

The Vascular Flora of Mason Mountain Wildlife Management Area, Mason County, Texas

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Abstract - A survey of the vascular flora of Mason Mountain Wildlife Management Area, located in the Llano Uplift of Central Texas, was conducted between spring of 2001 and spring of 2006. A total of 693 species and infraspecific taxa in 103 families and 376 genera were documented from 14 plant associations. Poaceae (117 species), Asteraceae (102 species), Fabaceae (46 species), and Euphorbiaceae (31 species) were the families with the largest number of species. Five taxa, *Campanula reverchonii* (basin bellflower), *Eriogonum tenellum* Torr. var. *ramosissimum* (tall buckwheat), *Isoetes lithophila* (rock quillwort), *Packera texensis* (Llano groundsel), and *Tradescantia pedicellata* (Edwards Plateau spiderwort) are endemic to the Llano Uplift, while 24 others are endemic to Texas. Other noteworthy taxa included *Isoetes piedmontana* (Piedmont quillwort), *Pilularia americana* (American pillwort), and *Senecio ampullaceus* (Texas ragwort).

Introduction

The Llano Uplift (Gould 1975, Lyndon B. Johnson School of Affairs 1978) of Texas comprises about 12,950 km² (5000 mi²) of gently rolling to hilly lands that lie to the west of Austin and encompasses portions of Blanco, Burnet, Gillespie, Kimble, Llano, Lampasas, Mason, Menard, McCulloch, San Saba, and Travis counties. The study area is located in the eastern portion of the Edwards Plateau vegetation area of the state and is characterized by granite outcrops. Correll and Johnston (1970) describe the Edwards Plateau as a region of significant endemism; however, the granite-outcrop portion of this region has received limited botanical exploration over the past 150 years. Some of the first efforts to describe these outcrops' flora were by Lindheimer (Geiser 1948), who made two collecting trips to the Llano Uplift in 1847–48, and Reverchon, who made the first extensive collections in the region in 1885–86. Others included Whitehouse (1933), Roemer (1849), Butterwick (1979), and Walters and Wyatt (1982). These studies were mostly concentrated on an area centered on present day Enchanted Rock State Park in Llano County. Mason County was not included. The general lack of botanical study in the Llano Uplift

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and specifically Mason County is reflected by the low number of plant collections represented in University of Texas Plant Resources Center's Flora of Texas database (2006). This database cites only 378 collections from Mason County out of approximately 250,000 records for the state. The low number of collections is undoubtedly due to the high percentage of land in private ownership that is mostly unavailable for scientific study.

In 1997, Mr. C.G. Johnson donated to the State of Texas the area now known as the Mason Mountain Wildlife Management Area (MMWMA), a gift that consisted of approximately 2147 ha (5304 ac) located about 10 km northwest of Mason in Mason County. Today, MMWMA is the largest publicly owned property on the Llano Uplift. Prior to acquisition, the area was a working ranch that primarily raised exotic ungulates for hunting and for breeding stock. The area is currently divided into seven pastures by 2.4-m high fences. Among the non-native ungulates present are *Tragelaphus strepsiceros* Pallas (greater kudu), *Oryx gazella* Gray (gemsbok) and nine others. *Odocoileus virginianus* Zimmermann (white-tailed deer) is the only native ungulate. Presently, the specific mission of MMWMA is to manage natural resources of the area in a holistic, ecosystem process-oriented philosophy. To accomplish this goal, Texas Parks and Wildlife Department (TPWD) has implemented a public hunting program and also offers limited public access for natural interpretation and restoration events. In an effort to reduce the population of exotics and generate revenue, a program of aggressive hunting and selling of exotic ungulates has been implemented (Schwertner 1998).

The present study is part of an effort by TPWD to enumerate the flora of lands under their authority (see Fleming et al. 2002, Singhurst et al. 2003). The specific objectives of this research were to compile an annotated checklist of the flora of MMWMA, determine if plants of special concern are present, and provide a qualitative description of the plant communities of the area.

Materials and Methods

The checklist (shown in **Supplementary Appendix 1**. Available only online at <http://dx.doi.org/10.1656/S497.s1>) has been compiled largely from specimens collected between summer of 1998 and fall of 2005. Vouchers were made for all species except for a few cacti that were photographed with a digital camera for identification. Nomenclature follows Jones et al. (1997), Turner et al. (2003), and United States Department of Agriculture (2005). Plant specimens were deposited at Baylor University Herbarium (BAYLU) and Mason Mountain Wildlife Management Area Herbarium (herein referred to as MMWMA). All duplicate specimens were sent to the University of Texas Herbarium (TEX-LL). The flora of Texas database of the University of Texas Plant Resources Center (TEX-LL), (2006) and the Herbarium Specimen Browser of Texas A&M University (both TAES and TAMU), College Station (2006), was examined for additional records. This, however, yielded minimal results because the study area was generally not

available for botanical study while privately owned, and thus few herbarium specimens were collected there before 1999.

Plant associations (Fig. 1; **Supplementary Appendix 2**. Available only online at <http://dx.doi.org/10.1656/S497.s2>) were mapped utilizing 1996 digital orthophoto aerial photography and ERDAS Imagine 8.7 software (Leica Geosystems 2005) based on dominant species (qualitative floristic

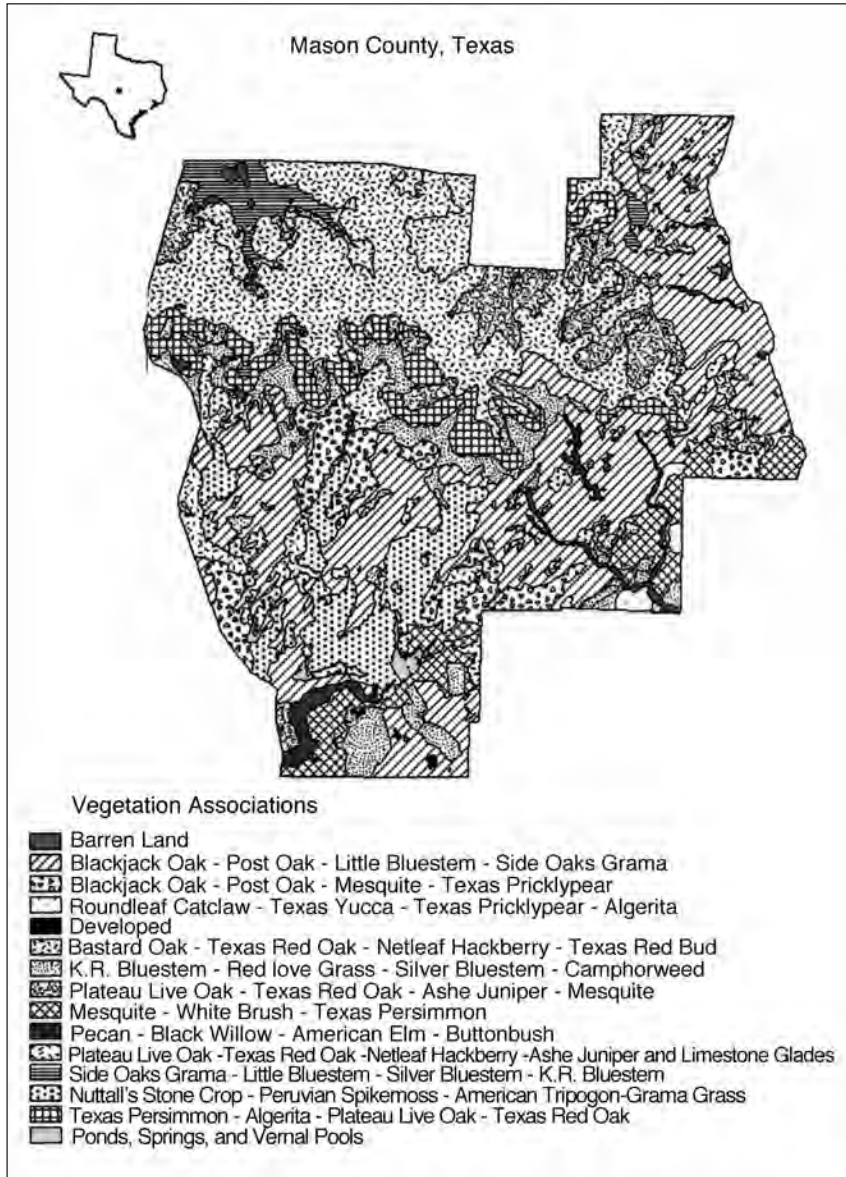


Figure 1. A vicinity map showing Mason Mountain Wildlife Management Area Vegetation Associations (Leica Geosystems, ERDAS Imagine 8.7).

inventories), landscape position (utilizing digital raster graphic elevation lines), and digital soils (Natural Resource Conservation Service 2006). Sorenson's Index (Jongman et al. 1995, Sorensen 1948) was used to compare floristic similarity between MMWMA and Enchanted Rock State Natural Area (O'Kennon 1993), a 655-ha. (1643-ac) granite dome complex located in Llano County, TX, approximately 64 km (40 mi) southeast of the study area. Sorenson's Index is calculated as: $2C / (A + B)$, where C is the number of shared taxa, A is the number of taxa in sample one, while B is the number in sample two. The focus of this analysis is to compare the ecology relation or resemblance between the two largest conservation tracts of land on the Llano Uplift.

A plant association is defined as an assemblage of definite floristic composition, presenting a uniform physiognomy, and growing in uniform habitat conditions (Flahault and Schroter 1910). In this sense, the association concept applies to existing vegetation regardless of successional status. The plant associations are arranged into terrestrial, aquatic, disturbed, and barren or developed systems, which are further subdivided into natural and disturbed types. The natural types of both terrestrial and aquatic systems are further subdivided into units based upon the underlying geology, this being sandstone, igneous, or limestone. Natural types are characterized predominantly by woody dominants that were presumed to be remnants of the natural vegetation. Disturbed types that lack woody species would be expected because of past or current land-use practices such as tillage. Disturbed aquatic systems are referred to as artificial impoundments. Vernal pools within wetland types are defined as precipitation-filled seasonal wetlands inundated during periods when temperature is sufficient for plant growth, followed by a brief waterlogged-terrestrial stage and culminating in extreme desiccating soil conditions of extended duration (Keeley and Zedler 1998).

Study Area

The MMWMA is located within the subtropical humid region of the modified marine climate, an area of central Texas characterized by long, hot summers and mild winters (Bomar 1995). Based on data from a recent 100-yr. period, average annual precipitation is approximately 66 cm (26 in), with a maximum of 71 cm (28 in) and a minimum of 61 cm (24 in) (Hatch et al. 1990). Average annual temperature is approximately 18.8 °C (Hatch et al. 1990). The growing season is about 240 days, with the frost-free period extending from April through October (Hatch et al. 1990). MMWMA is located on the northwest portion of the Llano Uplift and is characterized by rolling terrain with elevation ranging from 518 m (1700 ft) to 621 m (2040 ft) (Hatch et al. 1990).

The geology (Fig. 2) of the area is comprised of seven formations: dolomite, granite, limestone, quartz, sand, sandstone, and shale. Soils are

classified as clay loam, deep sand, sandy loam, granite sand, granite gravel, granite hills (rock outcropping), sandstone hills (rock outcropping), and flat and steep limestone hills (rock outcropping) (Natural Resource Conservation Service 2006). The south-southeast portion of MMWMA is predominantly Packsaddle Schist (fine- to medium-grained quartz feldspar biotite, gneiss and marble). The lower, middle, and upper Hickory Sandstones (which includes

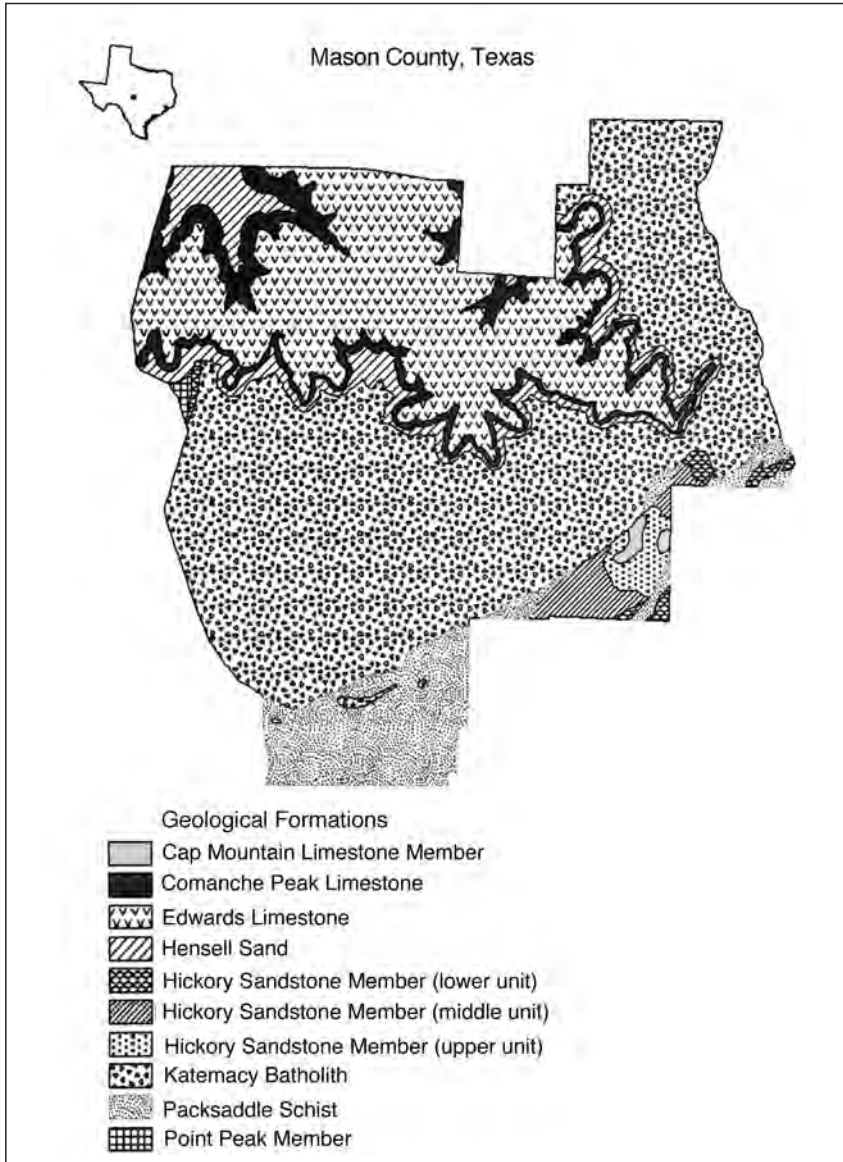


Figure 2. A map showing Mason Mountain Wildlife Management Area Geologic Formations (University of Texas Bureau of Economic Geology 1982).

lower, middle, and upper layers composed of quartz, silt, calcite, and massive sandstone) are included within this formation. The Cap Mountain Limestone (finely grained, distinctly jointed, and somewhat massive limestone) also occurs in the southeast corner of MMWMA as two small bluffs. Just north of these is an extensive area of granite composed of Katemcy Batholiths (coarse gravel and massive pink granite) that form the large hilly “domes” and include a few small inclusions within the Packsaddle Schist. North of the Katemcy Batholiths, two narrow bands of the Hensell Sand (fine-grained, poorly sorted, dolomitic sandstone) and Comanche Peak Limestone (fine grained, dolimitized) are exposed on steep slopes and in small canyons. Just to the north of the Hensell Sand and Comanche Peak Limestone is an Edwards Limestone (fine grained, dolimitized, and chert nodules) mesa, which is the highest point in the property. The preceding summary of the geology, which is discussed from south-southeast to north-northwest, is extracted from the University of Texas Bureau of Economic Geology (1982).

Results

The MMWMA flora (**Supplementary Appendix 1**. Available only online at <http://dx.doi.org/10.1656/S497.s1>) consists of 693 species and infraspecific taxa in 103 families and 376 genera. Ferns and fern allies constituted 20 species, gymnosperms 1, monocots 184, and dicots 488. The largest families were Poaceae (117), Asteraceae (102), Fabaceae (46), and Euphorbiaceae (31). Other families with a significant number of species included Cyperaceae (30), Lamiaceae (17), Brassicaceae (17), Scrophulariaceae (14), and Apiaceae (13). Genera with the largest number of species are *Cyperus* (12), *Eragrostis* (11), *Panicum* (10), and *Croton* (9). Introduced species (59) represent 8.51% of the total flora, of which 23 were in the Poaceae. Five highly restricted Llano Uplift endemics (Carr 2002, 2005) that are ranked as special plants of concern (Nature Serve 2006) occur at MMWMA. These are *Campanula reverchonii* Gray (basin bellflower; G2S2), *Eriogonum tenellum* Torr. var. *ramosissimum* Benth. (tall buckwheat; G5T3), *Isoetes lithophila* N.E. Pfeiffer (rock quillwort; G2S2), *Packera texensis* R.J. O’Kennon and D.K. Trock (Llano groundsel ; G2S2), and *Tradescantia pedicellata* Celarier (Edwards Plateau spiderwort; G2S2). More widespread Texas endemic taxa that were abundant at MMWMA include *Astragalus pleianthus* (Shinners) Isely (Edwards Plateau milkvetch), *Castilleja purpurea* (Nutt.) G. Don var. *lindheimeri* (Gray) Shinners (Lindheimer’s Indian paintbrush), *Chaetopappa bellidifolia* (Gray & Engelm.) Shinners (whiteray leastdaisy), *Chamaesyce angusta* (Engelm.) Small (blackfoot sandmat), *Cheilanthes kaulfussii* Kunze (Kaulfuss’ lipfern), *Croptilon hookerianum* (Torr. & Gray) House var. *hookerianum* (Hooker’s scratchdaisy), *Euphorbia roemeriana* Scheele (Roemers’ spurge), *Galactia texana* (Scheele) Gray (Texas milkpea), *Indigofera miniata* var. *texana* (Buckl.) B.L. Turner (Texas indigo), *Lechea san-sabeana* (Buckl.) Hodgdon (San Saba pinweed), *Lesquerella densiflora* (Gray) S. Wats. (denseflower bladderpod), *Muhlenbergia lindheimeri* A.S. Hitchc.

(Lindheimer's muhly), *Nolina lindheimeriana* (Scheele) S. Wats. (devil's shoestring), *Parthenocissus heptaphylla* (Buckl.) Britt. ex Small (sevenleaf creeper), *Phlox pilosa* subsp. *latisejala* Wherry (downy phlox), *P. roemeriana* Scheele (goldeneye phlox), *Silphium albiflorum* Gray (white rosinweed), *Tephrosia lindheimeri* Gray (Lindheimer's hoarypea), *Tradescantia edwardsiana* Tharp (plateau spiderwort), *Triodanis texana* McVaugh (Texas Venus' looking-glass), *Vitis monticola* Buckl. (sweet mountain grape), and *Yucca rupicola* Scheele (Texas yucca). Texas endemics restricted to a single mesic limestone canyon at MMWMA include *Arabis petiolaris* (Gray) Gray (Brazos rockcress), *Argythamnia aphoroides* Muell.-Arg. (Hill Country silverbush), and *Matelea edwardsensis* Correll (plateau milkvine). There are several other noteworthy species. *Isoetes piedmontana* Piedmont (quillwart) is known in Texas from this study area and two sites in Llano County (Holmes et al. 2005). The species also occurs in Alabama, Georgia, North Carolina, South Carolina, and Virginia (Holmes et al. 2005). *Pilularia americana* A. Braun (American pillwort) is restricted to a few granite and limestone vernal pools and shallow ponds in Burnet, Llano, Mason, and Wise counties in Texas (K. McLemore and R.J. O'Kennon, Botanical Research Institute of Texas, Fort Worth, pers. comm.; Turner et al. 2003). American pillwort occurs in one shallow pond at MMWMA. Also present is *Senecio ampullaceus* Hook. (Texas groundsel), endemic to the West Gulf Coastal Plains (Sorrie and Weakly 2001), which is at the western limits of its distribution. A few eastern plants also reach their southern and western-most known distribution at MMWMA and include *Fimbristylis puberula* (Michx.) Vahl var. *interior* (Britt.) Kral (hairy fimbry), *Juncus diffusissimus* Buckl. (slimpod rush), *Lepuropetalon spathulatum* Ell. (petiteplant), and *Rumex hastatulus* Baldw. (heartwing sorrel).

O'Kennon (1993) recorded a total of 555 species at the much smaller Enchanted Rock State Natural Area (ERSNA), with 37 being introduced. The park consists of two granite domes (Enchanted Rock dome and Little Rock dome) and a large canyon between the domes. The canyon is largely shaded and remains moist for most of the year, thus supporting many shade and seep species that do not occur at MMWMA. The park also has more surface seeps and spring contacts than are present at MMWMA. ERSNA has 555 species recorded and MMWMA has 693 species, with 367 species common to both areas. The similarity index for the two areas is:

$$\begin{aligned} IS &= 2C / (A + B) \\ &= 2(367) / (555 + 693) \\ &= 0.588 \end{aligned}$$

Discussion

MMWMA is a floristically diverse landscape that currently cites the highest number of plant taxa (693 species and infraspecific taxa) documented for a defined area within the Llano Uplift. This number is 27% of the species recorded within the Edwards Plateau by Stanford (1976).

MMWMA also has a low number of non-native plants (59 of 693 species), which is 8.51% of the flora documented. For comparative purposes, ERSNA has 37 non-native plants (6.7%) of the 555 species reported (O'Kennon 1993). Thirty species occurring at MMWMA are listed as Texas endemic plants (Carr 2002, 2005; Nature Serve 2006). Travis and Bexar counties, which lie on the east and southeast edge of the Llano Uplift, have the highest number of Texas endemics, with 89 and 85 respectively (Flora of Texas Consortium 1996). This, in part, seems related to their larger size and that they lie within four of the ten vegetational areas of the state. In comparison, Mason County has 50 Texas endemics, while adjacent Llano County has 39 endemic plants recorded (Flora of Texas Consortium 1996), but both lie fully within one vegetational region (Edwards Plateau). In further comparison of MMWMA with ERSNA, MMWMA contains 30 endemic plants (60.0% of the endemics documented for Mason County), whereas ERSNA has 21 endemic plants (53.8% of the endemics documented for Llano County). In addition, the similarity index value (0.588) for these two areas in the same ecoregion appears low. This low value could, in part, be related to the size of the areas or more likely to the presence of the limestone plant community associations at MMWMA.

MMWMA is also a strikingly complex site, with 12 natural or semi-natural plant community associations (Fig. 1; **Supplementary Appendix 2**. Available only online at <http://dx.doi.org/10.1656/S497.s2>). The study resulted in the discovery of two plant community associations (**Supplementary Appendix 1**. Available only online at <http://dx.doi.org/10.1656/S497.s1>) not previously documented in Texas, but known in Oklahoma, which is approximately 400 km to the north. Additionally, two newly described associations, which are apparently limited to Texas, were discovered and documented.

While the present work contributes to the botanical knowledge of the state, it can only serve as an invitation for additional botanical study of this very interesting geological area of Texas.

Acknowledgments

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Tom Wendt and Lindsey Woodruff at TEX-LL Herbarium, University of Texas, assisted with specimen identification. Bill Carr of The Nature Conservancy of Texas was extremely helpful in introducing us to the Llano Uplift and determining several plant collections. Edwin Bridges (Botanical and Ecological Consultants in Bremerton, WA) graciously reviewed and provided suggestions on the manuscript. We would also like to thank the many others mentioned in the annotated list of vascular plants who assisted

with field collections. Dr. Jack Stanford played a crucial role in making early collections and identification of specimens at MMWMA Herbarium.

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Online Supplementary Appendix 1 to: Singhurst, J.R., L.L. Sanchez, D. Frels, Jr., T.W. Schwertner, M. Mitchell, S. Moren, and W.C. Holmes. 2007. The Vascular Flora of Mason Mountain Wildlife Management Area, Mason County, Texas. Southeastern Naturalist 6(4):683–692.

Species Checklist

This annotated checklist is divided into pteridophytes, gymnosperms, and flowering plants, which are subdivided into monocots and dicots. Family, genus, and species are arranged alphabetically beneath each major heading. Nomenclature follows Jones et al. (1997), Turner et al. (2003), and United States Department of Agriculture (2005). Collectors and collection numbers are given as: VA = Vivian Ackerson, BC = William R. Carr, DG = Duane German, PH = Peggy Horner, CL = Chaixiang Liu, MM = Mark Mitchell, SH = Sara Moren, DP = Dana Price, AP = Angela Proctor, MR = M. Regnier, CS = Chris Sanchez, LS = Laura Sanchez, TWS = T. Wayne Schwertner, JS = Jason Singhurst, JWS = Jack Stanford, and AW = Amy Winters. An asterisk (*) denotes an introduced species. Vouchers verified at BAYLU and MMWMA Herbarium.

VASCULAR PLANT TAXA OF MASON MOUNTAIN WILDLIFE MANAGEMENT AREA

PTERIDOPHYTA (FERNS AND FERN ALLIES)

DRYOPTERIDACEAE

Woodsia obtusa (Spreng.) Torr. subsp. *occidentalis* Windham - bluntnose cliff fern - JS 8752; LS & JWS 2357; LS 3225

ISOETACEAE

Isoetes lithophila Pfeiffer - rock quillwort - JS 9639; LS 3128; LS 3339

I. melanopoda Gay & Durieu ex Durieu - blackfoot quillwort - JS 8743; LS 3880

I. piedmontana (N.E. Pfeiffer) C.F. Reed - Piedmont quillwort - LS & JWS 2364; LS & JWS 3208; LS & JWS 3211

MARSILEACEAE

Marsilea vestita Hook. & Grev. subsp. *vestita* - water clover fern - JS 10228; LS & JWS 3212; LS 4038

Pilularia americana A. Braun - American pillwort - LS 3635

PTERIDACEAE

Argyrochosma dealbata (Pursh) Windh. - powdery cloak fern - JS 8749

Astrolepis sinuata (Lag. ex Sw.) Benh. & Windh. subsp. *sinuata* - wavy scaly cloakfern - JS 8461; JS 8749; LS & JWS 2367; LS 4250

Cheilanthes alabamensis (Buckl.) Kunze - Alabama lipfern - LS 3705

C. kaulfussii Kunze - Kaulfuss' lipfern - LS & JWS 1593; LS 3482; LS 3506

C. lindheimeri Hook. - fairyswords - JS 8754; LS & JWS 2358; LS 3094

C. tomentosa Link - woolly lipfern - JS 8756; JS 8441; LS 3093; LS 3510; LS 3586; LS 4023

Notholaena grayi G. Davenport - Gray's cloak fern - JS 7797

- N. standleyi* Maxon - cloak fern - JS 7794
Pellaea atropurpurea (L.) Link - purple cliffbrake fern - JS 8439; JS 10086; LS 3658
P. ovata (Desv.) Weatherby - ovate-leaf cliffbrake - JS 8736; LS 2178
P. wrightiana Hook. - Wright's cliffbrake - JS 8445; JS 8753; JS, VA, DG, PH, & CL 8045; LS & JWS 2356; LS 4251

SELAGINELLACEAE

- Selaginella arenicola* Underwood subsp. *riddellii* (Van Eselt.) R. Tryon - Riddell's spikemoss - LS 3096; LS 3490
S. peruviana (Milde) Hieron. - Peruvian spikemoss - JS & SH 9347; LS 3095; LS 3521; LS 3656
S. wrightii Hieron. - Wright's spikemoss - JS & SH 9344; JS & SH 9345

CONIFERS

CUPRESSACEAE

- Juniperus ashei* Buchh. - Ashe's juniper - TWS 020

MONOCOTS

AGAVACEAE

- Nolina lindheimeriana* (Scheele) S. Wats. - devil's-shoestring - JS 9209; LS 3609
N. texana S. Wats. - sacahuista - JS 10071
Yucca constricta Buckl. - Buckley's yucca - LS 3328
Y. rupicola Scheele - Texas yucca - JS 9206
Y. reverchonii Trel. - Plateau yucca - JS s.n.

BROMELIACEAE

- Tillandsia recurvata* (L.) L. - small ballmoss - JS 6879

COMMELINACEAE

- Commelina erecta* L. var. *erecta* - white mouth dayflower - JS 9231; LS 3092; LS 3878
Tradescantia edwardsiana Tharp. - Plateau spiderwort - JS 9298
T. gigantea Rose - giant spiderwort - LS 2166
T. occidentalis (Britton) Smyth - prairie spiderwort - LS 3673; LS 4230; LS 4261
T. pedicellata Celarier - Edwards Plateau spiderwort - JS & DP 9065

CYPERACEAE

- Carex amphibola* Steud. var. *amphibola* - narrowleaf sedge - JS, VA, DG, PH, & CL 8067
C. frankii Kunth - Frank's sedge - JS 10100
C. gravida Bailey - heavy sedge - LS 3173
C. microdonta Torr. & Hook. - little tooth sedge - JS 9252
C. muehlenbergii Schkuhr ex Willd. var. *enervis* Boott - Muhlenberg caric sedge - JS & AW 7747; LS & JWS 2375
C. planostachys Kunze - cedar sedge - JS & DP 9093; JS 9252; LS 3651
C. tetrastachys Scheele - Britton's sedge - JS 9253
Cyperus acuminatus Torr. & Hook. ex Torr. - taperleaf flat sedge - JS 9282
C. croceus Vahl - Baldwin flat sedge - JS, VA, DG, PH, & CL 8042; LS 3017
C. echinatus (L.) Wood - globe flat sedge - JS 8040
C. erythrorhizos Muhl. - red root flat sedge - JS 8062
C. haspan L. - haspan flat sedge - JS 9255
C. odoratus L. - fragrant flat sedge - JS, BC, & CS s.n.
C. polystachyos Rottb. - manyspike flat sedge - JS, VA, DG, PH, & CL 8050
C. retroflexus Buckley - oneflower flat sedge - JS, BC, & CS 8217; LS 3146; LS 3334
 **C. rotundus* L. - purple nut grass - JS, VA, DG, PH, & CL 8041

- C. squarrosus* L. - bearded flat sedge - JS, BC, & CS 8242; JS 9296; LS 3021
C. strigosus L. - false nut grass - JS, BC, & CS 8229; JS, VA, DG, PH, & CL 8069; JS, VA, DG, PH, & CL 8607; LS 3018
C. surinamensis Rottb. - tropical flat sedge - JS 9625
Eleocharis atropurpurea (Retz.) J. & K. Presl - purple spikerush - LS 3020a
E. montevidensis Kunth - sand spikerush - JS 9289
E. obtusa (Willd.) J.A. Schult. var. *obtusa* - blunt spikerush - JS 8741; LS 3016
E. parvula (Roemer & J.A. Schultes) Link ex Bluff, Nees & Schauer - dwarf spikerush - JS, BC, & CS 8228; LS 3020b; JS 9250
Fimbristylis autumnalis (L.) Roem. & Schult. - slender fimbry - JS, BC, & CS 8214; JS 9291; JS 9627
F. puberula (Michx.) Vahl var. *interior* (Britt.) Kral - hairy fimbry - JS 9637
F. vahlii (Lam.) Link - Vahl's fimbry - JS, BC, & CS 8212; LS 3019
Fuirena simplex Vahl - western umbrella sedge - JS, BC, & CS 8223; JS 9251
Kyllinga brevifolia Rottb. - short leaf flat sedge - JS 9263
Rhynchospora nivea Boeck. - showy whitetop - JS 9287; LS 3071
Schoenoplectus pungens (Vahl) Palla - American bulrush - JS 9257

IRIDACEAE

- Nemastylis geminiflora* Nutt. - prairie pleatleaf - LS 3685
Sisyrinchium chilense Hook. - swordleaf blue-eyed grass - MM 51; JS 9214; LS 3692
S. minus Engelm. & Gray - dwarf blue-eyed grass - LS & JWS 3213

JUNCACEAE

- Juncus bufonius* L. - toad rush - LS & JWS 2374
J. diffusissimus Buckl. - slimpod rush - JS, BC, & CS 8219; LS 3015; LS 3046
J. dudleyi Wieg. - Dudley's rush - JS 9297; JS & SH 9346
J. interior Wieg. - inland rush - LS & JWS 2376
J. marginatus Rostk. - grassleaf rush - LS 3047
J. texanus (Engelm.) Coville - Texas rush - JS 9285
J. torreyi Coville - Torrey's rush - JS & SH 9350; LS 3322

LEMNACEAE

- Wolffia columbiana* Karst. - Columbian watermeal - LS & JWS 3216

LILIACEAE

- Allium canadense* L. var. *fraseri* Ownbey - meadow garlic - TWS 93; LS 3179
A. drummondii Regel - Drummond's onion - JS & DP 9081; JS & DP 9089; TWS 68
A. hyacinthoides Bush - wild onion - LS 2158
A. kunthii G. Don - Kunth's onion - LS & JWS 3209
Androstephium coeruleum (Scheele) Greene - blue funnel lily - LS 2187; LS 3653
Cooperia drummondii Herbert - evening rainlily - LS 3090
C. pedunculata Herbert - prairie lily - JS 9292; LS 3352
Nothoscordum bivalve (L.) Britt. - crowpoison - JS 8747; MM 84; LS 3639
Schoenocaulon texanum Scheele - Texas feathershank - JS 9207; MM 99; JS & SH 9376

NAJADACEAE

- Najas guadalupensis* (Spreng.) Magnus - southern water nymph - LS & JWS 3199

ORCHIDACEAE

- Spiranthes magnicamporum* Sheviak - Great Plains ladies' tresses - LS 3512

POACEAE

- Alopecurus carolinianus* Walt. - Carolina foxtail - LS & JWS 3191
Andropogon gerardii Vitman - big bluestem - LS & TWS 3524
A. glomeratus (Walt.) B.S.P. - bushy bluestem - JS, BC, & CS 8224; LS 3513
Aristida oligantha Michx. - oldfield three awn - JS s.n.; LS 3109

- A. purpurascens* Poir. - arrowfeather threeawn - LS 3108
A. purpurea Nutt. var. *longiseta* (Steud.) Vasey - fender threeawn - LS 3063
A. purpurea Nutt. var. *purpurea* - purple threeawn - LS 4265
A. purpurea Nutt. var. *wrightii* (Nash) Allred - Wright's threeawn - JS 8748; TWS 57; LS 3064
Bothriochloa barbinodis (Lag.) Herter - cane bluestem - LS 3112; LS 3610
B. hybrida (Gould) Gould - hybrid beardgrass - LS 3522
 **B. ischaemum* (L.) Keng var. *songarica* (Rupr. ex Fisch & C.A. Mey) Celarier & Harlan - yellow bluestem - LS 3045; LS 3823
B. laguroides (DC.) Herter subsp. *torreyana* (Steud.) Allred & Gould - silver beardgrass - JS & SH 9335; LS 3335
Bouteloua aristidoides (Kunth) Griseb. - needle grama - LS 4010
B. curtipendula (Michx.) Torr. var. *curtipendula* - sideoats grama - TWS 06
B. gracilis (Willd. ex Kunth) Lag. ex Griffiths - blue grama - JS & SH 9332; LS 3130
B. hirsuta Lag. - JS & DP 9082; hairy grama - LS 3115
B. pectinata Featherly - tall grama - TWS 135; TWS 138; JS & SH 9340
B. rigidiseta (Steud.) A.S. Hitchc. - Texas grama - TWS 69; AP 42; LS 3135
B. trifida Thurb. - red grama - JS 7744; TWS 75; LS 3144
 **Bromus catharticus* Vahl - rescuegrass - JS 9236; TWS 59; LS 2179; LS 3641; LS 4264
 **B. japonicus* Thunb. ex Murray - Japanese brome - JS & DP 9077; LS 3319
Buchloe dactyloides (Nutt.) Engelm. - buffalograss - MM 88; JS & SH 9341
Cenchrus spinifex Cav. - coastal sandbur - LS 3009; LS 3992
Chloris subdolichostachya Muell. (pro sp.) (*cucullata* × *verticillata*) - shortspike windmill grass - LS 3475
C. cucullata Bisch. - hooded windmill grass - MM 63; LS 3134
C. verticillata Nutt. - tumble windmill grass - LS 3011; LS 3474
 **Cynodon dactylon* (L.) Pers. - Bermudagrass - LS 3003; LS 3598
 **Desmazeria rigida* (L.) Tutin - fern grass - JS s.n.
Dichanthelium acuminatum (Sw.) Gould & C.A. Clark var. *lindheimeri* (Nash) Gould & C.A. Clark - Lindheimer panicgrass - LS 3076
D. oligoanthes (J.A. Schultes) Gould var. *scribnerianum* (Nash) Gould - Scribner's rosette grass - LS & JWS 3198
Digitaria californica (Benth.) Henr. - Arizona cottontop - LS 3117; LS 4263
 **D. ciliaris* (Retz.) Koel. - southern crabgrass - JS, BC, & CS 8222; LS 3464
D. cognata (J.A. Schultes) Pilger subsp. *pubiflora* (Vasey) J. Wipff - Carolina crabgrass - LS 3113; LS 3457
D. patens (Swallen) Henr. - Texas cottontop - LS 3147
 **Echinochloa colona* (L.) Link - jungle rice - JS & SH 9349; LS 3465
 **E. crus-galli* (L.) P. Beauv. - barnyard grass - LS 3481
E. muricata (Beauv.) Fern. var. *microstachya* Wieg. - rough barnyardgrass - LS 3623
E. walteri (Pursh) Heller - coast cockspur - JS, BC, & CS 8213
Elymus canadensis L. - Canada wild rye - LS 3877
E. virginicus L. - Virginia wildrye - JS 9237; LS 3320
 **Eragrostis barrelieri* Daveau - Mediterranean love grass - LS 3477
E. capillaris (L.) Nees - lace grass - LS 2164
 **E. cilianensis* (All.) Vignalo ex Janchen - stinkgrass - JS & SH 9313; LS 3054; LS 3536
E. curtipedunculata Buckl. - gummy lovegrass - LS 3111; LS 3148
 **E. curvula* (Schrad.) Nees - weeping lovegrass - LS & JWS 1600; LS 4231
E. intermedia A.S. Hitchc. - plains lovegrass - JS, VA, DG, PH & CL 8049; LS 3321
E. pectinacea (Michx.) Nees ex Steud. var. *pectinacea* - spreading lovegrass - JS & DP 9075; LS 3121; LS 3478; LS 3537; LS 4020
E. secundiflora J. Presl subsp. *oxylepis* (Torr.) S.D. Koch - red lovegrass - JS & SH 9315; LS 3008; LS 3013; LS 3061
E. sessilispica Buckl. - tumble lovegrass - LS 3012; LS 3060
 **E. superba* Peyr. - Wilman's lovegrass - JS, VA, DG, PH, CL & TWS 8058; TWS 136; TWS 139; LS 3885
E. trichodes (Nutt.) Wood - sand lovegrass - JS 10076; LS 3138; LS 4130

- Eriochloa sericea* (Scheele) Munro ex Vasey - Texas cupgrass - LS 3157
Erioneuron pilosum (Buck.) Nash - hairy tridens - JS 8441; LS & JWS 2359; LS 3155
Hilaria belangeri (Steud.) Nash - curlymesquite - TWS 83; LS 3136
Hordeum pusillum Nutt. - little barley - MM 65; LS 4262
 **H. vulgare* L. - common barley - JS & AW 7745
Leersia oryzoides (L.) Sw. var. *enervis* Boott - rice cutgrass - JS & SH 9386
Leptochloa dubia (Kunth) Nees - green sprangletop - JS s.n.; LS 3120
L. fascicularis (Lam.) Kunth subsp. *fascicularis* (Lam.) N. Snow - bearded sprangletop - LS 3005; LS 4037
Limnodea arkansana (Nutt.) L.H. Dewey - Ozark grass - JS s.n.; LS & JWS 2354; LS & JWS 2378
 **Lolium arundinaceum* (Shreb.) Darbysh. - tall fescue - JS s.n.
 **L. perenne* L. - perennial ryegrass - JS s.n.
Melica nitens (Scribn.) Nutt. ex Piper - three flower melic - JS s.n.
Muhlenbergia arenicola Buckl. - sand muhly - JS 10095
M. lindheimeri A.S. Hitchc. - Lindheimer's muhly - JS 10085; LS 3467
M. reverchonii Vasey & Scribn. - seep muhly - JS 10075; LS 4025
M. schreberi Gmel. - nimblewill muhly - JS 7743; LS 3125
Nassella leucotricha (Trin. & Rupr.) Pohl - Texas winter grass - TWS 56; LS 3535
Panicum capillare L. - common witchgrass - JS 9243; LS 3995
P. coloratum L. - klinegrass - LS 3994
P. dichotomiflorum Michx. - fall P. - JS & SH 9355
P. diffusum Sw. - spreading P. - JS 9244
P. hallii Vasey var. *hallii* - Hall's panic grass - JS, VA, DG, PH, & CL 8048; LS 3154; LS 3517; LS 3993
P. hians Ell. - gaping P. - JS, BC, & CS 8232; JS & SH 9355; LS 3126
P. linearifolium Scribn. ex Nash - slim-leaf rosette grass - LS & JWS 2353
P. obtusum Kunth - vine mesquite - JS 8457; LS 3131
P. pedicellatum Vasey - cedar panic - JS 1009
P. virgatum L. - switchgrass - JS, BC, & CS 8231; LS 3466
 **Paspalum dilatatum* Poir. - dallisgrass - JS 9294; LS 3323
P. distichum L. - knot grass - JS & SH 9314
 **P. notatum* Fluegge - Bahia grass - JS, BC, & CS 8234
P. plicatulum Michx. - brownseed P. - JS & SH 9308; LS 3122; LS 3508
P. pubiflorum Rupr. ex Fourn. var. *pubiflorum* - hairyseed P. - JS, VA, DG, PH, & CL 8046; LS 4024
P. setaceum Michx. var. *stramineum* (Nash) D.J. Banks - thin P. - JS, VA, DG, PH, & CL 8070; LS 3123; LS 4271
 **P. urvillei* Steud. - Vasey's grass - JS, BC, & CS 8233; JS, BC, & CS s.n.; LS 3594
Phalaris caroliniana Walt. - Carolina canarygrass - JS s.n.; LS & JWS 2365
 **Poa annua* L. - annual bluegrass - JS s.n.; LS 2148; LS 3176
P. arachnifera Torr. - Texas bluegrass - TWS 58; LS 3696
P. chapmaniana Scribn. - Chapman's bluegrass - LS 2180
 **Polypogon monspeliensis* (L.) Desf. - annual rabbit's foot - JS, VA, DG, PH, & CL 8072; TWS 121; LS 3618
Schedonnardus paniculatus (Nutt.) Trel. - tumblegrass - JS s.n.; LS 3133
Schizachyrium scoparium (Michx.) Nash var. *frequens* (C.E. Hubb.) Gould - little bluestem - JS s.n.; LS 3114
Setaria leucopila (Scribn. & Merr.) K. Schum. - streambed bristlegrass - LS 4013
S. parviflora (Poir.) Kerguelen - knotroot bristlegrass - JS, BC, & CS 8220
S. reverchonii (Vasey) Pilger - Reverchon's bristlegrass - LS 3247
S. scheelei (Steud.) A.S. Hitchc. - southwestern bristlegrass - JS s.n.; LS 3124
Sorghastrum nutans (L.) Nash - yellow Indiangrass - JS, BC, & CS 8241; LS 3462
 **Sorghum halepense* (L.) Pers. - Johnson grass - JS s.n.; LS 3532
Sphenopholis obtusata (Michx.) Scribn. var. *obtusata* - prairie wedgescale - JS & SH 9310
Sporobolus compositus (Poir.) Merr. var. *compositus* - tall dropseed - JS s.n.; LS 3062; LS 4007

- S. compositus* (Poir.) Merr. var. *drummondii* (Trin.) Kartesz & Gandhi - Drummond's dropseed - LS 3158
- S. cryptandrus* (Torr.) Gray - sand dropseed - JS s.n.; LS 3476
- **S. indicus* (L.) R. Br. - smut grass - LS 3132
- S. neglectus* Nash - puffsheath dropseed - LS 3159
- S. pyramidatus* (Lam.) A.S. Hitchc. - whorled dropseed - JS & SH 9380; LS 3118
- **Stenotaphrum secundatum* (Walter) Kuntze - St. Augustine grass - LS 4039
- Tragus berteronianus* J.A. Schultes - spiked bur grass - LS 3010; LS 3143; LS 4011
- Tridens albescens* (Vasey) Woot. & Standl. - white tridens - LS 3004; LS 3143
- T. flavus* (L.) Hitchc. - purpletop tridens - LS 3048; LS 3996
- T. muticus* (Torr.) Nash - slim tridens - JS, BC, & CS 8247; LS 3493
- T. strictus* (Nutt.) Nash - longspike tridens - LS 3044
- T. texanus* (S.Wats.) Nash - Texas fluffgrass - LS 3037; LS 4012
- Tripogon spicatus* (Nees) Ekman - American five-minute grass - JS, BC, & CS 8206; JS, BC, & CS s.n.; LS 3119
- Tripsacum dactyloides* (L.) L. - eastern gammagrass - JS & SH 9310
- Trisetum interruptum* Buckl. - prairie trisetum - JS s.n.
- Urochloa texana* (Buckl.) R. Webster - Texas signalgrass - LS 3055; LS 3485; LS 3531; LS 3999
- Vulpia octoflora* (Walt.) Rydb. var. *octoflora* - sixweeks fescue - JS 8750; TWS 85; LS 3644

PONTEDERIACEAE

- Heteranthera limosa* (Sw.) Willd. - blue mudplantain - JS 10084; LS 3507

POTAMOGETONACEAE

- Potamogeton nodosus* Poir. - longleaf pondweed - LS 3073; LS & JWS 3202
- P. pusillus* L. - small pondweed - LS & JWS 3201

SMILACACEAE

- Smilax bona-nox* L. - saw greenbrier - JS 9234; JS 10088; TWS 25; TWS 28; LS 3689

TYPHACEAE

- Typha latifolia* L. - common cattail - JS 9288; LS 3514

DICOTS

ACANTHACEAE

- Dyschoriste linearis* (Torr. & Gray) Kuntze - polkadots - JS & SH 9364; LS 3330
- Justicia pilosella* (Nees) Hilsenb. - low ruellia - LS 4238
- Ruellia humilis* Nutt. var. *humilis* - low ruellia - LS 3622
- R. nudiflora* (Engelm. & Gray) Urban var. *nudiflora* - violet ruellia - JS s.n.

AMARANTHACEAE

- Amaranthus palmeri* S. Wats. - carelessnessweed - JS & SH 9312; LS 3086; LS 3597
- A. polygonoides* L. - tropical amaranth - LS 3991
- A. rudis* Sauer - tall amaranth - JS & SH 9330
- Froelichia floridana* (Nutt.) Moq. var. *floridana* - plains snakecotton - JS, BC, & CS 8235
- F. gracilis* (Hook.) Moq. - slender snakecotton - JS. s.n.; LS 3470; LS 3523
- Gossypianthus lanuginosus* (Poir.) Moq. var. *lanuginosus* - woolly cottonflower - JS s.n.; LS 3052

ANACARDIACEAE

- Rhus lanceolata* (Gray) Britt. - flame-leaf sumac - TWS 016; LS 4031
- R. trilobata* Nutt. var. *trilobata* - skunkbush - JS 9225; LS 3680
- R. virens* Lindeheimer ex Gray - evergreen sumac - LS 3088; LS 4139
- Toxicodendron radicans* (L.) O. Ktze. - poison oak - JS s.n.; LS 3674

APIACEAE (UMBELLIFERAE)

- Bifora americana* Benth. & Hook. f. ex S. Wats. - prairie bishop - TWS 109
Centella erecta (L.f.) Fernald - spadeleaf - JS s.n.
Cyclospermum leptophyllum (Pers.) Sprague ex Britt. & Wilson - slim lobe celery - JS & DP 9079
Chaerophyllum tainturieri Hook. var. *tainturieri* - chervil - JS s.n.; LS 2189
Daucus pusillus Michx. - American wild carrot - LS 3318
Eryngium leavenworthii Torr. & Gray - Leavenworth's eryngo - LS 3538
Hydrocotyle verticillata Thunb. - whorled marshpennywort - JS, BC, & CS 8218; LS 3072; LS 3619
Polytaenia nuttallii DC. - Nuttall's prairie parsley - LS & JWS 3215
Ptilimnium capillaceum (Michx.) Raf. - threadleaf mock Bishop's - JS 9280
Spermolepis echinata (Nutt. ex DC.) Heller - bristly scaleseed - LS & JWS 2377; LS & JWS 3196; LS 3661; LS 3875
S. inermis (Nutt. ex DC.) Mathias & Constance - Red River scaleseed - AW 119; LS & JWS 2355; LS 3224; LS 3697; LS 3879
 **Torilis arvensis* (Huds.) Link - spreading hedgeparsley - MM 100
 **T. nodosa* (L.) Gaertn. - knotted hedgeparsley - LS 3222

APOCYNACEAE

- Amsonia ciliata* Walt. var. *texana* (Gray) Coult. - Texas bluestar - LS 3682
A. longiflora Torr. var. *salpignantha* (Woods.) S.P. McLaughlin - tubular bluestar - LS 3353

ASCLEPIADACEAE

- Asclepias asperula* (Dcne.) Woods. - spider milkweed - TWS 108
A. oenotheroides Cham. & Schlecht. - Zizotes milkweed - MM 107; LS 4283
A. verticillata L. - whorled milkweed - JS 9304; LS 3081; LS 3617
A. viridiflora Raf. - green-flower milkweed - JS 7793; LS 4033
Cynanchum barbigerum (Scheele) Shinnars - bearded swallow-wort - JS, VA, DG, PH, & CL 8043; JS, VA, DG, PH, & CL 8044; TWS 010
C. racemosum (Jacq.) Jacq. var. *unifarium* (Scheele) E. Sundell - talayote -LS 3592
Funastrum crispum (Benth.) Schltr. - wavyleaf twinevine - MM 102; LS 3882
Matelea biflora (Raf.) Woods. - star milkvine - LS 3237
M. edwardsensis Correll - Plateau milkvine - TWS 105; JS 10089
M. reticulata (Engelm. ex Gray) Woods. - netted milkvine - LS 3022; LS 3349

ASTERACEAE (COMPOSITAE)

- Achillea millefolium* L. - western yarrow - AP 37
Ambrosia artemisiifolia L. - common ragweed - JS 8451
A. confertiflora DC. - field ragweed - JS, BC, & CS 8238; LS 3534
A. psilostachya DC. - western ragweed - JS 10082; LS 3105; LS 3533
A. trifida L. var. *texana* Scheele - Texan great ragweed - LS 3097
Amphiachyris dracunculoides (DC.) Nutt. - broomweed - JS 8466; JS, BC, & CS 8237; TWS 04; LS 3141
Aphanostephus ramosissimus DC. - lazy daisy - MM 47; JS & SH 9329; LS 3590; LS 4252
A. skirrhobasis (DC.) Trel. var. *skirrhobasis* - Arkansas lazy daisy - JS 9272; LS 3612; LS 3819; LS 3874
Artemisia ludoviciana Nutt. subsp. *mexicana* - Mexican sagebrush - JS 10077; LS 3156; LS 4140
Baccharis neglecta Britt. - Roosevelt-weed - JS 10081; LS 4125
B. texana (Torr. & A. Gray) A. Gray - prairie baccharis - LS 4032
Brickellia cylindracea Gray & Engelm. - gravelbar brickellbush - LS 3039; LS 4138
B. eupatorioides (L.) Shinnars var. *texana* - brickellbush - JS, BC, & CS 10078; JS 10073
 **Carduus nutans* L. var. *macrocephalus* (Desf.) Nyman - muskthistle - JS 9262; LS 3818
 **Carthamus lanatus* L. - woolly distaff thistle - LS 3605
 **Centaurea melitensis* L. - Maltese star-thistle -JS s.n.; LS 3229
Chaetopappa asteroides Nutt. ex DC. - common leastdaisy - JS 8755; JS & SH 9319; LS 2165

- C. bellidifolia* (Gray & Engelm.) Shinnery - hairy leavedaisy - AP 35; AW 118; MM 64
Cirsium texanum Buckl. - Texas chrysopsis - Texas thistle - JS & AW 7746; LS & JWS 3220
C. undulatum (Nutt.) Speng. - wavyleaf thistle - JS 9290; LS 3347
Coryza canadensis (L.) Cronq. - Canadian horseweed - JS, BC, & CS 8225; JS 8454; LS 3460
Coreopsis tinctoria Nutt. var. *tinctoria* - plains coreopsis - JS 9264
C. wrightii (Gray) H.M. Parker - rock tickseed - JS 9303; LS 3329
Croptilon hookerianum (Torr. & Gray) House var. *hookerianum* - Hooker's scratchdaisy - JS 8443; LS 3488
Eclipta prostrata (L.) L. - yerba de tago - JS, BC, & CS 8215; LS 3479; LS 4026
Engelmannia peristenia (Raf.) Goodman & Lawson - Engelmann's daisy - LS 3241
Erigeron modestus Gray - plains fleabane - JS 8460; JS 10093; TWS 101; LS 3140
E. tenuis Torr. & Gray. - slenderleaf fleabane - JS, BC, & CS s.n.
Eupatorium serotinum Michx. - late eupatorium - JS, BC, & CS 8221; LS 3463
Evax candida (Torr. & Gray) Gray - silver pigmy cudweed - LS & JWS 2361
E. prolifera Nutt. ex DC. - bighead evax - JS 9279; LS 3694
E. verna Raf. - manystem evax - TWS 67; LS 3695
Gaillardia pulchella Foug. - Indian blanket - MM 110; JS 9306; JS & SH 9316; LS 3231
G. suavis (Gray & Engelm.) Britton & Rusby - rayless Indian blanket - JS 9211; LS 3527
**Gamochaeta falcata* (Lam.) Cabrera - cudweed - JS & SH 9356
G. pensylvanica (Willd.) Cabrera - cudweed - JS 8740; LS 2149; LS 3822
G. purpurea (L.) Cabrera - purple cudweed - LS 2173
Grindelia lanceolata Nutt. - narrowleaf gumweed - LS 3137
G. squarrosa (Pursh) Dunal - curly-cup gumweed - JS 9201
Gutierrezia sarothrae (Pursh) Britt. & Rusby - broom snakeweed - LS 3149
G. texana (DC.) Torr. & Gray - Texas snakeweed - JS 9484; LS 3150
Helenium amarum (Raf.) H. Rock var. *badium* (Gray ex Wats.) Waterfall - Basin sneezeweed - MM 90; LS 3234; LS 3487
H. elegans DC. var. *amphilobum* (Gray) Bierner - pretty sneezeweed - JS & AW 7749
H. microcephalum DC. var. *microcephalum* - smallhead sneezeweed - JS 9266
Helianthus annuus L. - common sunflower - JS & SH 9389; LS 3526
Heterotheca canescens (DC.) Shinnery - gray gold aster - AP 34
H. stenophylla (Gray) Shinnery - narrowleaf gold aster - AP 36; JS, BC, & CS 8203; JS & SH 9370; LS 3489; LS 3706
H. subaxillaris (Lam.) Britt. & Rusby - camphorweed - JS, BC, & CS 8202; TWS 01
Hymenopappus scabiosaesus L'Her. - flattop woolly-white - TWS 103; JS 9270; JS & SH 9323
Hymenoxys odorata DC. - western bitterweed - JS 8759
Krigia cespitosa (Raf.) Chamb. - weedy dwarf dandelion - JS 9239
K. wrightii (Gray) Chambers ex Kim - Wright's dwarfdandelion - LS & JWS 3204
Lactuca floridana (L.) Gaertn. - woodland lettuce - JS 9221
L. ludoviciana (Nutt.) Riddell - biannual lettuce - LS 3336
**L. serriola* L. - prickly lettuce - LS 4000
Liatris mucronata DC. - dotted gayfeather - JS, BC, & CS 8250; JS 10074; LS 3456
Lindheimeria texana Gray & Engelm. - Texas star - JS 9235; MM 95; JS & SH 9381
Lygodesmia texana (Torr. & Gray) Greene - Texas skeleton plant - TWS 106
Marshallia caespitosa Nutt. ex DC. var. *signata* Beadle & F.E. Boynt - Barbara's buttons - JS 9208
Melampodium leucanthum Torr. & Gray - plains blackfoot - JS & DP 9094; TWS 111
Packera glabella (Poir) C. Jeffrey - butterweed - LS 3181
P. texensis R.J. O' Kennon and D.K. Trock - Plateau groundsel - LS 3646
Palafoxia callosa (Nutt.) Torr. & Gray - small palafoxia - JS, BC, & CS 8201; JS 9217; JS, BC, & CS s.n.; JS & SH 9361; LS 3471
Palafoxia rosea (Bush) Cory var. *macrolepis* (Rydb.) B.L. Turner & Morris - rose palafoxia - JS 8455
Parthenium hysterophorus L. - Santa Maria feverfew - LS 3160
Pinaropappus roseus (Less.) Less. - white rocklettuce - LS 3248
Pluchea odorata (L.) Cass. - purple stinkweed - JS, BC, & CS 8244; LS 4126
Pseudognaphalium canescens (DC.) A. Anderberg - Wright cudweed - JS 8746; JS 9299; LS 2150

- P. obtusifolium* (L.) Hillard & Burt - rabbit-tobacco - LS 4124
P. stramineum (Kunth) A. Anderberg - cottonbatting plant - JS 8740; JS 9356
Pyrrhopappus pauciflorus (D. Don) DC. - smallflower desert-chicory - JS & SH 9386
Ratibida columnifera (Nutt.) Woot. & Standl. - upright prairie coneflower - JS, BC, & CS 8243;
 MM 104
Rudbeckia hirta var. *pulcherrima* Farw. - Farw. blackeyed Susan - LS 3876
Senecio ampullaceus Hook. - Texas groundsel - JS & DP 9068; MM 55; LS 3180
S. tridenticulatus Rydb. - three-tooth ragwort - JS & AW 7750
Silphium albiflorum Gray - white rosinweed - JS 9202
S. radula Nutt. - rough-stem rosinweed - LS 4028
Simsia calva (Engelm. & Gray) Gray - awnless bushsunflower - LS 3035
Solidago canadensis L. var. *scabra* Torr. & Gray - Canada goldenrod - JS & SH 9310
S. nemoralis Ait. - oldfield goldenrod - JS & SH 9309
S. petiolaris Aiton - downy ragged goldenrod - LS 4132
S. radula Nutt. - western rough goldenrod - LS 3461
 **Sonchus asper* (L.) Hill - spiny sowthistle - LS & JWS 3200
Symphotrichum drummondii (Lindley) G. Nesom subsp. *texanum* (Burgess) G. Nesom - Texas
 aster - JS, BC, & CS 8248
S. ericoides (L.) G. Nesom - heath aster - TWS 05; LS 3107
S. patens (Ait.) G. Nesom var. *patens* - barrens silky aster - TWS 08
S. pratense (Raf.) Nesom - barrens silky aster - JS & SH 9317; LS 3025; LS 3472
S. subulatum (Michx.) G. Nesom - hierba del marrano - JS 10079; JS 8453; LS 3106
Tetragonotheca texana Engelm. & Gray ex Gray - Plateau nerve ray - JS 9215
Tetranneuris linearifolia (Hook.) Greene - fineleaf four-nerve daisy - JS & SH 9380
T. scaposa (DC.) Greene - stemmed four-nerve daisy - JS & SH 9336; LS 2184; LS 3151
Thelesperma filifolium (Hook.) Gray var. *filifolium* - greenthread - TWS 80; AP 39
T. simplicifolium Gray - slender greenthread - JS & SH 9371; TWS 114
Thymophylla pentachaeta (DC.) Small - fiveneedle pricklyleaf - JS 8440; JS 7788; TWS 79;
 MM 46; LS 3034; LS 3142
T. tenuiloba (DC.) Small var. *tenuiloba* - bristleleaf pricklyleaf - LS & JWS 3214
Verbesina encelioides (Cav.) Benth. & Hook. f. ex Gray - cowpen daisy - JS 10070; LS 3049
V. virginica L. - white crown-beard - JS 9215
Vernonia baldwinii Torr. - western ironweed - LS 4029
V. lindheimeri Gray & Engelm. - woolly ironweed - AP 40; JS, BC, & CS s.n.; JS & SH 9382
Wedelia texana (Gray) B.L. Turner - orange zexmenia - JS 10099; LS 3230
Xanthisma texanum DC. subsp. *drummondii* (Torr. & Gray) J. Semple - sleepy-daisy - AW 120;
 LS 3813
Xanthium strumarium L. - abrojo - JS, BC, & CS 8249; LS 4127

BERBERIDACEAE

- Mahonia trifoliolata* (Moric.) Fedde - algerita - JS & AW 7748; TWS 29; LS 3649

BORAGINACEAE

- Buglossoides arvensis* (L.) I.M. Johnston - corn gromwell - LS 3655
Heliotropium tenellum (Nutt.) Torr. - pasture heliotrope - LS 3604
Lithospermum incisum Lehm. - narrowleaf stoneseed - LS 2154; LS 3643

BRASSICACEAE (CRUCIFERAE)

- Arabis petiolaris* (Gray) Gray - Brazos rockcress - LS 2171; LS 3228
 **Capsella bursa-pastoris* (L.) Medik. - shepherd's purse - TWS 72
Descurainia pinnata (Walt.) Britt. - western tansy mustard - MM 82; JS 8757; JS 8758
Draba cuneifolia Nutt. ex Torr. & Gray - wedge leaf whitlow grass - JS & DP 9090; LS 3652
D. platycarpa Torr. & Gray - broad pod whitlow grass - JS 8737; LS 3168; LS 3640; LS 3654
Lepidium austrinum Small - southern pepperwort - LS 2190
L. virginicum L. - Virginia pepperweed - TWS 91; JS 8751; LS 4260
Lesquerella argyraea (Gray) S. Wats. - silver bladderpod - AW 123; MM 48; LS & JWS 3194;
 LS 4259
L. densiflora (Gray) S. Wats. - denseflower bladderpod - JS & DP 9078; MM 97; LS 3239

- L. fendleri* (Gray) S. Wats. - Fendler's bladderpod - JS 8742
L. gordonii (Gray) S. Wats. - Gordon's bladderpod - LS & JWS 2348; LS 3169; LS 3190; LS & JWS 3193
 **Rorippa nasturtium-aquaticum* (L.) Hayek - watercress - MM 45
R. sessiliflora (Nutt.) A.S. Hitchc. - stalkless yellowcress - JS, BC, & CS 8209
R. teres (Michx.) R. Stuckey - southern marsh yellowcress - JS 8745; LS 4256
 **Sisymbrium altissimum* L. - tall tumbled mustard - LS 3174
 **S. irio* L. - London rocket - LS 4285
 **S. officinale* (L.) Scopoli - hedge mustard - JS, BC, & CS s.n.

BUDDLEJACEAE

- Polyppremum procumbens* L. - juniper leaf - JS, VA, DG, PH, CL, & TWS 8053; LS & JWS 3219

CACTACEAE

- Coryphantha sulcata* (Engelm.) Britt. & Rose - pineapple cactus - LS s.n. (photo)
Echinocactus texensis Hopffer - devil's pincushion cactus - JS s.n. (photo); LS 3708
Echinocereus reichenbachii (Terscheck ex Walp.) Haage var. *reichenbachii* - lace actus - JS s.n. (photo); LS & JWS 3218
E. triglochidiatus Engelm. - kingcup cactus - LS & JWS 3217
Mammillaria heyderi Muehlenpfordt - little nipple cactus - LS 3665
Opuntia engelmannii Salm-Dyck var. *lindheimeri* (Engelm.) Parfitt & Pinkava - Texas pricklypear - JS s.n. (photo); LS 4232
O. leptocaulis DC. - pencil cactus - JS 9242
O. macrorhiza Engelm. - twistspine pricklypear - LS 4233
O. phaeacantha Engelm. - tulip pricklypear - LS 4236
O. tunicata (Lehm.) Link & Otto var. *davisii* (Engelm. & Bigelow) L. Benson - thistle cholla - JS s.n. (photo)

CALLITRICHACEAE

- Callitriche heterophylla* Pursh - larger waterstarwort - JS 8744; LS & JWS 2360

CAMPANULACEAE

- Campanula reverchonii* Gray - basin bellflower - JS 10234
Triodanis coloradoensis (Buckl.) McVaugh - Colorado Venus' looking glass - JS 9274; LS & JWS 2372
T. leptocarpa (Nutt.) Nieuwl. - slimpod Venus' looking-glass - JS 9295
T. texana McVaugh - Texas Venus' looking-glass - LS & JWS 2371

CAPPARACEAE

- Polanisia decandra* (L.) DC. subsp. *trachysperma* (Torr. & Gray) H.H. Iltis - roughseed clammy weed - JS, VA, DG, PH, CL, & TWS 8055; JS 9269; LS 3530

CAPRIFOLIACEAE

- Lonicera albiflora* Torr. & Gray - western white honeysuckle - JS 9213; TWS 27; LS 3690
Viburnum rufidulum Raf. - rusty blackhaw - LS 3084; LS 3670

CARYOPHYLLACEAE

- Arenaria benthamii* Fenzl ex Torr. & Gray - hilly sandwort - LS 2185; LS 3681
Cerastium brachypodum (Engelm. ex Gray) B.L. Robins. - shortstalk chickweed - LS 2151; LS 3165; LS 3662
 **C. glomeratum* Thuillier - chickweed - JS & DP 9073
Paronychia jamesii Torr. & Gray - James' nailwort - JS, VA, DG, PH, & CL 8066
P. lindheimeri Engelm. ex Gray var. *lindheimeri* - forked nailwort - LS 3001; LS 3602
 **Polycarpon tetraphyllum* (L.) L. - fourleaf manyseed - JS, VA, DG, PH, & CL 8047; LS 3824
Silene antirrhina L. - sleepy silene - LS 3166; LS & JWS 3203
Stellaria media (L.) Vill. - common chickweed - LS 3637

CHENOPODIACEAE

- **Chenopodium album* L. var. *album* - pigweed - JS 8461
C. leptophyllum (Moq.) Nutt. ex S. Wats. - narrowleaf goosefoot - LS 3516

CISTACEAE

- Helianthemum georgianum* Chapman - Georgia frostweed - JS, VA, DG, PH, CL, & TWS 8054;
 LS 3314
Lechea san-sabeana (Buckl.) Hodgdon - San-Saba pinweed - JS, VA, DG, PH, CL, & TWS
 8059; LS 3324; LS 3351
L. tenuifolia Michx. - narrowleaf pinweed - LS 3316

CLUSIACEAE

- Hypericum drummondii* (Grev. & Hook.) Torr. & Gray - Drummond St. John's-wort - JS 9258;
 LS 3453; LS 4009
H. mutilum L. - dwarf St. John's-wort - JS 9284; LS & JWS 3207

CONVOLVULACEAE

- Convolvulus equitans* Benth. - Texas bindweed - MM 94; LS 4008
Dichondra recurvata Tharp & M.C. Johnston - oakwoods pony foot - LS 2160; LS & JWS
 3197
Evolvulus nuttallianus J.A. Schultes - shaggy dwarf morning glory - JS & SH 9324; LS 3691
E. sericeus Sw. - silver dwarf morning glory - JS & DP 9088; AP 44; JS & SH 9322; JS & SH
 9365
Ipomoea cordatotriloba Dennst. var. *torreyana* (Gray) D.F. Austin - purple bindweed - AW
 137; LS 3350
I. hederacea Jacq. - ivy-leaf morning-glory - JS, BC, & CS 8204
I. purpurea (L.) Roth - Mexican morning-glory - JS, BC, & CS s.n.

CORNACEAE

- Cornus drummondii* C.A. Mey. - roughleaf dogwood - LS 3704

CRASSULACEAE

- Crassula aquatica* (L.) Schoenl. - water pigmyweed - JS 7789; LS 2167
Sedum nuttallianum Raf. - Nuttall's stonecrop - JS 9267; LS 3327

CUCURBITACEAE

- Cucurbita foetidissima* Kunth - buffalo gourd - JS 9200; LS 3816
Ibervillea lindheimeri (Gray) Greene - Lindheimer globeberry - JS 8446; LS 4003
Melothria pendula L. - drooping melonette - LS 3585

CUSCUTACEAE

- Cuscuta indecora* Choisy - bigseed alfalfa dodder - JS 9293; JS & SH 9343; LS & JWS 2369

EBENACEAE

- Diospyros texana* Scheele - Texas persimmon - TWS 31; AP 41; LS 3701

ELATINACEAE

- Bergia texana* (Hook.) Seub. ex Walp. - Texas bergia - LS 4017
Elatine brachysperma A. Gray - shortseed waterwort - LS & JWS 3192

EUPHORBIACEAE

- Acalypha monococca* (Englem ex Gray) Mill. & Ghandi - slender three seed mercury - LS 3042;
 LS 3458; LS 4267
A. phleoides Cav. - shrubby copperleaf - LS 3032
Argythamnia aphoroides Muell.Arg. - Hill Country silverbush - LS 3491; LS 3608a
A. humilis (Engelm. & Gray) Muell.Arg. var. *humilis* - low wild mercury - JS 10090; LS 3080;
 LS 4254

- A. simulans* Ingram - Plateau silverbush - LS 3608b; LS 4030
Chamaesyce angusta (Engelm.) Small - blackfoot euphorbia - JS & SH 9379; LS 3026
C. fendleri (Torr. & Gray) Small - Fendler's sandmat - LS 3245
C. glyptosperma (Engelm.) Small - ribseed sandmat - LS 3129
C. maculata (L.) Small - spotted spurge - JS 10096; LS 3056
C. nutans (Lag.) Small - eyebane - JS 9205; LS 3511
C. prostrata (Ait.) Small - prostrate euphorbia - JS 8465
C. serpens (Kunth.) Small - mat spurge - JS & SH 9366
C. villifera (Scheele) Small - hairy euphorbia - JS & SH 9379
Cnidoscopus texanus (Muell.Arg.) Small - Texas bullnettle - LS 4234
Croton capitatus Michx. - hogwort - JS 8458
C. dioicus Cav. - grassland C. - JS 9275
C. fruticosus Torr. - bush C. - JS 8456; LS & JWS 2368; LS 3189
C. glandulosus L. - vente conmigo - JS & SH 9321
C. incanus Kunth on H.B.K. - Torrey's C. - JS 7796
C. lindheimerianus Scheele var. *lindheimerianus* - three-seed C. - JS, BC, & CS 8207; LS 4284
C. monanthogynus Michx. - one-seed C. - JS 8462; JS 10097; LS 3492
C. pottsii (Klotzsch) Muell.Arg. var. *pottsii* - leather weed C. - JS 9238
C. texensis (Klotzsch) Muell. - Texas croton - JS 8463; LS 3620; LS 4235
Euphorbia cyathophora Murr. - fire on the mountain - JS 10080
E. dentata Michx. - toothed spurge - JS 9204; LS 3459
E. marginata Pursh - snow-on-the-mountain - JS 10083; LS 3525
E. roemeriana Scheele - Roemer's euphorbia - JS 9273
E. spathulata Lam. - warty spurge - JS 9278; LS 3226
Phyllanthus polygonoides Nutt. ex Spreng. - smartweed leafflower - JS 9277; JS & SH 9385;
 TWS 115
Stillingia texana I.M. Johnston - Texas toothleaf - JS & SH 9387; TWS 98
Tragia ramosa Torr. - branched noseburn - TWS 89; JS & SH 9377; LS 3139

FABACEAE

- Acacia roemeriana* Scheele - roundflower catclaw - TWS 21; LS 3687
Astragalus crassicaarpus Nutt. var. *berlandieri* Barneby - groundplum milkvetch - LS 3182
A. lotiflorus - lotus milk vetch - LS 2186; LS 3683
A. nuttallianus DC. var. *nuttallianus* - smallflowered milk-vetch - MM 54; JS & DP 9070
A. plattensis Nutt. - Platte River milk-vetch - LS 2161
A. pleianthus (Shinners) Isely - Edwards Plateau milkvetch - LS 2175
Cercis canadensis L. var. *texensis* (S. Wats.) M. Hopkins - Texas redbud - LS 2182; LS 3675
Clitoria mariana L. - Atlantic pigeonwings - LS 3348; LS 4281
Dalea aurea Nutt. ex Pursh - golden prairieclover - JS 9260; JS, VA, DG, PH, & CL 8063; JS
 & SH 9375; LS 3611
D. frutescens Gray - black dalea - JS 10069; LS 3603
D. lasiathera Gray - purple prairieclover - TWS 96; JS & SH 9362; LS 3243
D. nana Torr. ex Gray - dwarf prairie clover - LS 3077; LS 3600
Desmanthus illinoensis (Michx.) MacM. ex B.L. Robins. & Fern. - prairie bundleflower - JS 9226
D. velutinus Scheele - velvet bundleflower - JS 8450; JS & SH 9383; LS 3343
D. virgatus (L.) Willd. var. *acuminatus* (Benth.) Isely - wild tanton - LS 3331
Desmodium paniculatum (L.) DC. - panicledleaf ticktrefoil - LS 3100; LS 4276
D. psilophyllum Schlecht. - simpleleaf ticktrefoil - LS 3099; LS 4275
Eysenhardtia texana Scheele - Texas kidneywood - JS 10068; LS 3616
Galactia heterophylla Gray - Gray's milkpea - LS 3872; LS 3997
G. texana (Scheele) Gray - Texas milkpea - JS & SH 9342
G. volubilis (L.) Britt. - downy milkpea - LS 3591
Indigofera miniata Ortega var. *texana* (Buckl.) B.L. Turner - Texas indigo - JS, BC, & CS s.n.;
 LS 3589

- Lespedeza stuevei* Nutt. - tall lespedeza - LS 3043; LS 4015
L. texana Britton - Texas lespedeza - LS 4022
Lotus unifoliolatus (Hook.) Benth. - Pursh deer vetch - JS & SH 9354; LS 3315
Lupinus texensis Hook. - Texas lupine - LS 3162
 **Medicago minima* (L.) L. - small medicago - JS & SH 9388; LS 3820
M. polymorpha L. - burclover - LS 3667; LS 3821
 **Melilotus officinalis* (L.) Lam. - yellow sweetclover - JS 8441
Mimosa aculeaticarpa Ortega var. *biuncifera* (Benth.) Barneby - catclaw - TWS 22; JS & DP 9091; LS 4005
M. borealis Gray - fragrant mimosa - JS 9224; TWS 14; LS 3688
M. nuttallii (DC.) B.L. Turner - catclaw sensitive brier - JS 9212
Pediomelum rhombifolium (Torr. & Gray) Rydb. - Gulf Indian breadroot - LS & JWS 3210; LS 3621
Prosopis glandulosa Torr. - honey mesquite - JS 9227; TWS 15
Psoraleidum tenuiflorum (Pursh) Rydb. - slimleaf scurfpea - JS & SH 9378
Rhynchosia minima (L.) DC. - least snoutbean - JS & SH 9311
R. senna Gillies ex Hook. var. *texana* (Torr. & Gray) M.C. Johnston - Texas snoutbean - AW 122; LS 3066; LS 4001
Senna pumilio (Gray) Irwin & Barneby - dwarf senna - JS & DP 9087; LS 3238
S. roemeriana (Scheele) Irwin & Barneby - two-leaf senna - JS & SH 9372
Sophora affinis Torr. & Gray - Eve's necklacepod - JS 9232; JS 9233; LS 3707
S. secundiflora (Ortega) Lag. ex DC. - mescal bean - LS 3087
Strophostyles helvula (L.) Ell. - trailing fuzzybean - JS, BC, & CS 8230; JS, BC, & CS s.n.; JS 9249
S. leiosperma (Torr. & Gray) Piper - slickseed fuzzybean - LS 3584
Tephrosia lindheimeri Gray - Lindheimer's hoarypea - LS 4237
Vicia ludoviciana Nutt. ssp. *ludoviciana* - deer pea vetch - JS & DP 9069; MM 66; JS, VA, DG, PH, & CL 8068; JS & SH 9352; LS 2170; LS & JWS 2349
Zornia bracteata J.F. Gmel. - viperina - LS 3455; LS 4014; LS 4270

FAGACEAE

- Quercus buckleyi* Nixon & Dorr - Texas red oak - Plateau live oak - JS 8449; LS 2181; LS 3650
Q. fusiformis Small - Plateau live oak - TWS 24; JS, VA, DG, PH, & CL 8061; LS 3679
Q. marilandica Muenchh. - blackjack oak - TWS 30; LS 3647
Q. sinuata Walt. var. *breviloba* (Torr.) C.H. Muller - bastard oak - JS 8062a; JS, VA, DG, PH, & CL 8062; LS 3678
Q. stellata Wangenh. var. *stellata* - post oak - TWS 17; LS 3664

FUMARIACEAE

- Corydalis micrantha* (Engelm. ex Gray) Gray subsp. *australis* (Chapman) G.B. Ownbey - JS & DP 9072; smallflower fumewort - LS 2176
C. curvisiliqua Engelm. subsp. *curvisiliqua* - curvepod fumewort - LS 3642

GENTIANACEAE

- Centaurium beyrichii* (Torr. & Gray) B.L. Robins. var. *beyrichii* - quinneweed - JS, VA, DG, PH, CL, & TWS 8039
C. calycosum (Buckl.) Fern. - Arizona centaury - JS, VA, DG, PH, & CL 8060; LS 3346
C. texense (Griseb.) Fern. - Lady Bird's centaury - JS, VA, DG, PH, & CL 8064
Eustoma russellianum (Hook.) G. Don - showy prairie gentian - JS & SH 9363
S. campestris Nutt. - Texas star - JS & SH 9353; LS 3313
S. formosa Buckl. - stately rose gentian - JS, VA, DG, PH, & CL 8074; LS 3881

GERANIACEAE

- **Erodium cicutarium* (L.) L'Her. ex Ait. - redstem stork's bill - TWS 76; JS 8760
E. texanum Gray - Texas stork's bill - LS 3170

Geranium carolinianum L. - Carolina geranium - LS 4266
G. texanum (Trel.) Heller - Texas geranium - LS 2145; LS 2169; LS 3187; LS 3666

HYDROPHYLLACEAE

Nama hispidum Gray - bristly nama - JS, VA, DG, PH, CL, & TWS 8051; LS 3588
N. jamaicense L. - Jamaicanweed - LS 3613
Phacelia congesta Hook. - caterpillars - AW 124; JS 9240

JUGLANDACEAE

Carya illinoensis (Wangenh.) K. Koch - pecan - JS 9223
Juglans major (Torr.) Heller - Heller Arizona walnut - LS 3669

KRAMERIACEAE

Krameria lanceolata Torr. - trailing krameria - JS & SH 9373; LS 3332

LAMIACEAE

Hedeoma acinoides Scheele - slender false pennyroyal - JS 9276
H. drummondii Benth. - Drummond's false pennyroyal - JS 9218; LS 3152
H. reverchonii (Gray) Gray var. *serpyllifolium* (Small) R.S. Irving - rock hedeoma - JS & SH 9384; LS 3601
Isanthus brachiatus (L.) B.S.P. - fluxweed - LS 3515
 **Lamium amplexicaule* L. - henbit deadnettle - LS 2143; LS 3638
 **Marrubium vulgare* L. - horehound - TWS 78
 **Mentha spicata* L. - spearmint - JS 9245
Monarda citriodora Cerv. ex Lag. - lemon beebalm - JS 9248; AP 33; JS & SH 9328; LS 3342
M. clinopodioides A. Gray - basil beebalm - LS 3873
Salvia azurea Michx. ex Lam. var. *grandiflora* Benth. - pitcher sage - LS 3078
S. farinacea Benth. - mealycup sage - JS & DP 9092; TWS 112
S. texana (Scheele) Torr. - Texas sage - LS 3023; LS 3686
Scutellaria drummondii Benth. - Drummond's skullcap - JS & DP 9067; LS 2172; LS 3188; LS 3518
S. wrightii Gray - Wright's skullcap - LS 3519
Teucrium canadense L. - Canada germander - JS 8062b
T. laciniatum Torr. - cut-leaf germander - LS 3884; LS 4253
Warnockia scutellarioides (Engelm. & Gray) M.W. Turner - prairie brazoria - JS 9241

LENTIBULARIACEAE

Utricularia gibba L. - humped bladderwort - JS 9254; LS 3338

LINACEAE

Linum berlandieri Hook. var. *berlandieri* - Berlandier's yellow flax - JS & SH 9320
L. hudsonioides Planch. - Texas flax - LS 3065; LS 3454
L. rigidum Pursh - stiffstem flax - JS 9219
L. rupestre (A. Gray) Engelm. ex A. Gray - rock flax - JS & SH 9357; LS 4006

LOASACEAE

Mentzelia nuda (Pursh) T. & G. - bractless mentzelia - JS & SH 9518
M. oligosperma Nutt. ex Sims. - chicken-thief - JS 9271; LS 3091; LS 3337
M. reverchonii (Urban & Gilg) Thomps. & Zavortink - Reverchon's blazingstar - JS 9302

LOGANIACEAE

Mitreola petiolata (J.F. Gmel.) Torr. & A. Gray - lax hornpod - LS 4040

LYTHRACEAE

Ammannia coccinea Rottb. - valley redstem - JS, BC, & CS 8021; LS 4034
Rotala ramosior (L.) Koehne - lowland rotala - LS 3002; LS 4035

MALVACEAE

- Abutilon fruticosum* Guill. & Perrottet - Texas Indian mallow - MM 81; JS & DP 9083
Callirhoe involucrata (Torr. & Gray) Gray - purple poppymallow - JS 9281; TWS 71
 **Malva parviflora* L. - cheeseweed mallow - LS 3177
Rhynchosida physocalyx (Gray) Fryxell - buffpetal - LS 3053
Sida abutilifolia P. Mill. - spreading fanpetals - MR s.n.; LS 3333
S. lindheimeri Engelm. & Gray - showy fanpetals - TWS 03; LS 4273
Sphaeralcea angustifolia (Cav.) G. Don - copper globemallow - MM 62; LS 3178; LS 3817

MELIACEAE

- **Melia azedarach* L. - Chinaberry - LS 3050

MENISPERMACEAE

- Cocculus carolinus* (L.) DC. - common moonseed - JS 10087; LS 3998

MOLLUGINACEAE

- **Glinus radiatus* (Ruiz & Pavon) Rohrb. - spreading sweetjuice - JS, BC, & CS 8208; JS & SH 9337
 **Mollugo verticillata* L. - green carpetweed - JS, BC, & CS 8211; JS & SH 9339; LS 3006; LS 3990

MORACEAE

- Morus microphylla* Buckl. - Texas mulberry - LS 3036

NYCTAGINACEAE

- Boerhavia diffusa* L. - scarlet spiderling - JS, BC, & CS 8236; LS 3483; LS 4129
B. erecta L. - erect spiderling - JS 9305
Mirabilis albida (Walt.) Heimerl - white four o'clock - JS 10098
M. linearis (Pursh) Heimerl - narrowleaf four o'clock - JS & SH 9338; LS 3085; LS 3452
M. latifolia (Gray) Diggs, Lipscomb, and O'Kennon - broadleaf four o'clock - LS 3038; LS 4279

OLEACEAE

- Forestiera pubescens* Nutt. - stretchberry - JS 8762; TWS 11; TWS 12; LS 3657
Menodora heterophylla Moric. ex DC. - low menodora - JS & DP 9085; JS 8761; LS 2183; LS 3244

ONAGRACEAE

- Calylophus berlandieri* Spach - Berlandier's sundrops - JS 9203; ACR 117; LS 3702
C. hartwegii (Benth.) Raven subsp. *pubescens* (Gray) Towner & Raven - Hartweg's sundrops - LS 3246
Gaura coccinea Nutt. ex Pursh - scarlet beeblossom - LS 3240; LS 3606; LS 3693
G. drummondii (Spach) Torr. & Gray - Drummond's beeblossom - LS 3235
G. parviflora Dougl. ex Lehm. - small flower gaura - JS 9263; LS 3236
G. triangulata Buckl. - prairie beeblossom - JS & SH 9334
Ludwigia palustris (L.) Ell. - marsh seedbox - LS 3068
L. peploides (Kunth) Raven - floating primrose-willow - JS 9256
L. repens J.R. Forst. - creeping primrose-willow - LS 3069; LS 4027
Oenothera laciniata Hill - cutleaf evening-primrose - JS & SH 9327; LS 3671
O. triloba Nutt. - stemless evening-primrose - JS 9259

OXALIDACEAE

- Oxalis corniculata* L. - creeping woodsorrel - MM 52; LS 3079
O. drummondii Gray - Drummond's woodsorrel - JS 10092; LS 3161

PAPAVERACEAE

- Argemone albiflora* Hornem. - bluestem pricklypoppy - MM 49

PASSIFLORACEAE

Passiflora tenuiloba Engelm. - birdwing passionflower - LS 3033

PEDALIACEAE

Proboscidea louisianica (Mill.) Thell. - common devil's claw - LS 4018

PHYTOLACCACEAE

Phytolacca americana L. - pokeweed - JS s.n.; LS 3145

Rivina humilis L. - rougeplant - JS, VA, DG, PH, & CL 8041; JS & SH 9325; LS 3494

PLANTAGINACEAE

Plantago helleri Small - Heller's plantain - MM 61

P. heterophylla Nutt. - slender plantain - LS 2168; LS 3663

P. patagonica Jacq. - woolly plantain - TWS 60; LS 3825

P. virginica L. - paleseed plantain - JS 9301; LS 2162; LS & JWS 2351

P. wrightiana Dcne. - Wright's plantain - LS & JWS 2352; LS & JWS 2370; LS 3826

POLEMONIACEAE

Gilia rigidula Bentham - bluebowls - JS 9210; TWS 113

Ipomopsis rubra (L.) Wherry - standing cypress - JS 9230; AP 38

Phlox drummondii Hook. subsp. *macallisteri* (Whitehouse) Wherry - McAllister's phlox - MM 86; LS 3672

P. pilosa L. subsp. *latisepala* Wherry - downy phlox - JS, VA, DG, PH, CL, & TWS 8052

P. roemeriana Scheele - goldeneye phlox - JS 9300

POLYGALACEAE

Polygala alba Nutt. - white milkwort - JS & SH 9368

P. lindheimeri Gray - shrubby milkwort - JS & SH 9374

POLYGONACEAE

Eriogonum annuum Nutt. - annual buckwheat - JS, VA, DG, PH, CL, & TWS 8057; JS 8447; TWS 07; LS 4002

E. longifolium Nutt. - longleaf buckwheat - LS 3024

E. multiflorum Benth. - heart sepal buckwheat - JS 8452; JS, BC, & CS 8245

E. tenellum Torr. var. *ramosissimum* Benth. - tall buckwheat - JS 8442; JS, BC, & CS 8205; JS & SH 9359; LS 3040; LS 3520

Polygonum hydropiperoides Michx. - swamp smartweed - JS & SH 9351; LS 3469; LS 3480

**P. lapathifolium* L. - curltop smartweed - JS, BC, & CS 8210

**Rumex crispus* L. - curly dock - LS 2147

R. hastatulus Baldw. - heartwing sorrel - LS & JWS 2366

PORTULACACEAE

Portulaca halimoides L. - silkcotton purslane - JS & SH 9331

**P. oleracea* L. - little hogweed - LS & JWS 1597

P. pilosa L. - kiss me quick - LS 3029

P. umbraticola Kunth - wingpod purslane - JS & SH 9333; LS 3484; LS 4021

Talinum aurantiacum Engelm. - orange fameflower - LS 3615

T. parviflorum Nutt. - prairie flameflower - JS 8459; LS & JWS 2362

PRIMULACEAE

**Anagallis minima* (L.) Krause - chaffweed - LS & JWS 2363; LS & JWS 3205

Samolus ebracteatus Kunth subsp. *cuneatus* (Small) R. Knuth - limewater brookweed - JS 9283

S. valerandi L. subsp. *parviflorus* (Raf.) Hulten - seaside brookweed - JS, VA, DG, PH, & CL 8073; LS 3593; LS 4277

RAFFLESIIACEAE

Pilostyles thurberi Gray - Thurber's stemsucker - LS 3624

RANUNCULACEAE

- Anemone berlandieri* Pritz. - ten-petal anemone - JS 8739; LS 3648
Clematis drummondii Torr. & Gray - Drummond's clematis - LS 3031
Delphinium carolinianum Walt. subsp. *virescens* (Nutt.) R.E. Brooks - prairie larkspur - JS 9268; LS 3703
Ranunculus pusillus Poir. - weak buttercup - LS & JWS 3206

RHAMNACEAE

- Condalia viridis* I.M. Johnston - green snakewood - LS 3027
Frangula caroliniana (Walt.) Gray - Carolina buckthorn - JS 7786; LS 4240
Ziziphus obtusifolia (Hook. ex Torr. & Gray) Gray - lotebush - TWS 13
 **Z. zizyphus* (L.) Karst. - common jujube - LS 3051; LS 3814

ROSACEAE

- Prunus angustifolia* Marsh. - chickasaw plum - JS 9216
 **P. persica* (L.) Batsch - peach - LS 2146
Rubus trivialis Michx. - southern dewberry - JS 8459; LS 3698

RUBIACEAE

- Cephalanthus occidentalis* L. - common buttonbush - JS, VA, DG, PH, & CL 8071; LS 3595
Diodia teres Walt. var. *teres* - poorjoe - LS 3028; LS 3098; LS 3468
Galium aparine L. - catchweed bedstraw - JS 8461; LS 2144
G. texense Gray - Texas bedstraw - JS & DP 9071; LS 2174; LS 3172
G. virgatum Nutt. - southwestern bedstraw - LS 2157; LS & JWS 2373
Hedyotis nigricans (Lam.) Fosberg - diamondflowers - JS 9261; JS & SH 9367; LS 3344
Houstonia pusilla Schoepf - tiny bluet - JS 7790; LS 3185

RUTACEAE

- Ptelea trifoliata* L. subsp. *trifoliata* var. *mollis* Torr. & Gray - woolly hoptree - LS 3083; LS 4241
Thamnosma texana (Gray) Torr. - rue of the mountains - JS & DP 9086; LS 3153
Zanthoxylum hirsutum Buckl. - Texas Hercules' club - JS, VA, DG, PH, CL, & TWS 8056; LS 3232

SALICACEAE

- Salix nigra* Marsh. - black willow - JS 9229; LS 3668

SAPINDACEAE

- Sapindus saponaria* L. var. *drummondii* (Hook. & Arn.) L.D. Benson - western soapberry - TWS 23
Ungnadia speciosa Endl. - Mexican buckeye - JS & SH 9388; LS 3184; LS 3676

SAPOTACEAE

- Sideroxylon lanuginosum* Michx. - gummy bumelia - JS 8464 & JS 9220; TWS 09

SAXIFRAGACEAE

- Lepuropetalon spathulatum* Ell. - petiteplant - JS 7795

SCROPHULARIACEAE

- Bacopa rotundifolia* (Michx.) Wettst. - disk water hyssop - JS & SH 9348; LS 3509
Buchnera americana L. - American bluehearts - JS 9286; LS 3070; LS 3341
Castilleja indivisa Engelm. - entireleaf Indian paintbrush - TWS 70; LS 3699
C. purpurea (Nutt.) G. Don var. *lindheimeri* (Gray) Shinnars - Lindheimer's Indian paintbrush - LS 4239
Leucospora multifida (Michx.) Nutt. - narrowleaf paleseed - LS 3075; LS 4016
Lindernia dubia (L.) Pennell var. *anagallidea* (Michx.) Cooperrider - yellowseed false pimpernel - JS, BC, & CS 8227; LS 3014; LS 3583
Maurandella antirrhiniflora (Humb. & Bonpl. ex Willd.) Rothm - roving sailor - JS s.n.; LS 3495
Mecardonia procumbens (Mill.) Small - prostrate water-hyssop - prostrate water-hyssop - JS 9247
Mimulus glabratus Kunth var. *jamesii* (T. & G. ex Benth) Gray - James' monkeyflower - MM 53; JS & DP 9074; LS 3074; LS 4278

Nuttallanthus texanus (Scheele) D.A. Sutton - toadflax - JS 7791; LS 3163

Penstemon cobaea Nutt. - cobaea beardtongue - JS 9265; LS 3709

**Verbascum thapsus* L. - common mullein - LS 3067; LS 4128

**Veronica arvensis* L. - corn speedwell - LS 2152; LS 3233

V. peregrina L. - neckweed - JS & DP 9076; LS 2159; LS 3164

SOLANACEAE

Bouchetia erecta DC. - painted tongue - JS & DP 9066

Calibrachoa parviflora (Juss.) D'Arcy - seaside petunia - LS 3183

Chamaesaracha coniodes (Moric. ex Dunal) Britton - ground saracha - LS 3599

C. sordida (Dunal) Gray - hairy five eyes - JS & DP 9084

Physalis cinerascens (Dunal) A.S. Hitchc. - smallflower groundcherry - LS & JWS 2350; LS 3102; LS & JWS 3195

Physalis heterophylla Nees - clammy groundcherry - LS 3227; LS 3614

Solanum citrullifolium A. Br. var. *citrullifolium* - melon nightshade - JS, BC, & CS 8239

S. dimidiatum Raf. - western horse nettle - JS 10094; LS 3529

S. elaeagnifolium Cav. - silverleaf nightshade - TWS 87

S. ptychanthum Dunal - west Indian nightshade - LS 3101

S. rostratum Dunal - buffalobur nightshade - JS 8444; LS 3528

S. triquetrum Cav. - Texas nightshade - MM 50

STERCULIACEAE

Hermannia texana Gray - Texas burstwort - JS, VA, DG, PH, & CL 8065; LS 3041; LS 3883

ULMACEAE

Celtis laevigata Willd. var. *reticulata* Torr. - netleaf hackberry - TWS 26; JS 9228; LS 3677

U. americana L. - American elm - JS 9222; LS 3175; MM 77

U. crassifolia Nutt. - cedar elm - TWS 19

URTICACEAE

Parietaria pensylvanica Muhl. ex Willd. - Pennsylvania pellitory - JS, VA, DG, PH, & CL 8075; LS 2177; LS 3223

Urtica chamaedryoides Pursh - heart-leaf nettle - JS 10072

VALERIANACEAE

Valerianella amarella (Lindh. ex Engelm.) Krok - hairy corn salad - JS 8441

VERBENACEAE

Aloysia gratissima (Gillies & Hook.) Troncoso - whitebrush - JS & DP 9080; TWS 32; LS 3815

Lippia nodiflora (L.) Michx. - turkey tangle frogfruit - LS 3007; LS 3473; LS 3607

Glandularia bipinnatifida (Nutt.) Nutt. var. *bipinnatifida* - Dakota vervain - JS, BC, & CS 8246; LS 2155; LS 2188

G. pumila (Rydb.) Unger - pink vervain - JS 7792; LS 2156; LS 3167; LS 4257

Verbena bracteata Lag. & Rodr. - bigbract verbena - JS & SH 9369

**Verbena brasiliensis* Vell. - Brazilian vervain - JS & SH 9326; LS 3317

V. canescens Kunth - gray vervain - JS & SH 9360; LS 3242

V. halei Small - Texas vervain - TWS 02; AP 43; LS 4272

V. plicata Greene - fanleaf vervain - LS 3171; LS 4255

VIOLACEAE

Hybanthus verticillatus (Ort.) Baill. var. *verticillatus* - whorled nod violet - JS 8738; LS 3221

Viola sororia Willd. - sister violet - JS 8446

VISCACEAE

Phoradendron tomentosum (DC.) Engelm. ex Gray - Christmas mistletoe - JS, BC, & CS 8240; JS 7787; LS 3645

VITACEAE

Ampelopsis cordata Michx. – heartleaf peppervine - LS 4280

Cissus incisa Des Moulins - ivy treebine - JS 8448; JS, BC, & CS 8226; LS 3326

Parthenocissus heptaphylla (Buckl.) Britt. ex Small - sevenleaf creeper - LS 3030; LS 3325;
LS 4004

Vitis cinerea (Engelm.) Millard - graybark grape - LS 3082

V. monticola Buckley - sweet mountain grape - LS 3089

V. mustangensis Buckl. - mustang grape - JS 9246; LS 3700

ZYGOPHYLLACEAE

Kallstroemia parviflora Norton - warty caltrop - LS 4258

**Tribulus terrestris* L. - puncturevine - JS & SH 9318; LS 3486



Online Supplementary Appendix 2 to: Singhurst, J.R., L.L. Sanchez, D. Frels, Jr., T.W. Schwertner, M. Mitchell, S. Moren, and W.C. Holmes. 2007. The Vascular Flora of Mason Mountain Wildlife Management Area, Mason County, Texas. Southeastern Naturalist 6(4):683–692.

Plant associations

Two associations are reported for the first time as occurring in Texas (The Nature Conservancy 1997). These include the Blackjack Oak-Post Oak-Mesquite/Texas Pricklypear and the Blackjack Oak-Post Oak/Little Bluestem-Side Oats Grama associations. Both are currently known from the Wichita and Quartz Mountains of Oklahoma (National Vegetation Classification System 1997). Two others, Roundleaf Catclaw-Texas Yucca-Texas Prickly Pear-Agarito and the Texas Persimmon-Agarito-Plateau Live Oak-Texas Red Oak are described as new plant associations. Both are probably restricted to the Llano Uplift of central Texas.

The name, location, and a short description emphasizing the major characteristic species, soils, and geology of each association follow. In an effort for brevity, it should be noted that the woodland associations are all of a stunted nature, with trees being 2–10 m tall.

NATURAL TERRESTRIAL ASSOCIATIONS

SANDSTONE TYPES

Roundleaf Catclaw-Texas Yucca/Texas Pricklypear-Agarito Association encompasses 12.4 ha (30.7 ac) of small ridge top sandstone outcrops on the Nebgen-Oben complex developed on the Hickory Sandstone Formation. Slopes vary from 1–8%. This association is fairly open, largely lacks trees, and is sparsely covered with small shrubs, cacti, and small tufts of perennial grasses. Ferns commonly occur under east- and northeast-facing hanging rock shelves. Dominant shrubs include *Acacia roemeriana*, *Mahonia trifoliolata*, *Opuntia engelmannii* var. *lindheimeri* and *Yucca rupicola*. Less frequently occurring woody shrubs and cacti include *Diospyros texana*, *Echinocereus reichenbachii* var. *reichenbachii*, *Echinocactus texensis*, *Opuntia leptocaulis*, and *Rhus trilobata* var. *trilobata*. Common graminoids include *Aristida purpurea* var. *wrightii*, *Bouteloua gracilis*, *B. hirsuta*, *Buchloe dactyloides*, *Erioneuron pilosum*, *Hilaria belangeri*, and *Vulpia octoflora*. Herbaceous species include *Artemisia ludoviciana* subsp. *mexicana*, *Chaetopappa bellidifolia*, *Chamaesyce serpens*, *C. villifera*, *Cheilanthes tomentosa*, *Croton texensis*, *Dalea aurea*, *Erigeron modestus*, *Evax prolifera*, *Evolvulus sericeus*, *Gaillardia suavis*, *Galium texanum*, *Hedeoma drummondii*, *Hedyotis nigricans*, *Mimosa nuttallii*, *Mirabilis linearis*, *Paronychia jamesii*, *Pellea wrightiana*, *Selaginella wrightii*, and *Verbena canescens*.

Mesquite-White Brush-Texas Pricklypear-Texas Persimmon Association comprises 103.4 ha (255.4 ac) on Ligon fine sandy loam, Nebgen-Oben complex, and Keese gravelly sandy loam both on the Hickory Sandstone and Packsaddle Schist Formations. Slopes vary from 1–5%. These areas have been subjected to tillage and surface scrapage in the past, resulting in nearly impenetrable stands of *Aloysia gratissima*, *Diospyros texana*, *Opuntia engelmannii* var. *lindheimeri*, and *Prosopis glandulosa*. Common grasses included *Aristida oligantha*, *Bothriochloa ischaemum* var. *songarica*, *Bromus japonicus*, *Buchloe dactyloides*, and *Sorghum halepense*. The herbaceous vegetation consisted of *Ambrosia artemisiifolia*, *Amphiachyris dracunculoides*, *Boerhavia erecta*, *Chenopodium album*, *Clematis drummondii*, *Cuscuta indecora*, *Froelichia gracilis*, *Glandularia bipinnatifida* var. *bipinnatifida*, and *Ratibida columnifera*.

GRANITE TYPES

Blackjack Oak-Post Oak-Mesquite/Texas Prickly Pear Association occupies 116.3 ha (287.3 ac) on a variety of granite gravel and granite sands, which include the Keese-Rock outcrop complex, Voca gravelling sandy loam, and Click gravelly coarse sandy loam, all of the Katemcy Granite Formation. Slopes are gentle and vary from 1–8%. Historically, these areas were probably oak savannas with inter-dispersed grassland openings. The current abundance of invasive species such as mesquite and prickly pear and general lack of bunch grasses, suggest change brought about by severe livestock overgrazing. Other shrub and vine species include *Cocculus carolinus*, *Diospyros texana*, *Echinocereus reichenbachii* var. *reichenbachii*, *Ibervillea lindheimeri*, *Matelea reticulata*, *Opuntia leptocaulis*, *Rubus trivialis*, *Smilax bona-nox*, and *Toxicodendron radicans*. Non-woody vegetation is dominated by early successional grasses such as *Aristida oligantha*, *Bothriochloa ischaemum* var. *songaria*, *Bromus japonicus*, *Vulpia octoflora* and scattered, but infrequent, patches of *Bouteloua curtipendula* var. *curtipendula*, *Chloris cucullata*, *Eragrostis secundiflora* subsp. *oxylepis*, and *Schizachyrium scoparium*.

Blackjack Oak-Post Oak/Little Bluestem-Side Oats Grama Association includes 624.8 ha (1543.9 ac) on the Keese-Rock outcrop complex and Voca gravelling sandy loam. Slopes vary from 1–30%. The association is a mosaic of *Quercus* spp.-dominated woodlands and savannas with an extremely diverse ground cover. These areas are currently subjected to moderate grazing pressure by both native and exotic ungulates. Common cacti include *Coryphantha sulcata*, *Echinocereus reichenbachii* var. *reichenbachii*, *Echinocactus texensis*, *Echinocereus triglochidiatus* and *Mammillaria heyderi*. Typical vines include *Cocculus carolinus*, *Matelea reticulata*, and *Smilax bona-nox*. Most of the ground cover consists of grasses, particularly *Bouteloua curtipendula* var. *curtipendula* and *Schizachyrium scoparium*. Less frequent graminoids include *Aristida purpurea* var. *longiseta*, *A. purpurea* var. *wrightii*, *Bothriochloa laguroides* subsp. *torreyana*, *Bouteloua hirsuta*, *B. pectinata*, *B. rigidiseta*, *Chloris cucullata*, *Eragrostis secundiflora*, *Leptochloa dubia*, *Panicum hallii* var. *hallii*, *P. linearifolium*, *Paspalum pubiflorum*, *P. setaceum*, *Schedonnardus paniculatus*, *Sorghastrum nutans*, *Sphenopholis obtusa*, *Sporobolus cryptandrus*, and *Tridens flavus*.

The Nuttall's Stone Crop-Peruvian Spikemoss-American Tripogon-Grama Grass Granite Outcrop Association consists of 201.1 ha (496.9 ac) of exposed granite surfaces and occurs on slope positions of 1–30% on a variety of bare granite, granite gravel, and granite sands, including the Keese-Rock outcrop complex and Voca gravelly sandy loam over the Katemcy Formation granite. The association is best developed at the base of large and small patch openings within the *Quercus marilandica*-*Q. stellata*/*Schizachyrium scoparium*-*Bouteloua curtipendula* association. These sites have scattered soil-filled depressions, crevices, gravel areas, and shallow vernal pools inhabited by annuals and species adapted to extreme drought. Species that occur in shallow sand or gravel accumulations include *Aphanostephus skirrhobasis*, *Helenium amarum*, *Hypericum gentianoides*, *Sedum nuttallianum*, *Plantago wrightiana*, and *Talinum parviflorum*. Areas with deeper soils are dominated by *Schizachyrium scoparium* and a lesser abundance of *Aristida purpurea* var. *longiseta*, *B. curtipendula* var. *curtipendula*, and *Bouteloua hirsuta*. Bare rock is occupied by scattered patches of crustose and foliose lichens, mosses, and several ferns and fern allies, including *Cheilanthes lindheimeri*, *C. tomentosa*, *Selaginella arenicola* subsp. *riddellii*, *S. peruviana*, *Pellaea wrightiana*, and *Woodsia obtusa* subsp. *occidentalis*.

Pecan-Black Willow-American Elm/Buttonbush Association occurs in intermittent streams and seasonally wet depression drainages in both the Katemcy and Edwards Formations. Slope is gentle (1–5%) and consists of 34.2 ha (84.6 ac). Small, seasonally intermittent seeps occur between the granite domes, often stair-stepping down slope to fluvial intermittent creek drainages. These drainages are defined by streambeds with seasonal ponded water in Katemcy and Pontotoc fine sandy loam. This association exhibits a sharp ecotone with the *Quercus marilandica*-*Q. stellata* / *Schizachyrium scoparium*-*Bouteloua curtipendula* var. *curtipendula* association. The vegetation has a well-defined overstory and a generally sparse shrub layer. Additional canopy associates include *Ulmus crassifolia* and *Celtis laevigata* var. *reticulata*. Additional understory shrubs and vines include *Cissus incisa*, *Cocculus carolinus*, *Cornus drummondii*, *Diospyros texana*, *Parthenocissus heptaphylla*, *Sapindus saponaria* var. *drummondii*, *Smilax bona-nox*, *Sophora affinis*, and *Toxicodendron radicans*. Diagnostic graminoids include *Andropogon*

glomeratus, *Dichantheium acuminatum* var. *lindheimeri*, *Elymus canadensis*, *Melica nitens*, *Muhlenbergii lindheimeri*, *Nassella leucotricha*, *Panicum hallii* var. *hallii*, *P. virgatum*, *Paspalum setaceum* var. *stramineum* and *Tridens flavus*.

LIMESTONE TYPES

Plateau Live Oak-Texas Red Oak-Ashe Juniper-Mesquite Association covers 174.2 ha (430.5 ac) in canyons with steep slopes of 20–40% and in Bracket cobbly loam clay soils formed from the Edwards Limestone Formation. Canopy cover is between 65–85%, and because of their location in small canyons, occurrences of this association are largely protected from fire. Other woody species occurring in the area are *Cercis canadensis* var. *texensis*, *Cocculus carolinus*, *Cornus drummondii*, *Diospyros texana*, *Forestiera pubescens*, *Frangula caroliniana*, *Lonicera albiflora*, *Mahonia trifoliolata*, *Matelea edwardsensis*, *Morus microphylla*, *Quercus sinuata* var. *brevifolia*, *Parthenocissus heptaphylla*, *Ptelea trifoliata* var. *mollis*, *Sideroxylon lanuginosum*, *Smilax bona-nox*, *Sophora secundiflora*, *Rubus trivialis*, *Toxicodendron radicans*, *Ungnadia speciosa*, *Viburnum rufidulum*, and *Vitis monticola*. Herbaceous flora includes *Arabis petiolaris*, *Brickellia eupatorioides*, *Cheilanthes alabamensis*, *Clitoria mariana*, *Dichantheium acuminata* var. *lindheimeri*, *Galactia volubilis*, *Gilia rigidula*, *Isanthus brachiatus*, *Maurandella antirrhiniflora*, *Melica nitens*, *Panicum hallii* var. *hallii*, *Passiflora tenuiloba*, *Pellaea atropurpurea*, *P. ovata*, *Phacelia congesta*, *Simsia calva*, *Solidago nemoralis*, *Tradescantia edwardsiana*, and *Wedelia texana*.

Texas Persimmon-Agarito-Plateau Live Oak-Texas Red Oak Association comprises 119.1 ha (294.4 ac) on steep slopes of 20–40% located on the Edwards Limestone Formation. The surface geology consists of chalky, white, eroded limestone and small pockets of Brackett cobbly loam and clay soils. These sites are sparsely vegetated and are comprised mostly of shrubs, infrequent stunted trees, and a moderately rich herbaceous flora. Other woody plants include *Croton fruticosus*, *C. pottsii*, *Eysenhardtia texana*, *Forestiera pubescens*, *Nolina lindheimeri*, *N. texana*, and *Rhus trilobata* var. *trilobata*. Herbaceous flora includes *Asclepias asperula*, *Bouteloua gracilis*, *Calylophus berlandieri*, *Chaetopappa bellidifolia*, *Chamaesyce serpens*, *C. villifera*, *Croton lindheimerianus* var. *lindheimerianus*, *Dalea aurea*, *Erioneuron pilosum*, *Gilia rigidula*, *Helenium microcephalum* var. *microcephalum*, *Linum berlandieri*, *Marshallia caespitosa*, *Mentzelia reverchonii*, *Mirabilis linearis*, *Palafoxia callosa*, *Paronychia lindheimeri*, *Penstemon cobaea*, *Polygala alba*, *P. lindheimeri*, *Silphium albiflorum*, and *Stillingia texana*.

Plateau Live Oak-Texas Red Oak-Netleaf Hackberry-Ashe Juniper Woodland and Glades consists of 100 ha (247.2 ac) on the upper edges of canyons on the Edwards Limestone. The rolling terrain has slopes of 1–20%. This association is basically an oak mott-savanna complex with patches of midgrass prairie occurring on the highest mesa tops that consist of the Tarrant clay and Bracket cobbly loam soils. Other common woody plants include *Cercis canadensis* var. *texensis*, *Diospyros texana*, *Forestiera pubescens*, *Mahonia trifoliolata*, *Matelea reticulata*, *Parthenocissus heptaphylla*, *Smilax bona-nox*, *Sophora secundiflora*, *Toxicodendron radicans*, and *Yucca rupicola*. Graminoid flora includes *Aristida purpurea* var. *wrightiana*, *Bouteloua curtipendula* var. *curtipendula*, *Carex planostachys*, *Elymus virginicus*, *Erioneuron pilosum*, *Schizachyrium scoparium*, *Sorghastrum nutans*, *Sphenopholis obtusata*, and *Tridens muticus*. Herbaceous flora includes *Ambrosia artemisiifolia*, *Brickellia eupatorioides*, *Galactia texana*, *Gilia rigidula*, *Glandularia pumila*, *Hymenopappus scabiosaeus*, *Lesquerella densiflora*, *Liatris mucronata*, *Melampodium leucanthum*, *Palafoxia callosa*, *Parietaria pensylvanica*, *Rhynchosia minima*, *Salvia farinacea*, *Senna roemeriana*, *Stillingia texana*, *Tetraeneuris scapos*, *Thelesperma simplicifolium*, *Vernonia lindheimeri*, and *Viguiera dentata*.

Several small glade openings occur on the flat, massive exposures of Edwards Limestone within the association and consist of very shallow depressions that accumulate soil. This community is dominated by *Sedum nuttallianum* and *Nostoc commune* (Nostocaceae, Cyanophyta), but vegetative cover is generally less than 10%, even during wet periods. Associated species include *Allium drummondii*, *Centaurium texense*, *Chaetopappa asteroides*, *Cooperia pedunculata*, *Draba cuneifolia*, *Evax prolifera*, *Hedeoma acinoides*, *Houstonia pusilla*, *Paronychia jamesii*, *Rotala ramosior*, *Veronica peregrina*, and *Vulpia octoflora* var. *octoflora*.

Bastard Oak-Texas Red Oak-Netleaf Hackberry-Texas Red Bud Association consists of 100 ha (247.2 ac) of moderately steep slopes of 1–20% on the upper edges of canyons and rolling terrain on Edwards Limestone Formation. This association is basically an oak savanna complex that occurs on the highest mesa tops on Brackett cobbly loam and Tarrant clay soils. These sites are characterized by low-growing trees and patches of mid-grass prairie. Other woody species include *Forestiera pubescens*, *Juniperus ashei*, *Matelea reticulata*, *Parthenocissus heptaphylla*, *Rhus lanceolata*, *Smilax bona-nox*, *Toxicodendron radicans*, *Yucca rupicola*, and *Ziziphus obtusifolia*. Graminoid flora includes *Aristida purpurea* var. *wrightiana*, *Bouteloua curtipendula* var. *curtipendula*, *B. rigidiseta*, *B. pectinata*, *Bothriochloa laguroides* subsp. *torreyana*, *Erioneuron pilosum*, *Hilaria belangeri*, and *Sphenopholis obtusata*. The herbaceous flora is characterized by *Asclepias verticillata*, *Calylophus berlandieri*, *Centaureum beyrichii*, *Dalea aurea*, *Delphinium carolinianum* subsp. *virescens*, *Euphorbia spathulata*, *Galactia texana*, *Hedeoma reverchonii* var. *serpyllifolium*, *Hybanthus verticillatus* var. *verticillatus*, *Krameria lanceolata*, *Lesquerella densiflora*, *Liatris mucronata*, *Penstemon cobaea*, *Senna roemeriana*, *Stillingia texana*, *Tetragonotheca texana*, and *Thelesperma simplicifolium*.

DISTURBED TERRESTRIAL ASSOCIATIONS

DISTURBANCE TYPES

King Ranch Bluestem-Red Love Grass-Silver Bluestem-Camphorweed Association comprises 209.9 ha (518.4 ac) on relatively flat slopes of less than 5% of the Katemcy, Ligon, Lone Oak, and Shep fine sandy loams and the Campair fine sands of the Hensell Sand Formation (Fig. 1). All sites were formerly tilled. These sites are dominated by xeric areas with herbaceous flora, with many species being limited to this association. Other commonly occurring plants include *Aphanostephus skirrhobasis*, *Asclepias oenotheroides*, *Croptilon divaricatum*, *Cyperus echinatus*, *C. odoratus*, *Descurainia pinnata*, *Eriogonum multiflorum*, *Froelichia floridana* var. *floridana*, *Indigofera miniata* var. *texana*, *Lechea tenuifolia*, *Mentzelia nuda*, *Mirabilis albidia*, *Monarda citriodora*, *Nama hispidum*, *Palafoxia rosea* var. *macrolepis*, *Polypremum procumbens*, *Rumex hastatulus*, *Selaginella arenicola* subsp. *riddellii*, *Senecio ampullaceus*, *Thelesperma filifolium*, *Tradescantia pedicellata*, and *Zornia bracteata*.

Side Oats Grama-Little Bluestem-Silver Bluestem-King Ranch Bluestem Association comprises 58.3 ha (144 ac) on relatively flat slopes of 5% on Nurkum clay and Shep fine sandy loam on the Hensell Sand and Katemcy Formation. These sites were formerly tilled and are now in early successional stages of recovery. Other herbaceous associates include *Abutilon fruticosum*, *Asclepias viridiflora*, *Ambrosia artemisiifolia*, *Amphiachyris dracunculoides*, *Aristida purpurea* var. *wrightii*, *Buchloe dactyloides*, *Chloris cucullata*, *Croton capitatus*, *Eragrostis intermedia*, *Eragrostis secundiflora*, *Desmanthus illinoensis*, *Froelichia gracilis*, *Gaura parviflora*, *Hymenopappus scabiosaeus*, *Lindheimera texana*, *Menodora heterophylla*, *Monarda citriodora*, *Ratibida columnifera*, *Senna pumilio*, *Senna roemeriana*, *Sorghum halepense*, *Verbena halei*, and *Vulpia octoflora* var. *octoflora*.

NATURAL AQUATIC ASSOCIATIONS

NATURAL WETLAND TYPES

Pond, springs, and vernal pools are wetland features totaling 15.4 ha (38.1 ac) that include two natural ponds, 2 springs, and 34 vernal pools. The ponds, maintain a fairly constant pool level during normal rainfall years. Springs primarily occur at a contact of just below *Sedum nuttallianum*-*Selaginella peruviana* and *Quercus marilandica*-*Q. stellata* / *Schizachyrium scoparium*-*Bouteloua curtipendula* var. *curtipendula* associations. Submerged and floating aquatics include *Chara* sp. (Characeae), *Najas guadalupensis*, *Pilularia americana*, *Potamogeton pusillus*, *Utricularia gibba*, and *Wolffia columbiana*. Typical emergent species include *Eleocharis obtusa*, *E. parvula*, *Juncus marginatus*, and *Typha latifolia*.

Vernal pools (Keeley and Zedler 1998), seasonal isolated wetlands formed in depressions of

the Katemcy Granite Formation, are restricted to eroded depressions in the granite domes within the *Sedum nuttallianum*-*Selaginella peruviana* granite outcrops. Each pool has an independent hydrology. Species that are restricted to these pools include *Bacopa rotundifolia*, *Crassula aquatica*, *Heteranthera limosa*, *Isoetes lithophila*, and *I. peidmontana*. Other aquatics include *Eleocharis parvula*, *Hypericum mutilum*, *Juncus diffusissimus*, and *Potamogeton nodosus*.

The natural springs flow most of the year, except in periods of extreme drought. The dominant shrub and vine species include *Cephalanthus occidentalis* and *Vitis mustangensis*. Grasses and sedges occurring mainly at the seepy edges of the springs and comprise the majority of species, including *Andropogon glomeratus*, *Cyperus haspan*, *Echinochloa walteri*, *Fimbristylis autumnalis*, *Fimbristylis puberula* var. *interior*, *Fuirena simplex*, *Juncus diffusissimus*, *J. texanus*, *J. torreyi*, *Leersia oryzoides*, *Muhlenbergia lindheimeri*, *Panicum dichotomiflorum*, *P. hi-ans*, *P. virgatum*, *Paspalum urvillei*, *Rhynchospora nivea*, and *Schoenoplectus pungens*. Other herbaceous flora includes *Callitriche heterophylla*, *Centella erecta*, *Eupatorium serotinum*, *Hydrocotyle verticillata*, *Mimulus glabratus* var. *jamesii*, *Mitreola petiolata*, *Mentha spicata*, and *Woodsia obtusa*.

DISTURBED AQUATIC ASSOCIATIONS

DISTURBED WETLAND TYPES

Reservoirs (artificial impoundments), have a few of the same pond associates, but are characterized by greater fluctuation in water levels. Vegetation mostly consists of marginal and shallow-water emergent rushes, sedges, and grasses, including *Cyperus erythrorhizos*, *C. strigosus*, *Echinochloa colona*, *E. crus-galli*, *Eleocharis montevidensis*, *E. obtusa*, *Fimbristylis autumnalis*, *F. vahlii*, *Juncus dudleyi*, *J. interior*, *J. marginatus*, and *Kyllinga brevifolia*. Other associated flora includes *Ammannia coccinea*, *Eclipta prostrata*, *Helenium elegans* var. *amphibolum*, *Lindernia dubia*, *Marsilea vestita*, *Mecardonia procumbens*, *Pluchea odorata*, *Rorippa sessiliflora*, *R. teres*, *Rotala ramosior*, and *Xanthium strumarium*.

BARREN AND DEVELOPED LAND

Barren and developed land consists of about 12.0 ha (29.6 ac) that are heavily impacted by human use, such as lawns and parking areas near buildings, roads, etc. Typically, these areas are occupied by early succession annuals that vary from season to season and frequency of disturbance. Herbaceous annuals include *Capsella bursa-pastoris*, *Descurainia pinnata*, *Erodium cicutarium*, *Geranium texanum*, *Glandularia bipinnatifida* var. *bipinnatifida*, *Krigia caespitosa*, *Lamium amplexicaule*, *Lepidium virginicum*, *Nothoscordum bivalve*, *Oenothera laciniata*, *Plantago virginica*, *Solanum elaeagnifolium*, *Stellaria media*, and *Veronica arvensis*.