

A Field Guide

to the Flora of New Mexico State University's
Corona Range and Livestock Research Center



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INTRODUCTION

Site Description

New Mexico State University's Corona Range and Livestock Research Center (Fig. 1) is located in the southeast central portion of New Mexico approximately eight miles northeast of Corona. The center occupies area in both Lincoln and Torrance counties. It covers approximately 43.47 square miles (27,830 acres or 11,262 hectares). Elevations on the ranch range from 6,700 feet (2,042 meters) on the top of the mesa in the extreme southwestern corner of the Mesa Pasture to 5,720 feet (1,743 meters) in the extreme southeastern corner of East Johnson Pasture. The total elevational relief of the ranch is 980 feet (299 meters). The topography is characterized by rolling hills alternating with undulating to flat areas. The slopes leading to the top of the mesa are steep and rocky with a predominately north/northwest aspect.

Climate

The climate of the center and the surrounding area is classified as semiarid continental, characterized by warm summers and cold winters. The majority of precipitation falls in mid-summer and early fall as the result of high intensity, short duration, convectional thunderstorms. Mean annual precipitation (47-year average) is 11.78 inches (29.92 cm). Mean annual temperature (43-year average) is 50.7°F. The mean number of days with temperatures greater than or equal to 90°F is 39; the mean number of days with temperatures less than or equal to 32°F is 177. The first killing frost occurs

between the October 20 and 30. The mean number of frost-free days is 188 (Kunkel, 1984; Tuan et al., 1973).

Geology

The center lies in the Great Plains Geologic Province. The prevailing topography includes gently rolling to flat plains, limestone sinkholes, sand dunes, and steep rocky mesas and outcrops. The geology is dominated by two Permian formations, the San Andres Formation, composed of limestone, and the Yeso Formation, which is slightly older and composed of gypsum and dolomite. Both of these formations are subject to dissolution by water, resulting in the formation of sinkholes and the characteristic Karst topography. Good examples of this may be found in the northern and eastern portions of the ranch. A less dominant contributor to the geology of the center is the Glorieta Sandstone Formation. Soils derived from this formation can be found scattered in the southeastern portions of the center (Chronic, 1987; Hunt, 1977).

Soils

The center's soils are a heterogeneous mix of mostly alluvial soils derived from limestone and sandstone. Within the ranch boundaries there are 17 different soil types. The principal differences among the varied soil associations and complexes are soil depth, land position, and slope. They are classified into four suborders, the Calciorthids, Calciustolls, Haplargids, and Paleorthids. The Calciorthids and Haplargids are char-

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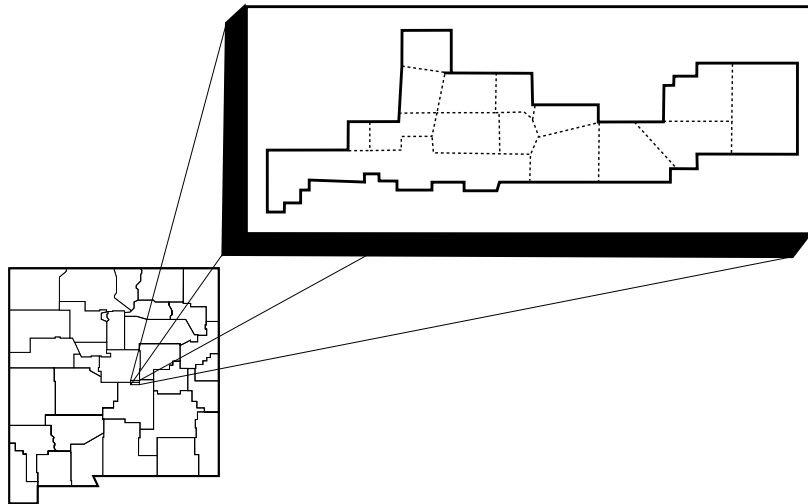


Figure 1. Map showing the location of New Mexico State University's Corona Range and Livestock Research Center.

acteristic of nearly flat to gently or strongly sloping plains and valleys interspersed with steep and rolling upland ridges and hills. These soils usually are shallow on the upland ridges and low hills and moderately deep to deep on the lesser sloping areas. The ridges and low hills support moderate to dense stands of piñon and juniper trees, whereas the remaining areas support mainly grama grasses, three-awn grasses, muhly grasses, needle grasses, winterfat, Bigelow's sagebrush, and cholla. Calciustolls and Paleorthids are characteristic of gently sloping to moderately steep or rolling areas. These soils typically are shallow to bedrock or indurated caliche. This association supports mainly three-awn grasses and grama grasses with scattered juniper trees, cholla, and broom snakeweed (Marker et al., 1974; USDA, 1970, 1980).

Taxonomic Methodology

This guide includes all vascular plants (ferns and fern allies, conifers, monocots, dicots) and mosses present on the ranch. Other nonvascular plants (other than mosses) are not included.

Nomenclature of all plants was based on Roalson and Allred (1995). Most plant identifications were made using the following publications: *A Flora of New Mexico* (Martin and Hutchins, 1980, 1981), *Arizona Flora* (Kearney and Peebles, 1960), *A Field Guide to the Grasses of New Mexico* (Allred, 1993), *Intermountain*

Flora (Cronquist et al., 1977, 1984, 1989, 1994, 1997), *The Cacti of the United States and Canada* (Benson, 1982), *Manual of The Vascular Flora of Texas* (Correll and Johnston, 1970), and a draft version of *A Flora of The Chihuahuan Desert Region* (Henrickson and Johnston, 1997). Identification of certain troublesome taxa was made using relevant monographs and taxonomic revisions. Identifications were checked against specimens located at NMSU's Range Science Herbarium (NMCR) and NMSU's Biology Herbarium (NMC). A complete set of voucher specimens is located at the herbarium at the center and a duplicate set is located at the Range Science Herbarium (NMCR).

Summary of the Flora

Sixty plant families representing 301 species are known from the center. The four largest families are Poaceae (67 species), Asteraceae (53 species), Fabaceae (17 species), and Brassicaceae (nine species). The three largest genera (total number of species) were *Muhlenbergia* (eight species) and *Eragrostis* (seven species) in the Poaceae, and *Dalea* (six species) in the Fabaceae. Table 1 lists the total number of families, genera, species, and exotic and native species present on the ranch. No endemic or rare/threatened/endangered species are found within the boundaries of the center.

Table 1. Statistical summary of the Corona research center's flora.

Family	Number of genera	Number of species	Exotic species	Native species
Agavaceae	2	3	0	3
Amaranthaceae	3	3	1	4
Amblystegiaceae	1	1	0	1
Anacardiaceae	1	1	0	1
Apiaceae	1	2	0	2
Asclepiadaceae	1	4	0	4
Asteraceae	41	50	3	53
Berberidaceae	1	1	0	1
Boraginaceae	3	4	0	4
Brassicaceae	9	12	1	13
Bryaceae	2	2	0	2
Cactaceae	3	5	0	5
Capparidaceae	1	1	0	1
Caryophyllaceae	2	3	0	3
Chenopodiaceae	8	7	4	11
Commelinaceae	2	2	0	2
Convolvulaceae	3	4	2	6
Cucurbitaceae	1	1	0	1
Cupressaceae	1	1	0	1
Cuscutaceae	1	1	0	1
Cyperaceae	1	4	0	4
Dryopteridaceae	1	1	0	1
Ephedraceae	1	1	0	1
Euphorbiaceae	3	6	0	6
Fabaceae	10	15	2	17
Fabroniaceae	1	1	0	1
Fagaceae	1	1	0	1
Fumariaceae	1	1	0	1
Grimmiaceae	1	1	0	1
Hydrophyllaceae	1	1	0	1
Krameriaceae	1	1	0	1
Lamiaceae	5	6	1	7
Leskeaceae	1	1	0	1
Liliaceae	1	1	0	1
Linaceae	1	2	0	2
Loasaceae	1	1	0	1
Malvaceae	2	4	1	5
Martyniaceae	1	1	0	1
Nyctaginaceae	2	5	0	5
Oleaceae	1	1	0	1
Onagraceae	3	4	0	4
Orobanchaceae	1	1	0	1
Oxalidaceae	1	1	0	1
Pinaceae	1	2	0	2
Plantaginaceae	1	1	0	1
Poaceae	31	58	9	67
Polemoniaceae	3	4	0	4
Polygalaceae	1	1	0	1
Polygonaceae	3	3	2	5
Portulacaceae	2	1	1	2
Pottiaceae	3	5	0	5
Pteridaceae	2	2	0	2
Ranunculaceae	1	1	0	1
Rosaceae	2	2	0	2
Rubiaceae	2	2	0	2
Scrophulariaceae	3	4	1	5
Solanaceae	5	6	1	7
Ulmaceae	1	1	0	1
Verbenaceae	3	5	0	5
Viscaeae	1	1	0	1
Zygophyllaceae	2	1	1	2
Totals	60	199	301	271

Exotic Species

Approximately 10 percent of the flora is composed of exotic species. This includes 30 species (table 2) from 14 plant families. The two families with the largest number of exotic species are the Poaceae (nine species) and the Chenopodiaceae (five species). The exotics originated in Europe, South America, Central America, and Eurasia. The largest number of exotic species originated from Europe (11 species) and Eurasia (11 species).

An interesting and little known exotic is *Salsola collina*, closely related to the common Russian thistle and only recently found in New Mexico and infrequently encountered in the United States. This species is known mainly from the Great Basin region and scattered locations in the Midwest and Canada (Mosyakin, 1996).

Table 2. Exotic species of the Corona research center.

Family	Species	Origin
Asteraceae	Lactuca serriola	Europe
Asteraceae	Tragopogon dubius	Eurasia
Asteraceae	Xanthium spinosum	South America
Brassicaceae	Descurainia sophia	Europe
Chenopodiaceae	Chenopodium album	Europe
Chenopodiaceae	Kochia scoparia	Eurasia
Chenopodiaceae	Salsola collina	Asia
Chenopodiaceae	Salsola tragus	Asia
Chenopodiaceae	Teloxys botrys	Eurasia
Convolvulaceae	Convolvulus arvensis	Eurasia
Convolvulaceae	Ipomoea purpurea	Tropical America
Fabaceae	Melilotus albus	Eurasia
Fabaceae	Medicago sativa	Europe
Lamiaceae	Marrubium vulgare	Eurasia
Malvaceae	Malva neglecta	Eurasia
Poaceae	Bromus catharticus	South America
Poaceae	Bromus japonicus	Eurasia
Poaceae	Bromus tectorum	Mediterranean
Poaceae	Cynodon dactylon	Africa
Poaceae	Echinochloa crus-galli	Europe
Poaceae	Eragrostis barrelieri	Europe
Poaceae	Eragrostis cilianensis	Europe
Poaceae	Setaria viridis	Europe
Poaceae	Tragus berteronianus	Europe
Polygonaceae	Polygonum aviculare	Eurasia
Polygonaceae	Rumex crispus	Eurasia
Portulacaceae	Portulaca oleracea	Eurasia
Scrophulariaceae	Verbascum thapsus	Europe
Solanaceae	Physalis ixocarpa	Tropical America
Zygophyllaceae	Tribulus terrestris	Europe

Floristic Influences

The flora of the Corona research center is shaped by influences from four floristic provinces. The Rocky Mountain flora to the north contributes species such as *Pinus ponderosa* and *Penstemon jamesii*. From the south, the Chihuahuan Desert flora contributes many species, e.g., *Bouteloua eriopoda*, *Sporobolus airoides*, *Desmanthus cooleyi*, and *Evolvulus nuttallianus*. The Great Plains to the east expresses its influence on the Corona flora with the presence of species such as *Buchloe dactyloides*, *Bouteloua gracilis*, *Liatris punctata*, *Guara coccinea*, and *Psoralea tenuiflora*. The Great Basin Flora to the north and west is represented by such species as *Cercocarpus montanus*, *Rhus trilobata*, *Ceratoides lanata*, *Artemisia bigelovii*, *Pinus edulis*, *Juniperus monosperma*, and *Atriplex canescens*.

Toxic Plants

There are 23 known toxic species present (table 3), distributed among 11 plant families. The most commonly encountered species are *Gutierrezia sarothrae*, *Kochia scoparia*, and *Astragalus mollissimus*; the least encountered are *Suckleya suckleyana*, *Xanthium strumarium*, and *Portulaca oleracea*. Toxic compounds found in these plants are according to Fuller et al. (1986) and Allison (1991).

Table 3. Toxic plant species of the Corona research center.

Species	Principle Toxin
<i>Asclepias latifolia</i>	Glycosides and Alkaloids
<i>Asclepias subverticillata</i>	Glycosides and Alkaloids
<i>Amaranthus palmeri</i>	Nitrates
<i>Astragalus missouriensis</i>	Swainsonine
<i>Astragalus mollissimus</i>	Swainsonine
<i>Chenopodium album</i>	Nitrates
<i>Cleome serrulata</i>	Nitrates
<i>Convolvulus arvensis</i>	Nitrates
<i>Datura quercifolia</i>	Solanaceous alkaloids
<i>Descurainia pinnata</i>	Unknown
<i>Eragrostis cilianensis</i>	Unknown
<i>Gutierrezia sarothrae</i>	Saponins
<i>Helianthus annuus</i>	Nitrates
<i>Kochia scoparia</i>	Alkaloids and Nitrates
<i>Machaeranthera pinnatifida</i>	Selenium
<i>Melilotus albus</i>	Dicoumarin
<i>Nolina texana</i>	Sapogenin
<i>Portulaca oleracea</i>	Oxalates
<i>Salvia reflexa</i>	Nitrates
<i>Senecio flaccidus</i>	Pyrrrolizidine alkaloides
<i>Senecio ridellii</i>	Pyrrrolizidine alkaloides
<i>Suckleya suckleyana</i>	Cyanide
<i>Xanthium strumarium</i>	Carboxytrascyloside (a glycoside)

Vegetation

Grassland Vegetation

In general, grassland vegetation occupies the northern half of the center. The dominant grass species on the western portion of the grassland is *Bouteloua gracilis*. On the eastern portion, *Stipa neomexicana* is the dominant species. In low areas with heavy soils in the central portions, small to medium size areas are dominated by *Buchloe dactyloides*.

Table 4. Species commonly present in grassland areas.

Grasses	Shrubs	Forbs
<i>Aristida purpurea</i>	<i>Artemisia bigelovii</i>	<i>Astragalus mollissimus</i>
<i>Bouteloua gracilis</i>	<i>Atriplex canescens</i>	<i>Castilleja integra</i>
<i>Buchloe dactyloides</i>	<i>Berberis haematocarpa</i>	<i>Chaetopappa ericoides</i>
<i>Elymus longifolius</i>	<i>Ceratoides lanata</i>	<i>Dalea spp.</i>
<i>Elymus smithii</i>	<i>Dalea Formosa</i>	<i>Gaura coccinea</i>
<i>Eragrostis spp.</i>	<i>Ericameria pulchella</i>	<i>Grindelia nuda</i>
<i>Lycurus setosus</i>	<i>Gutierrezia sarothrae</i>	<i>Ipomopsis longiflora</i>
<i>Muhlenbergia arenacea</i>	<i>Lycium pallidum</i>	<i>Lesquerella fendleri</i>
<i>Muhlenbergia torreyi</i>	<i>Nolina texana</i>	<i>Linum lewisii</i>
<i>Oryzopsis hymenoides</i>	<i>Opuntia imbricata</i>	<i>Machaeranthera spp.</i>
<i>Panicum obtusum</i>	<i>Opuntia polyacantha</i>	<i>Nama hispidum</i>
<i>Pleuraphis jamesii</i>	<i>Yucca baccata</i>	<i>Penstemon ambiguus</i>
<i>Sporobolus airoides</i>	<i>Yucca glauca</i>	<i>Ratibida columnifera</i>
<i>Sporobolus cryptandrus</i>		<i>Senecio flaccidus</i>
<i>Stipa neomexicana</i>		<i>Zinnia grandiflora</i>

Woodland Vegetation

Woodland vegetation occupies the southern half of the rangeland. This area is characterized by the presence of *Pinus edulis* and *Juniperus monosperma*. The spacing of individual plants varies greatly and influences the amount of understory growth. In general, grasses such as *Sporobolus contractus* and *Bouteloua gracilis*, forbs such as *Sphaeralcea incana* and *Lesquerella fendleri*, and less abundant shrubs such as *Lycium pallidum* dominate the understory vegetation.

Table 5. Species commonly present in woodland areas.

Grasses	Trees and Shrubs	Forbs
<i>Andropogon gerardii</i>	<i>Atriplex canescens</i>	<i>Castilleja integra</i>
<i>Aristida</i> spp.	<i>Berberis haematocarpa</i>	<i>Chenopodium</i> spp.
<i>Bothriochloa</i>		
<i>springfieldii</i>	<i>Cercocarpus montanus</i>	<i>Descurainia obtusa</i>
<i>Bouteloua</i> spp.	<i>Juniperus monosperma</i>	<i>Hedeoma drummondii</i>
<i>Chechrus ciliaris</i>	<i>Lycium pallidum</i>	<i>Lesquerella</i> spp.
<i>Elymus smithii</i>	<i>Menodora scabra</i>	<i>Machaeranthera</i> spp.
<i>Eragrostis intermedia</i>	<i>Opuntia imbricata</i>	<i>Marrubium vulgare</i>
<i>Koeleria macrantha</i>	<i>Opuntia polyacantha</i>	<i>Mirabilis multiflora</i>
<i>Muhlenbergia</i> spp.	<i>Pinus edulis</i>	<i>Physalis ixocarpa</i>
<i>Oryzopsis hymenoides</i>	<i>Quercus undulata</i>	<i>Salvia subincisa</i>
<i>Oryzopsis macrantha</i>	<i>Rhus trilobata</i>	<i>Solanum jamesii</i>
<i>Poa bigelovii</i>	<i>Yucca baccata</i>	<i>Sphaeralcea coccinea</i>
<i>Poa fendleriana</i>		<i>Sphaeralcea incana</i>
<i>Schizachyrium scoparium</i>		
<i>Sporobolus contractus</i>		
<i>Sporobolus flexuosus</i>		

Table 6. Species commonly present in transition areas.

Grasses	Trees and Shrubs	Forbs
<i>Aristida</i> spp.	<i>Artemisia bigelovii</i>	<i>Chamaesaracha conoides</i>
<i>Bothriochloa</i>		
<i>springfieldii</i>	<i>Berberis haematocarpa</i>	<i>Chenopodium album</i>
<i>Bouteloua</i> spp.	<i>Ceratoides lanata</i>	<i>Cryptantha crassisepala</i>
<i>Chechrus ciliaris</i>	<i>Ericameria pulchella</i>	<i>Descurainia obtusa</i>
<i>Elymus longifolius</i>	<i>Juniperus monosperma</i>	<i>Desmanthus cooleyi</i>
<i>Elymus smithii</i>	<i>Lycium pallidum</i>	<i>Evolvulus nuttallianus</i>
<i>Eragrostis intermedia</i>	<i>Opuntia imbricata</i>	<i>Froelichia gracilis</i>
<i>Lycurus setosus</i>	<i>Opuntia polyacantha</i>	<i>Gaillardia pulchella</i>
<i>Oryzopsis hymenoides</i>	<i>Quercus undulata</i>	<i>Hedeoma drummondii</i>
<i>Panicum obtusum</i>	<i>Yucca baccata</i>	<i>Ipomopsis longiflora</i>
<i>Pleuraphis jamesii</i>		<i>Lesquerella</i> spp.
<i>Sporobolus airoides</i>		<i>Machaeranthera</i> spp.
<i>Sporobolus contractus</i>		<i>Marrubium vulgare</i>
<i>Sporobolus cryptandrus</i>		<i>Mirabilis multiflora</i>
<i>Sporobolus flexuosus</i>		<i>Physalis ixocarpa</i>
<i>neomexicana</i>		<i>Salvia reflexa</i>
		<i>Salvia subincisa</i>

Transition Vegetation

Transition vegetation extends in a more or less east-west belt through the center of the range. It is characterized by species common to both the woodland and grassland vegetation. The dominant woody plant is *Juniperus monosperma*. The understory is dominated by grasses and, to a lesser extent, forbs and shrubs.



Identification **Manual**

To use these keys, first determine which of the following groups your plant fits into by reading the descriptions. Find the identification key for that group on the page indicated. The keys to genus and species are listed alphabetically by family, starting on the next page.

Tentative identifications may be checked against specimens housed at the center's herbarium. In addition, photos of nearly all the plants may be consulted on the Internet at http://www.nmsu.edu/~dars/ka_plants.htm

Mosses (p. 9)

Plants low and mat forming with tiny scalelike leaves. Plants reproducing by spores. Spores borne in capsules raised above the leaves. Plants often found growing on rocks, crevices, or forming cushionlike mats on the soil.

Ferns (p. 9)

Herbaceous plants that reproduce by spores borne on the underside of the leaves. These plants do not produce flowers or seeds. Ferns usually have highly dissected leaves that unroll like a fiddle-neck.

Cacti (p. 9)

Spine covered plants with succulent fleshy stems. Obvious leaves absent. Spines borne in obvious clusters or patches. The flowers are showy with many waxy petals and inferior ovaries. Only one family: Cactaceae

Woody Plants (p. 9)

Trees, shrubs, or subshrubs with obvious woody stems that persist from year to year. Plants reproduce by seed borne in flowers or cones.

Grasses and Grasslike Plants (p. 10)

Herbaceous plants that lack obvious showy flowers. The leaves are narrow with parallel veins. The flowers lack sepals and petals, and are hidden in clusters of chaffy bracts.

Forbs (p. 10)

Herbaceous plants usually producing showy flowers. The leaves are usually broad and have netted veins, but may be narrow and obscurely veined. The flowers usually develop sepals and petals and are not usually hidden.



Abbreviations

mm = millimeters

cm = centimeters

KEYS TO FAMILIES

(The families are treated on p. 15)

Mosses (Hand lens required)

- 1 Leaves distinctly tipped with a white hair point
 - 2 Leaves twisted spirally around the stem when dry *Jaffueliobryum* (GRIMMIACEAE)
 - 2 Leaves not twisted spirally around the stem when dry
 - 3 Stems \pm prostrate-spreading, leaf tips opaque to whitish, stems slender *Fabronia* (FABRONIACEAE)
 - 3 Stems \pm erect, leaf tips definitely white, stems robust
 - 4 Plants white in appearance when dry *Bryum* (BRYACEAE)
 - 4 Plants greenish brown to rust-colored when dry, leaves appressed to the stem when dry but widely spreading when wet *Tortula* (POTTIACEAE)
- 1 Leaves not tipped with a white hair point
 - 5 Leaves when dry shriveled up so that they all appear tangled together *Weissia* (POTTIACEAE)
 - 5 Leaves when dry not shriveled up so that the all appear tangled together
 - 6 Plants growing on dead or living trees, plants when dry black to blackish-green *Pseudoleskeella* (LESKEACEAE)
 - 6 Plants growing on soil
 - 7 Plants minute, usually than less than 2 mm tall
 - 8 Leaves when dry tightly appressed to the stem, leaf apex acuminate, plants with a glistening luster *Pohlia* (BRYACEAE)
 - 8 Leaves when dry not tightly appressed to the stem, leaf apex not acuminate, plants dull and lacking a glistening luster *Didymodon* (POTTIACEAE)
 - 7 Plants more than 2 mm tall
 - 9 Plants light green to yellowish green, with a glossy luster . *Amblystegium* (AMBLYSTEGIACEAE)
 - 9 Plants dark olive green to blackish when dry *Didymodon* (POTTIACEAE)

Ferns

- 1 Sporangia borne in clusters along the leaf margins PTERIDACEAE
- 1 Sporangia borne in distinct clusters away from the leaf margins DRYOPTERIDACEAE

Cacti

- Only one family CACTACEAE

Woody Plants

- 1 Leaves needle or scalelike, plants monoecious or dioecious, plants bearing cones
 - 2 Leaves needlelike, mostly 2-3 to a fascicle, plants large trees PINACEAE
 - 2 Leaves \pm scale of wedge like, not in fascicles, plants trees or shrubs
 - 3 Nodes of the stem bearing a whorl of small papery scales, cones borne at the nodes, plants green-yellow in color, small rather low shrubs EPHEDRACEAE
 - 3 Nodes of stem not as above, leaves small green wedge-shaped, leaves tightly appressed to stem CUPRESSACEAE

- 1 Leaves not needlelike, plants not bearing cones
 - 4 Shrubs or subshrubs, flowers small individually, but clustered on a common receptacle into dense heads subtended by modified leaves (phyllaries) that often resemble sepals, remains of the head are present long after the flowers have died, sepals represented by a modified pappus borne at the top of the fruit (achene), this composed of scales, bristles, awns, or absent, individual flowers are of two general types, strap-shaped ray flowers and tube-shaped disc flowers, sunflower family ASTERACEAE
 - 4 Shrubs or trees, flowers other than above
 - 5 Leaves compound, separated into leaflets
 - 6 Leaves twice compound, leaflets entire, small shrubs, flowers purple, calyx hairy FABACEAE
 - 6 Leaves once compound
 - 7 Leaves palmately compound, leaflet margins round-lobed, pubescent, fruit a pubescent drupe, flowers yellow, borne in tight clusters ANACARDIACEAE
 - 7 Leaves pinnately compound, leaflets spine tipped, fruit a glabrous berry, flowers brownish BERBERIDACEAE
 - 5 Leaves simple, may be lobed or dissected
 - 8 Leaves deeply lobed, the underside of the leaf covered with copper-colored hairs, fruits with long plumose appendage ROSACEAE
 - 8 Leaves not deeply lobed, features not as above
 - 9 Leaves linear to elliptic, the margins entire
 - 10 Leaves sword shaped, plants in dense rosettes, flowers green to cream-colored AGAVACEAE
 - 10 Leaves not sword-shaped, plants not in dense rosettes, flowers other than green to cream-colored
 - 11 Leaves linear, pubescence composed of scurfy hairs (looks like the plant is covered with bran flakes), fruits with four wings CHENOPODIACEAE
 - 11 Leaves linear to elliptic, light or glaucous green in color, fruit a fleshy red berry SOLANACEAE
 - 9 Leaves variously shaped, the margins toothed, lobed, or serrate
 - 12 Leaf margins more or less coarsely serrate, leaves glabrous, leaf base strongly unequal, tree ULMACEAE
 - 12 Leaves shallowly lobed, margin coarsely serrate to entire, upper and lower leaf surfaces with dendritic (tree- shaped) hairs, low shrubs to trees FAGACEAE

Grasses and Grasslike Plants

- 1 Stems 3-angled; leaves 3-ranked and appearing whorled CYPERACEAE
- 1 Stems \pm rounded, occasionally flattened, but never 3-angled; leaves 2-ranked POACEAE

Forbs

- 1 Plants parasitic, with or without chlorophyll, if green then distinctly growing on and attached to a host plant KEY A
- 1 Plants not as above, plants green and rooted in the soil
 - 2 Leaves simple, basal or alternate, generally sheathing the stem, the veins parallel; flower parts in sets of three or multiples of three; monocotyledons KEY B
 - 2 Leaves simple to compound, alternate, opposite, or basal, usually not sheathing the stem, the veins generally netted; flower parts in sets of four or five or multiples thereof; dicotyledons
 - 3 Plants with whitish milky sap KEY C
 - 3 Plants without whitish milky sap

- 4 Flowers small individually but clustered on a common receptacle into dense heads subtended by modified leaves (phyllaries) that often resemble sepals; remains of the head are present long after the flowers have died; sepals represented by a modified pappus borne at the top of the fruit (achene), this composed of scales, bristles, awns, or absent; individual flowers are of two general types, strap-shaped ray flowers and tube-shaped disc flowers; sunflower family ASTERACEAE
- 4 Flowers not as above
 - 5 Sepals and or petals absent KEY D
 - 5 Sepals and petals both present
 - 6 Ovary inferior, sepals, petals, and stamens arising from the top of the ovary KEY E
 - 6 Ovary superior, sepals, petals, and stamens arising from immediately below the ovary
 - 7 Leaves alternate or basal
 - 8 Petals fused together, at least at the base KEY F
 - 8 Petals not fused KEY G
 - 7 Leaves \pm opposite or whorled KEY H

KEY A (Plants parasitic)

- 1 Plants green, parasitic on juniper or piñon VISCACEAE
- 1 Plants not green, with or without chlorophyll, parasitic on plants other than juniper and piñon
 - 2 Plants with twining, trailing, vinelike stems; flowers white, radially symmetric (flowers can be cut in more than 1 plane to produce 2 halves that are mirror images of each other) CUSCUTACEAE
 - 2 Plants erect, appearing rooted in the soil, parasitic *Gutierrezia sarothrae*, flowers purplish, bilaterally symmetric (flowers can only be cut in one plane to produce two halves that are mirror images of one another) OROBANCHACEAE

KEY B (Monocotyledons)

- 1 Flowers blue, subtended by an inflated leaf surrounding the flower when immature; leaves cauline; plants not developing a subterranean bulb COMMELINACEAE
- 1 Flowers white to cream colored, not subtended by a inflated leaf surrounding the flower when immature; leaves basal; plants developing a subterranean bulb (onion) LILIACEAE

KEY C (Dicotyledons with milky sap)

- 1 Flowers without true petals, but petaloid structures often present; flowers contained in a cuplike structure (cyathium), the stamens and the ovary often hanging out of the cyathium; fruit a globose capsule, the seeds hairless EUPHORBIACEAE
- 1 Flowers with true petals, not contained in a cyathium; fruit an elongated pod, the seeds with a tuft of long hair at one end ASCLEPIADACEAE

KEY D (Sepals and/or petals absent)

- 1 Leaves opposite of whorled
 - 2 Perianth segments (sepals and petals) scalelike, scarious; stamens 2-5; fruit a utricle AMARANTHACEAE
 - 2 Perianth segments petallike
 - 3 Ovary appearing inferior, a constriction usually present at the tip of the ovary before the flaring of the perianth; flower purplish in color; stamens 3; fruit an anthocarp (the ovary surrounded by a persistent floral tube) NYCTAGINACEAE
 - 3 Ovary clearly superior, the perianth clearly flaring from the base of the ovary; fruit an achene (like a sunflower seed) POLYGONACEAE
- 1 Leaves alternate
 - 4 Plants with white milky juice; ovary and fruit 3-celled EUPHORBIACEAE
 - 4 Plants without white milky juice; ovary and fruit 1-celled

- 5 Stipules present and united into a sheath around the stem..... POLYGONACEAE
- 5 Stipules not united or absent
 - 6 Flowers contained within a cuplike structure POLYGONACEAE
 - 6 Flowers not contained within a cup
 - 7 Perianth segments (sepals and petals) scalelike, scarious, filaments of stamens fused below into a short crown AMARANTHACEAE
 - 7 Perianth segments membranous, filaments of stamens not as above CHENOPODIACEAE

KEY E (Dicotyledons, ovary inferior)

- 1 Leaves succulent PORTULACACEAE
- 1 Leaves distinctly not succulent
 - 2 Leaves alternate or basal
 - 3 Plants prostrate, vinelike; leaves arrow-shaped; plants with a fetid odor CUCURBITACEAE
 - 3 Plants erect to prostrate, if vinelike then the features other than above
 - 4 Plants covered with clinging hairs; stamens and petals intergrading LOASACEAE
 - 4 Hairs if present not clinging; stamens and petals distinct, not intergrading ONAGRACEAE
 - 2 Leaves opposite or whorled
 - 5 Flowers with 5 petals; flowers purplish, opening at dusk or early in the morning NYCTAGINACEAE
 - 5 Flowers with 4 petals; flowers reddish to white, opening during the day RUBIACEAE

KEY F (Dicotyledons, ovary superior, leaves alternate or basal, petals fused)

- 1 Flowers zygomorphic (bilaterally symmetrical)
 - 2 Leaves compound, distinctly divided into leaflets
 - 3 Flowers with a long rounded spur; fruit a nut FUMARIACEAE
 - 3 Flowers lacking a rounded spur; fruit a legume FABACEAE
 - 2 Leaves simple, may be lobed but not divided into leaflets
 - 4 Plants copiously covered with glandular (sticky) hairs; leaves broad; fruit a pod with long curving horns PEDALIACEAE
 - 4 Plants \pm glabrous, leaves \pm narrow, fruit a capsule without horns SCROPHULARIACEAE
- 1 Flowers actinomorphic (Radially symmetrical)
 - 5 Leaves compound, divided into leaflets FABACEAE
 - 5 Leaves simple to lobed, but not divided into leaflets
 - 6 Leaves all basal, densely wooly-hairy, lanceolate; petals scarious; inflorescence spikelike; plants annual PLANTAGINACEAE
 - 6 Plants with features other than above
 - 7 Styles 3-cleft; ovary 3-celled; fruit a 3-valved capsule; flower with a long tube POLEMONIACEAE
 - 7 Style not 3-cleft; ovary and fruit various; flower tube short
 - 8 Plants with dendritic (branched or star-shaped) hairs; fruit resembling a cheese wheel with wedge-shaped segments MALVACEAE
 - 8 Plants glabrous to variously hairy but without dendritic hairs; fruit other than above
 - 9 Stamens 2-3; fruit a didymous capsule (appearing to be composed of two pea-shaped halves) OLEACEAE
 - 9 Stamens 5; fruit other than above
 - 10 Ovary 4-lobed and 4-celled; fruit composed of 4 nutlets BORAGINACEAE
 - 10 Ovary may be lobed but not 4-lobed, 1- or 2-celled; fruit various
 - 11 Ovary and fruit 1-chambered HYDROPHYLLACEAE
 - 11 Ovary and fruit 2-chambered
 - 12 Styles 1-2; stigmas more than 1; corolla twisted in the bud CONVOLVULACEAE
 - 12 Style and stigma 1; corolla not twisted in the bud SOLANACEAE

KEY G (Dicotyledons, ovary superior, leaves alternate or basal, petals not fused)

- 1 Flowers zygomorphic (bilaterally symmetrical)
 - 2 Flowers with a spur
 - 3 Flowers golden-yellow FUMARIACEAE
 - 3 Flowers bluish-white RANUNCULACEAE
 - 2 Flowers without a spur
 - 4 Flowers with four sepals and four petals, mostly purplish; fruit a 1-celled capsule; leaves compound CAPPARACEAE
 - 4 Flowers with 5 sepals and 5 petals, mostly whitish-pink; fruit a 2-celled capsule; leaves simple POLYGALACEAE
- 1 Flowers actinomorphic (radially symmetrical)
 - 5 Leaves obviously succulent PORTULACACEAE
 - 5 Leaves not succulent
 - 6 Leaves tongue shaped; stipules fused and sheathing the stem POLYGONACEAE
 - 6 Leaves and stipules not as above
 - 7 Sepals fused at least at the base
 - 8 Leaves compound; fruit a legume FABACEAE
 - 8 Leaves simple; fruit various
 - 9 Plants with branched or star-shaped hairs; fruit resembling a cheese wheel with wedge-shaped segments MALVACEAE
 - 9 Hairs and fruits other than above OLEACEAE
 - 7 Sepals not fused
 - 10 Flowers with more than 20stamens, the filaments fused into a column around the styles MALVACEAE
 - 10 Flowers with less than 20 stamens, the filaments not fused into a column
 - 11 Plants covered with stinging hairs EUPHORBIACEAE
 - 11 Plants not covered with stinging hairs
 - 12 Filaments of stamens long (1.5-2.5 cm), red; leaves compound with three leaflets CAPPARACEAE
 - 12 Filaments of stamens less than 1.5 cm long, not red; leaves simple
 - 13 Petals and sepals 4 in number; herbage with stellate (star-shaped) hairs BRASSICACEAE
 - 13 Petals and sepals 5 in number; herbage without stellate hairs
 - 14 Stems developing a bulbous structure below ground; leaves cloverlike OXALIDACEAE
 - 14 Stems not developing a bulbous structure below ground; leaves not cloverlike
 - 15 Petals reddish-purple; fruit elongating and becoming beaklike, splitting into separate 1-seeded segments GERANIACEAE
 - 15 Petals blue to orange; fruit a capsule, not as above LINACEAE

KEY H (Dicotyledons, ovary superior, leaves opposite of whorled)

- 1 Flowers zygomorphic (bilaterally symmetrical)
 - 2 Ovary and fruit deeply 4-lobed; fruit composed of nutlets
 - 3 Stems square; styles 2-cleft; plants generally with a mint odor; corolla definitely zygomorphic LAMIACEAE
 - 3 Stems generally not square, if square then the plants without a mint odor; stigma only slightly cleft; corolla only slightly zygomorphic VERBENACEAE
 - 2 Ovary not 4-lobed; fruit a capsule
 - 4 Leaf bases sagittate; plants densely covered with glandular (sticky) hairs PEDALIACEAE
 - 4 Leaf bases not sagittate; plants glabrous or variously hairy but not as above SCROPHULARIACEAE

- 1 Flowers actinomorphic (radially symmetrical)
 - 5 Leaves definitely succulent PORTULACACEAE
 - 5 Leaves not succulent
 - 6 Stipules fused, sheathing the stem POLYGONACEAE
 - 6 Stipules not fused, not sheathing the stem
 - 7 Leaves compound, divided into leaflets; fruits with sharp spines (goat-head) ZYGOPHYLLACEAE
 - 7 Leaves simple, entire to toothed, not compound; fruit lacking spines
 - 8 Flowers borne in a cuplike structure
 - 9 Leaves mostly basal; plants from stout woody caudex; stamens 6-9; styles 3; flowers opening during the day POLYGONACEAE
 - 9 Leaves cauline; plants not from woody caudex; stamens 1-5; style 1; flowers opening at dusk NYCTAGINACEAE
 - 8 Flowers not borne in a cuplike structure
 - 10 Flowers bright yellow; fruit a didymous capsule (appearing to be composed of two pea-shaped halves) OLEACEAE
 - 10 Flowers whitish; fruit a capsule, not didymous CARYOPHYLLACEAE



FAMILY TREATMENTS

The families are arranged alphabetically. Each species treatment includes scientific name, common name (UPPERCASE), duration (annual or perennial), origin (native or exotic), a brief statement of the habitat, flowering times, and an estimation of its relative abundance (scarce, numerous, abundant) and distribution (localized, dispersed, widespread) on the range. Important synonyms are listed in brackets.

AGAVACEAE / AGAVE FAMILY

- 1 Flowers large, 2 cm or greater in length; leaves \pm fleshy, the tips spinose *Yucca*
- 1 Flowers small, 0.5 cm or less long; leaves not fleshy, but somewhat grasslike, lacking a spiny tip *Nolina*

Nolina

Nolina texana S. Wats. TEXAS BEARGRASS or SACAHUISTA. Perennial, native. Mainly in the eastern portions of the range, piñon/juniper savanna to open grassland. Flowering May-June. Numerous, dispersed.

Yucca

- 1 Stem absent, or less than 25 cm tall at maturity; leaves thick, greater than 2 cm wide, the margins producing coarse fibers *Y. baccata*
- 1 Stems 1 meter or more tall at maturity; leaves \pm thin, less than 1.5 cm wide, the margins producing more delicate fibers *Y. glauca*

Yucca baccata (Engelm.) Trel. BANANA YUCCA. Perennial, native; open grassland, washes, found in most areas on the range. Flowering April-May. Numerous, dispersed.

Yucca glauca Nutt. GREAT PLAINS YUCCA. Perennial, native. Scattered throughout the range. Flowering May-June. Numerous, dispersed.

AMARANTHACEAE / AMARANTH FAMILY

- 1 Leaves alternate *Amaranthus*
- 1 Leaves opposite
 - 2 Plants prostrate, forming dense mats; leaves ovate-lanceolate, less than 3 cm long *Guilleminea*
 - 2 Plants erect, not forming dense mats; leaves linear to linear-lanceolate, greater than 3 cm long *Froelichia*

Amaranthus

- 1 Plants erect; male and female flowers on separate plants *A. palmeri*
- 1 Plants prostrate; male and female flowers on the same plant *A. blitoides*

Amaranthus blitoides S. Wats. PROSTRATE PIGWEED. Annual, native. Waste areas and disturbed ground, water tanks, corrals. Flowering July-October. Scarce, dispersed. [*Amaranthus graezicans* L.]

Amaranthus palmeri Wats. CARELESSWEED, REDROOT. Annual, native. Disturbed ground. Flowering September-October. Scarce, dispersed.

Froelichia

Froelichia gracilis (Hook.) Moq. SLENDER SNAKE COTTON. Annual, native. Common on sandy sites. Flowering March-September. Numerous, dispersed.

Guilleminea

Guilleminea densa (Willd.) Moq. var. *aggregata* Uline & Bray COTTONFLOWER. Perennial, native. Rocky or sandy soils, disturbed ground. Flowering June-September. Numerous, dispersed.

ANACARDIACEAE / CASHEW FAMILY

Rhus

Rhus trilobata Nutt. var. *pilosissima* Engler SKUNK-BRUSH SUMAC. Perennial, native. Various habitats, mostly on rocky slopes. Flowering April-May. Scarce, dispersed. [*Rhus aromatica* Ait. var. *pilosissima* (Engler) Shinnery]

APIACEAE / CARROT FAMILY

Cymopterus

- 1 Leaves olive green, not glutinous, the lobes of divided leaves blunt to obtuse at the tips *C. montanus*
- 1 Leaves light green, glutinous and sticky, the lobes of divided leaves acute at the tips *C. newberryi*

Cymopterus montanus (Nutt.) Torr. SPRING-PARSLEY. Perennial, native. Grassland areas, sandy loamy soils. Flowering April-May. Scarce, localized.

Cymopterus newberryi (S. Wats.) M. E. Jones STICKY SPRING-PARSLEY. Perennial, native. Found in grassland areas, sandy loamy soils. Flowering April-May. Scarce, localized

ASCLEPIADACEAE / MILKWEED FAMILY

Asclepias

- 1 Leaves greater than 4 cm wide *A. latifolia*
- 1 Leaves generally less than 1.5 cm wide
 - 2 Leaves up to 2 mm wide; flowers white, small, usually less than 2 mm long *A. subverticillata*
 - 2 Leaves 5-12 mm wide; flowers not white, may be cream-colored, usually more than 2 mm long
 - 3 Plants erect; leaves with a hooked tip *A. asperula*
 - 3 Plants sub-erect; leaves without hooked tips *A. rusbyi*

Asclepias asperula (Dcne.) Woodson subsp. *asperula* ANTELOPE-HORN MILKWEED. Perennial, native. Common in sandy piñon/juniper areas. Flowering June-August. Numerous, dispersed. Toxic.

Asclepias latifolia (Torr.) Raf. BROADLEAF MILKWEED. Perennial, native. Mostly along roadsides and moderately disturbed sites, compacted soils. Flowering May-August. Numerous, widespread. Toxic.

Asclepias rusbyi (Vail) Woodson MILKWEED. Perennial, native. Open grasslands to piñon/juniper woodland areas, mostly sandy soils. Flowering June-September. Scarce, localized. Toxic.

Asclepias subverticillata (A. Gray) Vail WHORLED MILKWEED, POISON MILKWEED. Perennial, native. Common in moderately moist, moderately disturbed areas, sheep bedding areas. Flowering June-late August. Numerous, dispersed. Toxic.

ASTERACEAE / SUNFLOWER FAMILY

Flower head = the aggregation of all the flowers, these all inserted on a receptacle

Ray flower = the showy straplike flower, usually around the outer perimeter of the head

Disc flower = the tubular flowers, usually in the center of the head

Pappus = modified sepals, borne at the apex of the achene/ovary, of bristles, hairs, or scales

Phyllaries = the sepallike bracts subtending the flower head, these composing the involucre

Involucre = the whorl of phyllaries subtending the flower head

- 1 Flower heads with only ray flowers (strap-shaped flowers); plants with milky juice GROUP A
- 1 Flower heads with both ray and disc flowers, or with all disc flowers; plants without milky juice
 - 2 Only disc flowers present in the head; ray flowers absent GROUP B
 - 2 Both ray and disc flowers present in the head
 - 3 Pappus of capillary bristles GROUP C
 - 3 Pappus of scales, awns, or absent GROUP D

GROUP A (Heads with ray flowers only; plants with milky juice)

- 1 Leaves all basal *Taraxacum*
- 1 Leaves cauline (borne on the stem)
 - 2 Leaves sessile, the bases sagittate; stems, at least the lower, covered with stiff bristles *Lactuca*
 - 2 Leaves and stems not as above
 - 3 Leaves ovate-orbicular, the margins spiny *Acourtia*
 - 3 Leaves linear to weakly linear-lanceolate, the margins not spiny
 - 4 Peduncle (stem supporting flower heads) gradually expanding towards the top; flowers yellow; lower leaves usually well over 5 cm long *Tragopogon*
 - 4 Peduncle not gradually expanding towards the top; flowers pinkish; lower leaves usually less than 4 cm long *Stephanomeria*

GROUP B (Corolla all tubular)

- 1 Leaves, fruits, stems, and/or flower heads with spines or hooks
 - 2 Flower heads clothed in hooks *Xanthium*
 - 2 Flower heads not clothed in hooks
 - 3 Flowers purple to lavender, the lower surface densely tomentose, the margins spinose; pappus plumose *Cirsium*
 - 3 Flowers yellow, the lower surface not densely tomentose, the margins not spinose; pappus not plumose *Ambrosia*
- 1 Leaves, fruits, stems, or flower heads without spines or hooks (may be variously hairy)
 - 4 Leaves opposite, at least the lower ones
 - 5 Leaves \pm cordate; flower heads arranged in corymbose cymes; corollas white to cream-yellow *Eupatorium*
 - 5 Leaves not cordate; flower heads not arranged as above; corollas yellow to purplish
 - 6 Phyllaries fused at least below the middle; leaves linear to broadly lanceolate, the margins entire; plants with many short, white appressed hairs; corollas pink to purple *Palafoxia*
 - 6 Phyllaries not fused; leaves divided into linear segments (pinnatifid), the margins entire; plants glabrous; corollas yellow *Thelesperma*
 - 4 Leaves alternate throughout
 - 7 Leaves deeply divided
 - 8 Heads small, usually less than 4 mm long (from the base of the phyllaries to the tip of the flowers); plants with sage scent *Artemisia*
 - 8 Heads larger, usually greater than 8 mm long; plants without sage scent *Hymenopappus*
 - 7 Leaves not divided, may be lobed or toothed
 - 9 Heads small, usually less than 6 mm long
 - 10 Plants covered with a dense mat of tangled white hairs; phyllaries scarious (dry-looking, not green) *Gnaphalium*
 - 10 Plants not covered with a dense mat of tangled white hairs; phyllaries not scarious
 - 11 Plants annual; leaf margins toothed to serrate; stems densely leafy throughout *Laennecia*
 - 11 Plants perennial; leaf apex three-toothed; stems with a few, smaller leaves in upper portions *Artemisia*
 - 9 Heads larger, usually greater than 8 mm long
 - 12 Corollas deep purple to magenta; leaf margins entire *Liatris*
 - 12 Corollas yellow to greenish yellow; leaf margins serrate to shallowly toothed
 - 13 Leaves with petioles; corollas greenish-yellow; leaf margins serrate *Brickellia*
 - 13 Leaves sessile; corollas yellow; leaf margins shallowly toothed *Grindelia*

GROUP C (Ray and disc flowers present; pappus of capillary bristles)

- 1 Phyllaries in a single series
 - 2 Leaves highly dissected into linear segments; corollas yellow *Senecio*
 - 2 Leaves not dissected into linear segments, the margins may be toothed; corollas variously colored
 - 3 Flower heads small, usually less than 4 mm long; corollas greenish yellow *Laennecia*
 - 3 Flower head larger, usually greater than 6 mm long; corollas pink to white to lavender *Erigeron*
- 1 Phyllaries in 2 or more series
 - 4 Plants low shrubs; phyllaries graduated and in overlapping ranks (the midrib of one phyllary aligned with the midrib of the next) *Ericameria*
 - 4 Plants herbaceous (may be perennial); phyllaries not as above
 - 5 Plants lacking a leafy stem; leaves in a basal rosette *Townsendia*
 - 5 Plants with a leafy stem
 - 6 Phyllary tips recurved (hooked); leaf margins with stiff white hair-points *Machaeranthera*
 - 6 Phyllary tips not recurved; leaf margins not as above
 - 7 Leaves spatula-shaped; plants with a pleasant odor produced by many oil glands on the herbage *Heterotheca*
 - 7 Leaves awl-shaped; plants without odor or oil glands *Chaetopappa*

GROUP D (Ray flowers present; pappus consisting of awns, scales, or absent)

- 1 Phyllaries with translucent oil glands; plants with a lemon odor
 - 2 Base of leaves with spiny white bristles; leaves dissected *Pectis*
 - 2 Base of leaves without spiny white bristles; leaves not dissected *Dyssodia*
- 1 Phyllaries without translucent oil glands; plants without a lemon odor
 - 3 Receptacle of inflorescence obviously columnar or globular *Ratibida*
 - 3 Receptacle of inflorescence not columnar or globular
 - 4 Leaves opposite, at least below
 - 5 Ray flowers white to cream-colored, not yellow or red *Melampodium*
 - 5 Ray flowers yellow or red, not white or cream colored
 - 6 Leaf margins entire
 - 7 Leaves linear; ray flowers large and showy, 6-18 mm wide; apex of phyllaries rounded, with a green band below *Zinnia*
 - 7 Leaves lanceolate; ray flowers smaller, 2-3 mm wide; apex of phyllaries acute, without green band below *Sanvitalia*
 - 6 Leaf margins serrate to dentate, not entire
 - 8 Fruit (achene) with corky wings *Verbesina*
 - 8 Fruit without wings *Helianthus*
 - 4 Leaves alternate or basal
 - 9 Plants perennial
 - 10 Leaves all basal, wooly hairy; heads solitary on the stem *Tetraneuris*
 - 10 Leaves cauline, not all basal, variously hairy or glabrous but not wooly hairy
 - 11 Plants subshrubs, woody at the base; leaves linear; heads numerous and clustered at the ends of branches *Gutierrezia*
 - 11 Plants herbaceous, not at all woody; leaves of various shapes; heads not as above
 - 12 Leaf margins entire to weakly crisped or serrate, but not lobed or dissected
 - 13 Ray flowers 3-5 in number, shallowly lobed at the apex; phyllaries with white wooly hairs *Psilostrophe*
 - 13 Ray flowers greater than 5 in number, not lobed; phyllaries with ciliate margins but not wooly hairy *Helianthus*
 - 12 Leaf margins lobed, dissected, or lyrate
 - 14 Leaf margins lyrate (pinnatifid with the terminal lobe enlarged); phyllaries obtuse at apex *Berlandiera*
 - 14 Leaf margins not as above; phyllaries more or less acute, not obtuse

- 15 Disk flowers yellow; phyllary margins with ciliate hairs *Engelmannia*
- 15 Disk flowers reddish-brown to purplish; phyllary margins not ciliate *Gaillardia*
- 9 Plants annual
 - 16 Stems with stalked glands, at least the upper portions *Bahia*
 - 16 Stems without stalked glands
 - 17 Ray flowers purple, deeply cleft *Palafoxia*
 - 17 Ray flowers yellow, not deeply cleft *Dicranocarpus*

Acourtia

Acourtia nana (Gray) Reveal & King DESERT HOLLY. Perennial, native. Sandy, gravelly, or clayey soils, mostly in the eastern portions of the range. Flowering April-December. Numerous, localized. [*Perezia nana* Gray]

Ambrosia

- 1 Plants annual; fruits spiny *A. acanthicarpa*
- 1 Plants perennial from slender rhizomes; fruits not spiny *A. psilostachya*

Ambrosia acanthicarpa Hook. ANNUAL BURSAGE. Annual, native. Disturbed areas, usually heavy soils. Flowering August-October. Numerous, dispersed.

Ambrosia psilostachya DC.. Perennial, native. WESTERN RAGWEED, disturbed areas, usually heavy soils. Flowering July- October. Scarce, dispersed.

Artemisia

- 1 Plants low shrubs; leaves entire except for 3 teeth or lobes at the apex *A. bigelovii*
- 1 Plants herbaceous, not shrubby; leaves not as above
 - 2 Leaves of lower stems parted nearly to the midrib into slender lobes about 1 mm wide *A. carruthii*
 - 2 Leaves nearly entire or with broad lobes usually more than 2 mm wide and not extending to near the midrib *A. ludoviciana*

Artemisia bigelovii Gray BIGELOW-SAGE. Perennial, native. Mainly in grassland areas. Flowering August-October. Abundant, dispersed.

Artemisia carruthii A.W. Wood ex Carruth WORMWOOD. Perennial, native. Disturbed areas and open piñon/juniper woodland. Flowering August-October. Numerous, dispersed.

Artemisia ludoviciana Nutt. subsp. *albula* (Woot.) Keck LOUISIANA WORMWOOD. Perennial, native. Open rocky slopes in Mesa Pasture, at a wide variety elevations. Flowering August-October. Numerous, localized.

Bahia

Bahia dissecta (Gray) Britt. BAHIA. Perennial, native. Disturbed fence lines in grassland areas, in Mesa Pasture at the base of the mesa, rocky soils, piñon/juniper woodland. Flowering August-September. Scarce, localized.

Berlandiera

Berlandiera lyrata Benth. var. *lyrata* LYRELEAF GREEN-EYES. Perennial, native. Grassland areas on rocky limestone soils. Flowering May-September. Numerous, dispersed.

Brickellia

Brickellia grandiflora (Hook.) Nutt. CUTLEAF BRICKELLBUSH. Perennial, native. Sandy soils in juniper woodland. Flowering late August-September. Scarce, localized.

Chaetopappa

Chaetopappa ericoides (Torr.) Nesom SAND ASTER. Perennial, native. Dry open places throughout the range. Flowering May-September. Abundant, widespread. [*Leucelene ericoides* (Torr.) Greene]

Cirsium

Cirsium undulatum (Nutt.) Sprengle WAVY-LEAVED THISTLE. Perennial, native. Well-drained soils in open grasslands. Flowering late June-September. Abundant, widespread.

Dicranocarpus

Dicranocarpus parviflorus Gray PITCHFORK. Annual, native. Heavy clay soils, commonly in areas of ephemeral water accumulation. Flowering August-October. Scarce, localized.

Dyssodia

Dyssodia papposa (Vent.) Hitchc. FETID MARIGOLD, PRAIRIE DOGWEEED. Annual, native. Found in nearly all the areas of the range, especially along roadsides and other disturbed areas. Flowering June-October. Abundant, dispersed.

Engelmannia

Engelmannia peristenia (Raf.) Goodm. & Laws. ENGELMANN'S DAISY. Perennial, native. Open grasslands and piñon/juniper woodland. Flowering June-September. Abundant, dispersed. [*Engelmannia pinnatifida* Torr. & Gray]

Ericameria

- 1 Shrubs 80-120 cm tall; leaves glabrous to puberulent (with very small hairs), the margins entire; ray flowers 11-13 mm long *E. pulchella* subsp. *pulchella*
- 1 Shrubs 5- 50 cm tall, leaves glabrous, margins with a sand paper texture, ray flowers 7-12 mm long *E. pulchella* subsp. *baileyi*

Ericameria pulchella (Gray) Geene subsp. *baileyi* (Woot. & Standl.) Hall & Clem. RABBIT-BRUSH. Perennial, native. Found in the western parts of the range on limestone soils. Flowering late July-September. Numerous, dispersed.

Ericameria pulchella (Gray) Geene subsp. *pulchella* RABBIT-BRUSH. Perennial, native. Found in the eastern parts of the range on rocky limestone soils. Flowering late July-September. Numerous, dispersed.

Erigeron

Erigeron divergens Torr. & Gray SPREADING FLEABANE. Annual or short-lived perennial, native. Ubiquitous in open grasslands or piñon/juniper woodland areas. Flowering June-August. Numerous, dispersed.

Eupatorium

Eupatorium herbaceum (Gray) Greene THOROUGHWORT, JOE-PYE WEED. Perennial, native. Slopes of piñon/juniper woodland areas, usually growing on or very close to a rock outcrop. Flowering late July-October. Numerous, dispersed.

Gaillardia

Gaillardia pinnatifida Torr. CUT-LEAVED BLANKETFLOWER. Perennial, native. Ubiquitous to all areas of the range. Flowering June-October. Abundant, dispersed.

Gnaphalium

Gnaphalium canescens DC. CUDWEED. Perennial, native. Disturbed sandy rocky soil. Flowering late June-October. Numerous, dispersed.

Grindelia

- 1 Leaves at mid-stem oblong, 15-70 mm long, 4-13 mm wide; stems green *G. nuda* var. *aphanactis*
 - 1 Leaves at mid-stem ovate to oblong, 13-35 mm long, 6-9 mm wide; stems green or often reddish *G. nuda* var. *nuda*
- Grindelia nuda* A. Wood var. *aphanactis* (Rydb.) Nesom CURLYCUP GUMWEED. Biennial, native. Mostly in moist areas, especially around water holes. Flowering July-September. Abundant, dispersed. [*Grindelia aphanactis* Rydb.]

Grindelia nuda A. Wood var. *nuda* CURLYCUP GUMWEED. Biennial, native. Mostly in moist areas, especially around water holes. Flowering August-October. Abundant, dispersed.

Gutierrezia

Gutierrezia sarothrae (Pursh) Britt. & Rusby BROOM SNAKEWEED. Perennial, native. Common to grassland areas and disturbed sites. Flowering June-October. Abundant, widespread. Broom snakeweed may be poisonous to sheep and cattle causing abortion, but rarely death. The foliage contains a saponin that is most toxic during leaf formation and quickly decreases with maturity.

Helianthus

1 Plants perennial from rhizomes; leaves all opposite *H. ciliaris*

1 Plants annual; leaves mostly alternate

2 Phyllaries egg-shaped, abruptly narrowed to an acuminate apex *H. annuus*

2 Phyllaries lance-shaped, gradually narrowed towards an acute or obtuse apex *H. petiolaris*

Helianthus annuus L. COMMON SUNFLOWER. Annual, native. Drainages of small arroyos, roadsides. Flowering June-September. Scarce, localized. This plant can accumulate levels of nitrates that are toxic to livestock

Helianthus ciliaris DC. BLUEWEED. Perennial, native. Found generally on moist, somewhat alkaline soils. Flowering mid-June-September. Numerous, dispersed.

Helianthus petiolaris Nutt. PRAIRIE SUNFLOWER. Annual, native. Often found on disturbed, dry sandy soils. Flowering June-September. Numerous, dispersed.

Heterotheca

Heterotheca villosa (Pursh) Shinnars var. *nana* (A. Gray) Semple HAIRY GOLDENASTER. Perennial, native. Mainly on dry rocky slopes. Flowering late May-October. Numerous, dispersed.

Hymenopappus

Hymenopappus filifolius Hook. var. *cinereus* (Rydb.) Johnst. WOOLY-WHITE. Perennial, native. Generally on rocky or sandy, well drained soils. Flowering June-September. Numerous, dispersed.

Lactuca

Lactuca serriola L. var. *serriola* PRICKLY LETTUCE. Annual, exotic (from Europe). Disturbed areas, especially around the north and south headquarters. Flowering July-October. Numerous, dispersed. The flowering heads of this species open at daybreak and close by mid-morning.

Laennecia

Laennecia coulteri (Gray) Nesom COULTER CONYZA. Annual, native. Disturbed ground, often on alkaline soils. Flowering June-September. Abundant, dispersed.

Liatris

Liatris punctata Hook. DOTTED GAYFEATHER. Perennial, native. Rocky limestone soils on the eastern portions of the range. Flowering August-October. Scarce, localized.

Machaeranthera

1 Ray flowers yellow

2 Plants perennial *M. pinnatifida*

2 Plants annual *M. gracilis*

1 Ray flowers white or purple

3 Plants perennial; ray flowers whitish *M. blephariphylla*

3 Plants annual; ray flowers purplish *M. tanacetifolia*

Machaeranthera blephariphylla (Gray) Shinnars ASTER. Perennial, native. Limestone slopes. Flowering late July-September. Numerous, localized.

Machaeranthera gracilis (Nutt.) Shinnars SPINY-ASTER. Annual, native. Dry plains areas. Flowering June-September. Numerous, dispersed. [*Haplopappus gracilis* (Nutt.) Gray]

Machaeranthera pinnatifida (Hook.) Shinnars var. *pinnatifida* CUTLEAF IRONPLANT. Perennial, native. Disturbed areas throughout the range. Flowering May-October. Abundant, widespread. This plant can accumulate selenium and should be considered poisonous. [*Haplopappus spinulosus* (Pursh) DC.]

Machaeranthera tanacetifolia (HBK.) Nees TAHOKA DAISY. Annual, native. Sandy grassland areas. Flowering June-October. Abundant, dispersed.

Melampodium

Melampodium leucanthum Torr. & Gray PLAINS BLACKFOOT. Perennial, native. Found in all areas of the range, on all soil types. Flowering June-November. Abundant, widespread.

Palafoxia

Palafoxia sphacelata (Nutt. ex Torr.) Cory RAYED PALAFOXIA. Annual, native. Open sandy ground. Flowering June-mid September. Numerous, dispersed.

Pectis

Pectis angustifolia Torr. LEMONCILLO, LEMON WEED. Annual, native. All areas of the range, on all soil types. Flowering July-October. Abundant, dispersed.

Psilostrophe

Psilostrophe tagetina (Nutt.) Greene var. *tagetina* WOOLY PAPERFLOWER. Perennial, native. Found in dry open grassland areas. Flowering June-September. Numerous, dispersed.

Ratibida

- 1 Receptacle columnar; heads 10-55 mm long *R. columnifera*
- 1 Receptacle globular; heads 8-15 mm long *R. tagetes*

Ratibida columnifera (Nutt.) Woot. & Standl. MEXICAN HAT. Perennial, native. Found around water holes on heavy clay soils. Flowering July-September. Abundant, dispersed. [*Ratibida columnaris* (Sims) D. Don]

Ratibida tagetes (James) Benth. PRAIRIE CONEFLOWER. Perennial, native. Found around water holes on heavy clay soils. Flowering July-September. Abundant, dispersed.

Sanvitalia

Sanvitalia abertii Gray ABERT'S DOME. Annual, native. Most areas on the range. Flowering mid August-late September. Numerous, dispersed.

Senecio

- 1 Plants woolly-hairy, giving them a grayish appearance *S. flaccidus*
- 1 Plants glabrous, green in color *S. ridellii*

Senecio flaccidus Less. var. *flaccidus* THREADLEAF GROUNDSEL. Perennial, native. Open grassland areas. Flowering July-mid September. Numerous, dispersed. Toxic to cattle. [*Senecio douglasii* DC. var. *longilobus* (Benth.) Benson]

Senecio ridellii Torr. & Gray RIDDELL'S GROUNDSEL. Perennial, native. Open grassland areas. Flowering July-mid September. Numerous, dispersed. Toxic to cattle.

Stephanomeria

Stephanomeria pauciflora (Torr.) A. Nels. FEW FLOWERED WIRE LETTUCE. Perennial, native. Most areas of the range, plains and hills. Flowering June-October. Numerous, dispersed.

Taraxacum

Taraxacum officinale Webber DANDELION. Perennial, naturalized (from Eurasia). A weed of moist disturbed places. Flowering June-September. Scarce, dispersed.

Tetraneris

Tetraneris acaulis (Pursh) Greene var. *arizonica* (Greene) Parker STEMLESS HYMENOXYIS. Perennial, native. Rocky limestone ridges among the sinkholes on the eastern portion of the range. Flowering early July-September. Numerous, dispersed. [*Hymenoxys acaulis* (Pursh) Spreng var. *arizonica* (Greene) Parker]

Thelesperma

- 1 Leaves mostly crowded at the base; plants to 40 cm tall *T. longipes*
- 1 Leaves more evenly distributed along the stem; plants 80cm or more tall *T. megapotamicum*

Thelesperma longipes Gray COTA. Perennial, native. Rocky limestone soils. Flowering July-September. Numerous, dispersed.

Thelesperma megapotamicum (Spreng.) Kuntze GREENTHREAD. Perennial, native. Open plains and slopes. Flowering August-September. Numerous, dispersed.

Townsendia

Townsendia exscapa (Richards.) Porter EASTER DAISY, FLOR DE PASCUA. Perennial, native. On the western portion of the ranch in the Mesa Pasture. Flowering late April-early June. Scarce, localized.

Tragopogon

Tragopogon dubius Scop. YELLOW SALSIFY. Annual, exotic (from Eurasia). Disturbed ground. Flowering June-September. Numerous, dispersed.

Verbesina

Verbesina encelioides (Cav.) Benth. & Hook var. *encelioides* COWPEN DAISY, CROWNBEARD. Annual, native. Disturbed open ground. Flowering June-September. Numerous, dispersed.

Xanthium

1 Stems bearing three-forked spines in the axils of the leaves; petioles much shorter than the blades *X. spinosum*

1 Stems without three-forked spines at the axils of the leaves; petioles as long as or longer than the blades *X. strumarium*

Xanthium spinosum L. SPINY CLOTBUR. Annual, exotic (from South America). Disturbed areas, especially corrals or holding pens. Flowering June-August. Numerous, localized.

Xanthium strumarium L. var. *canadense* (Mill.) Torr. COMMON COCKLEBUR. Annual, native. Disturbed moist ground. Flowering June-September. Numerous, localized. Seedlings toxic to all livestock.

Zinnia

Zinnia grandifolia Nutt. ROCKY MOUNTAIN ZINNIA, PLAINS ZINNIA. Perennial, native. Open dry areas. Flowering late March-September. Abundant, widespread.

BERBERIDACEAE / BARBERRY FAMILY

Berberis

Berberis haematocarpa Woot. RED BARBERRY. Perennial, native. Disturbed areas in piñon/juniper woodland. Flowering April-May. Numerous, dispersed.

BORAGINACEAE / BORAGE FAMILY

1 Nutlets with hooked prickles *Lappula*

1 Nutlets without hooked prickles

2 Flowers yellow, conspicuous, trumpet shaped; petal lobes crinkled *Lithospermum*

2 Flowers white to bluish, usually small and inconspicuous, not trumpet shaped; petal lobes not crinkled *Cryptantha*

Cryptantha

1 Most flowers subtended by small, leafy bracts *C. minima*

1 Most flowers not subtended by small, leafy bracts *C. crassisepala*

Cryptantha crassisepala (Torr. & Gray) Greene var. *elechantha* I. M. Johnst. THICKSEPAL CRYPTANTHA. Annual, native. Dry sandy disturbed areas. Flowering April-July. Numerous, dispersed.

Cryptantha minima Rydb. THICKSEPAL CRYPTANTHA. Annual, native. Dry sandy disturbed areas. Flowering April-July. Scarce, dispersed.

Lappula

Lappula redowskii (Hornem.) Greene STICKSEED. Annual, native. A weed in dry disturbed sites. Flowering March-July. Numerous, dispersed.

Lithospermum

Lithospermum incisum Lehm. PUCCON, STONESEED. Perennial, native. Dry open plains and foothills. Flowering March-August. Scarce, dispersed.

BRASSICACEAE / MUSTARD FAMILY

- 1 Leaves dissected, lobed, or pinnately parted
 - 2 Leaves pinnately or bipinnately parted *Descurainia*
 - 2 Leaves lobed, never divided to the midrib *Rorippa*
- 1 Leaves entire or merely dentate to serrate
 - 3 Flowers purplish
 - 4 Leaves basal and cauline, the stem leaves arrow-shaped *Arabis*
 - 4 Leaves cauline, the stem leaves linear *Schoenocrambe*
 - 3 Flowers white or yellow
 - 5 Fruits more than 3 times as long as wide
 - 6 Plants annual; leaves basal *Draba*
 - 6 Plants perennial; leaves cauline *Erysimum*
 - 5 Fruits much less than 3 times as long as wide
 - 7 Fruits spectacle-shaped, with a shallow constriction between the two halves *Dimorphocarpa*
 - 7 Fruits spherical and not as above
 - 8 Flowers yellow; fruits globular, not much flattened *Lesquerella*
 - 8 Flowers white to cream colored; fruits definitely flattened *Lepidium*

Arabis

Arabis perennans Wats. COMMON ROCKCRESS. Perennial, native. Rocky slopes of the Mesa Pasture in piñon/juniper and ponderosa pine woodland. Flowering April-September. Scarce, localized.

Descurainia

- 1 Upper leaves bi- or tripinnate; fruits narrowly linear and containing more than 20 seeds *D. sophia*
- 1 Upper leaves once-pinnate; fruits club-shaped or elliptic, or if linear then containing less than 20 seeds
 - 2 Fruits club-shaped; plants canescent (hairy), giving the plant a grayish color *D. pinnata*
 - 2 Fruits linear; plants glabrous to somewhat pubescent, the plants ± greenish *D. obtusa*

Descurainia obtusa (Greene) O. E. Schultz subsp. *obtus* DESERT TANSY MUSTARD. Annual, native. Moderately moist areas in both grassland and piñon/juniper woodland. Flowering April-July. Numerous, dispersed.

Descurainia pinnata (Walt.) Britt. subsp. *ochroleuca* (Woot.) Detling WESTERN TANSY MUSTARD. Annual, native. Waste ground and disturbed areas, mostly along roads. Flowering May-August. Numerous, dispersed. The plants are toxic to livestock when eaten in large amounts.

Descurainia sophia (L.) Webb FLIXWEED. Annual, exotic (from Europe). Disturbed areas. Flowering May-August. Scarce, localized.

Dimorphocarpa

Dimorphocarpa wislizeni (Engelm.) Rollins SPECTACLE-POD. Annual, native. Open ground in grassland and piñon/juniper woodland areas. Flowering May-October. Numerous, dispersed. [*Dithyrea wislizeni* Engelm.]

Draba

Draba cuneifolia Nutt. var. *cuneifolia* WHITE DRABA, WHITLOGRASS. Annual, native. Open rocky slopes in the Mesa Pasture. Flowering March-May. Scarce, localized.

Erysimum

Erysimum capitatum (Dougl. ex Hook.) Greene var. *capitatum* WESTERN WALLFLOWER. Biennial, native. Open ground in grassland and piñon/juniper woodland areas. Flowering April-September. Numerous, widespread.

Lepidium

- 1 Plants annual; petals minute to absent, not exceeding the sepals *L. densiflorum*
- 1 Plants perennial; petals usually twice as long as the sepals *L. alyssoides*

Lepidium alyssoides Gray var. *alyssoides* PEPPERGRASS. Perennial, native. Dry grassland areas. Flowering May-September. Scarce, dispersed.

Lepidium densiflorum Schrad. var. *densiflorum* PEPPERGRASS. Annual, native. Dry grassland areas. Flowering April-August. Scarce, dispersed.

Lesquerella

- 1 Fruits with stellate hairs (star-shaped) *L. intermedia*
- 1 Fruits glabrous, without stellate hairs *L. fendleri*

Lesquerella fendleri (Gray) Wats. FENDLER'S BLADDERPOD. Perennial, native. Dry open ground. Flowering April-June. Numerous, dispersed.

Lesquerella intermedia (Wats.) Heller BLADDERPOD. Perennial, native. Dry slopes in piñon/juniper woodland. Flowering April-August. Numerous, dispersed.

Rorippa

Rorippa sinuata (Nutt.) A. S. Hitchc. YELLOW CRESS. Annual, native. Wet soil around water holes or swales. Flowering May-July. Scarce, localized.

Schoenocrambe

Schoenocrambe linearifolia (Gray) Rollins PURPLE MUSTARD. Perennial, native. Dry open areas, also among piñon/juniper woodland. Flowering July-September. Numerous, widespread.

BRYACEAE / BRYUM MOSS FAMILY

Bryum

Bryum argenteum Hedw. SILVERY BRYUM. A weedy cosmopolitan moss of open to semi-shady sites on soil, rock, roofs, and sidewalks. Numerous, widespread.

Pohlia

Pohlia cruda (Hedw.) Lindb. SPONGY GOURD MOSS. Widespread in the Northern Hemisphere, scattered in the Southern Hemisphere, on soil in rock crevices, roadbanks. Scarce, dispersed.

CACTACEAE / CACTUS FAMILY

- 1 Stems jointed; glochids (minute barbed bristles in addition to spines) present *Opuntia*
- 1 Stems not jointed; glochids not present
 - 2 Stems with separate nipplelike projections (tubercles) *Mammillaria*
 - 2 Stems with continuous longitudinal ribs *Echinocereus*

Echinocereus

Echinocereus fendleri (Engelm.) Engelm. ex Rumpler var. *fendleri* FENDLER'S HEDGEHOG. Perennial, native. Sandy soils in grassland and woodland areas. Flowering April-June. Scarce, dispersed.

Mammillaria

- 1 Spines straight or slightly curved, not hooked; juice of stem white milky (like condensed milk in texture) *M. heyderi*
- 1 Spines recurved, hooked (like a fishhook); juice of stem clear, not milky *M. wrightii*

Mammillaria heyderi Muhlenpf. var. *meiacantha* (Engelm.) L. Benson NIPPLE CACTUS. Perennial, native. Dry rocky limestone ridges. Flowering June-mid July. Scarce, localized.

Mammillaria wrightii Engelm. WRIGHT'S FISHHOOK. Perennial, native. Dry rocky limestone soils. Flowering August-September. Scarce, localized.

Opuntia

- 1 Plants low; stems flattened into pads; flowers yellow *O. polyacantha*
- 1 Plants tall (tree like); stems round in cross section, not flattened; flowers purple *O. imbricata*

Opuntia imbricata (Haw.) DC. TREE CHOLLA. Perennial, native. On somewhat sandy soils in both grassland and woodland areas. Flowering June-August. Numerous, widespread.

Opuntia polyacantha Haworth var. *trichophora* (Engelm. & Biglow) Coulter PLAINS PRICKLY PEAR. Perennial, native. On somewhat sandy soils in both grassland and woodland areas. Flowering June-August. Numerous, widespread.

CAPPARACEAE / CAPER FAMILY

Cleome

Cleome serrulata Pursh ROCKY MOUNTAIN BEEPLANT. Annual, native. Disturbed areas, especially around water holes. Flowering July-mid September. Numerous, widespread. This plant has been reported to accumulate toxic levels of nitrates, but its strong odor generally makes it unpalatable to livestock.

CARYOPHYLLACEAE / PINK FAMILY

- 1 Plants annual; sepals free from one another *Drymaria*
- 1 Plants perennial; sepals fused to one another *Paronychia*

Drymaria

Drymaria fendleri Wats. FENDLER'S DRYMARY. Annual, native. Moist rocky slopes on the mesa. Flowering May-June. Scarce, localized.

Paronychia

- 1 Stems erect to ascending, not cushionlike; leaves not crowded, much longer than the stipules *P. jamesii*
- 1 Stems forming dense cushionlike mats; leaves crowded along the stem, equaling or only slightly longer than the sepals *P. sessiliflora*

Paronychia jamesii Torr. & Gray NAILWORT. Perennial, native. Rocky soils of the eastern portions of the range. Flowering July-September. Numerous, dispersed.

Paronychia sessiliflora Nutt. NAILWORT. Perennial, native. On rocky limestone ridges in the north-central portion of the range. Flowering June-August. Scarce, localized.

CHENOPODIACEAE / GOOSEFOOT FAMILY

- 1 Plants shrubs, woody at least at the base
 - 2 Plants glabrous or with a scurfy pubescence (appearing mealy or scaly) *Atriplex*
 - 2 Plants densely white-wooly hairy, especially the inflorescence *Ceratoides*
- 1 Plants herbaceous
 - 3 Herbage covered with scurfy or mealy pubescence *Chenopodium*
 - 3 Herbage not covered with scurfy or mealy pubescence
 - 4 Leaf margins entire
 - 5 Stems with reddish to purplish vertical stripes; plants with few hairs; fruit surrounded by winged sepals *Salsola*
 - 5 Stems without stripes; plants, especially the inflorescence, wooly hair (more so at maturity); fruit naked *Kochia*
 - 4 Leaf margins lobed or variously toothed
 - 6 Plants densely glandular-pubescent, strongly but pleasantly aromatic *Teloxys*
 - 6 Plants not as above
 - 7 Sepals horizontally winged in fruit; leaves lance- to egg-shaped *Cycloloma*
 - 7 Sepals not winged; leaves orbicular to rhombic-ovate *Suckleya*

Atriplex

Atriplex canescens (Pursh) Nutt. FOUR-WING SALTBUUSH. Perennial, native. Dry rocky soils of the southwest portion of the range. Flowering July-August. Numerous, localized. This is an important browse plant for wildlife. The fruits are also an important food source for birds.

Ceratoides

Ceratoides lanata (Pursh) J.T. Howell WINTERFAT. Perennial, native. Open dry grassland areas. Flowering August-September. Numerous, dispersed. [*Eurotia lanata* (Pursh) Moq.]

Chenopodium

- 1 Stems leaves linear to narrowly ovate, three times longer than wide, or longer *C. dessicatum*
- 1 Stem leaves ovate to broadly triangular, 1-3 times longer than wide
 - 2 Leaves generally 2.5-8 cm long *C. album*
 - 2 Leaves generally 1-3 cm long *C. incanum*

Chenopodium album L. LAMBS QUARTER. Annual, exotic (from Europe). Moist disturbed soil around water holes. Flowering July-late September. Scarce, dispersed. This plant may accumulate nitrates; also, the pollen often causes hay fever.

Chenopodium dessicatum A. Nels. var. *dessicatum* GOOSEFOOT. Annual, native. Disturbed areas. Flowering July-October. Numerous, dispersed.

Chenopodium incanum (Wats.) Heller GOOSEFOOT. Annual, native. Disturbed ground and waste areas. Flowering May-September. Numerous, dispersed.

Cycloloma

Cycloloma atriplicifolia (Spreng.) Coult. WINGED PIGWEED. Annual, native. Sandy dry soil. Flowering June-September. Numerous, dispersed.

Kochia

Kochia scoparia (L.) Roth SUMMER CYPRESS, KOCHIA. Annual, exotic (from Eurasia). Disturbed ground, especially near water holes. Flowering July-October. Abundant, dispersed. This plant accumulates nitrates and is also linked to photosensitivity in livestock.

Salsola

- 1 Bracts appressed and strongly imbricate at maturity; inflorescence narrowly spicate, rather dense, not interrupted at maturity *S. collina*
 - 1 Bracts reflexed, not imbricate at maturity; inflorescence spicate, interrupted at maturity *S. tragus*
- Salsola collina* P. S. Pallas RUSSIAN THISTLE. Annual, exotic (from Asia). Disturbed ground, usually mixed in with *S. tragus*. Flowering May-August. Scarce, dispersed.
- Salsola tragus* L. RUSSIAN THISTLE. Annual, exotic-naturalized (from Asia). Disturbed ground. Flowering May-August. Abundant, widespread. This plant can accumulate dangerous levels of nitrates. [*Salsola australis* R. Br., *Salsola iberica* (Sennen & Pau) ex Czerepanov, *Salsola kali* of numerous works]

Suckleya

Suckleya suckleyana (Torr.) Rydb. POISON SUCKLEYA. Annual, native. Moist soil near or in water holes. Flowering July-August. Numerous, localized. Causes cyanide poisoning in livestock.

Teloxys

Teloxys botrys (L.) W.A. Weber JERUSALEM OAK. Annual, exotic-naturalized (from Eurasia). Disturbed sandy soils. Flowering July-October. Numerous, dispersed. [*Chenopodium botrys* L.]

COMMELINACEAE / SPIDERWORT FAMILY

- 1 Inflorescence subtended by a conspicuous, leafy, boat-shaped bract; fertile stamens 3 *Commelina*
- 1 Inflorescence not subtended as above; fertile stamens 6 *Tradescantia*

Commelina

Commelina erecta L. var. *angustifolia* (Michx.) Fernald WHITEMOUTH DAYFLOWER. Perennial, native. Moist sandy soils in open grassland or woodland areas. Flowering late June-September. Scarce, dispersed.

Tradescantia

Tradescantia occidentalis (Britt.) Smyth WESTERN SPIDERWORT. Perennial, native. Sandy, often moist soils, disturbed areas. Flowering late May-September. Scarce, dispersed.

CONVOLVULACEAE / MORNING-GLORY FAMILY

- 1 Stems erect to decumbent, not trailing or viny; leaves linear to lance shaped; flowers blue *Evolvulus*
- 1 Stems trailing or viny; leaves ovate, triangular, or heart-shaped; flowers variously colored
 - 2 Flowers mostly white, or with a tinge of pink *Convolvulus*
 - 2 Flowers scarlet, orange-red, or bluish, if pinkish then the entire flower pinkish *Ipomoea*

Convolvulus

- 1 Flowers 3-5 mm long, inconspicuously pubescent to glabrate; plants forming dense mats *C. arvensis*
- 1 Flowers 6-12 mm long, densely pubescent; plants not forming dense mats *C. equitans*

Convolvulus arvensis L. FIELD BINDWEED. Perennial, exotic-naturalized (from Eurasia). Disturbed sandy soils. Flowering May-July. Numerous, localized. May contain a purgative that causes distress in swine. This plant is a noxious weed.

Convolvulus equitans Benth. DAGGER BINDWEED. Perennial, native. Dry grassland areas. Flowering June-September. Scarce, localized.

Evolvulus

Evolvulus nuttallianus R. & S. HAIRY EVOLVULUS. Perennial, native. Disturbed sandy soils. Flowering May-July. Scarce, localized.

Ipomoea

- 1 Sepals, stems, and leaves hairy; flowers purple *I. purpurea*
- 1 Sepals, stems, and leaves not hairy; flower color other than purple
 - 2 Flowers scarlet-red, 3-5 cm long *I. cristulata*
 - 2 Flowers pinkish to pale purple, 1-1.5 cm long *I. costellata*

Ipomoea costellata Torr. CRESTRIB MORNING-GLORY. Annual, native. Dry grassland slopes and plains. Flowering July-September. Scarce, localized.

Ipomoea cristulata H. Hall. SCARLET CREEPER. Annual, native. Moist soil of swales and watering areas. Flowering June-September. Scarce, localized.

Ipomoea purpurea (L.) Roth COMMON MORNING-GLORY. Annual, native. exotic-naturalized (from tropical America). Disturbed ground. Flowering July-October. Scarce, localized. Contains purgative principles that may cause mild distress in swine. Seeds contain a LSD-like substance capable of causing extreme illness and hallucinations in humans.

CUCURBITACEAE / CUCUMBER FAMILY

Cucubita

Cucurbita foetidissima H. B. K. BUFFALO GOURD. Perennial, native. Diverse habitats, dry sandy to gravelly soils. Flowering June-August. Scarce, widespread. The vines emerge from heavy, water-storing tubers below ground.

CUPRESSACEAE / CYPRESS FAMILY

Juniperus

Juniperus monosperma (Engelm.) Sarg. ONE-SEED JUNIPER. Perennial, native. Dry rocky soils and rock outcrops. Abundant, widespread.

CUSCUTACEAE / DODDER FAMILY

Cuscuta

Cuscuta indecora Choisy DODDER. Annual, native. Parasitic on various herbaceous plants. Flowering July-September. Scarce, localized. This plant is suspected of causing scours in cattle.

CYPERACEAE / SEDGE FAMILY

Cyperus

- 1 Aerial stems without a bulbous base *C. esculentus*
- 1 Aerial stems with a bulbous base (resembling a very small onion)
 - 2 Spikelets borne at the tips of 4-8 elongate peduncles, not sessile *C. schweinitzii*
 - 2 Spikelets sessile or on 3-5 short peduncles
 - 3 Spikelets all sessile; leaves subtending inflorescence extending at right angles to slightly ascending *C. fendlerianus*
 - 3 Spikelets, or some of them, on short peduncles; leaves subtending inflorescence strongly ascending to erect *C. sphaerolepis*

Cyperus esculentus L. YELLOW NUT-SEDGE. Perennial, native. Moist heavy clay soils in or near waterholes. Flowering July-September. Numerous, dispersed.

Cyperus fendlerianus Boekl. var. *fendlerianus* FENDLER'S SEDGE. Perennial, native. Moist sandy soil. Flowering July-September. Scarce, dispersed.

Cyperus schweinitzii Torr. SEDGE. Perennial, native. Moist sandy soil. Flowering July-September. Scarce, dispersed.

Cyperus sphaerolepis Boeck. SEDGE. Perennial, native. Dry sandy soil. Flowering August-September. Scarce, dispersed.

DRYOPTERIDACEAE / WOOD FERN FAMILY

Woodsia

Woodsia oregana D. C. Eaton var. *cathcartiana* (B. L. Robins) Morton WESTERN CLIFF FERN. Perennial, native. Rock crevices on the mesa in the Mesa Pasture. Produces spores mostly August-October. Scarce, localized.

EPHEDRACEAE / EPHEDRA FAMILY

Ephedra

Ephedra torreyana Wats. TORREY'S EPHEDRA. Perennial, native. Dry rocky soils in the eastern portion of the ranch. Produces pollen and cones in the spring. Scarce, dispersed.

EUPHORBIACEAE / SPURGE FAMILY

- 1 Plants lacking white milky juice but with stinging hairs *Tragia*
- 1 Plants with white milky juice but without stinging hairs
 - 2 Leaves small, 1-3 cm long; plants mostly prostrate *Chamaesyce*
 - 2 Leaves larger, 3-7 cm long; plants mostly erect to decumbent *Euphorbia*

Chamaesyce

- 1 Leaf margins toothed, at least above the middle *C. strictospora*
- 1 Leaf margins entire
 - 2 Leaf margins revolute (curled under); plants perennial and hairy, giving the plant a gray appearance *C. lata*
 - 2 Leaf margins not revolute; plants annual ± glabrous, giving the plant a green color *C. micromera*

Chamaesyce lata (Engelm.) Small BEAVER SPURGE. Perennial, native. Disturbed sandy soil. Flowering June-September. Numerous, dispersed.

Chamaesyce micromera Boiss. DESERT SPURGE. Annual, native. Dry disturbed soils. Flowering June-October. Numerous, dispersed.

Chamaesyce strictospora (Engelm.) Small PUNCTURED-SEED SPURGE. Annual, native. Open sandy plains and slopes. Flowering July-September. Numerous, dispersed.

Euphorbia

1 Leaves all with entire margins *E. hexagona*

1 Leaves, at least some, with serrate margins *E. extipulata*

Euphorbia extipulata Engelm. SPURGE. Annual, native. Dry sandy soils. Flowering August-September. Scarce, dispersed.

Euphorbia hexagona Nutt. SPURGE. Annual, native. Found in grassland and woodland areas. Flowering June-September. Scarce, dispersed.

Tragia

Tragia ramosa Torr. NOSEBURN. Perennial, native. Rocky slopes and ridges. Flowering May-September. Numerous, widespread.

FABACEAE / PEA FAMILY

1 Plants shrubs, woody throughout *Dalea*

1 Plants herbaceous, if woody then only at the base

2 Leaves palmately compound

3 Leaves pubescent

4 Leaves with 5 leaflets; sepals bluish *Lupinus*

4 Leaves with 3 leaflets; sepals not bluish *Dalea*

3 Leaves glabrous

5 Herbage and fruits with copious glandular dots *Psoraleidium*

5 Herbage and fruits without glandular dots

6 Flowers blue; fruits spirally coiled *Medicago*

6 Flowers yellow; fruits not spirally coiled *Melilotus*

2 Leaves pinnately compound

7 Leaves twice-pinnately compound

8 Herbage covered with glandular dots; flowers not in headlike clusters; fruits the shape of a halfmoon *Pomaria*

8 Herbage not glandular; flowers in dense headlike clusters; fruits not as above *Desmanthus*

7 Leaves once-pinnately compound

9 Leaves ending in a tendril *Lathyrus*

9 Leaves not ending in a tendril

10 Flowers subtended by a bract, herbage usually with glandular dots *Dalea*

10 Flowers not subtended by a bract; herbage lacking glandular dots

11 Stamens all free, not fused *Sophora*

11 Nine stamens fused by their filaments, 1 free *Astragalus*

Astragalus

1 Plants annual *A. nuttallianus*

1 Plants perennial

2 Plants arising from rhizomelike caudex branches; flowers in headlike clusters at maturity *A. agrestis*

2 Plants not arising from rhizomelike caudex-branches; flowers not in headlike clusters except when very young

3 Plants with dolabriform hairs (the hair attached to the leaf in the center); fruits hairy *A. missouriensis*

3 Plants with basifixed hairs (the hairs attached to the leaf at the base); fruits glabrous *A. mollissimus*

Astragalus agrestis Dougl. ex G. Don FIELD MILKVETCH. Perennial, native. Moist sandy soils in grassland areas. Flowering May-late June. Scarce, localized.

Astragalus mollissimus Torr. var. *mollissimus* WOOLY LOCOWEED. Perennial, native. Open grassland areas. Flowering in two periods: April-early July and late August-late September. Numerous, widespread. These plants contain swainsonine, which affects the neurological, cardiovascular, and reproductive systems. We have two forms:

- 1 Flowers blue to purple forma *mollissimus*
- 1 Flowers cream to yellowish in color forma *flavus*

Astragalus missouriensis Nutt. var. *missouriensis* MISSOURI MILKVETCH. Perennial, native. Dry open grassland areas. Flowering April-June. This species is known to contain swainsonine, a toxic alkaloid.

Astragalus nuttallianus DC. var. *macilentus* (Small)Barneby NUTTALL'S MILKVETCH. Annual, native. Dry open grassland areas, usually sandy or rocky soils. Flowering April-June- and occasionally August-September. Apparently, these plants do not contain swainsonine.

Dalea

- 1 Plants shrubs, woody throughout *D. formosa*
- 1 Plants herbaceous, or only woody at the base
 - 2 Flowers yellow to white-cream in color
 - 3 Leaves palmately compound with three leaflets *D. jamesii*
 - 3 Leaves pinnately compound
 - 4 Inflorescence densely hairy, 5-8 cm long *D. compacta*
 - 4 Inflorescence glabrous, 2.5-3.2 cm long *D. candida*
 - 2 Flowers pink to deep purple in color
 - 5 Leaflets 0.5-1 mm wide; plants erect *D. purpurea*
 - 5 Leaflets 2-3 mm wide; plants prostrate *D. lanata*

Dalea candida Willd. var. *oligophylla* (Torr.) Shinnery INDIGOBUSH. Perennial, native. Open, dry, sandy soil in grassland areas. Flowering late May-September. Numerous, dispersed. [*Petalostemon candidus* (Willd.) Michx. var. *oligophyllus* (Torr.) F. J. Herm.]

Dalea compacta Spreng. var. *compacta* PRAIRIE CLOVER. Perennial, native. Open, dry, often calcareous soil in grassland areas. Flowering June-August. Numerous, dispersed. [*Petalostemon compactus* (Spreng.) Swezey]

Dalea formosa Torr. FEATHER INDIGOBUSH. Perennial, native. Rocky limestone slopes on the eastern portion of the range. Flowering April-July. Numerous, dispersed.

Dalea jamesii (Torr.) Torr. & Gray JAMES'S DALEA. Perennial, native. Dry sandy soils. Flowering May-July. Numerous, dispersed.

Dalea lanata Spreng. var. *terminalis* (M. E. Jones) Barneby SPREADING DALEA. Perennial, native. Dry, disturbed sandy soils. Flowering late July-late September. Numerous, dispersed. [*Dalea terminalis* M. E. Jones]

Dalea purpurea Vent. var. *purpurea* PURPLE PRAIRIE-CLOVER. Perennial, native. Dry, open, sandy ground. Flowering July-September. Numerous, dispersed. [*Petalostemon purpureum* (Vent.) Rydb.]

Desmanthus

Desmanthus cooleyi (Eaton) Trel. COOLEY'S BUNDLEFLOWER. Perennial, native. Disturbed ground around the trash pits. Flowering July-September. Scarce, localized.

Lathyrus

Lathyrus eucosmus Butters & St. John BUSH PEAVINE. Perennial, native. Disturbed heavy soils. Flowering July-September. Scarce, localized.

Lupinus

Lupinus brevicaulis Wats. SHORT-STEMMED LUPINE. Annual, native. Moist sandy soils. Flowering May-June. Scarce, localized.

Medicago

Medicago sativa L. ALFALFA. Perennial, exotic (from Europe). Disturbed ground around the barns at both north and south headquarters. Flowering July-September. Scarce, localized. This plant is an escapee from the alfalfa hay that is trucked in for winter-feed.

Melilotus

Melilotus albus Medicus WHITE SWEETCLOVER. Biennial, exotic (from Eurasia). Disturbed ground along roads. Flowering June-September. Numerous, dispersed.

Pomaria

Pomaria jamesii (Torr. & Gray) Walp. CAESALPINIA. Perennial, native. Open dry grassland areas. Flowering May-August. Numerous, dispersed. [*Hoffmanseggia jamesii* Torr. & Gray, *Caesalpinia jamesii* (Torr. & Gray) Fisher]

Psoralidium

Psoralidium tenuiflorum (Pursh) Rydb. SCUFPEA. Perennial, native. Dry rocky plains and slopes. Flowering August-September. Numerous, dispersed. [*Psoralea tenuiflora* Pursh]

Sophora

Sophora nuttalliana B.L. Turner SILKY SOPHORA. Perennial, native. Sandy soils in grassland areas. Flowering April-May. Scarce, localized.

FABRONIACEAE / FABRONIA MOSS FAMILY

Fabronia

Fabronia ciliaris (Brid.) Brid. var. *wrightii* (Sull. ex Sull. & Lesq.) Buck FABRONIA. Diminutive native moss found in soil pockets on the walls of limestone sinkholes. Producing spores under moist conditions. Scarce, localized.

FAGACEAE / OAK FAMILY

Quercus

Quercus undulata Torr. WAVYLEAF OAK. Perennial, native. Dry sandy soils. Flowering April-May. Abundant, dispersed. This plant is of hybrid origin and highly variable in form.

FUMERIACEAE / BLEEDING HEART FAMILY

Corydalis

Corydalis aurea Willd. GOLDEN SMOKE. Annual, native. Sandy moist disturbed soil. Flowering May-mid June. Numerous, dispersed.

GRIMMIACEAE / GRIMMIA MOSS FAMILY

Jaffueliobryum

Jaffueliobryum wrightii (Sull. in Gray) Ther. BEARD MOSS. A small cushion-moss to be found on limestone walls of sinkholes. Producing spores under moist conditions. Scarce, localized.

HYDROPHYLLACEAE / WATERLEAF FAMILY

- 1 Leaves toothed to lobed; inflorescence resembling a scorpion tail *Phacelia*
1 Leaves entire; inflorescence not as above *Nama*

Nama

Nama hispidum Gray var. *hispidum* PURPLE CURL-LEAF. Annual, native. Dry soils of various habitats. Flowering June-September. Scarce, dispersed.

Phacelia

Phacelia integrifolia Torr. var. *texana* (Voss) Atwood SAND PHACELIA. Annual, native. Dry rocky soils of the eastern portions of the range. Flowering June-July. Scarce, localized.

KRAMERIACEAE / RATANY FAMILY

Krameria

Krameria lanceolata Torr. THREE FANS, PROSTRATE RATANY. Perennial, native. Dry sandy and rocky soils in open grassland areas. Flowering July-August. Scarce, localized.

LAMIACEAE / MINT FAMILY

- 1 Stems densely tomentose (wooly hairy) *Marrubium*
- 1 Stems glabrous to lightly pubescent
 - 2 Flowers white to cream-colored
 - 3 Plants annual; leaves entire to merely serrate *Monarda*
 - 3 Plants perennial; leaves deeply lobed *Teucrium*
 - 2 Flowers blue to purple
 - 4 Calyx strongly bilabiate *Salvia*
 - 4 Calyx tubular, not bilabiate *Hedeoma*

Hedeoma

- 1 Plants 15-35 cm tall; leaf margins serrate; veins of leaves conspicuously elevated *H. plicatum*
- 1 Plants 15-60 cm tall; leaf margins entire; veins of leaves not as above *H. drummondii*

Hedeoma drummondii Benth. DRUMMOND'S FALSE PENNYROYAL. Perennial, native. Well-drained soils in open ground. Flowering June-September. Abundant, dispersed.

Hedeoma plicatum Torr. FALSE PENNYROYAL. Perennial, native. Rocky dry soil on the mesa. Flowering July-August. Scarce, localized.

Marrubium

Marrubium vulgare L. COMMON HOREHOUND. Perennial, exotic (from Eurasia). Moist ground in both grassland and woodland areas. Flowering April-September. Abundant, widespread. This plant is heavily grazed in the spring, and apparently is important early spring forage for both livestock and wildlife.

Monarda

Monarda pectinata Nutt. SPOTTED BEEBALM. Annual, native. Dry, open, sandy grassland areas. Flowering June-August. Numerous, dispersed.

Salvia

- 1 Corolla approximately 1.5 times as long as the calyx; calyx glandular-pubescent, the upper half blue, the lower half green *S. subincisa*
- 1 Corolla only slightly longer than the calyx; calyx not glandular pubescent, green throughout, *S. reflexa*

Salvia reflexa Hornem. ROCKY MOUNTAIN SAGE. Annual, native. Open areas in piñon/juniper woodland. Flowering July-late August. Numerous, dispersed. This plant may contain high levels of nitrates.

Salvia subincisa Benth. SAGE. Annual, native. Open sandy ground. Flowering August-September. Scarce, dispersed.

Teucrium

Teucrium laciniatum Torr. CUTLEAF GERMANDER. Perennial, native. Open grassland areas. Flowering June-early August. Scarce, dispersed.

LESKEACEAE / LESKEA MOSS FAMILY

Pseudoleskeella

Pseudoleskeella tectorum (Funck ex Brid.) Kindb. ex Broth LESKEA. Native moss of moist soil, rock, occasionally logs. Producing spores under moist conditions. Numerous, dispersed.

LILIACEAE / LILY FAMILY

Allium

Allium macropetalum Rydb. ARIZONA ONION. Perennial, native. Dry, open grasslands. Flowering April-late May. Numerous, dispersed.

LINACEAE / FLAX FAMILY

Linum

- 1 Petals blue; plants glabrous, perennial *L. lewisii*
- 1 Petals yellow-orange; plants minutely pubescent, annual *L. puberulum*

Linum lewisii Pursh WESTERN BLUE FLAX. Perennial, native. Open grassland areas, especially along fences. Flowering June-August. Numerous, dispersed.

Linum puberulum (Engelm.) Heller ORANGE FLAX. Annual, native. Dry sandy soils. Flowering June-late August. Numerous, dispersed.

LOASACEAE / STICKLEAF or LOASA FAMILY

Mentzelia

Mentzelia laciniata (Rydb.) J. Darl. STICKLEAF. Perennial, native. Open grassland areas in the eastern portions of the range. Flowering June-August. Scarce, dispersed.

MALVACEAE / MALLOW FAMILY

- 1 Plants annual; flowers white to light-blue; leaves kidney-shaped *Malva*
- 1 Plants perennial; flowers rose to red; leaves not kidney-shaped *Sphaeralcea*

Malva

Malva neglecta Wallr. COMMON MALLOW. Annual, exotic (from Eurasia). Disturbed areas around buildings. Flowering June-September. Scarce, dispersed.

Sphaeralcea

- 1 Leaves linear; plants few-flowered *S. leptophylla*
- 1 Leaves broader; plants many-flowered
 - 2 Leaves deeply cleft with several narrow lobes *S. coccinea*
 - 2 Leaves toothed or shallowly lobed
 - 3 Leaves ovate in outline, the mature leaf blades up to 4 cm long *S. incana*
 - 3 Leaves lance-shaped in outline, the mature leaf blades usually greater than 7 cm long *S. angustifolia*

Sphaeralcea angustifolia (Cav.) G. Don var. *cuspidata* (Britt.) Gray NARROWLEAF GLOBEMALLOW. Perennial, native. Dry sandy soils, especially along roads. Flowering June-early September. Numerous, widespread.

Sphaeralcea coccinea (Pursh) Rydb. var. *coccinea* RED GLOBEMALLOW. Perennial, native. Open grassland and woodland areas. Flowering June-September. Numerous, widespread.

Sphaeralcea incana Torr. var. *incana* GLOBEMALLOW. Perennial, native. Dry sandy soils, especially along roads. Flowering June-September. Numerous, widespread.

Sphaeralcea leptophylla (Gray) Rydb. SILVERY GLOBEMALLOW. Perennial, native. Dry rocky slopes. Flowering June-September. Numerous, dispersed.

NYCTAGINACEAE / FOUR O'CLOCK FAMILY

- 1 Involucral bracts subtending the inflorescence united; flowers pink to purple, 3-8 per involucre *Mirabilis*
- 1 Involucral bracts subtending the inflorescence separate, not united; flowers white-pink, 15-35(45) per involucre *Abronia*

Abronia

Abronia fragrans Nutt. SNOWBALL SAND VERBENA. Perennial, native. Sandy soil in South Johnson Pasture. Flowering June-August. Scarce, localized.

Mirabilis

- 1 Leaves linear to lanceolate
 - 2 Leaves linear; stems densely hairy (pilose to hirsute) *M. hirsuta*
 - 2 Leaves lanceolate, stems glabrous or only puberulent, to glabrate *M. linearis*
- 1 Leaves ovate to heart-shape
 - 3 Involucre 3-flowered, 7-9 mm long; stamens 3; leaves generally widest at the base, not succulent and thick *M. oxybaphoides*
 - 3 Involucre with 6-8 flowers, 20-60 mm long; stamens 5; leaves generally widest near the middle, succulent and thick *M. multiflora*

Mirabilis hirsuta (Pursh) MacMillan HAIRY FOUR O'CLOCK. Perennial, native. Sandy soils of hills and plains. Flowering July-September. Numerous, dispersed. [*Oxybaphus hirsutus* (Pursh) Sweet]

Mirabilis linearis (Pursh) Heimerl NARROWLEAVED FOUR O'CLOCK. Perennial, native. Sandy slopes and plains. Flowering July-September. Numerous, dispersed. [*Oxybaphus linearis* (Pursh) Robins var. *linearis*]

Mirabilis multiflora (Torr.) Gray MANY FLOWERED FOUR O'CLOCK. Perennial, native. Sandy or rocky soils in both grassland and woodland areas. Flowering June-late September. Numerous, widespread.

Mirabilis oxybaphoides Gray FOUR O'CLOCK. Perennial, native. Predominately under juniper trees. Flowering July-September. Scarce, dispersed.

OLEACEAE / OLIVE FAMILY

Menodora

Menodora scabra Gratz var. *laevis* (Woot. & Standl.) Steyerl. ROUGH MENODORA. Perennial, native. Dry soils in piñon/juniper woodland areas. Flowering July-August. Scarce, dispersed.

ONAGRACEAE / EVENING PRIMROSE FAMILY

- 1 Flowers bright yellow *Calylophus*
- 1 Flowers pink-red or white, not bright yellow
 - 2 Flowers 3-5 cm across; flowers white when fresh *Oenothera*
 - 2 Flowers less than 3 cm across; flowers pink-red when fresh
 - 3 Plants 6-12 cm tall; stigma deeply 4-lobed; plants known from the edge of water holes in heavy clay soils *Oenothera*
 - 3 Plants 15-40 cm tall; stigma capitate, not lobed; plants mostly of sandy, drier soils *Gaura*

Calylophus

Calylophus hartwegii (Benth.) Raven subsp. *filifolius* (Eastw.) Towner & Raven HARTWEG'S SUNDROPS. Perennial, native. Calcareous rocky soils. Flowering June-September. Numerous, dispersed.

Gaura

Gaura coccinea Nutt. SCARLET GAURA. Perennial, native. Open plains and hills. Flowering June-September. Abundant, dispersed.

Oenothera

- 1 Flowers red with white spots, 1-1.8 cm wide *O. canescens*
- 1 Flowers white to pinkish, 3-5 cm wide *O. albicaulis*

Oenothera albicaulis Pursh PRAIRIE EVENING PRIMROSE. Annual, native. Open grassland areas. Flowering April-July. Scarce, dispersed.

Oenothera canescens Torr. & Frem. SPOTTED EVENING PRIMROSE. Perennial, native. Moist heavy clay soils around waterholes. Flowering June-September. Scarce, localized.

OROBANCHACEAE / BROOMRAPE FAMILY

Orobanche

Orobanche ludoviciana Nutt. var. *arenosa* (Suksd.) Cronq. BROOMRAPE. Perennial, native. Sandy soils. Flowering July-August. Scarce, dispersed. This plant is parasitic on *Gutierrezia sarothrae*.

OXALIDACEAE / WOODSORREL FAMILY

Oxalis

Oxalis alpina (Rose) Kunth WOODSORREL. Perennial, native. Shaded rock slopes. Flowering July-August. Scarce, dispersed. [*Oxalis metcalfei* (Small) Kunth, *Oxalis monticola* Small]

PEDALIACEAE / DEVIL'S CLAW FAMILY

Proboscidea

Proboscidea parvifolia (Woot.) Woot. & Standl. DEVIL'S CLAW. Annual, native. Dry, sandy disturbed soils. Flowering May-October. Scarce, localized.

PINACEAE / PINE FAMILY

Pinus

- 1 Leaves (needles) 10-25 cm long; plants large trees, the bark smelling like vanilla *P. ponderosa*
- 1 Leaves (needles) 2-3.5 cm long; plants shrubs or small trees, the bark not as above *P. edulis*

Pinus edulis Engelm. COLORADO PIÑON PINE. Perennial, native. Sandy rocky slopes. Numerous, dispersed. This is our state tree.

Pinus ponderosa Laws. var. *scopulorum* (Engelm.) PONDEROSA PINE, WESTERN YELLOW PINE. Perennial, native. Dry slopes on the mesa and in the juniper woodland. Scarce, localized.

PLANTAGINACEAE / PLANTAIN FAMILY

Plantago

Plantago patagonica Jacq. WOOLY INDIAN-WHEAT. Annual, native. disturbed ground, especially around the bunkhouse. Flowering April-August. Numerous, widespread. [*Plantago purshii* R. & S.]

POACEAE (GRAMINEAE) / GRASS FAMILY

- 1 Spikelets enclosed in sharp, spiny burs *Cenchrus*
- 1 Spikelets not enclosed in spiny burs
 - 2 Glumes covered with rows of hooked prickles *Tragus*
 - 2 Glumes not covered with hooked prickles
 - 3 Spikelets subtended by one or more bristles *Setaria*
 - 3 Spikelets not subtended by bristles
 - 4 Inflorescence a spike, without pedicels or branches GROUP A
 - 4 Inflorescence not a spike, pedicels and/or branches present
 - 5 Spikelets disarticulating below the glumes GROUP B

- 5 Spikelets disarticulating above the glumes
 - 6 Spikelets with only a single floret GROUP C
 - 6 Spikelets with more than a single floret GROUP D

GROUP A (inflorescence a spike)

- 1 Plants tufted
 - 2 Spikelets 3 at each node *Hordeum*
 - 2 Spikelets not arranged as above
 - 3 First glume with 2 awns; leaf blades terminating in a small hairlike bristle *Lycurus*
 - 3 First glume with a single awn; leaf blades not terminating in a small hairlike bristle *Elymus*
- 1 Plants rhizomatous or stoloniferous
 - 4 Plants annual, stoloniferous *Munroa*
 - 4 Plants perennial, rhizomatous
 - 5 Spikelets in clusters of 3, with short awns, villous at the base *Pleuraphis*
 - 5 Spikelets not in clusters of 3 but single at each node, awnless, glabrous or glabrate at the base *Elymus*

GROUP B (disarticulation below the glumes)

- 1 Ligule absent *Echinochloa*
- 1 Ligule present
 - 2 Spikelets without awns
 - 3 First glume absent or very small, less than 0.5 mm long; pedicels very short, 0.2-1 mm long *Paspalum*
 - 3 First glume well developed, 1 mm or longer; pedicels more than 1 mm long *Panicum*
 - 2 Spikelets with awns
 - 4 Spikelets in pairs, one sessile and one pedicellate
 - 5 Plants over 1 meter tall when mature *Andropogon*
 - 5 Plants less than 1 meter tall when mature
 - 6 Inflorescence a panicle with branches, very hairy, plumose; pedicels and rami joints with a longitudinal groove in the center *Bothriochloa*
 - 6 Inflorescence a single unbranched spicate raceme, but several of these scattered along the flowering shoot, not extremely hairy, not plumose; pedicels not as above *Schizachyrium*
 - 4 Spikelets not in pairs
 - 7 Panicles with 1 to many flaglike branches; leaf blades not terminating in a small hairlike bristle *Bouteloua*
 - 7 Panicles spike-like, without flaglike branches; leaf blades terminating in a small hairlike bristle *Lycurus*

GROUP C (spikelets with one floret only)

- 1 Spikelets awnless or with a minute awn, less than 2 mm long
 - 2 Spikelets awnless; panicle with whorled branches at the tip of the stalk *Cynodon*
 - 2 Spikelets with a minute awn less than 2 mm long; panicle rebranching, the branches not digitate
 - 3 Spikelets nearly sessile on the branch; inflorescence a panicle of wiry, spike-like branches breaking at the base and tumbling entire *Schedonnardus*
 - 3 Spikelets pedicellate; panicle not as above
 - 4 Lemmas with 3 nerves; sheaths without long hairs at the collar (short hairs in *M. pungens*); ligule a membrane *Muhlenbergia*
 - 4 Lemmas with 1 nerve; sheaths with long hairs at the collar; ligule a ring of hairs *Sporobolus*
- 1 Spikelets with well-developed awns
 - 4 Awns deciduous, easily broken off or dropping, leaving a small nub at the apex of the lemma *Oryzopsis*
 - 4 Awns persistent, not easily broken off nor dropping
 - 5 Lemma with 3 awns *Aristida*
 - 5 Lemma with 1 awn only

- 6 Callus of floret (base of lemma) well-developed, pointed, sharp (to test this poke your thumb with it); awn twisted *Stipa*
- 6 Callus not well-developed; awn not as above *Muhlenbergia*

GROUP D (spikelets with two or more florets)

- 1 Panicle branches digitate at tip of stem (like a windmill), or whorled *Chloris*
- 1 Panicles not as above
 - 2 Lemmas with 3 nerves, these usually prominent
 - 3 Spikelets in dense clusters, these harbored in the leaves *Munroa*
 - 3 Spikelets other than above
 - 4 Inflorescence a panicle of rebranching primary branches
 - 5 Lemma nerves hairy; leaves with white margins *Erioneuron*
 - 5 Lemma nerves glabrous; leaves without white margins *Eragrostis*
 - 4 Inflorescence a panicle of unbranched primary branches
 - 6 Spikelets 5- to 8-flowered; glumes blunt; lemma notched at the apex *Leptochloa*
 - 6 Spikelets 2- to 3-flowered; glumes not blunt; lemma not as above
 - 7 Plants forming dense mats, 4-8 cm tall *Buchloe*
 - 7 Plants forming rings or tufts, well over 8 cm tall *Bouteloua*
 - 2 Lemmas with 5-7 nerves, these usually obscure
 - 8 Lemma with 9 awns *Enneapogon*
 - 8 Lemma with a single awn or awnless
 - 9 Margins of sheaths fused to near the summit; caryopsis adhering to the palea; lemmas awned or awnless *Bromus*
 - 9 Margins of sheaths not fused to near the summit but overlapping; caryopsis free of the palea; lemmas awnless *Poa*

Andropogon

Andropogon gerardii Vitmann BIG BLUESTEM. Perennial, native. Sandy areas in South Johnson Pasture. Flowering August-September. Numerous, localized. We have two subspecies:

- 1 Awn of sessile spikelet 0-5 mm long; rhizomes well developed subsp. *hallii* (Hack.) Wipff
- 1 Awn of sessile spikelet 8-20 mm long; rhizomes absent or short subsp. *gerardii*

Aristida

- 1 Plants annual *A. adscensionis*
- 1 Plants perennial
 - 2 Inflorescence branches erect, without axillary swellings at the base *A. purpurea*
 - 2 Inflorescence branches stiffly spreading, with axillary swellings at the base
 - 3 Plants densely tufted, forming small mounds; apex of lemma not twisted or twisted only 1-2 turns *A. havardii*
 - 3 Plants loosely tufted, not forming mounds; apex of lemma strongly twisted 4 or more turns *A. divaricata*

Aristida adscensionis L. SIXWEEKS THREEAWN. Annual, native. Dry soils, especially along roads. Flowering July-September. Numerous, widespread.

Aristida divaricata Humb. & Bonpl. POVERTY THREEAWN. Perennial, native. Rocky soils. Flowering July-August. Numerous, widespread.

Aristida havardii Vasey HAVARD THREEAWN. Perennial, native. Open grassland areas. Flowering June-September. Numerous, dispersed.

Aristida purpurea Nutt. PURPLE THREEAWN. Perennial, native. Dry grassland areas and slopes. Flowering June-September. Abundant, widespread. We have 5 varieties:

- 1 Awns 4-10 cm long
 - 2 Second glume generally less than 16 mm long; awns delicate and flexible var. *purpurea* PURPLE THREEAWN
 - 2 Second glume longer than 16 mm; awns stout var. *longiseta* (Steud.) Vasey RED THREE AWN
- 1 Awns 1-4 cm long
 - 3 Panicle beige to straw-colored var. *nealleyi* (Vasey) Allred NEALLY'S THREEAWN
 - 3 Panicles dark brown or olive-colored
 - 4 Panicle less than 15 cm long; leaf blades less than 10 cm long var. *fendleriana* (Steud) Vasey FENDLER'S THREEAWN
 - 4 Panicle more than 15 cm long; leaf blades more than 10 cm long var. *wrightii* (Nash) Allred WRIGHT'S THREEAWN

Bothriochloa

Bothriochloa springfieldii (Gould) Parodi SPRINGFIELD'S BLUESTEM. Perennial, native. Rocky to sandy slopes in both grassland and woodland areas. Flowering July-September. Numerous, dispersed.

Bouteloua

- 1 Plants annual *B. barbata*
- 1 Plants perennial
 - 2 Internodes woolly hairy *B. eriopoda*
 - 2 Internodes glabrous, not woolly hairy
 - 3 Inflorescence with 20 or more branches, each falling as a unit and leaving a small stub *B. curtipendula*
 - 3 Inflorescence with five or less branches, these persistent on the main axis
 - 4 Axis of panicle branch extending well beyond the last spikelet as a stiff bristle *B. hirsuta*
 - 4 Axis of panicle branch not extending beyond the last spikelet *B. gracilis*

Bouteloua barbata Lag. var. *barbata* SIXWEEKS GRAMA. Annual, native. Disturbed sandy soils along roads. Flowering late June-September. Numerous, dispersed.

Bouteloua curtipendula (Michx.) Torr. var. *curtipendula* SIDEOATS GRAMA. Perennial, native. Rocky slopes and plains. Flowering June-late September. Abundant, widespread.

Bouteloua eriopoda (Torr.) Torr. BLACK GRAMA. Perennial, native. Rocky or sandy slopes and flats. Flowering July-September. Scarce, dispersed.

Bouteloua gracilis (H.B.K.) Lag. BLUE GRAMA. Perennial, native. Found in all habitats on the ranch. Flowering July-early October. Abundant, widespread.

Bouteloua hirsuta Lag. HAIRY GRAMA. Perennial, native. Found in all habitats on the ranch. Flowering July-late September. Numerous, widespread.

Bromus

- 1 Lemmas glabrous *B. catharticus*
- 1 Lemmas hairy
 - 2 Awn of lemma 8-18 mm long; inflorescence becoming purple in age *B. tectorum*
 - 2 Awn of lemma 1.5-5 mm long; inflorescence not becoming purple in age *B. japonicus*

Bromus catharticus Vahl RESCUEGRASS. Annual or short-lived perennial, exotic (from South America). Disturbed ground. Flowering May-July. Numerous, dispersed.

Bromus japonicus Thunb. JAPANESE BROME. Annual, exotic (from Eurasia). Disturbed areas. Flowering June-September. Numerous, dispersed.

Bromus tectorum L. DOWNY CHESS. Annual, exotic (from Mediterranean). Disturbed areas. Flowering June-late August. Numerous, localized. This plant is known to cause mechanical injury to the mouths of livestock because of the stiff awns.

Buchloe

Buchloe dactyloides (Nutt.) Engelm. BUFFALO GRASS. Perennial, native. Well-drained grassland areas. Flowering July-October. Numerous, dispersed.

Cenchrus

Cenchrus incertus M.A. Curtis SANDBUR. Annual, native. Disturbed sandy soil. Flowering July-October. Abundant, widespread.

Chloris

- 1 Plants annual; panicle with digitate branches, all the branches whorled at the tip of the main axis *C. virgata*
- 1 Plants perennial; panicle with several whorls of branches along the main axis of the inflorescence *C. verticillata*

Chloris verticillata Nutt. TUMBLE WINDMILLGRASS. Perennial, native. Loamy soils. Flowering July-October. Numerous, dispersed.

Chloris virgata Sw. SHOWY WINDMILLGRASS. Annual, native. Disturbed compacted soils. Flowering July-September. Numerous, dispersed.

Cynodon

Cynodon dactylon (L.) Pers. BERMUDA GRASS. Perennial, exotic (from Africa). Disturbed ground. Flowering June-August. Numerous, localized.

Echinochloa

Echinochloa crus-galli (L.) Beauv. BARNYARDGRASS. Annual, exotic (from Europe). Disturbed ground. Flowering July-October. Scarce, localized.

Elymus

- 1 Spikelets solitary at each node; plants with creeping rhizomes; awns 0-4 mm long *A. smithii*
- 1 Spikelets 2 or more at each node; plants without creeping rhizomes; awns more than 1 cm long *E. longifolius*

Elymus longifolius (Smith) Gould LONGLEAF SQUIRRELTAIL. Perennial, native. Found in both grassland and woodland areas. Flowering July-September. Numerous, widespread. [*Sitanion hystrix* (Nutt.) J.G. Smith in part]

Elymus smithii (Rydb.) Gould WESTERN WHEATGRASS. Perennial, native. Moist clay swales. Flowering May-September. Numerous, widespread. [*Agropyron smithii* Rydb.]

Enneapogon

Enneapogon desvauxii Beauv. SPIKE PAPPUSGRASS. Perennial, native. Dry sandy soils along roadsides. Flowering July-September. Numerous, dispersed. [*Pappophorum wrightii* Wats.]

Eragrostis

- 1 Plants annual
 - 2 Lemmas with minute craterlike glands on the keel, near the apex *E. cilianensis*
 - 2 Lemmas lacking craterlike glands
 - 3 Lateral pedicels appressed to the panicle, rarely diverging as much as 20 degrees *E. pectinacea*
 - 3 Lateral pedicels not appressed to the panicle, but spreading or diverging 45 degrees or more
 - 4 Caryopsis (grain) with a groove on the side opposite the embryo; stem node not subtended by a yellow glandular ring *E. mexicana*
 - 4 Caryopsis without a groove on the side opposite the embryo; stem node subtended by a yellow glandular ring *E. barrelieri*
- 1 Plants perennial
 - 5 Spikelets sessile on the unbranched primary panicle branches *E. sessilispica*
 - 5 Spikelets pedicelled, at least shortly so, the primary panicle branches rebranched
 - 6 Mature spikelets 3-5 mm wide, these arranged in overlapping clusters *E. secundiflora*
 - 6 Mature spikelets less than 2.5 mm wide, these not arranged in overlapping clusters *E. intermedia*

Eragrostis barrelieri Daveau MEDITERRANEAN LOVEGRASS. Annual, exotic (from Europe). Disturbed soils along roadsides. Flowering June-July. Numerous, dispersed.

Eragrostis cilianensis (All.) Lut. ex Janchen STINKGRASS. Annual, exotic (from Europe). Disturbed ground. Flowering July-September. Numerous, widespread. This grass can be toxic if consumed in large quantities, especially to horses.

- Eragrostis intermedia* A. S. Hitchc. PLAINS LOVEGRASS. Perennial, native. Sandy and or rocky grassland areas. Flowering June-August. Numerous, dispersed.
- Eragrostis mexicana* (Hornem.) Link MEXICAN LOVEGRASS. Annual, native. Moist disturbed sites, especially around water holes or tanks. Flowering July-September. Numerous, dispersed.
- Eragrostis pectinacea* (Michx.) Nees ex Steud. var. *pectinacea* CAROLINA LOVEGRASS. Annual, native. Sandy plains and alkaline soils. Flowering June-September. Numerous, dispersed.
- Eragrostis secundiflora* Presl RED LOVEGRASS. Perennial, native. Sandy rocky soil. Flowering July-September. Numerous, dispersed.
- Eragrostis sessilispica* Buckl. TUMBLE LOVEGRASS. Perennial, native. Sandy soils in South Johnson Pasture. Flowering July-September. Scarce, localized.

Erioneuron

- Erioneuron pilosum* (Buckl.) Nash HAIRY TRIDENS. Perennial, native. Limestone hills and rock outcrops. Flowering July-September. Scarce, dispersed. [*Tridens pilosum* (Buckl.) Hitchc.]

Hordeum

- 1 Plants perennial; awns 4-8 cm long *H. jubatum*
- 1 Plants annual; awns 0.7-1.2 cm long *H. pusillum*

- Hordeum jubatum* L. FOXTAIL BARLEY. Perennial, native. Moist swales and drainages. Flowering June-late July. Scarce, dispersed.

- Hordeum pusillum* Nutt. LITTLE BARLEY. Annual, native. Disturbed moist ground. Flowering June-August. Scarce, localized.

Koeleria

- Koeleria macrantha* (Ledeb.) Schult., JUNEGRASS. Perennial, native. rocky slopes of the mesa in the Mesa Pasture. Flowering early June-mid July. Scarce, dispersed. [*Koeleria cristata* of many authors]

Leptochloa

- Leptochloa dubia* (H. B. K.) Nees, GREEN SPRANGLETOP. Perennial, native. rocky limestone slopes in Mesa Pasture. Flowering July-September. Numerous, localized..

Lycurus

- Lycurus setosus* (Nutt.) C. Reeder, WOLFTAIL. Perennial, native. found in both grassland and woodland areas on the ranch. Flowering July-October. Abundant, widespread. [*Lycurus phleoides* Kunth var. *glaucifolius*]

Muhlenbergia

- 1 Plants with wiry, much-branched stems, bushlike *M. porteri*
- 1 Plants not as above, not bushy in appearance
- 2 Plants with creeping rhizomes
- 3 Panicles reddish, the branches spreading to divergent at maturity; blades stiff and sharply pointed; collar hairy *M. pungens*
- 3 Panicles not reddish, the branches mostly erect to appressed; blades not stiff nor sharply pointed; collar glabrous *M. repens*
- 2 Plants tufted, lacking rhizomes
- 4 Panicles contracted
- 5 Awns 6-17 mm long; ligule with erect projections out the side *M. pauciflora*
- 5 Awns less than 6 mm long; ligule without lateral projections
- 6 Leaf sheaths compressed-keeled; blades flat or folded *M. wrightii*
- 6 Leaf sheaths rounded on the back; blades flat to rolled *M. dubia*
- 4 Panicles open
- 7 Leaf blades strongly recurving, less than 1 mm wide, 1-4 cm long; pedicels longer than the spikelets *M. torreyi*
- 7 Leaf blades generally straight, 1-2 mm wide, 3-17 cm long; pedicels shorter than the spikelets *M. arenicola*

- Muhlenbergia arenicola*** Buckl. SAND MUHLY. Perennial, native. very sandy areas. Flowering August-September. Numerous, widespread.
- Muhlenbergia dubia*** Fourn., PINE MUHLY. Perennial, native. wooded slopes, mountain canyon. Flowering August-early October. Scarce, localized.
- Muhlenbergia pauciflora*** Buckl., NEW MEXICO MUHLY. Perennial, native. rocky dry slopes and mountain outcrop. Flowering July-September. Scarce, localized.
- Muhlenbergia porteri*** Scribn. ex Beal, BUSH MUHLY. Perennial, native. Rocky slopes and mesas. Flowering July-September. Scarce, localized.
- Muhlenbergia pungens*** Thurb. SANDHILL MUHLY. Perennial, native. Very sandy areas in South Johnson Pasture. Flowering July-August. Scarce, localized.
- Muhlenbergia repens*** (Presl) A.S. Hitchc. CREEPING MUHLY. Perennial, native. Moist swales. Flowering August-September. Scarce, localized.
- Muhlenbergia torreyi*** (Kunth) A. S. Hitchc. ex Bush RING MUHLY. Perennial, native. Dry sandy plains. Flowering July-September. Numerous, widespread.
- Muhlenbergia wrightii*** Vasey ex Coulter SPIKE MUHLY. Perennial, native. Damp plains and slopes. Flowering July-September. Scarce, localized.

Munroa

- Munroa squarrosa*** (Nutt.) Torr. FALSE BUFFALOGRASS. Annual, native. Sandy plains and flats. Flowering July-September. Scarce, dispersed.

Oryzopsis

- 1 Lemmas with copious long hairs; glumes 2.5-3.5 mm long *O. hymenoides*
- 1 Lemmas glabrous; glumes 4-10 mm long *O. micrantha*

Oryzopsis hymenoides (Roem. & Schult.) Ricker ex Piper INDIAN RICEGRASS. Perennial, native. Sandy plains. Flowering July-August. Numerous, widespread. [*Stipa hymenoides* Roem & Schult.]

Oryzopsis micrantha (Trin. & Rupr.) Thurb. LITTLESEED RICEGRASS. Perennial, native. Rocky, sandy plains, especially under trees. Flowering June-August. Numerous, dispersed.

Panicum

- 1 Plants annual *P. hirticaule*
- 1 Plants perennial
- 2 Panicles contracted; lemmas and glumes with obtuse tips *P. obtusum*
- 2 Panicles open; lemmas and glumes with acute tips *P. hallii*

Panicum hallii Vasey var. *hallii* HALL'S PANICUM. Perennial, native. Rocky calcareous soils, often around sinkholes. Flowering July-September. Numerous, dispersed.

Panicum hirticaule Presl var. *hirticaule* MEXICAN WITCHGRASS. Annual, native. Dry rocky, sandy plains. Flowering July-September. Numerous, dispersed.

Panicum obtusum H.B.K. VINE MESQUITE. Perennial, native. Usually heavy clay soils of swales or flats. Flowering June-September. Abundant, widespread.

Paspalum

Paspalum setaceum Michx. var. *ciliatifolium* (Michx.) Vasey FRINGELEAF PASPALUM. Perennial, native. Very sandy soils. Flowering July-September. Scarce, dispersed. [*Paspalum ciliatifolium* Michx.]

Pleuraphis

Pleuraphis jamesii Torr. GALLETA. Perennial, native. Plains and foothills. Flowering July-September. Numerous, dispersed. [*Hilaria jamesii* (Torr.) Benth.]

Poa

- 1 Plants annual; base of floret with long cobwebby hairs *P. bigelovii*
- 1 Plants perennial; base of floret with short stiff hairs *P. fendleriana*

Poa bigelovii Vasey & Scribn. BIGELOW'S BLUEGRASS. Annual, native. Moist wooded areas. Flowering late May-early July. Scarce, dispersed.

Poa fendleriana (Steud.) Vasey subsp. *fendleriana* FENDLER'S MUTTONGRASS. Perennial, native. Moist rocky slopes. Flowering April-early June. Scarce, localized.

Schedonnardus

Schedonnardus paniculatus (Nutt.) Trel. TUMBLEGRASS. Perennial, native. Plains and grasslands. Flowering July-September. Abundant, localized.

Schizachyrium

Schizachyrium scoparium (Michx.) Nash var. *scoparium* LITTLE BLUESTEM. Perennial, native. Plains, woodlands, or rocky slopes. Flowering July-September. Numerous, localized. [*Andropogon scoparius* Michx. var. *scoparius*]

Setaria

1 Plants perennial *S. leucopila*

1 Plants annual

2 Panicles loose, the lower branches developed and spreading, the main axis visible *S. grisebachii*

2 Panicles dense, the lower branches usually weakly developed and congested, the main axis not visible *S. viridis*

Setaria grisebachii Fourn. GRISEBACH'S BRISTLEGRASS. Annual, native. Moist shady areas under piñon or juniper. Flowering July-September. Numerous, localized.

Setaria leucopila (Scribn. & Merr.) K, Schum. PLAINS BRISTLEGRASS. Perennial, native. Dry rocky soils. Flowering July-September. Numerous, localized.

Setaria viridis (L.) Beauv. GREEN BRISTLEGRASS. Annual, exotic (from Europe). Disturbed ground. Flowering July-September. Numerous, localized.

Sporobolus

1 Panicles dense and spikelike, the branches appressed to the main axis *S. contractus*

1 Panicles open, not spikelike

2 Leaf sheaths very hairy at the summit; roots thin

3 Mature panicles nodding; pedicels divaricate or flexuous, and usually tangled together; hairs at collar 1-1.5 mm long *S. flexuosus*

3 Mature panicles erect, often including in the sheath; pedicels erect to spreading but not flexuous; hairs at collar 2-4 mm long *S. cryptandrus*

2 Leaf sheaths hairy but not copiously hairy; roots thick

4 Panicles 10-45 cm long; branchlets not flowering to the base; pedicels 0.5-2 mm long, usually spreading *S. airoides*

4 Panicles 20-60 cm long; branchlets densely flowered to the base; pedicels 0.5-2 mm long, appressed to the branchlets *S. wrightii*

Sporobolus airoides (Torr.) Torr. ALKALISACATON. Perennial, native. Sandy gravelly plains and flats. Flowering June-late September. Numerous, dispersed.

Sporobolus contractus A. S. Hitchc. SPIKE DROPSEED. Perennial, native. Dry sandy soils. Flowering July-September. Numerous, dispersed.

Sporobolus cryptandrus (Torr.) A. Gray SAND DROPSEED. Perennial, native. Dry plains and hills. Flowering June-September. Numerous, dispersed.

Sporobolus flexuosus (Thurb. ex Vasey) Rydb. MESA DROPSEED. Perennial, native. Dry sandy soils. Flowering August-September. Scarce, dispersed.

Sporobolus wrightii Munro ex Scribn. GIANT SACATON. Perennial, native. Compacted soils of swales and plains, often alkaline soils. Flowering July-September. Scarce, localized.

Stipa

- 1 Awns of lemmas 1.4-2 cm long *S. scribneri*
- 1 Awns of lemmas 11-27 cm long
 - 2 Upper half of awn plumose, with feathery hairs 2-3 mm long *S. neomexicana*
 - 2 Upper half of awn not plumose, any hairs present less than 1 mm long *S. comata*

Stipa comata Trin. & Rupr. var. *comata* NEEDLE-AND-THREAD. Perennial, native. Woodland clearings. Flowering June-mid July. Scarce, localized.

Stipa neomexicana (Thurb. ex Coult.) Scribn. NEW MEXICO FEATHER GRASS. Perennial, native. Rocky limestone slopes and plains. Flowering June-mid July. Abundant, dispersed.

Stipa scribneri Vasey SCRIBNER'S NEEDLEGRASS. Perennial, native. Mesas and rocky wooded slopes. Flowering July-September. Scarce, localized.

Tragus

Tragus berteronianus Schult. SPIKE BURGRASS. Annual, exotic (from Europe). Open disturbed ground, along roads. Flowering mid Aug-mid September. Numerous, localized.

POLEMONIACEAE / PHLOX FAMILY

- 1 Leaves entire, not divided into segments, 2-3 mm wide *Phlox*
- 1 Leaves divided into segments, if entire (upper leaves) then 0.5-1 mm wide
 - 2 Corolla funnel shaped; flowers purple *Gilia*
 - 2 Corolla trumpet shaped; flowers light-blue to whitish *Ipomopsis*

Gilia

Gilia rigidula Benth. subsp. *acerosa* (Gray) Wherry BLUE BOWLS. Perennial, native. Dry rocky limestone soils. Flowering May-September. Numerous, dispersed.

Ipomopsis

- 1 Corolla tube 25-40 mm long; petal lobes 8-12 mm long *I. longiflora*
- 1 Corolla tube 15-25 mm long; petal lobes 5-7 mm long *I. laxiflora*

Ipomopsis laxiflora (Coult.) V. Grant TRUMPET GILIA. Annual, native. Grassland areas. Flowering June-August. Scarce, dispersed.

Ipomopsis longiflora (Torr.) V. Grant subsp. *longiflora* TRUMPET GILIA. Annual, native. Grassland areas, often sandy limestone soils. Flowering June-September. Numerous, dispersed.

Phlox

Phlox nana Nutt. SANTA FE PHLOX. Perennial, native. Hills, plains, mountain slopes, and grassy areas. Flowering June-late August. Scarce, localized.

POLYGALACEAE / MILKWORT FAMILY

Polygala

Polygala alba Nutt. WHITE MILKWORT. Perennial, native. Somewhat rocky grassland areas. Flowering May-August. Numerous, dispersed.

POLYGONACEAE / BUCKWHEAT FAMILY

- 1 Leaves hairy at least on the lower surface *Eriogonum*
- 1 Leaves glabrous
 - 2 Flowers all axillary; plants prostrate (growing and spreading on the soil surface) *Polygonum*
 - 2 Flowers mostly terminal on the stem (some axillary); plants erect *Rumex*

Eriogonum

- 1 Stems woolly hairy
 - 2 Flower clusters subtended by obvious leafy-bracts *E. jamesii*
 - 2 Flower clusters not subtended by obvious leaf-bracts *E. lachnogynum*
- 1 Stems hairless
 - 3 Leaves narrowly elliptic to oblanceolate; flowers yellow *E. havardii*
 - 3 Leaves ovate to orbicular; flowers white to pink, not yellow *E. tenellum*

Eriogonum havardii Wats. HAVARD'S BUCKWHEAT. Perennial, native. Rocky hillsides and ridges. Flowering June-September. Scarce, dispersed.

Eriogonum jamesii Benth. var. *flavescens* Wats. JAMES'S BUCKWHEAT. Perennial, native. Dry often rocky slopes. Flowering July-October. Numerous, dispersed.

Eriogonum lachnogynum Torr. BUCKWHEAT. Perennial, native. Dry rocky hillsides and ridges. Flowering June-August. Numerous, dispersed.

Eriogonum tenellum Torr. CUSHION BUCKWHEAT. Perennial, native. Dry rocky slopes. Flowering July-September. Numerous, dispersed.

Polygonum

Polygonum aviculare L. KNOTWEED. Annual, exotic (from Eurasia), disturbed ground. Flowering July-September. Numerous, localized.

Rumex

Rumex crispus L. CURLYLEAF DOCK. Perennial, exotic-naturalized (from Eurasia). Disturbed ground. Flowering April-July. Scarce, localized. This plant has caused oxalate poisoning in sheep in England and Australia.

PORTULACACEAE / PURSLANE FAMILY

- 1 Plants prostrate; leaves flattened; ovary partly inferior; flowers yellow *Portulaca*
- 1 Plants erect; leaves terete; ovary completely superior; flowers pink to purplish *Talinum*

Portulaca

Portulaca oleracea L. COMMON PURSLANE. Annual, exotic-naturalized (from Eurasia). Disturbed ground. Flowering July-September. Scarce, dispersed. No reports of poisoning in the United States, but this plant has been reported to contain toxic levels of oxalates in Australia.

Talinum

Talinum parviflorum Nutt. FLAME FLOWER. Perennial, native. Rocky soils on mesas on wooded slopes. Flowering June-August. Scarce, dispersed.

POTTIACEAE / POTTIA MOSS FAMILY

Didymodon

- 1 Leaves short-ovate, the margins revolute their entire length *D. revolutus*
- 1 Leaves ovate to long-lanceolate, the margins not revolute or only at the base *D. rigidulus*

Didymodon revolutus (Card.) Williams DIDYMODON. Growing on calcareous rock, soil, and walls. producing spores when moist. Scarce, dispersed.

Didymodon rigidulus Hedw. DIDYMODON. growing on calcareous rock, soil, and walls. Producing spores when moist. Scarce, dispersed.. We have two varieties:

- 1 Leaves long-elliptic to long -triangular var. *rigidulus*
- 1 Leaves long-lanceolate var. *icmadophilus* (Schimp. ex C. Mull.) Zand.

Tortula

Tortula ruralis (Hedw.) Gaertn. HAIRY STAR MOSS, TWISTED MOSS. Dry to moist soil and rock, not known to produce spores in New Mexico. Numerous, widespread.

Weissia

- 1 Leaves long-lanceolate *W. controversa*
- 1 Leaves ovate-lanceolate *W. condensa*

Weissia condensa (Voit ex Sturm) Lindb. WEISSIA. Growing on ledges and cliffs. Producing spores under moist conditions. Scarce, dispersed.

Weissia controversa Hedw. WEISSIA. Growing on ledges and cliffs, or around the base of trees. Producing spores under moist conditions. Scarce, dispersed.

PTERIDACEAE / MAIDENHAIR FERN FAMILY

- 1 Blades conspicuously hairy and/or scaly, often so dense that the underside of the blade is not easily seen *Cheilanthes*
- 1 Blade hairless or sparsely hairy, the underside of the blade easily seen *Pallaea*

Cheilanthes

Cheilanthes feei T. Moore SLENDER LIP FERN. Perennial, native. Calcareous ledges and rocky slopes. Producing spores June-October. Scarce, localized.

Pallaea

Pallaea atropurpurea (L.) Link PURPLE CLIFF-BRAKE. Perennial, native. Calcareous ledges and rocky slopes. Producing spores June-October. Scarce, localized.

RANUNCULACEAE / BUTTERCUP FAMILY

Delphinium

Delphinium wootonii Rydb. WOOTON'S LARKSPUR. Perennial, native. Rocky slopes in grassland areas. Flowering May-June. Scarce, localized.

ROSACEAE / ROSE FAMILY

- 1 Leaves pinnately divided; young branches whitish; bark exfoliating; petals present, white *Fallugia*
- 1 Leaves serrate (near apex only) to entire; young branches not whitish; bark not exfoliating; petals absent, the sepals yellow *Cercocarpus*

Cercocarpus

Cercocarpus breviflorus Gray MOUNTAIN MAHOGANY. Perennial, native. Dry rocky hillsides. Flowering June-September. Numerous, localized. [*Cercocarpus montanus* of numerous works]

Fallugia

Fallugia paradoxa (D. Don) Endl. APACHE PLUME. Perennial, native. dry slopes and arroyos. Flowering June-October. Numerous, localized.

RUBIACEAE / MADDER FAMILY

Hedyotis

- 1 Flowers white; stems leafy their entire length; capsule free from the calyx only about 1/3 of its length *H. nigricans*
- 1 Flowers bright pink to reddish; leaves mostly basal; capsule free from calyx 2/3 or more its length *H. rubra*

Hedyotis nigricans (Lam.) Fosberg NARROWLEAF BLUET. Perennial, native. Dry rocky hillsides and grasslands. Flowering Mat-September. Numerous, dispersed. [*Houstonia nigricans* (Lam.) Fern.]

Hedyotis rubra Cav. SCARLEY BLUET. Perennial, native. Open dry sandy or stony places. Flowering May-July. Scarce, dispersed. [*Houstonia rubra* Cav.]

SCROPHULARIACEAE / FIGWORT FAMILY

- 1 Herbage densely woolly-hairy, the hairs stellate (star-shaped); fertile stamens 5; leaves alternate *Verbascum*
- 1 Herbage mostly glabrous, if woolly then the hairs not stellate; fertile stamens 4; leaves opposite
 - 2 Flowers blue to lavender to violet; fertile stamens 4 with a 5th sterile stamen present *Penstemon*
 - 2 Flowers greenish to bright red; fertile stamens 4, lacking a 5th sterile stamen *Castilleja*

Castilleja

Castilleja integra A. Gray WHOLE LEAF PAINTBRUSH. Perennial, native. Piñon/juniper woodland and grassland areas. Flowering June-September. Numerous, widespread.

Penstemon

- 1 Leaves mostly less than 2 cm long; flowers whitish pink *P. ambiguus*
- 1 Leaves mostly greater than 2 cm long; flowers blue
 - 2 Flowers and upper stem covered with stalked glands; flowers generally borne on the side of the stem; leaves less than 6 mm wide *P. jamesii*
 - 2 Flowers and upper stem not covered with stalked glands; flowers borne on both sides of the stem; leaves greater than 10 mm wide *P. fendleri*

Penstemon ambiguus Torr. subsp. *ambiguus* MOTH PENSTEMON, BUSH PENSTEMON. Perennial, native. Sandy slopes in open grassland areas. Flowering May-late June. Numerous, dispersed.

Penstemon fendleri Torr. & Gray FENDLER'S PENSTEMON. Perennial, native. Calcareous grassland soils on the eastern portions of the ranch. Flowering May-June. Numerous, dispersed.

Penstemon jamesii Benth. JAMES PENSTEMON. Perennial, native. Grassland areas. Flowering May-June. Numerous, dispersed.

Verbascum

Verbascum thapsus L. COMMON MULLEIN. Biennial, exotic (from Europe). Disturbed roadsides and fence lines. Flowering Jul-late August. Numerous, localized.

SOLANACEAE / POTATO OR NIGHTSHADE FAMILY

- 1 Plants shrubs with thorns; fruit a fleshy red berry *Lycium*
- 1 Plants herbaceous; fruit various
 - 2 Flowers 4-6 cm long; plants foul-smelling; fruit a spiny capsule *Datura*
 - 2 Flowers less than 4 cm; plants not foul-smelling; fruit a berry or a spiny capsule in one species
 - 3 Anthers appearing fused into a column around the style *Solanum*
 - 3 Anthers not appearing fused into a column around the style
 - 4 Plants annual, with short curled hairs; calyx inflated in fruit *Physalis*
 - 4 Plants perennial, with long flat hairs; calyx not inflated *Chamaesaracha*

Chamaesaracha

Chamaesaracha coniodes (Moric ex Dun.) Britt. SMOOTH CHAMAESARACHA. Perennial, native. Sandy rocky plains and disturbed areas. Flowering April-August. Numerous, dispersed.

Datura

Datura quercifolia H.B.K. OAKLEAF THORN-APPLE. Annual, native. Sandy disturbed soils. Flowering August-September. Scarce, dispersed. Toxic.

Lycium

Lycium pallidum Miers. PALE WOLFBERRY. Perennial, native. Dry hills and plains. Flowering May-June. Numerous, dispersed.

Physalis

Physalis ixocarpa Brot. ex Hornem TOMATILLO, STRAWBERRY TOMATO. Annual, exotic (from tropical America). Disturbed sandy areas. Flowering June-August. Numerous, dispersed..

Solanum

- 1 Fruit a spiny capsule; flower yellow *S. rostratum*
- 1 Fruit a berry; flowers yellow or blue
 - 2 Plants spiny-prickly; tubers (little potatoes) not present; flowers blue *S. elaeagnifolium*
 - 2 Plants not spiny-prickly; tubers present; flowers yellow *S. jamesii*

Solanum elaeagnifolium Cav. SILVERLEAF NIGHTSHADE. Perennial, native. disturbed areas. Flowering June-August. Abundant, widespread. Toxic.

Solanum jamesii Torr. WILD POTATO. Perennial, native. Open wooded slopes. Flowering July-September. Scarce, dispersed.

Solanum rostratum Dunal BUFFALO BUR. Annual, native. Disturbed ground. Flowering June-September. Abundant, widespread.

ULMACEAE / ELM FAMILY

Celtis

Celtis reticulata Torr. NET-LEAF HACKBERRY. Perennial, native. Rock outcrops. Flowering April-May. Scarce, localized.

VERBENACEAE / VERVAIN FAMILY

- 1 Fruit composed of 2 small nutlets; flowers slightly zygomorphic; plants low, trailing herbs of disturbed moist lowlands *Phyla*
- 1 Fruit composed of 4 nutlets; flowers \pm actinomorphic; plants not trailing and usually not of moist lowlands
 - 2 Calyx only slightly longer than the fruit; style 1-3 mm long; flowers in elongate spikes *Verbena*
 - 2 Calyx 1-3 mm longer than the fruit; style 6-24 mm long; flower in dense compact headlike clusters at the apex if the stems *Glandularia*

Glandularia

Glandularia bipinnatifida (Nutt.) Nutt. PINK VERVAIN. Perennial, native. Calcareous, disturbed soils along roadsides. Flowering March-September. Abundant, widespread.

Phyla

Phyla cuneifolia (Torr.) Greene FROG FRUIT. Perennial, native. Heavy clay soils in swales and areas of ephemeral water accumulation. Flowering June-August. Scarce, dispersed.

Verbena

- 1 Leaves mostly entire and linear, the lower leaves sometimes with a few teeth *V. perennis*
- 1 Leaves mostly toothed
 - 2 Leaves plicate (like a folding fan), the veins usually whitish toward the margin *V. plicata*
 - 2 Leaves not plicate, the veins not whitish *V. bracteata*

Verbena bracteata Lag. & Rodr. WEED VERBENA. Perennial, native. Disturbed areas especially along roadsides. Flowering May-September. Numerous, widespread.

Verbena perennis Woot. SLENDER VERBENA. Perennial, native. Rocky grassy slopes and roadsides. Flowering July-September. Numerous, dispersed.

Verbena plicata Greene PLEATED VERBENA. Perennial, native. Dry rocky calcareous soils. Flowering May-September. Scarce, localized.

VISCACEAE / MISTLETOE FAMILY

Arceuthobium

Arceuthobium divaricatum Engelm. MISTLETOE. Perennial, native. Parasitic on *Pinus edulis*. Flowering August-September. Numerous, dispersed.

ZYGOPHYLLACEAE / CALTROP FAMILY

- 1 Fruits strongly spiny *Tribulus*
1 Fruits not spiny *Kallstroemia*

Kallstroemia

Kallstroemia parviflora Norton WARTY CARPETWEED. Annual, native. Dry hills and plains. Flowering August-September. Numerous, dispersed.

Tribulus

Tribulus terrestris L. GOATHEAD. PUNCTURE VINE. Annual, exotic-naturalized (from Europe). Disturbed areas. Flowering late June-August. Numerous, dispersed. Toxic and pernicious.



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