*). At least two species of rush, *Juncus* species, were also common.

Plant species usually identified in sandy soils of Pleistocene river terraces were found between the berms and just to the east of ponded areas and south of Cougar Creek. One of these, Greenman bluets (*Hedyotis greenmanii*), an apparent central and south Texas endemic, has been previously identified in Travis County on only one prior occasion, in 1915 (Carr, 1996). Other interesting plant species also typical of Pleistocene terraces, and found at the same general location, were least blue-eye grass (*Sisyrinchium minus*), trailing pearlwort (*Sagina decumbens*) and small bluets (*Hedyotis crassifolia*).

Along the wastewater line right-of-way, bermudagrass was the matrix grass with some localized competition from buffalograss (*Buchloe dactyloides*) and Texas wintergrass. Prairie coneflower (*Ratibida columnifera*) was a very common herb. Most of the trees retained within in the wastewater line were cedar elm with Ashe junipers and mesquite as the common invasives.

A variety of tree and shrub species including sugar hackberry, mesquite, pencil cactus, toothache tree (*Zanthoxylum hirsutum*), fragrant sumac (*Rhus aromatica*) and prairie sumac (*Rhus lanceolata*) were in an expanded fencerow woodland located east of the berm system.

Recently disturbed areas, the berms and adjacent scraped areas, had an abundance of annual weeds and grasses. An especially noteworthy introduced perennial herb identified was blessed milk thistle (*Silybum marianum*). This gigantic introduced thistle has green and white mottled leaves and rigid sharp spines on all its vegetative parts. Supposedly, the Virgin Mary squirted milk on the leaves accounting for their whitish coloration. Concoctions derived from this herb are used in Europe for the treatment of liver ailments (Diggs et al., 1999). In addition to blessed milkweed, some of the introduced herbs identified, and probably contributed by the hydromulch, were annual bluegrass (*Poa annua*), rescuegrass (*Bromus uniloides*), Japanese brome (*Bromus japonicus*), wheat, oats, a cultivated variety of *Phlox drummondii*, turnip (*Brassica rapa*) and Morocco toadflax (*Linaria maroccana*), tentatively identified from a description in (The American Horticultural Society, 1992).

Table 4, Plant Species Identified at the Cougar Creekbelt, lists the scientific name, common name(s) and habit of plant species identified at the Cougar Creekbelt. Plant species are grouped by family and listed in phylogenetic order following Hatch et al. (1990). Habit, Column 3, provides information on the primary season in which the species fruits and flowers, whether the species is annual or perennial and the growth form of the species. Warm season refers to species that reproduce sexually during summer and fall. Cool season refers to species that reproduce sexually during late winter and spring. An asterisk (*) following the scientific name of a plant in the tables indicates the plant is an introduced species. DE and a number after a scientific name indicate that a specimen is on file at DE.

Table 4
Plant Species and their Habits at the Cougar Creekbelt

Marsiliaceae	Water-Clover Family	Habit
Marsilea vestita DE 2946	hooked pepperwort	warm season perennial
Typhaceae	Cattail Family	Habit
Typha domingensis	narrowleaf cattail	warm season perennial
Cupressaceae	Cypress Family	Habit
Juniperus ashei	Ashe juniper	warm season perennial
Poaceae	Grass Family	Habit
Aristida purpurea var. purpurea	purple threeawn	warm season perennial
Aristida purpurea var. wrightii	Wright threeawn	warm season perennial
Avena fatua*	common oats	cool season annual
Bothriochloa barbinodos	cane bluestem	warm season perennial
Bothriochloa ischaemum*	King Ranch bluestem	warm season perennial
Bothriochloa laguroides	silver bluestem	warm season perennial
Bouteloua curtipendula	side-oats grama	warm season perennial
Bouteloua rigidiseta	Texas grama	warm season perennial
Bouteloua trifida	red grama	warm season perennial
Bromus japonicus*	Japanese brome	cool season annual
Bromus uniloides*	rescuegrass	cool season annual
Buchloe dactyloides	buffalograss	warm season perennial
Chloris verticillata	tumble windmillgrass	warm season perennial
Cynodon dactylon*	bermudagrass	warm season perennial
Dichanthelium oligosanthes	Scribner panicgrass	cool season perennial
Echinochloa colonum*	jungle-rice	warm season annual
Elymus virginicus	Virginia wildrye	cool season perennial
Elymus canadensis	Canada wildrye	cool season perennial
Eragrostis intermedia	plains lovegrass	warm season perennial
Erioneuron pilosum	hairy woolygrass	warm season perennial
Hilaria belangeri	curly mesquite	warm season perennial
Hordeum pusillum	little barley	cool season annual
Leptochloa dubia	green spangletop	warm season perennial
Lolium perenne*	perennial ryegrass	cool season perennial
Panicum capillare DE 2831	common witchgrass	warm season annual
Panicum hallii	Hall panicum	warm season perennial
Panicum obtusum DE 2836	vine-mesquite	warm season perennial
Panicum virgatum	switchgrass	warm season perennial

Paspalum dilatatum*	Dallisgrass	warm season perennial
Paspalum urvillei*	Vaseygrass	warm season perennial
Phalaris caroliniana	Carolina canarygrass	cool season annual
Poa annua	annual bluegrass	cool season annual
Schizachryium scoparium	little bluestem	warm season perennial
Setaria geniculata	knot-root bristlegrass	warm season perennial
Setaria scheelei	southwestern bristlegrass	warm season perennial
Sorghum halapense*	Johnsongrass	warm season perennial
Sporobolous asper	tall dropseed	warm season perennial
Sporobolous vaginiflorus	poverty dropseed	warm season annual
Stipa leucotricha	Texas wintergrass, speargrass	cool season perennial
Tridens albescens	white tridens	warm season perennial
Tridens flavus	purpletop	warm season perennial
Triticum aestivum* DE 3092	wheat	cool season annual
Vulpia octoflora DE 3073	common sixweekgrass	cool season annual

Cyperaceae

Carex brittonia	Britton sedge	cool season perennial
Carex cherokeensis	Cherokee sedge	cool season perennial
Carex microdonta	little-tooth sedge	cool season perennial
Carex muhlenbergia var. enermis	Muhlenberg sedge	cool season perennial
Carex perdentata		cool season perennial
Carex planostachys	cedar sedge	cool season perennial
Cyperus acuminatus	taperleaf flatsedge	warm season perennial
Cyperus esculentus	yellow nutgrass	warm season perennial
Cyperus ochraceus	pond flatsedge	warm season perennial
Cyperus retroflexus	oneflower flatsedge	cool season perennial
Cyperus rotundus*	nutgrass	cool season perennial
Eleocharis acicularis	Reverchon spikerush	warm season perennial
Eleocharis montevidensis	sand spikrush	cool season perennial
Eleocharis palustris	large-spike spikerush	warm season perennial

Arecaceae

Sabal minor	dwarf palmetto	shrub, warm season perennial
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Juncaceae

Juncus dudleyi	Dudley rush	cool season perennial
Juncus interior	inland rush	warm season perennial
Juncus texanus	Texas rush	cool season perennial

Bromeliaceae

Tillandsia recurvata	ballmoss	epiphyte, warm season perennial
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Commelinaceae

Tradescantia humilis

Spiderwort Family

Texas spiderwort

Habit

herb, cool season perennial

LiliaceaeAllium canadense
Nothoscordum bivalve DE 3017
Smilax bona-nox
Yucca rupicola**Lily Family**Canada garlic
crow-poison, false garlic
saw greenbrier
Texas yucca**Habit**herb, cool season perennial
herb, cool season perennial
vine, cool season perennial
shrub, cool season perennial**Amaryllidaceae**

Cooperia pendunculata

Amaryllis Family

gaint rain lily

Habit

herb, cool season perennial

IridaceaeSisyrinchium minus DE 3082
Sisyrinchium pruinatum**Iris Family**least blue-eye grass
dotted blue-eye grass**Habit**herb, cool season annual
herb, cool season perennial**Salicaceae**

Salix nigra

Willow Family

black willow

Habit

tree, cool season perennial

FagaceaeQuercus buckleyi
Quercus durandii var. breviloba
Quercus virginiana**Beech Family**Texas oak
shin oak
live oak**Habit**tree, cool season perennial
tree, cool season perennial
tree, cool season perennial**Ulmaceae**Celtis laevigata
Ulmus crassifolia**Elm Family**sugar hackberry
cedar elm**Habit**tree, cool season perennial
tree, cool season perennial**Urticaceae**Parietaria pensylvanica
Urtica chamaedryoides**Nettle Family**rock pellitory
heart-leaf nettle**Habit**herb, warm season annual
herb, cool season annual**Polygonaceae**Rumex crispus*
Rumex pulcher***Knotweed Family**curly dock
fiddle dock**Habit**herb, warm season perennial
herb, cool season perennial**Viscaceae**

Phoradendron tomentosum

Mistletoe Family

mistletoe

Habit

epiphytic, parasitic, cool season shrub

Phytolaccaceae

Rivina humilis

Caryophyllaceae

Arenaria serpyllifolia DE 3045
 Cerastium glomeratum* DE 3019
 Sagina decumbens DE 3022
 Silene antirrhina
 Stellaria media*

Ranunculaceae

Anemone berlandieri
 Clematis drummondii
 Ranunculus macranthus

Berberidaceae

Mahonia trifoliata
 Nandina domestica*

Papaveraceae

Argemone aurantiaca

Menispermaceae

Cocculus carolinus

Brassicaceae

Brassica rapa*
 Draba cuneifolia
 Draba platycarpa
 Lepidium austrinum
 Lepidium virginicum
 Lesquerella gracilis
 Lesquerella recurvata DE 3046
 Rapistrum rugosum*
 Sibara virginica DE 3012

Rosaceae

Geum canadense
 Rubus trivialis

Pokeweed Family

pigeonberry, bloodberry

Pink Family

thyme leaf sandwort
 cluster chickweed
 trailing pearlwort
 sleepy catchfly
 chickweed starwort

Buttercup Family

tenpetal anemone
 Texas virgin's bower
 old man's beard
 showy buttercup

Barberry Family

agarito
 heavenly bamboo

Poppy Family

pricklepoppy

Moonseed Family

Carolina snailseed

Mustard Family

turnip
 wedgeleaf draba
 broadpod draba
 southern pepperweed
 Virginia pepperweed
 shite bladderpod
 slender bladderpod
 yellow rocket
 Virginia sibara

Rose Family

white avens
 southern dewberry

Habit

herb, warm season perennial

Habit

herb, cool season annual
 herb, cool season annual
 herb, all season annual
 herb, cool season annual
 herb, cool season annual

Habit

herb, cool season perennial
 subshrub, warm season perennial
 herb, cool season perennial

Habit

shrub, cool season perennial
 warm, cool season perennial

Habit

herb, cool season annual

Habit

vine, cool season perennial

Habit

herb, cool season annual
 herb, cool season annual
 herb, cool season annual
 herb, cool season annual
 herb, cool season annual
 herb, cool season annual
 herb, cool season annual
 herb, cool season annual
 herb, cool season annual

Habit

herb, cool season perennial
 vine, cool season perennial

Fabaceae

Astragalus nuttallianus
 Cercis canadensis
 Chamaecrista fasciculata
 Indigofera miniata
 Lupinus texensis
 Medicago lupulina* DE 3025
 Medicago minima* DE 3024
 Medicago polymorpha var. vulgaris*
 Parkinsonia aculeata
 Prosopis glandulosa
 Rhynchosia minima
 Rhynchosia senna var. texana
 Schrankia roemeriana
 Senna lindheimeriana
 Sesbania drummondii
 Sesbania vesicaria
 Vicia leavenworthii
 Vicia sativa var. nigra*

Legume Family

Nuttall's locoweed
 redbud
 prairie senna, partridge pea
 indigo
 Texas bluebonnet
 black medic
 least burclover
 common burclover
 retama
 honey mesquite
 least snoutbean
 Texas snoutbean
 Roemer sensitive briar
 Lindheimer senna
 Drummond rattlebush
 bag-pod rattlebush
 Leavenworth vetch
 narrow-leaved vetch

Habit

herb, cool season perennial
 small tree, cool season perennial
 herb, warm season annual
 herb, cool season perennial
 herb, cool season annual
 herb, cool season annual
 herb, cool season annual
 herb, cool season annual
 small tree, warm season perennial
 tree, warm season perennial
 vine, warm season perennial
 herb, warm season perennial
 vine, warm season perennial
 herb, warm season perennial
 herb, warm season perennial
 shrub, warm season perennial
 subshrub, warm season annual
 vine, cool season annual
 herb, cool season annual

Geraniaceae

Erodium circuitarium
 Erodium texanum
 Geranium carolinianum DE 3076
 Geranium texanum

Geranium Family

alfilaria, stork's bill
 Texas filaree, heron bill
 Carolina geranium
 Texas geranium

Habit

herb, cool season annual
 herb, warm season perennial
 herb, cool season annual
 herb, cool season annual

Oxalidaceae

Oxalis dillennii
 Oxalis drummondii

Wood-Sorrel Family

yellow sour-clover
 Dillen's wood-sorrell
 Drummond wood-sorrell

Habit

herb, warm season perennial
 herb, warm season perennial

Linaceae

Linum rigidum

Flax Family

stiffstem flax

Habit

herb, warm season annual

Rutaceae

Ptelea trifoliata
 Zanthoxylum hirsutum

Citrus Family

skunkbush, hoptree
 toothache tree

Habit

small tree, cool season perennial
 small tree, cool season perennial

Meliaceae

Melia azedarach*

Mahogany Family

Chinaberry

Habit

tree, cool season perennial

biaceae	Spurge Family	Habit
a lindheimeri	Lindheimer three-seeded mercury	herb, warm season perennial
mnia humilis var. humilis	low wild mercury	herb, warm season perennial
ruticulosus	bush croton	shrub, warm season perennial
nonanthogynous	oneseed croton	herb, warm season annual
bia dentata	toothed spurge	herb, warm season annual
bia marginata	snow-on-the-mountain	herb, warm season annual
bia maculata	spotted spurge	herb, warm season annual
bia nutans	eyebane	herb, warm season annual
bia serpens	mat spurge	herb, warm season annual
brevispica	shortspike noseburn	herbaceous vine, all season perennial
ramosa	catnip noseburn	herb, warm season perennial
rdiaceae	Sumac Family	Habit
romatica	fragrant sumac	shrub, cool season perennial
anceolata	prairie sumac	shrub, warm season perennial
dendron radicans	poison ivy	vine, cool season perennial
oliaceae	Holly Family	Habit
ecidua	possum-haw	shrub, cool season perennial
omitoria	yaupon	shrub, cool season perennial
daceae	Soapberry Family	Habit
ospermum halicacabum	balloon vine	vine, warm season perennial
dus saponaria	western soapberry	tree, cool season perennial
adia speciosa	Mexican buckeye	shrub, cool season perennial
eeae	Grape Family	Habit
elopsis arborea	peppervine	vine, warm season perennial
is incisa	ivy treebine, cow itch	vine, warm season perennial
enocissus quinquefolia	Virginia creeper	vine, warm season perennial
berlandieri	winter grape	vine, cool season perennial
mustangensis	mustang grape	vine, cool season perennial
vaceae		
nilon fruticosum	Texas Indian mallow, pelotazo	herb, warm season perennial
wissadula holosericea	velvetleaf mallow	herb, warm season perennial
vaviscus arboreus	Drummond wax-mallow	subshrub, all season perennial
	Turk's cap	
liola caroliniana DE 3078	Carolina modiola	herb, cool season annual

Gentianaceae	Gentian Family	Habit
<i>Eustoma grandiflorum</i>	showy prairie gentian	herb, warm season annual
Apocyanaceae	Dogbane Family	Habit
<i>Vinca major</i> *	large periwinkle	herb, cool season perennial
Asclepiadaceae	Milkweed Family	Habit
<i>Asclepias asperula</i>	antelope horns	herb, all season perennial
<i>Asclepias oenotherioides</i>	hierba de zizotes	herb, warm season perennial
<i>Matelea biflora</i>	two-flower milkvine	herb, all season perennial
<i>Matelea reticulata</i>	pearl milkvine	vine, warm season perennial
Convolvulaceae	Morning-Glory Family	Habit
<i>Convolvulus equitans</i>	gray bindweed, Texas bindweed	vine, warm season perennial
<i>Dichondra carolinensis</i>	grass ponyfoot	herb, warm season perennial
<i>Dichondra recurvata</i> DE 3106	shortgrass ponyfoot	herb, cool season perennial
<i>Ipomoea trichocarpa</i>	common morningglory	herbaceous vine, warm season perennial
Polemoniaceae	Phlox Family	Habit
<i>Phlox drummondii</i>	phlox cultivated variety	herb, cool season annual
Hydrophyllaceae	Waterleaf Family	Habit
<i>Nama jamaicense</i>	fiddleleaf nama	herb, all season annual
<i>Nemophila phacelioides</i>	large-flower baby blue-eyes	herb, cool season annual
Boraginaceae	Borage Family	Habit
<i>Heliotropium tenellum</i>	pasture heliotrope	herb, warm season annual
Verbenaceae	Vervain Family	Habit
<i>Callicarpa americana</i>	American beautyberry	shrub, warm season perennial
<i>Phyla nodiflora</i>	fogfruit, frogfruit	herb, warm season perennial
<i>Verbena canescens</i>	gray vervain	herb, warm season perennial
<i>Verbena bipinnatifida</i>	Dakota vervain	herb, warm season annual
<i>Verbena brasiliensis</i> *	Brazilian vervain	herb, warm season annual
<i>Verbena officinale</i> ssp. <i>halei</i>	slender vervain	herb, warm season perennial
<i>Verbena xutha</i>	Coarse vervain	herb, warm season annual
Lamiaceae (Labiatae)	Mint Family	Habit
<i>Lamium amplexicaule</i> *	henbit deadnettle	herb, cool season annual

Hedeoma acinioides
Hedeoma drummondii
Marrubium vulgare*
Monarda citriodora
Salvia coccinea
Salvia farinacea
Salvia roemeriana
Scutellaria ovata
Stachys crenata
Teucrium canadense

Solanaceae

Bouchetia erecta DE 3018
Physalis cinerascens
Solanum dimidiatum
Solanum elaeagnifolium
Solanum rostratum

Scrophulariaceae

Agalinis heterophylla
Castilleja indivisa
Linaria canadensis
Linaria maroccana*
Mecardonia vandellioides
Veronica arvensis*
Veronica peregrina

Acanthaceae

Ruellia nudiflora

Plantaginaceae

Plantago rhodosperma

Rubiaceae

Galium aparine
Galium texense
Galium virgatum DE 3020
Hedyotis crassifolia DE 3026
Hedyotis greenmanii DE 3021
Hedyotis nigricans

slender mock pennyroyal
Drummond mock pennyroyal
common horehound
lemon horsemint
tropical sage
mealycup sage
cedar sage
tuber skullcap
shade betony
American germander

Potato Family

erect Bouchetia
beach groundcherry
western horse nettle
silverleaf nightshade
buffalobur

Snapdragon Family

prairie gerardia
Texas paintbrush
oldfield toadflax
Moroccan toadflax, fairy lights
prostrate mecardonia
common speedwell
purslane speedwell

Acanthus Family

violet ruellia

Plantain Family

redseed plantain

Madder Family

catchweed bedstraw
Texas bedstraw
southwest bedstraw
small bluets
Greenman bluets
bluet

herb, cool season annual
herb, warm season perennial
herb, warm season perennial
herb, warm season annual
herb, warm season perennial
herb, warm season perennial
herb, warm season perennial
herb, warm season perennial
herb, cool season annual
herb, warm season perennial

Habit

herb, all season perennial
herb, warm season perennial
herb, warm season perennial
herb, warm season perennial
herb, warm season annual

Habit

herb, warm season annual
herb, cool season annual
herb, cool season annual
herb, cool season annual
herb, warm season perennial
herb, cool season annual
herb, cool season annual

Habit

herb, warm season perennial

Habit

herb, cool season annual

Habit

herb, cool season annual
herb, cool season perennial
herb, cool season annual
herb, cool season annual
herb, cool season annual
herb, warm season perennial

Caprifoliaceae

Lonicera japonica*
 Lonicera sempervirens
 Viburnum rufidulum

Honeysuckle Family

Japanese honeysuckle
 trumpet honeysuckle
 downy viburnum

Habit

vine, cool season perennial
 shrub/vine, cool season perennial
 shrub, cool season perennial

Valerianaceae

Valerianella amarella
 Valerianella radiata

Valerian Family

hairy cornsalad
 beaked cornsalad

Habit

herb, cool season annual
 herb, cool season annual

Cucurbitaceae

Cucurbita foetidissima

Gourd Family

stinking gourd

Habit

herbaceous vine, warm season perennial

Campanulaceae

Triodanis perfoliata DE 3017

Bellflower Family

Venus looking-glass

Habit

herb, cool season annual

Asteraceae

Achillea millefolium
 Ambrosia cumanensis
 Ambrosia trifida
 Aster drummondii ssp. texanus
 Aster ericoides
 Aster subulatus
 Baccharis neglecta
 Calyptocarpus vialis
 Cirsium texanum
 Eclipta prostrata
 Engelmannia pinnatifida
 Eupatorium havanense
 Evax prolifera
 Evax verna
 Gaillardia pulchella
 Gutierrezia texana
 Helianthus annuus
 Hymenopappus scabiosaeus
 Iva annua
 Krigia cespitosa DE 3023
 Lindheimera texana
 Melampodium leucanthum
 Parthenium hysterophorus
 Ratibida columnifera
 Senecio tampicanus
 Silybum marianum*
 Solidago canadensis

Sunflower Family

western yarrow
 western ragweed
 giant ragweed
 Texas aster
 Heath aster
 hierra del marrano
 Roosevelt weed
 prostrate lawnflower
 southern thistle
 yerba de tago
 Engelmann daisy
 shrubby boneset
 bighead rabbit-tobacco
 manystem rabbit-tobacco
 Indian blanket, firewheel
 Texas broomweed
 common sunflower
 flattop woollywhite, old plainsman
 sumpweed
 weedy dwarf dandelion
 Texas star
 plains blackfoot daisy
 ragweed parthenium
 upright prairie coneflower
 Tampico groundsel
 blessed milk thistle
 common goldenrod

Habit

herb, cool season perennial
 herb, warm season perennial
 herb, warm season annual
 herb, warm season perennial
 herb, warm season perennial
 herb, warm season annual
 shrub, warm season perennial
 herb, warm season annual
 herb, warm season perennial
 herb, warm season perennial
 herb, cool season perennial
 subshrub, warm season perennial
 herb, cool season annual
 herb, cool season annual
 herb, warm season annual
 herb, warm season annual
 herb, warm season annual
 herb, all season biennial
 herb, warm season perennial
 herb, cool season annual
 herb, cool season annual
 herb, warm season perennial
 herb, warm season perennial
 herb, warm season perennial
 herb, cool season annual
 herb, cool season perennial
 herb, warm season perennial

Taraxacum officinale*	common dandelion	herb, cool season perennial
Verbesina virginica	frostweed	herb, warm season perennial
Viguera dentata	sunflower golden-eye	herb, warm season perennial
Wedelia hispida	orange zexmenia	subshrub, warm season perennial
Xanthium strumarium	spiny cocklebur	herb, warm season annual

An * terminating a scientific name indicates the species is introduced to the Austin area.
 DE and a number following the scientific name indicates a specimen on file at DE.

3.3 Prairieland Preserve

3.3.1 Physical Characteristics

The Prairie Land Preserve (Figure 5) comprises 21.34 acres along Williamson Creek. On the east the site abuts Brodie Lane. The geologic substrate is Edwards limestone, the usual cave-forming limestone of Travis County. Obliging, a cave occurs near the north site boundary. Site topography showed little variation except along channels of Williamson Creek which transects the site flowing west to east. Average site elevation is about 700 feet. Williamson Creek at the site is ephemeral and no surface water occurs except during and shortly following precipitation events.

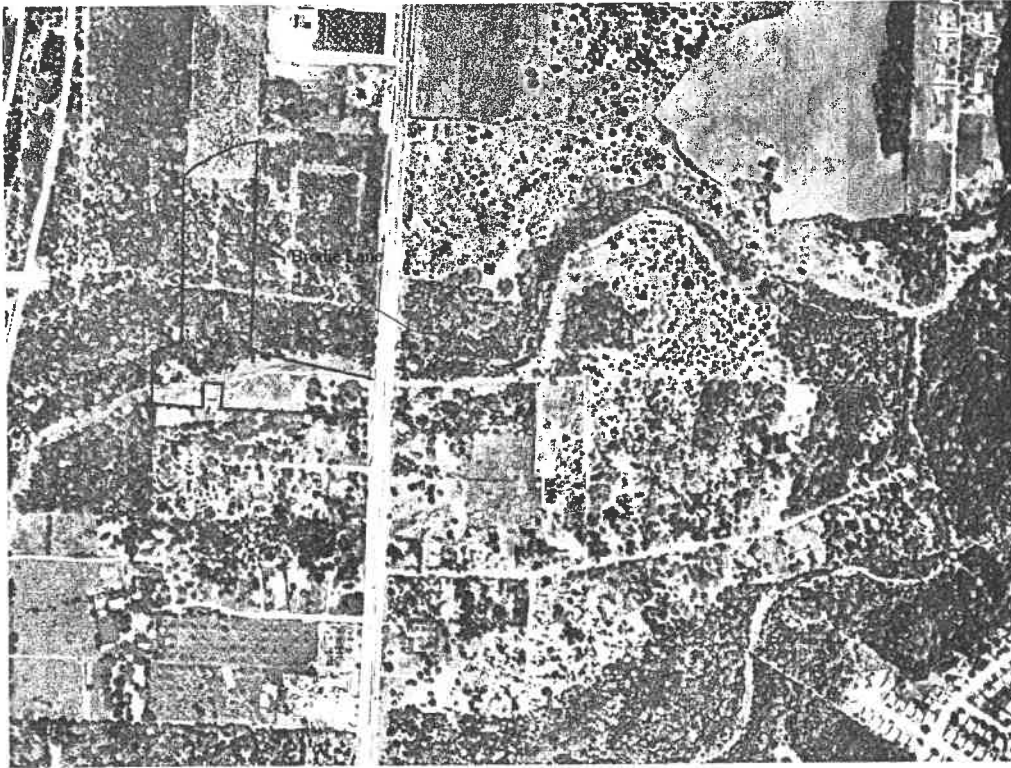
Soil map units included for the site by SCS are Mixed Alluvial Land and Tarrant and Speck soils. Mixed Alluvial Land, which comprises the stream bed(s) of Williamson Creek at the site, is composed of silt, gravelly alluvium and limestone rock fragments and boulders. Field investigations at the site indicated rather broad alluvial terraces within the Williamson Creek flood plain. In addition to the materials mentioned by SCS, two to three feet deep, silt and sand alluvial deposits were contained on the Williamson Creek floodplain. Tarrant and Speck soils are shallow, ranging from 10 to 18 inches in depth, and are underlain by hard limestone. Tarrant soils are a dark grayish-brown clay. Speck soils are a reddish-brown clay loam. One can readily distinguish these two soils by checking the color of ant mounds on the site. As Burford Westlund says, "Ants never lie".

3.3.2 Man-Made Features

A radio tower and associated out-buildings surrounded by a chain link fence are located near the southwest corner of the site. A gravel road connects the radio facility to Brodie Lane. A wastewater line crosses the site north of Williamson Creek.

3.3.3 Disturbance Features

The prairie component of the site, located south of Williamson Creek, is bisected by an east-west gravel road. Because grass dominant species identified along the margins of the road were mainly introduced species, bermudagrass and King Ranch bluestem, it is reasonable to assume that the road margins were graded and subsequently seeded with these species. At about 20 feet distance from the road, silver bluestem, Indiangrass and side-oats grama were identified as the tall and mid-grass dominant species. An exception to this generalization was the east end of the site adjacent to Brodie Lane, an area sparsely vegetated with annual weeds, but which was recently seeded to native wild flowers. Vegetation dominants on the sewer line located north of



Source: Aerial Photography
Scale: 1" = 500'
Boundaries are closely approximate.



N

DE DRUID ENVIRONMENTAL
Figure 5 Prairieland Preserve
City of Sunset Valley
Travis County, Texas

Williamson Creek were par for such a milieu, bermudagrass and annual weeds.

The floodplain of Williamson Creek was strewn with trash piles during the DE site visits, mainly old tires and construction materials. Evidently the site has been used as an occasional dump. The trash situation was aggravated by flotsam and jetsam transported by stream flow and caught in the floodplain brush.

The northern wooded component of the site had more Ashe juniper than the author of this report deems appropriate (a rare event). Most of the junipers noted were in the 3-6 inch dbh range, devoid of leaves on all but their topmost branches, and so closely spaced that a pedestrian, passing through them, has a disagreeable experience. Thousands of Texas ash seedlings were noted under the juniper canopy, struggling for light and sustenance.

3.3.4 Management Recommendations

Mowing the grassland component of the site in late spring and early summer is recommended to encourage the mid and tall grass prairie species and aid in the suppression of introduced grass species. Mowing will also suppress woody invaders of the grassland. In addition, the hay might be sold, or given to Sunset Valley residents. The several trash piles along Williamson Creek are recommended for removal.

Thinning of the Ashe juniper thicket north of Williamson Creek is recommended. In particular juniper should be removed where saplings of deciduous tree species such as Texas ash (*Fraxinus texensis*), shin oak, post oak (*Quercus stellata*), and live oak are visible in the understory, and also along grass patch margins.

3.3.5 Prairieland Preserve - Potential Climax Plant Species Identified by NRCS

The range sites described by SCS for the Prairieland Preserve are the Rocky Upland and the Bottomland range sites. Decreaser plant species for the Rocky Upland range site are little bluestem (*Schizachyrium scoparium*), big bluestem (*Andropogon gerardii*), Indiangrass (*Sorghastrum nutans*), green spangletop (*Leptochloa dubia*) and Canada wildrye (*Elymus canadensis*). Of these, only big bluestem was not identified on site. However, none of these grass species were important components of the site vegetation. All the species listed should be considered as potential candidates for use in grassland restoration projects.

The Bottomland range site, in excellent condition as described by SCS, has a 25% cover of elm, live oak , hackberry and pecan. The remaining cover is comprised of tall and midgrasses with little bluestem, Indiangrass and Virginia wildrye as dominant species. Also present are big bluestem, switchgrass and eastern gammagrass (*Tripsacum dactyloides*). Of these species, cedar

elm, live oak, sugar hackberry, switchgrass (a few clumps) and Virginia wildrye were found on the Mixed Alluvial Land of the Bottomland range site within the Prairieland Preserve. Presumably this bottomland community, in terms of grass species composition, was not in excellent condition. Again, any of the species noted by SCS are recommended as restoration candidates.

3.3.6 Prairieland Preserve - Plant Communities as Characterized by the Texas Natural Heritage Program

The juniper-oak woodland on the Prairieland component north of Williamson Creek resembles the description of the Live Oak-Midgrass Series as described by TNHP. Past disturbance

Plateau Live Oak-Midgrass series (G3S3)

This mainly evergreen woodland occupies uplands of the Edwards Plateau, where it is often intermixed with midgrass grassland on flats and on gentle slopes. Composition varies with substrate (i.e. between the limestone derived soils of the Plateau proper and the generally sandier soils of the Llano Uplift) and precipitation. Canopy cover ranges from open to closed, with mottes of monoculture live oak present in some areas. Texas oak (*Quercus bucklevi*), cedar elm (*Ulmus crassifolia*), post oak (*Quercus stellata*), Ashe juniper (*Juniperus ashei*), scalybark oak (*Quercus sinuata* var. *breviloba*), *Quercus* spp. , and shrubs such as *Rhus* spp. and *Condalia* spp. are variously present. Shallow soils or disturbed areas often support Ashe juniper or mesquite (*Prosopis glandulosa*) dominated woodlands or shrublands, while openings in good condition are mid-grass grasslands with species such as little bluestem (*Schizachyrium scoparium*), sideoats grama (*Bouteloua curtipendula*), and curly mesquite (*Hilaria belangeri*).

events at the site, possibly including overgrazing and a resultant loss of topsoil, may have allowed Ashe juniper to succeed to its present dominant status at the expense of the perennial grass species and deciduous tree and shrub species indicated in the above description.

The grassland south of Williamson Creek is an enigma. Little bluestem (*Schizachyrium scoparium*) is usually the characteristic species of relict native prairie patches in central Texas. However, at the Prairieland site, within the prairie community, little bluestem was not identified, though it may be present as a minor component. (It was seen in clearings north of Williamson Creek within the Prairieland Preserve and a few patches were identified east of Williamson Creek in the Sunset Valley Creekbelt). Silver bluestem (*Bothriochloa laguroides*), a visual dominant at the site, appeared to fill the niche usually occupied by little bluestem. In any event, the near absence of little bluestem makes comparison of the site with TNHP grassland communities less than satisfactory.

3.3.7 Observed Vegetation Structure, Dominant and Interesting Plant Species

Four more or less discrete vegetation communities were identified at the Prairieland Preserve (Figure 5). North of Williamson Creek was a live oak-midgrass community where Ashe juniper

was a ubiquitous invasive. Important canopy trees identified were live oak, shin oak, post oak, cedar elm, sugar hackberry and Texas ash. Among the shrub and small tree species competing unenthusiastically with the Ashe juniper were wafer ash (*Ptelea trifoliata*), Texas persimmon, Texas kidney wood, fragrant sumac and elbow-bush. Interestingly, literally thousands of Texas ash seedlings were observed in the understory below dense juniper thickets. Cedar sage was the most frequently seen herbaceous species. In grassy clearings, silver bluestem, side-oats grama, purple threeawn (*Aristida purpurea*), tall dropseed (*Sporobolous asper*), poverty dropseed (*Sporobolous vaginiflora*) and curly mesquite (*Hilaria belangeri*) were common. Little bluestem was seen infrequently in these clearings.

A change in herbaceous plant cover was noted on low terraces immediately adjacent to Williamson Creek. In this more mesic environment, creek oats (*Chasmanthium latifolium*) and rustyseed paspalum (*Paspalum langei*) were common. (Note that the author here substitutes the common name 'creek oats' for the common name, 'inland sea oats'. He has always found the latter name disturbing). In addition to these native perennials, alluvial deposits of low terraces had a cover of introduced annual grass species, mainly brome grasses (*Bromus* spp.) Some common herbs noted in this environment were pigeonberry (*Rivina humilis*), showy buttercup (*Ranunculus macranthus*), Drummond ruellia (*Ruellia davisiorum*) and Texas aster (*Aster drummondii* ssp. *texanus*). Several large patches of the introduced ground cover, large periwinkle (*Vinca major*) were also seen, typically in association with another introduced species, Japanese honeysuckle (*Lonicera japonica*). Possum-haw (*Ilex decidua*) and American beautyberry (*Callicarpa americana*) were noteworthy shrubs. Osage orange (*Maclura pomifera*) was noted in the canopy.

A transitional community was identified south of Williamson Creek along the north margin of the prairie community. This community was intermittent in distribution and dominated by shrubs, perennial herbs and grasses. Conspicuous species identified included Ashe juniper, honey mesquite (*Prosopis glandulosa*), fragrant mimosa (*Mimosa borealis*), Texas kidneywood, agarito (*Mahonia trifoliata*), Texas yucca and orange zexmenia (*Wedelia hispida*). Grass species composition was similar to that found in woodland clearings north of Williamson Creek.

The midgrass prairie community, though appearing rather uniform, was actually rather patchy in terms of matrix species. On the margins of the gravel road, King Ranch bluestem and bermudagrass were common. At variable distances from the road, these species were replaced by silver bluestem, buffalograss and curly mesquite as matrix species. Also common and conspicuous were Indiangrass, side-oats grama and tall dropseed. A variety of grassland herbs were also common. Some of these, characteristic of prairie communities, were prairie gerardia (*Agalins herterophylla*), Maximilian sunflower (*Helianthus maximiliana*) and plateau nerveray (*Tetragonotheca texana*).

Another area of note was found along the dirt road that transects the Prairieland north of Williamson Creek, running north-south. The road crosses a disturbed grassland community. However, on mostly bare ground within the road margins were found several plant species indicative of Pleistocene terrace deposits of the Colorado River. A similar association of plants was noted at one location within the Cougar Creekbelt. Characteristic species at both sites were least blue-eye grass (*Sisyrinchium minus*) and Greenman bluets (*Hedyotis greenmanii*). Also found in this area was prairie pinkroot (*Spigelia lindheimeri*).

Table 5, Plant Species Identified at the Prairieland Preserve, lists the scientific name, common name(s) and habit of plant species identified at the Prairieland Preserve. Plant species are grouped by family and listed in phylogenetic order following Hatch et al. (1990). Habit, Column 3, provides information on the primary season in which the species fruits and flowers, whether the species is annual or perennial and the growth form of the species. Warm season refers to species that reproduce sexually during summer and fall. Cool season refers to species that reproduce sexually during late winter and spring. An asterisk (*) following the scientific name of a plant in the tables indicates the plant is an introduced species. DE and a number after a scientific name indicate that a specimen is on file at DE.

Table 5
Plant Species and their Habits at the Prairieland Preserve

Cupressaceae	Cypress Family	Habit
Juniperus ashei	Ashe juniper	warm season perennial
Poaceae	Grass Family	Habit
Aristida purpurea var. purpurea	purple threeawn	warm season perennial
Aristida purpurea var. wrightii	Wright threeawn	warm season perennial
Bothriochloa barbinodos	cane bluestem	warm season perennial
Bothriochloa ischaemum*	King Ranch bluestem	warm season perennial
Bothriochloa laguroides	silver bluestem	warm season perennial
Bouteloua curtipendula	side-oats grama	warm season perennial
Bouteloua rigidisetia	Texas grama	warm season perennial
Bouteloua trifida	red grama	warm season perennial
Bromus japonicus*	Japanese brome	cool season annual
Bromus uniloides*	rescuegrass	cool season annual
Buchloe dactyloides	buffalograss	warm season perennial
Cenchrus incertus	common sandbur	warm season perennial
Chloris verticillata	tumble windmillgrass	warm season perennial
Cynodon dactylon*	bermudagrass	warm season perennial
Dichanthelium oligosanthes	Scribner panicgrass	cool season perennial
Digitaria cognata	fall witchgrass	warm season perennial
Echinochloa colonum*	jungle-rice	warm season annual
Elymus virginicus	Virginia wildrye	cool season perennial
Elymus canadensis	Canada wildrye	cool season perennial
Eragrostis intermedia	plains lovegrass	warm season perennial
Hilaria belangeri	curly mesquite	warm season perennial
Hordeum pusillum	little barley	cool season annual
Limnodea arkansana	ozarkgrass	cool season annual
Lolium perenne*	perennial ryegrass	cool season perennial
Panicum hallii	Hall panicum	warm season perennial
Panicum obtusum DE 2836	vine-mesquite	warm season perennial
Panicum virgatum	switchgrass	warm season perennial
Paspalum dilatatum*	Dallisgrass	warm season perennial
Paspalum langei	rustyseed pasplum	warm season perennial
Paspalum urvillei*	Vaseygrass	warm season perennial
Poa annua	annual bluegrass	cool season annual
Schizachryium scoparium	little bluestem	warm season perennial
Setaria geniculata	knot-root bristlegrass	warm season perennial
Setaria scheelei	southwestern bristlegrass	warm season perennial
Sorghum halapense*	Johnsongrass	warm season perennial
Sporobolous asper	tall dropseed	warm season perennial
Sporobolous vaginiflorus	poverty dropseed	warm season annual

Stipa leucotricha	Texas wintergrass, speargrass	cool season perennial
Tridens albescens	white tridens	warm season perennial
Tridens flavus	purpletop	warm season perennial
Vulpia octoflora	common sixweekgrass	cool season annual

Cyperaceae

Sedge Family

Habit

Carex muhlenbergia var. enermis	Muhlenberg sedge	cool season perennial
Carex perdentata		cool season perennial
Carex planostachys	cedar sedge	cool season perennial
Cyperus retroflexus	oneflower flatsedge	cool season perennial
Cyperus rotundus*	nutgrass	cool season perennial

Bromeliaceae

Pineapple Family

Habit

Tillandsia recurvata	ballmoss	epiphyte, warm season perennial
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Commeliniaceae

Spiderwort Family

Habit

Tinantia anomala	false dayflower	herb, cool season annual
Tradescantia edwardsiana	plateau spiderwort	herb, cool season perennial
Tradescantia humilis	Texas spiderwort	herb, cool season perennial

Juncaceae

Rush Family

Habit

Juncus interior	inland rush	warm season perennial
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Liliaceae

Lily Family

Habit

Allium canadense	Canada garlic	herb, cool season perennial
Allium canadense var. fraseri DE 3161	Canada garlic	herb, cool season perennial
Allium drummondii	Drummond onion	herb, cool season perennial
Smilax bona-nox	saw greenbrier	vine, cool season perennial
Yucca rupicola	Texas yucca	shrub, cool season perennial
Yucca sp.		

Amaryllidaceae

Amaryllis Family

Habit

Cooperia pedunculata	giant rainlily	herb, cool season perennial
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Iridaceae

Iris Family

Habit

Sisyrinchium minus	least blue-eye grass	herb, cool season annual
Sisyrinchium pruinatum	dotted blue-eye grass	herb, cool season perennial

Fagaceae

Quercus buckleyi
Quercus durandii var. *breviloba*
Quercus virginiana

Beech Family

Texas oak
 shin oak
 live oak

Habit

tree, cool season perennial
 tree, cool season perennial
 tree, cool season perennial

Ulmaceae

Celtis laevigata
Ulmus crassifolia

Elm Family

sugar hackberry
 cedar elm

Habit

tree, cool season perennial
 tree, cool season perennial

Urticaceae

Parietaria pensylvanica
Urtica chamaedryoides

Nettle Family

rock pellitory
 heart-leaf nettle

Habit

herb, warm season annual
 herb, cool season annual

Polygonaceae

*Rumex crispus**
*Rumex pulcher**

Knotweed Family

curly dock
 fiddle dock

Habit

herb, warm season perennial
 herb, cool season perennial

Viscaceae

Phoradendron tomentosum

Mistletoe Family

mistletoe

Habit

epiphytic, parasitic, cool season shrub

Phytolaccaceae

Rivina humilis

Pokeweed Family

pigeonberry, bloodberry

Habit

herb, warm season perennial

Caryophyllaceae

Arenaria benthamii
Sagina decumbens
*Stellaria media**

Pink Family

hilly sandwort
 trailing pearlwort
 chickweed starwort

Habit

herb, cool season annual
 herb, cool season annual
 herb, cool season annual

Ranunculaceae

Anemone berlandieri
Clematis drummondii

Ranunculus macranthus

Buttercup Family

tenpetal anemone
 Texas virgin's bower
 old man's beard
 showy buttercup

Habit

herb, cool season perennial
 subshrub, warm season perennial

 herb, cool season perennial

Berberidaceae

Mahonia trifoliata
*Nandina domestica**

Barberry Family

agarito
 heavenly bamboo

Habit

shrub, cool season perennial
 warm, cool season perennial

Menispermaceae

Cocculus carolinus

PapaveraceaeArgemone aurantiaca
Papaver somniferum***Brassicaceae**Draba platycarpa
Lepidium austrinum
Lepidium virginicum
Lesquerella recurvata
Rapistrum rugosum***Rosaceae**Geum canadense
Rubus trivialis**Fabaceae**Cercis canadensis
Desmanthus illinoiensis
Desmanthus velutinus
Desmanthus virgatus DE 3163
var. acuminatus
Lathyrus pusillus
Lupinus texensis
Medicago lupulina*
Medicago minima
Medicago polymorpha var. vulgaris
Melilotus albus*
Melilotus officinalis*
Mimosa borealis
Prosopis glandulosa
Rhynchosia minima
Schrankia roemeriana
Senna lindheimeriana
Senna roemeriana
Sesbania drummondii
Trifolium incarnatum* DE 3136
Vicia leavenworthii**Moonseed Family**

Carolina snailseed

Poppy Familypricklepoppy
opium poppy**Mustard Family**broadpod draba
southern pepperweed
Virginia pepperweed
slender bladderpod
yellow rocket**Rose Family**white avens
southern dewberry**Legume Family**redbud
Illinois bundleflower
velvet bundleflower
sharppod bundleflowerlow pea vine
Texas bluebonnet
black medic
least burclover
common burclover
white sweetclover
yellow sweetclover
fragrant mimosa
honey mesquite
least snoutbean
Roemer schrankia
Lindheimer senna
twoleaf senna
Drummond rattlebush
crimson clover
Leavenworth vetch**Habit**

vine, warm season perennial

Habitherb, cool season annual
herb, cool season annual**Habit**herb, cool season annual
herb, cool season annual
herb, cool season annual
herb, cool season annual
herb, cool season annual**Habit**herb, cool season perennial
vine, cool season perennial**Habit**small tree, cool season perennial
herb, warm season perennial
subshrub, warm season perennial
subshrub, warm season perennialherb, cool season annual
herb, cool season annual
herb, cool season annual
herb, cool season annual
herb, cool season annual
herb, all season annual
herb, all season annual
shrub, warm season perennial
tree, warm season perennial
vine, warm season perennial
vine, warm season perennial
herb, warm season perennial
herb, warm season perennial
shrub, warm season perennial
herb, cool season annual
vine, cool season annual

Geraniaceae

Erodium cicutarium
 Erodium texanum
 Geranium carolinianum

Geranium Family

alfilaria, stork's bill
 Texas filaree, heron bill
 Carolina geranium

Habit

herb, cool season annual
 herb, warm season perennial
 herb, cool season annual

Oxalidaceae

Oxalis dillennii
 Oxalis drummondii

Wood-Sorrel Family

yellow sour-clover
 Dillen's wood-sorrell
 Drummond wood-sorrell

Habit

herb, warm season perennial
 herb, warm season perennial

Rutaceae

Ptelea trifoliata
 Zanthoxylum hirsutum

Citrus Family

skunkbush, hoptree
 toothache tree

Habit

small tree, cool season perennial
 small tree, cool season perennial

Meliaceae

Melia azedarach*

Mahogany Family

Chinaberry

Habit

tree, cool season perennial

Euphorbiaceae

Acalypha lindheimeri
 Argythamnia humilis var. humilis
 Argythamnia simulans
 Croton fruticosus
 Croton monanthogynous
 Euphorbia dentata
 Euphorbia marginata
 Euphorbia maculata
 Euphorbia nutans
 Euphorbia serpens
 Euphorbia spathulata
 Phyllanthus polygonoides
 Tragia brevispica
 Tragia ramosa

Spurge Family

Lindheimer three-seeded mercury
 low wild mercury
 plateau wild mercury
 bush croton
 oneseed croton
 toothed spurge
 snow-on-the-mountain
 spotted spurge
 eyebane
 mat spurge
 warty spurge
 knotweed leaf flower
 shortspike noseburn
 catnip noseburn

Habit

herb, warm season perennial
 herb, warm season perennial
 herb, warm season perennial
 shrub, warm season perennial
 herb, warm season annual
 herb, warm season annual
 herb, warm season annual
 herb, warm season annual
 herb, warm season annual
 herb, warm season annual
 herb, warm season annual
 herb, cool season annual
 minute shrub, warm season perennial
 vine, all season perennial
 herb, warm season perennial

Anacardiaceae

Rhus aromatica
 Rhus lanceolata
 Toxicodendron radicans

Sumac Family

fragrant sumac
 prairie sumac
 poison ivy

Habit

shrub, cool season perennial
 shrub, warm season perennial
 vine, cool season perennial

Aquifoliaceae

Ilex decidua

Holly Family

possum-haw

Habit

shrub, cool season perennial

<i>Ilex vomitoria</i>	yaupon	shrub, cool season perennial
Sapindaceae	Soapberry Family	Habit
<i>Sapindus saponaria</i>	western soapberry	tree, cool season perennial
<i>Ungradia speciosa</i>	Mexican buckeye	shrub, cool season perennial
Vitaceae	Grape Family	Habit
<i>Ampelopsis arborea</i>	peppervine	vine, warm season perennial
<i>Cissus incisa</i>	ivy treebine, cow itch	vine, warm season perennial
<i>Parthenocissus quinquefolia</i>	Virginia creeper	vine, warm season perennial
<i>Vitis berlandieri</i>	winter grape	vine, cool season perennial
<i>Vitis mustangensis</i>	mustang grape	vine, cool season perennial
Malvaceae		
<i>Abutilon fruticosum</i>	Texas Indian mallow, pelotazo	herb, warm season perennial
<i>Allowissadula holosericea</i>	velvetleaf mallow	herb, warm season perennial
<i>Malvaviscus arboreus</i>	Drummond wax-mallow	subshrub, all season perennial
	Turk's cap	
<i>Modiola caroliniana</i>	Carolina modiola	herb, cool season annual
<i>Sida abutifolia</i>	spreading sida	herb, warm season perennial
Cactaceae	Cactus Family	Habit
<i>Opuntia leptocaulis</i>	pencil cactus	shrub, warm season perennial
<i>Opuntia lindheimeri</i>	Texas prickly pear	shrub, cool season perennial
Onagraceae	Evening Primrose Family	Habit
<i>Gaura brachycarpa</i>	plains gaura	herb, cool season annual
<i>Gaura parviflora</i>	small-flower gaura	herb, all season annual
<i>Oenothera speciosa</i>	pink evening primrose	herb, warm season perennial
<i>Oenothera laciniata</i>	downy evening primrose	herb, cool season perennial
<i>Oenothera triloba</i>	stemless evening primrose	herb, cool season perennial
Apiaceae	Carrot Family	Habit
<i>Chaerophyllum tainturei</i> DE 3027	chervil	herb, cool season annual
<i>Ciclospermum leptophyllum</i>	slimlobe celery	herb, cool season annual
<i>Daucus pusillus*</i> DE 3165	southwestern carrot	herb, cool season annual
<i>Polytaenia texana</i>	Texas parsley	herb, cool season perennial
<i>Sanicula canadensis</i>	Canada sanicle	herb, cool season perennial
<i>Scandix pecten-veneris*</i> DE 3137	Venus' comb	herb, cool season annual
<i>Torilis arvensis*</i>	hedge parsley	herb, cool season annual

Cornaceae	Dogwood Family	Habit
Garrya ovata ssp. lindheimeri	Lindheimer's silk-tassel	small tree, cool season perennial
Sapotaceae	Sapodilla Family	Habit
Bumelia lanuginosa	gum bumelia, coma	small tree, warm season perennial
Ebenaceae	Ebony Family	Habit
Diospyros texana	Texas persimmon	shrub, cool season perennial
Oleaceae	Olive Family	Habit
Foresteria pubescens	elbow-bush	shrub, cool season perennial
Ligustrum japonicum*	Japanese privet	small tree, warm season perennial
Ligustrum sinense*	Chinese privet	shrub, warm season perennial
Fraxinus texensis	Texas ash	tree, cool season perennial
Fraxinus velutina	velvet ash, Texas ash	tree, cool season perennial
Loganiaceae	Logania Family	Habit
Spigelia lindheimeri DE 3167	prairie pinkroot, wormgrass	herb, cool season perennial
Apocyanaceae	Dogbane Family	Habit
Vinca major*	large periwinkle	herb, cool season perennial
Asclepiadaceae	Milkweed Family	Habit
Asclepias oenotherioides	hierba de zizotes	herb, warm season perennial
Matelea reticulata	pearl milkvine	vine, warm season perennial
Convolvulaceae	Morning-Glory Family	Habit
Dichondra carolinensis	grass ponyfoot	herb, warm season perennial
Ipomoea trichocarpa	morningglory	herbaceous vine, warm season perennial
Polemoniaceae	Phlox Family	Habit
Phlox drummondii*	phlox cultivar	herb, cool season annual
Hydrophyllaceae	Waterleaf Family	Habit
Nemophila phacelioides	large-flower baby blue-eyes	herb, cool season annual

Boraginaceae

Lithospermum incisum
Heliotropium tenellum

Verbenaceae

Callicarpa americana
Lantana camara*
Phyla sp.
Verbena canescens
Verbena bipinnatifida
Verbena brasiliensis*
Verbena officinale ssp. halei
Verbena xutha

Lamiaceae (Labiatae)

Lamium amplexicaule*
Hedeoma acinioides
Hedeoma drummondii
Marrubium vulgare*
Monarda citriodora
Salvia coccinea
Salvia farinacea
Salvia roemeriana
Salvia texana
Scutellaria ovata

Solanaceae

Bouchetia erecta
Chamaesaracha edwardsiana? DE 3084
Physalis cinerascens
Solanum dimidiatum
Solanum elaeagnifolium
Solanum rostratum

Scrophulariaceae

Agalinis heterophylla
Mecardonia vandellioides
Penstemon cobaea
Veronica peregrina

Acanthaceae

Ruellia davisiorum

Borage Family

narrowleaf puccoon
pasture heliotrope

Vervain Family

American beautyberry
West Indian lantana
fogfruit, frogfruit
gray vervain
Dakota vervain
Brazilian vervain
slender vervain
coarse vervain

Mint Family

henbit deadnettle
slender mock pennyroyal
Drummond mock pennyroyal
common horehound
lemon horsemint
tropical sage
mealycup sage
cedar sage
Texas sage
tuber skullcap

Potato Family

erect Bouchetia
Edwards false nightshade
beach groundcherry
western horse nettle
silverleaf nightshade
buffalobur

Snapdragon Family

prairie gerardia
prostrate mecardonia
Cobaea foxglove
purslane speedwell

Acanthus Family

Drummond ruellia

Habit

herb, cool season perennial
herb, warm season annual

Habit

shrub, warm season perennial
shrub, warm season perennial
herb
herb, warm season perennial
herb, warm season annual
herb, warm season annual
herb, warm season perennial
herb, warm season annual

Habit

herb, cool season annual
herb, cool season annual
herb, warm season perennial
herb, warm season perennial
herb, warm season annual
herb, warm season perennial
herb, warm season perennial
herb, warm season perennial
herb, cool season perennial
herb, warm season perennial

Habit

herb, all season perennial
herb, all season perennial
herb, warm season perennial
herb, warm season perennial
herb, warm season perennial
herb, warm season annual

Habit

herb, warm season annual
herb, all season perennial
herb, cool season perennial
herb, cool season annual

Habit

herb, warm season perennial

Ruellia nudiflora	violet ruellia	herb, warm season perennial
Plantaginaceae	Plantain Family	Habit
Plantago rhodosperma	redseed plantain	herb, cool season annual
Rubiaceae	Madder Family	Habit
Galium aparine	catchweed bedstraw	herb, cool season annual
Galium texense	Texas bedstraw	herb, cool season perennial
Galium virgatum	southwest bedstraw	herb, cool season annual
Hedyotis greenmanii	Greenman bluets	herb, cool season annual
Hedyotis nigricans	bluet	herb, warm season perennial
Caprifoliaceae	Honeysuckle Family	Habit
Lonicera japonica*	Japanese honeysuckle	vine, cool season perennial
Viburnum rufidulum	downy viburnum, rusty blackhaw	shrub, cool season perennial
Valerianaceae	Valerian Family	Habit
Valerianella amarella	hairy cornsalad	herb, cool season annual
Valerianella radiata	beaked cornsalad	herb, cool season annual
Campanulaceae	Bellflower Family	Habit
Triodanis perfoliata	Venus looking-glass	herb, cool season annual
Asteraceae	Sunflower Family	Habit
Achillea millefolium	western yarrow	herb, cool season perennial
Ambrosia cumanensis	western ragweed	herb, warm season perennial
Ambrosia trifida	giant ragweed	herb, warm season annual
Aster drummondii ssp. texanus	Texas aster	herb, warm season perennial
Aster subulatus	hierrba del marrano	herb, warm season annual
Baccharis neglecta	Roosevelt weed	shrub, warm season perennial
Calyptocarpus vialis	prostrate lawnflower	herb, warm season annual
Centaurea melitensis*	Malta star thistle	herb, all season annual
Cirsium texanum	southern thistle	herb, warm season perennial
Engelmannia pinnatifida	Engelmann daisy	herb, cool season perennial
Erigeron strigosus DE 3166	prairie fleabane	herb, cool season annual
Eupatorium havanense	shrubby boneset	subshrub, warm season perennial
Gaillardia pulchella	Indian blanket, firewheel	herb, warm season annual
Gamochaeta pensilvanica DE 3170	Pennsylvania cudweed	herb, all season annual
Gamochaeta purpurea DE 3162	purple cudweed	herb, all season annual
Gutierrezia texana	Texas broomweed	herb, warm season annual
Helianthus annuus	common sunflower	herb, warm season annual
Hymenopappus scabiosaeus	flattop woolywhite, old plainsman	herb, cool season biennial

<i>Iva annua</i>	sumpweed	herb, warm season perennial
<i>Krigia cespitosa</i>	weedy dwarf dandelion	herb, cool season annual
<i>Melampodium leucanthum</i>	plains blackfoot daisy	herb, warm season perennial
<i>Parthenium hysterophorus</i>	ragweed parthenium	herb, warm season perennial
<i>Pyrrhopappus multicaulis</i>	manystem false dandelion	herb, cool season annual
<i>Ratibida columnifera</i>	upright prairie coneflower	herb, warm season perennial
<i>Solidago canadensis</i>	common goldenrod	herb, warm season perennial
<i>Sonchus asper</i> *	prickly sowthistle	herb, all season annual
<i>Taraxacum officinale</i> *	common dandelion	herb, all season perennial
<i>Thelesperma filifolium</i>	slender greenthread	herb, warm season perennial
<i>Tetragonotheca texana</i>	plateau nerve-ray	herb, warm season perennial
<i>Verbesina virginica</i>	frostweed	herb, warm season perennial
<i>Viguera dentata</i>	sunflower golden-eye	subshrub, warm season perennial
<i>Wedelia hispida</i>	orange zexmenia	subshrub, warm season perennial
<i>Xanthium strumarium</i>	spiny cocklebur	herb, warm season annual

An * terminating a scientific name indicates the species is introduced to the Austin area.
 DE and a number following the scientific name indicate a specimen on file at DE.

3.4 Sunset Valley Creekbelt

3.4.1 Physical Characteristics

The Sunset Valley Creekbelt (Figure 6) is about 67 acres in extent and the largest of the conservation areas. Williamson Creek trends west to east across the site. Creek flow is ephemeral throughout the Sunset Valley Creekbelt and no permanent water body was identified on the site. Floodplain terraces and uplands along the creek drop in elevation from about 700 feet at Brodie Lane to about 670 feet on the east site boundary.

The geologic substrate underlying the Sunset Valley Creekbelt is identified by Garner and Young as Edwards limestone on the western third of the site and Buda limestone on the balance of the site. Several fine outcrops of Edwards limestone were identified along Williamson Creek within 300 feet of Brodie Lane. Outcrops of Buda limestone were tentatively identified on ridgetops adjacent to Williamson Creek on the western third of the site. However, these same outcrops bear a strong resemblance to Georgetown limestone. Whatever the limestone substrate, a small population of Alabama lipfern, the only fern population discovered within the Sunset Valley Creek Belt, was identified on limestone outcrops along the south creek bank of Williamson Creek near the east site boundary.

Interestingly, a north-south trending fault line neatly separates Edwards limestone from Buda limestone west to east on the site according to Garner and Young. Soil map units included for the site by SCS are Mixed Alluvial Land and Tarrant and Speck soils. Soil map units included for the site by SCS are Mixed Alluvial Land and Tarrant and Speck soils. Mixed Alluvial Land, which comprises the stream bed(s) of Williamson Creek at the site, is composed of silt, gravelly alluvium and limestone rock fragments and boulders. Field investigations at the site indicated rather broad alluvial terraces within the Williamson Creek flood plain. In addition to the materials mentioned by SCS, two to three feet deep, silt and sand alluvial deposits were contained on the Williamson Creek floodplain. Tarrant and Speck soils are shallow, ranging from 10 to 18 inches in depth, and are underlain by hard limestone. Tarrant soils are a dark grayish-brown clay. Speck soils are a reddish-brown clay loam. One can readily distinguish these two soils by checking the color of ant mounds on the site. As Burford Westlund says, "Ants never lie".

3.4.2 Man-Made Features

A wastewater line was constructed along Williamson Creek and parallels the creek across the site. The wastewater line crosses from the south to the north bank of the creek about 900 feet west of the east site boundary. Some small areas above the north bank of the creek appeared to have been graded, or material was dumped in past years, as evidenced by mounds of limestone



Source: Aerial Photograph
Scale: 1" = 500'



DE DRUID ENVIRONMENTAL

Figure 6 Sunset Valley Creekbelt and
South Rim Conservation Area
Travis County, Texas

rubble.

3.4.3 Disturbance Features

Considerable flotsam and jetsam was accumulated along Williamson Creek as a result of stream flow. However, rubbish piles conspicuous along the creek within the Prairieland Preserve, were absent from the Sunset Valley Creekbelt. Several brush piles were identified south of Williamson creek consisting mainly of junipers, probably cleared by the previous owner for purposes of range improvement.

3.4.4 Management Recommendations

In the absence of brush control, large areas of the site, especially those areas with thin soils, will succeed to juniper and mixed juniper-deciduous thickets. Deeper soil areas, for example the alluvial terraces already disturbed by waste water line construction, will probably succeed to mesquite thickets. Evidence for these hypotheses was found at several locations across the site where thickets of young Ashe juniper were developed under live oaks on the thin soils of side slopes. Young honey mesquite saplings were identified as common invasives in the waste water line right-of-way and in other deeper soil locales.

Small juniper and mesquite saplings may be removed by the simple expedient of lopping them off basally with shears. However, if perennial grasses are not subsequently established on areas of brush removal, especially sites succeeding to juniper, brush species will continuously reoccupy these sites in short order. Seeding or planting midgrass perennials, Texas wintergrass, tall dropseed, little bluestem, silver bluestem and side-oats grama, is recommended to follow any brush removal activities since these species, when well established, tend to limit the spread of invasive shrubs.

A trail, of sorts, was found paralleling the north bank of Williamson Creek. This trail intercepts, and provides access to, most of the interesting geological and botanical elements extant on the site. However, since the trail was made, and is kept open by ungulates, cows and deer, some minor modifications need to be accomplished to accommodate the passage of humans. Human use of this trail might also disrupt its use by deer and other wildlife species. Alternatively, the existing waste water line seems appropriate as a trail except where it intrudes on a residential area in the southwest corner of the property. No additional trail options are recommended.

3.4.5 Sunset Valley Creekbelt - Potential Climax Plant Species Identified by NRCS

The soil map units identified by SCS for the Sunset Valley Creek Belt are Tarrant and Speck soils and Mixed Alluvial Land. The corresponding range site are the Rocky Upland and

Bottomland range sites. Table 6 identifies the decreaser plant species listed by SCS for these range sites. All species listed in Table 6 were found at the site except big bluestem (*Andropogon gerardii*) and eastern gammagrass (*Tripsacum dactyloides*).

Table 6
Decreaser Plant Species for the Rocky Upland and Bottomland Range Sites

Rocky Upland

Trees

Common Name	Scientific Name
live oak	<i>Quercus virginiana</i>

Grasses

big bluestem	<i>Andropogon gerardii</i>
Canada wildrye	<i>Elymus canadensis</i>
green spangletop	<i>Leptochloa dubia</i>
little bluestem	<i>Schizachyrium scoparium</i>
Indiangrass	<i>Sorghastum nutans</i>

Bottomland

Trees

Common Name	Scientific Name
cedar elm	<i>Ulmus crassifolia</i>
live oak	<i>Quercus virginiana</i>
sugar hackberry	<i>Celtis laevigata</i>
pecan	<i>Carya illinoensis</i>

Grasses

little bluestem	<i>Schizachyrium scoparium</i>
Indiangrass	<i>Sorghastrum nutans</i>
Virginia wildrye	<i>Elymus virginicus</i>
big bluestem	<i>Andropogon gerardii</i>

eastern gammagrass
switchgrass

Tripsacum dactyloides
Panicum virgatum

3.4.6 Sunset Valley Creekbelt - Plant Community as Characterized by the Texas Natural Heritage Program

The plant community extant at the site closely corresponds to the live oak-mid-grass as identified by TNHP.. The TNHP description follows:

Plateau Live Oak-Midgrass series (G3S3)

This mainly evergreen woodland occupies uplands of the Edwards Plateau, where it is often intermixed with midgrass grassland on flats and on gentle slopes. Composition varies with substrate (i.e. between the limestone derived soils of the Plateau proper and the generally sandier soils of the Llano Uplift) and precipitation. Canopy cover ranges from open to closed, with mottes of monoculture live oak present in some areas. Texas oak (*Quercus bucklevi*), cedar elm (*Ulmus crassifolia*), post oak (*Quercus stellata*), Ashe juniper (*Juniperus ashei*), scalybark oak (*Quercus sinuata* var. *breviloba*), *Quercus* spp. , and shrubs such as *Rhus* spp. and *Condalia* spp. are variously present. Shallow soils or disturbed areas often support Ashe juniper or mesquite (*Prosopis glandulosa*) dominated woodlands or shrublands, while openings in good condition are mid-grass grasslands with species such as little bluestem (*Schizachyrium scoparium*), sideoats grama (*Bouteloua curtipendula*), and curly mesquite (*Hilaria belangeri*).

3.4.7 Observed Vegetation Structure, Dominant and Interesting Plant Species

Plant community structure at the site was closed canopy juniper-oak woodland, along and within low stream terraces, live oak-cedar elm woodland with a dense juniper-deciduous shrub mid-story on the eastern fourth of the site and live oak- mid-grass on the upland balance of the site (Figure 6). An area of midgrass prairie, equivalent in structure and species composition to the grassland on the Prairieland Preserve was identified in the northwest corner of the site adjacent to Brodie Lane.

Dominant tree species along stream terraces were live oak, Ashe juniper and cedar elm. Other common tree species identified within this community were Osage-orange, shin oak, Texas oak, sugar hackberry and, along the south creek terrace, post oak. Shrub species composition was similar to that of flood plain terraces within the Prairieland Preserve with the exception that mountain laurel (*Sophora secundiflora*) was noted with increasing regularity within flood plains on Buda limestone substrates. A herbaceous community also similar to that found on alluvial substrates within the Prairieland Preserve was noted along the western third of Williamson Creek within the Sunset Valley Creekbelt, but this community, dominated by creek oats and rustyseed paspalum, diminished eastward as a predominantly rocky substrate replaced silt and sand alluvium.

The woodland on the eastern third of the site had live oak, Ashe juniper and cedar elm as visual dominants. Since none of the tree and shrub species found in this part of the Sunset Valley Creek Belt were unique to the site, the numerous species need not be enumerated here, but are included in Table 5. The herbaceous species component encountered was also similar to that found within the live oak-midgrass community and along alluvial terraces on the site.

The live oak-midgrass community at the site occurred mainly on uplands above Williamson Creek. Live oak was the dominant tree species although cedar elm was also very common. Ashe juniper was the most common invasive shrub species under oak mottes, although elbow-bush, Texas croton (*Croton fruticulosa*) and yaupon (*Ilex vomitoria*), were common and widely distributed. Honey mesquite was a common shrub invasive.

South of Williamson Creek, and in numerous clearings north of Williamson Creek, grassland patches occurred in various stages of succession. Important species in midgrass patches were tall dropseed, Texas wintergrass, side-oats grama and purpletop (*Tridens flavus*). Short grass areas within the grassland matrix had curly mesquite or buffalograss as the dominant species. One interesting introduced grass species was Kleberg bluestem (*Dichanthium annulatum*), found in the wastewater line on the south side of Williamson Creek about 100 feet east of Brodie Lane. This species is common in south Texas, but has only been reported in Travis County on two previous occasions. A number of disturbed structural grassland areas were identified north of Williamson Creek where annual weeds and grasses were important vegetative components. Typical species of these areas were brome grasses, annual bluegrass (*Poa annua*) and burclovers (*Medicago* spp).

Table 7, Plant Species Identified at the Sunset Valley Creekbelt, lists the scientific name, common name(s) and habit of plant species identified at the Sunset Valley Creekbelt. Plant species are grouped by family and listed in phylogenetic order following Hatch et al. (1990). Habit, Column 3, provides information on the primary season in which the species fruits and flowers, whether the species is annual or perennial and the growth form of the species. Warm season refers to species that reproduce sexually during summer and fall. Cool season refers to species that reproduce sexually during late winter and spring. An asterisk (*) following the scientific name of a plant in the tables indicates the plant is an introduced species. DE and a number after a scientific name indicate that a specimen is on file at DE.

Table 7
Plant Species and their Habits at the Sunset Valley Creekbelt

Polypodiaceae	Fern Family	Habit
<i>Cheilanthes alabamensis</i>	Alabama lipfern	warm season perennial
Cupressaceae	Cypress Family	Habit
<i>Juniperus ashei</i>	Ashe juniper	warm season perennial
Poaceae	Grass Family	Habit
<i>Aristida purpurea</i> var. <i>purpurea</i>	purple threeawn	warm season perennial
<i>Aristida purpurea</i> var. <i>wrightii</i>	Wright threeawn	warm season perennial
<i>Avena fatua</i>	oats	cool season annual
<i>Bothriochloa barbinodos</i>	cane bluestem	warm season perennial
<i>Bothriochloa ischaemum</i> *	King Ranch bluestem	warm season perennial
<i>Bothriochloa laguroides</i>	silver bluestem	warm season perennial
<i>Bouteloua curtipendula</i>	side-oats grama	warm season perennial
<i>Bouteloua rigidiset</i> a	Texas grama	warm season perennial
<i>Bouteloua trifida</i>	red grama	warm season perennial
<i>Bromus japonicus</i> *	Japanese brome	cool season annual
<i>Bromus uniloides</i> *	rescuegrass	cool season annual
<i>Buchloe dactyloides</i>	buffalograss	warm season perennial
<i>Chloris verticillata</i>	tumble windmillgrass	warm season perennial
<i>Cynodon dactylon</i> *	bermudagrass	warm season perennial
<i>Dichanthelium oligosanthes</i>	Scribner panicgrass	cool season perennial
<i>Dichanthium annulatum</i> *	Kleberg bluestem	warm season annual
<i>Echinochloa colonum</i> *	jungle-rice	warm season annual
<i>Elymus virginicus</i>	Virginia wildrye	cool season perennial
<i>Elymus canadensis</i>	Canada wildrye	cool season perennial
<i>Eragrostis intermedia</i>	plains lovegrass	warm season perennial
<i>Erioneuron pilosum</i>	hairy woolygrass	warm season perennial
<i>Festuca arundinacea</i> *	tall fescue	cool season perennial
<i>Hilaria belangeri</i>	curly mesquite	warm season perennial
<i>Hordeum pusillum</i>	little barley	cool season annual
<i>Leptochloa dubia</i>	green spangletop	warm season perennial
<i>Lolium perenne</i> *	perennial ryegrass	cool season perennial
<i>Panicum capillare</i>	common witchgrass	warm season annual
<i>Panicum hallii</i>	Hall panicum	warm season perennial
<i>Panicum obtusum</i>	vine-mesquite	warm season perennial
<i>Panicum virgatum</i>	switchgrass	warm season perennial
<i>Paspalum dilatatum</i> *	Dallisgrass	warm season perennial
<i>Paspalum urvillei</i> *	Vaseygrass	warm season perennial

Phalaris caroliniana	Carolina canarygrass	cool season annual
Poa annua	annual bluegrass	cool season annual
Schizachryium scoparium	little bluestem	warm season perennial
Setaria geniculata	knot-root bristlegrass	warm season perennial
Setaria scheelei	southwestern bristlegrass	warm season perennial
Sorghum halapense*	Johnsongrass	warm season perennial
Sporobolous asper	tall dropseed	warm season perennial
Sporobolous vaginiflorus	poverty dropseed	warm season annual
Stipa leucotricha	Texas wintergrass, speargrass	cool season perennial
Tridens albescens	white tridens	warm season perennial
Tridens flavus	purpletop	warm season perennial
Vulpia octoflora	common sixweekgrass	cool season annual

Cyperaceae

Carex brittoniana	Britton sedge	cool season perennial
Carex microdonta	littletooth sedge	cool season perennial
Carex mulenbergia var. enermis	Muhlenberg sedge	cool season perennial
Carex perdentata		cool season perennial
Carex planostachys	cedar sedge	cool season perennial
Cyperus retroflexus	oneflower flatsedge	cool season perennial
Cyperus rotundus*	nutgrass	cool season perennial

Areaceae

Sabal minor	dwarf palmetto	shrub, warm season perennial
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Bromeliaceae

Tillandsia recurvata	ballmoss	epiphyte, warm season perennial
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Commeliniaceae

Tradescantia humilis	Texas spiderwort	herb, cool season perennial
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Liliaceae

Allium canadense	Canada wild onion	herb, cool season perennial
Allium drummondii	Drummond onion	herb, cool season perennial
Smilax bona-nox	saw greenbrier	vine, cool season perennial
Yucca rupicola	Texas yucca	shrub, cool season perennial
Yucca constricta?	Buckley yucca	shrub, warm season perennial
Yucca sp.		

Amaryllidaceae

Cooperia pedunculata	giant rain lily	herb, cool season perennial
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Iridaceae

Nemastylis geminiflora
 Sisyrinchium minus
 Sisyrinchium pruinatum
 Sisyrinchium ensigerum

Iris Family

prairie pleatleaf
 least blue-eye grass
 dotted blue-eye grass
 swordleaf blue-eye grass

Habit

herb, cool season perennial
 herb, cool season perennial
 herb, cool season perennial
 herb, cool season perennial

Fagaceae

Quercus buckleyi
 Quercus durandii var. breviloba
 Quercus virginiana

Beech Family

Texas oak
 shin oak
 live oak

Habit

tree, cool season perennial
 tree, cool season perennial
 tree, cool season perennial

Ulmaceae

Celtis laevigata
 Ulmus crassifolia

Elm Family

sugar hackberry
 cedar elm

Habit

tree, cool season perennial
 tree, cool season perennial

Urticaceae

Parietaria pensylvanica
 Urtica chamaedryoides

Nettle Family

rock pellitory
 heart-leaf nettle

Habit

herb, warm season annual
 herb, cool season annual

Polygonaceae

Rumex crispus*
 Rumex pulcher*

Knotweed Family

curly dock
 fiddle dock

Habit

herb, warm season perennial
 herb, cool season perennial

Viscaceae

Phoradendron tomentosum

Mistletoe Family

mistletoe

Habit

epiphytic, parasitic, cool season shrub

Phytolaccaceae

Rivina humilis

Pokeweed Family

pigeonberry, bloodberry

Habit

herb, warm season perennial

Caryophyllaceae

Arenaria benthamii
 Cerastium glomeratum*
 Stellaria media*

Pink Family

hilly sandwort
 cluster chickweed
 chickweed starwort

Habit

herb, cool season annual
 herb, cool season annual
 herb, cool season annual

Ranunculaceae

Clematis drummondii
 Ranunculus macranthus

Buttercup Family

Texas virgin's bower
 old man's beard
 showy buttercup

Habit

subshrub, warm season perennial
 herb, cool season perennial

Berberidaceae

Mahonia trifoliata
Nandina domestica*

Papaveraceae

Argemone albiflora
Argemone aurantiaca

Fumariaceae

Corydalis micrantha var. australis

Brassicaceae

Draba cuneifolia
Lepidium austrinum DE 3148
Lepidium virginicum
Lesquerella gracilis
Lesquerella recurvata
Rapistrum rugosum*

Rosaceae

Geum canadense
Prunus mexicana
Pyracantha sp.*
Rubus trivialis

Fabaceae

Astragalus nuttallianus
Cercis canadensis
Lupinus texensis
Eyesenhardtia texana
Indigofera miniata
Lathyrus pusillus
Medicago lupulina*
Medicago minima*
Medicago polymorpha var. vulgaris
Melilotus albus*
Melilotus indicus*
Melilotus officinalis*
Mimosa borealis
Parkinsonia aculeata

Pediomelum rhombifolium

Barberry Family

agarito
heavenly bamboo

Poppy Family

white pricklepoppy
pricklepoppy

Fumitory Family

southern corydalis

Mustard Family

wedgeleaf draba
southern pepperweed
Virginia pepperweed
white bladderpod
slender bladderpod
yellow rocket

Rose Family

white avens
Mexican plum
firethorn sp.
southern dewberry

Legume Family

redbud
Texas bluebonnet
Texas kidneywood
western indigo
low pea vine
black medic
least burclover
common burclover
white sweetclover
annual yellow sweetclover
yellow sweetclover
fragrant mimosa
retama

roundleaf scurfpea

Habit

shrub, cool season perennial
warm, cool season perennial

Habit

herb, cool season annual
herb, cool season annual

Habit

herb, cool season annual

Habit

herb, cool season annual
herb, cool season annual
herb, cool season annual
herb, cool season annual
herb, cool season annual
herb, cool season annual

Habit

herb, cool season perennial
small tree, cool season perennial
shrub, cool season perennial
vine, cool season perennial

Habit

herb, cool season annual
small tree, cool season perennial
herb, cool season annual
shrub, warm season perennial
herb, cool season perennial
herb, cool season annual
herb, cool season annual
herb, cool season annual
herb, cool season annual
herb, all season annual
herb, cool season annual
herb, all season annual
shrub, warm season perennial
small tree, warm season perennial

herb, cool season perennial

<i>Prosopis glandulosa</i>	honey mesquite	tree, warm season perennial
<i>Rhynchosia minima</i>	least snoutbean	vine, warm season perennial
<i>Rhynchosia senna</i> var. <i>texana</i>	Texas snoutbean	herb, warm season perennial
<i>Schrankia roemeriana</i>	Roemer sensitivebriar	vine, warm season perennial
<i>Senna lindheimeriana</i>	Lindheimer senna	herb, warm season perennial
<i>Sesbania drummondii</i>	Drummond rattlebush	shrub, warm season perennial
<i>Vicia leavenworthii</i>	Leavenworth vetch	vine, cool season annual
<i>Vicia sativa</i> var. <i>nigra</i> *	narrow leaved vetch	herb, cool season annual

Geraniaceae

Geranium Family

Habit

<i>Erodium cicutarium</i>	alfalaria, stork's bill	herb, cool season annual
<i>Erodium texanum</i>	Texas filaree, heron bill	herb, warm season perennial
<i>Geranium carolinianum</i>	Carolina geranium	herb, cool season annual
<i>Geranium texanum</i>	Texas geranium	herb, cool season annual

Oxalidaceae

Wood-Sorrel Family

Habit

<i>Oxalis dillennii</i>	yellow sour-clover	herb, warm season perennial
<i>Oxalis drummondii</i>	Dillen's wood-sorrell Drummond wood-sorrell	herb, warm season perennial

Linaceae

Flax Family

Habit

<i>Linum hudsonoides</i>	Hudson flax	herb, all season annual
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Rutaceae

Citrus Family

Habit

<i>Ptelea trifoliata</i>	skunkbush, hoptree	small tree, cool season perennial
<i>Zanthoxylum hirsutum</i>	toothache tree	small tree, cool season perennial

Simaroubaceae

Quassia Family

Habit

<i>Ailanthus altissima</i> *	tree of heaven	small tree, cool season perennial
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Meliaceae

Mahogany Family

Habit

<i>Melia azedarach</i> *	Chinaberry	tree, cool season perennial
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Euphorbiaceae

Spurge Family

Habit

<i>Acalypha lindheimeri</i>	Lindheimer three-seeded mercury	herb, warm season perennial
<i>Argythamnia humilis</i> var. <i>humilis</i>	low wild mercury	herb, warm season perennial
<i>Argythamnia simulans</i>	plateau wild-mercury	herb, cool season perennial
<i>Croton fruticosus</i>	bush croton	shrub, warm season perennial
<i>Croton monanthogynous</i>	oneseed croton	herb, warm season annual
<i>Euphorbia dentata</i>	toothed spurge	herb, warm season annual
<i>Euphorbia marginata</i>	snow-on-the-mountain	herb, warm season annual

Euphorbia nutans	eyebane	herb, warm season annual
Euphorbia serpens	mat euphorbia	herb, warm season annual
Euphorbia spathulata	warty euphorbia	herb, cool season annual
Phyllanthus polygonoides	knotweed	subshrub, cool season perennial
Tragia brevispica	shortspike noseburn	vine, all season perennial
Tragia ramosa	catnip noseburn	herb, warm season perennial

Anacardiaceae

Sumac Family

Habit

Rhus aromatica	fragrant sumac	shrub, cool season perennial
Rhus lanceolata	prairie sumac	shrub, warm season perennial
Toxicodendron radicans	poison ivy	vine, cool season perennial

Aquifoliaceae

Holly Family

Habit

Ilex decidua	possum-haw	shrub, cool season perennial
Ilex vomitoria	yaupon	shrub, cool season perennial

Aceraceae

Maple Family

Habit

Acer negundo	box elder	tree, cool season perennial
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Sapindaceae

Soapberry Family

Habit

Sapindus saponaria	western soapberry	tree, cool season perennial
Ungradia speciosa	Mexican buckeye	shrub, cool season perennial

Vitaceae

Grape Family

Habit

Ampelopsis arborea	peppervine	vine, warm season perennial
Cissus incisa	ivy treebine, cow itch	vine, warm season perennial
Parthenocissus quinquefolia	Virginia creeper	vine, warm season perennial
Vitis berlandieri	winter grape	vine, cool season perennial
Vitis mustangensis	mustang grape	vine, cool season perennial

Malvaceae

Texas Indian mallow, pelotazo
 velvetleaf mallow
 finger poppymallow
 Drummond wax-mallow
 Turk's cap
 Carolina modiola
 spreading sida

herb, warm season perennial
 herb, warm season perennial
 herb, cool season perennial
 subshrub, all season perennial
 herb, cool season annual
 herb, warm season perennial

Abutilon fruticosum
 Allowissadula holosericea
 Callirhoe digitata DE 3145
 Malvaviscus arboreus
 Modiola caroliniana
 Sida abutifolia

Cactaceae

Opuntia leptocaulis
Opuntia lindheimeri

Cactus Family

pencil cactus
 Texas prickly pear

Habit

shrub, warm season perennial
 shrub, cool season perennial

Onagraceae

Gaura brachycarpa
Oenothera laciniata
Oenothera speciosa
Oenothera triloba

Evening Primrose Family

plains gaura
 downy evening primrose
 pink evening primrose
 stemless evening primrose

Habit

herb, cool season annual
 herb, cool season perennial
 herb, warm season perennial
 herb, cool season perennial

Apiaceae

Chaerophyllum tainturei
*Ciclospermum leptophyllum**
Polytaenia texana
Sanicula canadensis
*Scandix pecten-veneris**
*Torilis arvensis**

Carrot Family

chervil
 slimlobe celery
 Texas parsley
 Canada sanicle
 Venus' comb
 hedge parsley

Habit

herb, cool season annual
 herb, cool season annual
 herb, cool season perennial
 herb, cool season perennial
 herb, cool season annual
 herb, cool season annual

Cornaceae

Garrya ovata ssp. *lindheimeri*

Dogwood Family

Lindheimer's silk-tassel

Habit

small tree, cool season perennial

Sapotaceae

Bumelia lanuginosa

Sapodilla Family

gum bumelia, coma

Habit

small tree, warm season perennial

Ebenaceae

Diospyros texana

Ebony Family

Texas persimmon

Habit

shrub, cool season perennial

Oleaceae

Foresteria pubescens
*Ligustrum japonicum**
*Ligustrum sinense**
Fraxinus texensis
Fraxinus velutina

Olive Family

elbow-bush
 Japanese privet
 Chinese privet
 Texas ash
 Arizona ash, velvet ash

Habit

shrub, cool season perennial
 small tree, warm season perennial
 shrub, warm season perennial
 tree, cool season perennial
 tree, cool season perennial

Apocyanaceae

*Vinca major**

Dogbane Family

large periwinkle

Habit

herb, cool season perennial

Asclepiadaceae

Asclepias asperula
 Asclepias oenotherioides
 Matelea biflora
 Matelea reticulata

Milkweed Family

antelope-horn
 hierba de zizotes
 two-flower milkvine
 pearl milkvine

Habit

herb, all season perennial
 herb, warm season perennial
 vine, all season perennial
 vine, warm season perennial

Convolvulaceae

Convolvulus equitans
 Dichondra carolinensis

Morning-Glory Family

gray bindweed
 grass ponyfoot

Habit

vine, warm season perennial
 herb, warm season perennial

Polemoniaceae

Gilia incisa

Phlox Family

splitleaf gilia

Habit

herb, warm season annual

Hydrophyllaceae

Nemophila phacelioides

Waterleaf Family

large-flower baby blue-eyes

Habit

herb, cool season annual

Boraginaceae

Heliotropium tenellum

Borage Family

pasture heliotrope

Habit

herb, warm season annual

Verbenaceae

Callicarpa americana
 Lantana camara*
 Verbena canescens
 Verbena bipinnatifida
 Verbena brasiliensis*
 Verbena officinale ssp. halei
 Verbena xutha

Vervain Family

American beautyberry
 West Indian lantana
 gray vervain
 Dakota vervain
 Brazilian vervain
 slender vervain
 coarse vervain

Habit

shrub, warm season perennial
 shrub, warm season perennial
 herb, warm season perennial
 herb, warm season annual
 herb, warm season annual
 herb, warm season perennial
 herb, warm season annual

Lamiaceae (Labiatae)

Lamium amplexicaule*
 Hedeoma acinioides
 Hedeoma drummondii
 Marrubium vulgare*
 Monarda citriodora
 Salvia coccinea
 Salvia farinacea
 Salvia roemeriana
 Salvia texana DE 3149
 Scutellaria drummondii
 Scutellaria ovata
 Stachys crenata

Mint Family

henbit deadnettle
 slender mock pennyroyal
 Drummond mock pennyroyal
 common horehound
 lemon horsemint
 tropical sage
 mealycup sage
 cedar sage
 Texas sage
 Drummond skullcap
 tuber skullcap
 shade betony

Habit

herb, cool season annual
 herb, cool season annual
 herb, warm season perennial
 herb, warm season perennial
 herb, warm season annual
 herb, warm season perennial
 herb, warm season perennial
 herb, warm season perennial
 herb, cool season perennial
 herb, cool season perennial
 herb, warm season perennial
 herb, cool season annual

Solanaceae

Bouchetia erecta
 Chamaesaracha edwardsiana
 Physalis cinerascens
 Solanum dimidiatum
 Solanum elaeagnifolium
 Solanum rostratum.

Potato Family

erect bouchetia
 Edwards false nightshade
 beach groundcherry
 western horse nettle
 silverleaf nightshade
 buffalobur

Habit

herb, all season perennial
 herb, all season perennial
 herb, warm season perennial
 herb, warm season perennial
 herb, warm season perennial
 herb, warm season annual

Scrophulariaceae

Agalinis heteophylla
 Veronica arvensis*

Snapdragon Family

prairie gerardia
 common speedwell

Habit

herb, warm season annual
 herb, cool season annual

Acanthaceae

Ruellia davisorum
 Ruellia nudiflora

Acanthus Family

Drummond ruellia
 violet ruellia

Habit

herb, warm season perennial
 herb, warm season perennial

Plantaginaceae

Plantago rhodosperma

Plantain Family

redseed plantain

Habit

herb, cool season annual

Rubiaceae

Galium aparine
 Galium texense
 Galium virgatum
 Hedyotis nigricans
 Sherardia arvensis*

Madder Family

catchweed bedstraw
 Texas bedstraw
 southwest bedstraw
 bluet
 spurwort

Habit

herb, cool season annual
 herb, cool season perennial
 herb, cool season annual
 herb, warm season perennial
 herb, cool season annual

Caprifoliaceae

Lonicera japonica*
 Viburnum rufidulum

Honeysuckle Family

Japanese honeysuckle
 downy viburnum, rusty blackhaw

Habit

vine, cool season perennial
 shrub, cool season perennial

Valerianaceae

Valerianella radiata

Valerian Family

beaked cornsalad

Habit

herb, cool season annual

Campanulaceae

Triodanis perfoliata var. biflora DE 3147

Bellflower Family

Venus looking-glass

Habit

herb, cool season annual

Asteraceae**Sunflower Family****Habit**

<i>Achillea millefolium</i>	western yarrow	herb, cool season perennial
<i>Ambrosia cumanensis</i>	western ragweed	herb, warm season perennial
<i>Ambrosia trifida</i>	giant ragweed	herb, warm season annual
<i>Aster drummondii</i> ssp. <i>texanus</i>	Texas aster	herb, warm season perennial
<i>Aster subulatus</i>	hierrba del marrano	herb, warm season annual
<i>Baccharis neglecta</i>	Roosevelt weed	shrub, warm season perennial
<i>Calyptocarpus vialis</i>	prostrate lawnflower	herb, warm season annual
<i>Centaurea melitensis</i> *	Malta starthistle	herb, all season annual
<i>Cirsium texanum</i>	southern thistle	herb, warm season perennial
<i>Engelmannia pinnatifida</i>	Engelmann daisy	herb, cool season perennial
<i>Evax prolifera</i>	bighead rabbit-tobacco	herb, cool season annual
<i>Evax verna</i>	manystem rabbit-tobacco	herb, cool season annual
<i>Eupatorium havanense</i>	shrubby boneset	subshrub, warm season perennial
<i>Gaillardia pulchella</i>	Indian blanket, firewheel	herb, warm season annual
<i>Gamochaeta pensilvanica</i>	Pennsylvania cudweed	herb, all season annual
<i>Gutierrezia texana</i>	Texas broomweed	herb, warm season annual
<i>Helianthus annuus</i>	common sunflower	herb, warm season annual
<i>Hymenopappus scabiosaeus</i>	flattopp woollywhite	herb, all season biennial
<i>Iva annua</i>	sumpweed	herb, warm season perennial
<i>Krigia cespitosa</i>	weedy dwarf dandelion	herb, cool season annual
<i>Lindheimera texana</i>	Texas star	herb, cool season annual
<i>Melampodium leucanthum</i>	plains blackfoot daisy	herb, warm season perennial
<i>Parthenium hysterophorus</i>	ragweed parthenium	herb, warm season perennial
<i>Pinaropappus roseus</i>	white rock lettuce	herb, all season perennial
<i>Pyrrhopappus multicaulis</i>	manystem false dandelion	herb, cool season annual
<i>Ratibida columnifera</i>	upright prairie coneflower	herb, warm season perennial
<i>Senecio tampicanus</i>	Tampico groundsel	herb, cool season annual
<i>Solidago canadensis</i>	common goldenrod	herb, warm season perennial
<i>Sonchus asper</i>	prickly sowthistle	herb, all season annual
<i>Taraxacum officinale</i>	common dandelion	herb, all season perennial
<i>Tetragonotheca texana</i> DE 3146	plateau nerve-ray	herb, warm season perennial
<i>Tetraneuris scaposa</i>	slenderstem bitterweed	herb, all season perennial
<i>Verbesina virginica</i>	frostweed	herb, warm season perennial
<i>Viguera dentata</i>	sunflower golden-eye	subshrub, warm season perennial
<i>Wedelia hispida</i>	orange zexmenia	subshrub, warm season perennial
<i>Xanthium strumarium</i>	spiny cocklebur	herb, warm season annual

An * terminating a scientific name indicates the species is introduced to the Austin area.
DE and a number following the scientific name indicate a specimen on file at DE.

3.5 South Hills Conservation Area

3.5.1 Physical Characteristics

The South Hills Conservation Area (Figure 6) is 42.81 acres in extent. The terrain is hilly. Highest elevations are about 740 feet on hilltops located on the east and south of the site. Slope is generally to the west and sometimes precipitous. Fault lines cross the site, including the Balcones Fault, trending mainly north-south, but also east-west. The lowest elevation is about 670 feet along the west site boundary constituted by the Dry Branch of Williamson Creek. Creek flow is ephemeral with drainages entering the site from both the south and west and having a confluence in the northwest corner of the site. The Dry Branch of Williamson Creek flows north to an intersection with the main branch of Williamson Creek near the northwest corner of the site.

The usual sequence of geologic units in Sunset Valley according to Garner and Young is, from top to bottom, sand and gravel alluvium, Buda limestone, Del Rio clay, Georgetown limestone and Edwards limestone. Down-faulting within the confines of what is now the South Hills Conservation Area has produced, at least for the author of this text, a very complex geologic substrate. According to Garner and Young the following substrates are exposed from top to bottom at the site; Buda limestone, Del Rio clay, Georgetown limestone and Edwards limestone.

Starting with the oldest bottom formation, Edwards limestone is supposedly exposed in the water line/creek channel along the southwest site boundary. The darker colored, nodular Georgetown limestone was identified on side slopes adjacent to this creek channel with exemplary outcrops noted along west-facing slopes above the east bend in the channel. The hills on the site above the Georgetown limestone were comprised of Del Rio clay with a Buda limestone cap. An excellent example of the high gypsum content of the upper portions of Del Rio clay was noted on eroded, sparsely vegetated slopes southwest of the trail circle in the south corner of the site. The Del Rio clay and Buda limestone contain abundant pelecypods (clams), and these were conspicuous component of colluvial deposits at the bottom of slopes.

Soil map units at the site identified by SCS include Mixed Alluvial Land, Tarrant soils rolling and Ferris-Heiden complex. Mixed Alluvial Land and Tarrant soils. The Ferris-Heiden complex soils are mapped as occurring on slopes and flats along the east site boundary. Ferris soils are light olive-gray clay at the surface becoming mottled yellow with increasing depth. Heiden soils are grayish brown clay also mottled yellow with increasing depth. Ferris-Heiden soils are highly susceptible to erosion

3.5.2 Man-Made Features

A waste-water line was constructed in the Dry Branch creek bottom on the west boundary of the site. DE was informed by Helen Besse that an old home site with a root cellar and partial foundation are located behind her former residence on Oakdale. Several trails have apparently been developed by adjacent property owners, and some property owners have cleared areas adjacent to their yards, encroaching on the conservation area.

3.5.3 Disturbance Features

Apart from the wastewater line, the only major disturbance feature noted on the site involved extensive dumping of concrete on the plateau west of Dublin Drive. In addition to concrete, various other materials removed from adjacent construction sites may have been dumped including native limestone rock excavated from nearby construction sites. The depth to which fill materials are deposited on the site, being beyond the scope of this report, was not ascertained by DE. Vegetatively considered, the area covered with fill material is a mess, with various bur clovers (*Medicago* spp.) and other cool season annual species, many of which are non-native, as the dominant plant species in terms of basal cover. Even a variety of domesticated onions were common on the area, probably escapees persisting in the wild from plantings at the old home site.

3.5.4 Management Recommendations

Removal of the concrete fill on the plateau and side slopes in the area northwest of the terminus of Dublin Drive would increase the aesthetic appeal of this area. The dumped native limestone, however, is rather attractive and could provide a diversion for amateur rockhounds like the author of this report.

Because of the extreme erosion hazard associated with soils developed over Del Rio clay, for example, Tarrant soils and especially Ferris-Heiden complex soils, removal of woody vegetation on the site should be limited to flats, and associated with the experimental planting of mid-grasses and tall grasses identified by SCS as appropriate for the site. The plateau west of Dublin Drive is an example of such an area. Presently, some steep slopes are eroded to the parent material, typically Del Rio clay. The experimental plugging of hardy bunch grasses like purple three-awn and side-oats grama on the margins of these areas might provide evidence that these slopes can be stabilized.

Extant pedestrian trails, at least those flagged at the time of the DE site visits, seemed to provide access only to plateau tops and juniper-dominated slopes. This subset of the trails extant on the

site, does not provide adequate coverage of interesting geological features contained within the site, for example, the Georgetown limestone outcrops along the Dry Fork Branch of Williamson Creek. On the other hand, the flagged trails are screened from adjacent neighborhoods and generally avoid areas of eroded slopes where unflagged trails are developed, especially in the southern third of the site. If formal trails are to be developed on slopes and other areas not presently designated by flagging, then it is strongly recommended that trail design employ switchbacks and other mechanisms designed to ordinate trails parallel to, rather than in vertical positions to slopes.

3.5.5 South Hills Conservation Area - Potential Climax Plant Species Identified by NRCS

Ferris-Heiden soils are placed in the Gullied Blackland range site by SCS. SCS opines that these sites were originally true tallgrass prairie dominated by big bluestem and Indiangrass. Other important decreaser grass species for Ferris-Heiden sites are little bluestem, switchgrass (*Panicum virgatum*) and Virginia wildrye (*Elymus virginicus*). Of these, only Virginia wildrye was identified during field investigations along the east site boundary. Tarrant soils rolling and Mixed Alluvial Land, the two other soil map units identified as occurring on the site by SCS, are included within the Rocky Upland and the Bottomland range sites. Decreasers species are listed in Table 8 below. Of the species listed, only big bluestem (*Andropogon gerardii*), Indiangrass (*Sorghastrum nutans*) and eastern gammagrass (*Tripsacum dactyloides*) were not found during field surveys.

Table 8
Decreasers Plant Species of the Rocky Upland and Bottomland Range Sites

Rocky Upland

Trees

Common Name	Scientific Name
live oak	<i>Quercus virginiana</i>

Grasses

big bluestem	<i>Andropogon gerardii</i>
Canada wildrye	<i>Elymus canadensis</i>
green spangletop	<i>Leptochloa dubia</i>
little bluestem	<i>Schizachyrium scoparium</i>
Indiangrass	<i>Sorghastrum nutans</i>

Bottomland

Trees

Common Name	Scientific Name
cedar elm	<i>Ulmus crassifolia</i>
live oak	<i>Quercus virginiana</i>
sugar hackberry	<i>Celtis laevigata</i>
pecan	<i>Carya illinoensis</i>

Grasses

little bluestem	<i>Schizachryium scoparium</i>
Indiangrass	<i>Sorghastrum nutans</i>
Virginia wildrye	<i>Elymus virginicus</i>
big bluestem	<i>Andropogon gerardii</i>
eastern gammagrass	<i>Tripsacum dactyloides</i>
switchgrass	<i>Panicum virgatum</i>

3.5.6 The South Hills Conservation Area Plant Community as Characterized by the Texas Natural Heritage Program

The extant plant community at the South Hills Conservation Area corresponds most closely to the Ashe juniper-oak community of TNHP. This description is as follows:

Ashe Juniper-Oak Series (G4S4) (*Juniperus ashei*-*Quercus* spp.) This evergreen shrubland or woodland primarily inhabits shallow-soiled, sloping sites over limestone in the Edwards Plateau. Disturbed areas over deeper soils on flat uplands may also support this community. It circumscribes a fairly wide degree of variation, and on dry sites may form an open shrubland with midgrasses and xeromorphic shrubs or may form closed canopy woodlands or low forest on more favorable sites. Texas, scalybark, scrub, and plateau live oaks (*Quercus buckleyi*, *Q. sinuata* var. *breviloba*, *Q. pungens*, and *Q. fusiformis*) along with evergreen sumac (*Rhus virens*) and agarito (*Berberis trifoliolata*) are components. To the west and north this type may grade into the redberry (Pinchot) juniper (*Juniperus pinchotii*)-midgrass series. This community type forms landscape mosaics with plateau live oak woodland and grasslands on uplands and deciduous oak woodlands on adjacent mesic slopes.

However, and information provided by SCS seems to lend itself to this conclusion, the site may have, in its pre-settlement condition, had substantially fewer trees and more grasses.

3.5.7 Observed Vegetation Structure, Dominant and Interesting Plant Species

The site is predominantly wooded with Ashe juniper as the dominant species of both the mid-story and canopy. Many of the Ashe junipers on the site exceed 12 inches dbh and these large trees form an important canopy component. The second most commonly encountered tree on the site was cedar elm, which to some degree replaces Ashe juniper on flats. Like Ashe juniper, cedar elm was represented in the mid-story by numerous young saplings. Only on the plateau tops along the eastern site boundary were these species replaced to some extent by other tree and shrub species. In these areas, live oak, small sugar hackberry, Texas persimmon and pencil cactus (*Opuntia leptocaulis*) were much more common, relative to the site dominants, than on slopes and creek terraces. Other common trees noted for the site were Texas oak and shin oak.

Woodland clearings were rather uncommon on the site. However, a few small open areas had native midgrasses including silver bluestem, tall dropseed and side-oats grama as the most visually common species. Along the south fence row boundary little bluestem was also common. Disturbed areas on the northeast corner of the site had a cover of mostly introduced weeds.

A population of Alabama lipfern (*Cheilanthes alabamensis*) was found on west-facing hilltops in the approximate center of the site. Rough lipfern (*Cheilanthes horridula*) may also be present. A spikerush species, (*Eleocharis palustris*), was noted along a shaded trail just east of the Dry Branch of Williamson Creek in the southern third of the site. Apparently sufficient permanent moisture collects, possibly from hillside seepage, to support this rather hydric species. Littletooth sedge (*Carex microdonta*) was a common associate of the spikerush. Several areas of the South Hills appeared to be suitable for shining hexalectris and a mid-summer orchid hunt at the site is planned by DE.

Table 9, Plant Species and their Habits at the South Hills Conservation Area, lists the scientific name, common name(s) and habit of plant species identified at the South Hills Conservation Area. Plant species are grouped by family and listed in phylogenetic order following Hatch et al. (1990). Habit, Column 3, provides information on the primary season in which the species fruits and flowers, whether the species is annual or perennial and the growth form of the species. Warm season refers to species that reproduce sexually during summer and fall. Cool season refers to species that reproduce sexually during late winter and spring. An asterisk (*) following the scientific name of a plant in the tables indicates the plant is an introduced species. DE and a number after a scientific name indicate that a specimen is on file at DE.

Table 9
Plant Species and their Habits at the South Hills Conservation Area

Polypodiaceae	Fern Family	Habit
Cheilanthes alabamensis	Alabama lipfern	warm season perennial
Cupressaceae	Cypress Family	Habit
Juniperus ashei	Ashe juniper	tree, warm season perennial
Poaceae	Grass Family	Habit
Aristida purpurea var. purpurea	purple threeawn	warm season perennial
Aristida purpurea var. wrightii	Wright threeawn	warm season perennial
Bothriochloa ischaemum*	King Ranch bluestem	warm season perennial
Bothriochloa laguroides	silver bluestem	warm season perennial
Bouteloua curtipendula	side-oats grama	warm season perennial
Bouteloua rigidisetia	Texas grama	warm season perennial
Bromus japonicus*	Japanese brome	cool season annual
Bromus uniloides*	rescuegrass	cool season annual
Buchloe dactyloides	buffalograss	warm season perennial
Chloris verticillata	tumble windmillgrass	warm season perennial
Cynodon dactylon*	bermudagrass	warm season perennial
Dichanthelium oligosanthes	Scribner panicgrass	cool season perennial
Elymus virginicus	Virginia wildrye	cool season perennial
Eragrostis intermedia	plains lovegrass	warm season perennial
Hilaria belangeri	curly mesquite	warm season perennial
Hordeum pusillum	little barley	cool season annual
Limnodea arkanasana	ozarkgrass	cool season annual
Lolium perenne	perennial ryegrass	cool season perennial
Leptochloa dubia	green spangletop	warm season perennial
Panicum hallii	Hall panicum	warm season perennial
Panicum virgatum	switchgrass	warm season perennial
Paspalum dilatatum*	Dallisgrass	warm season perennial
Poa annua	annual bluegrass	cool season annual
Schizachryium scoparium	little bluestem	warm season perennial
Setaria geniculata	knot-root bristlegrass	warm season perennial
Setaria scheelei	southwestern bristlegrass	warm season perennial
Sorghum halapense*	Johnsongrass	warm season perennial
Sporobolous asper	tall dropseed	warm season perennial
Sporobolous vaginiflorus	poverty dropseed	warm season annual
Stipa leucotricha	Texas wintergrass, speargrass	cool season perennial
Tridens albescens	white tridens	warm season perennial
Tridens flavus	purpletop	warm season perennial
Vulpia octoflora	common sixweekgrass	cool season annual

Cyperaceae

Carex brittoniana
 Carex bulbostylis, C. amphibola
 Carex microdonta
 Carex muhlenbergia var. enermis
 Carex perdentata
 Carex planostachys
 Cyperus retroflexus
 Cyperus rotundus*
 Eleocharis montevidensis
 Eleocharis palustris

Bromeliaceae

Tillandsia recurvata

Commelinaceae

Tradescantia humilis

Liliaceae

Allium canadense
 Allium drummondii
 Allium sp.
 Camassia scilloides
 Smilax bona-nox
 Yucca rupicola

Iridaceae

Sisyrinchium pruinosum
 Nemastylis geminiflora

Salicaceae

Populus deltoides
 Salix nigra

Fagaceae

Quercus buckleyi
 Quercus durandii var. breviloba
 Quercus virginiana

Sedge Family

Britton's sedge
 globose sedge
 little-tooth sedge
 Muhlenberg sedge

 cedar sedge
 oneflower flatsedge
 nutgrass
 sand spikerush
 largespike spikerush

Pineapple Family

ballmoss

Spiderwort Family

Texas spiderwort

Lily Family

Canada onion
 Drummond onion
 cultivar
 wild hyacinth
 saw greenbrier
 Texas yucca

Iris Family

dotted blue-eye grass
 prairie pleatleaf

Willow Family

eastern cottonwood
 black willow

Beech Family

Texas oak
 shin oak
 live oak

Habit

cool season perennial
 cool season perennial
 cool season perennial
 cool season perennial
 cool season perennial
 cool season perennial
 cool season perennial
 cool season perennial
 cool season perennial
 cool season perennial
 all season perennial

Habit

epiphyte, warm season perennial

Habit

herb, cool season perennial

Habit

herb, cool season perennial
 herb, cool season perennial
 herb, cool season perennial
 vine, cool season perennial
 shrub, cool season perennial

Habit

herb, cool season perennial
 herb, cool season perennial

Habit

tree, cool season perennial
 tree, cool season perennial

Habit

tree, cool season perennial
 tree, cool season perennial
 tree, cool season perennial

Ulmaceae	Elm Family	Habit
Celtis laevigata	sugar hackberry	tree, cool season perennial
Ulmus crassifolia	cedar elm	tree, cool season perennial
Moraceae	Mulberry Family	Habit
Morus rubra	red mulberry	tree, cool season perennial
Urticaceae	Nettle Family	Habit
Parietaria pensylvanica	rock pellitory	herb, warm season annual
Urtica chamaedryoides DE 3079	heart-leaf nettle	herb, cool season annual
Polygonaceae	Knotweed Family	Habit
Rumex crispus*	curly dock	herb, warm season perennial
Rumex pulcher*	fiddle dock	herb, cool season perennial
Viscaceae	Mistletoe Family	Habit
Phoradendron tomentosum	mistletoe	epiphytic, parasitic, cool season shrub
Nyctaginaceae	Four O'clock Family	Habit
Mirabilis jalapa*	common four o'clock	subshrub, warm season perennial
Phytolaccaceae	Pokeweed Family	Habit
Rivina humilis	pigeonberry, bloodberry	herb, warm season perennial
Caryophyllaceae	Pink Family	Habit
Arenaria benthamii	hilly sandwort	herb, cool season annual
Stellaria media*	chickweed starwort	herb, cool season annual
Ranunculaceae	Buttercup Family	Habit
Anemone berlandieri	tenpetal anemone	herb, cool season perennial
Clematis drummondii	Texas virgin's bower	subshrub, warm season perennial
Ranunculus macranthus	old man's beard	herb, cool season perennial
Ranunculus muricatus*	showy buttercup	herb, cool season annual
	roughseed buttercup	
Berberidaceae	Barberry Family	Habit
Mahonia trifoliata	agarito	shrub, cool season perennial
Nandina domestica*	heavenly bamboo	warm, cool season perennial

Papaveraceae

Argemone aurantiaca
Papaver somniferum*

Poppy Family

pricklepoppy
opium poppy

Habit

herb, cool season annual
herb, cool season annual

Fumariaceae

Corydalis micrantha var. australis

Fumitory Family

southern corydalis

Habit

herb, cool season annual

Brassicaceae

Draba platycarpa
Lepidium austrinum DE 3112
Lepidium virginicum
Lesquerella recurvata
Rapistrum rugosum*

Mustard Family

broadpod draba
southern pepperweed
Virginia pepperweed
yellow rocket

Habit

herb, cool season annual
herb, cool season annual
herb, cool season annual
herb, cool season annual

Rosaceae

Geum canadense
Rubus trivialis

Rose Family

white avens
southern dewberry

Habit

herb, cool season perennial
vine, cool season perennial

Fabaceae

Astragalus crassicaarpus
Astragalus nuttallianus
Cercis canadensis
Desmodium paniulatum
Lupinus texensis
Medicago lupulina*
Medicago minima
Medicago polymorpha var. vulgaris
Mimosa borealis
Parkinsonia aculeata*
Prosopis glandulosa
Rhynchosia minima
Rhynchosia senna var. texana
Schranksia roemeriana
Senna linheimeriana
Vicia leavenworthii
Vicia sativa var. nigra

Legume Family

ground plum
Nuttall's astragalus
redbud
panicked tickclover
Texas bluebonnet
black medic
least burclover
common burclover
fragrant mimosa
retama
honey mesquite
least snoutbean
Texas snoutbean

Habit

herb, cool season perennial
herb, cool season annual
small tree, cool season perennial
herb, warm season perennial
herb, cool season annual
herb, cool season annual
herb, cool season annual
herb, cool season annual
shrub, warm season perennial
shrub, warm season perennial
tree, warm season perennial
vine, warm season perennial
herb, warm season perennial

Lindheimer senna
Leavenworth vetch
narrow leaved vetch

herb, warm season perennial
vine, cool season annual
herb, cool season perennial

Geraniaceae

Erodium circuitarium
Erodium texanum
Geranium carolinianum

Geranium Family

alfilaria, stork's bill
Texas filaree, heron bill
Carolina geranium

Habit

herb, cool season annual
herb, warm season perennial
herb, cool season annual

Oxalidaceae	Wood-Sorrel Family	Habit
<i>Oxalis dillennii</i>	yellow sour-clover	herb, warm season perennial
<i>Oxalis drummondii</i>	Dillen's wood-sorrell Drummond wood-sorrell	herb, warm season perennial
Rutaceae	Citrus Family	Habit
<i>Ptelea trifoliata</i>	skunkbush, hoptree	small tree, cool season perennial
Simaroubaceae	Quassia Family	Habit
<i>Ailanthus altissima*</i>	tree of heaven	small tree, cool season perennial
Meliaceae	Mahogany Family	Habit
<i>Melia azedarach*</i>	Chinaberry	tree, cool season perennial
Euphorbiaceae	Spurge Family	Habit
<i>Acalypha lindheimeri</i>	Lindheimer three-seeded mercury	herb, warm season perennial
<i>Argythamnia humilis</i> var. <i>humilis</i>	low wild mercury	herb, warm season perennial
<i>Argythamnia simulans</i>	plateau wild mercury	herb, warm season perennial
<i>Croton fruticosus</i>	bush croton	shrub, warm season perennial
<i>Croton monanthogynous</i>	oneseed croton	herb, warm season annual
<i>Euphorbia dentata</i>	toothed spurge	herb, warm season annual
<i>Euphorbia marginata</i>	snow-on-the-mountain	herb, warm season annual
<i>Euphorbia maculata</i>	spotted spurge	herb, warm season annual
<i>Euphorbia nutans</i>	eyebane	herb, warm season annual
<i>Euphorbia serpens</i>	mat spurge	herb, warm season annual
<i>Euphorbia spathulata</i>	warty spurge	herb, cool season annual
<i>Phyllanthus polygonoides</i>	knotweed leaf flower	very small shrub, warm season perennial
<i>Stillangia texana</i>	Texas queen's delight	subshrub, cool season perennial
<i>Tragia brevispica</i>	shortspike noseburn	herbaceous vine, all season perennial
<i>Tragia ramosa</i>	catnip noseburn	herb, warm season perennial
Anacardiaceae	Sumac Family	Habit
<i>Rhus aromatica</i>	fragrant sumac	shrub, cool season perennial
<i>Rhus lanceolata</i>	prairie sumac	shrub, warm season perennial
<i>Toxicodendron radicans</i>	poison ivy	vine, cool season perennial
Aquifoliaceae	Holly Family	Habit
<i>Ilex decidua</i>	possum-haw	shrub, cool season perennial
<i>Ilex vomitoria</i>	yaupon	shrub, cool season perennial

Sapindaceae

Sapindus saponaria
 Ungnadia speciosa

Soapberry Family

western soapberry
 Mexican buckeye

Habit

tree, cool season perennial
 shrub, cool season perennial

Vitaceae

Ampelopsis arborea
 Parthenocissus heptaphylla
 Parthenocissus quinquefolia
 Vitis berlandieri
 Vitis mustangensis

Grape Family

peppervine
 sevenleaf creeper
 Virginia creeper
 winter grape
 mustang grape

Habit

vine, warm season perennial
 vine, warm season perennial
 vine, warm season perennial
 vine, cool season perennial
 vine, cool season perennial

Malvaceae

Abutilon fruticosum
 Allowissadula holosericea
 Malvaviscus arboreus

Mallow Family

Texas Indian mallow, pelotazo
 velvetleaf mallow
 Drummond wax-mallow
 Turk's cap
 Carolina modiola
 spreading sida

Habit

herb, warm season perennial
 herb, warm season perennial
 subshrub, all season perennial

 herb, cool season annual
 herb, warm season perennial

Modiola caroliniana
 Sida abatifolia

Cactaceae

Opuntia leptocaulis
 Opuntia lindheimeri

Cactus Family

pencil cactus
 Texas prickly pear

Habit

shrub, warm season perennial
 shrub, cool season perennial

Onagraceae

Oenothera laciniata
 Oenothera speciosa

Evening Primrose Family

downy evening primrose
 pink evening primrose

Habit

herb, cool season perennial
 herb, warm season perennial

Apiaceae

Chaerophyllum tainturei
 Limnoscium pinnatum
 Polytaenia texana
 Sanicula canadensis
 Torilis arvensis*

Carrot Family

chervil
 Arkansas dogshade
 Texas parsley
 Canada sanicle
 hedge parsley

Habit

herb, cool season annual
 herb, cool season annual
 herb, cool season perennial
 herb, cool season perennial
 herb, cool season annual

Cornaceae

Garrya ovata ssp. lindheimeri

Dogwood Family

Lindheimer's silk-tassel

Habit

small tree, cool season perenial

Sapotaceae

Bumelia lanuginosa

Sapodilla Family

gum bumelia, coma

Habit

small tree, warm season perennial

Ebenaceae	Ebony Family	Habit
Diospyros texana	Texas persimmon	shrub, cool season perennial
Oleaceae	Olive Family	Habit
Foresteria pubescens	elbow-bush	shrub, cool season perennial
Ligustrum japonicum*	Japanese privet	small tree, warm season perennial
Ligustrum sinense*	Chinese privet	shrub, warm season perennial
Fraxinus texensis	Texas ash	tree, cool season perennial
Fraxinus velutina	velvet ash, Texas ash	tree, cool season perennial
Apocyanaceae	Dogbane Family	Habit
Vinca major*	large periwinkle	herb, cool season perennial
Asclepiadaceae	Milkweed Family	Habit
Asclepias asperula	antelope horn	herb, all season perennial
Asclepias oenotherioides	hierba de zizotes	herb, warm season perennial
Matelea reticulata	pearl milkvine	vine, warm season perennial
Convolvulaceae	Morning-Glory Family	Habit
Convolvulus equitans	Texas bindweed	herbaceous vine, warm season perennial
Dichondra carolinensis	grass ponyfoot	herb, warm season annual
Ipomoea trichocarpa	common morningglory	herbaceous vine, warm season perennial
Polemoniaceae	Phlox Family	Habit
Gilia incisa	splitleaf gilia	herb, warm season annual
Hydrophyllaceae	Waterleaf Family	Habit
Nana jamaicense	fiddleleaf nama	herb, all season annual
Nemophila phacelioides	large-flower baby blue-eyes	herb, cool season annual
Phacelia congesta	blue curls	herb, warm season annual
Boraginaceae	Borage Family	Habit
Heliotropium tenellum	pasture heliotrope	herb, warm season annual
Verbenaceae	Vervain Family	Habit
Callicarpa americana	American beautyberry	shrub, warm season perennial
Verbena canescens	gray vervain	herb, warm season perennial
Verbena bipinnatifida	Dakota vervain	herb, warm season annual
Verbena brasiliensis*	Brazilian vervain	herb, warm season annual

Verbena officinale ssp. halei
Verbena xutha

slender vervain
coarse vervain

herb, warm season perennial
herb, warm season annual

Lamiaceae (Labiatae)

Lamium amplexicaule*
Hedeoma acinioides
Hedeoma drummondii
Marrubium vulgare*
Monarda citriodora
Salvia farinacea
Salvia roemeriana
Scutellaria drummondii
Scutellaria ovata

Mint Family

henbit deadnettle
slender mock pennyroyal
Drummond mock pennyroyal
common horehound
lemon horsemint
mealycup sage
cedar sage
Drummond skullcap
tuber skullcap

Habit

herb, cool season annual
herb, cool season annual
herb, warm season perennial
herb, warm season perennial
herb, warm season annual
herb, warm season perennial
herb, warm season perennial
herb, cool season perennial
herb, warm season perennial

Solanaceae

Bouquetia erecta
Solanum dimidiatum
Solanum elaeagnifolium
Solanum rostratum

Potato Family

erect bouquetia
western horse nettle
silverleaf nightshade
buffalobur

Habit

herb, all season perennial
herb, warm season perennial
herb, warm season perennial
herb, warm season annual

Scrophulariaceae

Agalinis heterophylla
Mecardonia vandelliioides
Penstemon cobaea
Veronica arvensis*

Snapdragon Family

prairie gerardia
prostrate mecardonia
Cobaea beardtongue, foxglove
common speedwell

Habit

herb, warm season annual
herb, all season annual
herb, cool season perennial
herb, cool season annual

Acanthaceae

Ruellia davisiorum
Ruellia nudiflora

Acanthus Family

Drummond ruellia
violet ruellia

Habit

herb, warm season perennial
herb, warm season perennial

Plantaginaceae

Plantago rhodosperma

Plantain Family

redseed plantain

Habit

herb, cool season annual

Rubiaceae

Galium aparine
Galium texense
Galium virgatum
Hedyotis nigricans
Sherardia arvensis*

Madder Family

catchweed bedstraw
Texas bedstraw

Habit

herb, cool season annual
herb, cool season perennial
herb, warm season perennial
herb, cool season annual

Caprifoliaceae

Lonicera japonica*
 Viburnum rufidulum

Valerianaceae

Valerianella amarella
 Valerianella radiata

Campanulaceae

Triodanis perfoliata

Asteraceae

Achillea millefolium
 Ambrosia cumanensis
 Ambrosia trifida
 Aster drummondii ssp. texanus
 Aster subulatus
 Baccharis neglecta
 Brickellia cylindracea
 Calyptocarpus vialis
 Centaurea melitensis*
 Cirsium texanum
 Engelmannia pinnatifida
 Eupatorium havanense
 Gaillardia pulchella
 Gutierrezia texana
 Hymenopappus scabiosaeus
 Iva annua
 Melampodium leucanthum
 Parthenium hysterophorus
 Ratibida columnifera
 Pinaropappus roseus
 Pyrrhopappus multicaulis
 Solidago canadensis
 Sonchus asper*
 Taraxacum officinale*
 Tetragonotheca texana
 Tetraneuris scaposa
 Verbesina virginica
 Viguera dentata
 Wedelia hispida

Honeysuckle Family

Japanese honeysuckle
 downy viburnum, rusty blackhaw

Valerain Family

hairy cornsalad
 beaked cornsalad

Bellflower Family

Venus looking-glass

Sunflower Family

western yarrow
 western ragweed
 giant ragweed
 Texas aster
 hierrba del marrano
 Roosevelt weed
 gravelbar bricklebush
 prostrate lawnflower
 Malta star thistle
 southern thistle
 Engelmann daisy
 shrubby boneset
 Indian blanket, firewheel
 Texas broomweed
 flattop woolly-white, old plainsman
 sumpweed
 plains blackfoot daisy
 ragweed parthenium
 upright prairie coneflower
 white rocklettuce
 manystem false dandelion
 common goldenrod
 prickly sowthistle
 common dandelion
 plateau nerve-ray
 slenderstem bitterweed
 frostweed
 sunflower golden-eye
 orange zexmenia

Habit

vine, cool season perennial
 shrub, cool season perennial

Habit

herb, cool season annual
 herb, cool season annual

Habit

herb, cool season annual

Habit

herb, cool season perennial
 herb, warm season perennial
 herb, warm season annual
 herb, warm season perennial
 herb, warm season annual
 shrub, warm season perennial
 herb, warm season perennial
 herb, warm season annual
 herb, warm season annual
 herb, warm season perennial
 herb, cool season perennial
 subshrub, warm season perennial
 herb, warm season annual
 herb, warm season annual
 herb, all season perennial
 herb, warm season perennial
 herb, warm season perennial
 herb, warm season perennial
 herb, warm season perennial
 herb, cool season annual
 herb, warm season perennial
 herb, all season annual
 herb, cool season perennial
 herb, warm season perennial
 herb, all season perennial
 herb, warm season perennial
 subshrub, warm season perennial
 subshrub, warm season perennial

4.0 SUMMARY

The five areas surveyed are representative of two major plant communities, juniper-oak woodland and live oak-savannah. Juniper-oak woodland is the plant community at the Gaines Creekbelt. The plant community of the South Hills Conservation Area is also very similar in structure and composition of dominant species to the juniper-oak community. However, many of the plant species endemic to the Edwards Plateau and associated with Edwards limestone that are present at the Gaines site are missing from the South Hills. The Cougar Creekbelt, the Prairieland Preserve and the Sunset Valley Creekbelt most closely approximate live oak-savannah. However, some areas within these sites, for example the Prairieland Preserve grassland and wooded areas on low alluvial terraces of Williamson Creek do not fit within the community parameters described for live-oak savannah. The Prairieland grassland resembles the little bluestem-Indiangrass community which is usually described as an important pre-settlement grassland of central Texas. However, little bluestem is virtually absent from the site. The live oak and juniper dominated bottoms of Williamson Creek are probably indicative of past disturbance of these sites and the gradual replacement of native grasses and deciduous trees by Ashe juniper. Of particular interest in this regard is the apparent near-absence of pecans, hickories and walnuts (*Carya* and *Juglans* species) along Williamson Creek.

All the sites have native vegetation as dominants in all strata except in areas of recent human disturbance. Examples of areas where introduced species are dominant in the herbaceous strata are most of the waste water lines, the berms and graded areas along Cougar Creek and the north plateau of the South Hills. Experimental seeding and planting of native species is recommended for these areas. Control of the annoying introduced herb, beggar's lice, is recommended. Thinning of invasive tree species, mainly Ashe juniper and honey mesquite, is also recommended for areas where erosion potential following tree removal is low. These areas are mainly located in the Cougar Creekbelt, Prairieland Preserve and Sunset Valley Creekbelt. Clearing of woody species is not recommended for the Gaines Creekbelt and should be restricted to areas of low relief at the South Hills. Several introduced shrub and tree species were identified at all the sites. However, most of these were found to occur at rather low densities and their control should not represent a high priority.

Several species of plants endemic to the Edwards Plateau were identified. Hopefully, several additional rare Texas endemics will be identified during subsequent summer surveys. In addition, and departing from topics botanical to the zoological, the golden-checked warbler (*Dendroica chrysoparia*), a federally listed endangered species, was found at the Gaines Creekbelt.

Several introduced plant species, new to, or seldom reported for Travis County, were also

identified. Some of these may have the potential to become very pesky weeds in our area. Three species in particular, *Cyperus entrerianus*, *Silybum marianum*, and *Hypochaeris microcephala* should probably be monitored to determine their potential as nuisance species.

Restoration of native grassland communities on areas where grassland currently exists, and in some areas of flat terrain extensively invaded by junipers, mainly located within the Cougar and Sunset Valley creekbelts and the Prairieland Preserve, is recommended. Restoration efforts should concentrate on the re-establishment of native perennial grasses identified by SCS and TNHP as once being important vegetation components on these sites. Thinning of trees and shrubs should, however, be avoided unless a definitive plan for grassland restoration is in place.

Mowing of areas identified as containing plant species characteristic of Colorado River Pleistocene terrace deposits is highly recommended. These areas were noted in the Cougar Creekbelt and Prairieland Preserve. Summer and fall mowing of these sites should prevent succession to midgrass prairie and maintain the early successional structure required by the several interesting plant species found on these sites. In addition, this variation in management treatment will assure plant species diversity on these sites.

5.0 Literature Cited

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APPENDIX- PHOTOLOG

**Botanical and Ecological Inventory of the Sunset Valley Creekbelts,
Preserves and Conservation Areas**

Disturbance Features

One of several dumps along the south boundary of the Gaines Creekbelt



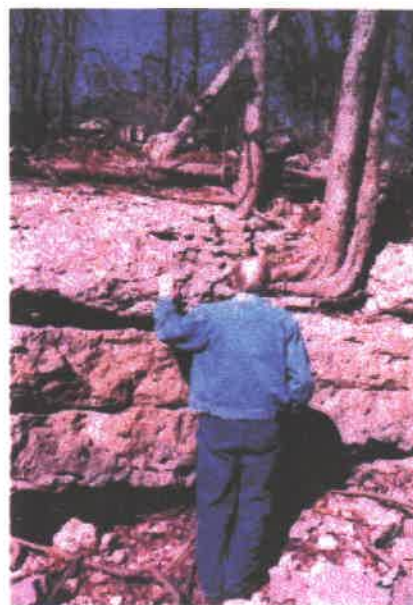
Construction materials dumped on the south bank of Williamson Creek in the Prairieland Preserve



A bicycle jump on a hilltop in the South Hills Conservation Area



South Hills Conservation Area

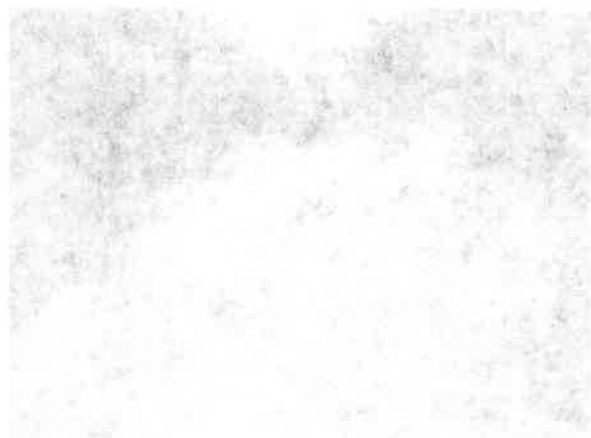


Top left: Exposed Del Rio clay containing gypsum and *Exogyra arietina* fossils

Top right: Burford Westlund inspects an outcrop of Georgetown limestone on the Dry Fork of Williamson Creek

Bottom: One of the "cactus gardens" found on hilltops of the South Hills Conservation Area





Prairieland Preserve



Top: Texas ash (*Fraxinus texensis*) seedlings in juniper duff under dense juniper canopy

Bottom: Floodplain alluvium of Williamson Creek, looking west from near the west boundary



Sunset Valley Creekbelt



Top: Lower sized Ashe juniper invasives

Bottom: Post oaks along the south terrace of Williamson Creek



Prairieland Preserve



Top: Looking west across the prairie, the tall grass in flower is Indiangrass, the shrub is honey mesquite

Bottom: A grassy clearing within the woodland north of Williamson Creek, common grasses are curly mesquite, tall dropseed, poverty dropseed and side-oats grama, little bluestem is also present



Cougar Creekbelt

Ephemeral pond at base of south berm, Burger Center in background



Piggy and Lulu enjoying a probable jurisdictional wetland, note the drowned live oak



The north margin of a ponded section of Cougar Creek, dead weed in foreground is annual sumpweed



Gaines Creekbelt



Top: blackstem spleenwort (*Asplenium resiliens*) an epipetric fern
Bottom: Asian holly-fern (*Cyrtomium falcatum*), an introduced, naturalized? fern



Gaines Creekbelt



Top: Bill Carr posing on 90 foot tall cliff face above Gaines Creek

Bottom: Pat McNeal indicating a remarkably large clump of heavenly bamboo (*Nandina domestica*) - this naturalized introduced shrub is heavily browsed by deer



Gaines Creekbelt



Top left: Detention basin outlet, south central drainage canyon

**Top right: Edwards limestone terrace at
Bottom of drainage**

Center: old Ashe juniper

**Bottom left: shin oak with browsed
basal shoots**

**Bottom right: the trail to Barton Creek
grasses includes side-oats
grama. tall dropseed and
Texas wintergrass**



