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PLANTS OF THE FLORISSANT FOSSIL BEDS NATIONAL MONUMENT

Mary E. Edwards & William A. Weber

Bulletin No. 2
Pikes Peak Research Station
Colorado Outdoor Education Center
Florissant, CO 80816
1990

Edwards & Weber 1990

PIKES PEAK RESEARCH STATION

COLORADO OUTDOOR
EDUCATION CENTER
FLORISSANT, COLORADO 80816

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Pikes Peak Research Station is a nonprofit organization dedicated to promoting the understanding of the natural world through research and education. Actively engaged in interdisciplinary research on the ecosystems of the Pikes Peak region, PPRS is a part of Colorado Outdoor Education Center, a pioneer in nature programs for all ages since 1962.

COVER ILLUSTRATION
Mariposa Lily
Calochortus Gunnisonii

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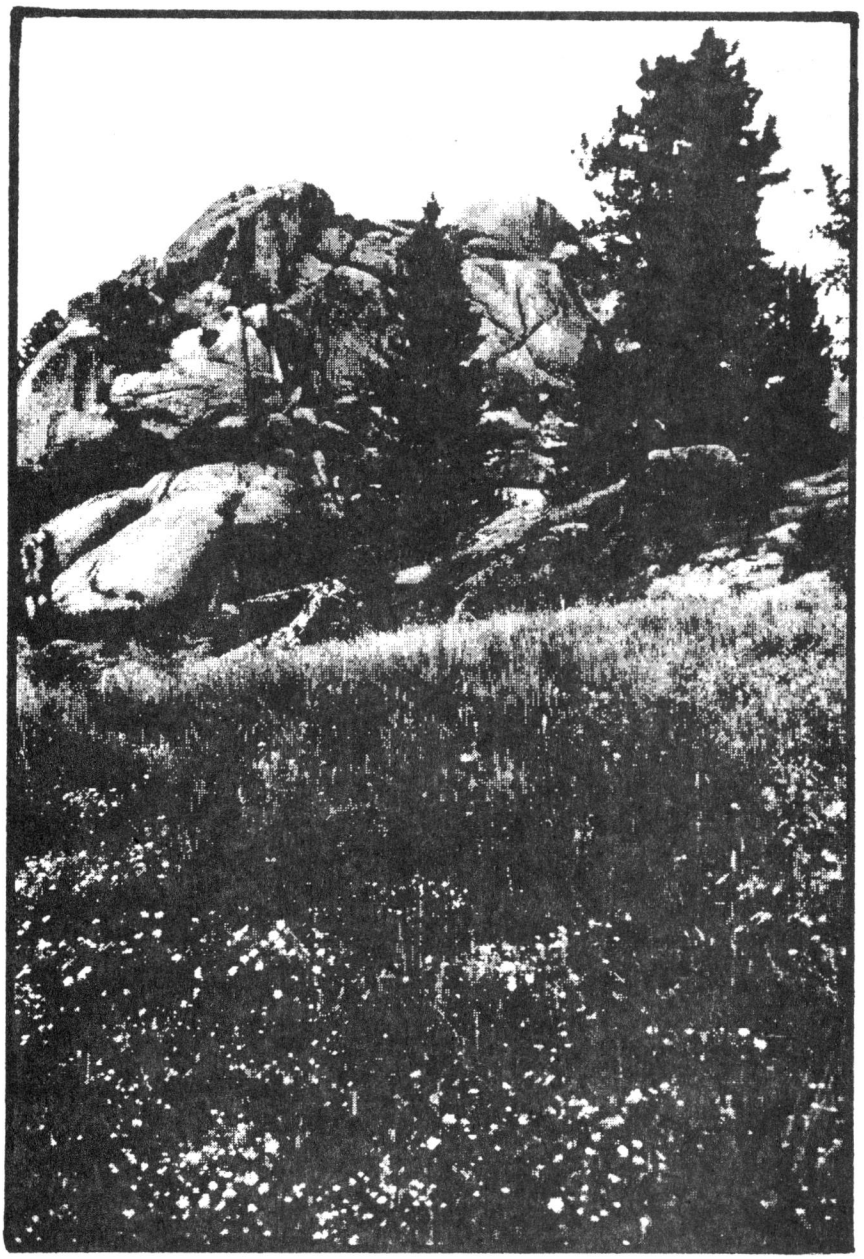

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PREFACE

Plants manage the business of life from a fixed spot. What animals achieve by active movement plants must accomplish by adaptive form. The feather-like stigmas of a grass flower filter the air for floating pollen; a dandelion with tiny paratroopers establishes a new beachhead; and a mountain mahogany seed drills itself by hygroscopic movement through the leaf litter on an arid hillside. These examples illustrate plant-life's shrewd mastery of the environment.

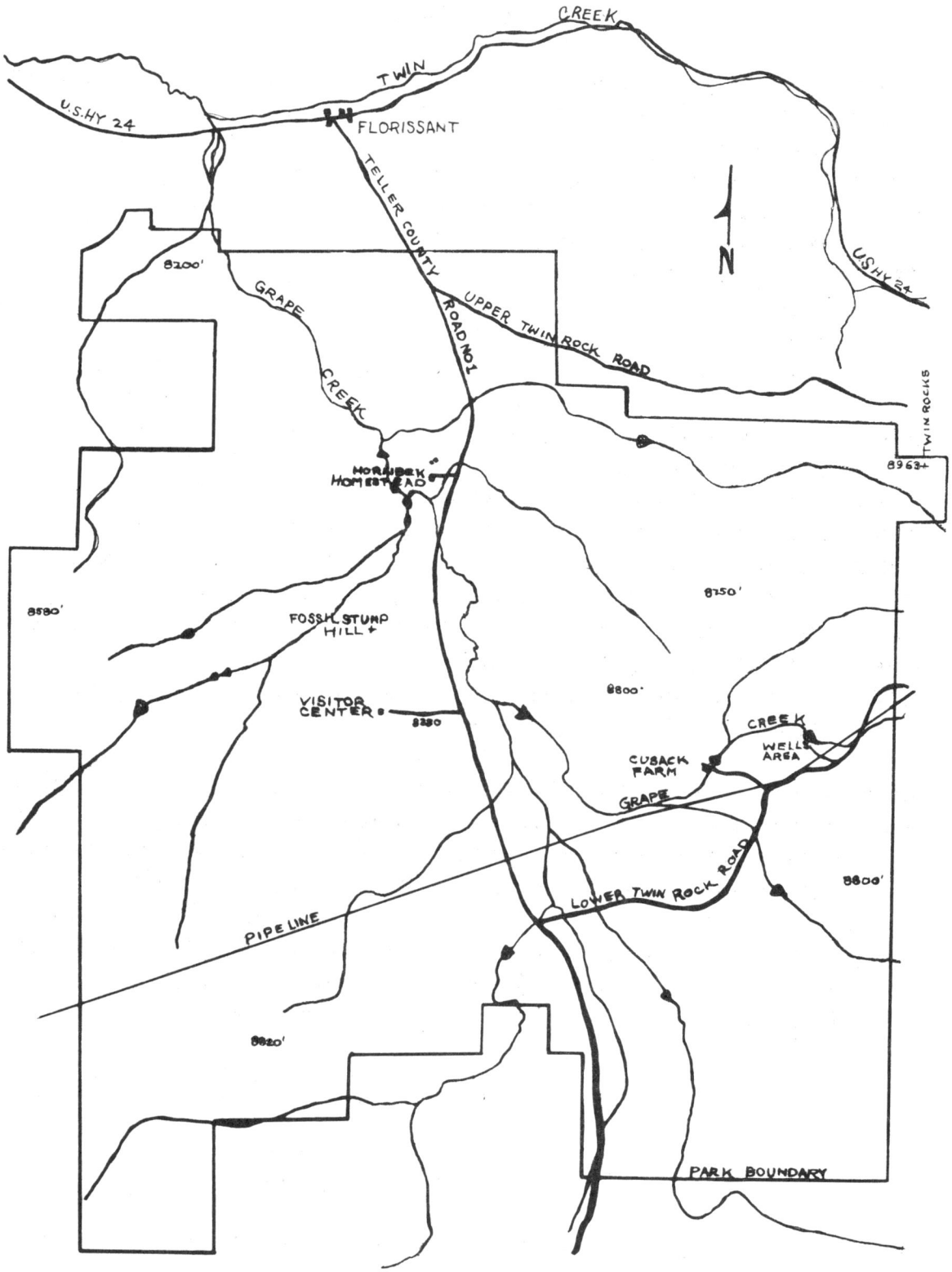
Plants are highly sensitive to their surroundings. From their small fortresses they must endure the coldest temperatures, the strongest winds, the longest drought, fire, and the attacks of predators. Because of their sensitivity, plants are the best indicators of environmental conditions. The shade of a branch, reflection from a rock, or burrowing of a gopher may have drastic effects. By observing vegetation closely we may determine the depth and reliability of the water table, the strength and direction of winds and the haunts, numbers and types of animals in an area. We may also discover the long forgotten business of man--an old road is now a gully; a line of bushes marks a decayed fenceline; a scarred pine trunk reveals an indian campsite.

Once again we are struck by the interrelatedness of all life, both past and present, and its effect upon the future. We hope the following lists, used together with the herbarium of the Florissant Fossil beds can help us understand more about the incredible happenings that can be seen and understood when our consciousness is free and finely tuned. No matter how we care to divide the phenomena of life, regardless of the names we choose to give species, each individual adds to the wondrous variety of the whole.

Frederick E. Sanborn
Director,
Colorado Outdoor
Education Center

"I believe a leaf of grass is no less than the journeywork of the stars."

Walt Whitman



FLORISSANT FOSSIL BEDS NATIONAL MONUMENT

TELLER COUNTY COLORADO

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PLANTS OF FLORISSANT FOSSIL BEDS NATIONAL MONUMENT

by Mary E. Edwards & William A. Weber

Introduction

The beautifully preserved Oligocene plant and insect fossils found near Florissant, Teller County, Colorado, are famous throughout the world. Although they were known much earlier by ranchers, specimens were first collected by Theodore L. Mead, a young student at Cornell University, who brought them, in 1871, to the attention of the paleoentomologist Samuel Scudder of Harvard. The specimens were first described by A. C. Peale, geologist with the U. S. Geological Survey and the Hayden Survey of 1874. However, the present-day flora was not investigated until much later.

In August, 1905, Dr. Francis Ramaley, plant ecologist at the University of Colorado, made the first collections of the modern Florissant flora. His specimens and field notebooks are housed at the University of Colorado Herbarium (COLO) at Boulder, and a duplicate set of specimens is at the Rocky Mountain Herbarium (RM) at Laramie, Wyoming. In the 1930's, 1940's and early 1950's, Dr. C. W. T. Penland, botanist at Colorado College, Colorado Springs, and his colleague, Dr. John B. Hartwell, a prominent Colorado Springs surgeon, did some collecting in Teller County. Ramaley wrote a short paper (Ramaley 1906) describing the Florissant area and listing the species of his collections. He intended to write a detailed, formal report, but, unfortunately, never did.

In 1981 The Colorado Native Plant Society (CONPS) was asked by Dr. F. Martin Brown, on behalf of the National Park Service, to begin a long-term inventory and to make an herbarium for the Florissant Fossil Beds National Monument. This project lasted from the summer of 1981 through 1988. An herbarium of about 1,000 specimens representing about 430 taxa was presented to the Monument in 1987. Because of lack of space at the Monument, the herbarium is temporarily housed at Pikes Peak Research Station of the Colorado Outdoor Education Center located five miles southwest of the Monument. Herbarium COLO has the first duplicate set, and the Denver Botanical Garden's Kathryn Kalmbach Herbarium has a partial set.

The Colorado Native Plant Society wishes to acknowledge the tremendous help it has received from many sources without which the project would not have succeeded, and to thank the following people: Dr. F. Martin Brown, entomologist, naturalist and head emeritus, Fountain Valley School Science Department, Colorado Springs, who inspired the project; Thomas Wylie, Roger Martin and Robert Reyes, Monument superintendents, and members of their staffs for their assistance, interest and gracious hospitality; Gary Waggoner, National Park Service botanist, for his valuable help, and Dr. Boyce A. Drummond, director of Pikes Peak Research Station, who has been most thoughtful and cooperative in making the herbarium available.

Last, but far from least, a special acknowledgement and thanks is extended to all of the members of CONPS who helped with collecting, mounting of plants, filing, and a myriad of other chores; to Velma Richards for suggestions, editing and proofreading; and to Leslie Shader for his many hours of computing in preparation of plant lists. The Florissant Committee in charge of the project comprised: Ann Armstrong, Athalie Barzee, Ann Cooper, Miriam Denham, Mary Edwards, Lloyd Hayes, Diana Mullineaux, Velma Richards, Peter Root, Rick Sanborn, Leslie Shader, Eleanor von Bargen, and Janet Wingate. The project was enthusiastically supported by the entire membership of CONPS.

The Florissant Fossil Beds

By an Act of Congress on August 20, 1969, 5,992.5 acres of the ancient Lake Florissant basin and surroundings became Florissant Fossil Beds National Monument. The Monument lies 35 miles west of Colorado Springs in Teller County, one half mile south of US Hwy. 24 and the town of Florissant. County Road, Teller 1, bisects the Monument from north to south; Upper Twin Rock Road crosses the northeast corner, while Lower Twin Rock Road crosses the southeastern section. The monument is surrounded by privately-owned land in small ranches and subdivisions. The western boundary of the Monument is less than a mile from the Pike National Forest boundary.

The geology of the Florissant area begins with a huge Pre-Cambrian batholith of Pikes Peak Granite, which formed well below the earth's surface just over one billion years ago. This uplifted mass of coarse-grained pink crystalline rock extends over a wide area and forms the basement layer under the Monument; it also forms the core of Pikes Peak (14,108 ft.), the dominant feature of the landscape 15 miles to the east. Weathered rounded boulders, outcrops, and coarse gravels of this ancient granite are evident on the low Florissant hills today.

Rocks formed in this region after Pre-Cambrian times were weathered away, creating a geological gap, or unconformity, between Pikes Peak Granite and rocks formed during the Tertiary period. Thirty-five million years ago, in the early Oligocene Epoch, a series of violent volcanic eruptions in the Thirtynine Mile volcanic field near Guffy, 15 miles southwest of the Monument, covered a broad area, including the Florissant Basin, with volcanic debris consisting of massive mudflows, breccia, tuffs, and ash. Fossilized stumps of an extinct species of giant sequoia seen today are remnants of an ancient buried forest.

Later in the Oligocene, mud and lava, flowing from the Guffy volcanoes across the south end of the Florissant Basin, blocked south-flowing streams and created a narrow lake approximately ten miles long and two miles wide. Ancient Lake Florissant extended from just south of the present-day Monument boundary almost to present-day Lake George at its north end. The climate during this period was warm-temperate and fairly dry, much like that of the present Monterey region of northeastern Mexico. A forest of mixed conifers and hardwoods grew along the streams and lake shore of the Basin, consisting of white cedar, *Chamaecyparis* and giant sequoia, *Sequoioxylon pearsallii*, as well as ancestral species of ash, maple, elm, poplar, and other deciduous trees. A dry scrub forest of pine and live-oak covered the higher ground.

Subsequently, during intermittent eruptions over a period of a hundred thousand years or more, volcanic ash and dust drifted over Lake Florissant, trapping plant parts and insects in layer upon layer of thin sediments. These fine-grained shale layers, containing delicate, often carbonized, fossils are known as the Florissant "paper shales." Following the deposition of the shales, continuing massive mud and ash flows capped the shale layers in many places. This hard caprock helped to preserve the easily-eroded shales during the subsequent uplift of the region. Remnants of these Oligocene volcanic deposits form scattered outcrops on hills surrounding Florissant today (MacGinitie 1953).

When ancient Lake Florissant was formed, 35 million years ago, elevation may have been as low as 2,800 ft. above sea level. As the modern Rocky Mountains began to rise in the Laramide orogeny starting about 65 million years ago, erosion was occurring at the same time, forming an apron of debris around mountaintops. Erosion cut into the granite of the peaks, scouring them down until a relatively flat, undulating surface, the Tertiary Pediment (sometimes called the Rocky Mountain Peneplain) remained. This is visible along the Front Range between 8,000 and 9,000 ft. above sea level, in broad, rolling uplands, evident in the Florissant area today. Beginning about 29 million years ago, the

While farming and ranching had the biggest impact on the Florissant area, lumbering was very important to the lives of early settlers. The remnants of a small local sawmill can be seen today a short distance southwest of the Visitor Center. An early photograph taken by Ramaley shows a rather barren scene of downed trees and stumps.

Over many years, the rich treasure of fossil plants and insects in the Florissant Shales was collected by scientists and exploited by land-owners for profit. The small building occupied today by the Monument Headquarters and Visitor Center was, until the early 1960's, a part of a tourist enterprise called the "Pike Petrified Forest" and, under another owner, the "Henderson Petrified Forest". After much effort on the part of state and local citizens, Florissant Fossil Beds National Monument became a reality in 1969.

Present-day Plant Distribution

Vegetational habitats in the Florissant area can be divided roughly into five kinds: broad dry meadows or grasslands; low rolling hills with open stands of ponderosa pine (*Pinus ponderosa*); riparian and other wetland communities along the streams; dry rocky slopes and ridges; and disturbed, ruderal sites.

Broad dry meadows or grasslands

Flat dry grasslands with extensions into the surrounding low hills mark the ancient Lake Florissant basin and make up the major land areas of the Monument. The plant cover here is low shrubs, grasses, and annual or perennial herbs. As has been noted, the Florissant area is dry compared with areas of similar elevation farther north {partly due to the extreme porosity of the friable Pikes Peak Granite which weathers to coarse gravel}. This is evident in the composition of the grassland vegetation.

A number of low shrubby species, most of them composites (Asteraceae) are characteristic of desert-steppe. Some of these are the rabbitbrushes, *Chrysothamnus viscidiflorus* and *C. parryi*; gumweed, *Grindelia subalpina*; snakeweed, *Gutierrezia sarothrae*; silver sagebrush, *Artemisia frigida*; prairie sage, *A. ludoviciana*; horsebrush, *Tetradymia canescens*; and Colorado rubber plant, *Picradenia richardsonii*.

Among the numerous species of grasses, some of the most common are Arizona fescue, *Festuca arizonica*; mountain muhly, *Muhlenbergia montana*; blue grama, *Bouteloua gracilis*; needle-and-thread, *Stipa comata*; sleepygrass, *S. robusta*; pine dropseed, *Blepharoneuron tricholepis*; nodding brome, *Bromopsis porteri*; smooth brome, *B. inermis*; squirreltail, *Elymus longifolius*; and oatgrass, *Danthonia parryi*.

Varying with the season a variety of herbs occur. Some of the more conspicuous are golden-aster, *Heterotheca fulcrata*; ragwort, *Packera tridenticulata*; miner's candle, *Oreocarya virgata*; wallflower, *Erysimum capitatum*; mariposa, *Calochortus gunnisonii*; paintbrush, *Castilleja integra*; owl-clover, *Orthocarpus luteus*; penstemon, *Penstemon virgatus ssp. asagrayi*; flax, *Adenolinum lewisii*; daisy, *Erigeron vetensis*; and ground plum, *Astragalus crassicarpus*.

Low rolling wooded hills

The dry grassland community gives way to low forested hills covered with open stands of ponderosa pine. In fact, nearly 90 per cent of the forested area of the Monument is ponderosa pine interspersed with small aspen groves, *Populus tremuloides*. Grassy openings give the hills a park-like appearance. The bunch grasses, *Festuca arizonica* and *Muhlenbergia montana*, which are subclimax species in the Pikes Peak region, are the most common understory species. Other common grasses are muttongrass, *Poa fendleriana*; Junegrass, *Koeleria macrantha*; and *Elymus longifolius*.

In grassy openings, the most abundant herbs are puccoon, *Lithospermum multiflorum*; *Packera fendleri*; scarlet gilia, *Ipomopsis aggregata*; loco, *Oxytropis lambertii* and *O. splendens*; and less common but very showy, scarlet penstemon, *Penstemon barbatus*.

Small aspen groves occur in moister parts of the ponderosa woodland and on north-facing slopes and streamsides. Characteristic of this habitat are the Colorado columbine, *Aquilegia coerulea*; daisy, *Erigeron formosissimus*; gentianella, *Gentianella acuta*; elk thistle, *Cirsium coloradense*; and wild rose, *Rosa woodsii*. Douglas-fir, *Pseudotsuga menziesii*, is usually present on rocky north-facing slopes where the soil is cooler the microclimate more mesic. Tall shrubs, such as choke-cherry, *Padus virginiana*; and mountain maple, *Acer glabrum*, are often found here. Understory plants are typical of cool, shaded places: lousewort, *Pedicularis procera*; bearberry, *Arctostaphylos adenotricha*; pyrolas, *Pyrola rotundifolia* and *Orthilia secunda*; twinflower, *Linnaea borealis*; and larkspur, *Delphinium ramosum*.

Wetland or riparian communities

Wetland communities are of five types: forested corridors along small streams, open wet meadows near streams and ponds, marshy areas, mud flats, and standing or flowing water.

There are several narrow valleys in which there are small streams; in these the tree canopy is dense, with birch, *Betula fontinalis*; alder, *Alnus incana*; balsam poplar, *Populus balsamifera*; Colorado blue spruce, *Picea pungens*; and douglas-fir. Tall shrubs such as chokecherries and willows are common. Characteristic low shrubs include *Rosa woodsii*; red osier, *Swida sericea*; and bush-honeysuckle, *Distegia involucrata*. Occasionally one meets with the tall herb, baneberry, *Actaea spicata*.

Grasses commonly found include manna-grass, *Glyceria maxima*; and tufted hairgrass, *Deschampsia cespitosa*. Sedges are abundant, including *Carex utriculata*, *C. simulata*, and spike-rush, *Eleocharis palustris*. Characteristic herbs include blue-eyed-grass, *Sisyrinchium montanum*; angelica, *Angelica ampla*; hemlock parsley, *Conioselinum*; chiming bells, *Mertensia ciliata*; and monkshood, *Aconitum columbianum*.

In the more open valleys, the sandbar willow, *Salix exigua*, is abundant on streamsides. Wide areas of seasonally wet meadows line Grape Creek as it winds across the Monument. Smaller but similar sites occur along some of the smaller tributaries. Among the common grasses of this habitat are foxtail barley, *Critesion jubatum*; timothy, *Phleum pratense*; Kentucky bluegrass, *Poa pratensis*; redtop, *Agrostis gigantea*; and sweetgrass, *Hierochloë hirta*. Common low shrubs and herbs include shrubby fivefinger, *Pentaphylloides floribunda*; silverweed, *Argentina anserina*; black-eyed Susan, *Rudbeckia hirta*; and checker mallow, *Sidalcea neomexicana*.

Where the water table is at or near the surface along streams or around stock ponds, there are wide expanses of marshy meadow. Dominant here are the sedges *Carex utriculata*, *C. nebrascensis*, and bands of the dark green rush, *Juncus arcticus*. Common grasses include canary-grass, *Phalaroides arundinacea*; reedgrass, *Calamagrostis canadensis*; foxtail, *Alopecurus aequalis*; and ticklegrass, *Agrostis scabra*.

Herbs common in the marshy meadows are scouring-rush, *Hippochaete laevigata*; water-hemlock, *Cicuta douglasii*; dock, *Rumex densiflorus*; iris, *Iris missouriensis*; *Ligularia bigelovii*; chickweed, *Stellaria longifolia*; and bedstraw, *Galium trifidum*. On drying muddy shores of streams and ponds, mudwort, *Limosella aquatica*; and water starwort, *Callitriche verna*, are often abundant. Cudweed, *Filaginella uliginosa*, frequently occurs here also.

Old stock ponds and slow streams support some aquatic plants. Each stock pond tends to contain a slightly different plant association. A pond east of the Cusack farm hosts water milfoil, *Myriophyllum sibiricum*; and water crowfoot, *Batrachium trichophyllum*. *Callitriche hermaphroditica* and *Batrachium* are found at another site, while a third pond where the water level had fallen rapidly has no evidence of any aquatic plants. A large stock pond on Grape Creek contains a pondweed, *Potamogeton berchtoldii*. *Batrachium* is common in slow streams throughout the Monument.

Dry rocky slopes and ridges

These areas usually are crowned with outcrops of granite boulders or volcanic rocks. The soils in general are porous and coarse-textured. Piñon pine, *Pinus edulis*, occasionally occurs on the summits, along with limber pine, *Pinus flexilis*. Bristlecone pine, *P. aristata* is found in two locations. One small stand is on the west end of Fossil Stump Hill on a dry, steep, west-facing slope; a second one is located in the same general area but on the east side of Grape Creek.

Mountain mahogany, *Cercocarpus montanus*, is an abundant shrub on many south or west-facing slopes. Waxflower, *Jamesia americana*, and Boulder raspberry, *Oreobatus deliciosus*, occur on dry slopes among boulders where moisture accumulates.

Herbs often found in this habitat include golden smoke, *Corydalis aurea*; cinquefoil, *Potentilla hippiana*; and saxifrage, *Micranthes rhomboidea*. *Tetraneuris brevifolia*, while not common on the Monument, is locally abundant in several areas. It is typically an alpine species, unusual to find at Florissant. Mountain ball cactus, *Pediocactus simpsonii*, is abundant on gravelly south-facing slopes. Some of the most common grasses are Arizona fescue, *Festuca arizonica*; and the muhlys, *Muhlenbergia montana*, *M. filiculmis*, and *M. richardsonis*.

Disturbed or ruderal areas

These include roadsides, old fields, eroded sites, space around buildings, and denuded floodplains. Adventive taxa dominate these sites and include yellow sweet-clover, *Melilotus officinalis*; pigweed, *Chenopodium berlandieri*; Canada thistle, *Cirsium arvense*; and knotweed, *Polygonum arenastrum*. Russian pigweed, *Axyris amaranthoides*, an adventive from southwest Asia, not seen until a few years ago, is now found in fields and dry meadows throughout the monument. It has been present in the north end of South Park for many years.

A sixty-six-foot wide right-of-way owned by the Homestake Municipal Waterline crosses the lower half of the Monument diagonally. After construction, in the early 1960's, this was planted with smooth brome, *Bromopsis inermis*, which now forms a nearly solid swath across the Monument from west to east.

On both sides of Lower Twin Rock Road there are large sections of land that were cultivated for seed potatoes in the 1930's, and the old terraces are still visible. This land appears to be undergoing weedy stages of succession, but it was not studied by CONPS, nor has there been any special effort to collect plants here. There are numerous grasses and other herbaceous plants, one of the most showy and common being mountain pepper-grass, *Lepidium montanum* ssp. *alyssoides*, noted by Ramaley as being an abundant and striking plant.

Plant Geography

The Southern Rocky Mountains have been called a crossroads of plant migration, taking place over millions of years. Certain groups characteristic of the Great Basin

reach their eastern limits along the flanks of the Rockies. Species characteristic of the eastern woodlands and prairies abutted against the mountains during the Pleistocene and were isolated in relictual pockets during the desiccation of the High Plains, and ancient connections are evident between our flora and that of Middle and southwest Asia. Genera present in the fossil record of the Oligocene at Florissant and Creede still flourish here (Weber 1965, 1976, 1987).

From the standpoint of the modern Florissant flora, the fossil discoveries reported by MacGinitie (1953) from Florissant and by Stewart (1940) from Creede, demonstrate that the modern flora still possesses elements of the Tertiary one. Stewart reported leaf impressions of *Jamesia*, and fossils of taxa comparable to the modern *Populus acuminata*, *Ribes coloradense*, *Mahonia*, *Cercocarpus*, and *Sabina*. MacGinitie reported *Pinus florissantii* (*aff. P. ponderosa*), *Populus crassa* (*aff. P. angustifolia*), *Salix taxifolioides* (*aff. S. exigua*), as well as the genera *Quercus*, *Rosa*, *Acer*, and *Humulus* (incorrectly listed as *Vitis*). Other genera, such as *Platanus*, *Carpinus*, and *Cercis* have since retreated southward into southern Arizona and Mexico. Many other genera no longer exist, or are now restricted to eastern Asia, and, of course, the giant *Sequoioxylon pearsallii* (*Sequoia affinis*), seen as great stumps at Florissant, is extinct.

At Florissant, the following species may be said to have a high probability of being relictual since the Tertiary: *Jamesia americana*, *Oreobatus deliciosus*, *Harbouria trachypleura*, *Aletes anisatus*, *Asplenium septentrionale*, and *Dryopteris filix-mas*. *Mahonia repens*, inexplicably, has not been found here.

Taxa belonging to the eastern woodland and prairie element include lousewort, *Pedicularis canadensis*. This has been found in several locations where it grows abundantly on cool, moist, northeast-facing slopes in mixed forest.

The rarest species on the Monument also belongs to the woodland-prairie group. The white upland aster, *Unamia alba*, is listed by the Colorado Natural Heritage Inventory as a "species of special concern". So far three thriving populations have been found. *Unamia* occurs in grassy openings at the edge of moist aspen groves on gentle northeast-facing slopes. It is associated with low-altitude grassland species such as *Festuca arizonica*, *Castilleja integra*, and *Orthocarpus luteus*, although in a more mesic site the low goldenrod, *Solidago nana*, and *Gentianella acuta* occur with it. Blooming time is late July and August.

In southern Colorado, the unpredictability of wet and dry seasons results in rather great temporary changes in the flora as seen from year to year. New disturbances result in new immigrant weed species. A single season, or a few seasons of inventory activity do not guarantee a comprehensive catalog of a local flora. The following catalog of plants is representative and exhaustive but probably not complete; future collectors are encouraged to add to it.

Key to the Habitats

For the sake of brevity, the habitats in which the plants listed below are generally to be found are abbreviated, e.g. 3C, meaning in marshy areas. A key to these habitat types follows.

1. Broad, dry meadows or grasslands.
   A. Probable former lake bed.
2. Rolling wooded parkland
   A. Open ponderosa pine forest
   B. Aspen groves
   C. Shaded north-facing slopes, mixed woods

3. Riparian and other wetland communities
   A. Wooded streamsides (riparian)
   B. Open wet or moist meadows near streams or ponds
   C. Marshy areas
   D. Mud flats
   E. Aquatic habitats (floating or submerged)
4. Dry rocky slopes and ridges
   A. South or southwest-facing slopes
   B. North or northwest-facing slopes
5. Ruderal sites (disturbed areas, old fields, roadsides, eroded areas, compacted ground and floodplains)

CHECK LIST OF VASCULAR PLANTS

Note: The names follow Wittmann, Weber & Johnston (1989) *Catalog of the Colorado Flora.* Commonly used names for the same taxa are enclosed in square brackets; these are not always true synonyms. Introduced taxa have the abbreviation ADV (adventive) following the name. The three-letter acronym following the family name is a useful short reference to the family (Weber 1982). Vernacular names follow the scientific names when available; new vernacular names are not coined.

PTERIDOPHYTES

ASPIDIACEAE - SHIELD-FERN FAMILY (ASD)

Dryopteris filix-mas (L.) Schott, Male Fern (4B)

ASPLENIACEAE - SPLEENWORT FAMILY (ASL)

Asplenium septentrionale (L.) Hoffmann, Grass Fern (4A, 4B)
Asplenium trichomanes L., Maidenhair Spleenwort (4B)

ATHYRIACEAE - LADY FERN FAMILY (ATY)

Cystopteris fragilis (L.) Bernh., Brittle Fern (3A, 4B)
Cystopteris reevesiana Lellinger (3A)

EQUISETACEAE - HORSETAIL FAMILY (EQU)

Equisetum arvense L., Horsetail (3A,B)
Hippochaete laevigata (A. Braun) Farwell [*Equisetum*], Scouring-rush (3B)

SELAGINELLACEAE - LITTLE CLUB-MOSS FAMILY (SEL)

Selaginella densa Rydberg (4B)
Selaginella underwoodii Hieronymus (2C)

SINOPTERIDACEAE - LIP FERN FAMILY (SIN)

Cheilanthes cancellata Mickel [*Notholaena fendleri*], Zigzag Cloak Fern (4A)
Cheilanthes fendleri Hooker, Fendler's Lip Fern (4A)

GYMNOSPERMS

CUPRESSACEAE - CYPRESS FAMILY (CUP)

Juniperus communis L. ssp **alpina** (J. E. Smith) Celak., Common Juniper (4A,B)
Sabina scopulorum (Sargent) Rydberg [*Juniperus*], Rocky Mountain Red Cedar (2B)

PINACEAE - PINE FAMILY (PIN)

Picea pungens Engelmann, Colorado Blue Spruce (2C, 3A)
Pinus aristata Engelmann, Bristlecone Pine (4A)
Pinus contorta Douglas ssp **latifolia** (Engelmann) Critchfield was reported by Ramaley without locality.

Pinus edulis Engelmann, Piñon Pine (4A)
Pinus flexilis James, Limber Pine (2A, 4A)
Pinus ponderosa Douglas *ex* P. & C. Lawson ssp **scopulorum**, Ponderosa Pine (S. Watson) W. A. Weber (4A)
Pseudotsuga menziesii (Mirbel) Franco [*P. taxifolia*], Douglas-fir (2A)

ANGIOSPERMS (MONOCOTS AND DICOTS)

ACERACEAE - MAPLE FAMILY (ACE)

Acer glabrum Torrey, Mountain Maple (2C)

AGAVACEAE - AGAVE FAMILY (AGA)

Yucca glauca Nuttall, Spanish Bayonet (4A)

ALLIACEAE - ONION FAMILY (ALL)

Allium cernuum Roth, Nodding Onion (1, 2A, 4A)
Allium geyeri S. Watson (3B)

ALSINACEAE - CHICKWEED FAMILY (ASN)

Cerastium strictum L. [*C. arvense*], Mouse-ear (3B)
Eremogone fendleri (Gray) Ikonnikov [*Arenaria*], Sandwort (1, 2A, 4A, 4B)
Moehringia lateriflora (L.) Fenzl [*Arenaria*] (3A)
Paronychia sessiliflora Nuttall, Nailwort (4A)
Spergulastrum lanuginosum Michaux ssp **saxosum** (A. Gray) W. A. Weber [*Arenaria*] (4A,B)
Stellaria longifolia Mühl. *ex* Willd., Chickweed (3A, 3B)

AMARANTHACEAE - AMARANTH FAMILY (AMA)

Amaranthus retroflexus L.: ADV (5)

APIACEAE - PARSLEY FAMILY (API)

Aletes anisatus (A. Gray) Theobald & Tseng (4A)
Angelica ampla A. Nelson (3B)
Cicuta douglasii (DC.) C. & R., Water-hemlock (3C)
Conioselinum scopulorum (A. Gray) C. & R., Hemlock Parsley (3A)
Harbouria trachypleura (A. Gray) C. & R., Whisk-broom Parsley (1)
Heracleum sphondylium L. ssp. **montanum** (Schleicher ex Gaudin) Briquet in Schinz & Thellung, Cow Parsnip (3C)
Pseudocymopterus montanus (A. Gray) C. & R., Mountain Parsley (1, 2C)

APOCYNACEAE - DOGBANE FAMILY (APO)

Apocynum androsaemifolium L., Spreading Dogbane (4A)

ASCLEPIADACEAE - MILKWEED FAMILY (ASC)

Asclepias hallii A. Gray (5)

ASTERACEAE - SUNFLOWER FAMILY (AST)

Achillea lanulosa Nuttall, Yarrow (1, 2C)
Agoseris aurantiaca (Hooker) Greene (3B)
Agoseris glauca (Pursh) Raf. var **dasycephala** (T. & G.) Jepson (3B)
Antennaria microphylla Rydberg, Pussytoes (1)
Antennaria parvifolia Nuttall (1, 2C, 3B, 4A)
Antennaria pulcherrima (Hooker) Greene ssp **anaphaloides** (Rydberg) W. A. Weber (4B)
Artemisia biennis Willd., Biennial Wormwood: ADV (3B)
Artemisia carruthii Wood (4A)
Artemisia frigida Willd., Silver Sagebrush (1, 2A, 4A)
Artemisia ludoviciana Nuttall, Prairie Sage (1)
Artemisia ludoviciana Nuttall ssp **incompta** (Nuttall) Keck (4A)
Aster adscendens Lindley in DC. [*A. chilensis*] (1, 4A, 5)
Aster hesperius A. Gray (3B)
Aster porteri A. Gray (2A, 2C)
Bahia dissecta (A. Gray) Britton (2A, 4A, 5)
Bidens tenuisecta A. Gray, Spanish Needles (5)
Brickellia grandiflora (Hooker) Nuttall, Tasselflower (2A)
Carduus nutans L. ssp. **macrolepis** (Peterman) Kazmi, Musk Thistle: ADV (4A)
Centaurea dealbata Willd.: ADV (2C)
Chaenactis douglasii (Hooker) H. & A., Dusty Maiden (4A)
Chrysothamnus parryi (A. Gray) Greene, Rabbitbrush (4A, 5)
Chrysothamnus viscidiflorus (Hooker) Nuttall (1, 5)
Cirsium arvense (L.) Scopoli, Canada Thistle: ADV (3B)
Cirsium canescens Nuttall (5)
Cirsium coloradense (Rydberg) Ckll. (3B)
Cirsium incanum (S. G. Gmelin) Bieb. [*C. arvense var.*]: ADV (3B)
Cirsium ochrocentrum A. Gray was reported by Ramaley.
Cyclachaena xanthifolia (Nuttall) Fresen [*Iva*], Marsh-elder (5)
Erigeron canus A. Gray, Fleabane (1)
Erigeron compositus Pursh (4A)
Erigeron flagellaris A. Gray (1, 4A, 4B, 5)
Erigeron formosissimus Greene (2B, 3B)
Erigeron lonchophyllus Hooker (3C)
Erigeron subtrinervis Rydberg *ex* Porter & Britton (4B)
Erigeron vetensis Rydberg (4A, 5)
Filaginella uliginosa (L.) Opiz [*Gnaphalium*], Cudweed (3B, 3C)
Grindelia subalpina Greene, Gumweed (1)
Gutierrezia sarothrae (Pursh) Britton & Rusby, Snakeweed (5)
Helianthella parryi A. Gray (2A, 2C)
Helianthus annuus L., Common Sunflower (5)
Helianthus petiolaris Nuttall (5)
Heterotheca fulcrata (Greene) Shinners [*Chrysopsis*], Golden Aster (1A, 5)
Heterotheca horrida (Rydberg) V. Harms [*Chrysopsis*] (4A)
Hymenopappus newberryi (A. Gray) I. M. Johnston [*Leucampyx*] (2A)
Lactuca tatarica (L.) C. A. Meyer ssp **pulchella** (Pursh) Stebbins (1)
Lepidotheca suaveolens Nuttall [*Matricaria matricarioides*], Pineappleweed (5)
Ligularia bigelovii (A. Gray) W. A. Weber var **hallii** (A. Gray) W. A. Weber [*Senecio*] (3B)
Lygodesmia juncea (Pursh) Hooker, Skeletonweed (4A, 5)
Machaeranthera pattersonii (A. Gray) Greene [*Aster*], Tansy Aster (2A, 5)
Oligosporus campestris (L.) Cassini ssp **pacificus** (Nuttall) W. A. Weber [*Artemisia*] (1, 2C)
Oreochrysum parryi (A. Gray) Rydberg [*Haplopappus, Solidago*] (2C)
Packera cana (Hooker) Weber & Löve [*Senecio*] (1)
Packera fendleri (A. Gray) Weber & Löve [*Senecio*] (2A)
Packera neomexicana (A. Gray) Weber & Löve [*Senecio*] (2C)

Packera pseudaurea (Rydberg) Weber & Löve [*Senecio*] (3B)
Packera tridenticulata (Rydberg) Weber & Löve [*Senecio*] (1, 2A, 3B)
Picradenia richardsonii Hooker [*Hymenoxys*], Colorado Rubber Plant (1, 2A, 4A)
Psilochenia runcinata (James *ex* Torrey) Löve & Löve [*Crepis*], Hawksbeard (2B, 3B)
Ratibida columnifera (Nuttall) Wooton & Standley, Prairie Cone-flower (3B)
Rudbeckia hirta L., Black-eyed Susan (1, 2b, 3b)
Senecio eremophilus Rydberg ssp **kingii** (Rydberg) Douglas & Douglas, Ragwort, (3B, 4A)
Senecio spartioides T. & G., Broom Senecio (1, 2A)
Solidago canadensis L., Goldenrod (3B)
Solidago missouriensis Nuttall (3B)
Solidago nana Nuttall (2B)
Solidago spathulata DC. var **neomexicana** (A. Gray) Cronquist (2C)
Symphyotrichum laeve (L.) Löve & Löve [*Aster*] (2B, 3B)
Taraxacum officinale G. H. Weber in Wiggers, Dandelion: ADV (3B, 5)
Tetradymia canescens DC., Horsebrush (1, 4A)
Tetraneuris brevifolia Greene [*Hymenoxys acaulis* var. *caespitosa*] (4B)
Townsendia exscapa (Richardson) Porter, Easter Daisy (2A)
Tragopogon dubius Scopoli ssp **major** (Jacquin) Vollmann, Salsify: ADV (1)
Unamia alba (Nuttall) Rydberg [*Aster ptarmicoides*], White Upland Aster (2B)
Virgulus falcatus (Lindley) Reveal & Keener [*Aster*] (5)
Ximenesia encelioides Cav. [*Verbesina*], Crownbeard: ADV (5)

BETULACEAE - BIRCH FAMILY (BET)

Alnus incana (L.) Moench ssp **tenuifolia** (Nuttall) Breitung, Alder (3A)
Betula fontinalis Sargent [*B. occidentalis*], River Birch (3A)

BORAGINACEAE - BORAGE FAMILY (BOR)

Hackelia floribunda (Lehmann) I. M. Johnston, False Forget-me-not (2A, 3B)
Lappula redowskii (Hornemann) Greene, Stickseed (3B, 5)
Lithospermum multiflorum Torrey *ex* A. Gray (2A,B,C)
Mertensia ciliata (James *ex* Torrey) G. Don, Chiming Bells (3B)
Mertensia lanceolata (Pursh) A. DC. (1, 2C)
Oreocarya thyrsiflora Greene [*Cryptantha*] (1, 4A)
Oreocarya virgata (Porter) Greene [*Cryptantha*], Miner's Candle (4A)

BRASSICACEAE - MUSTARD FAMILY (BRA)

Arabis hirsuta (L.) Scopoli, Hairy Rock Cress (1)
Armoracia rusticana GMS, Horseradish: ADV (5)
Boechera drummondii (A. Gray) Löve & Löve [*Arabis*], Rock Cress (1, 2A, 4A)
Boechera fendleri (S. Watson) W. A. Weber [*Arabis*] (1, 2A)
Camelina microcarpa Andrz. *ex* DC., False Flax: ADV (5)
Cardaria draba (L.) Desvaux, Whiteweed. Not collected, but a dense stand seen along a trail about a mile WSW of Headquarters.
Descurainia pinnata (Walter) Britton (5)
Descurainia richardsonii (Sweet) O. E. Schulz, Tansy Mustard (5)
Descurainia sophia (L.) Webb *ex* Prantl: ADV (5)
Draba aurea M. Vahl *ex* Hornemann, Whitlow-wort (1, 2A,C)
Draba nemorosa L.: ADV (3B, 4A)
Draba rectifructa C. L. Hitchcock (5)
Draba streptocarpa A. Gray (1, 2A, 4A)
Erysimum capitatum (Douglas) Greene, Wallflower (1, 4A)
Lepidium montanum Nuttall ssp **alyssoides** (A. Gray) C. L. Hitchcock, Pepper-grass (1, 5)
Lepidium ramosissimum A. Nelson (5)

Lesquerella montana (A. Gray) S. Watson, Bladder-pod (1A, 4A)
Noccaea montana (L.) F. K. Meyer, Wild Candytuft [*Thlaspi*] (4B, 5)
Rorippa curvipes Greene var **alpina** (S. Watson) Stuckey, Yellow Cress (3D)
Rorippa palustris (L.) Besser ssp **hispida** (Desvaux) Jonsell (3C)
Rorippa teres (Michaux) Stuckey (3B,D)
Thlaspi arvense L., Fanweed: ADV (1A, 3B, 5)

CACTACEAE - CACTUS FAMILY (CAC)

Opuntia fragilis (Nuttall) Haworth, Brittle Cactus (4A)
Pediocactus simpsonii (Engelmann) Britton & Rose var **minor** (Engelmann) Ckll., Mountain Ball Cactus (4A)

CALLITRICHACEAE - WATER-STARWORT FAMILY (CLL)

Callitriche hermaphroditica L. (3E)
Callitriche verna L. emend. Lönnroth (3D)

CALOCHORTACEAE - MARIPOSA FAMILY (CCT)

Calochortus gunnisonii S. Watson (1)

CAMPANULACEAE - BELLFLOWER FAMILY (CAM)

Campanula parryi A. Gray, Harebell (1, 3B)
Campanula rotundifolia L. (4A)

CANNABACEAE - HOPS FAMILY (CAN)

Humulus lupulus L. ssp **americanus** (Nuttall) Löve & Löve [var. *neomexicanus*], Wild Hops (3A)

CAPPARACEAE - CAPER FAMILY (CPP)

Cleome serrulata Pursh, Rocky Mountain Bee Plant (1)

CAPRIFOLIACEAE - HONEYSUCKLE FAMILY (CPR)

Distegia involucrata (Banks *ex* Sprengel) Ckll. [*Lonicera*], Bush Honeysuckle (3A)
Linnaea borealis L. ssp **americana** (Forbes) Hultén *ex* Clausen, Twinflower (2C)

CARYOPHYLLACEAE - PINK FAMILY (CRY)

Gastrolychnis drummondii (Hooker) Löve & Löve [*Lychnis*], Campion (1, 2A)

CHENOPODIACEAE - GOOSEFOOT FAMILY (CHN)

Amaranthus blitoides S. Watson (5)
Axyris amaranthoides L.: ADV (5)
Chenopodium album L., Pigweed: ADV (5)
Chenopodium atrovirens Rydberg (4A, 5)
Chenopodium berlandieri Moquin (1)
Chenopodium capitatum (L.) Asch., Strawberry Blite: ADV (2C)
Chenopodium desiccatum A. Nelson (5)
Chenopodium foliosum (Moench) Asch.: ADV (2A, 5)
Chenopodium leptophyllum (Moquin) S. Watson (4A)

Kochia sieversiana (Pallas) C. A. Meyer [*K. scoparia*]: ADV (5)
Monolepis nuttalliana (Schultes) Greene, Povertyweed (5)

CONVALLARIACEAE - MAYFLOWER FAMILY (CVL)

Maianthemum stellatum (L.) Link [*Smilacina*], False Solomon's Seal (2B,C, 4A, 5)

CONVOLVULACEAE - MORNING-GLORY FAMILY (CNV)

Convolvulus arvensis L., Creeping Jenny: ADV (5)

COPTACEAE - MEADOW-RUE FAMILY (COP)

Thalictrum fendleri Engelmann *ex* A. Gray (4A, 2C)

CORNACEAE - DOGWOOD FAMILY (COR)

Swida sericea (L.) Holub [*Cornus*], Red Osier (3A)

CRASSULACEAE - STONECROP FAMILY (CRS)

Amerosedum lanceolatum (Torrey) Löve & Löve [*Sedum*], Stonecrop (1, 2C)

CYPERACEAE - SEDGE FAMILY (CYP)

Carex aquatilis Wahlenberg (3C)
Carex athrostachya Olney (3B)
Carex aurea Nuttall (3B,C)
Carex disperma Dewey (3A)
Carex douglasii F. Boott in Hooker (3B)
Carex festivella Mack. (3B,C)
Carex lanuginosa Michaux (3B,C)
Carex microptera Mack. (3B)
Carex nebrascensis Dewey (3C)
Carex obtusata Liljeblad (1)
Carex oreocharis Holm (1)
Carex pensylvanica Lamarck ssp **heliophila** (Mack.) W. A. Weber [*C. heliophila*] (1, 2A)
Carex pityophila Mack. (2A)
Carex praegracilis F. Boott (3B)
Carex simulata Mack. (2C)
Carex stenophylla Wahlenberg ssp **eleocharis** (L. H. Bailey) Hultén [*C. eleocharis*] (2A)
Carex utriculata F. Boott [erroneously *C. rostrata*] (3C)
Eleocharis palustris (L.) R. & S. [*E. macrostachya*], Spike-rush (3C)
Scirpus microcarpus J. & K. Presl [*S. rubrotinctus*] (3C)

ELAEAGNACEAE - OLEASTER FAMILY (ELE)

Elaeagnus commutata Bernh., Silverberry (4A,B)

ERICACEAE - HEATH FAMILY (ERI)

Arctostaphylos adenotricha (Fernald & Macbride) Löve *et al.* [*A. uva-ursi*],Bearberry, Kinnikinnik (2C, 4A)

EUPHORBIACEAE - SPURGE FAMILY (EUP)

Chamaesyce glyptosperma (Engelmann) Small (5)
Chamaesyce serpyllifolia (Persoon) Small [*Euphorbia*], Thyme-leaved Spurge: ADV (5)
Tithymalus montanus (Engelmann) Small [*Euphorbia*] (1A, 4A)
Tithymalus uralensis (Fischer *ex* Link) Prokhanov [*Euphorbia esula*], Leafy Spurge: ADV (3B)

FABACEAE - PEA FAMILY (FAB)

Astragalus adsurgens Pallas var **robustior** Hooker, Milk Vetch (1, 2A,C)
Astragalus agrestis Douglas *ex* G. Don [*A. dasyglottis*] (1, 2A, 3B)
Astragalus alpinus L. (2B, 3B)
Astragalus crassicarpus Nuttall var **paysonii** (Kelso) Barneby, Ground Plum (1,4A,5)
Astragalus drummondii Douglas *ex* Hooker (1, 2A)
Astragalus hallii A. Gray (2A)
Astragalus miser Douglas in Hooker var **oblongifolius** (Rydberg) Cronquist (2A)
Astragalus parryi A. Gray (2A, 4A,B)
Astragalus sparsiflorus A. Gray (2A)
Astragalus tenellus Pursh (2A,C)
Dalea purpurea Ventenat, Prairie-clover (1)
Lupinus kingii S. Watson (4, 5)
Medicago lupulina L., Black Medic: ADV (1)
Medicago sativa L., Alfalfa: ADV (1, 5)
Melilotus officinalis (L.) Lamarck, Yellow Sweet-clover: ADV (5)
Oxytropis deflexa (Pallas) DC. var **foliolosa** (Hooker) Barneby (3B)
Oxytropis lambertii Pursh, Loco-weed (1)
Oxytropis multiceps Nuttall (4A)
Oxytropis sericea Nuttall (4B)
Oxytropis splendens Douglas *ex* Hooker (1, 2A)
Thermopsis divaricarpa A. Nelson, Golden Banner (5)
Trifolium hybridum L., Alsike Clover: ADV (1)
Trifolium repens L., White Dutch Clover: ADV (1, 3A)
Vicia americana Mühl. *ex* Willd., Vetch (3B, 4A)

FUMARIACEAE - FUMITORY FAMILY (FUM)

Corydalis aurea Willd., Golden Smoke (4A, 5)

GENTIANACEAE - GENTIAN FAMILY (GEN)

Chondrophylla aquatica (L.) W. A. Weber [*Gentiana or Ciminalis fremontii*], Dwarf Gentian (3A,B)
Frasera speciosa Douglas *ex* Grisebach [*Swertia*], Monument Plant (1, 2A)
Gentianella acuta (Michaux) Hiitonen [*Gentiana amarella*] (2A,B, 4B)
Pneumonanthe affinis (Grisebach) Greene [*Gentiana*], Bottle Gentian (1, 2A,3B)
Swertia perennis L., Star Gentian (3A)

GERANIACEAE - GERANIUM FAMILY (GER)

Erodium cicutarium (L.) L'Heritier, Alfilaria: ADV (5)
Geranium caespitosum James *ex* Torrey ssp **atropurpureum** (Heller) W. A. Weber (1)
Geranium richardsonii Fischer & Trautv. (3A)

GROSSULARIACEAE - GOOSEBERRY FAMILY (GRS)

Ribes aureum Pursh, Golden Currant (3B)
Ribes cereum Douglas, Wax Currant (2C, 4A)
Ribes inerme Rydberg, Mountain Gooseberry (3A,B)

HALORAGACEAE - WATER MILFOIL FAMILY (HAL)

Myriophyllum sibiricum Komarov [*M. exalbescens*] (3E)

HELLEBORACEAE - HELLEBORE FAMILY (HEL)

Aconitum columbianum Nuttall *ex* T. & G., Monkshood (3A)
Actaea rubra (Aiton) Willd. ssp **arguta** (Nuttall in T. & G.) Hultén, Red Baneberry (2C, 3A)
Aquilegia coerulea James *ex* Torrey, Colorado Columbine (2B, 3A)
Delphinium ramosum Rydberg, Larkspur (2C)

HYDRANGEACEAE - HYDRANGEA FAMILY (HDR)

Jamesia americana T. & G., Waxflower (4A)

HYDROPHYLLACEAE - WATERLEAF FAMILY (HYD)

Phacelia alba Rydberg, Scorpion-weed (5)
Phacelia denticulata Osterhout (4A)
Phacelia heterophylla Pursh (4A)

HYPERICACEAE - ST. JOHNSWORT FAMILY (HYP)

Hypericum formosum HBK (3B)

IRIDACEAE - IRIS FAMILY (IRI)

Iris missouriensis Nuttall (3B,C)
Sisyrinchium montanum Greene, Blue-eyed-grass (3B)

JUNCACEAE - RUSH FAMILY (JUN)

Juncus arcticus Willd. ssp **ater** (Rydberg) Hultén [*J. balticus*] (3B,C)
Juncus bufonius L., Toad rush: ADV (3D)
Juncus longistylis Torrey (3C)
Luzula parviflora (Ehrhart *ex* Hoffmann) Lejeune, Wood Rush (3A)

JUNCAGINACEAE - ARROW-GRASS FAMILY (JCG)

Triglochin palustre L. (3C)

LAMIACEAE - MINT FAMILY (LAM)

Dracocephalum parviflorum Nuttall [*Moldavica*], Dragonhead (3B, 5)
Mentha arvensis L.. Field Mint (3C)
Scutellaria brittonii Porter, Skullcap (1)
Scutellaria galericulata L. var **epilobiifolia** (Hamilton) Jordal (3B)
Stachys palustris L. ssp **pilosa** (Nuttall) Epling (3B)

LEMNACEAE - DUCKWEED FAMILY (LMN)

Lemna minor L. (3C)

LINACEAE - FLAX FAMILY (LIN)

Adenolinum lewisii (Pursh) Löve & Löve [*Linum*], Wild Blue Flax (4A)

LOASACEAE - LOASA FAMILY (LOA)

Nuttallia rusbyi (Wooton) Rydberg [*Mentzelia*], Evening Star (5)
Nuttallia speciosa (Osterhout) Greene [*Mentzelia*] (5)

MALVACEAE - MALLOW FAMILY (MLV)

Sidalcea neomexicana A. Gray, Checker Mallow (3B)

MELANTHIACEAE - DEATH CAMAS FAMILY (MLN)

Anticlea elegans (Pursh) Rydberg [*Zygadenus*], Death Camas (3B)

NYCTAGINACEAE - FOUR-O'CLOCK FAMILY (NYC)

Oxybaphus linearis (Pursh) B. L. Rob. [*Mirabilis*], Umbrella-wort (4A)

ONAGRACEAE - EVENING-PRIMROSE FAMILY (ONA)

Chamerion danielsii D. Löve [*Epilobium angustifolium*], Fireweed (3A)
Epilobium brachycarpum K. Presl [*E. paniculatum*], Willow-herb (5)
Epilobium ciliatum Raf. ssp **glandulosum** (Lehmann) Hoch & Raven [*E. adenocaulon, E. glandulosum*] (3B,C)
Epilobium saximontanum Haussknecht (3B, 4B)
Gaura coccinea Nuttall *ex* Pursh (1, 5)
Oenothera caespitosa Nutt. ssp **macroglottis** (Rydberg) Wagner *et al.* (5)
Oenothera coronopifolia T. & G., Evening-primrose (1, 5)
Oenothera flava (A. Nelson) Garrett (1, 3B)
Oenothera villosa Thunberg ssp **strigosa** (Rydberg) Dietrich & Raven [*O. strigosa*] (1, 3A)

ORCHIDACEAE - ORCHID FAMILY (ORC)

Calypso bulbosa (L.) Reichenbach f., Fairy Slipper (2C)
Limnorchis saccata (Greene) Löve & Simon [*Habenaria*], Bog Orchid (3A)

OROBANCHACEAE - BROOM-RAPE FAMILY (ORO)

Orobanche fasciculata Nuttall, Broom-rape (1)

OXALIDACEAE - WOOD-SORREL FAMILY (OXL)

Oxalis dillenii Jacquin [*O. stricta*] (3B, 4A)
Oxalis violacea L. (4B)

PARNASSIACEAE - GRASS-OF-PARNASSUS FAMILY (PAR)

Parnassia parviflora DC. (3B)

PLANTAGINACEAE - PLANTAIN FAMILY (PTG)

Plantago eriopoda Torrey; Redwool Plantain (3C)
Plantago lanceolata L., English Plantain: ADV (5)
Plantago major L., Common Plantain: ADV (3B)

POACEAE - GRASS FAMILY (POA)

X Agrohordeum macounii (Vasey) Lepage (3B)
Agropyron cristatum (L.) Gaertner ssp **cristatum**, Crested Wheatgrass: ADV (1)
Agrostis gigantea Roth [*A. alba*], Redtop: ADV (3B)
Agrostis scabra Willd., Ticklegrass (3B)
Alopecurus aequalis Sobol, Meadow Foxtail (3B)
Anisantha tectorum (L.) Nevski [*Bromus*], Cheatgrass: ADV (5)
Avena fatua L. var **sativa** (L.) Haussknecht, Oats: ADV (5)
Beckmannia syzigachne (Steudel) Fernald ssp **baicalensis** (Kuznetzow) Koyama & Kuwano, Sloughgrass (3B,C)
Blepharoneuron tricholepis (Torrey) Nash, Pine Dropseed (1, 2A)
Bouteloua gracilis (HBK) Lagasca *ex* Griffiths, Blue Grama (1, 2A)
Bouteloua hirsuta Lagasca, Black Grama (1)
Bouteloua simplex Lagasca: ADV (5)
Bromopsis inermis (Leysser) Holub [*Bromus*], Smooth Brome: ADV (1, 5)
Bromopsis porteri (Coulter) Holub [*Bromus*] (1, 5)
Bromopsis pumpelliana (Scribner) Holub [*Bromus*] (1, introduced in a reseeded area)
Calamagrostis canadensis (Michaux) P. Beauvois, Reedgrass (3B)
Calamagrostis purpurascens R. Brown in Richardson (4A)
Calamagrostis stricta (Timm) Koeler (3B)
Catabrosa aquatica (L.) P. Beauvois, Brookgrass (3E)
Ceratochloa carinata (H. & A.) Tutin [*Bromus marginatus*], Mountain Brome: ADV (5)
Critesion brachyantherum (Nevski) W. A. Weber [*Hordeum*], Meadow Barley: ADV (3B, 5)
Critesion jubatum (L.) Nevski [*Hordeum*], Foxtail Barley (5)
Danthonia parryi Scribner, Oatgrass (1, 4A)
Deschampsia cespitosa (L.) P. Beauvois, Tufted Hairgrass (3C)
Elymus elymoides (Raf.) Swezey [*Sitanion hystrix*]. Squirreltail (3B)
Elymus longifolius (J. G. Smith) Gould [*Sitanion*] (1, 4A, 5)
Elymus trachycaulus (Link) Gould *ex* Shinners [*Agropyron*], Slender Wheatgrass (1, 5)
Elytrigia intermedia (Host) Nevski [*Agropyron*], Intermediate Wheatgrass: ADV (5)
Elytrigia repens (L.) Nevski [*Agropyron*], Quackgrass: ADV (3B)
Festuca arizonica Vasey, Fescue (1)
Festuca ovina L. was reported by Ramaley. This does not occur in Colorado. The specimen has not been found, but is either *F. idahoensis* or *F. saximontana.*
Glyceria grandis S. Watson in Gray [*G. maxima*], Mannagrass (3C)
Glyceria striata (Lamarck) Hitchcock var **stricta** (Scribner) Fernald (3C)
Hierochloë hirta (Schrank) Borbas ssp **arctica** (J. Presl in K. Presl) G. Weimarck [*H. odorata*], Sweetgrass (3B)
Koeleria macrantha (Ledebour) Schultes [*K. gracilis*], Junegrass (2A)
Lolium perenne L. ssp **italicum** (A. Braun) Syme, Ryegrass: ADV (3B, 5)
Muhlenbergia andina (Nuttall) Hitchcock, Muhly (4A)
Muhlenbergia filiculmis Vasey (1, 3B, 4A)
Muhlenbergia montana (Nuttall) Hitchcock (1, 3A)
Muhlenbergia richardsonis (Trinius) Rydberg (1, 4A, 5)
Pascopyrum smithii (Rydberg) Löve [*Agropyron*], Western Wheatgrass (2A, 3B)
Phalaroides arundinacea (L.) Rauschert [*Phalaris*], Reed Canarygrass: ADV (3B)
Phleum pratense L., Timothy: ADV (3B)
Poa agassizensis Boivin & D. Löve, Bluegrass (1)
Poa compressa L., Canada Bluegrass: ADV (3B)

Poa fendleriana (Steudel) Vasey, Muttongrass (1, 2A)
Poa glauca M. Vahl ssp **rupicola** (Nash) W. A. Weber [*P. rupicola*] (1)
Poa glaucifolia Scribner & Williams (2A)
Poa nervosa (Hooker) Vasey (1)
Poa palustris L. (3B)
Poa pratensis L., Kentucky Bluegrass: ADV (3B)
Psathyrostachys juncea (Fischer) Nevski [*Elymus*] Russian Wild Rye: ADV (5)
Puccinellia airoides Watson & Coulter, Alkaligrass (3B)
Schedonnardus paniculatus (Nuttall) Trelease, Tumblegrass (1, 5)
Schizachyrium scoparium (Michaux) Nash [*Agropyron*], Little Bluestem (1, 2A)
Sporobolus cryptandrus (Torrey) A. Gray, Sand Dropseed (5)
Stipa comata Trin. & Ruprecht, Needle-and-thread (1)
Stipa robusta (Vasey) Scribner, Sleepygrass (1)
Stipa viridula Trinius (5)
Triticum aestivum L., Wheat: ADV (5)

POLEMONIACEAE - PHLOX FAMILY (PLM)

Collomia linearis Nuttall (1, 3B, 5)
Gilia pinnatifida Nuttall [*G. calcarea*] (1, 4A)
Ipomopsis aggregata (Pursh) V. Grant ssp **candida** (Rydberg) V. & A. Grant [*Gilia*], White Gilia (1)
Ipomopsis aggregata (Pursh) V. Grant ssp **collina** (Greene) Wilken & Allard [*Gilia*], Scarlet Gilia (1, 4a)
Polemonium foliosissimum (A. Gray) A. Gray, Jacob's Ladder (3b)

POLYGONACEAE - KNOTWEED FAMILY (PLG)

Acetosella vulgaris (K. Koch) Fourreau [*Rumex*], Sheep-sorrel: ADV (1)
Bistorta bistortoides (Pursh) Small [*Polygonum*], Bistort (3b)
Bistorta vivipara (L.) S. Gray [*Polygonum*], Alpine Bistort (3a)
Eriogonum cernuum Nuttall (5)
Fallopia convolvulus (L.) Löve [*Polygonum*], Black Bindweed: ADV (5)
Persicaria lapathifolia (L.) S. Gray [*Polygonum*]: ADV (3d)
Polygonum arenastrum Boreau [*P. aviculare*], Knotweed: ADV (5)
Pterogonum alatum (Torrey) Gross [*Eriogonum*], Winged Buckwheat (1)
Rumex aquaticus L. ssp **occidentalis** (S. Watson) Hultén [*R. occidentalis*], Dock (3c)
Rumex densiflorus Osterhout (3b)
Rumex triangulivalvis (Danser) Rech.f. (3b,c)

PORTULACACEAE - PURSLANE FAMILY (POR)

Crunocallis chamissoi (Ledebour *ex* Sprengel) Rydberg [*Claytonia*], Water Spring Beauty (3a,c)
Talinum parviflorum Nuttall *ex* T. & G. (4a)

POTAMOGETONACEAE - PONDWEED FAMILY (POT)

Potamogeton berchtoldii Fieber in Berchtold & Fieber (3e)

PRIMULACEAE - PRIMROSE FAMILY (PRM)

Androsace septentrionalis L., Rock Primrose (2c, 4a, 5)
Dodecatheon pulchellum (Raf.) Merrill, Shooting Star (3a,b)
Glaux maritima L. var **angustifolia** Boivin, Sea Milkwort (3d)

PYROLACEAE - WINTERGREEN FAMILY (PYR)

Orthilia secunda (L.) House [*Pyrola, Ramischia*], One-sided Wintergreen (2c)
Pyrola rotundifolia L. ssp **asarifolia** (Michaux) Löve [*P. asarifolia*], Swamp Wintergreen (2C)

RANUNCULACEAE - BUTTERCUP FAMILY (RAN)

Anemone multifida Poiret var **globosa** (Nuttall) T. & G., Windflower (2A,B, 3B)
Batrachium trichophyllum (Chaix) v. d. Bosch [*Ranunculus*], Water Crowfoot (3E)
Clematis ligusticifolia Nutt., Virgin's Bower (3B)
Coriflora hirsutissima (Pursh) W. A. Weber [*Clematis*], Sugarbowls (1)
Halerpestes cymbalaria (Pursh) Greene ssp **saximontana** (Fernald) Moldenke [*Ranunculus*], Shore Buttercup (3B,D)
Hecatonia scelerata (L.) Fourreau [*Ranunculus*], Blister Buttercup: ADV (3B,D)
Pulsatilla patens (L.) Miller ssp **multifida** (Pritzel) Zamels [*Anemone*], Pasque Flower (1, 2A)
Ranunculus abortivus L. ssp **acrolasius** (Fernald) Kapoor & Löve, Small-flowered Crowfoot (3A)
Ranunculus cardiophyllus Hooker (3A,B)
Ranunculus hyperboreus Rottboel ssp **intertextus** (Greene) Kapoor & Löve; Floating Buttercup (3A,B)
Ranunculus inamoenus Greene (3B)
Ranunculus macounii Britton (3A,B)

ROSACEAE - ROSE FAMILY (ROS)

Argentina anserina (L.) Rydberg [*Potentilla*], Silverweed (3B)
Cercocarpus montanus Raf., Mountain-mahogany (4A)
Chamaerhodos erecta (L.) Bunge ssp **nuttallii** (Pickering *ex* Rydberg) Hultén (1, 2A, 5)
Drymocallis fissa (Nuttall) Rydberg [*Potentilla*] (1, 2A, 4A)
Erythrocoma triflora (Pursh) Greene [*Geum*] (2A, 3B)
Fragaria vesca L. ssp **bracteata** (Heller) Staudt [*F. americana*], Wild Strawberry (2C)
Fragaria virginiana P. Miller ssp **glauca** (S. Watson) Staudt [*F. ovalis*] (2C, 3B)
Geum macrophyllum Willd. var **perincisum** Raup, Avens (3A,B)
Oreobatus deliciosus (James *ex* Torrey) Rydberg [*Rubus*], Boulder Raspberry (1, 4A)
Padus virginiana (L.) P. Miller ssp **melanocarpa** (A. Nelson) W. A. Weber [*Prunus*], Choke-cherry (3A)
Pentaphylloides floribunda (Pursh) Löve [*Potentilla fruticosa*], Shrubby Cinquefoil (1, 2B)
Physocarpus monogynus (Torrey) Coulter (4B)
Potentilla concinna Richardson, Cinquefoil (1, 2A)
Potentilla effusa Douglas *ex* Lehmann (4A)
Potentilla hippiana Lehmann (1, 4B)
Potentilla pensylvanica L. (1, 4A,B)
Potentilla plattensis Nuttall *ex* T. & G. (3A,B)
Potentilla pulcherrima Lehmann (3C)
Potentilla subjuga Rydberg (3B)
Rosa arkansana Porter, Arkansas Rose (2C, 4A,)
Rosa woodsii Lindley, Wild Rose (4A, 5)
Rubus idaeus L. ssp **melanolasius** (Dieck) Focke, Wild Raspberry (4A)

RUBIACEAE - MADDER FAMILY (RUB)

Galium septentrionale R. & S. [*G. boreale*], Northern Bedstraw (1, 4A)
Galium trifidum L. ssp **subbiflorum** (Wiegand) Puff, Bedstraw (3A,B)
Galium triflorum Michaux, Fragrant Bedstraw (3A)

SALICACEAE - WILLOW FAMILY (SAL)

Populus balsamifera L., Balsam Poplar (3A)
Populus tremuloides Michaux, Quaking Aspen (3A)
Salix brachycarpa Nuttall, Willow (3A)
Salix exigua Nuttall, Sandbar Willow (3A)
Salix lutea Nuttall (3A)
Salix monticola Bebb in Coulter (3A)

SAXIFRAGACEAE - SAXIFRAGE FAMILY (SAX)

Ciliaria austromontana (Wiegand) W. A. Weber [*Saxifraga*], Spotted Saxifrage (2C, 4B)
Heuchera parvifolia Nuttall *ex* T. & G., Alum-root (1, 2C, 4A,B)
Micranthes rhomboidea (Greene) Small [*Saxifraga*], Snowball Saxifrage (3B, 4A)

SCROPHULARIACEAE - FIGWORT FAMILY (SCR)

Besseya plantaginea (Bentham in DC.) Rydberg, Kittentails (1, 2A, 4B)
Castilleja integra A. Gray in Torrey, Orange Paintbrush (1, 4A)
Castilleja miniata Douglas *ex* Hooker, Scarlet Paintbrush (2C)
Limosella aquatica L., Mudwort (3D)
Linaria vulgaris P. Miller, Butter-and-eggs: ADV (5)
Orthocarpus luteus Nuttall, Owl-clover (1)
Pedicularis canadensis L. ssp **fluviatilis** (Heller) W. A. Weber, Canada Lousewort (2B,C)
Pedicularis procera A. Gray [*P. grayi*], Tall Lousewort (2C)
Penstemon barbatus Torrey ssp **torreyi** (Bentham) Keck, Scarlet Penstemon (2A)
Penstemon crandallii A. Nelson (2C, 4A, 5)
Penstemon glaber Pursh [*P. alpinus*] (5)
Penstemon secundiflorus Bentham in DC. (5)
Penstemon virgatus A. Gray ssp **asa-grayi** Crosswhite [*P. unilateralis*] (1, 4A)
Rhinanthus minor L., Yellow Rattle (3B)
Scrophularia lanceolata Pursh, Figwort (3B)
Veronica americana Schweinitz *ex* Bentham, Speedwell (3A,C)
Veronica catenata Pennell [*V. salina*] (3A)
Veronica peregrina L. ssp **xalapensis** (HBK) Pennell, Purslane Speedwell (3B)

SOLANACEAE - NIGHTSHADE FAMILY (SOL)

Solanum triflorum Nuttall, Cut-leaved Nightshade (5)

TYPHACEAE - CAT-TAIL FAMILY (TYP)

Typha latifolia L., Broad-leaved Cattail (3C)

URTICACEAE - NETTLE FAMILY (URT)

Parietaria pensylvanica Mühl. *ex* Willd., Pellitory (4)
Urtica gracilis Aiton, Nettle (3B)

UVULARIACEAE - BELLWORT FAMILY (UVU)

Streptopus fassettii Löve & Löve [*S. amplexifolius* var. *chalazatus*], Twisted Stalk (3A)

VALERIANACEAE - VALERIAN FAMILY (VAL)

Valeriana capitata Pallas *ex* Link ssp **acutiloba** (Rydberg) F. G. Meyer (2A,C, 3B)
Valeriana edulis Nuttall (1, 2B,C)

VIOLACEAE - VIOLET FAMILY (VIO)

Viola biflora L., Twin-flower Violet (3A)
Viola epipsiloides Löve & Löve [*V. epipsila* var. *repens*], Swamp Violet (3A)

VISCACEAE - MISTLETOE FAMILY (VIS)

Arceuthobium vaginatum (Willd.) K. Presl ssp **cryptopodum** (Engelmann) Hawksworth & Wiens, Dwarf Mistletoe (2A)

WOODSIACEAE - WOODSIA FAMILY (WDS)

Woodsia mexicana Fée (4A)
Woodsia oregana D. C. Eaton (4A)

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