

# A FLORISTIC INVENTORY OF THE CIMARRON NATIONAL GRASSLAND (KANSAS) AND THE COMANCHE NATIONAL GRASSLAND (COLORADO)

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## ABSTRACT

We report the results of a floristic inventory conducted in southwestern Kansas and southeastern Colorado, an area that includes Cimarron National Grassland, Comanche National Grassland, and adjacent private lands. Our study area, spread over Baca, Las Animas, and Otero counties in Colorado and Morton County in Kansas, encompasses 567,300 acres. Results are enumerated in an annotated checklist, based on 9,281 numbered collections of vascular plants. A total of 635 unique taxa are documented from 87 families, including 80 exotics and 26 species of conservation concern. *Cyperus retroflexus* is reported as an addition to the flora of Kansas. Two state records are documented for Colorado: *Astrolepis integerrima* and *Digitaria pubiflora*.

## RESUMEN

Se aportan los resultados de un inventario florístico realizado en el suroeste de Kansas y sureste de Colorado, un área que incluye el Cimarron National Grassland, Comanche National Grassland, y tierras adyacentes privadas. Nuestra área de estudio, se extiende por los condados de Baca, Las Animas, y Otero en Colorado y condado de Morton en Kansas, abarca 567,300 acres. Los resultados se enumeran en un catálogo anotado basado en 9,281 colecciones numeradas de plantas vasculares. Un total de 635 taxa únicos, se documentan de 87 familias, incluyendo 80 exóticas y 26 especies con interés de conservación. *Cyperus retroflexus* es una adición a la flora de Kansas. Se documentan dos citas estatales para Colorado: *Astrolepis integerrima* y *Digitaria pubiflora*.

## INTRODUCTION

We report on a vascular plant inventory of Cimarron National Grassland (Cimarron) and Comanche National Grassland (Comanche), located in extreme southwestern Kansas and southeastern Colorado, respectively (Fig. 1). Included are private lands adjacent to the Comanche National Grassland.

The Cimarron consists of 108,175 acres located primarily in Morton County, Kansas, with a disjunct parcel of 480 acres in Stevens County. The Comanche, located in three Colorado counties (Baca, Las Animas, and Otero) encompasses 443,765 acres. Both Grasslands, together covering 551,940 acres, are managed by the USDA Forest Service. The private lands included in our study comprise 15,360 acres scattered throughout Las Animas and Otero counties. Thus, the total area, herein referred to as the Grasslands, covers 567,300 acres. Elevation ranges from about 3,200 feet to just over 6,400 feet.

The Grasslands are located in the Great Plains floristic region (Fenneman 1946). Comprehensive treatments that include this area are Rydberg (1932) and Great Plains Flora Association (1986). Although several state Floras cover Colorado, (Harrington 1954; Weber & Wittman 2001a; Weber & Wittman 2001b), only a few checklists and inventories exist for the area. These publications focus on areas near or within the Grasslands boundaries (Anderson 1950; Clark 1996; Freeman 1989; Hazlett 2004; Shaw et al. 1989; Weber & Wittman 1994).

This botanical inventory is part of the larger effort by the Rocky Mountain Herbarium (RM) to produce a critical flora of the Rocky Mountains and to map, based on vouchered specimens, the distributions of its taxa in relatively fine detail (Hartman 1992; Hartman & Nelson 2008; Hartman et al. 2009). To this end, 64 inven-

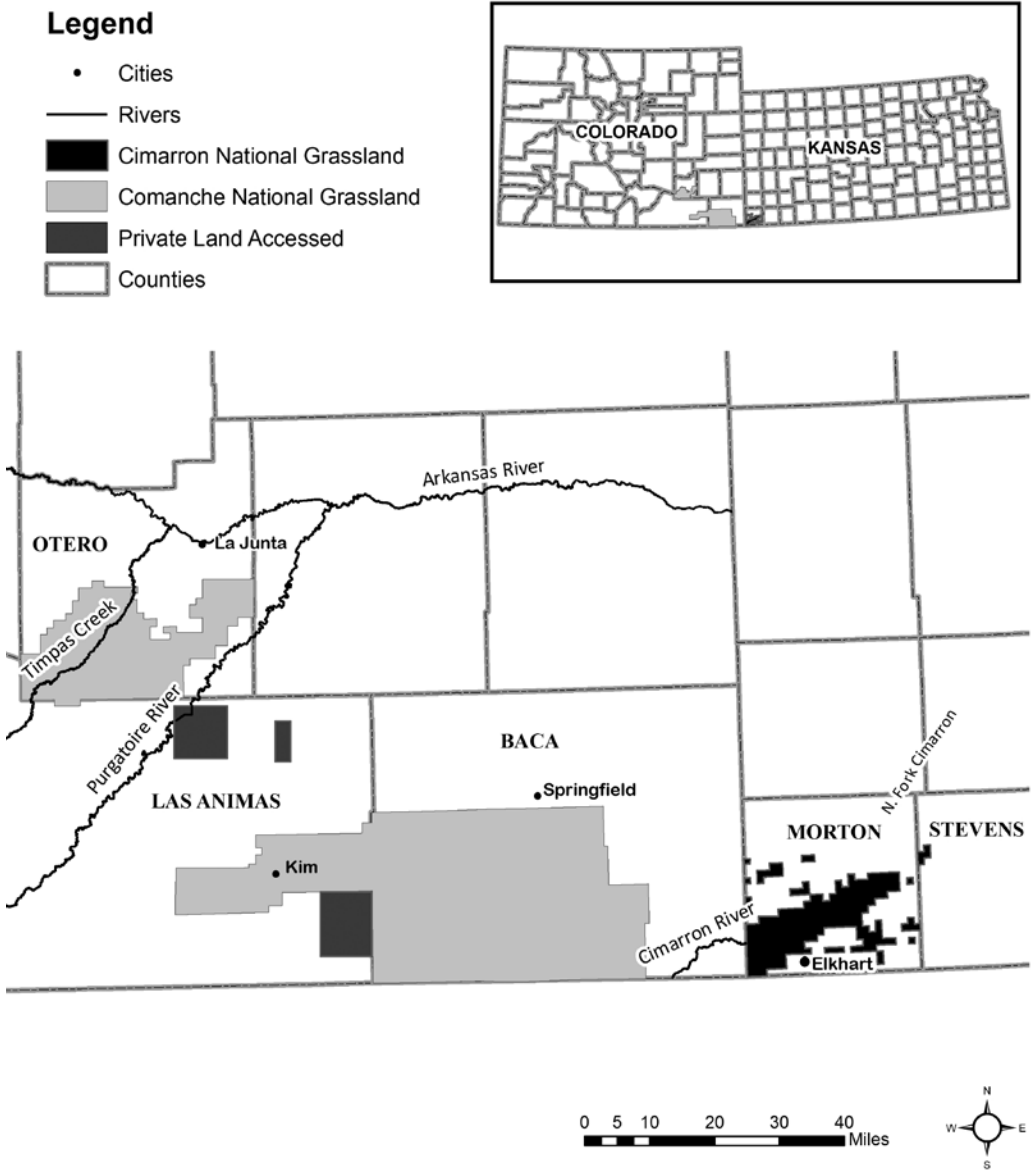


FIG. 1. The location of the Cimarron National Grassland and the Comanche National Grassland in extreme southwest Kansas and adjacent Colorado, respectively, and an enlargement of the area.

ories (48 as MS thesis projects) have been conducted. The Grasslands represent the easternmost project completed thus far.

**Topography**

The Cimarron and the Comanche are located in the Great Plains region of the United States. Within this region, two ecological subregions have been identified: Western High Plains and Southwest Tablelands (Omernik 1995). The Western High Plains, covering Baca and Morton counties, are characterized topographically as smooth to slightly irregular, with a high percentage of dryland agriculture (Chapman et al. 2001). Typical plant

communities are grasslands and shrublands. The Southwest Tablelands of Las Animas and Otero counties are characterized by red sandstone canyons, mesas, rock outcrops, and little arable land (Chapman et al. 2006). Here, shrublands and woodlands are the dominant plant communities.

The entire study area is located within the Arkansas River watershed. The Cimarron River traverses the southeastern corner of Baca County, then flows northeast through Morton and Stevens counties, Kansas (Fig. 1). The broad, gently east-sloping plains north of the Cimarron River, in Kansas, contain the lowest point at approximately 3,259 feet (Freeman 1989). The Cimarron River is often dry, with a sandy bed and subsurface water. The Purgatoire River flows northeast through the western unit of the Comanche, carving the Purgatoire River Canyon through sandstones on the plains, and ultimately emptying into the Arkansas River east of La Junta. The highest elevation (6,444 feet) is in the Mesa de Maya area, Las Animas County, near Tobe, Colorado.

### **Climate**

The climate in the region is semiarid, as precipitation levels are influenced by the rain shadow of the Rocky Mountains, the effect of which weakens eastward. Thus, the Cimarron receives more annual precipitation than the Comanche. The Elkhart weather station near Cimarron National Grassland receives an average of 17.92 inches of precipitation annually, whereas La Junta and Springfield, both near Comanche National Grassland, average 15.29 and 16.03 inches, respectively (HPRCC 2010). Weather patterns are characterized by low relative humidity, abundant sunshine, infrequent precipitation, moderate to high winds, and high rates of evaporation (Doesken et al. 2003).

Mean high temperatures range from 70.8°F in La Junta to 65.5°F in Kim. The mean low temperatures are highest in Elkhart (41°F) and lowest in Kim (36°F).

Intense thunderstorms with violent winds and hail are not uncommon from mid April through October, when the majority of the annual precipitation falls (70–80%). Average annual precipitation from five weather stations in the area ranges from 14.89 to 17.92 inches (HPRCC 2010). During 2007, the first of the two field seasons, precipitation was categorized as extremely moist in southwestern Kansas, and near normal in southeastern Colorado (NCDC 2010). Snowstorms in December of 2006 deposited a record 45 inches of snow, resulting in lush vegetation during the 2007 collecting season. In 2008, levels were near normal in southwestern Kansas. However, extremely low precipitation levels were documented in southeastern Colorado, causing drought and frequent dust storms on the Comanche (Doesken 2009). Consequently, fewer species were documented during the second collecting season.

### **Geology**

The Grasslands and vicinity can be divided into four major geologic areas: High Plains, Mesa de Maya, Purgatoire River, and Arkansas Valley. The High Plains stretch across the eastern portion of the area encircled by Elkhart, Kim and Springfield, and encompass a broad, rolling upland dissected by rivers and streams. During the Paleozoic and Mesozoic eras, little faulting occurred in the High Plains. The Laramide Orogeny (72 to 40 mya) that led to the uplift of the Rocky Mountains caused inland Cretaceous seas to retreat. Subsequently (late Cretaceous and Tertiary periods), rivers flowing eastward cut deep valleys and deposited alluvial materials that washed eastward forming the High Plains.

The Mesa de Maya region, like most of eastern Colorado, is composed of sedimentary formations laid down through the Paleozoic and Mesozoic eras (Chronic and Chronic 1972). However, Mesa de Maya, a mammoth plateau extending into southeastern Las Animas County from northern New Mexico, is the result of volcanic eruptions during the Pliocene (Clark 1996). Lava flows formed a hard basalt cap on the more erosive Ogallala Formation. The sedimentary formations eroded more quickly, resulting in irregularly-shaped networks of canyons (Clark 1996). The Morrison, Ralston Creek, and Entrada formations, all sedimentary strata of Jurassic Period, are exposed on the New Mexico border. The Chacuaco Creek drainage forms the western border of Mesa de Maya and displays some of the most complex geology in eastern Colorado. Cretaceous Dakota Sandstone is visible along the banks, and is overlain by the Carlile Shale, Greenhorn Limestone, and Graneros Shale. Above these strata rest the limestones and shales of the Niobrara Formation, followed by the Ogallala that is capped by basalt (Tweto 1979).

The Purgatoire River flows northeast between the two units of the Comanche, winding through a maze of canyons (Fig. 1). The lowest exposed strata, all Permian in age, are the Big Basin, Dry Creek, and White Horse formations (Lockley et al. 1997). During the Triassic Period, the red sandstones of the Chinle Formation were deposited. In Picketwire Canyon, Jurassic deposits are visible, including the Entrada Formation, the Ralston Creek/Bell Ranch Formation, and the Morrison Formation (Lockley et al. 1997). These Jurassic deposits contain the largest dinosaur trackway in North America. Later, during the Cretaceous, the area was submerged by a shallow sea that deposited Cretaceous strata that include the Purgatoire, Dakota Sandstone, Graneros Shale, Greenhorn Limestone, Carlile Shale, and Niobrara formations (chronologically). The Purgatoire Formation includes two members of the nearly white Lytle Sandstone and the Glencairn Sandstone and Marine Shales (Lockley et al. 1997). The fluvial sandstones and conglomerate of the Lytle Formation are indicative of fast-moving water. In contrast, the Glencairn Formation is a thin, brittle bed of marine sediments sandwiched between the Lytle and Dakota sandstones. Dakota sandstone of marine origin is readily recognizable, with its caramel and dark brown shades, and prominently lines the rims of the canyons that wind through the Purgatoire Valley. Graneros Shale, Greenhorn Limestone, Carlile Shale, and the Niobrara formations, all late Cretaceous, form the slopes and rounded hills above the canyon rim (Lockley et al. 1997).

The Arkansas River cuts a broad valley through eastern Colorado. Heavy use of water for irrigation has lowered the levels of the river considerably, but it remains the largest in southeastern Colorado. The river bed and floodplain are awash with alluvium, along with older Quaternary gravels. Rounded, undulating hills to the south rise up from the floodplain between Timpas Creek and the Purgatoire River. These hills are capped by late Cretaceous shale and limestone of the Niobrara Formation.

#### METHODS

Field work on the Cimarron National Grassland and the Comanche National Grassland was conducted during the summers of 2007 and 2008. A total of 134 days were spent collecting (May 25–Aug 27, 2007; May 12–Aug 1, 2008). An additional two days in April 2008 served to document early blooming species such as *Cymopterus acaulis* and *Leucocrinum montanum*. We returned in September to collect especially late blooming members of Poaceae and Asteraceae, among them *Schizachryium scoparium* and *Artemisia filifolia*, respectively.

We used the “meander search” strategy (Goff et al. 1982; Ristau 1998; Hartman 1992; Hartman & Nelson 2008). Thus, sites were not selected at random, but chosen to provide adequate geographic coverage. We also chose sites that captured the range of geologic substrates, soil types, and plant communities. This methodology allowed us to document a much greater diversity of taxa. Species of conservation concern and noxious weeds were a collecting priority.

At each collection site (431 total), a waypoint was taken using a GPS unit. Field notes were taken on the habitat, dominant plant species and landforms. Collecting took place within a one-half mile radius or less of each waypoint. All species present in flower or fruit were collected, placed in plastic bags, and stored in an ice chest. Plants were pressed at the Carrizo Work Center outside of Springfield, the Comanche National Grassland office in La Junta, and the Higbee Barn, 17 miles south of La Junta. Specimens were placed in folded sheets of newspaper, inserted between cardboards, and then secured in a plant press. The press was then placed on a drier for one to two days. Once dry, the specimens were bundled and transported to the RM. Other details regarding collecting are described in Hartman (1992) and Hartman and Nelson (2008); standard collecting protocol followed in all RM floristic studies. Nomenclature follows that adopted for the RM Plant Specimen Database (Hartman et al. 2009).

The Annotated Checklist is based on 9,281 collections from the Cimarron National Grassland, the Comanche National Grassland, and adjacent private lands. This includes 521 specimens collected by Brian Elliott in 2003 and 2004 from the Comanche. In 2008, we were permitted by land owners to collect on five ranches bordering the Comanche. These ranches offered sites with the most dramatic topographic relief: high flat grasslands on top of Black Mesa, deep canyons cut by Carrizo Creek, and red sandstone spires of Beatty Canyon.

All specimens are housed at RM. The specimen data were entered into the RM Plant Specimen Database and are available online (Hartman et al. 2009). Duplicates were sent to COLO, CS, and KANU herbaria.

## RESULTS AND DISCUSSION

Results of the study are included in the following sections. Vegetation Types, Exotic Taxa and Noxious Weeds, Taxa of Conservation Concern, State Records, and Summary of Taxa.

**VEGETATION TYPES**

The vegetation on the Cimarron and the Comanche has been described by Freeman (1989), Hazlett (2004), and Shaw et al. (1989). Based on these classifications, we identified 11 vegetation types within five broad physiognomic categories. Each contains common associates and physical features such as climate and landform.

**Grassland**

*Shortgrass prairie*.—Shortgrass prairie is the most widespread vegetation type. It occupies the gentle hills and plains across Baca and Morton counties, at low elevations (3,200–4,500 feet). This true grassland community is dominated by warm-season grasses, with only scattered shrubs. The dominant grass species are *Aristida purpurea* var. *longiseta*, *Bouteloua gracilis*, *Buchloë dactyloides*, *Elymus smithii*, *Muhlenbergia torreyi*, *Sporobolus cryptandrus*. *Hilaria jamesii* (*Pleuraphis jamesii*) is the subdominant, often occurring in large patches. Two cacti are common: the shrubby *Cylindropuntia imbricata* and the low-growing *Opuntia polyacantha*. Tree cover is limited to scattered stands of *Juniperus monosperma*, with very limited occurrences of *Celtis reticulata*. Overstory species are *Ipomoea leptophylla* and *Yucca glauca*. Representative forbs include *Astragalus missouriensis* var. *missouriensis*, *Engelmannia pinnatifida*, *Erysimum asperum*, *Gutierrezia sarothrae*, *Lygodesmia juncea*, *Mirabilis linearis*, *Psoraleidum tenuiflorum*, *Sphaeralcea coccinea*, *Stephanomeria pauciflora*, *Thelesperma megapotamicum*, and *Xanthisma spinulosum* var. *spinulosum*. This vegetation type on the Grasslands is typically managed as rangeland.

*Midgrass Prairie*.—Southwestern Baca County and southeastern Las Animas County contain patches of midgrass prairie that intergrade into Juniper woodland (see description below). Dominant grasses representative of tallgrass prairie elements include *Andropogon gerardii*, *Bothriochloa laguroides*, and *Bouteloua curtipendula*. Shortgrass prairie grass elements include *Bouteloua gracilis*, *B. hirsuta*, *Hilaria jamesii* (*Pleuraphis jamesii*), and *Hesperostipa comata*. Characteristic forbs include: *Asclepias latifolia*, *Liatris punctata*, *Ratibida columnifera*, *Solidago wrightii*, and *Thelesperma megapotamicum*. The most extensive patches of midgrass prairie can be found in Carrizo, Holt, and Picture canyons (Baca County). *Amorpha canescens*, *Mimosa quadrivalvis* var. *angustata* (*Mimosa nuttallii*), *Onosmodium molle*, and *Sorghastrum nutans* are sporadic in the canyons, and are also representative species of the tallgrass prairie. If grazing pressure is low, this vegetation type displays the richest floristic diversity.

*Rocky Upland Prairie*.—Rocky breaks and uplands of sandy and calcareous deposits occur throughout portions of Baca, Las Animas, Morton and Otero counties. Perhaps the most recognized example of the Rocky upland prairie within the Comanche National Grassland occurs approximately 20 miles south of La Junta. Here, the shale barrens that rise above the Purgatoire River Valley harbor a distinct plant community dominated by *Cryptantha thyrsoiflora*, *Dalea purpurea*, *Dalea jamesii*, *Echinocereus reichenbachii*, *Eremogone hookeri*, *Eriogonum lachnogynum*, *Paronychia jamesii*, and *Tetraneuris acaulis*. This unique assemblage of forbs is interspersed with the grass species *Achnatherum hymenoides* and *Hesperostipa neomexicana*. Scattered *Juniperus monosperma* trees are present and *Rhus trilobata* var. *trilobata* and *Artemisia bigelovii* are the most common shrubs. Exotic species are uncommon due to low disturbance, harsh environmental conditions, and inaccessibility by cattle.

**Shrublands**

*Sandsage Prairie*.—Stabilized and active sand dunes occur over large expanses along the Cimarron River in Morton County, and near Campo in southeastern Baca County. Distinctive Sandsage prairie occupies dunes that lie in a band 1–5 miles wide, south of the river. Dense stands of *Artemisia filifolia*, *Ericameria nauseosa*, and *Yucca glauca* dominate the community. Typical forbs are *Abronia fragrans*, *Chenopodium pratericola*, *Mentzelia nuda*, *Oenothera lavandulifolia*, *Palafoxia rosea*, and *Polanisia dodecandra*. Grass species provide less plant cover

here, and include *Andropogon hallii*, *Calamovilfa gigantean*, *Elymus elymoides*, *Panicum capillare* var. *capillare*, *Schedonnardus paniculatus*, and *Sporobolus cryptandrus*.

*Saline Bottom Shrubland*.—Small stretches of this shrubland are restricted to alluvial fans along streams and arroyos. The Purgatoire River and Timpas Creek in Otero County host its most extensive coverage. The overstory is dominated by *Sarcobatus vermiculatus* and *Atriplex canescens*. The understory is comprised of the following grass species: *Distichlis spicata*, *Elymus smithii*, *Muhlenbergia arenacea*, and *Sporobolus airoides*. Forb cover is low, but commonly includes: *Gutierrezia sarothrae*, *Opuntia fragilis*, and *Plantago patagonica*.

### Woodlands

*Cottonwood Gallery Forest*.—These forests occur in deep, sandy soils of alluvial fans along flood plains of the Purgatoire and Cimarron rivers. It is also present in small patches along smaller creeks and streams. The dominant tree species is *Populus deltoides* var. *occidentalis* (*Populus deltoides* ssp. *monolifera*), with occasional occurrences of *Salix amygdaloides*. Common shrubs are *Ericameria nauseosa* and *Salix exigua*. Thickets of the exotic shrub *Tamarix ramosissima* are present along these rivers. Understory forbs include *Croton texensis*, *Opuntia tortispina*, *Sphaeralcea coccinea*, and *Tradescantia occidentalis*. The exotic grass *Bromus japonicus* is often present along with the native species *Elymus elymoides*.

*Juniper Woodland*.—Juniper woodlands occur where more than 25 percent of the total cover consists of juniper (Schrupp et al. 2000). These woodlands are found in the southwestern portion of the Comanche, often on the Dakota Sandstone Formation. This is the most common vegetation type in the Southwest Tablelands Ecoregion (Chapman et al. 2001). *Juniperus monosperma* is often the dominant tree species: more infrequently *Juniperus scopulorum* is the co-dominant. The latter community, found in rock canyons and hillsides in the western portion of the study area, typically has an understory of *Cercocarpus montanus*, *Ptelea trifoliata*, *Rhus trilobata* var. *trilobata*, and *Ribes aureum*. The xeric-adapted ferns *Cheilanthes eatonii*, *C. fendleri*, and *Pellaea atropurpurea* occur in cracks of sandstone canyon walls, often on south-facing exposures. Forb associates frequently include *Asclepias asperula*, *Dalea purpurea*, *Eriogonum tenellum*, *Melampodium leucanthum*, *Mirabilis linearis*, and *Psoralidium tenuiflorum*. Common understory grasses are *Bouteloua curtipendula*, *B. eriopoda*, and *B. hirsuta*. Woodlands dominated by *Juniperus monosperma* typically exhibit widely spaced trees often interspersed with *Rhus trilobata* var. *trilobata*. Open, dry patches between trees often contain *Bouteloua* spp., *Melampodium leucanthum*, and *Mirabilis multiflora*.

*Pinyon-Juniper Woodland*.—Pinyon-juniper woodlands are restricted to the southwestern portion of the Comanche and adjacent private lands. The tree species *Juniperus monosperma*, *J. scopulorum*, and *Pinus edulis* dominate the overstory. Common shrubs are *Cercocarpus montanus*, *Quercus gambelii*, *Quercus xundulata*, and *Rhus trilobata* var. *trilobata*. These woodlands were found in Baca, Otero, and Las Animas counties at elevations of 4,420 to 6,440 feet. In Baca County, it is restricted to three sites: southwest of Pritchett along East Carrizo Creek, Carrizo Canyon, and Big Hole Spring. In Otero County it is limited to Christian Canyon near Delhi, Colorado. Las Animas County contained the majority of sites with seven occurrences of pinyon-juniper woodland. Six vouchers of *Pinus ponderosa* were documented from these woodlands, all on private lands in Baca, Las Animas, and Otero counties, and represent the first occurrence in Otero County (USDA 2010). Common forbs found in this community type include *Castilleja integra*, *Echinocereus viridiflorus*, *Linum lewisii*, *Mirabilis multiflora*, and *Sophora nuttalliana* and the grasses *Bouteloua curtipendula*, *B. hirsuta*, and *Piptatherum micranthum*.

### Riparian

Riparian areas are limited in the arid Grasslands. However, major rivers (Arkansas, Cimarron, and Purgatoire), creeks, springs, small ponds, and irrigation ditches provide water to the otherwise dry lands. The Plains cottonwood, *Populus deltoides* var. *occidentalis*, forms gallery forests in Morton County, but occurs in scattered populations or as lone individuals elsewhere in the Grasslands (see description of Cottonwood gallery forest). *Salix exigua* is common across all five counties. *Typha* spp., *Tamarix ramosissima*, *Schoenoplectus pungens*, and *Calamovilfa gigantea* are found on the banks of major rivers and creeks. Small pools and ponds commonly host

*Lemna minor* and the following forbs: *Ranunculus scleratus*, *Rumex crispus*, and *Veronica anagallis-aquaticis*. Grasses include: *Distichlis spicata*, *Echinochloa muricata*, and *Polypogon monspeliensis*. *Eleocharis macrostachya*, *Equisetum laevigatum*, and *Juncus torreyi* may line edges of both standing and moving water.

### Disturbed

**Stock Pond.**—Excavated areas that serve to collect water for livestock are scattered throughout the Grasslands. Water levels fluctuate drastically throughout the season. Typical forbs that subsist on the muddy margins are *Atriplex argentea*, *Iva axillaris*, *Polygonum aviculare*, *Rorippa sinuata*, and *Xanthium strumarium*. The grass species *Polypogon monspeliensis* is also frequent on the banks, along with the exotic *Eragrostis cilianensis*. The cattail *Typha domingensis* was documented at ten of these sites.

**Roadside.**—This vegetation type often harbors more plant diversity than surrounding rangeland, especially during periods of drought. The combination of disturbance from road maintenance activities along with the exclusion of cattle by fences allows a mix of native species, along with exotic and weedy agricultural taxa, to thrive. With the absence of grazing pressure, native species often persist along a road margin yet are absent in an adjacent rangelands. For example, a rocky roadcut may contain members of the Rocky Upland Prairie such as *Dalea purpurea* and *Tetaneuris acaulis*, but a careful search reveals none of these species on the other side of a cattle fence. Common native grasses are *Cenchrus longispinus*, *Chloris verticillata*, *Elymus elymoides*, *Elymus smithii*, and *Hordeum pusillum*. Exotic grass species such as *Aegilops cylindrica*, *Bromus japonicus*, and *B. tectorum* are frequent. Forbs include *Convolvulus arvensis*, *Cucurbita foetidissima*, *Quincula lobata*, *Tragopogon dubius*, *Tribulus terrestris*, and *Verbena bracteata*. Weedy species of *Ambrosia*, *Chamaesyce*, *Cirsium*, *Melilotus*, *Physalis*, and *Solanum* are also common.

### EXOTIC TAXA AND NOXIOUS WEEDS

National Grasslands managed as rangeland have a high percentage of exotic taxa. Percentages from studies on several regional National Grasslands are as follows: Buffalo Gap (17.1%), Kiowa and Rita Blanca (11%), Ogallala (14.9%), Pawnee (22%), and Thunder Basin (16.3%) (Ebertowski 2005; Hazlett 1998; Hazlett et al. 2009; Kostel 2006). We documented 80 exotic taxa, comprising 12.6 percent of the species in the annotated checklist. The Colorado noxious weed list contains 68 plant species, 16 of which were collected in this study (CDA 2010). They are *Aegilops cylindrica*, *Arctium minus*, *Bromus tectorum*, *Cirsium vulgare*, *Convolvulus arvensis*, *Cynoglossum officinale*, *Dipsacum fullonum*, *Elaeagnus angustifolia*, *Erodium cicutarium*, *Hibiscus trionum*, *Linaria dalmatica*, *Sonchus arvensis*, *Sorghum halapense*, *Tamarix ramosissima*, *Tribulus terrestris*, and *Verbascum thapsus*. Of the 12 noxious weeds so designated for Kansas, three were documented in that state: *Convolvulus arvensis*, *Hoffmannsegia glauca*, and *Sorghum halapense*. The following Colorado noxious weeds were documented in Kansas where they are not so recognized: *Bromus tectorum*, *Elaeagnus angustifolia*, *Erodium cicutarium*, *Tamarix ramosissima*, and *Tribulus terrestris*.

### TAXA OF CONSERVATION CONCERN

A total of 26 taxa of conservation concern were documented from 72 sites on the Grasslands and adjacent private lands. No federally listed plant species were documented (USFW 2010), nor are any known from the area. Taxa of conservation concern are those tracked by the Colorado Natural Heritage Program and the Kansas Natural Heritage Program, or listed as Sensitive by the U.S. Forest Service (CNHP 2011; KNHP 2011; USFS 2011). These taxa are listed alphabetically below, followed by family name, counties of occurrence, and voucher (collector surname and collection number). County name and voucher citation are listed only for taxa of conservation concern status as recognized in Kansas versus Colorado.

- |  |   |
|--|---|
| <b>Achnatherum hymenoides</b> (Poaceae) Morton: Nelson<br>72121. | <b>Asclepias involucreta</b> (Apocynaceae) Baca: Kuhn<br>561.                 |
| <b>Argythamnia humilus</b> (Euphorbiaceae) Otero: Kuhn<br>2708.  | <b>Asclepias macrotis</b> (Apocynaceae) Las Animas:<br>Kuhn 3573, 5426, 7575. |

- Asclepias oenotheroides** (Apocynaceae) Las Animas: Kuhn 6946.
- Asplenium platyneuron** (Apocynaceae) Baca, Otero: Elliott 12036; Kuhn 6859; Nelson 72560.
- Berlandiera lyrata** (Asteraceae) Morton: Elliott 11996; Kuhn 760, 3958, 6563, 7131; Nelson 71851, 71909, 72154, 72428.
- Bothriochloa springfieldii** (Poaceae) Baca, Las Animas, Otero: Kuhn 3578, 3616, 6681; Nelson 72472.
- Cheilanthes eatonii** (Pteridaceae) Baca, Las Animas, Otero: Elliott 12042b; Kuhn 1494, 2919, 3786, 3787, 3801, 3811, 3863, 3864, 4347, 6982.
- Cuscuta umbellata** (Convolvulaceae) Hamilton: Kuhn 2827.
- Dalea cylindriceps** (Fabaceae) Morton: Kuhn 2268; Nelson 72053.
- Dalea jamesii** (Fabaceae) Morton: Kuhn 5988; Nelson 72164.
- Eleocharis rostellata** (Cyperaceae) Morton: Kuhn 1107.
- Fraseria coloradensis** (Gentianaceae) Baca: Kuhn 1902.
- Lobelia cardinalis** (Campanulaceae) Baca: Elliott 12026.
- Oenothera engelmannii** (Onagraceae) Morton: Kuhn 1056, 1119, 1135.
- Oenothera harringtonii** (Onagraceae) Otero: Kuhn 1331, 2762, 3105, 3310; Nelson 72495, 72555.
- Pellaea atropurpurea** (Pteridaceae) Baca, Las Animas: Elliott 11977; Kuhn 1506, 3775, 3873, 3874, 5799, 6981.
- Pellaea wrightiana** (Pteridaceae) Baca: Nelson 72562.
- Penstemon jamesii** (Plantaginaceae) Baca, Las Animas: Hartman 84838, 85020; Kuhn 766.
- Picradeniopsis oppositifolia** (Asteraceae) Morton: Kuhn 5918.
- Prunus angustifolia** (Rosaceae) Baca, Las Animas, Otero: Kuhn 3930, 5193, 6816, 7190.
- Sphaeralcea angustifolia** (Malvaceae) Morton: Kuhn 1183, 3981.
- Teucrium laciniatum** (Lamiaceae) Morton: Nelson 72052.
- Vernonia marginata** (Asteraceae) Morton: Kuhn 7404.
- Woodsia neomexicana** (Dryopteridaceae) Baca and Otero: Kuhn 3794, 4364, 5800, 7799, 7826.

## STATE RECORDS

We report two taxa new to the flora of Colorado: *Astrolepis integerrima* and *Digitaria pubiflora* (Weber and Wittman 2001b; USDA 2010; FNA 1993+). *Cyperus retroflexus* is reported here as an addition to the flora of Kansas (Freeman 2005).

***Astrolepis integerrima***, a xeric-adapted silver cloak fern, is known from Arizona, New Mexico, Oklahoma, and Texas (FNA 1993+). It was previously reported as a state record for Colorado by Clark (1996), but the specimen was subsequently annotated as *Astrolepis cochisensis* by Ranker and Orthner in 2000. Thus, our voucher from Baca County serves as the first collection from Colorado, and represents the northern geographic limit of the taxon. The voucher was collected in Sand Canyon, from shaded cracks in the sandstone canyon walls.

**COLORADO. Baca Co.:** Comanche National Grassland, Sand Canyon, ca. 25 air mi S of Pritchett; 37.0178°N, 102.8367°W, along sandstone cliffs with *Juniperus monosperma* and *Rhus aromatica*, 4,367 ft, 19 Apr 2008, Kuhn 3778 with E. Elliott and B. Elliott (RM).

***Digitaria pubiflora***, a crabgrass, is known from Arizona, New Mexico, Oklahoma, and Texas. Our two collections, from weedy, sandy roadsides in Baca County, represent its northern geographic limit.

**COLORADO. Baca Co.:** Comanche National Grassland, Picture Canyon, ca. 29 air mi SSW of Springfield, 37.0073°N, 102.7486°W, along *Salix*-dominated wet seep; shortgrass prairie with *Yucca* sp., *Opuntia* sp., and *Buchloe dactyloides*; grazed, 4,225 ft, 7 Jun 2007. Kuhn 862 (RM); side canyon of Holt Canyon, ca. 1.5 air mi N of Oklahoma, ca. 12 air mi SW of Campo, 37.0237°N, 102.7798°W, lower slopes and bottom of narrow side canyon with hackberry and soapberry, 4,320–4,400 ft, 21 Jun 2007, Nelson 72475 with Kuhn (RM); det. Kelly W. Allred.

***Cyperus retroflexus***, collected on the Cimarron National Grassland, is an addition to the flora of Kansas. Our voucher, collected from rolling sand dunes along the Cimarron River, represents the northern geographic

limit for the taxon. It has been documented in Alabama, Arizona, Arkansas, Louisiana, Mississippi, New Mexico, Oklahoma, and Texas.

**KANSAS. Morton Co.:** Cimarron National Grassland, along Cimarron River and Turkey Trail ca. 1 air mi E of KS Hwy 27, ca. 8.5 air mi N of Elkhart, 37.1233°N, 101.882°W to 37.1262°N, 101.8825°W, low sand dunes in the river bottom, with scattered cottonwoods, 3,375 ft, 18 Sep, Nelson 72034 (RM).

#### SUMMARY OF TAXA

List by taxon	List by special category	Major group
Families (87)	CO Noxious Weeds (16)	Ferns (11)
Genera (346)	KS Noxious Weeds (3)	Fern Allies (5)
Species (603)	Exotic Taxa (80)	Gymnosperms (5)
Hybrids (6)	CO Endemics (1)	Angiosperms (614)
Infraspecies (26)	KS Endemics (0)	
Unique Taxa (635)	Conserv. Concern (26)	

635 unique taxa, 603 species, 87 families

#### CONCLUSION

This paper presents the results of the first floristic inventory based on vouchered specimens that encompasses the Cimarron National Grassland, the Comanche National Grassland, and adjacent private lands. We report on results of 9,281 numbered collections of vascular plants collected over 567,300 acres. A total of 635 unique taxa representing 87 families were documented. Of these, 80 are exotic taxa of which 16 are designated as noxious weeds by Colorado; 3 by Kansas. We documented 26 species of conservation concern, 2 additions to the flora of Colorado, and 1 addition to the flora of Kansas.

#### ANNOTATED CHECKLIST

The checklist is divided into the major groups of vascular plant (fern allies, ferns, gymnosperms, and angiosperms) each with alphabetical listings by family and species. Nomenclature follows that adopted for the RM Plant Specimen Database (Hartman et al. 2009).

Following is a guide to format and abbreviations associated with individual taxa in the checklist. Collection data are available online at <http://www.rmh.uwyo.edu> (Hartman et al. 2009).

Taxon Authority (**number of collections**); COUNTY; elevational range in feet; vegetation type.

#### County:

Colorado= BA (Baca), LA (Las Animas), OT (Otero)

Kansas= MO (Morton)

#### Vegetation type:

**cgf** Cottonwood gallery forest

**mgp** Midgrass prairie

**rip** Riparian

**rup** Rocky upland prairie

**sgp** Shortgrass prairie

**stp** Stockpond

**jw** Juniper woodland

**pjw** Pinyon juniper woodland

**rd** Roadside

**sbs** Saline bottom shrubland

**ssp** Sandsage prairie

Symbols by category preceding Taxon:

- Taxon of Conservation Concern, Colorado
- Taxon of Conservation Concern, Kansas
- Introduced from outside North America
- × Hybrid
- ! State record

## FERN ALLIES

## Equisetaceae

- ×*Equisetum xferrii* Clute (1) OT; 4240'; rip  
*Equisetum arvense* L. (1) OT; 4160'; rip  
*Equisetum laevigatum* A. Braun (7) BA, LA, MO; 3410–6090'; rip  
*Equisetum variegatum* Schleich. ex F. Weber & D. Mohr var. *variegatum* (4) BA, LA; 4300–5100'; rip

## Selaginellaceae

- Selaginella densa* Rydb. (16) BA, LA, OT; 4250–5140'; jw, mpg, pjw, sgp, ssp

## FERNS

## Asplenaceae

- *Asplenium platyneuron* (L.) Britton, Sterns, & Poggenb. (3) BA, OT; 4300–4930'; mgp, rip  
*Asplenium trichomanes* L. (1) OT; 4930–4930'; rip

## Dryopteridaceae

- Cystopteris fragilis* (L.) Bernh. (2) LA; 5530–5530'; pjw, rip  
 ○ *Woodsia neomexicana* Windham (5) BA, OT; 4260–4930'; jw, mgp, rip  
*Woodsia scopulina* D. C. Eaton (1) BA; 4300–4300'; mgp

## Marsileaceae

- Marsilea vestita* Hook. & Grev. (3) LA, OT; 4760–5740'; rip

## Pteridaceae

- ! *Astrolepis integerrima* (Hook.) D.M. Benham & Windham (1) BA; 4370–4370'; jw  
 ○ *Cheilanthes eatonii* Baker (11) BA, LA, OT; 4250–5140'; jw, mgp, pjw, rip  
*Cheilanthes feei* T. Moore (15) BA, LA, OT; 4150–6440'; jw, mgp, pjw, rup  
 ○ *Pellaea atropurpurea* (L.) Link (7) BA, LA; 4250–5140'; jw, mgp, pjw  
 ○ *Pellaea wrightiana* Hook. (1) BA; 4340–4400'; mgp

## GYMNOSPERMS

## Cupressaceae

- Juniperus monosperma* (Engelm.) Sarg. (96) BA, LA, MO, OT; 3540–6210'; mgp, pjw, rd, rup, sgp  
*Juniperus scopulorum* Sarg. (26) BA, LA, MO; 3410–6440'; mgp, pjw, rd, rup, sgp  
*Juniperus virginiana* L. (11) BA, LA, MO, OT; 3410–5560'; mgp, pjw, rd, sgp

## Pinaceae

- Pinus edulis* Engelm. (19) BA, LA, OT; 4420–6440'; pjw  
*Pinus ponderosa* C. Lawson & P. Lawson (7) BA, LA, OT; 4620–6080'; jw, pjw, sgp

## ANGIOSPERMS

## Adoxaceae

- Sambucus nigra* L. ssp. *cerulea* (Raf.) R. Bolli (7) LA, OT; 4230–6090'; rip, rd, sgp

## Aizoaceae

- Sesuvium verrucosum* Raf. (1) OT; 4150–4150'; stp

## Agavaceae

- Yucca glauca* Nutt. (63) BA, LA, MO, OT; 3290–5980'; jw, mgp, pjw, rd, rup, sgp, ssp

## Alismataceae

- Alisma gramineum* Lej. (1) LA; 5040–5040'; rip  
*Sagittaria brevirostra* Mackenzie & Bush (1) BA; 4250–4250'; rip  
*Sagittaria cuneata* E. Sheld. (1) LA; 5860–5860'; rip

- Sagittaria latifolia* Willd. (1) OT; 4800–4800'; rip

## Alliaceae [traditionally Liliaceae]

- Allium textile* A. Nelson & J.F. Macbr. (8) BA, LA, MO, OT; 3490–6440'; mgp, rup, sgp

## Amaranthaceae [including Chenopodiaceae]

- Amaranthus albus* L. (3) BA, OT; 3970–4400'; rd  
*Amaranthus arenicola* I.M. Johnst. (10) BA, MO; 3300–4490'; rd, sgp, ssp  
*Amaranthus blitoides* S. Watson (22) BA, LA, MO, OT; 3440–6130'; jw, mgp, rd, sgp, ssp  
*Amaranthus palmeri* S. Watson (12) BA, LA, OT; 4300–5860'; mgp, rd, rup, sgp  
*Amaranthus powellii* S. Watson (2) LA, OT; 4940–5940'; rd, sgp  
*Atriplex argentea* Nutt. var. *argentea* (7) OT; 4540–4940'; rup, sgp  
*Atriplex canescens* (Pursh) Nutt. var. *canescens* (36) LA, MO, OT; 3430–6210'; jw, mgp, rup, sbs, sgp

- Chenopodium album* L. (5) BA, LA; 4250–5860'; mgp, sgp

- *Chenopodium berlandieri* Moq. var. *zschackei* (Murr) Murr ex Asch. (7) BA, MO, OT; 3330–4830'; rip, rd, sgp, ssp, stp

- Chenopodium fremontii* S. Watson (9) LA, OT; 4300–6210'; jw, pjw

- *Chenopodium glaucum* L. (1) LA; 6030–6030'; stp

- Chenopodium incanum* (S. Watson) A. Heller var. *incanum* (15) BA, LA, OT; 4050–5900'; jw, mgp, rd, sgp

- Chenopodium pratericola* Rydb. (28) BA, LA, MO, OT; 3310–5360'; cgf, jw, mgp, rd, rup, sgp, ssp

- Chenopodium simplex* (Torr.) Raf. (1) LA; 4500–4500'; rip

- Chenopodium subglabrum* (S. Watson) A. Nelson (16) LA, OT; 4220–6060'; jw, mgp, pjw, rup, ssp

- Cycloloma atriplicifolium* (Spreng.) J.M. Coult. (4) BA, MO; 3330–4460'; rd, ssp

- Froelichia floridana* (Nutt.) Moq. (1) LA; 4970–4970'; pjw

- Froelichia gracilis* (Hook.) Moq. (4) BA, MO; 3380–4490'; rup, sgp, ssp  
 ■ *Kochia scoparia* (L.) Schrad. (13) BA, LA, OT; 4220–6130'; jw, rd, sgp, stp

- Krascheninnikovia lanata* (Pursh) A. Meeuse & A. Smit (13) LA, OT; 4210–6060'; pjw, rup, sgp

- Monolepis nuttalliana* (Schult.) Greene (3) MO, OT; 3660–4800'; mgp, sgp, stp

- *Salsola collina* Pall. (4) OT; 4330–5100'; jw, rd, sgp

- *Salsola tragus* L. (37) BA, LA, MO, OT; 3270–6130'; mgp, pjw, rd, rup, sgp, ssp, stp

- Suckleya suckleyana* (Torr.) Rydb. (2) OT; 4340–4500'; rip, stp

- Tidestromia lanuginosa* (Nutt.) Standl. (1) OT; 4350–4350'; jw

## Anacardiaceae

- Rhus trilobata* Nutt. var. *trilobata* (60) BA, LA, MO, OT; 3410–6090'; jw, mgp, pjw, rup, sgp

- Toxicodendron rydbergii* (Small ex Rydb.) Greene (4) BA; 4150–4440'; jw, mgp, rip

## Apiaceae

- Berula erecta* (Huds.) Coville var. *incisa* (Torr.) Cronquist (4) LA; 4560–5370'; rip

- Cymopterus acaulis* (Pursh) Raf. (15) BA, LA, OT; 4370–5980'; jw, mgp, pjw, rup, sgp

- Cymopterus montanus* Torr. & A. Gray (12) BA, LA, OT; 4400–5980'; jw, mgp, rup, sgp

- Lomatium foeniculaceum* (Nutt.) J.M. Coult. & Rose var. *foeniculaceum* (2) LA; 5990–6050'; pjw

## Apocynaceae [including Asclepiadaceae]

- Apocynum cannabinum* L. (7) MO, OT; 3350–4240'; cgf, rip, ssp  
*Asclepias arenaria* Torr. (7) BA, MO, OT; 3370–4750'; cgf, rup, ssp  
*Asclepias asperula* (Decne.) Woodson var. *asperula* (8) BA, LA, OT; 4290–5370'; jw, pjw, rup

- Asclepias engelmanniana* Woodson (20) BA, LA, MO, OT; 3420–5900'; jw, mgp, rup, sgp, ssp
- *Asclepias involuocrata* Engelm. ex Torr. (3) BA, LA; 5000–5560'; sgp
- Asclepias latifolia* (Torr.) Raf. (45) BA, LA, MO, OT; 3360–6060'; jw, mgp, pjw, rd, rup, sgp, ssp
- *Asclepias macrotis* Torr. (3) LA; 4370–4820'; jw, rup
- *Asclepias oenotheroides* Cham. & Schltld. (1) LA; 5100–5100'; pjw
- Asclepias pumila* (A. Gray) Vail (2) BA, LA; 4760–5600'; pjw, sgp
- Asclepias speciosa* Torr. (5) LA, MO, OT; 3410–6090'; rip
- Asclepias subverticillata* (A. Gray) Vail (19) BA, LA, MO, OT; 3620–6090'; mgp, pjw, rip, sgp, ssp
- Asclepias tuberosa* L. var. *interior* (Woodson) Shinners (1) LA; 6080–6080'; pjw
- Asclepias viridiflora* Raf. (15) BA, MO, OT; 3430–4980'; jw, mgp, pjw, rup, sgp, ssp
- Araceae**
- Lemna minor* L. (4) BA, LA; 4800–5100'; rip
- Lemna turionifera* Landolt (5) BA, LA; 4250–5110'; rip
- Asteraceae**
- Agoseris parviflora* (Nutt.) D. Dietrich (1) MO; 3420–3420'; sgp
- Ambrosia confertiflora* DC. (5) LA, OT; 4220–5770'; jw, rup, sgp
- Ambrosia psilostachya* DC. (26) BA, LA, MO, OT; 3330–5770'; mgp, pjw, rd, sgp, ssp
- *Arctium minus* Bernh. (2) LA; 5450–5960'; jw, rd
- Artemisia biennis* Willd. var. *biennis* (2) OT; 4160–4250'; sgp
- Artemisia bigelovii* A. Gray (16) LA, OT; 4330–4990'; jw, mgp, rup, sgp
- Artemisia campestris* L. var. *caudata* (Michx.) Palmer & Steyerem. (1) OT; 5140–5140'; pjw
- Artemisia carruthii* A.W. Wood ex Carruth (2) BA, LA; 4600–5420'; sgp
- Artemisia dracuncululus* L. (1) OT; 4930–4930'; rd
- Artemisia filifolia* Torr. (6) BA, LA, OT; 4300–4910'; mgp, sgp, ssp
- Artemisia frigida* Willd. (1) LA; 5860–5860'; sgp
- Artemisia ludoviciana* Nutt. var. *albula* (Wootton) Shinners (4) LA, OT; 4220–4930'; jw
- Artemisia ludoviciana* Nutt. var. *ludoviciana* (4) BA, LA, OT; 4300–4930'; jw, mgp
- Artemisia ludoviciana* Nutt. var. *mexicana* (Willd. ex Spreng.) A. Gray (1) OT; 4800–4800'; rup
- Baccharis salicina* Torr. & A. Gray (1) MO; 3470–3470'; rip
- Baccharis wrightii* A. Gray (2) OT; 4860–4930'; pjw, sgp
- *Berlandiera lyrata* Benth. (9) BA, MO; 3430–4860'; jw, mgp, pjw, rup, sgp
- Brickellia brachyphylla* (A. Gray) A. Gray (1) OT; 5100–5100'; jw
- Brickellia californica* (Torr. & A. Gray) A. Gray (5) BA, LA, OT; 4300–4930'; jw, mgp
- Brickellia eupatorioides* (L.) Shinners var. *corymbulosa* (Torr. & A. Gray) Shinners (4) OT; 4590–5100'; rup, sgp
- Chaetopappa ericoides* (Torr.) G.L. Nesom (48) BA, LA, MO, OT; 3420–6030'; jw, mgp, pjw, rd, rup, sgp, ssp
- Cirsium ochrocentrum* A. Gray (23) BA, LA, MO; 3350–5960'; mgp, rd, rup, sgp, ssp
- Cirsium undulatum* (Nutt.) Spreng. (30) BA, LA, MO, OT; 3640–5900'; mgp, pjw, rd, rup, sgp, ssp
- *Cirsium vulgare* (Savi) Ten. (1) BA; 4250–4250'; rd
- Conyza canadensis* (L.) Cronquist (25) BA, LA, OT; 4050–6060'; jw, mgp, pjw, rd, rup, sgp, ssp, stp
- Cyclachaena xanthifolia* (Nutt.) Fresen. (4) BA, LA, OT; 4300–5860'; mgp, rd, sgp, stp
- Diaperia prolifera* (Nutt. ex DC.) Nutt. (7) BA, OT; 4080–4770'; mgp, pjw, sgp, ssp
- Dyssodia papposa* (Vent.) Hitchc. (10) LA, MO, OT; 3430–6210'; jw, rd, rup, sgp
- Echinacea angustifolia* DC. (2) BA; 4820–4980'; jw, mgp
- Engelmannia pinnatifida* A. Gray ex Nutt. (54) BA, LA, MO; 3200–5430'; jw, mgp, rd, rup, sgp, ssp
- Ericameria nauseosa* (Pall. ex Pursh) G.L. Nesom & G. I. Baird var. *graveolens* (Nutt.) Reveal & Schuyler (1) BA; 4750–4750'; rip
- Ericameria nauseosa* (Pall. ex Pursh) G.L. Nesom & G. I. Baird var. *nauseosa* (6) BA, LA, OT; 4340–5770'; jw, rip, rd, sbs, sgp
- Ericameria nauseosa* (Pall. ex Pursh) G.L. Nesom & G. I. Baird var. *oreophila* (A. Nelson) G.L. Nesom & G. I. Baird (4) BA, LA; 4410–5860'; rip, rd, sbs, sgp
- Erigeron bellidiastrum* Nutt. var. *bellidiastrum* (21) BA, MO, OT; 3290–4910'; cgf, mgp, rup, sgp, ssp
- Erigeron bellidiastrum* Nutt. var. *robustus* Cronquist (10) BA, LA, MO; 3360–4780'; cgf, jw, sgp, ssp
- Erigeron concinnus* (Hook. & Arn.) Torr. & A. Gray var. *subglaber* (Cronquist) G.L. Nesom (1) LA; 5560–5560'; sgp
- Erigeron divergens* Torr. & A. Gray (37) BA, LA, MO, OT; 3530–6130'; mgp, pjw, rd, rup, sgp
- Erigeron pumilus* Nutt. var. *pumilus* (Cronquist) Cronquist (3) LA; 5110–5230'; pjw, sgp
- Gaillardia aristata* Pursh (1); BA, 4166'; sgp
- Gaillardia pinnatifida* Torr. (26) BA, LA, MO, OT; 3660–5980'; mgp, pjw, rd, rup, sgp
- Gaillardia pulchella* Foug. (24) BA, MO; 3290–4610'; jw, mgp, rup, sgp, ssp
- Grindelia inornata* Greene var. *inornata* (19) BA, LA, OT; 3200–5680'; mgp, pjw, rd, sgp, ssp
- Grindelia squarrosa* (Pursh) Dunal (18) BA, LA, OT; 4240–5940'; jw, mgp, rd, rup, sgp, stp
- Gutierrezia sarothrae* (Pursh) Britton & Rusby (31) BA, LA, OT; 4220–6210'; jw, mgp, rd, rup, sgp
- Helianthus annuus* L. (60) BA, LA, MO, OT; 3270–6210'; cgf, jw, pjw, rd, rup, sgp, ssp, stp
- Helianthus ciliaris* DC. (1) MO; 3580–3580'; sgp
- Helianthus petiolaris* Nutt. var. *petiolaris* (36) BA, LA, OT; 3350–5680'; cgf, mgp, pjw, rd, rup, sgp, ssp, stp
- × *Helianthus petiolaris* Nutt. × *Helianthus annuus* L. (4) MO, OT; 3660–4820'; rd, rup, sgp
- Heliomeris multiflora* Nutt. var. *nevadensis* (A. Nelson) W.F. Yates (1) LA; 6060–6060'; pjw
- Heterotheca horrida* (Rydb.) V.L. Harms (24) BA, LA, OT; 3970–6060'; mgp, pjw, rup, sgp, ssp
- Heterotheca subaxillaris* (Lam.) Britton & Rusby (2) BA; 4300–4300'; mgp
- Heterotheca villosa* (Pursh) Shinners var. *villosa* (19) BA, LA, OT; 4230–5140'; jw, mgp, pjw, rup, sgp, ssp
- Hymenopappus filifolius* Hook. var. *cinereus* (Rydb.) I.M. Johnston (8) OT; 4370–4800'; mgp, rup, sgp
- Hymenopappus filifolius* Hook. var. *polycephalus* (Osterh.) B.L. Turner (3) BA, OT; 4400–4760'; rup, sgp
- Hymenopappus flavescens* A. Gray var. *flavescens* (35) BA, LA, MO; 3290–5180'; cgf, mgp, rd, rup, sgp, ssp
- Hymenopappus tenuifolius* Pursh (37) BA, LA, MO, OT; 3200–5980'; jw, mgp, pjw, rup, sgp, ssp
- Hymenoxys odorata* DC. (6) OT; 4290–4780'; mgp, pjw, rup, sgp
- Iva axillaris* Pursh (9) LA, OT; 4300–6030'; rip, rd, rup, sgp, stp
- *Lactuca serriola* L. (19) BA, LA, OT; 4220–6210'; jw, mgp, rip, rd, rup, sgp
- Liatis punctata* Hook. (21) BA, LA, OT; 4220–6210'; jw, mgp, rup, sgp
- Lygodesmia juncea* (Pursh) D. Don ex Hook. (40) BA, LA, MO, OT; 3290–5600'; jw, mgp, rd, rup, sgp, ssp
- Machaeranthera tanacetifolia* (Kunth) Nees (26) BA, LA, OT; 3200–5190'; mgp, rup, sgp, ssp
- Melampodium leucanthum* Torr. & A. Gray (76) BA, LA, MO, OT; 3290–5560'; jw, mgp, pjw, rup, sgp, ssp

- Mulgedium pulchellum* (Pursh) G. Don (2) OT; 4160–4210'; rd, rip  
*Nothocalais cuspidata* (Pursh) Greene (4) LA, OT; 4560–5230'; jw, rd, rup, sgp  
*Oönonopsis foliosa* (A. Gray) Greene var. *foliosa* (43) LA, OT; 4200–6130'; jw, mgp, rd, rup, sgp  
*Packera plattensis* (Nutt.) W.A. Weber & Á. Löve (1) BA; 4720–4720'; sgp  
*Packera tridenticulata* (Rydb.) W.A. Weber & Á. Löve (27) BA, LA, OT; 4170–5980'; mgp, pjw, rup, sgp  
*Palafoxia rosea* (Bush) Cory (17) BA, LA, OT; 4220–4940'; pjw, rd, rup, sgp, ssp  
*Palafoxia sphacelata* (Nutt ex Torr.) Cory (8) BA, LA, MO, OT; 3380–4820'; cgf, jw, mgp, rup, sgp, ssp  
*Pectis angustifolia* Torr. (2) BA, OT; 4240–4360'; jw, sgp  
*Pericome caudata* A. Gray (1) BA; 4300–4300'; mgp  
 ● *Picradeniopsis oppositifolia* (Nutt.) Rydb. ex Britton (38) BA, LA, MO, OT; 3360–6030'; jw, rd, rup, sgp, ssp  
*Picradeniopsis woodhousei* (A. Gray) Rydb. (5) BA; 3870–4830'; sgp, ssp  
*Pseudognaphalium canescens* (DC.) Anderb. (2) BA, LA; 4300–5120'; mgp  
*Ratibida columnifera* (Nutt.) Wootton & Standl. (78) BA, LA, MO, OT; 3200–6080'; cgf, jw, mgp, pjw, rd, rup, sgp, ssp  
*Ratibida tagetes* (E. James) Barnhart (83) BA, LA, MO, OT; 3360–6130'; jw, mgp, pjw, rd, rup, sgp, ssp  
 ■ *Scorzonera laciniata* L. (11) BA, LA, OT; 4250–5720'; pjw, rd, rup, sgp  
*Senecio flaccidus* Less. var. *douglasii* (DC.) B.L. Turner & T.M. Barkley (24) BA, LA, MO, OT; 3580–6060'; jw, mgp, pjw, rup, sgp  
*Senecio spartioides* Torr. & A. Gray (7) BA, LA, OT; 4300–5770'; jw, mgp, rd, sgp  
*Solidago gigantea* Aiton (2) BA, MO; 3550–4300'; mgp  
*Solidago missouriensis* Nutt. (1) BA; 4300–4300'; mgp  
*Solidago mollis* Bartl. (4) LA, OT; 4310–6060'; pjw, ssp  
*Solidago nana* Nutt. (1) BA; 4760–4760'; rup  
*Solidago nemoralis* Aiton var. *longipetiolata* (Mack. & Bush) E.J. Palmer & Steyerem. (1) OT; 4930–4930'; sgp  
*Solidago wrightii* A. Gray (6) BA, LA, OT; 4300–5100'; jw, mgp, rup, sgp  
 ■ *Sonchus arvensis* L. (4) LA, OT; 4220–5370'; rd, rip  
 ■ *Sonchus asper* (L.) Hill (3) BA, LA, OT; 4250–4480'; rd  
*Stephanomeria pauciflora* (Torr.) A. Nelson (44) BA, LA, MO, OT; 3360–6030'; mgp, pjw, rd, rup, sgp, ssp  
*Symphytichum ericoides* (L.) G.L. Nesom var. *pansum* (S.F. Blake) G.L. Nesom (1) LA; 4410–4410'; rd  
*Symphytichum falcatum* (Lindl.) G.L. Nesom var. *commutatum* (Torr. & A. Gray) G.L. Nesom (11) BA, LA, OT; 4300–5770'; jw, rd, sgp  
 ■ *Taraxacum officinale* Weber ex F.H. Wigg. (10) BA, LA, MO, OT; 3410–5960'; cgf, pjw, rd, sgp  
*Tetranneuris acaulis* (Pursh) Greene var. *acaulis* (51) BA, LA, MO, OT; 3430–6050'; jw, mgp, pjw, rup, sgp  
*Tetranneuris scaposa* (DC.) Greene var. *scaposa* (5) BA, MO; 3480–4770'; pjw, rup, ssp  
*Thelesperma filifolium* (Hook.) A. Gray (15) BA, MO; 3290–4610'; jw, mgp, rd, rup, sgp, ssp  
*Thelesperma megapotamicum* (Spreng.) Kuntze (79) BA, LA, MO, OT; 3200–5700'; cgf, jw, mgp, pjw, rd, rup, sgp, ssp  
*Thelesperma subnudum* A. Gray (9) OT; 4390–5160'; rup, sgp  
*Thymophylla aurea* (A. Gray) Greene ex Britton var. *aurea* (5) OT; 4300–4620'; rd, rup, sgp  
*Townsendia excapa* (Richardson) Porter (4) LA, OT; 4640–6050'; pjw, rup  
 ■ *Tragopogon dubius* Scop. (78) BA, LA, MO, OT; 3380–6030'; cgf, mgp, pjw, rd, rup, sgp, ssp, stp  
*Verbesina encelioides* (Cav.) Benth. & Hook. f. ex A. Gray (11) BA, LA, OT; 4410–5860'; pjw, rd, rup, sgp  
 ● *Vernonia marginata* (Torr.) Raf. (1) MO; 3290–3290'; ssp  
*Xanthisma spinulosum* (Pursh) D.R. Morgan & R.L. Hartm. var. *glaberrimum* (Rydb.) D.R. Morgan & R.L. Hartm. (18) BA, LA, MO, OT; 3310–6060'; cgf, jw, mgp, pjw, rup, sgp, ssp  
*Xanthisma spinulosum* (Pursh) D.R. Morgan & R.L. Hartm. var. *paradoxum* (B.L. Turner & R.L. Hartm.) D.R. Morgan & R.L. Hartm. (13) BA, LA, MO, OT; 3370–4940'; jw, rup, sgp, ssp  
*Xanthisma spinulosum* (Pursh) D.R. Morgan & R.L. Hartm. var. *spinulosum* (131) BA, LA, MO, OT; 3200–5940'; jw, mgp, pjw, rd, rup, sgp, ssp, stp  
 ■ *Xanthium spinosum* L. (1) LA; 5960–5960'; sgp, stp  
*Xanthium strumarium* L. (14) BA, LA, OT; 4300–6210'; rd, stp  
*Zinnia grandiflora* Nutt. (75) BA, LA, MO, OT; 3410–6130'; mgp, pjw, rup, sgp, ssp, stp
- Boraginaceae**  
*Cryptantha cinerea* (Greene) Cronquist var. *cinerea* (3) BA, OT; 4250–4800'; mgp, sgp  
*Cryptantha cinerea* (Greene) Cronquist var. *jamesii* Cronquist (31) BA, LA, MO, OT; 3450–5560'; jw, mgp, pjw, rup, sgp, ssp  
*Cryptantha crassisejala* (Torr. & A. Gray) Greene (1) MO; 3380–3380'; ssp  
*Cryptantha minima* Rydb. (40) BA, LA, MO, OT; 3370–5720'; cgf, jw, mgp, pjw, rup, sgp, ssp  
*Cryptantha thyriflora* (Greene) Payson (27) BA, LA, OT; 4370–5370'; jw, mgp, pjw, rup, sgp  
*Cynoglossum officinale* L. (2) LA; 5960–6090'; pjw, rd  
*Heliotropium convolvulaceum* (Nutt.) A. Gray var. *convolvulaceum* (4) BA, MO; 3370–4460'; cgf, sgp, ssp  
*Lappula occidentalis* (S. Watson) Greene var. *cupulata* (A. Gray) L. C. Higgins (10) BA, LA, MO, OT; 3420–5980'; rd, rup, sgp, stp  
*Lappula occidentalis* (S. Watson) Greene var. *occidentalis* (23) BA, LA, MO, OT; 3390–5980'; cgf, mgp, pjw, rd, rup, sgp  
*Lithospermum incisum* Lehm. (63) BA, LA, MO, OT; 3290–6050'; mgp, pjw, rup, sgp, ssp  
*Mertensia brevistyla* S. Watson (1) LA; 5990–6050'; pjw  
*Mertensia lanceolata* (Pursh) A. DC. (1) LA; 6060–6440'; pjw  
*Onosmodium molle* Michx. var. *occidentale* (Mack.) I.M. Johnst. (5) BA, LA, OT; 4300–5360'; mgp, sgp
- Brassicaceae** [including Capparaceae]  
*Alyssum simplex* Rudolphi (1) OT; 4570–4570'; sgp  
*Boechnera fendleri* (S. Watson) W.A. Weber (1) LA; 5140–5140'; pjw  
 ■ *Camelina microcarpa* Andrzej. ex DC. (17) BA, LA, OT; 4290–5740'; mgp, pjw, rd, rup, sgp, stp  
 ■ *Capsella bursa-pastoris* (L.) Medik. (1) LA; 5110–5110'; rip, rd, stp  
 ■ *Chorisporea tenella* (Pall.) DC. (14) LA, MO, OT; 3420–5740'; jw, rd, rup, sgp, ssp, stp  
*Cleome serrulata* Pursh (4) LA, OT; 4350–5370'; jw  
 ■ *Conringia orientalis* (L.) Dumort. (1) OT; 4800–4800'; sgp  
*Descurainia pinnata* (Walter) Britton var. *osmiarum* (Cockerell) Shinners (15) BA, LA, MO, OT; 3380–6050'; mgp, pjw, rd, sgp, ssp, stp  
 ■ *Descurainia sophia* (L.) Webb ex Prantl (42) BA, LA, MO, OT; 3370–6030'; cgf, mgp, pjw, rd, rup, sgp, ssp, stp  
*Draba reptans* (Lam.) Fernald (3) LA, OT; 4290–5560'; jw, pjw, sgp  
*Erysimum asperum* (Nutt.) DC. (55) BA, LA, MO, OT; 3200–6030'; jw, mgp, rd, rup, sgp, ssp  
 ■ *Erysimum repandum* L. (1) OT; 4500–4500'; rd  
*Lepidium densiflorum* Schrad. var. *densiflorum* (35) BA, LA, MO, OT; 3380–6050'; cgf, jw, mgp, pjw, rd, rup, sgp, ssp  
*Lepidium densiflorum* Schrad. var. *macrocarpum* G. A. Mulligan (3) BA, MO; 3430–4780'; rup, ssp

*Physaria fendleri* (A. Gray) O'Kane & Al-Shehbaz (33) LA, OT; 4240–4990'; mgp, pjw, rup, sgp  
*Physaria montana* (A. Gray) Greene (1) LA; 5990–6050'; pjw  
*Physaria ovalifolia* (Rydb. ex Britton) O'Kane & Al-Shehbaz ssp. *ovalifolia* (6) BA, MO; 3480–4800'; mgp, rup, sgp, ssp  
*Polanisia dodecandra* (L.) DC. var. *trachysperma* (Torr. & A. Gray) H. H. Iltis (27) BA, LA, MO, OT; 3290–5430'; jw, mgp, rd, rup, sgp, ssp  
*Rorippa sinuata* (Nutt.) Hitchc. (5) BA, LA, OT; 4500–6130'; rd, sgp, stp  
 ■ *Sisymbrium altissimum* L. (10) BA, LA, MO; 3370–4880'; cgf, rip, rd, rup, sgp, ssp, stp  
*Stanleya pinnata* (Pursh) Britton var. *pinnata* (12) LA, OT; 4300–5370'; rup, sgp  
*Thelypodium wrightii* A. Gray ssp. *oklahomensis* Al-Shehbaz (2) BA, LA; 4260–4510'; jw, mgp

#### Cactaceae

*Coryphantha vivipara* (Nutt.) Britton & Rose (8) BA, LA, MO, OT; 3660–5100'; jw, pjw, rd, rup, sgp  
*Cylindropuntia imbricata* (Haw.) F.M. Knuth var. *imbricata* (40) BA, LA, OT; 4230–5980'; jw, mgp, rup, sgp  
*Echinocereus reichenbachii* (Walp.) Haage ex Britton & Rose (17) BA, LA, OT; 4350–4950'; jw, mgp, rup, sgp  
*Echinocereus viridiflorus* Engelm. (18) BA, LA, OT; 4290–6050'; jw, pjw, sgp, ssp  
*Opuntia fragilis* (Nutt.) Haw. (6) LA, MO, OT; 3490–6080'; pjw, rd, sbs, sgp  
*Opuntia phaeacantha* Engelm. (25) BA, LA, MO, OT; 3360–4980'; cgf, jw, rup, sgp, ssp  
*Opuntia polyacantha* Haw. var. *polyacantha* (39) BA, LA, MO, OT; 3350–6030'; jw, mgp, pjw, rd, rup, sgp  
*Opuntia tortispina* Engelm. & J.M. Bigelow (11) BA, LA, MO, OT; 3410–5360'; cgf, jw, mgp, sgp, ssp

#### Campanulaceae

○ *Lobelia cardinalis* L. (1) BA; 4300–4300'; rip  
*Triodanis perfoliata* (L.) Nieuwl. (4) BA, MO; 3360–4440'; cgf, rip

#### Cannabaceae

*Celtis occidentalis* L. (8) BA, LA, MO, OT; 3360–5450'; cgf, mgp, pjw, rup, sgp  
*Celtis reticulata* Torr. (16) BA, LA, MO, OT; 3310–5140'; cgf, jw, mgp, pjw, rup, sgp

#### Caprifoliaceae

■ *Kolkwitzia amabilis* Graebn. (1) BA; 4620–4620'; sgp  
*Lonicera tatarica* L. (1) BA; 4350'; rd  
*Symphoricarpos occidentalis* Hook. (2) LA; 4440–5900'; rip  
*Symphoricarpos oreophilus* A. Gray var. *oreophilus* (1) LA; 6060–6440'; pjw

#### Caryophyllaceae

*Eremogone hookeri* (Nutt.) W.A. Weber var. *hookeri* (15) LA, OT; 4350–5150'; mgp, pjw, rup, sgp  
*Eremogone hookeri* (Nutt.) W.A. Weber var. *pinetorum* (A. Nelson) Dorn (3) OT; 4290–4760'; pjw, rup  
*Paronychia jamesii* Torr. & A. Gray (18) BA, LA, MO, OT; 3410–5560'; jw, mgp, pjw, rup, sgp, ssp  
*Paronychia sessiliflora* Nutt. (17) LA, OT; 4240–6210'; jw, rup, sgp  
*Silene antirrhina* L. (4) BA, LA, OT; 4250–4610'; jw, pjw, rip

#### Celastraceae

■ *Euonymus bungeanus* Maxim. (1) BA; 4620–4620'; sgp

#### Commelinaceae

*Commelina erecta* L. (5) BA, LA, MO; 3330–5120'; mgp, pjw, rip, ssp  
*Tradescantia occidentalis* (Britton) Smyth var. *occidentalis* (27) BA, LA, MO, OT; 3310–5560'; cgf, jw, mgp, rip, sgp, ssp

#### Convolvulaceae

■ *Convolvulus arvensis* L. (81) BA, LA, MO, OT; 3360–6030'; jw, mgp, rip, rd, rup, sgp, ssp, stp  
*Convolvulus equitans* Benth. (23) BA, LA, MO, OT; 3490–5940'; jw, mgp, rd, rup, sgp  
 ■ *Cuscuta approximata* Bab. (1) OT; 4480–4480'; sgp  
*Cuscuta cuspidata* Engelm. (1) BA; 4910–4910'; mgp  
*Cuscuta pentagona* Engelm. (1) BA; 4140–4140'; rup  
 ● *Cuscuta umbellata* Kunth (5) LA; 3250–4570'; jw, rip, rd  
*Evolvulus nuttallianus* Schult. (71) BA, LA, MO, OT; 3310–5980'; cgf, jw, mgp, pjw, rup, sgp, ssp  
*Ipomoea leptophylla* Torr. (45) BA, LA, MO, OT; 3270–6060'; cgf, mgp, pjw, rd, rup, sgp, ssp

#### Cucurbitaceae

*Cucurbita foetidissima* Kunth (110) BA, LA, MO, OT; 3270–5960'; cgf, jw, mgp, pjw, rd, rup, sgp, ssp  
*Cyclanthera dissecta* (Torr. & A. Gray) Arn. (1) LA; 4870–4870'; rip

#### Cyperaceae

*Bolboschoenus maritimus* (L.) Palla ssp. *paludosus* (A. Nelson) T. Koyama (6) BA, LA, MO, OT; 3420–5040'; rip, stp  
*Carex aquatilis* Wahlenb. var. *aquatilis* (1) LA; 5030–5030'; rip  
*Carex brevior* (Dewey) Mack. ex Lunell (7) BA, LA; 4250–6090'; pjw, rip  
*Carex gravida* L. H. Bailey (16) BA, LA; 4250–5530'; jw, mgp, pjw, rip, rup, sgp, stp  
*Carex hystericina* Muhl. ex Willd. (5) BA, LA, OT; 4340–5530'; rip  
*Carex inops* L. H. Bailey ssp. *heliophila* (1) LA; 5990–6050'; pjw  
*Carex lanuginosa* Michx. (1) BA; 4250–4250'; rip  
*Carex praegracilis* W. Boott (2) LA, OT; 4570–5030'; rip  
*Carex vulpinoidea* Michx. (1) BA; 4250–4250'; rip  
*Cyperus bipartitus* Torr. (2) BA; 4300–4760'; mgp, pjw  
*Cyperus lupulinus* (Spreng) Marcks var. *lupulinus* (1) BA; 4255'; rip  
 ! *Cyperus retroflexus* Buckley (1) MO; 3380–3380'; cgf  
*Cyperus schweinitzii* Torr. (10) BA, MO; 3370–4820'; cgf, mgp, rip, rup, sgp, ssp, stp  
*Cyperus squarrosus* L. (1) BA; 4300–4300'; mgp  
*Eleocharis macrostachya* Britton (14) BA, LA, MO, OT; 3490–5470'; rip, stp  
*Eleocharis palustris* (L.) Roem. & Schult. (11) BA, LA, MO, OT; 3370–5740'; rip, stp  
 ● *Eleocharis rostellata* (Torr.) Torr. (2) MO; 3410–3420'; cgf, rip  
*Schoenoplectus pungens* (Vahl) Palla var. *pungens* (26) BA, LA, MO, OT; 3310–5110'; cgf, rip, stp  
*Schoenoplectus tabernaemontani* (C. C. Gmel.) Palla (15) BA, LA, MO, OT; 3340–6090'; rip, stp  
*Scirpus pallidus* (Britton) Fernald (6) BA, LA, OT; 4250–5530'; rip, stp

#### Dipsacaceae

■ *Dipsacus fullonum* L. (1) OT; 4160–4160'; rip

#### Elaeagnaceae

■ *Elaeagnus angustifolia* L. (7) BA, LA, MO, OT; 3550–5470'; rip, rd, rup, sgp

#### Elatinaceae

*Bergia texana* (Hook.) Seub. ex Walp. (1) OT; 6130–6130'; stp

#### Euphorbiaceae

○ *Argythamnia humilis* (Engelm. & A. Gray) Müll. Arg. var. *humilis* (2) OT; 4570–4650'; rd, sgp  
*Argythamnia mercurialina* (Nutt.) Müll. Arg. (3) BA, MO; 3430–4300'; mgp, rip, rup  
*Chamaesyce fendleri* (Torr. & A. Gray) Small (69) BA, LA, MO, OT; 3410–6130'; mgp, pjw, rd, rup, sgp, ssp  
*Chamaesyce glyptosperma* (Engelm.) Small (31) BA, LA, MO, OT; 3290–5940'; cgf, jw, rd, rup, sgp, ssp

*Chamaesyce lata* (Engelm.) Small (33) BA, LA, MO, OT; 3410–4990'; jw, mgp, pjw, rd, rup, sgp, ssp  
*Chamaesyce missurica* (Raf.) Shinners (15) BA, LA, MO; 3370–5170'; cgf, jw, mgp, sgp, ssp  
*Chamaesyce revoluta* (Engelm.) Small (5) OT; 4300–5040'; jw  
 ■ *Chamaesyce serpyllifolia* (Pers.) Small (10) LA, OT; 4440–5770'; rd, rup, sgp  
*Chamaesyce stictospora* (Engelm.) Small (14) BA, LA, OT; 3200–5860'; jw, rd, rup, sgp  
*Croton texensis* (Klotzsch) Müll. Arg. (98) BA, LA, MO, OT; 3290–5450'; cgf, mgp, pjw, rd, rup, sgp, ssp, stp  
*Euphorbia dentata* Michx. (26) BA, LA, MO, OT; 3360–5860'; cgf, jw, mgp, rd, rup, sgp, ssp  
*Euphorbia marginata* Pursh (36) BA, LA, MO, OT; 3490–6130'; pjw, rd, rup, sgp, ssp, stp  
*Euphorbia spathulata* Lam. (5) LA, OT; 4350–4980'; pjw, rup, sgp  
*Stillingia sylvatica* Garden ex L. (1) MO; 3370–3370'; ssp  
*Tragia ramosa* Torr. (31) BA, LA, OT; 4140–5770'; jw, mgp, pjw, rup, sgp, ssp

### Fabaceae

*Amorpha canescens* Pursh (4) BA, LA; 4300–5150'; jw, mgp, rip  
*Amorpha fruticosa* L. (5) LA, OT; 4160–4610'; pjw, rip  
*Astragalus bisulcatus* (Hook.) A. Gray var. *bisulcatus* (5) LA, OT; 4390–6090'; pjw, rd, rup, sgp  
*Astragalus ceramicus* E. Sheld. var. *filifolius* (A. Gray) F.J. Herm. (1) BA; 4250–4260'; cgf  
*Astragalus crassicaarpus* Nutt. var. *crassicaarpus* (1) LA; 5600–5600'; sgp  
*Astragalus crassicaarpus* Nutt. var. *paysonii* (E. H. Kelso) Barneby (5) BA; 4080–4880'; mgp, sgp  
*Astragalus drummondii* Douglas ex Hook. (1) LA; 6440–6440'; sgp  
*Astragalus gracilis* Nutt. (23) BA, LA, OT; 4080–6050'; mgp, pjw, rup, sgp  
*Astragalus lentiginosus* Douglas ex Hook. var. *diphysus* (A. Gray) M.E. Jones (3) LA; 4350–4610'; jw, pjw  
*Astragalus lotiflorus* Hook. (13) BA, MO, OT; 3420–4800'; mgp, sgp, ssp  
*Astragalus missouriensis* Nutt. var. *amphibolus* Barneby (8) BA, LA, OT; 4370–5560'; mgp, rup, sgp  
*Astragalus missouriensis* Nutt. var. *missouriensis* (35) BA, LA, MO, OT; 3480–5980'; jw, mgp, pjw, rup, sgp, ssp  
*Astragalus mollissimus* Torr. var. *mollissimus* (13) BA, LA; 4050–5360'; jw, mgp, pjw, rup, sgp  
*Astragalus nuttallianus* DC. var. *austrinus* (Small) Barneby (2) LA, OT; 4290–4610'; pjw  
*Astragalus pectinatus* (Hook.) Douglas ex G. Don (1) OT; 4310–4310'; ssp  
*Astragalus racemosus* Pursh var. *longisetus* M.E. Jones (4) LA, OT; 4550–5740'; rup, sgp  
*Astragalus racemosus* Pursh var. *racemosus* (3) LA, OT; 4860–5370'; mgp, rup  
*Astragalus shortianus* Nutt. (1) OT; 4520–4520'; rup  
 ■ *Caragana arborescens* Lam. (1) BA; 4620–4620'; sgp  
*Dalea aurea* Nutt. ex Pursh (12) BA, LA, MO; 3350–6060'; jw, mgp, pjw, rup, sgp, ssp  
*Dalea candida* Michx. var. *oligophylla* (Torr.) Shinners (36) BA, LA, MO, OT; 3430–6060'; mgp, pjw, rup, sgp, ssp  
 ● *Dalea cylindriceps* Barneby (4) BA, MO; 3370–4390'; cgf, ssp  
*Dalea enneandra* Nutt. (15) BA, LA, MO; 3290–4770'; jw, mgp, pjw, rup, sgp, ssp  
*Dalea formosa* Torr. (1) BA; 4250–4440'; jw  
 ● *Dalea jamesii* (Torr.) Torr. & A. Gray (26) BA, LA, MO, OT; 3370–5560'; jw, mgp, pjw, rup, sgp, ssp  
*Dalea lanata* Spreng. var. *lanata* (1) MO; 3370–3370'; ssp  
*Dalea nana* Torr. ex A. Gray var. *nana* (2) BA, MO; 3310–4240'; cgf, sgp

*Dalea purpurea* Vent. var. *arenicola* (Wemple) Barneby (36) BA, LA, OT; 4150–4950'; jw, mgp, pjw, rup, sgp, ssp  
*Dalea purpurea* Vent. var. *purpurea* (4) OT; 4290–4980'; pjw, rup  
*Dalea tenuifolia* (A. Gray) Shinners (7) BA, MO; 3430–4980'; pjw, rup, sgp  
*Desmanthus cooleyi* (Eaton) Trel. (5) BA; 3870–4590'; sgp, ssp  
*Desmanthus illinoensis* (Michx.) MacMill. ex B.L. Rob. & Fernald (4) MO, OT; 3350–4210'; rip, sgp, ssp  
*Gleditsia triacanthos* L. (9) BA, LA, MO, OT; 3410–5470'; cgf, jw, rip, rd, sgp  
*Glycyrrhiza lepidota* Pursh (18) BA, LA, MO, OT; 3350–6090'; cgf, rip, ssp  
*Hedysarum boreale* Nutt. var. *boreale* (6) LA, OT; 4380–4510'; jw, rup, sgp  
*Hoffmannseggia drepanocarpa* A. Gray (13) BA, OT; 4280–4940'; mgp, pjw, rup, sgp  
*Hoffmannseggia glauca* (Ortega) Eifert (5) MO, OT; 3420–4780'; jw  
*Lathyrus eucosmus* Butters & H. St. John (3) OT; 4500–4930'; rup  
*Lathyrus polymorphus* Nutt. var. *incanus* (J. G. Sm. & Rydb. ex Rydb.) Dorn (2) BA, OT; 4780–4800'; mgp, ssp  
*Lupinus plattensis* S. Watson (2) BA; 4240–4800'; mgp, ssp  
*Lupinus pusillus* Pursh var. *pusillus* (5) BA, OT; 4230–4400'; mgp, pjw, rup  
 ■ *Medicago lupulina* L. (2) BA; 4760–4800'; pjw, rup  
 ■ *Medicago sativa* L. (7) BA, OT; 4210–4930'; rip, rd, rup, sgp  
 ■ *Melilotus albus* Medik. (40) BA, LA, MO, OT; 3370–5860'; cgf, pjw, rip, rd, sgp, ssp  
 ■ *Melilotus officinalis* (L.) Pall. (61) BA, LA, MO, OT; 3360–6090'; cgf, mgp, pjw, rd, rup, sgp, ssp  
*Mimosa borealis* A. Gray (5) BA, LA; 4300–5150'; mgp, pjw  
*Mimosa quadrivalvis* L. var. *angustata* (Torr. & A. Gray) Barneby (3) MO; 3310–3410'; cgf, ssp  
*Oxytropis lambertii* Pursh var. *bigelovii* A. Gray (1) MO; 3480–3480'; ssp  
*Pediomelum cuspidatum* (Pursh) Rydb. (1) MO; 3430–3540'; rup  
*Pediomelum hypogaeum* (Nutt. ex Torr. & A. Gray) Rydb. var. *hypogaeum* (2) BA, OT; 4310–4860'; jw, sgp  
*Pomaria jamesii* (Torr. & A. Gray) Walp. (29) BA, LA, MO, OT; 3410–4990'; jw, mgp, pjw, rup, sgp, ssp  
*Psoralidium lanceolatum* (Pursh) Rydb. (8) BA, MO; 3370–4910'; cgf, mgp, rup, sgp  
*Psoralidium tenuiflorum* (Pursh) Rydb. (123) BA, LA, MO, OT; 3200–6210'; jw, mgp, pjw, rd, rup, sgp, ssp  
*Robinia pseudoacacia* L. (1) BA; 4270–4270'; rd  
*Sophora nuttalliana* B.L. Turner (39) BA, LA, MO, OT; 3430–6080'; jw, mgp, pjw, rd, rup, sgp  
*Strophostyles leiosperma* (Torr. & A. Gray) Piper (1) MO; 3370–3370'; rip  
*Vicia americana* Muhl. ex Willd. var. *minor* Hook. (12) LA, OT; 4310–6440'; jw, mgp, rd, rup, sgp, ssp  
*Vicia ludoviciana* Nutt. var. *ludoviciana* (5) LA, OT; 4350–5360'; mgp, rup, sgp

### Fagaceae

× *Quercus xundulata* Torr. (9) BA, LA; 4730–6090'; jw, pjw  
*Quercus gambelii* Nutt. (3) BA, LA; 4860–6080'; pjw

### Frankeniaceae

*Frankenia jamesii* Torr ex A. Gray (4) OT; 4390–4990'; rup, sgp

### Gentianaceae

*Eustoma grandiflorum* (Raf.) Shinners (1) MO; 3370–3370'; rip  
 ○ *Frasera coloradensis* (C.M. Rogers) D.M. Post (1) BA; 4980–4980'; jw

### Geraniaceae

■ *Erodium cicutarium* (L.) L'Hér. ex Aiton (9) LA, MO, OT; 3470–5740'; cgf, rd, rup, sgp, stp

**Grossulariaceae**

*Ribes aureum* Pursh var. *aureum* (13) BA, LA, OT; 41500–6090'; jw, mgp, pjw, rup

*Ribes cereum* Douglas (12) BA, LA, OT; 4320–6080'; mgp, pjw, rup, sgp

*Ribes leptanthum* A. Gray (7) BA, LA; 4230–6440'; jw, mgp, pjw

**Haloragaceae**

*Myriophyllum sibiricum* Kom. (1) LA; 4870–4870'; rip

**Hydrangeaceae**

*Philadelphus microphyllus* A. Gray (1) OT; 4930–4930'; rip

**Hydrophyllaceae**

*Ellisia nyctelea* (L.) L. (1) LA; 5740–5740'; sgp

**Juglandaceae**

*Juglans nigra* L. (2) BA; 4340–4620'; mgp, sgp

**Juncaceae**

*Juncus arcticus* Willd. var. *balticus* (Willd.) Trautv. (2) MO, OT; 3550–4300'; rip

*Juncus dudleyi* Wiegand (9) BA, LA, OT; 4230–6090'; rip, stp

*Juncus interior* Wiegand (3) BA, OT; 4340–4930'; rip

*Juncus longistylis* Torr. (1) LA; 6080–6080'; rip

*Juncus nodosus* L. (1) BA; 4250–4250'; rip

*Juncus torreyi* Coville (10) BA, LA, MO, OT; 3380–5370'; rip

**Lamiaceae**

*Hedeoma drummondii* Benth. (3) BA, OT; 4820–5100'; jw, rup, sgp

*Lycopus americanus* Muhl. ex W. P. C. Barton (2) BA; 4300–4760'; mgp, pjw

■ *Marrubium vulgare* L. (19) BA, LA, OT; 4290–6130'; mgp, pjw, rip, rd, rup, sgp

*Mentha arvensis* L. (2) LA; 5530–5530'; rip

*Monarda pectinata* Nutt. (11) BA, LA, MO, OT; 3410–4860'; mgp, pjw, rip, rup, sgp, ssp

*Salvia reflexa* Hornem. (8) BA, LA, MO, OT; 3480–5320'; pjw, rup, sgp

*Teucrium canadense* L. var. *occidentale* (A. Gray) E. M. McClint. & Epling (2) OT; 4210–4240'; rup

*Teucrium laciniatum* Torr. (36) BA, LA, MO, OT; 3380–6090'; cgf, jw, pjw, rd, rup, sgp, ssp

**Liliaceae**

*Leucocrinum montanum* Nutt. ex A. Gray (3) BA, OT; 4560–4900'; jw, mgp

**Linaceae**

*Linum lewisii* Pursh var. *lewisii* (18) LA, OT; 4360–6080'; jw, mgp, pjw, rd, rup, sgp

*Linum pratense* (Norton) Small (19) BA, LA, MO, OT; 3350–5740'; mgp, pjw, rup, sgp, ssp

*Linum puberulum* (Engelm.) A. Heller (4) LA, OT; 4290–5740'; pjw, sgp

*Linum rigidum* Pursh (24) BA, MO, OT; 3420–4880'; mgp, pjw, rd, rup, sgp, ssp

**Loasaceae**

*Mentzelia albicaulis* (Douglas ex Hook.) Douglas ex Torr. & A. Gray (3) OT; 4290–4800'; mgp, pjw, rup

*Mentzelia decapetala* (Pursh ex Sims) Urb. & Gilg ex Gilg (8) BA, LA, OT; 4300–6130'; jw, mgp, rd, rup, sgp

*Mentzelia multiflora* (Nutt.) A. Gray (34) BA, LA, OT; 4220–4950'; pjw, rup, sgp

*Mentzelia nuda* (Pursh) Torr. & A. Gray (29) BA, LA, MO, OT; 3270–5600'; jw, mgp, pjw, rup, sgp, ssp

*Mentzelia oligosperma* Nutt. ex Sims (3) BA, LA; 4250–4440'; jw, mgp

*Mentzelia rusbyi* Wootton (17) BA, LA, OT; 4050–5370'; jw, pjw, rup, sgp

*Mentzelia reverchonii* (Urb. & Gilg) H.J. Thomp. & Zavort. (7) LA, OT; 4330–5360'; mgp, sgp

**Malvaceae**

*Callirhoë involucrata* (Torr. & A. Gray) A. Gray var. *lineariloba* (Torr. & A. Gray) A. Gray (7) MO; 3310–3540'; cgf, rup, sgp, ssp

■ *Hibiscus trionum* L. (1) OT; 4650–4650'; rd

■ *Malva neglecta* Wallr. (4) BA, LA; 4920–6030'; rip, rd, sgp

● *Sphaeralcea angustifolia* (Cav.) G. Don (31) BA, LA, MO, OT; 3420–6210'; jw, mgp, pjw, rd, rup, sgp, ssp

*Sphaeralcea coccinea* (Nutt.) Rydb. (111) BA, LA, MO, OT; 3310–6030'; cgf, jw, mgp, pjw, rd, rup, sgp, ssp

**Martyniaceae**

*Proboscidea louisianica* (Mill.) Thell. ssp. *louisianica* (9) BA, LA, OT; 4340–6130'; jw, mgp, rd, sgp, ssp

**Molluginaceae**

*Mollugo verticillata* L. (3) BA, MO; 3440–4300'; sgp, ssp

**Moraceae**

*Maclura pomifera* (Raf.) C.K. Schneid. (1) BA; 4300–4300'; sgp

■ *Morus alba* L. (6) BA, LA, MO, OT; 3530–5470'; jw, rd, rup, sgp, ssp

**Nyctaginaceae**

*Abronia fragrans* Nutt. ex Hook. (11) BA, LA, MO; 3370–5560'; jw, mgp, rup, sgp, ssp

*Mirabilis albida* (Walter) Heimerl (6) BA, LA; 4140–4970'; pjw, rup, ssp

*Mirabilis glabra* (S. Watson) Standl. (4) MO; 3370–3470'; cgf, rup

*Mirabilis linearis* (Pursh) Heimerl var. *linearis* (52) BA, LA, MO, OT; 3290–5370'; cgf, mgp, pjw, rd, rup, sgp, ssp

*Mirabilis multiflora* (Torr.) A. Gray var. *multiflora* (8) BA, LA, OT; 4350–5240'; jw, pjw, rup, sgp, ssp

*Mirabilis nyctaginea* (Michx.) MacMill. (8) LA, MO, OT; 3360–4870'; cgf

*Tripterocalyx micranthus* (Torr.) Hook. (1) OT; 4480–4480'; sgp

**Oleaceae**

■ *Fontanesia phillyreoides* Labill. ssp. *fortunei* (Carrière) Yaltirik (1) BA; 4630–4630'; sgp

*Fraxinus pennsylvanica* Marshall (3) BA, MO, OT; 3550–4330'; rip, sgp

■ *Syringa vulgaris* L. (1) BA; 4350–4350'; sgp

**Onagraceae**

*Oenothera albicaulis* Pursh (8) BA, LA, OT; 4040–5740'; mgp, sgp, ssp

*Oenothera cespitosa* Nutt. var. *cespitosa* (2) OT; 4640–4800'; jw, sgp

*Oenothera cinerea* (Wootton & Standl.) W.L. Wagner & Hoch ssp. *cinerea* (6) BA, MO; 3360–4460'; cgf, rup, ssp

*Oenothera coronopifolia* Torr. & A. Gray (2) LA, OT; 4320–5230'; jw, sgp

*Oenothera curtiflora* W.L. Wagner & Hoch (25) BA, LA, MO, OT; 3370–5420'; cgf, mgp, pjw, rup, sgp, ssp

● *Oenothera engelmannii* (Small) Munz (3) MO; 3310–3410'; cgf, ssp

○ *Oenothera harringtonii* W.L. Wagner (6) OT; 4440–4950'; rup

*Oenothera hartwegii* Benth. ssp. *pubescens* (A. Gray) W.L. Wagner & Hoch (5) BA, LA; 4730–5150'; jw, pjw, rup, ssp

*Oenothera howardii* (A. Nelson) W.L. Wagner (1) OT; 4390–4390'; rup

*Oenothera latifolia* (Rydb.) Munz (8) BA, LA, MO; 3350–5170'; cgf, mgp, sgp, ssp

*Oenothera lavandulifolia* Torr. & A. Gray (27) BA, LA, MO, OT; 3480–5980'; jw, mgp, rup, sgp, ssp

*Oenothera serrulata* Nutt. (20) BA, LA, MO; 3310–5170'; cgf, mgp, rup, sgp, ssp

*Oenothera suffrutescens* (Ser.) W.L. Wagner & Hoch (98) BA, LA, MO, OT; 3290–5980'; jw, mgp, pjw, rd, rup, sgp, ssp

*Oenothera villosa* Thunb. var. *villosa* (1) BA; 4760–4760'; sgp

**Orobanchaceae**

*Castilleja integra* A. Gray (5) LA, OT; 5100–6080'; pjw, sgp

*Castilleja sessiliflora* Pursh (14) LA, OT; 4300–5740'; jw, mgp, rup, sgp

*Orobanche fasciculata* Nutt. (1) LA; 6060–6440'; pjw

*Orobanche ludoviciana* Nutt. var. *multiflora* (Nutt.) G. Beck (5) BA, LA, OT; 4310–5600'; mgp, pjw, sgp, ssp

#### Oxalidaceae

*Oxalis dillenii* Jacq. (2) BA; 4230–4440'; jw, mgp

#### Papaveraceae

*Argemone hispida* A. Gray (3) MO, OT; 3330–4930'; rup, ssp

*Argemone polyanthemus* (Fedde) G.B. Ownbey (6) BA, LA, OT; 4250–4940'; jw, rd, sgp, ssp

*Argemone squarrosa* Greene var. *squarrosa* (6) BA, MO; 3350–4050'; rup, sgp, ssp

*Corydalis aurea* Willd. var. *aurea* (5) MO; 3380–3490'; cgf, rip, ssp

*Corydalis aurea* Willd. var. *occidentalis* Engelm. ex A. Gray (4) BA, MO, OT; 3450–4800'; mgp, pjw, sgp, ssp

#### Phrymaceae

*Mimulus glabratus* Kunth var. *jamesii* (Torr. & A. Gray ex Benth.) A. Gray (1) LA; 5120–5120'; rip

#### Plantaginaceae [including Scrophulariaceae in part]

■ *Linaria dalmatica* (L.) Mill. var. *dalmatica* (3) LA; 5260–5680'; rd, sgp  
*Penstemon albidus* Nutt. (16) BA, LA, MO, OT; 3480–5560'; rup, sgp, ssp

*Penstemon ambiguus* Torr. (7) BA, MO; 3370–4490'; sgp, ssp

*Penstemon angustifolius* Nutt. ex Pursh var. *caudatus* (A. Heller) Rydb. (20) BA, LA, OT; 4310–5980'; jw, mgp, pjw, rup, sgp

*Penstemon auriberbis* Pennell (3) OT; 4500–4800'; mgp

*Penstemon buckleyi* Pennell (1) BA; 4280–4280'; mgp

○ *Penstemon jamesii* Benth. (3) BA, LA; 4610–5980'; sgp

*Penstemon virgatus* A. Gray var. *asa-grayi* (Crosswh.) Dorn (1) OT; 4480–4480'; sgp

■ *Plantago major* L. (2) LA; 5100–5120'; rip

*Plantago patagonica* Jacq. (52) BA, LA, MO, OT; 3310–6050'; cgf, pjw, rup, sbs, sgp, ssp

*Veronica anagallis-aquatica* L. (9) BA, LA; 4250–5130'; rip

*Veronica catenata* Pennell (1) BA; 4760–4760'; rip

*Veronica peregrina* L. var. *xalapensis* (Kunth) H. St. John & F.W. Warren (4) LA; 5110–5740'; rip

#### Poaceae

● *Achnatherum hymenoides* (Roem. & Schult.) Barkworth (40) BA, LA, MO, OT; 3350–6050'; cgf, mgp, pjw, rd, rup, sgp, ssp

*Achnatherum robustum* (Vasey) Barkworth (3) LA; 5860–5960'; sgp

■ *Aegilops cylindrica* Host (8) BA, LA, OT; 4300–5190'; jw, rup, sgp

■ *Agropyron cristatum* (L.) Gaertn. var. *cristatum* (5) LA, OT; 4390–5260'; rd, rup, sgp

■ *Agropyron cristatum* (L.) Gaertn. var. *desertorum* (Fisch. ex Link) Dorn (3) BA; 4220–4940'; sgp, ssp

■ *Agrostis gigantea* Roth (2) LA, OT; 4690–4930'; rip

■ *Agrostis stolonifera* L. (3) LA; 5100–5900'; rip

*Andropogon gerardii* Vitman (2) BA; 4300–4820'; mgp

*Andropogon hallii* Hack. (3) BA, LA; 4760–6060'; pjw, rup, ssp

*Aristida adscensionis* L. (6) BA, LA, MO, OT; 3380–5030'; cgf, jw, mgp  
*Aristida divaricata* Humb. & Bonpl. ex Willd. (5) BA; 4760–4970'; mgp, pjw, ssp

*Aristida purpurea* Nutt. var. *fendleriana* (Steud.) Vasey (6) LA, MO, OT; 3410–4580'; jw, rup, sgp, ssp

*Aristida purpurea* Nutt. var. *longiseta* (Steud.) Vasey (193) BA, LA, MO, OT; 3290–6440'; cgf, jw, mgp, pjw, rd, rup, sgp, ssp

*Aristida purpurea* Nutt. var. *nealleyi* (Vasey) Allred (4) LA, OT; 4560–5120'; pjw, rup, sgp

*Aristida purpurea* Nutt. var. *purpurea* (39) BA, LA, MO, OT; 3330–5860'; cgf, jw, mgp, pjw, rd, rup, sgp, ssp

*Aristida purpurea* Nutt. var. *wrightii* (Nash) Allred (2) BA, LA; 4320–4410'; jw, mgp

■ *Bothriochloa ischaemum* (L.) Keng (7) BA, MO; 3360–4300'; cgf, rd, rup, sgp, ssp

*Bothriochloa laguroides* (DC.) Herter (81) BA, LA, MO, OT; 3220–5860'; cgf, jw, mgp, rd, rup, sgp, ssp

● *Bothriochloa springfieldii* (Gould) Parodi (4) BA, LA, OT; 4220–4930'; jw, mgp, sgp

*Bouteloua curtipendula* (Michx.) Torr. var. *curtipendula* (84) BA, LA, MO, OT; 3200–6210'; cgf, mgp, pjw, rd, rup, sgp, ssp

*Bouteloua eriopoda* (Torr.) Torr. (9) BA, LA, OT; 4220–4580'; jw, mgp, ssp

*Bouteloua gracilis* (Kunth) Lag. ex Griffiths (53) BA, LA, MO, OT; 3200–5770'; jw, mgp, rd, rup, sgp, ssp

*Bouteloua hirsuta* Lag. var. *hirsuta* (26) BA, LA, OT; 3970–6060'; jw, mgp, pjw, rup, sgp, ssp

*Bromus carinatus* Hook. & Arn. (3) LA, MO; 3410–5960'; jw, sgp, ssp

■ *Bromus commutatus* Schrad. (2) BA, MO; 3550–4170'; rd, sgp

■ *Bromus inermis* Leys. (10) LA, MO, OT; 3420–5800'; mgp, rd, rup, sgp, ssp

■ *Bromus japonicus* Thunb. ex Murray (57) BA, LA, MO, OT; 3360–5810'; cgf, jw, mgp, rd, rup, sgp, ssp

■ *Bromus tectorum* L. (38) BA, LA, MO, OT; 3380–5740'; cgf, mgp, pjw, rd, rup, sgp, ssp

*Buchloe dactyloides* (Nutt.) Engelm. (57) BA, LA, MO, OT; 3200–6030'; cgf, mgp, pjw, rd, rup, sgp, ssp

*Calamovilfa gigantea* (Nutt.) Scribn. & Merr. (2) BA, MO; 3470–4910'; mgp, rip

*Cenchrus longispinus* (Hack.) Fernald (27) BA, LA, MO, OT; 3300–5680'; cgf, jw, mgp, rd, rup, sgp, ssp

*Chloris verticillata* Nutt. (38) BA, LA, MO, OT; 3330–5180'; cgf, jw, mgp, pjw, rd, rup, sgp, ssp

*Chloris virgata* Sw. (5) BA, OT; 4250–4910'; mgp, sgp

■ *Cynodon dactylon* (L.) Pers. (1) LA; 4440–4440'; rip

*Dichanthelium oligosanthes* (Schult.) Gould var. *scribnerianum* (Nash) Gould (6) BA, LA; 3970–5530'; mgp, pjw, sgp, ssp

*Digitaria californica* (Benth.) Henrard (1) BA; 4300–4300'; mgp

! *Digitaria pubiflora* (Vasey) Wipff (2) BA; 4230–4400'; mgp

*Distichlis spicata* (L.) Greene (16) LA, MO, OT; 3380–4760'; cgf, rip, rd, sbs

■ *Echinochloa crus-galli* (L.) P. Beauv. (12) BA, LA, MO, OT; 3290–5940'; rip, rd, stp

*Echinochloa muricata* (P. Beauv.) Fernald var. *microstachya* Wiegand (14) BA, LA, MO, OT; 3340–5770'; rip, stp

*Elymus canadensis* L. var. *canadensis* (56) BA, LA, MO, OT; 3350–6030'; cgf, jw, mgp, pjw, rd, rup, sgp, ssp

■ *Elymus elongatus* (Host) Runemark var. *ponticus* (Podp.) Dorn (1) OT; 4200–4200'; sgp

*Elymus elymoides* (Raf.) Swezey var. *brevifolius* (J. G. Sm.) Dorn (113) BA, LA, MO, OT; 3200–6090'; cgf, jw, mgp, pjw, rd, rup, sgp, ssp

*Elymus glaucus* Buckley var. *glaucus* (11) BA, LA, MO, OT; 3200–5770'; jw, mgp, rup, sgp, ssp

■ *Elymus hispidus* (Opiz) Melderis var. *hispidus* (5) BA, OT; 4160–4930'; rd, sgp

*Elymus lanceolatus* (Scribn. & J. G. Sm.) Gould (6) BA, OT; 4510–4920'; rup, sgp

*Elymus smithii* (Rydb.) Gould (79) BA, LA, MO, OT; 3200–6090'; cgf, jw, mgp, pjw, rd, rup, sbs, sgp, ssp

■ *Eragrostis barrelieri* Daveau (4) BA, MO; 3290–4820'; mgp, ssp

■ *Eragrostis cilianensis* (All.) Vignolo ex Janch. (13) BA, LA, MO, OT; 3480–5860'; mgp, rip, rd, sgp, ssp, stp

*Eragrostis curtipedunculata* Buckley (3) BA, MO; 3380–4400'; cgf, mgp, sgp

*Eragrostis pectinacea* (Michx.) Nees ex Steud. var. *miserrima* (E. Fourn.) Reeder (1) OT; 4620–4620'; rup

*Eragrostis pilosa* (L.) P. Beauv. (3) BA, MO; 3301–4587'; ssp

*Eragrostis trichodes* (Nutt.) A.W. Wood (2) LA; 5860–5860'; sgp

*Eriochloa contracta* Hitchc. (1) OT; 4650–4650'; rd

- Erioneuron pilosum* (Buckley) Nash (50) BA, LA, MO, OT; 3380–5560'; cgf, jw, mgp, pjw, rup, sgp, ssp
- Glyceria striata* (Lam.) Hitchc. (3) LA; 5530–6090'; rip
- Hesperostipa comata* (Trin. & Rupr.) Barkworth var. *comata* (35) BA, LA, MO, OT; 3380–5980'; cgf, jw, mgp, pjw, rd, rup, sgp, ssp
- Hesperostipa neomexicana* (Thurb. ex J.M. Coult.) Barkworth (22) BA, LA, OT; 4240–5560'; rup, sgp
- Hilaria jamesii* (Torr.) Benth. (78) BA, LA, MO, OT; 3420–5240'; mgp, pjw, rd, rup, sgp
- Hopia obtusa* (Kunth) Zuloaga & Morrone (36) BA, LA, MO, OT; 3350–6130'; cgf, mgp, pjw, rd, rup, sgp, ssp
- Hordeum brachyantherum* Nevski (1) LA; 5470–5470'; rd
- Hordeum jubatum* L. ssp. *intermedium* Bowden (36) LA, MO, OT; 3420–5900'; mgp, pjw, rip, rd, sgp
- Hordeum jubatum* L. ssp. *jubatum* (1) BA; 4800–4800'; sgp
- Hordeum pusillum* Nutt. (32) BA, LA, MO, OT; 3380–6030'; cgf, jw, mgp, rd, rup, sgp, ssp
- Leptochloa fusca* (L.) Kunth ssp. *fascicularis* (Lam.) N. Snow (8) LA, MO, OT; 3340–6130'; rip, rd
- Lycurus setosus* (Nutt.) C. Reeder (4) BA, LA, OT; 4340–5370'; jw, mgp, pjw
- Muhlenbergia arenacea* (Buckley) Hitchc. (4) LA, OT; 4400–4550'; jw, sbs, sgp
- Muhlenbergia arenicola* Buckley (5) BA, LA, OT; 4090–5600'; jw, rd, sgp
- Muhlenbergia asperifolia* (Nees & Meyen ex Trin.) Parodi (10) LA, MO, OT; 3370–5770'; rip, sbs, sgp
- Muhlenbergia racemosa* (Michx.) Britton, Sterns, & Poggenb. (1) OT; 4930–4930'; rip
- Muhlenbergia torreyi* (Kunth) Hitchc. ex Bush (18) BA, LA, OT; 3200–5380'; mgp, pjw, rup, sgp, ssp
- Munroa squarrosa* (Nutt.) Torr. (21) BA, LA, MO, OT; 3290–6060'; jw, mgp, pjw, rd, rup, sgp, ssp
- Nassella viridula* (Trin.) Barkworth (9) LA, OT; 4990–6090'; pjw, rd, rup, sgp
- Panicum capillare* L. ssp. *capillare* (16) BA, MO, OT; 3380–5190'; cgf, mgp, pjw, rup, sgp, ssp
- Panicum hallii* Vasey (1) BA; 4250–4440'; jw
- Panicum virgatum* L. (20) BA, LA, MO, OT; 3290–5530'; cgf, mgp, pjw, sgp, ssp
- *Paspalum racemosum* Lam. (2) LA, MO; 3330–5370'; jw, ssp
- Paspalum setaceum* Michx. var. *stramineum* (Nash) D. J. Banks (4) BA, MO; 3350–4310'; rup, ssp
- Phalaris arundinacea* L. (1) MO; 3410–3410'; cgf
- Phalaris caroliniana* Walter (1) BA; 4340–4350'; rip
- Piptatherum micranthum* (Trin. & Rupr.) Barkworth (14) BA, LA, OT; 4310–6210'; jw, pjw, rup
- *Poa compressa* L. (8) BA, LA, MO, OT; 3550–6440'; pjw, rup
- Poa fendleriana* (Steud.) Vasey (1) OT; 4400–4400'; sgp
- *Poa pratensis* L. (1) LA; 5740–5740'; sgp
- Polypogon monspeliensis* (L.) Desf. (25) BA, LA, MO, OT; 3340–5420'; mgp, pjw, rip, rup, ssp, stp
- Polypogon viridis* (Gouan) Breistr. (3) BA, LA; 4250–5130'; rip
- *Puccinellia distans* (L.) Parl. (1) LA; 4690–4690'; rip
- Schedonnardus paniculatus* (Nutt.) Trel. (87) BA, LA, MO, OT; 3200–6080'; cgf, jw, mgp, pjw, rd, rup, sgp, ssp
- *Schedonorus arundinaceus* (Schreb.) Dumort. (4) BA, LA, MO, OT; 3380–5370'; rup
- Schizachyrium scoparium* (Michx.) Nash var. *scoparium* (10) BA, LA, OT; 4420–6210'; mgp, pjw, rup
- Setaria leucopila* (Scribn. & Merr.) K. Schum. (2) LA; 4500–4950'; jw, sgp
- *Setaria pumila* (Poir.) Roem. & Schult. (8) LA, MO, OT; 3300–5030'; rip, rup, sgp, ssp
- Setaria viridis* (L.) P. Beauv. (10) BA, LA, OT; 4150–5860'; jw, rd, rup, sgp, ssp
- Sorghastrum nutans* (L.) Nash (2) BA; 4300–4300'; mgp
- Sorghum bicolor* (L.) Moench (2) LA, OT; 4220–5940'; jw, sgp
- Sorghum halepense* (L.) Pers. (8) LA, MO, OT; 3330–5030'; rip, sgp, ssp
- Spartina pectinata* Link (1) OT; 4300–4300'; rip
- Sphenopholis obtusata* (Michx.) Scribn. (2) BA, OT; 4260–4930'; mgp
- Sporobolus airoides* (Torr.) Torr. (37) LA, MO, OT; 3380–6130'; cgf, jw, mgp, pjw, rd, rup, sbs, sgp, ssp
- Sporobolus contractus* Hitchc. (1) BA; 4910–4910'; mgp
- Sporobolus cryptandrus* (Torr.) A. Gray (42) BA, LA, MO, OT; 3200–5940'; cgf, jw, mgp, rd, rup, sgp, ssp
- Sporobolus texanus* Vasey (1) BA; 4260–4260'; mgp
- Tridens muticus* (Torr.) Nash var. *elongatus* (Buckley) Shinnars (10) LA, OT; 4300–4990'; jw, rup, sgp
- Triticum aestivum* L. (15) BA, LA, OT; 4290–6050'; pjw, rup, rd, sgp
- Vulpia octoflora* (9) BA, MO, OT; 3380–4770'; cgf, mgp, rup, sgp, ssp
- Polemoniaceae**
- Gilia ophthalmoides* Brand (4) OT; 4290–4800'; mgp, pjw, rup
- Giliastrum aceroides* (A. Gray) Rydb. (32) LA, OT; 4300–4990'; jw, mgp, rup, sgp
- Ipomopsis laxiflora* (J.M. Coult.) V.E. Grant (15) BA, LA, OT; 4222–5740'; jw, mgp, rup, sgp, ssp
- Ipomopsis pumila* (Nutt.) V.E. Grant (4) LA, OT; 4470–4580'; jw, sgp
- Microsteris gracilis* (Dougl. ex Hook.) Greene var. *humilior* (Greene) H. Mason (1) LA; 5740–5740'; sgp
- Phlox longifolia* Nutt. ssp. *longifolia* (6) OT; 4500–4800'; jw, mgp, rup
- Polygalaceae**
- Polygala alba* Nutt. (16) BA, LA, MO, OT; 3410–5120'; jw, mgp, pjw, rip, rup, sgp, ssp
- Polygonaceae**
- Eriogonum annuum* Nutt. (21) BA, LA, MO, OT; 3370–5370'; mgp, pjw, rup, sgp, ssp
- Eriogonum gordonii* Benth. (2) OT; 4540–4770'; rup
- Eriogonum jamesii* Benth. var. *jamesii* (20) BA, LA, OT; 4220–6210'; mgp, pjw, rup
- Eriogonum lachnogynum* Torr. ex Benth. var. *lachnogynum* (41) BA, LA, MO, OT; 3410–6210'; mgp, pjw, rup, sgp, ssp
- Eriogonum lonchophyllum* Torr. & A. Gray (2) OT; 4500–4940'; jw, sgp
- Eriogonum microthecum* Nutt. var. *effusum* (Nutt.) Torr. & A. Gray (7) LA, OT; 4330–5240'; jw, sgp
- Eriogonum tenellum* Torr. var. *tenellum* (45) BA, LA, OT; 3970–5560'; mgp, pjw, rup, sgp, ssp
- *Fallopia convolvulus* (L.) Á. Löve (1) MO; 3360–3360'; cgf
- Persicaria amphibia* (L.) Gray (1) LA; 5100–5100'; rip
- Persicaria bicornis* (Raf.) Nieuwl. (2) BA; 4300–4750'; rip, stp
- *Persicaria lapathifolia* (L.) Gray (5) LA, MO; 3370–4410'; rip
- *Polygonum aviculare* L. (38) BA, LA, MO, OT; 3200–6130'; pjw, rip, rup, sgp, ssp, stp
- Polygonum ramosissimum* Michx. var. *ramosissimum* (16) BA, LA, MO, OT; 3330–5860'; rip, rd, rup, sgp, ssp, stp
- Rumex altissimus* A.W. Wood (7) BA, LA, MO, OT; 3490–5320'; rip
- *Rumex crispus* L. (13) BA, LA, OT; 4160–6080'; rip, stp
- Rumex patientia* L. (1) LA; 4440–4440'; rip
- *Rumex stenophyllum* Ledeb. (1) LA; 4870–4870'; rip
- Portulacaceae**
- Phemeranthus parviflorus* (Nutt.) Kiger (3) BA, LA, OT; 4140–5100'; rup, sgp
- Portulaca halimoides* L. (1) LA; 5770–5770'; rip
- Portulaca oleracea* L. (3) LA, OT; 4540–6130'; sgp, stp
- Potamogetonaceae**
- Potamogeton foliosus* Raf. var. *foliosus* (1) LA; 4480–4480'; rip

*Stuckenia filiformis* (Pers.) Börner ssp. *occidentalis* (J.W. Robbins) R.R. Haynes, Les, & M. Král (1) OT; 4540–4540'; rip  
*Stuckenia pectinata* (L.) Börner (4) LA, MO; 3370–6030'; rip  
*Zannichellia palustris* L. (3) LA, OT; 4310–5110'; rip

#### Ranunculaceae

*Delphinium carolinianum* Walter ssp. *virescens* (Nutt.) R.E. Brooks (18) BA, MO, OT; 3310–5150'; cgf, mgp, pjw, rup, sgp, ssp  
*Ranunculus cymbalaria* Pursh (1) BA; 4300–4300'; rip  
*Ranunculus hyperboreus* Rottb. (1) BA; 4900–4900'; rip  
*Ranunculus sceleratus* L. var. *multifidus* Nutt. (6) BA, LA; 4260–5140'; rip  
*Ranunculus sceleratus* L. var. *sceleratus* (2) BA; 4250–4250'; rip

#### Rhamnaceae

*Ceanothus herbaceus* Raf. (1) MO; 3410–3410'; ssp

#### Rosaceae

*Cercocarpus montanus* Raf. var. *montanus* (15) LA, OT; 4320–6060'; jw, pjw, rup, sgp  
 ■ *Malus pumila* Mill. (2) BA, LA; 4370–5600'; jw, rd  
*Physocarpus monogynus* (Torr.) J.M. Coult. (4) LA; 5140–6050'; pjw, sgp  
*Potentilla pensylvanica* L. (1) LA; 5560–5560'; sgp  
*Potentilla rivalis* Nutt. var. *millegrana* (Engelm. ex Lehm.) S. Watson (5) LA, OT; 4500–5740'; pjw, sgp  
*Prunus americana* Marshall (3) BA, LA; 4050–5450'; jw, rip, rd, sgp  
 ○ *Prunus angustifolia* Marshall var. *angustifolia* (5) BA, LA, MO, OT; 3520–5550'; rd, rup, sgp, ssp  
 ■ *Prunus cerasus* L. (1) LA; 5110–5110'; rip  
*Prunus pensylvanica* L. f. (1) LA; 5110–5110'; rip  
*Prunus virginiana* L. var. *melanocarpa* (A. Nelson) Sarg. (3) LA, OT; 4310–6080'; pjw, rip  
*Rosa arkansana* Porter var. *arkansana* (1) LA; 4450–4450'; rip  
*Rubus deliciosus* Torr. (6) BA, LA; 4230–6090'; jw, pjw, rip  
 ■ *Spiraea trilobata* L. (1) BA; 4630–4630'; rd

#### Rubiaceae

■ *Galium aparine* L. (1) MO; 3360–3360'; cgf

#### Rutaceae

*Ptelea trifoliata* L. (11) LA, OT; 4350–6440'; jw, pjw, rip

#### Salicaceae

× *Populus* × *acuminata* Rydb. (2) LA, OT; 5100–5770'; rip  
 ■ *Populus alba* L. (1) LA; 5470–5470'; rd  
*Populus deltoides* W. Bartram ex Marshall var. *occidentalis* Rydb. (46) BA, LA, MO, OT; 3360–5900'; cgf, rip, rd, stp  
*Salix amygdaloides* Andersson (15) BA, LA, MO, OT; 3490–6090'; rip  
 × *Salix amygdaloides* Andersson × *Salix nigra* Marshall (1) BA; 4280–4280'; rip  
*Salix exigua* Nutt. ssp. *exigua* (20) BA, LA, MO, OT; 3350–5770'; rip  
*Salix exigua* Nutt. ssp. *interior* (Rowlee) Cronquist (8) BA, LA, MO, OT; 3370–5110'; rip  
*Salix nigra* Marshall (1) MO; 3350–3350'; rip

#### Santalaceae

*Comandra umbellata* (L.) Nutt. var. *pallida* (A. DC.) M.E. Jones (7) OT; 4380–4800'; jw, mgp, rup

#### Sapindaceae

*Sapindus saponaria* L. var. *drummondii* (Hook. & Arn.) L.D. Benson (10) BA, LA, OT; 4250–4980'; cgf, mgp, pjw, rip, rup, sgp

#### Sarcobataceae

*Sarcobatus vermiculatus* (Hook.) Torr. (5) LA, OT; 4510–5120'; jw, pjw, rup, sbs

#### Scrophulariaceae

■ *Verbascum thapsus* L. (19) BA, LA, OT; 3970–6030'; mgp, pjw, rd, sgp, ssp, stp

#### Solanaceae

*Chamaesaracha coniodes* (Moric. ex Dunal) Britton (18) BA, LA, MO, OT; 3530–4980'; jw, mgp, pjw, rd, rup, sgp  
*Chamaesaracha coronopus* (Dunal) A. Gray (3) BA, OT; 4480–4730'; jw, sgp  
*Physalis hederifolia* A. Gray var. *comata* (Rydb.) Waterf. (17) BA, LA, MO, OT; 3340–6090'; jw, pjw, rd, rup, sgp, ssp  
*Physalis hederifolia* A. Gray var. *fendleri* (A. Gray) Cronquist (1) OT; 4290–4390'; pjw  
*Physalis hispida* (Waterf.) Cronquist (38) BA, LA, MO, OT; 3270–5170'; cgf, jw, mgp, rd, rup, sgp, ssp  
*Physalis longifolia* Nutt. (19) BA, LA, MO, OT; 3340–5860'; cgf, pjw, rd, rup, sgp  
*Physalis virginiana* Mill. (3) MO, OT; 3410–4356'; jw, ssp  
*Quincula lobata* (Torr.) Raf. (35) BA, LA, MO, OT; 3660–6030'; jw, mgp, rd, rup, sgp, ssp  
*Solanum americanum* Mill. (4) BA, MO; 3380–4300'; cgf, mgp, rup  
*Solanum elaeagnifolium* Cav. (32) BA, LA, MO, OT; 3340–6210'; cgf, jw, mgp, pjw, rd, rup, sgp, ssp  
*Solanum rostratum* Dunal (44) BA, LA, MO, OT; 3290–6130'; cgf, jw, mgp, pjw, rd, rup, sgp, ssp  
*Solanum triflorum* Nutt. (1) OT; 4300–4300'; rd

#### Tamaricaceae

■ *Tamarix ramosissima* Ledeb. (40) LA, MO, OT; 3310–6130'; cgf, rip, sbs, stp

#### Typhaceae

*Typha angustifolia* L. (3) BA, LA, OT; 4540–5470'; rip, stp  
 × *Typha angustifolia* L. × *Typha domingensis* Pers. (2) LA, OT; 4560–5100'; rip, stp  
*Typha domingensis* Pers. (10) LA, MO, OT; 3380–5770'; rip, stp

#### Ulmaceae

*Ulmus americana* L. (7) BA, LA, MO, OT; 3200–4870'; jw, rip, rd, sgp  
 ■ *Ulmus parvifolia* Jacq. (1) LA; 5810–5810'; rd  
 ■ *Ulmus pumila* L. (13) BA, LA, MO, OT; 3620–5960'; jw, mgp, rd, rup, sgp, ssp  
*Ulmus rubra* Muhl. (1) LA; 5470–5470'; rd

#### Urticaceae

*Parietaria pensylvanica* Muhl. ex Willd. (2) LA, OT; 4930–5560'; jw, rip

#### Verbenaceae

*Glandularia bipinnatifida* (Nutt.) Nutt. var. *bipinnatifida* (60) BA, LA, MO, OT; 3350–5980'; jw, mgp, pjw, rd, rup, sgp, ssp  
*Phyla cuneifolia* (Torr.) Greene (3) BA, OT; 4280–4760'; mgp, rip, sgp, stp  
*Verbena bracteata* Lag. & Rodr. (110) BA, LA, MO, OT; 3200–6130'; cgf, jw, mgp, pjw, rd, rup, sgp, ssp  
*Verbena hastata* L. (4) BA, LA; 4300–5530'; mgp, pjw, sgp

#### Violaceae

*Hybanthus verticillatus* (Ortega) Baill. (8) LA, MO, OT; 3530–5900'; jw, mgp, rup, sgp  
*Viola nuttallii* Pursh (7) LA, OT; 4410–5740'; jw, mgp, rup, sgp

#### Vitaceae

*Parthenocissus quinquefolia* (L.) Planch. (1) LA; 5100–5100'; jw  
*Parthenocissus vitacea* (Kner) Hitchc. (8) BA, LA, OT; 4160–6090'; jw, pjw  
*Vitis acerifolia* Raf. (13) BA, LA; 4250–5530'; cgf, mgp, pjw, rip, rup

#### Zygophyllaceae

*Kallstroemia parviflora* Norton (1) LA; 4870–4870'; rd  
*Krameria lanceolata* Torr. (9) BA, MO; 3430–4870'; mgp, rup, sgp, ssp  
 ■ *Tribulus terrestris* L. (32) BA, LA, MO, OT; 3330–5960'; rd, sgp

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