

**VASCULAR FLORA OF THE ROCKY FLATS AREA,
JEFFERSON COUNTY, COLORADO, USA**

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ABSTRACT

The Rocky Flats Site (Site) is a U.S. Department of Energy (DOE) facility near Golden, Colorado that produced nuclear weapons components during the Cold War. Like many federal properties that have been off-limits to public access for decades, it has become a refugia for biodiversity as surrounding landscapes have been lost to agriculture and urbanization. A floristic study of the area was conducted on approximately 2,505 ha (6,189 ac) and includes the parcels currently managed and operated by DOE and the U.S. Fish and Wildlife Service (Rocky Flats National Wildlife Refuge). A flora of 630 species of vascular plants in 84 families and 340 genera was documented, including 12 species endemic to the southern Rocky Mountains and seven species considered rare or imperiled by the Colorado Natural Heritage Program. The flora of the Site is characterized by a predominantly Western North American floristic element, however, an Adventive floristic element contributes the greatest number of species. The vegetation is dominated by xeric tallgrass prairie and mixed grass prairie, with areas of wetland, shrubland, and riparian woodland. *Phytologia* 92(2): 121-150 (August 2, 2010).

KEY WORDS: Colorado, flora, phytogeography, refugia, Rocky Flats Site, Rocky Flats National Wildlife Refuge, U.S. Department of Energy, xeric tallgrass prairie

Government installations on otherwise undeveloped lands have received increased attention in recent years as refugia of biological diversity (Cohn, 1994; Gray and Rickard, 1989; Mann et al., 1996; Nickens, 1993). Many U.S. Department of Defense (DoD) and U.S. Department of Energy (DOE) lands contain protected habitat for

endangered, threatened, or sensitive plants, animals, and plant communities. Unlike national parks and forests, DoD and DOE lands have been off-limits, often serving as buffer areas separating facility operations from the general public for security reasons and protection from potential contaminant releases. As surrounding landscapes have been modified and changed by agriculture and urban development, many of these buffer areas have become large islands of relatively undisturbed biotic communities.

The DOE Rocky Flats Site (Site) between Golden and Boulder, Colorado, is one such area. Formerly known as the Rocky Flats Environmental Technology Site, the facility produced nuclear weapons components for nearly 40 years during the Cold War, from the early 1950s through 1989. From 1989 to 2005, the Site underwent environmental cleanup under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), more commonly known as Superfund. In 2001, prior to completion of cleanup activities, Congress enacted the Rocky Flats National Wildlife Refuge Act to set aside most of the Site as the Rocky Flats National Wildlife Refuge (RFNWR) once the Environmental Protection Agency certified that cleanup and closure activities were complete. Cleanup and closure of the Site concluded in October 2005. In July 2007, approximately 1597 ha (3947 ac) of the Site was transferred to the U.S. Fish and Wildlife Service (USFWS) to become the RFNWR. DOE retained the area where the former industrial complex was located, now known as the Central Operable Unit (COU), while most of the surrounding buffer area, known as the Peripheral Operable Unit (POU), was transferred to the USFWS.

For most of the last 50 years, the POU has remained largely undisturbed. During the 1970s and 1980s, a few ecological and environmental studies were conducted by researchers at the University of Colorado at Boulder and Colorado State University in Fort Collins, Colorado (Arthur and Alldredge, 1982; Clark et al., 1980; Weber et al., 1974; Little et al., 1980). Beginning in the early 1990s, ecological monitoring was conducted as part of the cleanup operations to ensure compliance with environmental laws and regulations, provide baseline ecological information, monitor resources, and provide technical support and data for ecological resource management. Over the years,

the vascular flora was inventoried to document the diversity of the plant life present at the Site. Ecological monitoring continues today for natural resource management as revegetation and habitat restoration return the area to a more natural state. This paper documents the vascular flora of the Rocky Flats area, encompassing both the COU and POU, and discusses the floristic and phytogeographic characteristics of the flora.

STUDY AREA

Located 25.7 km (16 mi) northwest of downtown Denver, the Site, approximately 2,505 ha [6,189 ac] in size, is located on the Colorado Piedmont approximately 3.2 km (2 mi) east of the mountain front between Golden and Boulder, Colorado. The Site is located at approximately 39° 53' N latitude and 105° 12' W longitude. Elevations range from 1,707 m (5,600 ft) on the eastern edge of the Site to 1,884 m (6,180 ft) along the western edge. The topography consists of gently east-sloping flat pediment (mesa) tops that have been dissected by intermittent and ephemeral streams, resulting in moderate to steep hillsides. The surface geologic unit of the mesa tops, the Rocky Flats Alluvium, is a glacial outwash fan originating from Coal Creek canyon to the west. The soils are classified as Nederland very cobbly sandy loams on the mesa tops interspersed with units of clay loams on hillslope and valley bottoms (SCS, 1980). According to records from the nearby National Renewable Energy Laboratory, the average annual precipitation is approximately 38 cm (15 in), most of which falls during April and May. The mean monthly temperature ranges from a low of approximately 1° C (34° F) in January to a high of approximately 22° C (71° F) during July. High winds, sometimes in excess of 145 km/hr (90 mph), frequently buffet the Site during the winter months.

METHODS

An early botanical inventory conducted by Weber et al. (1974) documented a flora of 327 vascular plants, 16 mosses, and 25 lichens at the Site. This inventory, deposited at the University of Colorado herbarium (COLO) in Boulder provided an initial species list for the Site. During the 1990s, dominant plant communities at the Site were inventoried and mapped as part of the ongoing ecological monitoring

program. The unpublished vegetation map and associated information was used for the Site plant community information presented in this report (K-H, 1997). Additional plant collections (through summer 2009) have provided a comprehensive inventory of the Site flora. Voucher specimens have been collected of all species documented at the Site. Specimens were collected, pressed and dried, identified, verified at COLO, and mounted using accepted herbarium techniques. The taxonomy used for this study follows GPFA (1986), Weber (1976), Weber (1990), and Weber and Wittman (2001), in that order of determination. The complete set of voucher specimens for the Site is housed at COLO.

Floristic summaries were compiled using the complete species list and included total species richness, total number of plant families, total number of genera, total number species by growth form, plant families and genera with the greatest number of species.

Plant geographers have long recognized that species have specific range distributions and that plant species can be grouped or classified based on their geographic distributions. When the taxa from a flora of a particular area or region are grouped based on similarities in worldwide distribution the resulting floristic classification categories are called phytogeographical elements (Peinado et al., 2009). A geographical analysis of the Rocky Flats species provided a representation of the phytogeographic elements that contribute to the flora of the Site. The geographical analysis followed the methodology used in recent regional floristic accounts by Hogan (1993), Clark (1996), and Nelson and Harmon (1997). Eleven elements were defined: Western North America (WNA), Great Plains (GP), Eastern North America (ENA), Southern Rocky Mountains (SR), Southwestern North America (SNA), North America (NA), Western Hemisphere (WH), Oroboreal (O), Circumpolar (C), Cosmopolitan (COS), and Adventive (A). Western North American species are generally distributed west of the 100th Meridian. Great Plains species are distributed across the central plains of North America. Distributions of Eastern North America species are generally east of the 100th Meridian. The Southern Rocky Mountains species are found in the Rocky Mountains from southern Wyoming and into Colorado and New Mexico. The Southwestern North American (Chihuahuan) species are

evidence of a Madrean influence. North American species are those distributed throughout most of the continent. Western Hemisphere species have distributions in North, Central, and South America. Oroboreal species have distributions across southern Canada, the northern United States, and south along the Appalachian mountains, and western Cordillera. Circumpolar species are those found throughout the Holarctic in North America, Europe, and Asia. Cosmopolitan species have a worldwide distribution. Adventive species are defined as native and non-native species that tend to grow in weedy, disturbed areas. Where possible, species were assigned elements based on determinations made previously by Hogan (1993), Clark (1996), Nelson (1993), and Nelson and Harmon (1997). Various floras were used to determine distributions of species not previously assigned element status, (Fernald, 1950; Gleason and Cronquist, 1963; GPFA, 1986; Hitchcock, 1971; Rydberg, 1932; USDA, NRCS, 2009).

RESULTS AND DISCUSSION

Plant Communities

The dominant plant communities at the Site can be divided into eight types: xeric tallgrass prairie, mesic mixed grassland, needle and threadgrass prairie, Great Plains riparian woodland, willow and wild indigo shrublands, tall upland shrubland, wetlands, and reclaimed grasslands.

Xeric tallgrass prairie. The xeric tallgrass prairie is considered to be a relict plant community from the last glaciation. This rare and unique prairie occurs only in a narrow band on the Colorado Piedmont, east of the mountain front in Colorado. The xeric tallgrass prairie on the Site, combined with that on City of Boulder Open Space to the west, is believed to be the largest remaining tract of this plant community in North America (CNHP, 1994, 1995). It covers approximately 733 ha (1,811 ac) at the Site and contains a unique mixture of tallgrass and montane species. Many of the tallgrass species are not commonly found between the mountain front and the true tallgrass prairie of the eastern Great Plains several hundred miles east. Dominant species within this community at the Site include *Andropogon gerardii* Vitman, *Muhlenbergia montana* (Nutt.) Hitchc., *Aster porteri* Gray, and *Poa*

compressa L. Other common species include *Stipa comata* Trin. & Rupr., *Sporobolus heterolepis* (A. Gray) A. Gray, *Andropogon scoparius* Michx., *Carex heliophila* Mack., *Liatris punctata* Hook., *Chrysopsis villosa* Pursh., *Arenaria fendleri* A. Gray, *Sorghastrum nutans* (L.) Nash, *Bouteloua gracilis* (H. B. K.) Lag ex Griffiths, and *Bouteloua curtipendula* (Michx.) Torr. Two rarer species found on the xeric tallgrass prairie include *Carex oreocharis* Holm. and *Stipa spartea* Trinius.

Mesic mixed grassland. The mesic mixed grassland covers the greatest area at the Site (approximately 896 ha [2,213 ac]) and is most abundant on the hillsides. It is classified by the presence of *Agropyron smithii* Rydb., *B. gracilis*, *B. curtipendula* and *B. japonicus* Thunb. ex Murr. Other common species include *Poa pratensis* L., *Stipa viridula* Trin., *Psoralea tenuiflora* Pursh, *Ratibida columnifera* (Nutt.) Woot. & Standl., and *Alyssum minus* (L.) Rothmaler var. *micranthus* (C. A. Mey.) Dudley.

Needle and threadgrass prairie. The needle and threadgrass prairie covers approximately 76 ha [189 ac] and is typically found on the eastern edges of the pediments. Dominant species are *Stipa comata*, and two exotic species, *Linaria dalmatica* (L.) Mill. and *B. japonicus*. Other commonly encountered species include *Stipa neomexicana* (Thur.) Scribn., *Poa pratensis*, *P. compressa*, *Yucca glauca* Nutt., *C. heliophila*, *B. gracilis*, *B. curtipendula*, and *A. minus*.

Great Plains riparian woodland. The Great Plains riparian woodland is found along reaches of all the streams at the Site and is classified primarily by the presence of a *Populus deltoides* Marsh. ssp. *monilifera* (Ait.) Eckenw. canopy. It only accounts for approximately 11 ha (28 ac) due to the intermittent and ephemeral nature of the streams at the Site. Other canopy species include *Populus angustifolia* James, *Salix amygdaloides* Anderss., and *Acer negundo* L. var. *interius* (Britt.) Sarg. The understory often contains *Salix exigua* Nutt. ssp. *exigua*, *Amorpha fruticosa* L., *Juncus balticus* Willd., *Cirsium arvense* (L.) Scop., *Bromus inermis* Leyss. ssp. *inermis*, *Carex nebrascensis* Dew., and a variety of other forbs and graminoids.

Willow and wild indigo shrublands. These shrublands are common along the streams in the valleys at the Site and often occur adjacent to the Great Plains riparian woodland. These shrublands cover approximately 17 ha (41 ac). They are classified by the presence of *S. exigua* and *A. fruticosa*, both of which can occur singly as dominants or together as co-dominants. Other common species include *J. balticus*, *C. arvense*, *C. nebrascensis*, *Typha latifolia* L., *Geranium caespitosum* James ssp. *caespitosum*, and *Agrostis stolonifera* L.

Tall upland shrubland. The tall upland shrubland is classified by the presence of *Prunus virginiana* L. var. *melanocarpa* (A. Nels.) Sarg., *Crataegus erythropoda* Ashe, and *Prunus americana* Marsh. These shrublands are considered unique to the Site and region, and they are found associated with the upper edges of hillside seep wetlands (CNHP, 1994). These often narrow, linear communities are common in the Rock Creek drainage on predominantly north-facing slopes at the Site. Although representing less than 1 percent of the total area of the Site (14 ha, 34 ac), more than 50 percent of the Site's flora is found in association with this community. Several plant species are found only associated with this community at the Site, including *Hydrophyllum fendleri* (Gray) Heller, *Osmorhiza chilensis* H. & A., *Osmorhiza longistylis* (Torr.) DC var. *longistylis*, *Smilax herbacea* L. var. *lasioneura* (Small) Rydb., *Viola rydbergii* Greene, *Viola scopulorum* (Gray) Greene, *Cystopteris fragilis* (L.) Bernh., *Physocarpus monogynus* (Torr.) Coult., *Lupinus argenteus* Pursh ssp. *ingratus* (Greene) Harmon, *Lupinus argenteus* Pursh var. *argenteus*, and *Agropyron griffithsii* Scribn. & Smith.

Wetlands. Wetlands at the Site are found along the streams and the hillside seep-fed wetlands on the north-facing slopes in the Rock Creek and Woman Creek drainages. The seeps emerge on the hillsides and form the wetlands at the juncture where the Rocky Flats Alluvium meets the bedrock. The wetlands cover approximately 165 ha (407 ac) at the Site. These wetlands are dominated by *J. balticus*, *C. arvense*, *Carex lanuginosa* Michx., and *T. latifolia*. Other common species include *Geum macrophyllum* Willd., *Barbarea vulgaris* R. Br., *C. nebrascensis*, *Asclepias incarnata* L., *Mentha arvensis* L., *Juncus longistylis* Torr., *Spartina pectinata* Link, and *Nasturtium officinale* R. Br.

Reclaimed grasslands. Two types of reclaimed grasslands occur at the Site. They are distinguished by the seed mixes that were used for reclamation. Areas seeded prior to the 1990s were seeded predominantly with exotic graminoid species and are dominated by *B. inermis* and *Agropyron intermedium* (Host) Beauv., with a few locations of *Agropyron cristatum* (L.) Gaertn. Little native vegetation is present at many of these reclaimed grasslands, even after more than a quarter-century (Nelson, 1999). These reclaimed areas account for approximately 261 ha (645 ac). Newly seeded reclamation grasslands have been seeded with native species, common to the native prairie communities at the Site. These areas are dominated by *Agropyron smithii*, *A. caninum* (L.) Beauv. ssp. *majus* (Vasey) C.L. Hitchc., *B. gracilis*, *B. curtipendula*, *Buchloe dactyloides* (Nutt.) Engelm., *A. gerardii*, *S. nutans*, and *Panicum virgatum* L. These areas cover approximately 263 ha (650 ac).

Floristics

The vascular flora of the Site consists of 630 species distributed across 84 families and 340 genera, including 5 pteridophytes, 5 gymnosperms, and 620 angiosperms. The checklist of the vascular flora of the Site is provided below. Seventy-six percent of the flora is composed of native species. The growth habits of the flora include 145 graminoids, 421 forbs, 32 shrubs, 24 trees, 6 cacti, and 2 vines. The plant families that contribute the greatest number of species to the flora are the Asteraceae (108 species), Poaceae (101 species), Fabaceae (34 species), Cyperaceae (31 species), Rosaceae (28 species), Brassicaceae (28 species), and Scrophulariaceae (24 species). Twelve species endemic to Colorado and the southern Rocky Mountains occur at the Site (Maley, 1994; Weber, 1976; Weber and Wittman, 1992): *A. porteri*, *Cryptantha virgata* (Porter) Payson, *Erigeron vetensis* Rydb., *Harbouria trachypleura* (Gray) C. & R., *Lithospermum multiflorum* Torr., *Penstemon secundiflorus* Benth., *Penstemon virens* Penn., *Penstemon virgatus* Gray ssp. *asa-grayi* Crosswhite, *Physaria vitulifera* Rydb., *Potentilla fissa* Nutt., *Scutellaria brittonii* Porter, and *Senecio fendleri* Gray.

No federally listed threatened or endangered plant species have been found at the Site; however, seven species of special concern

as listed by the CNHP are present (CNHP, 2009): *C. oreocharis*, *Aristida basiramea* Engelm. ex Vasey var. *basiramea*, *S. herbacea*, *Triodanis leptocarpa* (Nutt.) Nieuw., *Equisetum variegatum* Schleich., *Asclepias stenophylla* A. Gray, and *Amorpha nana* Nutt.

Phytogeography

The Site flora is predominantly Western North American in distribution (145 sp./23.0%; Table 1); however, the North American (89 sp./14.1%) and Great Plains (82 sp./13.8%) elements also contribute substantially to the flora. The high representation of Western North American and Great Plains elements is not unexpected given the ecotonal position of the Site at the juncture of the western prairie edge and foothills of the Rocky Mountains. One of the more interesting components of the Site flora is the Eastern North American element (31 sp./4.9%). It has been suggested that this element, comprising eastern woodland/prairie species, spread westward and contacted the Rocky Mountain region during the last glacial period (Weber 1965, 1976). These relict species remained in isolated refugia after the last ice age, in the cooler ravines and montane environments found in a narrow band along the eastern mountain front of Colorado. Many of the tallgrass prairie species found at the Site belong to this group, including *A. gerardii*, *A. scoparius*, *S. heterolepis*, *S. spartea*, and *S. nutans*. Other species at the Site that belong to this element include *Lobelia siphilitica* L. var. *ludoviciana* A. DC., *Ceanothus herbaceus* Raf. var. *pubescens* (T. & G.), *Agrimonia striata* Michx., *Helianthus rigidus* (Cass.) Desf. ssp. *subrhomboideus* (Rydb.) Heiser, and *Lysimachia ciliata* L. (Hogan, 1993; Maley, 1994; Weber, 1976).

One of the most striking discoveries of this study was that the Adventive element—both native and non-native species that prefer disturbed, weedy areas—contributed the highest number of species to the flora of the Site (166 sp./26.4%). The relatively high contribution of the Adventive element has also been documented in other recent regional floristic surveys. In the city of Boulder Mountain Parks, Hogan (1993) found that the Adventive element contributed 21.1% of the flora. Maley (1994) found that 17.3% of the flora of the Black Forest area between Denver and Colorado Springs came from the the Adventive element, while Clark found only a 12.9% contribution in the

Mesa de Maya region of southeastern Colorado. At higher elevations, the contribution of the Adventive element has been less than at lower elevations. In the Gore Range of central Colorado, Hogan (1992) reported the Adventive element contributed only 4% of the flora. In general, this would suggest that the percentage of Adventive element species in a local flora seems to be lower where there has been less impact from humans.

The significance of the Adventive element may be somewhat exaggerated, however, because species lists note only presence or absence, and do not provide any measure of abundance. Most of the Adventive element species at the Site do not occur in great numbers, and many are based on single collections. Several of these species have been found in recent years in the reclaimed grassland areas, most likely as seed mix contaminants. In most cases it is rare that they persist beyond one or two years. Some of the Adventive element species, however, present one of the greatest threats to, and challenges for management of the plant communities at the Site—noxious weeds. The noxious weeds that are currently problematic include *Centaurea diffusa* Lam., *C. arvensis*, *L. dalmatica* (L.) Mill., *Carduus nutans* L. ssp. *macrolepis* (Peterm.) Kazmi, *Euphorbia uralensis* Fisch. ex Link, *Onopordum acanthium* L., and *Verbascum thapsus* L.

CONCLUSIONS

The floristic richness at the Site is very high and diverse considering the relatively small size of the area. Much of this can be attributed to the ecotonal position of the Site at the juncture of the Great Plains and the foothills of the Rocky Mountains. The high representation of Western North American and Great Plains species supports this. The xeric tallgrass prairie, Great Plains riparian woodland, tall upland shrubland, and wetland communities and their respective floras found at the Site represent a rich heritage of what much of the Colorado Piedmont east of the mountain front in Colorado must have looked like in the past. This study documents the known vascular flora present at the Site and provides a baseline for future comparisons. As development and urbanization continue to transform the native landscape, areas like Rocky Flats continue to serve as refugia for plants and animals that were once much more common.

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Table 1. Phytogeographical element summary of the flora of the Rocky Flats area.

Phytogeographical Elements	Number of Species	Percent of Flora
Western North America (WNA)	145	23.0
North America (NA)	89	14.1
Great Plains (GP)	87	13.8
Eastern North America (ENA)	31	4.9
Southern Rocky Mountains (SR)	24	3.8
Circumpolar (C)	24	3.8
Southwestern North America (SNA)	23	3.7
Oroboreal (O)	17	2.7
Cosmopolitan (COS)	16	2.5
Western Hemisphere (WH)	8	1.3
Adventive (A)	166	26.4
Totals	630	100

CHECKLIST OF THE VASCULAR FLORA OF THE ROCKY FLATS AREA

Nomenclature follows GPFA (1986), Weber (1976), Weber (1990), Weber and Wittmann (2001), in that order of determination. The letters behind each species denote the phytogeographic element classification and follow the acronyms as defined in the text.

ACERACEAE

Acer glabrum Torr., WNA; *Acer negundo* L. var. *interius* (Britt.) Sarg., NA; *Acer platanoides* L., A

AGAVACEAE

Yucca glauca Nutt., GP

ALISMATACEAE

Alisma triviale Pursh, NA; *Sagittaria latifolia* Willd., NA

AMARANTHACEAE

Amaranthus albus L., NA; *Amaranthus graecizans* L., WNA; *Amaranthus retroflexus* L., A

ANACARDIACEAE

Rhus aromatica Ait. var. *trilobata* (Nutt.) A. Gray, WNA; *Toxicodendron rydbergii* (Small) Greene, NA

APIACEAE

Berula erecta (Huds.) Cov. var. *incisum*, NA; *Cicuta maculata* L. var. *angustifolia* Hook., NA; *Conium maculatum* L., A; *Daucus carota* L., A; *Harbouria trachypleura* (Gray) C. & R., SR; *Heracleum sphondylium* L. ssp. *montanum* (Schleich.) Briq., NA; *Ligusticum porteri* C. & R., SR; *Lomatium orientale* Coult. & Rose, GP; *Musineon divaricatum* (Pursh.) Nutt. var. *hookeri* T. & G., GP; *Osmorhiza chilensis* H. & A., O; *Osmorhiza longistylis* (Torr.) DC var. *longistylis*, O

APOCYNACEAE

Apocynum androsaemifolium L., NA; *Apocynum cannabinum* L., A

ASCLEPIADACEAE

Asclepias incarnata L., ENA; *Asclepias pumila* (Gray) Vail, GP;
Asclepias speciosa Torr., WNA; *Asclepias stenophylla* A. Gray, GP;
Asclepias viridiflora Raf., ENA

ASTERACEAE

Achillea millefolium L. ssp. *lanulosa* (Nutt.) Piper, WNA; *Agoseris glauca* (Pursh.) Dietr., WNA; *Ambrosia artemisiifolia* L., A; *Ambrosia psilostachya* DC., GP; *Ambrosia trifida* L., A; *Antennaria microphylla* Rydb., WNA; *Antennaria parvifolia* Nutt., WNA; *Anthemis cotula* L., A; *Arctium minus* Bernh., A; *Arnica fulgens* Pursh., WNA; *Artemisia campestris* L. ssp. *caudata* (Michx.) Hall & Clem., NA; *Artemisia dracunculus* L., WNA; *Artemisia frigida* Willd., NA; *Artemisia ludoviciana* Nutt. var. *ludoviciana*, NA; *Aster campestris* Nutt., WNA; *Aster falcatus* Lindl., WNA; *Aster fendleri* A. Gray, GP; *Aster hesperius* A. Gray var. *hesperius*, SNA; *Aster laevis* L. var. *geyeri* A. Gray, NA; *Aster porteri* Gray, SR; *Bidens cernua* L., A; *Bidens frondosa* L., A; *Carduus nutans* L. ssp. *macrolepis* (Peterm.) Kazmi, A; *Centaurea cyanus* L., A; *Centaurea diffusa* Lam., A; *Centaurea repens* L., A; *Centaurea solstitialis* L., A; *Chrysanthemum leucanthemum* L., A; *Chrysopsis fulcrata* Greene, WNA; *Chrysopsis villosa* Pursh., WNA; *Chrysanthamnus nauseosus* (Pall.) Britt. ssp. *graveolens* (Nutt.) Piper, WNA; *Chrysanthamnus nauseosus* (Pall.) Britt. ssp. *nauseosus*, WNA; *Cichorium intybus* L., A; *Cirsium arvense* (L.) Scop., A; *Cirsium flodmannii* (Rydb.) Arthur, GP; *Cirsium ochrocentrum* A. Gray, GP; *Cirsium undulatum* (Nutt.) Spreng., GP; *Cirsium vulgare* (Savi) Ten., A; *Conyza canadensis* (L.) Cronq., A; *Coreopsis tinctoria* Nutt., A; *Cosmos bipinnatus* Cav., A; *Crepis occidentalis* Nutt., WNA; *Crepis runcinata* (James) T. & G., WNA; *Dimorphotheca aurantiaca* D.C., A; *Dyssodia papposa* (Vent) Hitchc., NA; *Erigeron canus* A. Gray, GP; *Erigeron compositus* Pursh var. *dicoideus* A. Gray, WNA; *Erigeron divergens* T. & G., WNA; *Erigeron flagellaris* A. Gray, GP; *Erigeron pumilus* Nutt., WNA; *Erigeron speciosa* (Lindl.) DC. var. *macranthus* (Nutt.) Cronq., WNA; *Erigeron strigosus* Muhl. ex Willd., A; *Erigeron vetensis* Rydb., SR; *Gaillardia aristata* Pursh., WNA; *Gnaphalium chilense* Spreng., A; *Grindelia squarrosa* (Pursh.) Dun., GP; *Gutierrezia sarothrae* (Pursh.) Britt. & Rusby, WNA; *Haplopappus spinulosus* (Pursh) DC., GP; *Helianthus annuus* L., NA; *Helianthus ciliaris* DC., SNA; *Helianthus maximilianii* Schrad., GP;

Helianthus nuttallii T. & G., WNA; *Helianthus petiolaris* Nutt., GP; *Helianthus pumilus* Nutt., SR; *Helianthus rigidus* (Cass.) Desf. ssp. *subrhomboideus* (Rydb.) Heiser, GP; *Heliomeris multiflora* Nuttall, WNA; *Hymenopappus filifolius* Hook. var. *cinereus* (Rydb.) I. M. Johnst., GP; *Iva axillaris* Pursh., WNA; *Iva xanthifolia* Nutt., GP; *Kuhnia chlorolepis* Woot. & Standl., SNA; *Kuhnia eupatorioides* L., ENA; *Lactuca oblongifolia* Nutt., WNA; *Lactuca serriola* L., A; *Leucelene ericoides* (Torr.) Greene, WNA; *Liatris punctata* Hook., GP; *Lygodesmia juncea* (Pursh.) Hook., GP; *Machaeranthera bigelovii* (Gray) Greene, SNA; *Machaeranthera canescens* (Pursh) A. Gray, WNA; *Madia glomerata* Hook., O; *Microseris cuspidata* (Pursh.) Sch. Bip., GP; *Onopordum acanthium* L., A; *Picradeniopsis oppositifolia* (Nutt.) Rydb., GP; *Ratibida columnifera* (Nutt.) Woot. & Standl., GP; *Rudbeckia ampla* Nelson, ENA; *Scorzonera laciniata* L., A; *Senecio fendleri* Gray, SR; *Senecio integerrimus* Nutt., WNA; *Senecio plattensis* Nutt., GP; *Senecio spartioides* T. & G., WNA; *Senecio tridenticulatus* Rydb., WNA; *Solidago canadensis* L., NA; *Solidago gigantea* Ait., NA; *Solidago missouriensis* Nutt., WNA; *Solidago mollis* Bart., GP; *Solidago nana* Nutt., WNA; *Solidago rigida* L., ENA; *Sonchus arvensis* L. ssp. *uliginosus* (Bieb.) Nyman, A; *Sonchus asper* (L.) Hill, A; *Stephanomeria pauciflora* (Torr.) A. Nels., GP; *Taraxacum laevigatum* (Willd.) DC., A; *Taraxacum officinale* Weber, A; *Thelesperma megapotanicum* (Spreng.) O. Ktze., WH; *Townsendia grandiflora* (Nutt.), GP; *Townsendia hookeri* Beaman, GP; *Tragopogon dubius* Scop., A; *Tragopogon porrifolius* L., A; *Verbesina encelioides* (Cau) Benth. & Hook. ssp. *exauriculata* (Robins & Greenm.) Coleman, A; *Xanthium strumarium* L., A

BERBERIDACEAE

Berberis repens Lindl., WNA

BETULACEAE

Alnus incana (L.) Moench ssp. *tenuifolia* (Nuttall) Breitung, WNA;
Betula occidentalis Hook., WNA

BORAGINACEAE

Asperugo procumbens L., A; *Cryptantha virgata* (Porter) Payson, SR;
Cynoglossum officinale L., A; *Hackelia floribunda* (Lehm.) I. M. Johnst., WNA; *Lappula redowskii* (Hornem.) Greene, COS;

Lithospermum incisum Lehm., O; *Lithospermum multiflorum* Torr., SR; *Mertensia lanceolata* (Pursh.) A. DC., WNA; *Onosmodium molle* Michx. var. *occidentale* (Mack.) Johnst., GP; *Plagiobothrys scouleri* (H. & A.) I. M. Johnst., WNA

BRASSICACEAE

Alyssum alyssoides (L.) L., A; *Alyssum minus* (L.) Rothmaler var. *micranthus* (C. A. Mey.) Dudley, A; *Arabis fendleri* (S. Wats.) Greene var. *fendleri*, SNA; *Arabis glabra* (L.) Bernh., A; *Arabis hirsuta* (L.) Scop. var. *pyncocarpa* (Hopkins) Rollins, NA; *Barbarea vulgaris* R. Br., A; *Camelina microcarpa* Andr. ex DC., A; *Capsella bursa-pastoris* (L.) Medic., A; *Cardaria chalepensis* (L.) Hand-Mazz, A; *Cardaria draba* (L.) Desv., A; *Chorispora tenella* (Pall.) DC., A; *Conringia orientalis* (L.) Dum., A; *Descurainia pinnata* (Walt.) Britt., ENA; *Descurainia richardsonii* (Sweet) Schultz, O; *Descurainia sophia* (L.) Webb ex Prantl., A; *Draba nemorosa* L., A; *Draba reptans* (Lam.) Fern., NA; *Erysimum capitatum* (Nutt.) DC., WNA; *Erysimum repandum* L., A; *Hesperis matronalis* L., A; *Lepidium campestre* (L.) R. Br., A; *Lepidium densiflorum* Schrad., A; *Lesquerella montana* (A. Gray) Wats., GP; *Nasturtium officinale* R. Br., COS; *Physaria vitulifera* Rydb., SR; *Rorippa palustris* (L.) Bess. ssp. *hispida* (Desv.) Jonsell, WNA; *Sisymbrium altissimum* L., A; *Thlaspi arvense* L., A

CACTACEAE

Coryphantha missouriensis (Sweet) Britt. & Rose, GP; *Echinocereus viridiflorus* Engelm., GP; *Opuntia fragilis* (Nutt.) Haw., WNA; *Opuntia macrorhiza* Engelm., GP; *Opuntia polyacantha* Haw., GP; *Pediocactus simpsonii* (Engelm.) Britt. & Rose, WNA

CALLITRICHACEAE

Callitriche verna L., C

CAMPANULACEAE

Campanula rotundifolia L., C; *Lobelia siphilitica* L. var. *ludoviciana* A. DC., NA; *Triodanis leptocarpa* (Nutt.) Nieuw., GP; *Triodanis perfoliata* (L.) Nieuw., A

CANNABACEAE

Humulus lupulus L. var. *lupuloides* E. Small, SNA

CAPPARACEAE

Cleome serrulata Pursh., WNA; *Polansia dodecandra* (L.) DC. ssp. *trachysperma* (T. & G.) Iltis, WNA

CAPRIFOLIACEAE

Symphoricarpos occidentalis Hook., WNA; *Symphoricarpos oreophilus* Gray, WNA; *Viburnum opulus* L. var. *americanum* Ait, O

CARYOPHYLLACEAE

Arenaria fendleri A. Gray, SNA; *Cerastium arvense* L., C; *Cerastium brachypodum* (Engelm. ex A. Gray) Robins., NA; *Cerastium vulgatum* L., A; *Conosilene conica* (L.) Fourreau ssp. *conoidea* (L.) Love & Kjellqvist, A; *Gypsophila elegans* Bieb., A; *Paronychia jamesii* T. & G., GP; *Saponaria officinalis* L., A; *Silene antirrhina* L., A; *Silene drummondii* Hook., WNA; *Silene pratensis* (Raf.) Godr. & Gren, A; *Spergularia media* (L.) Presl., A; *Spergularia rubra* (L.) K. Presl., NA; *Stellaria longifolia* Muhl. ex Willd., C; *Vaccaria pyramidata* Medic., A

CERATOPHYLLACEAE

Ceratophyllum demersum L., C

CHENOPODIACEAE

Atriplex canescens (Pursh.) Nutt., WNA; *Chenopodium album* L., A; *Chenopodium atrovirens* Nutt., WNA; *Chenopodium berlandieri* Moq., NA; *Chenopodium botrys* L., A; *Chenopodium dessicatum* A. Nels., WNA; *Chenopodium fremontii* S. Wats., WNA; *Chenopodium glaucum* L., GP; *Chenopodium leptophyllum* Nutt. ex Moq., WNA; *Chenopodium overi* Aellen, WNA; *Kochia scoparia* (L.) Schrad., A; *Salsola iberica* Senn. & Pau., A

CLUSIACEAE

Hypericum majus (A. Gray) Britt., NA; *Hypericum perforatum* L., A

COMMELINACEAE

Tradescantia occidentalis (Britt.) Smyth, GP

CONVOLVULACEAE

Calystegia macounii (Greene) Brummitt, C; *Calystegia sepium* (L.) R. Br. ssp. *angulata* Brummitt, NA; *Convolvulus arvensis* L., A; *Evolvulus nuttallianus* R. & S., GP

CRASSULACEAE

Sedum lanceolatum Torr., WNA

CUPRESSACEAE

Juniperus communis L., C; *Juniperus scopulorum* Sarg., WNA

CUSCUTACEAE

Cuscuta approximata Bab., A

CYPERACEAE

Carex athrostachya Olney, WNA; *Carex aurea* Nutt., O; *Carex bebbii* (Bailey) Fern, O; *Carex brevior* (Dew.) Mack. ex Lunell., O; *Carex douglasii* F. Boott., WNA; *Carex eleocharis* Bailey, C; *Carex emoryi* Dew., ENA; *Carex filifolia* Nutt., WNA; *Carex heliophila* Mack., ENA; *Carex hystericina* Muhl. ex Willd., NA; *Carex interior* Bailey, NA; *Carex lanuginosa* Michx., NA; *Carex nebrascensis* Dew., WNA; *Carex oreocharis* Holm., SR; *Carex praegracilis* W. Boott., NA; *Carex rostrata* Stokes ex Willd., C; *Carex scoparia* Schkuhr. ex Willd., NA; *Carex simulata* Mack., WNA; *Carex stipata* Muhl., NA; *Carex vulpinoidea* Michx., NA; *Cyperus acuminatus* Torr. & Hook., NA; *Eleocharis acicularis* (L.) R. & S., C; *Eleocharis compressa* Sulliv., ENA; *Eleocharis macrostachya* Britt., COS; *Eleocharis obtusa* (Willd.) J.A. Schult., NA; *Eleocharis parvula* Link ex Boff. & Fingerbr. var. *anachaeta* (Torr.) Svens., WH; *Scirpus acutus* Muhl., NA; *Scirpus maritimus* L. var. *paludosus* (A. Nels.) Kukenth., COS; *Scirpus pallidus* (Britt.) Fern, NA; *Scirpus pungens* Vahl, NA; *Scirpus validus* Vahl., NA

ELAEAGNACEAE

Elaeagnus angustifolia L., A

EQUISETACEAE

Equisetum arvense L., COS; *Equisetum laevigatum* A. Br., NA; *Equisetum variegatum* Schleich., NA

EUPHORBIACEAE

Euphorbia dentata Michx., NA; *Euphorbia fendleri* T. & G., WNA; *Euphorbia marginata* Pursh., GP; *Euphorbia robusta* (Engelm.) Small, GP; *Euphorbia serpyllifolia* Pers., A; *Euphorbia spathulata* Lam., WNA; *Euphorbia uralensis* Fisch. ex Link, A; *Tragia ramosa* Nutt., WNA

FABACEAE

Amorpha fruticosa L., NA; *Amorpha nana* Nutt., GP; *Astragalus adsurgens* Pall. var. *robustior* Hook., WNA; *Astragalus agrestis* Dougl. ex G. Don, WNA; *Astragalus bisulcatus* (Hook.) A. Gray, GP; *Astragalus canadensis* L., NA; *Astragalus crassicaulus* Nutt., GP; *Astragalus drummondii* Dougl. ex Hook., NA; *Astragalus flexuosus* (Hook.) G. Don, GP; *Astragalus lotiflorus* Hook., GP; *Astragalus parryi* Gray, SR; *Astragalus shortianus* Nutt. ex T.&G., SR; *Astragalus spathulatus* Sheld., GP; *Astragalus tridactylus* Gray, GP; *Coronilla varia* L., A; *Dalea candida* Michx. ex Willd. var. *oligophylla* (Torr.) Shinn., GP; *Dalea purpurea* Vent, GP; *Glycyrrhiza lepidota* Pursh., WNA; *Lathyrus eucosmus* Butters and St. John, SNA; *Lotus corniculatus* L., A; *Lupinus argenteus* Pursh ssp. *ingratus* (Greene) Harmon, SR; *Lupinus argenteus* Pursh var. *argenteus*, WNA; *Medicago lupulina* L., A; *Medicago sativa* L. ssp. *sativa*, A; *Melilotus alba* Medic., A; *Melilotus officinalis* (L.) Pall., A; *Oxytropis lambertii* Pursh., GP; *Psoralea tenuiflora* Pursh., GP; *Robinia pseudoacacia* L., ENA; *Thermopsis rhombifolia* var. *divaricata* (Nels.) Isely, SR; *Trifolium hybridum* L., A; *Trifolium pratense* L., A; *Trifolium repens* L., A; *Vicia americana* Muhl. ex Willd., NA

FUMARIACEAE

Fumaria vaillantii Lois, A

GENTIANACEAE

Gentiana affinis Griseb., WNA; *Swertia radiata* (Kell.) O. Ktze., WNA

GERANIACEAE

Erodium cicutarium (L.) L'Her., A; *Geranium caespitosum* James ssp. *caespitosum*, SNA

GROSSULARIACEAE

Ribes aureum Pursh, WNA; *Ribes cereum* Dougl., WNA; *Ribes inerme* Rydb., WNA

HALORAGACEAE

Myriophyllum exalbescent Fern., NA

HYDROPHYLLACEAE

Hydrophyllum fendleri (Gray) Heller, WNA; *Phacelia heterophylla* Pursh., WNA

IRIDACEAE

Iris missouriensis Nutt., WNA; *Sisyrinchium montanum* Greene, O

JUNCACEAE

Juncus articulatus L., C; *Juncus balticus* Willd., WNA; *Juncus bufonius* L., COS; *Juncus dudleyi* Wieg., NA; *Juncus ensifolius* Wikst. var. *montanus* (Englm.) C. L. Hitchc., WNA; *Juncus interior* Wieg., GP; *Juncus longistylis* Torr., WNA; *Juncus nodosus* L., GP; *Juncus torreyi* Cov., NA; *Juncus tracyi* Rydb., WNA

JUNCAGINACEAE

Triglochin maritima L., NA

LAMIACEAE

Dracocephalum parviflorum Nutt., NA; *Hedeoma hispidum* Pursh., ENA; *Lycopus americanus* Muhl. ex Barton, NA; *Lycopus asper* Greene, GP; *Marrubium vulgare* L., A; *Mentha arvensis* L., COS; *Monarda fistulosa* L. var. *menthifolia* (Grah.) Fern., GP; *Monarda pectinata* Nutt., SNA; *Nepeta cataria* L., A; *Prunella vulgaris* L., COS; *Salvia reflexa* Hornem., GP; *Scutellaria brittonii* Porter, SR; *Stachys palustris* L. ssp. *pilosa* (Nutt.) Epling, O

LEMNACEAE

Lemna minor L., COS

LILIACEAE

Allium cernuum Roth, NA; *Allium geyeri* S. Wats., WNA; *Allium textile* A. Nels. & Macbr., GP; *Asparagus officinalis* L., A; *Calochortus*

gunnisonii S. Wats., WNA; *Leucocrinum montanum* Nutt., WNA; *Smilacina stellata* (L.) Desf., NA; *Zigadenus venenosus* Wats. var. *gramineus* (Rydb.) Walsh ex Peck, WNA

LINACEAE

Linum perenne L. var. *lewisii* (Pursh.) Eat. & Wright, WNA; *Linum pratense* (Nort.) Small, WNA; *Linum puberulum* (Englem.) Heller, SNA

LYTHRACEAE

Ammannia robusta Herr & Regel., NA; *Lythrum alatum* Pursh., ENA

MALVACEAE

Malva neglecta Wallr., A; *Sidalcea candida* Gray, WNA; *Sidalcea neomexicana* Gray, WNA; *Sphaeralcea coccinea* (Pursh.) Rydb., GP; *Sphaeralcea parvifolia* A. Nelson, A

NYCTAGINACEAE

Mirabilis hirsuta (Pursh.) MacM., GP; *Mirabilis linearis* (Pursh.) Heimerl, GP; *Mirabilis nyctaginea* (Michx.) MacM., GP

OLEACEAE

Fraxinus pennsylvanica Marsh, A

ONAGRACEAE

Calylophus serrulatus (Nutt.) Raven, GP; *Epilobium ciliatum* Raf. ssp. *glandulosum* (Lehm.) Hock & Raven, NA; *Epilobium paniculatum* Nutt., WNA; *Gaura coccinea* Pursh., WNA; *Gaura parviflora* Dougl., WNA; *Oenothera albicaulis* Pursh, GP; *Oenothera flava* (A. Nels.) Garrett, WNA; *Oenothera howardii* (A. Nels.) W. L. Wagner, GP; *Oenothera villosa* Thunb. ssp. *strigosa* (Rydb.) Dietrich & Raven, WNA

ORCHIDACEAE

Habenaria hyperborea (L.) R. Br., O

OROBANCHACEAE

Orobanche fasciculata Nutt., WNA

OXALIDACEAE

Oxalis dillenii Jacq., COS

PAPAVERACEAE

Argemone polyanthemus (Fedde) G. Ownbey, GP; *Eschscholzia californica* Chamisso, A; *Papaver rhoeas* L., A

PINACEAE

Picea pungens Engelm., SR; *Pinus ponderosa* Laws, WNA; *Pseudotsuga menziesii* (Mirb.) Franco, WNA

PLANTAGINACE

Plantago lanceolata L., A; *Plantago major* L., A; *Plantago patagonica* Jacq., A

POACEAE

Aegilops cylindrica Host, A; *Agropyron caninum* (L.) Beauv. ssp. *majus* (Vasey) C. L. Hitchc., NA; *Agropyron cristatum* (L.) Gaertn., A; *Agropyron dasystachyum* (Hook.) Scribn., GP; *Agropyron desertorum* (Fisch.) Schult., A; *Agropyron elongatum* (Host) Beauv., A; *Agropyron griffithsii* Scribn. & Smith, WNA; *Agropyron intermedium* (Host) Beauv., A; *Agropyron repens* (L.) Beauv., A; *Agropyron smithii* Rydb., NA; *Agropyron spicatum* (Pursh) Scribn. and Sm., WNA; *Agrostis scabra* Willd., NA; *Agrostis stolonifera* L., A; *Alopecurus geniculatus* L., C; *Andropogon gerardii* Vitman, ENA; *Andropogon saccharoides* Sw. var. *torreyanus* (Steud.) Hack., A; *Andropogon scoparius* Michx., ENA; *Apera interrupta* (L.) Beauvois, A; *Aristida basiramea* Engelm. ex Vasey var. *basiramea*, GP; *Aristida purpurea* Nutt. var. *longiseta* (Steud.) Vasey, WNA; *Aristida purpurea* Nutt. var. *robusta* (Merrill) A. Holmgren & N. Holmgr, WNA; *Avena fatua* var. *sativa* (L.) Hausskn., A; *Bouteloua curtipendula* (Michx.) Torr., NA; *Bouteloua gracilis* (H. B. K.) Lag ex Griffiths, WNA; *Bouteloua hirsuta* Lag, GP; *Bromus briziformis* F. & M., A; *Bromus inermis* Leyss. ssp. *inermis*, A; *Bromus japonicus* Thunb. ex Murr., A; *Bromus tectorum* L., A; *Buchloe dactyloides* (Nutt.) Engelm., GP; *Calamagrostis stricta* (Timm.) Koel, C; *Cenchrus longispinus* (Hack.) Fern, WH; *Ceratochloa marginata* (Nees ex Stued.) Jackson, WNA; *Chloris virgata* Sw., GP; *Cynodon dactylon* (L.) Pers., A; *Dactylis glomerata* L., A; *Danthonia spicata* (L.) Beauv. ex R. & S., NA; *Dichanthelium*

linearifolium (Scribn.) Gould, ENA; *Dichantherium oligosanthes* (Schultz) Gould var. *scribnerianum* (Nash) G, NA; *Digitaria sanguinalis* (L.) Scop., A; *Distichlis spicata* (L.) Greene var. *stricta* (Torr.) Beetle, WH; *Echinochloa crus-galli* (L.) Beauv., A; *Elymus canadensis* L., NA; *Elymus junceus* Fisch., A; *Eragrostis cilianensis* (All.) E. Mosher, A; *Eragrostis curvula* (Schrad.) Nees, A; *Eragrostis minor* Host, A; *Eragrostis pilosa* (L.) Beauv., A; *Eragrostis trichodes* (Nutt.) Wood, GP; *Festuca octoflora* Walt., NA; *Festuca ovina* L. var. *rydbergii* St. Yves, C; *Festuca pratensis* Huds., A; *Glyceria grandis* S. Wats. ex A. Gray, C; *Glyceria striata* (Lam.) Hitchc., NA; *Hordeum brachyantherum* Nevski, O; *Hordeum jubatum* L., COS; *Hordeum pusillum* Nutt., NA; *Koeleria pyramidata* (Lam.) Beauv., NA; *Leersia oryzoides* (L.) Sw., A; *Leptochloa fascicularis* (Lam.) A. Gray, WH; *Lolium perenne* L. var. *aristatum* Willd., A; *Lolium perenne* L. var. *perenne*, A; *Lycurus phleoides* H.B.K., SNA; *Muhlenbergia asperifolia* (Nees. & Mey.) Parodi, WNA; *Muhlenbergia filiformis* (Thurb.) Rydb., GP; *Muhlenbergia montana* (Nutt.) Hitchc., WNA; *Muhlenbergia racemosa* (Michx.) B. S. P., GP; *Muhlenbergia wrightii* Vasey, SNA; *Oryzopsis hymenoides* (R. & S.) Ricker, WNA; *Panicum capillare* L., A; *Panicum dichotomiflorum* Michx., NA; *Panicum virgatum* L., ENA; *Phalaris arundinacea* L., C; *Phleum pratense* L., A; *Phragmites australis* (Cav.) Trin. ex Steud., COS; *Poa bulbosa* L., A; *Poa canbyi* (Scribn.) Piper, O; *Poa compressa* L., A; *Poa fendleriana* (Steud.) Vasey, WNA; *Poa juncifolia* Scribn., WNA; *Poa palustris* L., C; *Poa pratensis* L., A; *Polypogon monspeliensis* (L.) Desf., A; *Schedonnardus paniculatus* (Nutt.) Trel., WH; *Secale cereale* L., A; *Setaria viridis* (L.) Beauv., A; *Sitanion hystrix* (Nutt.) Sm. var. *brevifolium* (Sm.) Hitchc., WNA; *Sorghastrum nutans* (L.) Nash, ENA; *Spartina pectinata* Link, NA; *Sphenopholis obtusata* (Michx.) Scribn., NA; *Sporobolus asper* (Michx.) Kunth, ENA; *Sporobolus cryptandrus* (Torr.) A. Gray, NA; *Sporobolus heterolepis* (A. Gray) A. Gray, ENA; *Sporobolus neglectus* Nash, ENA; *Stipa comata* Trin. & Rupr., WNA; *Stipa neomexicana* (Thur.) Scribn., SNA; *Stipa robusta* (Vasey) Scribn., SR; *Stipa spartea* Trinius, ENA; *Stipa viridula* Trin., GP; *Triticum aestivum* L., A; *X Agrohordeum macounii* (Vasey) Lepage, A

POLEMONIACEAE

Collomia linearis Nutt., WNA; *Gilia opthalmoides* Brand. ssp. *clokeyi* (Mason) A. & V. Grant, WNA; *Ipomopsis spicata* (Nutt.) V. Grant ssp.

spicata, WNA; *Microsteris gracilis* (Hook.) Greene, WNA; *Navarretia minima* Nutt., WNA

POLYGONACEAE

Eriogonum alatum Torr., WNA; *Eriogonum effusum* Nutt., GP; *Eriogonum jamesii* Benth., SNA; *Eriogonum umbellatum* Torr., WNA; *Polygonum arenastrum* Jord. ex Bor., A; *Polygonum convolvulus* L., A; *Polygonum douglasii* Greene, WNA; *Polygonum hydropiper* L., A; *Polygonum lapathifolium* L., A; *Polygonum pennsylvanicum* L., A; *Polygonum persicaria* L., A; *Polygonum ramosissimum* Michx., A; *Polygonum sawatchense* Small, WNA; *Rumex acetosella* L., A; *Rumex crispus* L., A; *Rumex maritimus* L., WH; *Rumex obtusifolius* L., A; *Rumex salicifolius* Weinm. ssp. *triangulivalvis* Danser, NA

POLYPODIACEAE

Cystopteris fragilis (L.) Bernh., COS

PORTULACACEAE

Claytonia rosea Rydb., WNA; *Portulaca oleracea* L., A; *Talinum parviflorum* Nutt., GP

POTAMOGETONACEAE

Potamogeton foliosus Raf., NA; *Potamogeton natans* L., C

PRIMULACEAE

Androsace occidentalis Pursh., WNA; *Dodecatheon pulchellum* (Raf.) Merrill, WNA; *Lysimachia ciliata* L., NA

RANUNCULACEAE

Anemone cylindrica A. Gray, O; *Anemone patens* L., C; *Clematis hirsutissima* Pursh, WNA; *Clematis ligusticifolia* Nutt., WNA; *Delphinium nuttalianum* Pritz. ex Walpers, WNA; *Delphinium virescens* Nutt. ssp. *penardii* (Huth) Ewan, GP; *Myosurus minimus* L., COS; *Ranunculus macounii* Britt., NA; *Ranunculus scleratus* L., A; *Ranunculus trichophyllus* Chaix, C; *Thalictrum dasycarpum* Fisch. & Ave-Lall, NA

RHAMNACEAE

Ceanothus fendleri A. Gray, SNA; *Ceanothus herbaceus* Raf. var. *pubescens* (T. & G.), ENA

ROSACEAE

Agrimonia striata Michx., ENA; *Amelanchier alnifolia* Nutt., WNA; *Crataegus erythropoda* Ashe, SR; *Crataegus succulenta* Link var. *occidentalis* (Britton) E. J. Palm., GP; *Geum aleppicum* Jacq., NA; *Geum macrophyllum* Willd., NA; *Physocarpus monogynus* (Torr.) Coult., SR; *Physocarpus opulifolius* (L.) Raf., ENA; *Potentilla arguta* Pursh, NA; *Potentilla fissa* Nutt., SR; *Potentilla gracilis* Dougl. ex Hook. var. *glabrata* (Lehm.) C. L. Hitchc., WNA; *Potentilla hippiana* Lehm., WNA; *Potentilla norvegica* L., C; *Potentilla paradoxa* Nutt., NA; *Potentilla pensylvanica* L., WNA; *Potentilla pulcherrima x hippiana*, WNA; *Potentilla rivalis* Nutt., WNA; *Prunus americana* Marsh., ENA; *Prunus pumila* L. var. *besseyi* (Bailey) Gl., GP; *Prunus virginiana* L. var. *melanocarpa* (A. Nels.) Sarg., NA; *Pyrus malus* L., A; *Rosa acicularis* Lindl., C; *Rosa arkansana* Porter, ENA; *Rosa woodsii* Lindl., WNA; *Rubus deliciosus* Torr., SNA; *Rubus idaeus* L. ssp. *sachalinensis* (Levl.) Focke var. *sachalinensis*, C; *Sanguisorba minor* Scop., A; *Sorbus scopulina* Greene, WNA

RUBIACEAE

Galium aparine L., A; *Galium septentrionale* Roemer & Schultes, C

SALICACEAE

Populus alba L., A; *Populus angustifolia* James, WNA; *Populus deltoides* Marsh. ssp. *monilifera* (Ait.) Eckenw., ENA; *Populus x acuminata* Rydb., GP; *Salix amygdaloides* Anderss., NA; *Salix exigua* Nutt. ssp. *exigua*, NA; *Salix exigua* Nutt. ssp. *interior* (Rowlee) Cronq., NA; *Salix fragilis* L., A; *Salix irrorata* Andersson, SNA; *Salix lutea* Nutt., WNA

SANTALACEAE

Comandra umbellata (L.) Nutt., WNA

SAXIFRAGACEAE

Heuchera parvifolia Nutt. ex T. & G., WNA; *Saxifraga rhomboidea* Greene, WNA

SCROPHULARIACEAE

Castilleja integra A. Gray, SNA; *Castilleja sessiliflora* Pursh., GP;
Collinsia parviflora Dougl. ex Lindl., WNA; *Gratiola neglecta* Torr.,
NA; *Limosella aquatica* L., O; *Linaria canadensis* (L.) Dum. var.
texana (Scheele) Penn., NA; *Linaria dalmatica* (L.) Mill., A; *Linaria*
vulgaris Hill, A; *Mimulus floribundus* Dougl. ex Lindl., WNA;
Mimulus glabratus H. B. K. var. *fremontii* (Benth.) A. L. Grant, WH;
Penstemon albidus Nutt., GP; *Penstemon eatonii* A. Gray var. *eatonii*,
A; *Penstemon palmeri* A. Gray, A; *Penstemon secundiflorus* Benth.,
SR; *Penstemon strictus* Benth. in De Candolle, SR; *Penstemon virens*
Penn., SR; *Penstemon virgatus* Gray ssp. *asa-grayi* Crosswhite, SR;
Scrophularia lanceolata Pursh., O; *Verbascum blattaria* L., A;
Verbascum thapsus L., A; *Veronica americana* (Raf.) Schwein. ex
Benth., NA; *Veronica anagallis-aquatica* L., A; *Veronica catenata*
Penn., A; *Veronica peregrina* L. var. *xalapensis* (H. B. K.) St. John &
Warren, A

SELAGINELLACEAE

Selaginella densa Rydb., WNA

SMILACACEAE

Smilax herbacea L. var. *lasioneura* (Small) Rydb., ENA

SOLANACEAE

Physalis heterophylla Nees, ENA; *Physalis pumila* Nutt. ssp. *hispida*
(Waterfall) Hinton, GP; *Physalis virginiana* P. Mill., ENA; *Quincula*
lobata (Torr.) Raf., SNA; *Solanum rostratum* Dun., A; *Solanum*
triflorum Nutt., SNA

TAMARICACEAE

Tamarix ramosissima Ledeb., A

TYPHACEAE

Typha angustifolia L., COS; *Typha latifolia* L., COS

ULMACEAE

Ulmus pumila L., A

URTICACEAE

Parietaria pensylvanica Muhl. ex Willd., NA; *Urtica dioica* L. ssp. *gracilis* (Ait.) Seland., NA

VERBENACEAE

Lippia cuneifolia (Torr.) Steud., WNA; *Verbena bipinnatifida* Nutt., SNA; *Verbena bracteata* Lag. & Rodr., A; *Verbena hastata* L., NA

VIOLACEAE

Hybanthus verticillatus (Ort.) Baill., GP; *Viola nuttallii* Pursh., WNA; *Viola rydbergii* Greene, WNA; *Viola scopulorum* (Gray) Greene, SNA; *Viola sororia* Willd., GP

VITACEAE

Vitis riparia Michx., ENA

ZYGOPHYLLACEAE

Tribulus terrestris L., A;