

**FLORISTIC SURVEY  
of  
CANNON AIR FORCE BASE  
and  
MELROSE AIR FORCE RANGE  
NEW MEXICO**

Final Report to U.S. Army  
Construction Engineering Research Laboratory  
Champaign, Illinois  
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# **FLORISTIC SURVEY OF CANNON AIR FORCE BASE AND MELROSE AIR FORCE RANGE, NEW MEXICO**

## **INTRODUCTION**

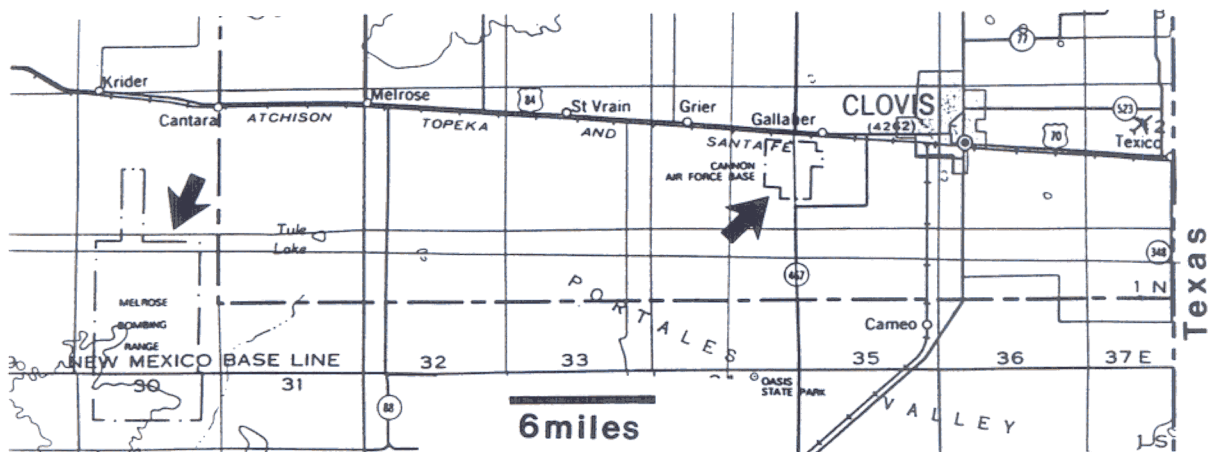
The objective of this survey was to assemble the first complete collection of vascular plants that occur within the boundaries of Melrose Air Force Range (MAFR) and the unlandscaped areas of Cannon Air Force Base (CAFB), and to produce a comprehensive, annotated list of all taxa collected. This information is essential for determining natural resource status and formulating land use management plans. Previous research on the flora of these installations included an endangered species inventory by the U.S. Army Corps of Engineers [USACE] in 1991, and a habitat survey by Parmenter & Muldavin et. al. from the New Mexico Natural Heritage Program (NMNHP) and the University of New Mexico (UNM) in 1994.

## **STUDY AREA**

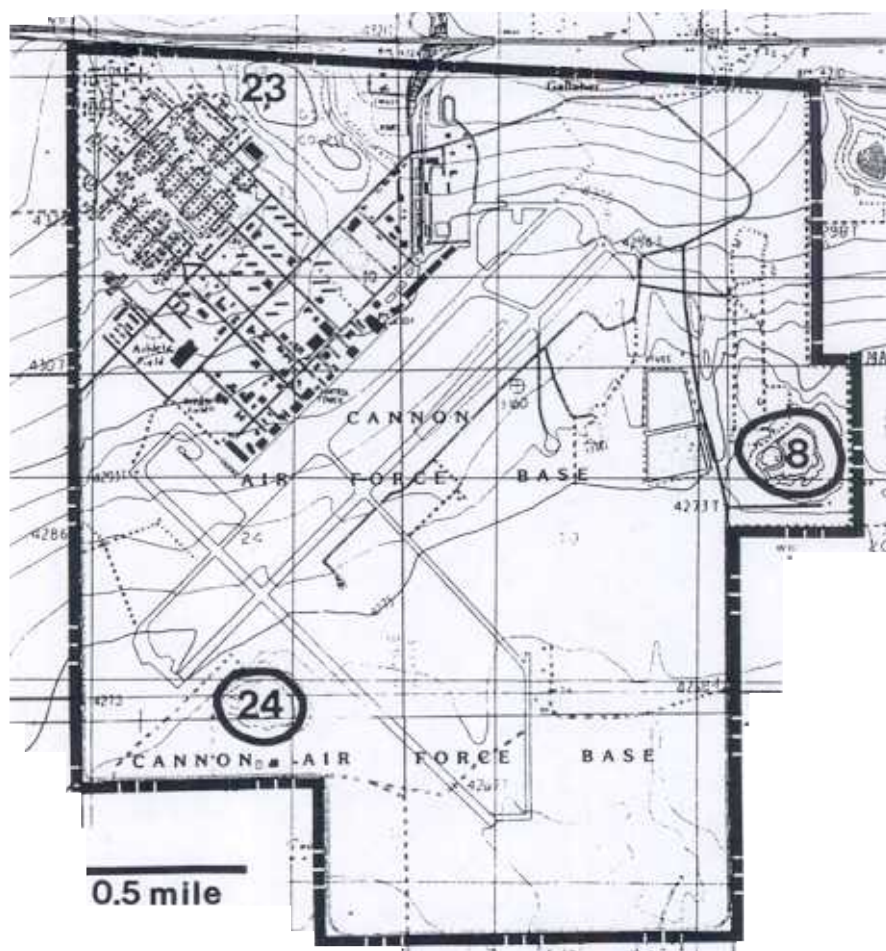
Cannon Air Force Base is on the eastern central plains of New Mexico in Curry County, six miles west of the city of Clovis and fifteen miles west of the Texas border. The main base (CAFB) has only small areas of native vegetation. This survey was conducted primarily on Melrose Air Force Range in Roosevelt County, twenty-eight miles west of CAFB (Fig. 1). MAFR consists of a target impact area surrounded by a buffer of rangeland that together cover about 24,000 hectares.

The semiarid climate of the area is characterized by highly variable precipitation patterns. The average annual precipitation is 35.5 cm (14 inches), most of which arrives with midsummer thunderstorms. 1993 was a dry year with the exception of a five-year-flood rain of 3.1 inches in July, as measured by a local rancher. 1994 was considered a drought year locally, with only a small amount of summer rain. The average highest annual temperature is 102 degrees F, and the average lowest -3.1 degrees F. Winds are seldom absent on these plains and their average speed is 19 km (12 miles) per hour year round. Annual free water surface evaporation rates average 190 cm to 203 cm (75 to 80 inches) per year (USACE 1991).

MAFR is in the Plains-Mesa Grassland vegetation zone described by Dick Peddie (1993). Most of the area is a gently rolling plain that includes low sand hills, mesquite grasslands, mixed species grasslands on both sand and clay, one major ephemeral draw, and two playas. In the southwestern corner, a rocky limestone mesa rises 61 to 91 meters above the plains, with steep side slopes and small canyons and draws along its edges. There are a few cultivated fields, scattered ranch buildings, windmills and cattle tanks, and many access roads. The primary land use outside of the impact area is cattle grazing, with the ranchers providing supplemental feed during much of the year.



**Figure 1. Locations of Cannon Air Force Base and Melrose Air Force Range.**



**Figure 2. Intensive sampling site 8, additional sites 23 and 24 on CAFB.**

# MELROSE AIR FORCE RANGE

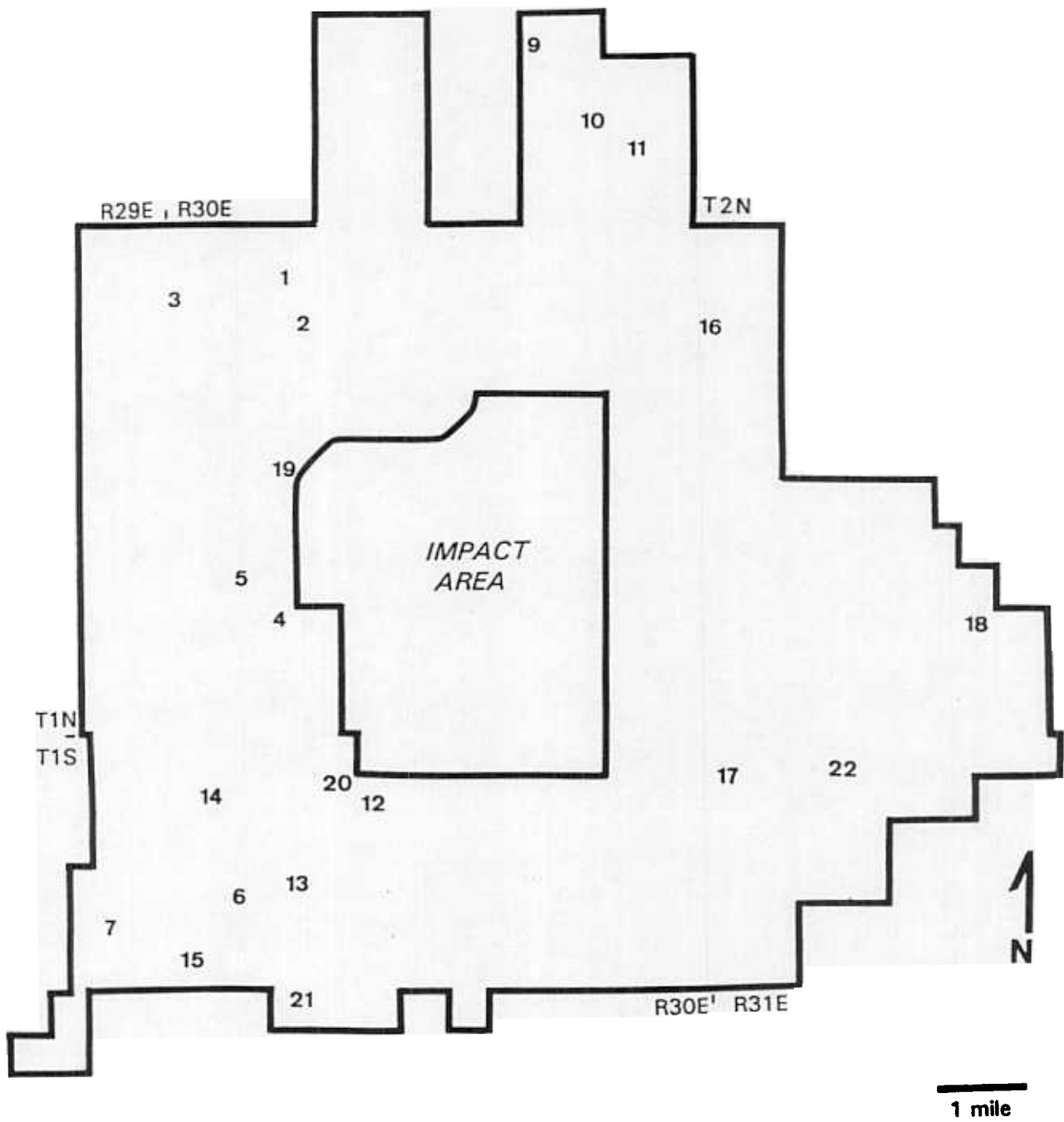


Figure 3. Intensive sampling sites 1-22 on MAFR.

## **METHODS**

In preparation for the plant inventory aerial photographs, county soil surveys, and topographic maps were inspected. The 1991 survey for threatened and endangered species was reviewed (USACE 1991). Potential sample sites were selected and marked on 7.5 minute topographic maps. Criteria for site selection was to include all slope classes of all soil series, as well as all vegetation community types according to the Dick-Peddie (1992) classification system. Final selection of the sample sites was made visually based on observed variations in topography and species composition during the first field reconnaissance trip in April, 1993.

On the main CAFB installation, the habitat surrounding an overflow sewage pond was sampled regularly (site #8), and two other ephemeral drainage areas were visited sporadically (site #s 23 and 24)(Fig. 2). Plants were collected at twenty-one regularly sampled sites surrounding the impact area on MAFR (Fig. 3). Habitat types within the impact area were well represented by sample sites around the periphery, but several searches were also made within it where the vegetation patterns were different because grazing is excluded and fires are more frequent. The twenty-two intensively sampled sites are described in Table 1. A 1:24,000 scale map of the sample sites and travel routes on MAFR is pocketed inside the back cover of this report.

The sample sites were described by community type, substrate, slope and aspect (Table 1). Community types were indicated as dominant species in the format of the NMNHP as used in the Biological Survey of MAFR (Parmenter & Muldavin 1994). The habitats described here do not all fit into the preliminary classifications given in the Survey report. Location data was recorded by General Land Office coordinates, directions from local landmarks, elevation in meters, and UTM coordinates (within 100 meters) measured with a Global Positioning System.

Sample sites were visited during each of five field trips during the first collecting season, and during each of four field trips during the second season. The field activities were recorded in a daily log (Appendix D). Each site was searched on foot by two biologists until all of the species in flower or fruit were recorded. Sample sites on unique habitats or habitats of higher biological diversity received priority attention. Playas, for example, were searched while and after they were holding water. The roadsides at each of the sample sites and at many of the cattle pasture gates were also searched, and when a previously uncollected species was observed anywhere on the installation, it was collected.

Specimens were collected in flower and/or fruit whenever possible. For each collection the following data were recorded: site number, a consecutive collection number, date, scientific name, relative abundance at the site, number of specimens taken, corolla color and other comments as needed. At least three specimens of all vascular plant species that occur on the installation were collected whenever possible.

**Table 1. Intensive Sampling Sites on MAFR, CAFB**

Site #	Community Type Soil Type; Slope; Aspect; Elevation
1	<i>Artemisia filifolia/Sporobolus cryptandrus</i> Springer loamy fine sand; Slope: <3 degrees; Aspect: 350 degrees azimuth; Elev: 1305 m
2	<i>Artemisia filifolia/Schizachyrium scoparium</i> Springer loamy fine sand; Slope: 3 degrees; Aspect: 15 degrees azimuth; Elev: 1314 m
3	<i>Helianthus petiolaris/Amaranthus palmeri</i> Springer loamy fine sand; Slope: <1 degree; Aspect: 360 degrees azimuth; Elev: 1314 m
4	<i>Schizachyrium scoparium/Aristida purpurea/Bouteloua hirsuta</i> Rough broken land and Mansker and Portales loams; Slope: 15 degrees; Aspect: 60 degrees azimuth; Elev: 1395 m
5	<i>Prosopis glandulosa/Bouteloua gracilis/Bouteloua hirsuta</i> Clovis and Amarillo fine sandy loam; Slope: <3 degrees; Aspect: 30 degrees azimuth; Elev: 1358 m
6	<i>Bouteloua gracilis/Buchloe dactyloides/Bouteloua curtipendula</i> Olton-Zita loams and Stegall loam; Slope: 0 degrees; Aspect: 0 degrees azimuth; Elev: 1424 m
7	<i>Bouteloua hirsuta/Aristida purpurea</i> Mansker and Portales loams and Potter soils; Slope: 5-15 degrees; Aspect: 200-290 degrees azimuth; Elev: 1418 m
8	<i>Echinochloa crus-galli/Kochia scoparia</i> Mankser and Amarillo fine sandy loam; Slope: <3 degrees; Aspect: pond shoreline; Elev: 1301 m
9	<i>Artemisia filifolia/Sporobolus airoides/Andropogon gerardii</i> Blown-out and dune land and Tivoli fine sand; Slope: 3-5 degrees; Aspect: 190 degrees azimuth; Elev: 1299 m
10	<i>Distichlis spicata/Sporobolus airoides</i> Archy loamy fine sand; Slope: 0 degrees; Aspect: low playa; Elev: 1277 m
11	<i>Bouteloua gracilis/Aristida purpurea/Bouteloua hirsuta</i> Springer soils; Slope: 5-8 degrees; Aspect: 150 degrees azimuth; Elev: 1287 m
12	<i>Bouteloua gracilis/Buchloe dactyloides/Bouteloua curtipendula</i> Stegall loam and Olton-Zita loams; Slope: <3 degrees; Aspect: 300 degrees azimuth; Elev: 1402 m

Table 1. Continued,

Site #	Community Type Soil Type; Slope; Aspect; Elevation
13	<i>Bothriochloa laguroides/Bouteloua curtipendula/Buchloe dactyloides</i> Olton-Zita loams; Slope: <3 degrees; Aspect: 45 degrees azimuth; Elev: 1415 m
14	<i>Bouteloua hirsuta/Bouteloua curtipendula</i> Mansker and Portales loams and Potter soils; Slope: 3-9 degrees; Aspect: 30 degrees azimuth; Elev: 1395 m
15	<i>Buchloe dactyloides/Eleocharis erythropoda</i> Mansker and Portales loams and Potter soils; Slope: 0 degrees; Aspect: playa bottom; Elev: 1419 m
16	<i>Artemisia filifolia/Sporobolus cryptandrus/Bouteloua hirsuta</i> Springer loamy fine sand; Slope: 3 degrees; Aspect: 50 degrees azimuth; Elev: 1290 m
17	<i>Bouteloua gracilis/Buchloe dactyloides/Prosopis glandulosa</i> Bippus and Spur soils and Potter soils; Slope: 3 degrees; Aspect: 20 degrees azimuth; Elev: 1302 m
18	<i>Prosopis glandulosa/Sporobolus cryptandrus/Bouteloua curtipendula</i> Amarillo and Clovis soils and Clovis loam; Slope: <3 degrees; Aspect: 50 degrees azimuth; Elev: 1294 m
19	<i>Bouteloua hirsuta/Buchloe dactyloides/Prosopis glandulosa</i> Amarillo fine sandy loam and Bippus and Spur soils; Slope: 3 degrees; Aspect: 34 degrees azimuth; Elev: 1341 m
20	<i>Bouteloua gracilis/Buchloe dactyloides/Panicum obtusum</i> Berthoud sandy loam and rough broken land; Slope: 3 degrees; Aspect: 45 degrees azimuth; Elev: 1386 m
21	<i>Bouteloua gracilis/Buchloe dactyloides/Hilaria mutica</i> Mansker and Portales loams and Potter soils; Slope: 3 degrees; Aspect: 100 degrees azimuth; Elev: 1398 m
22	<i>Bouteloua gracilis/Buchloe dactyloides/Hilaria mutica</i> Clovis loam; Slope: 1 degree; Aspect: 60 degrees azimuth; Elev: 1309 m



Specimens were pressed in standard plant presses immediately after collection at each site, and air dried. They were stored in herbarium cabinets. Each identification was verified using the manuals cited in the literature and specimens from the Herbarium of the Museum of Southwestern Biology at UNM, Tim Lowrey curator. Voucher specimens for all taxa were mounted and accessioned at UNM. Two additional specimens of each taxa were pressed in half sheet format for lamination and shipped to the Center for Ecological Management of Military Lands in Fort Collins, Colorado. Duplicate specimens were donated to the UNM herbarium teaching collection.

A computer database of collection information was created using DBASE and ACCESS software. The data fields are described in Appendix A. A checklist of the plants collected was compiled from the database. The checklist includes scientific and common names, synonyms, species codes (acronyms), plant habit (growth forms), and abundance (Appendix B). An alphabetical list of species by scientific names with common names is provided in Appendix C. A collection log was also produced from the database to accompany the specimens for lamination. An example of the information included in the log is described in Appendix E. Nomenclature follows Kartesz (1994) and PLANTS (USDASCS 1994). Recent classifications for grasses in New Mexico by Allred (1994) are listed as synonyms.

## RESULTS

A total of 594 separate collections were made at MAFR and CAFB. These collections represent 292 taxa, including 55 families, 183 genera, 285 species, and seven additional varieties or subspecies. The percentage of the total flora included was estimated at 97 percent. Additional annual and aquatic species that require more precipitation might be found during a wetter than average year. The best potential habitats for such species are in the playa at site 15, Sheep Canyon at site 14, and the deep sand at site 9.

No species with threatened, endangered, or sensitive status at the federal or state level were found during the surveys. *Opuntia tunicata* var. *davisii* (thistle cholla) was present as reported by the USACE (1991), but this species is no longer considered sensitive, as it was then. Another species, *Proboscidea sabulosa* (dune unicorn plant), was also reported on MAFR in 1991, and is still listed as sensitive in the state. This genus was represented only by the more common species, *Proboscidea louisianica* (common devilsclaw), in this survey. It is possible but unlikely that the dune unicorn would be found in the sand dunes during a wet year. There was potential habitat for *Euphorbia strictior* (Panhandle spurge) in the sandy areas, but no plants were found. This is a state sensitive species with a federal status of 3C (no longer considered threatened). The most unusual species found on the dry rangelands were two obligate aquatics, *Heteranthera limosa* (blue mudplantain) and *Marsilea vestita* (hairy pepperwort). They appeared and matured only in 1993 after the heavy rain that completely inundated the playa at site 15. The hairy pepperwort and other aquatic species were also found in artificial ponds on the golf course at CAFB.

**Table 2. Disturbance Response of Grasses**

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<b>Decrease with Grazing</b>	
Andropogon gerardii var. paucipilus	Sand bluestem
Bouteloua curtipendula var. curtipendula	Sideoats grama
Bouteloua eriopoda	Black grama
Elymus canadensis	Canada wildrye
Leptochloa dubia	Green spangletop
Lycurus setosus	Wolftail
Panicum hallii var. hallii	Hall's panicgrass
Schizachyrium scoparium	Little bluestem
Setaria leucopila	Streambed bristlegrass
Sorghastrum nutans	Yellow indiagrass
Sporobolus airoides	Alkali sacaton
Stipa neomexicana	New Mexico needlegrass
<b>Increase with Grazing</b>	
Bothriochloa laguroides ssp. torreyana	Silver beardgrass
Bouteloua gracilis	Blue grama
Bouteloua hirsuta	Hairy grama
Buchloe dactyloides	Buffalograss
Distichlis spicata var. stricta	Inland saltgrass
Echinochloa crus-gallii	Barnyard grass
Elymus longifolius	Longleaf squirreltail
Eragrostis curvula var. curvula	Weeping lovegrass
Hilaria mutica	Tobosa
Hordeum pusillum	Little barley
Panicum obtusum	Vine mesquite
Sporobolus contractus	Spike dropseed
Sporobolus cryptandrus	Sand dropseed
Tridens albescens	White tridens
<b>Weedy Invaders</b>	
Aristida adscensionis	Sixweeks threeawn
Aristida purpurea var. fendleriana	Fendler's threeawn
Aristida purpurea var. longiseta	Red threeawn
Aristida purpurea var. nealleyi	Blue threeawn
Aristida purpurea var. purpurea	Purple threeawn
Aristida purpurea var. wrightii	Wright's threeawn
Bouteloua barbata	Sixweeks grama
Bromus catharticus	Rescue grass
Bromus japonicus	Japanese brome
Chloris cucullata	Hooded windmill grass
Chloris verticillata	Tumble windmill grass
Echinochloa crus-gallii	Barnyard grass
Eragrostis cilianensis	Stinkgrass
Erioneuron pilosum	Hairy tridens
Hordeum pusillum	Little barley
Panicum capillare var. brevifolium	Witchgrass
Schedonnardus paniculatus	Tumblegrass
Sorghum halpense	Johnsongrass
Vulpia octoflora var. glauca	Sixweeks fescue

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No other complete species lists for this part of New Mexico were available for comparison of diversity. Many of the same species have been recorded on a few acres of ungrazed research area south of Clovis by C. Lumer, botanist at Eastern New Mexico University. The plants were found in greater abundance there on a much smaller area than MAFR where the nondominant species tended to be sparse and widely scattered. Within the ungrazed impact area, grass species that decrease with grazing, especially black grama grass, were more abundant than elsewhere. Annotations have been included in the database indicating the disturbance response of "important" range and wildlife grasses as provided in the Field Guide to Grasses of New Mexico (Allred 1994). The information was available for 42 of the 54 grass species collected (Table 2). They were evenly divided between weedy invaders, grazing increasers, and grazing decreaseers. The species that are known to thrive on disturbance and grazing constitute at least 52 percent of the grass species present. Many of the herbaceous species found along roadways, near old ranches and cattle tanks, and on old fields could also be classified as weedy invaders. The shoreline surrounding the sewage overflow pond on CAFB was dominated by aggressively weedy species. Information on noxious weed species in NM was not yet available from New Mexico State University in Las Cruces.

## Literature Cited

Allred, K.W. 1993. A field guide to the grasses of New Mexico. New Mexico State University, Las Cruces.

Barker, W.T., and T.M. Barkley, eds. 1986. Flora of the Great Plains. University Press of Kansas, Lawrence.

Benson, L. 1982. The cacti of the United States and Canada. Stanford Press, Stanford, CA.

Buchanan, D. and W. Ross. 1958. Soil survey of Curry County, New Mexico. USDA/NM Agricultural Experiment Station, U.S. Printing Office, Washington, D.C.

Correll, D.S., Correll, H.B. 1975. Aquatic and wetland plants of Southwestern United States. Stanford University Press, Stanford, California..

Correll, D.S. and M.C. Johnston. 1970. Manual of the vascular plants of Texas. The University of Texas, Austin.

Dick-Peddie, W.A. 1993. New Mexico vegetation, past, present, and future. University of New Mexico Press, Albuquerque.

Gould, F.W. 1973. Grasses of southwestern United States. University of Arizona Press, Tucson.

Kartesz, J.T. 1994. A synonymized checklist of the vascular flora of the United States, Canada, and Greenland. Timber Press Inc., Portland, Oregon.

Kirkpatrick, Z.M. 1992. Wildflowers of the Western Plains. University of Texas Press, Austin.

Martin, W.C., Hutchins, C.R. 1980. A flora of New Mexico. J. Cramer, Hirschberg, Germany.

McGregor, R.L. et al. 1986. Flora of the Great Plains. Univ. Press of Kansas, Lawrence.

New Mexico Native Plant Protection Advisory Committee. 1984. A handbook of rare and endemic plants of New Mexico. University of New Mexico Press, Albuquerque..

Parmenter, R.R., E. Muldavin et. al. 1994. A biological survey of Melrose Air Force Range, Melrose, New Mexico. Report prepared for Dept. of Defense, Canon Air Force Base.

Ross, W., and O. Bailey. 1967. Soil survey of Roosevelt County, New Mexico. USDA/NM Agricultural Experiment Station, U.S. Printing Office, Washington, .D.C.

Sivinsky, R., and K. Lightfoot, eds. 1992. Inventory of rare and endangered plants of New Mexico. N.M. Energy, Minerals and Natural Resources Dept., Santa Fe, New Mexico.

U.S. Army Corps of Engineers. 1991. Inventory of threatened and endangered species and wildlife recommendations for Melrose Air Force Range, New Mexico. Report prepared for Canon Air Force Base Natural Resources Dept.

USDA Soil Conservation Service. 1994. PLANTS of New Mexico-alphabetical listing. Technology Information Systems Division, Fort Collins, Colorado.

USDA/SCS. 1982. National list of scientific plant names. SCS-TP-159, Washington, D.C.

Vines, R.A. 1960. Trees, shrubs and woody vines of the southwest. University of Texas Press, Austin.

Whitson, T.D., editor. 1992. Weeds of the west. University of Wyoming, Jackson.

## APPENDIX A

### DATABASE STRUCTURE

<u>Field Name</u>	<u>Description</u>
INSTALID	Three-character code identifying installation
CODE	Species code from the PLANTS database
FAMILY	Plant family
GENUS	Plant genus
SPECIES	Specific epithet
AUTHOR	Author of the species
VAR-SPP	Variety or subspecies
VARAUTH	Author of variety or subspecies
SYNGENUS	Synonym genus
SYNSPP	Synonym species
SYNAUTH	Author of synonym
SYNVARSP	Synonym variety or subspecies
SYNVARAU	Author of synonym variety or subspecies
COMMON	Common name(s)
SITENO	Site number
COLLNO	Collection number
COLLDATE	Collection date
COLLECTR	Collector(s)
DETERMIN	Determiner of final identification
LOCALITY	Description of geographic area where collected
COUNTY	County where collected
UTM-E	Universal Transverse Mercator coordinate, easting
UTM-N	Universal Transverse Mercator coordinate, northing
ELEV	Elevation, in meters, above mean sea level
ASSOSPP	Dominant species: associated species
SOILTOPO	Soil type, slope, aspect
HABIT	Habit code, from the PLANTS database
ABUNDANC	Relative abundance, 1-5
FEDSTAT	Current Federal status (none found with federal status)
STATSTAT	Current State status (none found with state status)
COMMENTS	Comments on plant characteristics, site, habitat, etc.
UNMSP	Number of specimens deposited at UNM
CERLSP	Number of specimens deposited at CERL
DUPSP	Duplicate specimens: yes or no
UPDATE	Initials of person updating database

## APPENDIX B

### CHECKLIST OF THE PLANTS OF MELROSE AIR FORCE RANGE AND CANNON AIR FORCE BASE

Family, scientific name, species code and selected synonyms are listed according to the USDA/SCS PLANTS database (1994), and the Kartesz Checklist (1994).

Common names and some synonyms are from the PLANTS database, the Flora of the Great Plains (McGregor 1986), Wildflowers of the Western Plains (Kirkpatrick 1992), and Grasses of New Mexico (Allred 1994).

Two status and 17 habit categories are defined by the National List of Scientific Plant Names (1982). The categories and representative symbols used to define status are: (N) native and (I) introduced. Habit is represented by a combination of the following: (A) annual, (B) biennial, (P) perennial, (F) herbaceous, (S) shrub, (T) tree, (G) grasslike, (H) partly woody, (W) woody, (\$) succulent, (V) vine, (Z) submersed, (E) emergent, (/) floating, (@) tree epiphyte, (+) parasitic, and (\_) saprophytic.

Abundance of each species was estimated at each collection site on a qualitative scale from (1) rare, (2) infrequent, (3) common, to (4) abundant, and (5) dominant. It is presented in the list as a range of the ranks recorded.

## FAMILY

*Scientific name*

[*Synonym*]

Common name, Code, Habit, Abundance

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### ADIANTACEAE (Polypodiaceae)

*Cheilanthes feei* T. Moore

Slender lipfern, CHFE, NPF, 3

### AGAVACEAE

*Yucca glauca* Nutt ex Fraser

[*Yucca angustifolia* Pursh]

Small soapweed, YUGL, NS, 3-5

### AMARANTHACEAE

*Amaranthus albus* L.

[*Amaranthus graecizans* auct. non L.]

Prostrate pigweed, AMAL, NAF, 2-5

*Amaranthus palmeri* S. Wats.

Careless weed, AMPA, NAF, 3-5

*Froelichia gracilis* (Hook.) Moq.

[*Oplotheca gracilis* Hook.]

Slender snakecotton, FRGR3, NAF, 3

*Tidestromia lanuginosa* (Nutt.) Standl.

[*Cladanthrax lanuginosa* Nutt.]

Shrubby honeysweet, TILA2, NAF, 3

### ANACARDIACEAE

*Rhus trilobata* Nutt.

[*Rhus aromatica* var. *trilobata* (Nutt.) Gray]

Skunkbush sumac, RHTR, NS, 4

### APIACEAE (Umbelliferae)

*Cymopterus montanus* Nutt. ex Torr. & Gray

[*Phellopterus montanus* Nutt. ex Torr. & Gray (pro syn.)]

Mountain spring parsley, CYMO, NPF, 2



## FAMILY

*Scientific name*

[*Synonym*]

Common name, Code, Habit, Abundance

---

### ASCLEPIADACEAE

*Asclepias engelmanniana* Woods.  
Engelmann's milkweed, ASEN, NPF, 1-2

*Asclepias involucrata* Engelm. ex Torr.  
Dwarf milkweed, ASIN14, NPF, 1-2

*Asclepias latifolia* (Torr.) Raf.  
Broadleaf milkweed, ASLA4, NPF, 1-4

*Asclepias pumila* (Gray) Vail  
Plains milkweed, ASPU, NPF, 2

*Asclepias subverticillata* (Gray) Vail  
[*Asclepias galioides* auct. non Kunth]  
Whorled milkweed, ASSU2, NPF, 2

*Asclepias viridiflora* Raf.  
[*Acerates viridiflora* (Raf.) Pursh ex Eat.]  
Green milkweed, ASVI, NPF, 1-2

### ASTERACEAE (Compositae)

*Acourtia nana* (Gray) Reveal & King  
[*Perezia nana* Gray]  
Dwarf desert holly, ACNA2, NPF, 2-4

*Ambrosia confertiflora* DC.  
[*Franseria confertiflora* (DC.) Rydb.]  
Weakleaf burr ragweed, AMCO3, NPF, 5

*Ambrosia grayi* (A. Nels.) Shinnars  
[*Franseria tomentosa* Gray]  
Burr ragweed, AMBRO, NPH, 3

*Ambrosia psilostachya* DC.  
[*Ambrosia coronopifolia* T. & G.]  
Western ragweed, AMPS, NPF, 1-5

## FAMILY

*Scientific name*

[*Synonym*]

Common name, Code, Habit, Abundance

---

### ASTERACEAE cont.

*Aphanostephus skirrhobasis* (DC.) Trel

[*Keerlia skirrhobasis* DC.]

Arkansas dozedaisy, APSK, NAF, 1-3

*Artemisia bigelovii* Gray

Bigelow's sagebrush, ARBI3, NS, 3

*Artemisia dracunculus* L.

Silky wormwood, ARDR4, NPF, 4

*Artemisia filifolia* Torr.

[*Oligosporus filifolius* (Torr.) W.A. Weber]

Sand sagebrush, ARFI2, NSH, 4-5

*Artemisia ludoviciana* Nutt.

Louisiana wormwood, ARLU, NPFH, 2-5

*Aster subulatus* Michx.

Annual saltmarsh aster, ASSU5, NAEF, 4

*Baccharis salicina* Torr. & Gray

Great plains falsewillow, BASA, NS, 3

*Berlandiera lyrata* Benth.

Chocolate daisy, BELY, NPF, 1-3

*Brickellia eupatorioides* (L.) Shinnery var. *chlorolepis* (Woot. & Standl.) B.L.

Turner

[*Brickellia chlorolepis* (Woot. & Standl.) Shinnery]

False boneset, BREUC2, NPF, 1

*Brickellia laciniata* Gray

Splitleaf brickellbush, BRLA, NS, 3

*Chaetopappa ericoides* (Torr.) Nesom

[*Leucelene ericoides* (Torr.) Greene]

Rose heath, CHER2, NPF, 2-4

## FAMILY

*Scientific name*

[*Synonym*]

Common name, Code, Habit, Abundance

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### ASTERACEAE cont.

*Chrysothamnus pulchellus* (Gray) Greene ssp. *baileyi* (Woot. & Standl.) Hall & Clements

[*Chrysothamnus baileyi* Woot. & Standl.]

Southwest rabbitbrush, CHPUB, NS, 2-4

*Cirsium ochrocentrum* Gray

[*Cnicus ochrocentrus* (Gray) Gray]

Yellowspine thistle, CIOC2, NBPF, 2-3

*Conyza canadensis* (L.) Cronq.

[*Erigeron canadensis* L.]

Canadian horseweed, COCA5, NAF, 3

*Engelmannia pinnatifida* Gray ex Nutt.

Engelmann's daisy, ENPI, NPF, 2-3

*Erigeron colomexicanus* A. Nels.

[*Erigeron divergens* Torr. & Gray var. *cinereus* Gray]

Running fleabane, ERCO28, NBF, 3-4

*Erigeron flagellaris* Gray

[*Erigeron nudiflorus* Buckl.]

Trailing fleabane, ERFL, NBF, 3-4

*Evax verna* Raf.

Spring pygmy cudweed, EVVE, NAF, 3

*Gaillardia pinnatifida* Torr.

[*Gaillardia gracilis* A. Nels.]

Red dome blanketflower, GAPI, NPFH, 2-4

*Gaillardia pulchella* Foug.

[*Gaillardia drummondii* (Hook.) DC.]

Firewheel, GAPU, NAF, 2-3

*Grindelia nuda* var. *nuda* Wood

[*Grindelia squarrosa* (Pursh) Dunal var. *nuda* (Wood) Gray]

Curlytop gumweed, GRNUN, NBF, 1

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### ASTERACEAE cont.

*Gutierrezia sarothrae* (Pursh) Britt. & Rusby  
Broom snakeweed, GUSA2, NHS, 5

*Gutierrezia sphaerocephala* Gray  
[*Xanthocephalum sphaerocephalum* (Gray) Shinnery]  
Roundleaf snakeweed, GUSP, NHS, 1

*Helianthus annuus* L.  
Common sunflower, HEAN3, NAF, 4-5

*Helianthus ciliaris* DC.  
Texas blueweed, HECI, NPF, 2-5

*Helianthus petiolaris* Nutt.  
Prairie sunflower, HEPE, NAF, 2-5

*Heterotheca subaxillaris* (Lam.) Britt. & Rusby  
[*Heterotheca latifolia* Buckl.]  
Camphorweed, HESU3, NAF, 2-3

*Heterotheca villosa* (Pursh) Shinnery  
[*Chrysopsis villosa* (Pursh) Nutt. ex DC.]  
Hairy goldenaster, HEVI4, NPF, 3

*Hymenopappus filifolius* Hook.  
Threadleaf white ragweed, HYFI, NPF, 2-3

*Hymenopappus flavescens* var. *flavescens* Gray  
Yellow woolly-white, HYFLF, NBF, 2-4

*Liatris punctata* Hook.  
[*Lacinaria punctata* (Hook.) Kuntze]  
Dotted gayfeather, LIPU, NPF, 2

*Lygodesmia juncea* (Pursh) D. Don ex Hook.  
Rush skeletonplant, LYJU, NPF, 4

*Machaeranthera canescens* (Pursh) Gray ssp. *glabra* (Gray) B.L. Turner  
[*Machaeranthera linearis* Greene]  
Hoary tansyaster, MACAG2, NBPF, 3

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### ASTERACEAE cont.

***Machaeranthera pinnatifida*** (Hook.) Shinnery  
[*Haplopappus spinulosus* (Pursh) DC.]  
Lacy tansyaster, MAPI, NPF, 2-3

***Machaeranthera tanacetifolia*** (Kunth) Nees  
[*Aster tanacetifolius* Kunth]  
Tanseyleaf aster, MATA2, NAF, 1-2

***Melampodium leucanthum*** Torr. & Gray  
Blackfoot daisy, MELE2, NHPF, 2-4

***Palafoxia sphacelata*** (Nutt. ex Torr.) Cory  
[*Othake sphacelata* (Nutt. ex Torr.) Rydb.]  
Palafoxia, PASP, NAF, 2-3

***Picradeniopsis woodhousei*** (Gray) Rydb  
[*Bahia woodhousei* (Gray) Gray]  
Woodhouse's bahia, PIWO, NPF, 3

***Prionopsis ciliata*** (Nutt.) Nutt.  
[*Haplopappus ciliatus* (Nutt.) DC.]  
Sawtooth daisy, PRCI, NAF, 1

***Psilostrophe tagetina*** var. *tagetina* (Nutt.) Greene  
[*Riddellia tagetina* Nutt.]  
Plains paperflower, PSTAT, NPF, 1-4

***Ratibida columnifera*** (Nutt.) Woot. & Standl.  
[*Lepachys columnifera* (Nutt.) Rydb.]  
Upright prairie coneflower, RACO3, NPF, 3

***Ratibida tagetes*** (James) Barnh.  
[*Rudbeckia tagetes* James]  
Short-ray prairie coneflower, RATA, NPF, 4

***Senecio flaccidus*** var. *flaccidus* Less.  
[*Senecio douglasii* DC. var. *longilobus* (Benth.) L. Benson]  
Threadleaf groundsel, SEFLF, NFH, 2-3

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### ASTERACEAE cont.

*Senecio riddellii* Torr. & Gray

[*Senecio spartioides* Torr. & Gray var. *fremontii* (Torr. & Gray) Greenm. ex L.O.Will.]

Riddell's ragwort, SERI2, NFH, 5

*Stephanomeria pauciflora* (Torr.) A. Nels.

[*Lygodesmia pauciflora* (Torr.) Shinnery]

Brownplume wirelettuce, STPA4, NPFH, 2-4

*Tetraneris scaposa* (DC.) Greene

[*Hymenoxys scaposa* (DC.) Parker]

Yellow daisy, TESC2, NFH, 3-4

*Thelesperma megapotamicum* (Spreng.) Kuntze

[*Thelesperma gracile* (Torr.) Gray]

Indian Tea, THME, NPF, 2-3

*Thymophylla acerosa* (DC.) Strother

[*Dyssodia acerosa* DC.]

Pricklyleaf dogweed, THAC, NH, 1

*Townsendia exscapa* (Richards.) Porter

[*Townsendia sericea* Hook]

Easter daisy, TOEX2, NPF, 2-3

*Tragopogon dubius* Scop.

[*Tragopogon major* Jacq.]

Yellow salsify, TRDU, IBAF, 2

*Verbesina encelioides* (Cav.) Benth. & Hook ssp. *exauriculata* (Robins. & Greenm.) J.R. Coleman

[*Ximenesia exauriculata* (Robins & Greenm.) Rydb.]

Golden crownbeard, VEENE2, NAF, 1-4

*Vernonia marginata* (Torr.) Raf.

Plains ironweed, VEMA2, NPF, 2-4

*Xanthium spinosum* L.

[*Acanthoxanthium spinosum* (L.) Fourr.]

Spiny cocklebur, XASP2, NAF, 5

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### ASTERACEAE cont.

*Xanthium strumarium* L.

Rough cockleburr, XAST, NAF, 4

*Zinnia grandiflora* Nutt.

[*Crassina grandiflora* (Nutt.) Kuntze]

Rocky mountain zinnia, ZIGR, NH, 4

### BIGNONIACEAE

*Chilopsis linearis* (Cav.) Sweet

[*Bignonia linearis* Cav.]

Desert willow, CHLI2, NST, 1

### BORAGINACEAE

*Cryptantha cinerea* (Greene) Cronq. var. *jamesii* Cronq.

[*Cryptantha jamesii* (Torr.) Payson]

James' catseye, CRCI3, NPF, 2-3

*Cryptantha crassisepala* (Torr. & Gray) Greene

Thicksepal catseye, CRCR3, NAF, 1-3

*Heliotropium convolvulaceum* (Nutt.) Gray

[*Euploca convolvulacea* Nutt.]

Phlox heliotrope, HECO5, NAF, 3

*Lappula redowskii* auct non (Hornem.) Greene

[*Lappula occidentalis* (S. Wats.) Greene var. *occidentalis* (S. Wats.) Greene]

Desert stickseed, LARE, IAF, 4

*Lithospermum incisum* Lehm.

[*Batschia linearifolia* (Goldie) Small]

Puccoon, LIIN2, NPF, 1-2

### BRASSICACEAE (Cruciferae)

*Descurainia pinnata* (Walt.) Britt.

Western tanseymustard, DEPI, NABF, 2

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### BRASSICACEAE cont.

*Descurainia sophia* (L.) Webb ex Prantl

[*Sisymbrium sophia* L.]

Flixweed, DESO2, IABF, 3-5

*Dimorphocarpa wislizeni* (Engelm.) Rollins

[*Dithyrea wislizeni* Engelm.]

Spectacle pod, DIWI2, NABPF, 2

*Erysimum capitatum* (Dougl. ex Hook.) Greene

[*Erysimum elatum* Nutt.]

Western wallflower, ERCA14, NBPF, 2

*Lepidium densiflorum* Schrad.

[*Lepidium neglectum* Thellung]

Common pepperweed, LEDE, NABF, 4

*Lesquerella fendleri* (Gray) S. Wats.

[*Lesquerella foliaceae* Greene]

Fendler's bladderpod, LEFE, NPF, 2-4

*Rorippa sinuata* (Nutt.) A.S. Hitchc.

[*Radicula sinuata* (Nutt.) Greene]

Spreading yellowcress, ROSI2, NPF, 4

### CACTACEAE

*Echinocereus reichenbachii* (Terscheck ex Walp.) Haage f. var. *perbellus* (Britt. & Rose) L. Benson

[*Echinocereus caespitosus* Engelm. var. *perbellus* (Britt. & Rose) Weniger]

Lace hedgehog cactus, ECREP, N\$S, 2-3

*Echinocereus viridiflorus* var. *viridiflorus* Engelm.

[*Echinocereus viridiflorus* Engelm. var. *standleyi* (Britt. & Rose) Orcutt ex Weniger]

Green-flowered hedgehog cactus, ECVIV, N\$S, 2-3

*Escobaria vivipara* var. *vivipara* (Nutt.) Buxbaum

[*Coryphantha vivipara* (Nutt.) Britt. & Rose]

Pincushion cactus, ESVIV, N\$S, 1



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### CACTACEAE cont.

*Opuntia imbricata* (Haw.) DC.

Tree cholla, OPIM, N\$TS, 3-4

*Opuntia macrorhiza* Engelm.

[*Opuntia tortispina* Engelm. & Bigelow]

Twistspine prickly pear, OPMA2, N\$S, 3

*Opuntia phaeacantha* Engelm.

Tulip prickly pear, OPPH, NP\$S, 3

*Opuntia tunicata* (Lehm.) Link & Otto var. *davisii* (Engelm. & Bigelow) L. Benson

[*Opuntia davisii* Engelm. & Bigelow]

Thistle cholla, OPTUD, N\$S, 2

### CARYOPHYLLACEAE

*Paronychia jamesii* Torr. & Gray

[*Paronychia wardii* Rydb.]

James' nailwort, PAJA, NPFH, 2-3

### CHENOPODIACEAE

*Atriplex canescens* (Pursh) Nutt.

Fourwing saltbush, ATCA2, NS, 3

*Chenopodium berlandieri* Moq.

[*Chenopodium album* (L.) var. *berlandieri* (Moq.) MacKenzie & Bush]

Pitseed goosefoot, CHBE4, NAF, 3-5

*Chenopodium dessoratum* A. Nels.

[*Chenopodium pratericola* Rydb. ssp. *dessoratum* (A. Nels.) Aellen]

Aridland goosefoot, CHDE, NAF, 5

*Chenopodium glaucum* L.

Oakleaf goosefoot, CHGL3, IAF, 4-5

*Chenopodium incanum* (S. Wats.) Heller

[*Chenopodium fremontii* var. *incanum* S. Wats.]

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Mealy goosefoot, CHIN2, NAF, 2

## CHENOPODIACEAE cont.

*Cycloloma atriplicifolium* (Spreng.) Coult.

[*Kochia atriplicifolia* Spreng.]

Winged pigweed, CYAT, NAF, 2-3

*Kochia scoparia* (L.) Schrad.

Common kochia, IAF, IAF, 4

*Salsola kali* L.

Prickly russian thistle, SAKA, IAF, 4-5

*Salsola paulsenii* Litv.

Barb-wire russian thistle, SAPA8, IAF, 2-4

*Suckleya suckleyana* (Torr.) Rydb.

Poison suckleya, SUSU2, NAF, 4

## COMMELINACEAE

*Commelina erecta* L. var. *angustifolia* (Michx.) Fern.

[*Commelina angustifolia* Michx.]

Whitemouth dayflower, COERA, NPF, 1-2

*Tradescantia occidentalis* (Britt.) Smyth

Prairie spiderwort, TROC, NPF, 1

## COMPOSITAE See ASTERACEAE

## CONVOLVULACEAE

*Convolvulus equitans* Benth.

[*Convolvulus hermannioides* Gray]

Texas bindweed, COEQ, NPFV, 1-3

*Evolvulus nuttallianus* J.A. Schultes

[*Evolvulus pilosus* Nutt.]

Shaggy dwarf morning glory, EVNU, NPF, 1-2

*Evolvulus sericeus* Sw.

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Silver dwarf morning glory, EVSE, NPF, 2  
CONVOLVULACEAE cont.

*Ipomoea leptophylla* Torr.

Bush morning glory, IPLE, IPF, 2

CRUCIFERAE See BRASSICACEAE

## **CUCURBITACEAE**

*Cucurbita foetidissima* Kunth

[*Pepo foetidissima* (Kunth) Britt.]

Buffalo gourd, CUFO, NPF, 2

## **CUPRESSACEAE**

*Juniperus monosperma* (Engelm.) Sang.

Oneseed juniper, JUMO, NST, 2

## **CYPERACEAE**

*Cyperus esculentus* L.

Chufa flatsedge, CYES, NPG, 3

*Cyperus schweinitzii* Torr.

Schweinitz's flatsedge, CYSC3, NPG, 1

*Cyperus uniflorus* Boeckl.

[*Cyperus filiformis* Sw.]

Wiry flatsedge, CYUN4, NPG, 1-3

*Eleocharis erythropoda* Steud.

[*Eleocharis calva* Torr.]

Bald spikerush, ELER, NPG, 4-5

*Scirpus pungens* Vahl

[*Scirpus americanus* auct. non Pers.]

Threesquare bulrush, SCPU3, NPEG, 3-4

*Scirpus tabernaemontani* K.C. Gmel.

[*Scirpus validus* Vahl]

Softstem bulrush, SCTA80, NPEG, 4

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## EPHEDRACEAE

*Ephedra torreyana* S. Wats.

Torrey's mormon tea, EPTO, NS, 1-3

## EUPHORBIACEAE

*Argythamnia mercurialina* (Nutt.) Muell.-Arg.

[*Ditaxis mercurialina* (Nutt.) Coult.]

Tall silverbush, ARME5, NPF, 1-3

*Chamaesyce fendleri* var. *fendleri* (Torr. & Gray) Small

[*Euphorbia fendleri* Torr. & Gray]

Fendler's sandmat, CHFEF, NPF, 2-3

*Chamaesyce geyeri* (Engelm.) Small

[*Euphorbia geyeri* Engelm.]

Geyer's sandmat, CHGE2, NAF, 2

*Chamaesyce lata* (Engelm.) Small

[*Euphorbia lata* Engelm.]

Hoary sandmat, CHLA10, NPF, 1-3

*Chamaesyce missurica* (Raf.) Shinnery

[*Euphorbia missurica* Raf.]

Prairie sandmat, CHMI8, NAF, 2-4

*Croton pottsii* var. *pottsii* (Klotzsch) Muell.-Arg.

[*Croton corymbulosus* Engelm.]

Potts' leatherweed, CRPOP, NPF, 4

*Croton texensis* (Klotzsch) Muell.-Arg.

Texas croton, CRTE4, NAF, 2-3

*Euphorbia dentata* Michx.

[*Poinsettia dentata* (Michx.) Klotzsch & Garcke]

Toothed spurge, EUDE4, NAF, 2-3

*Euphorbia marginata* Pursh

[*Lepadena marginata* (Pursh) Nieuwl.]

Snow on the mountain, EUMA8, NAF, 5

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### EUPHORBIACEAE cont.

*Reverchonia arenaria* Gray  
Sand reverchonia, REAR, NAF, 2-3

*Stillingia sylvatica* Garden ex L.  
[*Stillingia salicifolia* (Torr.) Raf.]  
Queen's delight, STSY, NPF, 3-4

*Tragia ramosa* Torr.  
[*Tragia stylaris* Muell.-Arg.]  
Branched noseburn, TRRA5, NPF, 3

### FABACEAE (Leguminosae)

*Astragalus crassicaarpus* Nutt.  
[*Geoprimum crassicaarpum* (Nutt.) Rydb. ex Small]  
Groundplum milkvetch, ASCR2, NPF, 1-2

*Astragalus lotiflorus* Hook.  
[*Batidophaca lotiflorus* (Hook.) Rydb.]  
Lotus milkvetch, ASLO4, NPF, 1-4

*Astragalus missouriensis* Nutt.  
[*Xylophacos missouriensis* (Nutt.) Rydb.]  
Missouri milkvetch, ASMI10, NFH, 2-4

*Astragalus mollissimus* var. *mollissimus* Torr.  
Woolly milkvetch, ASMOM5, NPF, 4

*Astragalus nuttallianus* DC. var. *austrinus* (Small) Barneby  
Smallflowered milkvetch, ASNUA, NAF, 1-2

*Astragalus nuttallianus* var. *nuttallianus* DC.  
Smallflowered milkvetch, ASNU4, NAF, 1

*Caesalpinia gilliesii* (Hook.) Wallich ex D. Dietr.  
[*Poinciana gilliesii* Wallich ex Hook.]  
Bird-of-paradise shrub, CAGI, IST, 2

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### FABACEAE cont.

*Caesalpinia jamesii* (Torr. & Gray) Fisher  
[*Hoffmannseggia jamesii* Torr. & Gray]  
James' holdback, CAJA6, NPF, 1-4

*Dalea candida* Willd. var. *oligophylla* (Torr.) Shinnery  
[*Petalostemon oligophyllus* (Torr.) Torr. ex Smyth]  
White prairieclover, DACAO, NPF, 4

*Dalea enneandra* Nutt.  
[*Parosela enneandra* (Nutt.) Britt.]  
Nineanther prairieclover, DAEN, NPF, 1

*Dalea formosa* Torr.  
Featherplume, DAFO, NS, 2-3

*Dalea jamesii* (Torr.) Torr. & Gray  
James' prairieclover, DAJA, NPF, 1-2

*Dalea lanata* Spreng.  
[*Parosela lanata* (Spreng.) Britt.]  
Woolly prairieclover, DALA3, NPF, 3

*Dalea nana* var. *nana* Torr. ex Gray  
[*Parosela nana* (Torr. ex Gray) Heller]  
Dwarf prairieclover, DANA, NPF, 2-3

*Dalea purpurea* Vent.  
[*Petalostemon purpureus* (Vent.) Rydb.]  
Purple prairieclover, DAPU5, NPF, 2-4

*Desmanthus cooleyi* (Eat.) Trel.  
Cooley's bundleflower, DECO2, NPFH, 2-3

*Hoffmannseggia glauca* (Ortega) Eifert  
[*Hoffmannseggia densiflora* Benth.]  
Indian rushpea, HOGL2, NPF, 3

*Melilotus officinalis* (L.) Lam.  
[*Melilotus albus* Medik.]

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Yellow sweetclover, MEOF, IBAF, 3  
FABACEAE cont.

*Mimosa quadrivalvis* L. var. *occidentalis* (Woot. & Standl.) Barneby  
[*Schrankia occidentalis* (Woot. & Standl.) Standl.]  
Western mimosa, MIQUO, NPF, 2-3

*Prosopis glandulosa* Torr.  
[*Prosopis chilensis* (Molina) Stuntz var. *glandulosa* (Torr.) Standl.]  
Honey mesquite, PSTE5, NST, 2-4

*Psoraleidium tenuiflorum* (Pursh) Rydb.  
[*Psoralea tenuiflora* Pursh]  
Wild alfalfa, PSTE5, NPF, 3

*Sophora nuttalliana* B.L. Turner  
[*Vexibia nuttalliana* (B.L. Turner) W.A. Weber]  
Silky Sophora, SONU, NPF, 2-4

*Vicia exigua* Nutt.  
[*Vicia ludoviciana* ssp. *ludoviciana* Nutt.]  
Slim vetch, VIEX, NAF, 3

## GERANIACEAE

*Erodium cicutarium* (L.) L'Her.  
Redstem stork's bill, ERCI2, IABF, 4

GRAMINAE See POACEAE

## HYDROPHYLLACEAE

*Nama hispidum* Gray  
[*Nama foliosum* (Woot. & Standl. Tidestrom)]  
Bristly nama, NAHI, NAF, 3

*Phacelia integrifolia* Torr.  
Gypsum scorpionweed, PHIN, NABF, 1

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### **JUGLANDACEAE**

*Juglans nigra* L.

[*Wallia nigra* (L.) Alef.]

Black walnut, JUNI, NT, 1

### **JUNCACEAE**

*Juncus effusus* L.

Common rush, JUEF, NPEG, 3

### **KRAMERIACEAE**

*Krameria lanceolata* Torr.

[*Krameria secundiflora* auct. non DC.]

Trailing rhatany, KRLA, NPF, 2-3

LABIATAE See LAMIACEAE

### **LAMIACEAE (Labiatae)**

*Hedeoma drummondii* Benth.

[*Hedeoma campora* Rydb.]

Drummond's false pennyroyal, HEDR, NPAFH, 1-2

*Marrubium vulgare* L.

Horehound, MAVU, IPF, 3-4

*Monarda pectinata* Nutt.

Plains beebalm, MOPE, NAF, 2

*Salvia azurea* Michx. ex Lam.

Azure bluesage, SAAZ, PF, 1

*Salvia reflexa* Hornem.

[*Salvia lancifolia* Poir.]

Lanceleaf sage, SARE3, NAF, 2-3

*Teucrium laciniatum* Torr.

Lacy germander, TELA, NPF, 2-3

LEGUMINOSAE See FABACEAE



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### LILIACEAE See also AGAVACEAE

*Allium perdulce* S.V. Fraser  
Plains onion, ALPE2, NPF, 2

*Allium perdulce* S.V. Fraser  
Plains onion, ALPE2, NPF, 1-2

### LINACEAE

*Linum aristatum* Engelm.  
[*Cathartolinum aristatum* (Engelm.) Small]  
Bristle flax, LIAR3, NAF, 3

*Linum lewisii* Pursh  
[*Adenolinum lewisii* (Pursh) A. & D. Love]  
Prairie flax, LILE3, NPF, 1-2

*Linum rigidum* var. *rigidum* Pursh  
[*Cathartolinum rigidum* (Pursh) Small]  
Largeflower yellow flax, LIRIR, NAF, 2-3

### LOASACEAE

*Mentzelia nuda* (Pursh) Torr. & Gray  
[*Nuttallia nuda* (Pursh) Greene]  
Bractless blazingstar, MENU, NPBF, 3

*Mentzelia oligosperma* Nutt. ex Sims  
Chickentief, MEOL, NPFH, 3

### MALVACEAE

*Malvella leprosa* (Ortega) Krapov.  
[*Sida leprosa* (Ortega) K. Schum.]  
Alkali mallow, MALE3, NPF, 5

*Sphaeralcea angustifolia* (Cav.) G. Don ssp. *cuspidata* (Gray) Kearney  
[*Sphaeralcea angustifolia* (Cav.) G. Don var. *cuspidata* Gray]  
Copper globemallow, SPANC2, NPFH, 3

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### MALVACEAE cont.

*Sphaeralcea coccinea* (Nutt.) Rydb.  
[*Malvastrum coccineum* (Nutt.) Gray]  
Scarlet globemallow, SPCO, NBPEH, 2-4

### MARSILEACEAE

*Marsilea vestita* Hook. & Grev.  
[*Marsilea mucronata* A. Braun]  
Hairy pepperwort, MAV2, NPEF, 3

### MOLLUGINACEAE

*Mollugo cerviana* (L.) Ser.  
Threadstem carpetweed, MOCE, NAF, 2

*Mollugo verticillata* L.  
[*Mollugo berteriana* Ser.]  
Green carpetweed, MOVE, NAF,

### NYCTAGINACEAE

*Abronia fragrans* Nutt. ex Hook.  
Snowball sand verbena, ABR2, NPF, 2

*Mirabilis linearis* (Pursh) Heimerl  
[*Allionia linearis* Pursh]  
Narrowleaf four o'clock, MILI3, NPF, 1-2

### ONAGRACEAE

*Calylophus hartwegii* (Benth.) Raven  
[*Oenothera hartwegii* Benth.]  
Hartweg's sundrops, CAHA14, NFH, 2-4

*Calylophus serrulatus* (Nutt.) Raven  
[*Oenothera serrulata* Nutt.]  
Yellow sundrops, CASE12, NFH, 1-

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### ONAGRACEAE cont.

*Gaura coccinea* Nutt. ex Pursh

[*Gaura glabra* Lehm.]

Scarlet beeblossom, GACO5, NPF, 2-3

*Gaura villosa* Torr.

Woolly beeblossom, GAVI2, NPFH, 2-4

*Oenothera albicaulis* Pursh

[*Anogra albicaulis* (Pursh) Britt.]

Prairie evening primrose, OEAL, NAF, 3

*Oenothera canescens* Torr. & Frem.

[*Gaurella canescens* (Torr. & Frem.) A. Nels.]

Spotted evening primrose, OECA3, NPF, 2

*Oenothera latifolia* (Rydb.) Munz

[*Oenothera pallida* Lindl. ssp. *latifolia* (Rydb.) Munz]

Mountain evening primrose, OELA2, NPF, 3

*Oenothera triloba* Nutt.

[*Lavauxia triloba* (Nutt.) Spach]

Stemless evening primrose, OETR2, NABF, 2

### OROBANCHACEAE

*Orobanche ludoviciana* Nutt. ssp. *multiflora* (Nutt.) Collins comb. nov. ined.

[*Orobanche multiflora* Nutt.]

Manyflowered broomrape, ORLUM, NA-F, 1-2

*Orobanche uniflora* L.

Oneflowered broomrape, ORUN, NAF, 1

### PEDALIACEAE

*Proboscidea louisianica* (P. Mill.) Thellung

[*Martynia louisianica* P. Mill.]

Common devilsclaw, PRLO, NAF, 2

## FAMILY

*Scientific name*

[*Synonym*]

Common name, Code, Habit, Abundance

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## PLANTAGINACEAE

*Plantago patagonica* Jacq.

[*Plantago purshii* Roemer & J.A. Schultes]

Woolly plantain, PLPA2, NAF, 3

## POACEAE (Graminae)

*Andropogon gerardii* Vitmann var. *paucipilus* (Nash) Fern.

[*Andropogon hallii* Hack.]

Sand bluestem, ANGEP, NPG, 4

*Aristida adscensionis* L.

[*Aristida fasciculata* Torr.]

Sixweeks threeawn, ARAD, NAG, 3

*Aristida havardii* Vasey

[*Aristida barbata* Fourn.]

Havard's threeawn, ARHA3, NPG, 3

*Aristida oligantha* Michx.

Prairie threeawn, AROL, NAG, 3

*Aristida pupurea* Nutt. var. *wrightii* (Nash) Allred

[*Aristida wrightii* Nash]

Wright's threeawn, ARPUW, NPG, 3

*Aristida pupurea* Nutt. var. *fendleriana* (Steud. Vasey

[*Aristida fendleriana* Steud.]

Fendler's threeawn, ARPUF, NPG, 2

*Aristida pupurea* Nutt. var. *longiseta* (Steud.) Vasey

[*Aristida longiseta* Steud.]

Red threeawn, ARPUL, NPG, 3

*Aristida pupurea* Nutt. var. *nealleyi* (Vasey) Allred

[*Aristida glauca* (Nees) Walp.]

Blue threeawn, ARPUN, NPG, 2-4

*Aristida pupurea* var. *pupurea* Nutt.

[*Aristida pupurea* Nutt. var. *laxiflora* Merr.]

Purple threeawn, ARPUP6, NPG, 4-5

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---

### POACEAE cont.

*Bothriochloa bladhii* (Retz.) S.T. Blake  
[*Bothriochloa intermedia* (R. Br.) A. Camus]  
Australian beardgrass, BOBL, IPG, 4

*Bothriochloa laguroides* (DC.) Herter ssp. *torreyana* (Steud.) Allred & Gould  
[*Andropogon saccharoides* Sw. var. *torreyanus* (Steud.) Hack.]  
Silver beardgrass, BOLAT, NPG, 2-3

*Bouteloua barbata* Lag.  
[*Bouteloua arenosa* Vasey]  
Sixweeks grama, BOBA2, NAG, 1-4

*Bouteloua curtipendula* var. *curtipendula* (Michx. Torr.)  
Sideoats grama, BOCUC2, NPG, 1-5

*Bouteloua eriopoda* (Torr.) Torr.  
Black grama, BOER4, NPG, 2

*Bouteloua gracilis* (Willd. ex Kunth) Lag. ex Griffiths  
Blue grama, BOGR2, NPG, 3

*Bouteloua hirsuta* Lag.  
Hairy grama, BOHI2, NPG, 4-5

*Bromus catharticus* Vahl.  
[*Bromus unioloides* Kunth]  
Rescue grass, BRCA6, IAG, 2

*Bromus japonicus* Thunb. ex Murr.  
[*Bromus japonicus* Thunb. ex Murr. var. *porrectus* Hack.]  
Japanese brome, BRJA, IAG, 2

*Buchloe dactyloides* (Nutt.) Engelm.  
[*Bulbilis dactyloides* (Nutt.) Raf. ex Kuntze]  
Buffalograss, BUDA, NPG, 3-5

*Cenchrus incertus* M.A. Curtis  
[*Cenchrus carolinianus* Walt.]  
Coastal sandbur, CEIN4, NPAG, 3

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### POACEAE cont.

*Chloris cucullata* Bisch.

Hooded windmill grass, CHCU2, NPG, 4

*Chloris verticillata* Nutt.

Tumble windmill grass, CHVE2, NPG, 2-4

*Digitaria cognata* (Schult.) Pilger var. *pubiflora* Vasey ex L.H. Dewey

[*Digitaria cognata* (Schult.) Pilger ssp. *pubiflora* Wipff & Hatch]

Fall witchgrass, DICOP, NPG, 2-4

*Distichlis spicata* (L.) Greene var. *stricta* (Torr.) Scribn

[*Distichlis stricta* (Torr.) Rydb.]

Inland saltgrass, DISPS2, NPG, 5

*Echinochloa crus-galii* (L.) Beauv.

Barnyard grass, ECCR, IAG, 2

*Elymus canadensis* L.

[*Elymus canadensis* L. var. *robustus* (Scribn. & J.G. Sm.) Mack. & Bush]

Canada wildrye, ELCA4, NPG, 3

*Elymus longifolius* (J.G. Sm.) Gould

[*Elymus elymoides* (Raf.) Swezey]

Longleaf squirreltail, ELLO3, NPG, 2-4

*Eragrostis cilianensis* (All.) Lut. ex Janchen

[*Poa cilianensis* All.]

Stinkgrass, ERCI, IAG, 2-4

*Eragrostis curtipedicellata* Buckl.

Gummy lovegrass, ERCU, NPG, 2-4

*Eragrostis curvula* var. *curvula* (Schrad.) Nees

Weeping lovegrass, ERCU2, IPG, 3

*Eragrostis secundiflora* J. Presl.

[*Eragrostis beyrichii* J.G. Sm.]

Red lovegrass, ERSE, NPG, 3

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### POACEAE cont.

*Eragrostis sessilispica* Buckl.

[*Acamptocladus sessilispicus* (Buckl.) Nash]

Tumble lovegrass, ERSE2, NPG, 2

*Erioneuron pilosum* (Buckl.) Nash

[*Tridens pilosus* (Buckl.) A.S. Hitchc.]

Hairy tridens, ERPI5, NPG, 2

*Hilaria mutica* (Buckl.) Benth

[*Pleuraphis mutica* Buckley]

Tobosa, HIMU2, NPG, 3

*Hordeum pusillum* Nutt.

[*Critesion pusillum* (Nutt.) A. Love]

Little barley, HOPU, NAG, 3

*Leptochloa dubia* (Kunth) Nees

[*Diplachne dubia* (Kunth) Scribn.]

Green spangletop, LEDU, NPG, 2

*Leptochloa fascicularis* (Lam.) Gray

Bearded spangletop, LEFA, NAG, 1

*Lycurus setosus* (Nutt.) C.G. Reeder

[*Lycurus phleoides* H.B.K. var. *glaucofolius* Beal]

Wolftail, LYSE, NPG, 2-3

*Muhlenbergia arenacea* (Buckl.) A.S. Hitchc.

Ear muhly, MUAR, NPG, 3

*Muhlenbergia arenicola* Buckl.

Sand muhly, MUAR2, NPG, 3-4

*Muhlenbergia torreyi* (Kunth) A.S. Hitchc. ex Bush

[*Muhlenbergia gracillima* Torr.]

Ring muhly, MUTO2, NPG, 2

*Munroa squarrosa* (Nutt.) Torr.

[*Munroa squarrosa* (Nutt.) Torr. var. *floccuosa* Vasey ex Beal]

False buffalograss, MUSQ, NAG, 3

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### POACEAE cont.

*Panicum capillare* L. var. *brevifolium* Vasey ex Rydb. & Shear

[*Panicum capillare* L.]

Witchgrass, PACAB2, NAG, 4

*Panicum hallii* var. *hallii* Vasey

Hall's panicgrass, PAHAH, NPG, 2

*Panicum obtusum* Kunth

Vine mesquite, PAOB, NPG, 3

*Paspalum setaceum* Michx.

Thin paspalum, PASE5, NPG, 2

*Poa arida* Vasey

[*Poa glaucifolia* Scribn. & Williams ex Williams]

Plains bluegrass, POAR3, NPG, 2

*Schedonnardus paniculatus* (Nutt. Trel.

Tumblegrass, SCPA, NPG, 3

*Schizachyrium scoparium* (Michx.) Nash

[*Andropogon scoparius* Michx.]

Little bluestem, SCSC, NPG, 3-4

*Setaria leucopila* (Scribn. & Merr.) K. Schum.

[*Setaria macrostachya* Kunth]

Streambed bristlegrass, SELE6, NPG, 2-3

*Sorghastrum nutans* (L.) Nash

[*Sorghastrum avenaceum* (Michx.) Nash]

Yellow indiagrass, SONU2, NPG, 2

*Sorghum halpense* (L.) Pers.

[*Holcus halepensis* L.]

Johnsongrass, SOHA, IPG, 3-4

*Sporobolus airoides* (Torr.) Torr.

[*Agrostis airoides* Torr.]

Alkali sacaton, SPAI, NPG, 4



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### POACEAE cont.

*Sporobolus contractus* A.S. Hitchc.

[*Sporobolus cryptandrus* (Torr.) Gray var. *strictus* Scribn.]

Spike dropseed, SPCO4, NPG, 4

*Sporobolus cryptandrus* (Torr.) Gray

Sand dropseed, SPCR, NPG, 2-4

*Stipa neomexicana* (Thrub. ex Coult.) Scribn.

[*Hesperostipa neomexicana* (Thrub.) Barkw.]

New Mexico needlegrass, STNE2, NPG, 3

*Tridens albescens* (Vasey)

White tridens, TRAL2, NPG, 3

*Vulpia octoflora* (Walt.) Rydb. var. *glauca* (Nutt.) Fern.

[*Festuca octoflora* Walt. var. *glauca* (Nutt.) Fern.]

Sixweeks fescue, VUOCG, AG, 3

### POLEMONIACEAE

*Ipomopsis laxiflora* (Coult.) V. Grant

[*Gilia laxiflora* (Coult.) Osterhout]

Iron skyrocket, IPLA2, NBAF, 1-3

### POLYGALACEAE

*Polygala alba* Nutt.

White milkwort, POAL4, NPF, 2-5

### POLYGONACEAE

*Eriogonum annuum* Nutt.

Annual buckwheat, ERAN4, NBAF, 4

*Eriogonum tenellum* Torr.

Tall buckwheat, ERTE9, NPF, 3

*Polygonella americana* (Fisch. & Mey.) Small

[*Gonopyrum americanum* Fisch. & C.A. Mey.]

Southern jointweed, POAM3, NH, 2-3

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### POLYGONACEAE cont.

*Polygonum aviculare* L.

Prostrate pigweed, POAV, IAPF, 3

*Polygonum pensylvanicum* L.

[*Persicaria pensylvanica* (L.) G. Maza]

Pennsylvania smartweed, POPE2, NAEF, 2-5

*Polygonum ramosissimum* Michx.

[*Polygonum exsertum* auct. p.p. non Small]

Bushy knotweed, PORA3, NAF, 3

*Rumex crispus* L.

Curly dock, RUCR, IPF, 3

### POLYPODIACEAE See ADIANTACEAE

### PONTEDERIACEAE

*Heteranthera limosa* (Sw.) Willd.

[*Pontederia limosa* Sw.]

Blue mudplantain, HELI2, NNAEF, 4

### PORTULACACEAE

*Portulaca mundula* I.M. Johnston

[*Portulaca pilosa* L.]

Kiss me quick, POMU2, NA\$F, 2

*Portulaca oleracea* ssp. *oleracea* L.

[*Portulaca neglecta* Mackenzie & Bush]

Purslane, POOL, NA\$F, 2

*Portulaca parvula* Gray

[*Portulaca halimoides* L.]

Silk cotton purslane, POPA12, NA\$F, 2-3

*Portulaca retusa* Engelm.

[*Portulaca oleracea* ssp. *oleracea* L.]

Little hogweed, PORE4, NA\$F, 3

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### ROSACEAE

*Prunus angustifolia* Marsh.

Chickasaw plum, PRAN3, NST, 2

### RUBIACEAE

*Houstonia humifusa* (Gray) Gray

[*Hedyotis humifusa* Gray]

Matted bluet, HOHU, NAF, 1

### SALICACEAE

*Populus alba* L.

White poplar, POAL7, IT, 1

*Populus deltoides* Bartr. ex Marsh. ssp. *monilifera* (Ait.) Echenwalder

[*Populus monilifera* Ait.]

Plains cottonwood, PODEM, NT, 2-3

*Populus nigra* L.

[*Populus nigra* L. var. *italica* Du Roi]

Black poplar, Lombardy poplar, PONI, IT, 2

### SANTALACEAE

*Comandra umbellata* (L.) Nutt. ssp. *pallida* (A. DC.) Piehl

[*Comandra pallida* A. DC.]

Pale bastard toadflax, COUMP, NP+F, 2-3

*Comandra umbellata* ssp. *umbellata* (L.) Nutt.

[*Comandra richardsiana* Fern.]

Pale bastard toadflax, COUM, NP+F, 3

### SCROPHULARIACEAE

*Castilleja sessiliflora* Pursh

Downy paintbrush, CASE5, NPF, 2-3

*Penstemon ambiguus* Torr.

Pink plains penstemon, PEAM, NSH, 2-3

## FAMILY

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### SCROPHULARIACEAE cont.

*Penstemon fendleri* Torr. & Gray

Purple foxglove, PEFE, NPH, 1

*Penstemon jamesii* Benth.

[*Penstemon brevibarbatulus* Crosswhite]

James' beardtongue, PEJA, NPF, 1-2

### SOLANACEAE

*Chamaesaracha coniodes* (Moric. ex Dunal) Britt.

Gray five eyes, CHCO, NPF, 1

*Chamaesaracha coronopus* (Dunal) Gray

Greenleaf five eyes, CHCO2, NPF, 2

*Quincula lobata* (Torr.) Raf.

[*Physalis lobata* Torr.]

Chinese lantern, QULO2, NPF, 3-4

*Solanum elaeagnifolium* Cav.

Silverleaf nightshade, SOEL, NFH, 4

*Solanum rostratum* Dunal

[*Androcera rostrata* (Dunal) Rydb.]

Buffalobur nightshade, SORO, NAF, 2-3

### TAMARICACEAE

*Tamarix chinensis* Lour.

[*Tamarix pentandra* Pallas]

Fivestamen tamarisk, TACH2, IT, 2

### TYPHACEAE

*Typha angustifolia* L.

Narrowleaf cattail, TYAN, NPEF, 3

## FAMILY

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### ULMACEAE

*Celtis laevigata* Willd. var. *reticulata* (Torr.) L. Benson

[*Celtis reticulata* Torr.]

Netleaf hackberry, CELAR, NTS, 2

*Ulmus pumila* L.

Siberian elm, ULPU, ITS, 3

UMBELLIFERAE See APIACEAE

### VERBENACEAE

*Glandularia bipinnatifida* (Nutt.) Nutt.

[*Verbena bipinnatifida* Nutt.]

Dakota mock vervain, GLBI2, NPAF, 4

*Phyla cuneifolia* (Torr.) Greene

[*Lippia cuneifolia* (Torr.) Steud.]

Fogfruit, PHCU3, NPF, 3

*Verbena bracteata* Lag. & Rodr.

[*Verbena bracteosa* Michx.]

Bigbract verbena, VEBR, NAPF, 5

*Verbena plicata* Greene

Fanleaf vervain, VEPL, NPF, 1

### ZANNICHELLIACEAE

*Zannichellia palustris* L.

Horned pondweed, ZAPA, NPZF, 4

### ZYGOPHYLLACEAE

*Tribulus terrestris* L.

Puncture vine, TRTE, IAF, 2-4

## **APPENDIX C**

### **SCIENTIFIC AND COMMON NAMES OF PLANTS COLLECTED ON CANNON AIR FORCE BASE AND MELROSE AIR FORCE RANGE**

<b>GENUS</b>	<b>SPECIES</b>	<b>VAR</b>	<b>VAR / SSP</b>	<b>COMMON NAME</b>
<i>Abronia</i>				Snowball sand verberna
<i>Acourtia</i>				Dwarf desert holly
<i>Allium</i>				Plains onion
<i>Amaranthus</i>				Prostrate pigweed
<i>Amaranthus</i>				Careless weed
<i>Ambrosia</i>				Weakleaf burr ragweed
<i>Ambrosia</i>				Burr ragweed
<i>Ambrosia</i>				Western ragweed
<i>Andropogon</i>		var.	<i>paucipilus</i>	Sand bluestem
<i>Aphanostephus</i>				Arkansas dozedaisy
<i>Argythamnia</i>				Tall silverbush
<i>Aristida</i>				Sixweeks threeawn
<i>Aristida</i>				Havard's threeawn
<i>Aristida</i>				Prairie threeawn
<i>Aristida</i>		var.	<i>fendleriana</i>	Fendler's threeawn
<i>Aristida</i>		var.	<i>longiseta</i>	Red threeawn
<i>Aristida</i>		var.	<i>nealleyi</i>	Blue threeawn
<i>Aristida</i>		var.	<i>purpurea</i>	Purple threeawn
<i>Aristida</i>		var.	<i>wrightii</i>	Wright's threeawn
<i>Artemisia</i>				Bigelow's sagebrush
<i>Artemisia</i>				Silky wormwood
<i>Artemisia</i>				Sand sagebrush
<i>Artemisia</i>				Louisiana wormwood
<i>Asclepias</i>				Engelmann's milkweed
<i>Asclepias</i>				Dwarf milkweed
<i>Asclepias</i>				Broadleaf milkweed
<i>Asclepias</i>				Plains milkweed
<i>Asclepias</i>				Whorled milkweed
<i>Asclepias</i>				Green milkweed
<i>Aster</i>				Annual saltmarsh aster
<i>Astragalus</i>				Groundplum milkvetch
<i>Astragalus</i>				Lotus milkvetch
<i>Astragalus</i>				Missouri milkvetch
<i>Astragalus</i>		var.	<i>mollissimus</i>	Woolly milkvetch
<i>Astragalus</i>		var.	<i>austrinus</i>	Smallflowered milkvetch
<i>Astragalus</i>		var.	<i>nuttallianus</i>	Smallflowered milkvetch
<i>Atriplex</i>				Fourwing saltbush
<i>Baccharis</i>				Great plains falsewillow
<i>Berlandiera</i>				Chocolate daisy
<i>Bothriochloa</i>				Australian beardgrass
<i>Bothriochloa</i>		ssp.	<i>torreyana</i>	Silver beardgrass
<i>Bouteloua</i>				Sixweeks grama
<i>Bouteloua</i>		var.	<i>curtipendula</i>	Sideoats grama

<b>GENUS</b>	<b>SPECIES</b>	<b>VAR</b>	<b>VAR / SSP</b>	<b>COMMON NAME</b>
<i>Bouteloua</i>	<i>eriopoda</i>			Black grama
<i>Bouteloua</i>	<i>gracilis</i>			Blue grama
<i>Bouteloua</i>	<i>hirsuta</i>			Hairy grama
<i>Brickellia</i>	<i>eupatorioides</i>	var.	<i>chlorolepis</i>	False boneset
<i>Brickellia</i>	<i>laciniata</i>			Splitleaf brickellbush
<i>Bromus</i>	<i>catharticus</i>			Rescue grass
<i>Bromus</i>	<i>japonicus</i>			Japanese brome
<i>Buchloe</i>	<i>dactyloides</i>			Buffalograss
<i>Caesalpinia</i>	<i>gilliesii</i>			Bird-of-paradise shrub
<i>Caesalpinia</i>	<i>jamesii</i>			James' holdback
<i>Calylophus</i>	<i>hartwegii</i>			Hartweg's sundrops
<i>Calylophus</i>	<i>serrulatus</i>			Yellow sundrops
<i>Castilleja</i>	<i>sessiliflora</i>			Downy paintbrush
<i>Celtis</i>	<i>laevigata</i>	var.	<i>reticulata</i>	Netleaf hackberry
<i>Cenchrus</i>	<i>incertus</i>			Coastal sandbur
<i>Chaetopappa</i>	<i>ericoides</i>			Rose heath
<i>Chamaesaracha</i>	<i>coniodes</i>			Gray five eyes
<i>Chamaesaracha</i>	<i>coronopus</i>			Greenleaf five eyes
<i>Chamaesyce</i>	<i>fendleri</i>	var.	<i>fendleri</i>	Fendler's sandmat
<i>Chamaesyce</i>	<i>geyeri</i>			Geyer's sandmat
<i>Chamaesyce</i>	<i>lata</i>			Hoary sandmat
<i>Chamaesyce</i>	<i>missurica</i>			Prairie sandmat
<i>Cheilanthes</i>	<i>feei</i>			Slender lipfern
<i>Chenopodium</i>	<i>berlandieri</i>			Pitseed goosefoot
<i>Chenopodium</i>	<i>dessicatum</i>			Aridland goosefoot
<i>Chenopodium</i>	<i>glaucum</i>			Oakleaf goosefoot
<i>Chenopodium</i>	<i>incanum</i>			Mealy goosefoot
<i>Chilopsis</i>	<i>linearis</i>			Desert willow
<i>Chloris</i>	<i>cucullata</i>			Hooded windmill grass
<i>Chloris</i>	<i>verticillata</i>			Tumble windmill grass
<i>Chrysothamnus</i>	<i>pulchellus</i>	ssp.	<i>baileyi</i>	Southwest rabbitbrush
<i>Cirsium</i>	<i>ochrocentrum</i>			Yellowspine thistle
<i>Comandra</i>	<i>umbellata</i>	ssp.	<i>pallida</i>	Pale bastard toadflax
<i>Comandra</i>	<i>umbellata</i>	ssp.	<i>umbellata</i>	Pale bastard toadflax
<i>Commelina</i>	<i>erecta</i>	var.	<i>angustifolia</i>	Whitemouth dayflower
<i>Convolvulus</i>	<i>equitans</i>			Texas bindweed
<i>Conyza</i>	<i>canadensis</i>			Canadian horseweed
<i>Croton</i>	<i>pottsii</i>	var.	<i>pottsii</i>	Potts' leatherweed
<i>Croton</i>	<i>texensis</i>			Texas croton
<i>Cryptantha</i>	<i>cinerea</i>	var.	<i>jamesii</i>	James' catseye
<i>Cryptantha</i>	<i>crassisejala</i>			Thicksepal catseye
<i>Cucurbita</i>	<i>foetidissima</i>			Buffalo gourd
<i>Cycloloma</i>	<i>atriplicifolium</i>			Winged pigweed



GENUS	SPECIES	VAR	VAR / SSP	COMMON NAME
<i>Cymopterus</i>	<i>montanus</i>			Mountain spring parsley
<i>Cyperus</i>	<i>esculentus</i>			Chufa flatsedge
<i>Cyperus</i>	<i>schweinitzii</i>			Schweinitz's flatsedge
<i>Cyperus</i>	<i>uniflorus</i>			Wiry flatsedge
<i>Dalea</i>	<i>candida</i>	var.	<i>oligophylla</i>	White prairieclover
<i>Dalea</i>	<i>enneandra</i>			Nineanther prairieclover
<i>Dalea</i>	<i>formosa</i>			Featherplume
<i>Dalea</i>	<i>jamesii</i>			James' prairieclover
<i>Dalea</i>	<i>lanata</i>			Woolly prairieclover
<i>Dalea</i>	<i>nana</i>	var.	<i>nana</i>	Dwarf prairieclover
<i>Dalea</i>	<i>purpurea</i>			Purple prairieclover
<i>Descurainia</i>	<i>pinnata</i>			Western tanseymustard
<i>Descurainia</i>	<i>sophia</i>			Flixweed
<i>Desmanthus</i>	<i>cooleyi</i>			Cooley's bundleflower
<i>Digitaria</i>	<i>cognata</i>	var.	<i>pubiflora</i>	Fall witchgrass
<i>Dimorphocarpa</i>	<i>wislizeni</i>			Spectacle pod
<i>Distichlis</i>	<i>spicata</i>	var.	<i>stricta</i>	Inland saltgrass
<i>Echinocereus</i>	<i>reichenbachii</i>	var.	<i>perbellus</i>	Lace hedgehog cactus
<i>Echinocereus</i>	<i>viridiflorus</i>	var.	<i>viridiflorus</i>	Green-flowered hedgehog cactus
<i>Echinochloa</i>	<i>crus-gallii</i>			Barnyard grass
<i>Eleocharis</i>	<i>erythropoda</i>			Bald spikerush
<i>Elymus</i>	<i>canadensis</i>			Canada wildrye
<i>Elymus</i>	<i>longifolius</i>			Longleaf squirreltail
<i>Engelmannia</i>	<i>pinnatifida</i>			Engelmann's daisy
<i>Ephedra</i>	<i>torreyana</i>			Torrey's mormon tea
<i>Eragrostis</i>	<i>cilianensis</i>			Stinkgrass
<i>Eragrostis</i>	<i>curtipedicellata</i>			Gummy lovegrass
<i>Eragrostis</i>	<i>curvula</i>	var.	<i>curvula</i>	Weeping lovegrass
<i>Eragrostis</i>	<i>secundiflora</i>			Red lovegrass
<i>Eragrostis</i>	<i>sessilispica</i>			Tumble lovegrass
<i>Erigeron</i>	<i>colomexicanus</i>			Running fleabane
<i>Erigeron</i>	<i>flagellaris</i>			Trailing fleabane
<i>Eriogonum</i>	<i>annuum</i>			Annual buckwheat
<i>Eriogonum</i>	<i>tenellum</i>			Tall buckwheat
<i>Erioneuron</i>	<i>pilosum</i>			Hairy tridens
<i>Erodium</i>	<i>cicutarium</i>			Redstem stork's bill
<i>Erysimum</i>	<i>capitatum</i>			Western wallflower
<i>Escobaria</i>	<i>vivipara</i>	var.	<i>vivipara</i>	Pincushion cactus
<i>Euphorbia</i>	<i>dentata</i>			Toothed spurge
<i>Euphorbia</i>	<i>marginata</i>			Snow on the mountain
<i>Evax</i>	<i>verna</i>			Spring pygmy cudweed
<i>Evolvulus</i>	<i>nuttallianus</i>			Shaggy dwarf morning glory
<i>Evolvulus</i>	<i>sericeus</i>			Silver dwarf morning glory

<b>GENUS</b>	<b>SPECIES</b>	<b>VAR</b>	<b>VAR / SSP</b>	<b>COMMON NAME</b>
<i>Froelichia</i>	<i>gracilis</i>			Slender snakecotton
<i>Gaillardia</i>	<i>pinnatifida</i>			Red dome blanketflower
<i>Gaillardia</i>	<i>pulchella</i>			Firewheel
<i>Gaura</i>	<i>coccinea</i>			Scarlet beeblossom
<i>Gaura</i>	<i>villosa</i>			Woolly beeblossom
<i>Glandularia</i>	<i>bipinnatifida</i>			Dakota mock vervain
<i>Grindelia</i>	<i>nuda</i>	var.	<i>nuda</i>	Curlytop gumweed
<i>Gutierrezia</i>	<i>sarothrae</i>			Broom snakeweed
<i>Gutierrezia</i>	<i>sphaerocephala</i>			Roundleaf snakeweed
<i>Hedeoma</i>	<i>drummondii</i>			Drummond's false pennyroyal
<i>Helianthus</i>	<i>annuus</i>			Common sunflower
<i>Helianthus</i>	<i>ciliaris</i>			Texas blueweed
<i>Helianthus</i>	<i>petiolaris</i>			Prairie sunflower
<i>Heliotropium</i>	<i>convolvulaceum</i>			Phlox heliotrope
<i>Heteranthera</i>	<i>limosa</i>			Blue mudplantain
<i>Heterotheca</i>	<i>subaxillaris</i>			Camphorweed
<i>Heterotheca</i>	<i>villosa</i>			Hairy goldenaster
<i>Hilaria</i>	<i>mutica</i>			Tobosa
<i>Hoffmannseggia</i>	<i>glauca</i>			Indian rushpea
<i>Hordeum</i>	<i>pusillum</i>			Little barley
<i>Houstonia</i>	<i>humifusa</i>			Matted bluet
<i>Hymenopappus</i>	<i>filifolius</i>			Threadleaf white ragweed
<i>Hymenopappus</i>	<i>flavescens</i>	var.	<i>flavescens</i>	Yellow woolly-white
<i>Hymenopappus</i>	<i>flavescens</i>	var.	<i>flavescens</i>	Yellow woolly-white
<i>Ipomoea</i>	<i>leptophylla</i>			Bush morning glory
<i>Ipomopsis</i>	<i>laxiflora</i>			Iron skyrocket
<i>Juglans</i>	<i>nigra</i>			Black walnut
<i>Juncus</i>	<i>effusus</i>			Common rush
<i>Juniperus</i>	<i>monosperma</i>			Oneseed juniper
<i>Kochia</i>	<i>scoparia</i>			Common kochia
<i>Krameria</i>	<i>lanceolata</i>			Trailing rhatany
<i>Lappula</i>	<i>redowskii</i>			Desert stickseed
<i>Lepidium</i>	<i>densiflorum</i>			Common pepperweed
<i>Leptochloa</i>	<i>dubia</i>			Green spangletop
<i>Leptochloa</i>	<i>fascicularis</i>			Bearded spangletop
<i>Lesquerella</i>	<i>fendleri</i>			Fendler's bladderpod
<i>Liatris</i>	<i>punctata</i>			Dotted gayfeather
<i>Linum</i>	<i>aristatum</i>			Bristle flax
<i>Linum</i>	<i>lewisii</i>			Prairie flax
<i>Linum</i>	<i>rigidum</i>	var.	<i>rigidum</i>	Largeflower yellow flax
<i>Lithospermum</i>	<i>incisum</i>			Puccoon
<i>Lycurus</i>	<i>setosus</i>			Wolftail
<i>Lygodesmia</i>	<i>juncea</i>			Rush skeletonplant

GENUS	SPECIES	VAR	VAR / SSP	COMMON NAME
<i>Machaeranthera</i>	<i>canescens</i>	ssp.	<i>glabra</i>	Hoary tansyaster
<i>Machaeranthera</i>	<i>pinnatifida</i>			Lacy tansyaster
<i>Machaeranthera</i>	<i>tanacetifolia</i>			Tanseyleaf aster
<i>Malvella</i>	<i>leprosa</i>			Alkali mallow
<i>Marrubium</i>	<i>vulgare</i>			Horehound
<i>Marsilea</i>	<i>vestita</i>			Hairy pepperwort
<i>Melampodium</i>	<i>leucanthum</i>			Blackfoot daisy
<i>Melilotus</i>	<i>officinalis</i>			Yellow sweetclover
<i>Mentzelia</i>	<i>nuda</i>			Bractless blazingstar
<i>Mentzelia</i>	<i>oligosperma</i>			Chickenthief
<i>Mimosa</i>	<i>quadrivalvis</i>	var.	<i>occidentalis</i>	Western mimosa
<i>Mirabilis</i>	<i>linearis</i>			Narrowleaf four o'clock
<i>Mollugo</i>	<i>cerviana</i>			Threadstem carpetweed
<i>Mollugo</i>	<i>verticillata</i>			Green carpetweed
<i>Monarda</i>	<i>pectinata</i>			Plains beebalm
<i>Muhlenbergia</i>	<i>arenacea</i>			Ear muhly
<i>Muhlenbergia</i>	<i>arenicola</i>			Sand muhly
<i>Muhlenbergia</i>	<i>torreyi</i>			Ring muhly
<i>Munroa</i>	<i>squarrosa</i>			False buffalograss
<i>Nama</i>	<i>hispidum</i>			Bristly nama
<i>Oenothera</i>	<i>albicaulis</i>			Prairie evening primrose
<i>Oenothera</i>	<i>canescens</i>			Spotted evening primrose
<i>Oenothera</i>	<i>latifolia</i>			Mountain evening primrose
<i>Oenothera</i>	<i>triloba</i>			Stemless evening primrose
<i>Opuntia</i>	<i>imbricata</i>			Tree cholla
<i>Opuntia</i>	<i>macrorhiza</i>			Twistspine prickly pear
<i>Opuntia</i>	<i>phaeacantha</i>			Tulip prickly pear
<i>Opuntia</i>	<i>tunicata</i>	var.	<i>davisii</i>	Thistle cholla
<i>Orobanche</i>	<i>ludoviciana</i>	ssp.	<i>multiflora</i>	Manyflowered broomrape
<i>Orobanche</i>	<i>uniflora</i>			Oneflowered broomrape
<i>Palafoxia</i>	<i>sphacelata</i>			Palafoxia
<i>Panicum</i>	<i>capillare</i>	var.	<i>brevifolium</i>	Witchgrass
<i>Panicum</i>	<i>hallii</i>	var.	<i>hallii</i>	Hall's panicgrass
<i>Panicum</i>	<i>obtusum</i>			Vine mesquite
<i>Paronychia</i>	<i>jamesii</i>			James' nailwort
<i>Paspalum</i>	<i>setaceum</i>			Thin paspalum
<i>Penstemon</i>	<i>ambiguus</i>			Pink plains penstemon
<i>Penstemon</i>	<i>fendleri</i>			Purple foxglove
<i>Penstemon</i>	<i>jamesii</i>			James' beardtongue
<i>Phacelia</i>	<i>integrifolia</i>			Gypsum scorpionweed
<i>Phyla</i>	<i>cuneifolia</i>			Fogfruit
<i>Picradeniopsis</i>	<i>woodhousei</i>			Woodhouse's bahia
<i>Plantago</i>	<i>patagonica</i>			Woolly plantain

<b>GENUS</b>	<b>SPECIES</b>	<b>VAR</b>	<b>VAR / SSP</b>	<b>COMMON NAME</b>
<i>Poa</i>	<i>arida</i>			Plains bluegrass
<i>Polygala</i>	<i>alba</i>			White milkwort
<i>Polygonella</i>	<i>americana</i>			Southern jointweed
<i>Polygonum</i>	<i>aviculare</i>			Prostrate pigweed
<i>Polygonum</i>	<i>pennsylvanicum</i>			Pennsylvania smartweed
<i>Polygonum</i>	<i>ramosissimum</i>			Bushy knotweed
<i>Populus</i>	<i>alba</i>			White poplar
<i>Populus</i>	<i>deltoides</i>	ssp.	<i>monilifera</i>	Plains cottonwood
<i>Populus</i>	<i>nigra</i>			Black poplar
<i>Portulaca</i>	<i>mundula</i>			Kiss me quick
<i>Portulaca</i>	<i>oleracea</i>	ssp.	<i>oleracea</i>	Purslane
<i>Portulaca</i>	<i>parvula</i>			Silk cotton purslane
<i>Portulaca</i>	<i>retusa</i>			Little hogweed
<i>Prionopsis</i>	<i>ciliata</i>			Sawtooth daisy
<i>Proboscidea</i>	<i>louisianica</i>			Common devilsclaw
<i>Prosopis</i>	<i>glandulosa</i>			Honey mesquite
<i>Prunus</i>	<i>angustifolia</i>			Chickasaw plum
<i>Psilostrophe</i>	<i>tagetina</i>	var.	<i>tagetina</i>	Plains paperflower
<i>Psoralidium</i>	<i>tenuiflorum</i>			Wild alfalfa
<i>Quincula</i>	<i>lobata</i>			Chinese lantern
<i>Ratibida</i>	<i>columnifera</i>			Upright prairie coneflower
<i>Ratibida</i>	<i>tagetes</i>			Short-ray prairie coneflower
<i>Reverchonia</i>	<i>arenaria</i>			Sand reverchonia
<i>Rhus</i>	<i>trilobata</i>			Skunkbush sumac
<i>Rorippa</i>	<i>sinuata</i>			Spreading yellowcress
<i>Rumex</i>	<i>crispus</i>			Curly dock
<i>Salsola</i>	<i>kali</i>			Prickly russian thistle
<i>Salsola</i>	<i>paulsenii</i>			Barb-wire russian thistle
<i>Salvia</i>	<i>azurea</i>			Azure bluesage
<i>Salvia</i>	<i>reflexa</i>			Lanceleaf sage
<i>Schedonnardus</i>	<i>paniculatus</i>			Tumblegrass
<i>Schizachyrium</i>	<i>scoparium</i>			Little bluestem
<i>Scirpus</i>	<i>pungens</i>			Threesquare bulrush
<i>Scirpus</i>	<i>tabernaemontani</i>			Softstem bulrush
<i>Senecio</i>	<i>flaccidus</i>	var.	<i>flaccidus</i>	Threadleaf groundsel
<i>Senecio</i>	<i>riddellii</i>			Riddell's ragwort
<i>Setaria</i>	<i>leucopila</i>			Streambed bristlegrass
<i>Solanum</i>	<i>elaeagnifolium</i>			Silverleaf nightshade
<i>Solanum</i>	<i>rostratum</i>			Buffalobur nightshade
<i>Sophora</i>	<i>nuttalliana</i>			Silky sophora
<i>Sorghastrum</i>	<i>nutans</i>			Yellow indiagrass
<i>Sorghum</i>	<i>halpense</i>			Johnsongrass
<i>Sphaeralcea</i>	<i>angustifolia</i>	ssp.	<i>cuspidata</i>	Copper globemallow

<b>GENUS</b>	<b>SPECIES</b>	<b>VAR</b>	<b>VAR / SSP</b>	<b>COMMON NAME</b>
<i>Sphaeralcea</i>	<i>coccinea</i>			Scarlet globemallow
<i>Sporobolus</i>	<i>airoides</i>			Alkali sacaton
<i>Sporobolus</i>	<i>contractus</i>			Spike dropseed
<i>Sporobolus</i>	<i>cryptandrus</i>			Sand dropseed
<i>Stephanomeria</i>	<i>pauciflora</i>			Brownplume wirelettuce
<i>Stillingia</i>	<i>sylvatica</i>			Queen's delight
<i>Stipa</i>	<i>neomexicana</i>			New Mexico needlegrass
<i>Suckleya</i>	<i>suckleyana</i>			Poison suckleya
<i>Tamarix</i>	<i>chinensis</i>			Fivestamen tamarisk
<i>Tetaneuris</i>	<i>scaposa</i>			Yellow daisy
<i>Teucrium</i>	<i>laciniatum</i>			Lacy germander
<i>Thelesperma</i>	<i>megapotamicum</i>			Indian tea
<i>Thymophylla</i>	<i>acerosa</i>			Pricklyleaf dogweed
<i>Tidestromia</i>	<i>lanuginosa</i>			Shrubby honeysweet
<i>Townsendia</i>	<i>exscapa</i>			Easter daisy
<i>Tradescantia</i>	<i>occidentalis</i>			Prairie spiderwort
<i>Tragia</i>	<i>ramosa</i>			Branched noseburn
<i>Tragopogon</i>	<i>dubius</i>			Yellow salsify
<i>Tribulus</i>	<i>terrestris</i>			Puncture vine
<i>Tridens</i>	<i>albescens</i>			White tridens
<i>Typha</i>	<i>angustifolia</i>			Narrowleaf cattail
<i>Ulmus</i>	<i>pumila</i>			Siberian elm
<i>Verbena</i>	<i>bracteata</i>			Bigbract verbena
<i>Verbena</i>	<i>plicata</i>			Fanleaf vervain
<i>Verbesina</i>	<i>enceliodes</i>	ssp.	<i>exauriculata</i>	Golden crownbeard
<i>Verbesina</i>	<i>encelioides</i>	ssp.	<i>exauriculata</i>	Golden crownbeard
<i>Vernonia</i>	<i>marginata</i>			Plains ironweed
<i>Vicia</i>	<i>exigua</i>			Slim vetch
<i>Vulpia</i>	<i>octoflora</i>	var.	<i>glauca</i>	Sixweeks fescue
<i>Xanthium</i>	<i>spinosum</i>			Spiny cocklebur
<i>Xanthium</i>	<i>strumarium</i>			Rough cockleburr
<i>Yucca</i>	<i>glauca</i>			Small soapweed
<i>Zannichellia</i>	<i>palustris</i>			Horned pondweed
<i>Zinnia</i>	<i>grandiflora</i>			Rocky mountain zinnia

## APPENDIX D

### CAFB/MAFR FIELD ACTIVITY RECORD

#### **APRIL 5, 1993**

1:00 PM - 3:45 PM

Met Natural Resource Manager Rick Crow at his office and examined the maps and aerial photographs of Melrose Air Force Range (MAFR).

#### **APRIL 6, 1993**

Ellen DeBruin, David Bleakly, with Rick Crow, Jim Richards (Chief of Compliance)

8:00 AM - 3:00 PM

Field reconnaissance of Melrose Air Force Range. Drove all of the main access roads outside of the impact area. Stopped and walked around at each of the potential habitat sampling areas. Found and collected three species of forbs in bloom. The area was very dry, very little snowfall and no spring rains this year. Met with the range management staff at the administration center and received briefing on safety procedures for operating on and around the impact area.

4:00 PM - 6:00 PM

Soil map research, matched soil associations with observed field sites.

#### **April 7, 1993**

Ellen DeBruin, David Bleakly, with Rick Crow

8:00 AM - 5:00 PM

Selected 15 potential sample sites in the field on the western and southern portions of the range. Searched each site for flowering specimens. Six species were collected in flower.

#### **April 8, 1993**

Ellen DeBruin, David Bleakly, with Rick Crow

8:30 AM - 2:30 PM

Selected 6 potential sample sites in the field on the eastern side of the range. Searched five of the sites. Collected three more species that were blooming.

#### **May 3, 1993**

Ellen DeBruin, David Bleakly

8:30 AM - 12:30 PM

Travel from Albuquerque to Melrose Air Force Range.

1:30 PM - 3:00 PM

Located, mapped and described sample site #1 on deep red sandy soil with sagebrush and yucca in NW corner of the range. Collected 11 species in bloom, recorded names and abundance in log, pressed the specimens.

**3:30 PM - 5:00 PM**

Sample site #2 on compacted red sand with tall bunch grass, yucca. Collected 6 species.

**5:25 PM - 6:00 PM**

Sample site #3 on test area where native shrubs were planted for wildlife habitat. No blooming specimens were found.

**May 4, 1993**

Ellen DeBruin, David Bleakly

**9:30 AM - 11:10 AM**

Sample site #4 described on rocky limestone north slope of mesa. Fourteen blooming species collected, recorded, pressed.

**11:15 AM - 12:30 AM**

Sample site #5 in low drainage area, heavily grazed. Cannot locate any ungrazed portions of this habitat. Collected three species in bloom.

**2:00 PM - 3:30 PM**

Sample site #6 around old ranch grounds at Parker Ranch. Thirteen species collected in bloom, mostly very weedy.

**4:00 PM - 5:45 PM**

Sample site #7 on east slopes of limestone mesa top. Collected only one new species in bloom.

**May 5, 1993**

Ellen DeBruin, David Bleakly, Rick Crow

**9:00 AM - 11:00 AM**

Visited four potential sampling areas on the main base in town. Selected sample site #8 at the sewage treatment overflow area as the most diverse representation of vegetation. Collected 4 species in bloom, recorded and pressed them.

**1:00 PM - 2:30 PM**

Sample site #9 in sand dune badlands. Collected 9 species in bloom.

**3:00 PM - 4:00 PM**

Sample site #10 in old playa-sink area near abandoned windmill. Collected 3 species in bloom. Observed great horned owl with young on a nest. Collected one species by water tank along the road out.

**4:15 PM - 5:30 PM**

Sample site #11 on gentle ridge of white sandstone. Collected one species of Euphorbia unique to this site.

**May 6, 1993**

Ellen DeBruin, David Bleakly

**8:00 AM - 9:45 AM**

Sample site #12. Collected and processed 8 species in recently burned shortgrass upland.

10:00 AM - 11:30 AM

Sample site #13. Collected and processed 7 species in field with old water catchment terraces.

12:30 PM - 3:00 PM

Sample site #14 in small canyon with limestone cliffsides and fine soil in dry canyon bottom. Collected, recorded, and pressed 15 species. Observed great horned owls, pack rat middens, and evidence of other small animal activity.

3:30 PM - 4:50 PM

Sample site #15 in bottom of dry playa. Collected and processed three species in the playa and one on the roadside near the site.

**May 7, 1993**

Ellen DeBruin and David Bleakly

8:30 AM - 9:45 AM

Sample site #16 on sandy upland with diverse vegetative cover. Collected and processed 4 species.

10:30 AM - 11:30 AM

Sample site #17 in Canada Del Tule. Pasture dry and heavily grazed, arroyo bottom had young green plants emerging. Collected and processed six species.

12:00 PM - 1:00 PM

Sample site #18 in mesquite/shortgrass pasture, heavily grazed and dry. Found no species to collect at the site. Collected 3 species on roadside between #17 and #18.

1:30 PM - 5:00 PM

Travel back to Albuquerque.

**June 21, 1993**

Ellen DeBruin, David Bleakly

8:00 AM - 12:00 PM

Travel from Albuquerque to Melrose Air Force Range.

1:00 PM - 2:30 PM

Sample site #1. Collected, recorded and pressed 7 species. Soil was moist from recent rain, but plants were very dry due to very low precipitation during the last month.

2:45 PM - 4:00 PM

Sample site #2. Collected, recorded and pressed 9 species. Soil only slightly moist.



**4:15 PM - 5:30 PM**

Sample site #19. Described a new sample site on shortgrass/mesquite sandy upland. Grass cover more diverse and more abundant than on sites 1 and 2. Limestone gravel added to the sandy substrate. Collected and processed 9 species.

**5:50 PM - 6:30 PM**

Sample site #3. Collected and processed two species. Soil disturbed by new digging of water catchment basins around the planted shrubs in this wildlife habitat experimental area.

**June 22, 1993**

**9:00 AM - 11:00 AM**

Sample site #14. Collected and processed 16 species. This canyon habitat was less parched than the surrounding uplands. Two snakes and an owl were observed in the canyon.

**11:20 AM - 12:30 PM**

Sample site #4. Collected and processed 2 species. Very dry ridge, recent cattle grazing.

**12:40 PM - 1:15 PM**

Sample site #5. Collected and processed 2 species. Very dry lowland in heavily grazed pasture.

**1:25 PM - 1:40 PM**

Cattle tank between site #5 and the county road. Collected 2 species and recorded the location.

**2:30 PM - 3:15 PM**

Roadside near site #14. Collected and processed 6 species not observed elsewhere. The roadsides had a greater abundance and diversity of species in bloom than the adjacent dry pastures.

**3:30 PM - 4:00 PM**

Sample site #7. Collected and processed one species from the dry rocky hillside.

**4:15 PM - 4:50 PM**

Sample site #6. Collected and processed 5 species from the dry yards of old ranches.

**5:00 PM - 5:40 PM**

Sample site #15. Collected and processed three species from dry playa bed. Antelope have twice been observed grazing and resting in this playa.

5:40 PM - 6:00 PM

Roadside at site #15. Collected and processed three species.

**June 23, 1993**

Temperature 98 degrees F and strong hot, dry winds.

8:00 AM - 9:30 AM

Sample sites #12 and #20. Collected 4 species from site 12 on the burned area along the flight path for the aircraft. Added and described a new site #20 in a draw northwest of site 12 in a draw downhill from a dirt cattle tank. Six species were collected from site 20 including a *Euphorbia* not observed elsewhere.

9:40 AM - 10:45 AM

Sample site #13. Collected 4 species and processed the specimens for sites 12, 20 and 13.

11:00 AM - 12:10 PM

New Sample site #21 described at a previously unsampled soil and aspect combination on the south side of the range. Two species were collected on the site. Four species were collected from the adjacent roadside; the specimens were processed.

1:30 PM - 2:00 PM

Sample site #18. The area was searched but no species were collected at this site. The soil was extremely dry and cattle were grazing on the shortgrass between mesquite shrubs.

2:20 PM - 4:00 PM

New Sample site #22 described in flat dry shortgrass/mesquite pasture about 1.5 miles east of site 17. Site 22 includes a population of at least 40 individuals of the uncommon species *OPUNTIA DAVISII*. Specimens of flowers and joints were collected. Four species were collected and processed at the site.

4:15 PM - 5:20 PM

Sample site #17. Plants were green in the arroyo bottom. Collected one species, *EUPHORBIA MARGINATA*, which was not observed elsewhere.

**June 24, 1993**

7:30 AM - 10:30 AM

Sample site #8 at the sewage overflow pond on the main base. Cold north wind in the morning. Collected and processed 23 mostly weedy species on the shoreline and in the sand above the banks. Rick Crow came out to meet us and we gave him an informal report on our progress to date and discussed our field schedule for July.

**11:15 AM - 12:00 PM**

Near Sample site #9. Checked the cattle tank overflow area on the way to the site. The vehicle bogged down in the sand before we reached the site, so we proceeded on to site #10.

**1:00 PM - 2:15 PM**

Sample site #10. Collected and processed 6 species. The horned owl baby was still on the nest in the cottonwood.

**2:30 PM - 3:30 PM**

Sample site #11. Collected only one species. It was the same Euphorbia we collected in flower in May. Now the plants are still green and succulent while other plants on the site are brown and dry.

**4:00 PM - 5:00 PM**

Sample site #16. Collected and processed 8 species at the site and one species on the roadside as we were leaving the range.

**June 25, 1993**

**8:00 AM - 11:00 AM**

Sample site #9. Left the vehicle about half a mile from the site to avoid getting stuck in the sand. Hiked to the sand dune site, collected 17 species including a new unknown Euphorbia, recorded and pressed them back at the vehicle. Hot humid still day.

**11:00 AM - 4:30 PM**

Travel back to Albuquerque.

**July 19, 1993**

Ellen DeBruin, David Bleakly

**8:30 AM - 12:00 PM**

Travel from Albuquerque to Melrose Air Force Range.

**12:55 PM - 1:30 PM**

Sample site #1. Soil very churned up by recent cattle activity. Collected, recorded and pressed only two species.

**1:35 PM - 2:10 PM**

Sample site #2. Collected and processed three species. Two new composite species had buds but were not yet in bloom.

**2:20 PM - 3:10 PM**

Sample site #19. Collected and processed 7 species.

**3:24 PM - 3:45 PM**

Sample site #3. Collected and processed one species.

4:05 PM - 5:25 PM

Sample site #6. Collected and processed 11 species.

5:30 PM - 6:00 PM

Sample site #21. Collected and processed one species.

8:30 PM - 9:00 PM Entered activity log on computer.

**July 20, 1993**

8:00 AM - 12:00 PM

Species identification and data entry during heavy rain.

1:00 PM - 3:00 PM

Examined specimens at ENMU herbarium during thunderstorm.

3:45 PM - 6:00 PM

Sample site #8. Collected and processed 16 species.

**July 21, 1993**

8:00 AM - 10:00 AM

Visited ENMU field research site south of Clovis.

11:00 AM - 12:30 PM

Sample site #9. Collected and processed 6 species, searched an expanded area.

12:40 PM - 1:30 PM

Sample site #10. Collected and processed 4 species.

2:25 PM - 3:11 PM

Sample sites #4,5. Collected one species, no new ones, walked from 4 to 5 in the mud.

3:30 PM - 4:30 PM

Sample site #14. No new plants, little blooming, canyon bottom heavily washed by runoff, deep pool below the cliffs, one roadside collection.

4:45 PM - 5:15 PM

Sample site #15. Playa completely full of water. Old rancher described it as a 5 year event. He measured 3.1 inches of rain this week.

**July 22, 1993**

8:00 AM - 8:30 AM

Sample site #12. Two species collected.

**8:35 AM - 9:50 AM**

Sample site #20. Four species collected.

**10:00 AM - 10:20 AM**

Sample site #6. No new collections, one *CORYPHANTHA VIVIPARA* found

**10:30 AM - 11:05 AM**

Sample site #7. No new species

**12:45 PM - 1:20 PM**

Sample site #22. Collected and processed 2 species. *OPUNTIA DAVISII* in fruit.

**1:30 PM - 2:00 PM**

Sample site #17. No species to collect, *OPUNTIA DAVISII* infrequent here also.

**2:25 PM - 3:00 PM**

Sample site #18. No new species to collect.

**3:30 PM - 4:30 PM**

Sample site #16. Road impassable, searched same habitat near the site, also at granary, old field and roadside, 2 new collections.

### **August 30, 1993**

Ellen DeBruin, David Bleakly

**10:30 AM - 1:00 PM**

Travel from Albuquerque to MAFR

**2:00 PM - 4:00 PM**

Sample site #1. Collected and processed 22 species. Soil still very disturbed by cattle. Grasses flowering as a result of the late July rain. In addition to grasses, many of the specimens collected were duplicates of those found earlier, which are now in seed or in better blooming condition after the rain.

**4:05 PM - 5:00 PM**

Sample site #2. Collected and processed 15 species.

**5:00 PM - 5:30 PM**

Sample site #3. Collected and processed only one grass species, and one species at a gate en route. This disturbed site was very weedy. Some of the weeds had been cut back around the planted shrubs.

### **August 31, 1993**

**8:45 AM - 11:00 AM**

Sample sites #20 and #12. Collected and processed 14 species on site #20 and 2 species on site #12.

**11:10 AM - 12:00 PM**

**Sample site #13.** Collected and processed 6 species, three of which were found on the road bed where the water was standing during the last rain.

**1:00 PM - 2:30 PM**

**Sample site #14.** Collected and processed 6 species. There were red-spotted toads in the dry bottom of the pool that held 8 feet of rainwater in July.

**3:00 PM - 3:15 PM**

**Sample site #4.** No new species found and no specimens collected.

**3:20 PM - 4:15 PM**

**Sample site #5.** Collected and processed 7 species

**4:30 PM - 5:30 PM**

**Sample site #19.** Collected and processed 5 species of grass.

**September 1, 1993**

**8:15 AM - 9:20 AM**

**Sample site #8 on CAFB.** Collected and processed 7 species, saw (tame?) ferret under trees, stopped at Rick Crow's office.

**10:45 AM - 12:35 PM**

**Sample site #9.** Collected and processed 15 species, searched at windmill on way out.

**1:15 PM - 2:30 PM**

**Sample site #10.** Collected and processed five species.

**2:45 PM - 3:30 PM**

**Sample site #11.** Collected and processed three species, one at 5 gate trap.

**3:40 PM - 4:20 PM**

**Sample site # 16.** No new species found .

**September 2, 1993**

**8:45 AM - 10:40 AM**

**Sample site #15.** Water and mud still in lowest areas, large patch of aquatics in bloom, six new collections.

**10:50 AM - 11:45 AM**

**Sample site #7.** Searched in several drainages along the escarpment, collected one showy SALVIA sp., one grass.

**1:00 PM - 1:45 PM**

**Sample site #6.** Searched both Parker Ranch areas, no new species found.

**2:00 PM - 2:30 PM**

Sample site #21. No new species found

**2:45 PM - 3:15 PM**

Sample site #22. One species collected and processed.

**3:20 PM - 3:50 PM**

Sample site #17. No new species found.

**4:15 PM - 4:45 PM**

Sample site #18. No new species found.

**September 3, 1993**

**9:00 AM - 1:00 PM**

MAFR Impact area. Searched at nine sites along a complete circuit of the restricted access area, collected and processed 18 species.

**1:30 PM - 5:30 PM**

Travel to Albuquerque.

**October 4, 1993**

Ellen DeBruin, David Bleakly

**9:00 AM - 12:30 PM**

Ellen DeBruin, David Bleakly

Travel Albuquerque to Clovis.

**1:00 PM - 2:30 PM**

Sample site #9. Collected and processed 14 species, most with mature seeds.

**2:45 PM - 3:30 PM**

Sample site #10. Collected and processed 6 species.

**3:45 PM - 4:15 PM**

Sample site #11. One species collected and processed.

**4:30 PM - 5:00 PM**

Sample site #16. Collected 2 species in fruit.

**October 5, 1993**

**8:15 AM - 8:45 AM**

Sample site #15. Collected aquatics now in seed, some water left in ponds, no new species.

**9:00 AM - 10:30 AM**

Sample site #12. Collected 4 species in seed, burned area now grown over, not visible.

Sample site #20. Soil still moist below surface, most plants in seed, collected 4 late species.

**10:30 AM - 10:45 AM**

Sample site #13. Grasses mature, no new species to collect.

**10:50 AM - 12:00 PM**

Sample site #14. Canyon now dry, 3 species collected, prairie rattlesnake below the cliff.

**12:45 PM - 1:04 PM**

Sample site #4. Good cover of mature grasses, even black grama, no collections.

**1:10 PM - 1:25 PM**

Sample site #5. Better grass cover here also, no collections.

**1:25 PM - 1:55 PM**

Sample site #19. Some patches of black grama mature here also, no collections.

**2:05 PM - 2:30 PM**

Sample site #2. Three species collected in fruit.

**2:35 PM - 4:45 PM**

Sample sites #1, 3, 7, 6, and 21. Negative searches, no new species.

**October 6, 1993**

**8:00 AM - 9:00 AM**

Met with Rick Crow on CAFB.

**9:00 AM - 10:00 AM**

Sample site #8. Two species collected and processed.

**10:45 AM - 11:18 AM**

Sample site #22. Four species collected in seed.

Sample sites #17, 18. No new species.

**12:05 PM - 12:30 PM**

Northeast side of Impact Area. Good diverse grass cover with black grama mixed in, one species collected.

**12:30 PM - 1:15 PM**

Southeast side of Impact Area. Less grass diversity, prairie dog town, no species to collect.



1:30 PM - 5:30 PM

Travel to Albuquerque

**May 3, 4, 1994**

Ellen DeBruin, David Bleakly

Drought time in eastern NM! Very little growing. We checked all of the sample sites in two days and also made brief surveys at additional sites in the hope of finding pockets of green. We were able to relocate species that were recorded in the spring, 1993 for which we needed additional specimens. The *Echinocereus reichenbachii* were in full bloom. Collected and processed 18 specimens as listed below, all of which were previously collected and identified. No new species were found.

1:00 PM - 1:30 PM

Roadside north of site #10. Three species collected and processed

1:45 PM - 2:30 PM

Sample site #9 and windmill on the way. Two species collected.

2:45 PM - 4:00 PM

Sample sites #10, 11, 16. No specimens collected.

4:50 PM - 5:30 PM

Sample site #8. One specimen collected.

**May 4, 1994**

8:45 AM - 5:30 PM

Sample site #21. Three specimens collected.

Sample site #15. One new species collected.

Sample site #13. Two species collected.

Sample site #12. Four species collected.

Sample sites #14, 4. One species each.

**May 5, 1994**

9:00 AM - 11:00 AM

Surveyed the east half of the impact area again, no new species to collect, even in the recently burned area.

11:30 AM - 3:30 PM

Travel to Albuquerque.

**June 14, 1994**

Ellen DeBruin, David Bleakly

8:00 AM - 11:45 AM

Travel to MAFR

12:15 PM - 6:00 PM

Sample site #3. Four species collected and processed

Sample site #1. Two species collected.

Sample site #2. One species collected

Sample site #5. Two species collected, one new.

Sample site #21. One species collected.

Also visited sites #19, 4, 6, 7, and 15. No specimens collected.

**June 15, 1994**

8:00 AM - 12:30 PM

Surveyed seven sites on the main Impact Area. Collected six species, three of them new.

1:30 PM - 5:00 PM

Sample sites #9, 10, 11. One new species near #9, one in cattle tank near #11.

Sample sites #16, 17, 18, 22. No specimens collected.

**June 16, 1994**

8:30 AM - 9:45 AM

Sample site #14. Two species collected and processed.

10:00 AM - 12:00 PM

Sample sites #12, 13, and 20. One new species collected.

1:00 PM - 5:00 PM

Travel to Albuquerque

**August 22, 1994**

Ellen DeBruin, David Bleakly

11:00 AM - 4:00 PM

Travel Albuquerque to MAFR

Location data was collected at each site with a GPS unit.

5:00 PM - 7:30 PM

Sample sites #9, 10, 11, and 16. One collection at each site and one at the windmill.

**August 23, 1994**

8:30 AM - 9:30 AM

Main Impact Area. Collected one species.

9:30 AM - 11:30 AM

Sample sites #19, 5, 4, surveyed, no species collected.

11:30 AM - 12:30

Sample sites #3, 2, 1. Two species collected.

1:15 PM - 3:15 PM

Sample sites #14, 6, 7. One species collected on roadside by #14.

Thunderstorm

4:00 PM - 6:30 PM

Sample sites #13, 12, 20, 15, and 21. No specimens for collection.

**August 24, 1994**

8:30 AM - 12:30 PM

Sample site #8. One species collected.

Met Rick Crow and accompanied him to 2 additional sites of ephemeral water collection on CAFB. Assigned site #s 23, 24, and collected GPS data. Collected 12 species at site #23 and three species at site #24.

1:30 PM - 2:30PM

Travel CAFB to MAFR

2:30 PM - 4:00 PM

Sample sites #17, 18, 22. Gathered GPS data, collected 2 species at #17.

**October 20, 1994**

Ellen DeBruin, David Bleakly

9:00 AM - 12:30 PM

Travel Albuquerque to MAFR

1:00 PM - 2:15 PM

Meeting with Rick Crow at MAFR

2:30 PM - 5:30 PM

Sample sites #9, 10, 11, surveyed and GPS data again collected, no new specimens.

**October 21, 1995**

**8:45 AM - 2:30 PM**

Sample sites #1, 2, 3, 13, 20, 12, 14, 15, 4, 21, 19, and roadsides surveyed, collected more GPS readings but only one new specimen was found, at site #14.

**2:30 PM - 6:30 PM**

Main Impact Area surveyed. One specimen was found (no. 589). Additional GPS location data collected.

**6:30 PM - 10:30 PM**

Return to Albuquerque.

## APPENDIX E

### PLANT SPECIMEN COLLECTION LOG FORMAT

Fabaceae      *Dalea*                      *nana*    var. *nana*                      Torr. ex Gray  
COLLNO: 412                              Dwarf prairieclover                              8/31/93      Bleakly & DeBruin  
LOCALITY: Melrose Air Force Range, swale 5 mi. N of Mesa Rd., 0.8 mi. E of Krider Rd.  
UTM\_E: 607631                              UTM\_N: 3794387                              ELEV: 1358  
SOILTOPO:      Soils: Amarillo fine sandy loam and Clovis fine sandy loam, Slope: <3 degrees, Aspect: 30 degrees azimuth  
ASSOSPP:      *Prosopis glandulosa/Bouteloua gracilis/Bouteloua hirsuta: Yucca glauca, Opuntia imbricata, Buchloe dactyloides*  
ABUNDANCE: 3                              COMMENTS: Keel long and golden w/red tinge.