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A FLORISTIC STUDY IN THE DIAMOND CREEK DRAINAGE AREA, GILA NATIONAL FOREST, NEW MEXICO

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ABSTRACT

The Diamond Creek drainage is one of the major watershed systems of the Gila National Forest in southwestern New Mexico. The purposes of this study were to catalog the vascular plants of a portion of this drainage area, describe the vegetation zones, locate any threatened, endangered, or sensitive plant species, and assess plant regeneration in areas that have been burned. The study area is located in the eastern portion of the Gila National Forest along the Black Range in the northwest corner of Sierra County. It covers approximately 5600 hectares (14000 acres) and ranges in elevation from 2250 to 3000 m (7400 to 9850 ft). Collected from the upper main Diamond Creek drainage area were 348 species including an additional six infraspecific taxa. The five largest families (by number of species and infraspecific taxa) in the study area were the Asteraceae (58), Poaceae (52), Fabaceae (24), Rosaceae (19), and Cyperaceae (17). The study area can be classified as Montane Coniferous Forest with most of the study area dominated by Pinus ponderosa and Pseudotsuga menziesii var. glauca. This overall vegetation type is fractured by narrow canyons, open meadows, perennial and intermittent streams, and rock outcrops. Three sensitive plant species were located in the study area: Erigeron scopulinus, Senecio sacramentanus, and Draba mogollonica. Two fires have occurred in the study area in recent times. These burned areas are primarily covered by shrubs including Quercus gambelii, Robinia neomexicana var. neomexicana, and Populus tremuloides.

Key words: fire, floristics, Gila National Forest, New Mexico, sensitive plant species.

INTRODUCTION

The first major floristic work for New Mexico was compiled by Elmer Ottis Wooton and Paul C. Standley (1915) in their Flora of New Mexico. They cataloged 2975 species and infraspecific taxa within New Mexico. The vascular plants that they recognized for the state comprised 145 families, 848 genera, and 2903 species. Three other major floristic works for the state were published after Wooton and Standley’s initial treatment. The first of these was Ivar Tidestrom and S.T. Kittel’s (1941) A Flora of Arizona and New Mexico. The second, A Flora of New Mexico, by William C. Martin and Charles R. Hutchins, was published in 1980 and 1981. Spellenberg and coworkers (1986) later added over 200 additions and changes to Martin and Hutchins’s flora. The most recent floristic work, A Working Index of New Mexico Vascular Plant Names and its supplements (Roalson and Allred 1995), attempted a current listing of the vascular flora of New Mexico. It included additions to the state since Martin and Hutchins’s Flora. This last work recognized 3468 species and an additional 482 infraspecific taxa for the state.

Although these floras have recorded the majority of the vascular plant taxa in the state, mapping the distribution of the plants has been problematic. The best way to increase our knowledge of the distribution of plants in the state, as well as to locate any taxa not presently known to occur there, is to compile local floras. In New Mexico, several local floristic studies have already been conducted (Bowers 1982; Bleakly 1996; Table 1). In the southwest part of the state, however, only two floristic studies have been completed. The first was W. L. Wagner’s (1977) study of Animas Mountain in Hidalgo County. The second was J. T. Columbus’s (1988) study of the Flora of Cooke’s Range, the majority of which is located in northern Luna County.

The purposes of the present study were to catalog the vascular plant taxa in the upper main Diamond Creek drainage of the Gila National Forest and surrounding areas, to describe the vegetation zones in which these plants occur, to make general observations on plant regrowth in burned areas, and to locate and map any threatened, endangered, or sensitive plant species in the area.

What is now the Gila National Forest has a long history of plant collection. The first known collecting in the area was associated with the “Army of the West,” commanded by Colonel Stephan Watts Kearney, which crossed southwestern New Mexico in 1846. Lieutenant William Hemsley Emory, acting as natu-

1 Address for correspondence: Rancho Santa Ana Botanic Garden, 1500 N. College Ave, Claremont, California, 91711.
Table 1. Floristic studies completed in New Mexico (Bowers 1982; Bleakly 1996) (NMSU = New Mexico State University; UNM = University of New Mexico; MA = Master of Arts Thesis; MS = Master of Science Thesis; Ph.D. = Doctor of Philosophy Dissertation; BLM = Bureau of Land Management). The entries marked with an asterisk (*) are lists kept by the associated National Monument, National Park, or are unpublished lists.

<table>
<thead>
<tr>
<th>Author</th>
<th>Date</th>
<th>Location/Area of study</th>
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<tr>
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<td>1966</td>
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<td>1974</td>
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<td>Floristic affinities of Animas Mtns., sw NM. MS, UNM.</td>
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ralist for the expedition, made many collections along the route, which passed through the Mimbres Mountains and proceeded westward along the Gila River (McKelvey 1956). Important collections were made along the Gila River, in the Mimbres Mountains and along the Mimbres River, and in the vicinity of Santa Rita (including the areas of Copper Mines and Ben Moore) (Standley 1910). This was the beginning of several expeditions to find safe passage for immigrants to the West. In 1849, John Charles Frémont passed through the Mimbres Mountains and what would become the southern end of the Gila National Forest on his fourth expedition (McKelvey 1956). In 1851, Charles Wright traveled south of the National Forest area with the Boundary Commission and collected around Cooke’s Peak (Shaw 1987). Wright also collected near Santa Rita and in the Mimbres Mountains (Standley 1910).
Collections in the Gila National Forest and surrounding areas are known from more than ten botanists between the mid-1800s and the early 1900s, with the most important of these being E. L. Greene, O. B. Metcalfe, and E. O. Wooton. Greene made many collections in the Gila area with the majority of these being gathered in the 1880s (Standley 1910). Collection areas included Bear Mountain (near Silver City), Fort Bayard (between Silver City and Santa Rita), along the Gila River, in the Mogollon Mountains, at Pinos Altos (northeast of Silver City), at Santa Rita, and at Silver City.

Metcalfe made important collections in the vicinity of the Gila National Forest primarily between 1903 and 1905 (Standley 1910). In 1903 he collected in the Burro Mountains, at Mangas Springs, and in the Mogollon Mountains. In 1904 and 1905 Metcalfe made his Black Range collection. This included collections at Animas Creek, Hillsboro, Iron Creek, Kingston, and Santa Rita, as well as collections throughout the south end of the Black Range. Around this time he also made collections at Bear Mountain (near Silver City), at Cliff (northwest of Silver City on the Gila River), along the Gila River, and at Silver City (Standley 1910).

Wooton, based at the New Mexico College of Agriculture and Mechanic Arts (New Mexico State University) in Las Cruces, made many collections in the Gila National Forest area during his term as botanist at the college between 1890 and 1911 (Allred 1993a). In the vicinity of the Gila National Forest, Wooton made collections at Frisco (on the San Francisco River), along the Gila River, at Mangas Springs, in the Mogollon Mountains, and at Silver City.

Since the early 1900s, many botanists have visited the Gila National Forest. None of the collections made by these botanists are known to be from the study area along the upper main Diamond Creek with one exception. Thomas K. Todsen, of New Mexico State University, camped along Diamond Creek in the spring of 1981 and collected *Erigeron scopulinus* and *Geum triflorum*.


**MATERIALS AND METHODS**

**Physical Setting**

The Gila National Forest (originally called the Gila River Forest Reserve) was established in 1899 and is managed by the United States Forest Service. It is located in the southwestern part of New Mexico (Fig. 1). The study area is located in the eastern portion of the National Forest along the Black Range in the northwest corner of Sierra County (Fig. 1). Nearly all of the study area is located in the Aldo Leopold Wilderness Area. Two main drainage systems are included in the area: the upper main Diamond Creek and the upper Hoyt Creek (also known as Turkey Run) (Fig. 2). The study area covers approximately 5600 hectares (14000 acres) and is bounded on the south by Diamond Peak, the highest elevation of the drainage, which reaches 3000 m (9850 ft). The lowest elevation in the study area is where Diamond Creek runs south of Round Mountain at approximately 2250 m (7400 ft). The east edge of the drainage follows the Continental Divide. The drainage is nearly ten and a half air kilometers long and reaches just over eight air kilometers wide.

The upper main Diamond Creek drainage is dominated by Diamond Creek which flows from the southeast through the study area. Downstream, Diamond Creek joins the east fork of the Gila River. Three major canyons radiate from the central stream valley. These are Hell Canyon, Doubtful Canyon, and Fisherman's Canyon (Fig. 2). Dick-Peddie (1993) categorized the habitats of this area as being Montane Coniferous Forest with the summit of Diamond Peak being Subalpine Coniferous Forest.

The geology of the Black Range is complex. As explained by Erickson and Wedow (1976), during the
late Cretaceous and early Tertiary eras, long domes were uplifted along the Black Range. This was followed by a volcanic period of active andesitic lava flows during the early Tertiary, which are known as the Datil Formation. The time periods following the Tertiary were dominated by large erosion events that led to the exposure of ore deposits containing tin, gold, silver, copper, lead, and zinc. Mining of these ores was prevalent in the late nineteenth and early twentieth centuries (Harley 1934). Some of the rhyolite brought to the surface in the Datil Formation is tin-bearing. These areas were mined around Taylor Creek, north of the study area. No tin-bearing rhyolite has been recorded within the study area (Ericksen and Wedow 1976).

The climate of the north end of the Black Range is characterized by warm, mild summers and cold winters. While few climatic data are available from the study area, four nearby climate stations allow inference of the climatic conditions. The four stations are Mimbres Ranger Station, Winston, Gila Hot Springs, and Beaverhead Ranger Station, with mean annual precipitation amounts of 433 mm (17 in), 315 mm (12 in), 392 mm (15 in), 346 mm (14 in), respectively (Kunkel 1984). Since all of the stations are at least 223 m (730 ft) lower in elevation than the study area, it is expected that the actual precipitation in the study area is somewhat higher than those amounts reported here. A climatic station located along main Diamond Creek at approximately 2,300 m (7,800 ft) has gathered precipitation data during the months of June, July, August, and September (Wood and Turner 1994). A summary of these results is given in Table 2. These data indicate that the principal summer precipitation months are July and August. Due to the high elevation of the study area, at least this amount of additional precipitation would be expected in winter snowfall.

Although total precipitation varies from year to year, all stations reported that at least half of the average yearly precipitation came during the months of July, August, and September. This moisture occurs in the form of high-intensity, short-duration convectional rainstorms.

According to Kunkel (1984), the mean annual temperature for the Mimbres Ranger Station is 11 °C (52 °F), for Winston 11 °C (53 °F), for Gila Hot Springs 12 °C (53 °F), and for the Beaverhead Ranger Station 9 °C (48 °F). July is the hottest month at all stations with the mean temperature ranging from 19 °C (67 °F) to 22 °C (72 °F). Temperatures are coldest in January with the mean temperature ranging from 1 °C (30 °F) to 2 °C (36 °F) (Kunkel 1984). As with precipitation, these values were collected at elevations lower than the study area. The average starting date for the spring frost-free season is June 10. By September 20, the first killing frost has usually occurred (Tuan et al. 1973). This produces an average frost-free season of 102 days. The northern end of the Black Range receives normal annual sunshine in excess of 80 percent of that possible.

Survey Methodology

Plants were collected in the study area from late July 1993 to May 1995, excluding the winter months. All of the vegetation zones were sampled as often as possible throughout the growing season. Below average rainfall for 1994 may have affected the occurrence and abundance of plant species found during the collecting season. Collections were also made in areas north of the study area boundary, but within a range of about 5 air miles. These are listed in Appendix I.

Collections were made using standard 12 inch by 18 inch plant presses. Whenever possible, vegetative, reproductive, and fruiting material was collected for

<table>
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<th>Jun. 2-Jul.</th>
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each specimen. Notes were taken at each collection location and included information on plant community, abundance, soil characteristics, aspect, elevation, associated species, and the date of collection. Town­ship-range-section information was added from maps at a later date. In the case of threatened, endangered, or sensitive (TES) plant species, the size of the population and any other pertinent population information was included. TES populations were also mapped for the study area.

Fire is a natural component of forests in the southwestern United States. In recent years, two forest fires, started from lightning strikes, have occurred within the boundary of the study area. The first, the “Divide Fire,” occurred in 1989. This fire affected approximately 1300 hectares (3200 acres) of the study area. The most recent fire, the “Blackhawk Fire,” was in the early summer of 1993 and affected approximately 390 hectares (960 acres). Notes were taken regarding regeneration of the burned areas over the course of the field seasons. These notes described general observations made on the age class of woody plant regeneration, distribution, general occurrence rate, and presence or absence of shrubs not located outside of the burned areas.

Nomenclature of the plants was based upon Kartesz (1994) and Roalson and Allred (1995). Author abbreviations are as suggested in Brummitt and Powell (1992). The main body of plant identifications were made using the following works: A Flora of New Mexico (Martin and Hutchins 1980–1981), Arizona Flora (Kearney and Peebles 1960), A Field Guide to the Grasses of New Mexico (Alred 1993b), Flora of North America (Flora of North America Editorial Committee 1994), and Intermountain Flora (Cronquist et al. 1977, 1994). All specimens were checked against specimens located in the following herbaria: New Mexico State University- Biology Herbarium (NMC), New Mexico State University- Range Science Herbarium (NMCR), Texas A&M University- S. M. Tracy Herbarium (TAES), The University of New Mexico Herbarium (UNM), and The University of Texas Herbarium at Austin (TEX/LL). Voucher specimens are deposited at NMCR and the Gila National Forest Black Range District Herbarium. Selected specimens are deposited in the Botanical Research and Consulting Herbarium (BRCH) in Bryan, Texas, and The University of Michigan Herbarium (MICH), Ann Arbor, Michigan.

RESULTS

Flora

The taxa found in this study represented 74 families. The five largest families (by number of species and infraspecific taxa) were the Asteraceae (58), Poaceae (52), Fabaceae (24), Rosaceae (19), and Cyperaceae (17). The largest genus found in the study area was Carex (Cyperaceae) with 13 species. The genus Muhlenbergia (Poaceae) was second largest with 10 species. Table 3 lists the total number of families, genera, species, and infraspecific taxa collected in the study area, collected by the authors north of the study area, and as well as totals for the state. The totals for the state were obtained from Roalson and Allred (1995). Twenty-six of the 354 species and infraspecific taxa in the study area are introduced, primarily from Europe. The Poaceae and Asteraceae dominate the introduced taxa list with half of the species occurring in these two families.

Vegetation Zones

The study area can be classified as Montane Coniferous Forest (Dick-Peddie 1993). The canyon bottoms and higher elevations are Upper Montane Coniferous Forest (Dick-Peddie 1993) and are dominated by ponderosa pine (Pinus ponderosa var. scopulorum) and Douglas fir (Pseudotsuga menziesii var. glauca) with occasional white fir (Abies concolor), Engelmann spruce (Picea engelmannii), and southwestern white pine (Pinus strobiformis). The lower elevations, south-facing slopes, and rocky areas are Lower Montane Coniferous Forest (Dick-Peddie 1993) and are dominated by ponderosa pine, pinyon pine (Pinus edulis), and alligator juniper (Juniperus deppeana). The boundaries between these vegetation zones are blurred due to the large extent of burned areas. Most of the higher elevations were burned in 1989 so that the climax vegetation is difficult to determine. The Allotment Analysis Map for the South Fork Allotment (U.S.F.S., Gila National Forest, Black Range District) indicates Douglas fir and ponderosa pine as the dominant vegetation for all of these high elevation burned areas.

The habitat categories used in this treatment are riparian zones, open valley bottoms, slopes and ridges, high-elevation meadows, narrow canyons, and rock outcrops. These categories are based upon topography, moisture, and dominant vegetation.

Riparian zones include streambanks, ponds, and springs. The vegetation of these areas, though commonly surrounded by ponderosa pine, Douglas fir, and
other conifers, are characterized by the occurrence of various combinations of the following species: mountain alder (Alnus incana ssp. tenuifolia), willow (Salix lucida ssp. lasiandra), caric-sedges (Carex spp.), spike sedges (Eleocharis spp.), rushes (Juncus spp.), narrow-leaf cottonwood (Populus angustifolia), cliff-bush (Jasemia americana), Rocky Mountain maple (Acer glabrum), red-osier dogwood (Cornus sericea ssp. sericea), shortawn foxtail (Alopecurus aequalis), American mannagrass (Glyceria grandis), Rocky Mountain iris (Iris missouriensis), bluegrasses (Poa spp.), pondweeds (Potamogeton spp.), sorrels (Rumex spp.), monkey-flower (Mimulus glabratrus var. jamaesi), self-heal (Prunella vulgaris), and water-starwort (Callitriche heterophylla).

Open valley bottoms occur where the main Diamond Creek canyon broadens and is dominated by ponderosa pine and the tree form of Gambel's oak (Quercus gambeli). The overstory is often open with large meadow areas. These meadows are dominated by Kentucky bluegrass (Poa pratensis), Louisiana wormwood (Artemisia ludoviciana ssp. mexicana), and poison ivy (Toxicodendron rydbergii). Many other forbs and grasses are common throughout this area.

Slopes and ridges can be further segregated into lower-elevation dry slopes as opposed to higher-elevation mesic slopes. The dry slopes are commonly dominated by pinyon pine, alligator juniper, mountain mahogany (Cercocarpus montanus var. montanus), Gambel's oak, gray oak (Quercus grisea), wavyleaf oak (Quercus x undulata), and scattered ponderosa pine. The three oak species commonly grow together and often intergrade completely. This is because wavyleaf oak is a hybrid between Gambel's oak and gray oak and may cross back to either parent (Tucker 1961). Banana yucca (Yucca baccata) is also rather common on these dry slopes.

The mesic slopes are commonly dominated by ponderosa pine and Douglas fir, often with varying amounts of white fir, southwestern white pine, and Engelmann spruce. Gambel's oak is also common on these slopes, usually as a shrub but occasionally as a tree. The understory is commonly dominated by various members of the Asteraceae and grasses.

The high-elevation meadows are openings in a predominantly ponderosa pine/Douglas fir overstory on relatively level areas. These meadow areas are usually dominated by pine dropseed (Blepharoneuron tricholepis), mountain muhly (Muhlenbergia montana), and other muhly species (Muhlenbergia spp.). Various other forbs and grasses may be present.

The narrow canyons which feed into the main canyons of Diamond Creek and Hoyt Creek (Turkey Run) are usually much more heavily overgrown than other areas. These areas are dominated by Douglas fir and ponderosa pine, often with significant amounts of white fir and Engelmann spruce. The understory of these areas are dominated by a variety of grasses, sedges, and forbs, with members of the Asteraceae often dominant.

Rock outcrops were common throughout the study area. Vegetation occurring on these outcrops was sparse, with plants usually only growing in crevices and small soil pockets. Nearly all the vegetation was herbaceous, although mountain mahogany, banana yucca, pinyon pine, and alligator juniper were occasionally found growing out of these rock outcrops. Other taxa occurring on the outcrops were stonecrop (Sedum stelliforme), flameflower (Talinum confertiflorum), four-o'clocks (Mirabilis longiflora, M. oxyphaoides), Wright's gourd (Echinocereus wrightii), red-flowered hedgehog cactus (Echinocereus coccineus ssp. coccineus), plains pricklypear (Opuntia macrohiza ssp. macrohiza), New Mexico cliff fern (Woodia neomexicana), Fendler's lip fern (Chelianthes fenderi), rock fleabane (Erigeron scopulinus), and Mogollon whitlowgrass (Draba mogollonica).

Sensitive Species

Several species considered as threatened, endangered, or sensitive were thought to possibly occur in the study area (New Mexico Native Plant Protection Advisory Committee 1984). These included Aletes filifolius Mathias, Constance & Theobald, Allium goodingii Ownbey, Apacheria chiricahuensis Mason, Cirsiun gilense Wooton & Standley, Crataegus wootoniana Eggl., Draba mogollonica Greene, Erigeron hes- sii G. L. Nesom, Erigeron scopulinus G. L. Nesom & V. D. Roth, Scorphularia macrantha (A. Gray) Greene, Senecio quaerens Greene, Senecio sacramen tanus Wooton & Standley, Silene wrightii A. Gray, and Trifolium longipes Nutt. var. neurophyllum (Greene) Martin ex Isely. This list includes those species that are known from elevation ranges and habitats present in the study area. Of the plants on this list, Erigeron scopulinus, Senecio sacramentanus, and Draba mogollonica were found in the study area. Also, two species of Carex (Cyperaceae), C. amplifolia and C. rossii, not previously known from New Mexico, were found in the study area (Roalson et al. 1995).

Erigeron scopulinus, rock fleabane, was first described by G. L. Nesom and V. D. Roth (1981). The description was based upon collections from two locations: the Chiricahua Mountains of southeastern Arizona and the Black Range of southwestern New Mexico. This species dwells in crevices of vertical and horizontal rock outcrops where little or no soil has developed. Rock fleabane has been found at elevations ranging from 1800 to 2800 m (6000 to 9000 ft). This species is listed as a state sensitive species because of
its limited occurrence in New Mexico, but not endan­
gered (Sivinski and Lightfoot 1995).

Three populations of *Erigeron scopulinus* were located in the study area (Fig. 3). The first of these was located by Thomas K. Todsen on a south-facing, flow­banded, white rhyolite cliff face along Diamond Creek and was used in the original description of the species. Todsen collected plants at this location on 24 May 1981 and 10 June 1981. During the course of this study, while making general collections, two additional populations were located. The first of these was located at approximately 2650 m (8700 ft) along a ridge between Hell Canyon and Diamond Creek (T11S R10W sec. 35 SW1/4). The plants at this location spread across the horizontal rock faces of two rock outcrops separated by 10 m. This population consisted of 15 individuals with an average size of approximately 7.5 cm by 30 cm. This population was selectively collect­ed on 28 June 1994 (Roalson 911).

The third population was found at approximately 2750 m (9000 ft) on a near-vertical south-facing cliff on a ridge between Hell Canyon and Diamond Creek (T12S R10W NW3/4 sec. 2). Approximately 10 individuals were seen and they were of similar size as those individuals found at 2650 m.

The only perceived threat to *Erigeron scopulinus* is mining exploration (New Mexico Native Plants Protec­tion Advisory Committee 1984), which does not oc­cur in the study area. All three populations appeared to be vigorous and undisturbed.

*Senecio sacramentanus*, Sacramento groundsel, was described by E. O. Wooton and P. C. Standley (1913). This taxon is known from mountain meadows between the elevations of 2440 m and 3550 m (8000 to 11000 ft) in the central and western mountains of New Mex­ico. This species is listed as state priority 1 due to its limited distribution in the state. No threats to this taxon are known.

One population of Sacramento groundsel was found in the study area (Fig. 3). This population was selec­tively collected on 2 October 1995 (Roalson & Allred 1202) and occurred at approximately 2440 m (8,000 ft) in a side canyon to Hoyt Creek (Turkey Run) (T11S R10W sec. 23). The surrounding vegetation was dominated by ponderosa pine, Douglas fir, Gambel’s oak, and wild rose (*Rosa woodsii*). Other Sacramento groundsel plants were occasionally seen in this area.

*Draba mogollonica*, Mogollon whitlowgrass, was described by E. L. Greene (1881). This taxon grows in “moist cliff faces, rock cracks, crevices, and steep, shaded slopes with little soil development” (New Mexico Native Plants Protection Advisory Committee 1984) and occurs from 1500 m to 2900 m (5000 to 9,000 ft) in the mountains of central and western New Mexico. It is listed as state priority 1. Recently, large populations have been located in the mountains of cen­tral New Mexico (New Mexico Native Plants Protec­tion Advisory Committee 1984). There are no known threats to this species.

One population was found in a side canyon to Di­amond Creek (Fig. 3), along Forest Trail 42, near its intersection with Forest Trail 40 (T11S R10W Sec. 35) on 30 April 1994 (Roalson 776). The population oc­curred in soil pockets on a northwest-facing cliff, and in the rocks below it, at the base of a waterfall. The surrounding vegetation included ponderosa pine, Douglas fir, white fir, Rocky Mountain maple, willow, Gambel’s oak, and common choke cherry (*Prunus virginiana var. melanocarpa*).

**Burned Areas**

The Divide Fire and the Blackhawk Fire killed near­ly all of the trees where they occurred. At the time of the study areas affected by the Divide Fire had developed significant amounts of ground cover, but those affected by the Blackhawk Fire were still mostly bare ground with some shrub regrowth and a few herba­ceous plants occurring.

Areas burned in the Divide Fire have several dif­ferent vegetation compositions, depending primarily
on what the preburn vegetation was. After being burned, the highest-elevation areas (around Diamond Peak) became dominated by quaking aspen (Populus tremuloides), New Mexico locust (Robinia neomexicana var. neomexicana), and ninebark (Physocarpus monogynus). Also common on these burned slopes were common chokecherry, Rocky Mountain maple, gooseberry (Ribes pinetorum), raspberry (Rubus idaeus ssp. strigosus), thimble-berry (Rubus parviflorus), and rock-spiraea (Holodiscus dumosus). Some areas had regrowth of Gambel’s oak, but these areas were not very common at the higher elevations. Seedlings and juvenile ponderosa pine and Douglas fir were fairly common in this area and were up to approximately 6 dm (±2 ft) tall.

Narrow canyons that were burned in the Divide Fire (such as the upper part of Doubtful Canyon) predominantly had raspberry and thimble-berry regrowth with shrubs of pericome (Pericome caudata) common. Also occurring in these burned areas were gooseberry, New Mexico locust, and elderberry (Sambucus caerulea var. neomexicana). Seedlings of white fir up to approximately 3 dm (1 ft) tall were seen in large numbers in these areas.

Dry slopes that were burned in the Divide Fire were dominated by Gambel’s oak, New Mexico locust, gooseberry, and raspberry. Also occurring on these areas were quaking aspen and elderberry. Seedlings of ponderosa pine and Douglas fir were seen in these areas, but they were not common.

Areas burned in the Blackhawk Fire remained, for the most part, bare ground. Some basal resprouting has occurred on Gambel’s oak and elderberry with occasional herbs being predominantly members of the Asteraceae.

**ANNOTATED CHECKLIST OF THE VASCULAR FLORA**

The following checklist includes all vascular taxa collected or observed by the authors between 1993 and 1995. The families are arranged alphabetically under class or subclass headings with the genera within the genera also arranged alphabetically. New species records for the state are designated by a double plus (‡). Taxa considered sensitive by the Gila National Forest are designated by a dagger (†). Introduced species are designated by an asterisk (*). All vouchers were collected by E. H. Roalson and deposited in NMCR, unless otherwise noted. One taxon, Toxicodendron rydbergii, lacks a voucher specimen. Annotations accompanying each taxon are arranged in the following sequence:

- **Scientific Name.** Taxonomic authority. [Selected synonyms with author(s)] Vegetation zone(s). Special comments. Collection number (VOUCHER LOCATION, if any, in addition to NMCR).
CAREX DISPERMA Dewey. Riparian and aquatic zones. 824.
CAREX EBENE A Rydb. Riparian and aquatic zones. 794.
CAREX MICRORAPA Mack. Riparian and aquatic zones. 856.
CAREX NORVEGICA Retz. Riparian and aquatic zones. 889.
CAREX OBUTSATA Lilj. Open valley bottoms. 770.
CAREX PRAEGRACILIS W. Boott. Riparian and aquatic zones, mesic slopes and ridges. 770.
*CAREX ROSSIi Boot. Mesic slopes and ridges, burned areas. 975 (MICH).
CAREX STIPATA Muhl. ex Wild. var. STIPATA. Riparian and aquatic zones. 604.
CAREX WOOTONII Mack. Riparian and aquatic zones. Roalson & Allred 520.
CYPERUS PENDELRIANUS Boeck. Dry slopes and ridges. 709.
CYPERUS PARISHI Britton. Riparian and aquatic zones. 1063.
CYPERUS SPHAEROLEPIS Boeck. [C. fenderianus Boeck. var. debilis (Britton) Kük., C. rusbyi Britton]. Dry slopes and ridges. 1073.
ELEOCHARIS PALUSTRIS (L.) Roem. & Schult. Riparian and aquatic zones. 857.

IRIDACEAE

IRIS MISSOURIENSIS Nutt. Riparian and aquatic zones. 783.
SISYRINCHIUM ARIZONICUM Rothr. Mesic slopes and ridges. 623.

JUNCACEAE

JUNCUS CONFUSUS Coville. Riparian and aquatic zones. 566.
JUNCUS SAXIMONTANUS A. Nelson. Riparian and aquatic zones. 574.
JUNCUS TENUS Willi. Riparian and aquatic zones. 835.

LILIACEAE

ALLIUM CERUNUM Roth var. OBTSUM CockereI ex J. F. Macbr. Mesic slopes and ridges. 643.
ECHENIA FLAVESCENS (Schult. & Schult.f.) Cruden [Anthericum f. Schult. & Schult.f.]. Mesic slopes and ridges. 1054.
MAIANTHEMUM RACEMOSUM (L.) Link [Smilacina racemosa (L.) Desf.]. Mesic slopes and ridges, Narrow canyons. 779.
MAIANTHEMUM STELLATUM (L.) Link [Smilacina stellata (L.) Desf.]. Mesic slopes and ridges. 822.
ZIGADENUS VIRERGENS (Kunth) J. F. Macbr. Mesic slopes and ridges, burned areas. 976.

ORNITIDACEAE

MALAXIS WENDTII Salazar [Malaxis ehrenbergii auct. non (C. Rchb.) Kunztec]. Mesic slopes and ridges. 1015.
MALAXIS MACOSTACHYA (Lex.) Kunztec. Open valley bottoms. 1153.

POACEAE (GRAMINEAE)

*AGROSTIS GIGANTEA Roth. Riparian and aquatic zones. 1148.
AGROSTIS SCABRA Willd. Riparian and aquatic zones. 753.
ALOPECURUS AEGALIS Boel. Riparian and aquatic zones. 589.
BLEPHARONERON TRECHOLEPIS (Tort.) Nash. Dry slopes and ridges, high elevation meadows. 694.
BOUTELOUA CURTIPENDULA (Michx.) Tort. var. CURTIPENDULA. Dry slopes and ridges. 713.
BOUTELOUA GRACILIS (Willd. ex Kunth) Lag. ex Griffiths. Dry slopes and ridges, open valley bottoms. 635.
PANICUM CAPILLARE L. var. BREVIFOLIUM Vasey ex Rydb. & Shear. Open valley bottoms. 663.


PIPTOCHAETIUM PRINGLEI (Beal) Parodi. Dry slopes and ridges, open valley bottoms. 701.

*POA ANNUA L. Riparian and aquatic zones. 741.

POA BIGELOVI Vasey & Scribn. Mesic slopes and ridges, open valley bottoms. 1042.

POA FENDLERIANA (Steud.) Vasey ssp. FENDLERIANA. Riparian and aquatic zones, Mesic slopes and ridges, narrow canyons. 772.

*POA PRATENSIS L. Mesic slopes and ridges. 1136.

POA RUBRA L. Dry slopes and ridges, open valley bottoms. 756.

SETARIA GRISEBACHII E. Fourn. Open valley bottoms. 736.

SCHIZACHYRIS GRISEBACHII E. Fourn. Open valley bottoms. 736.

SCHIZACHYRIUM SCOPARIUM (Michx.) Nash [Andropogon scoparius Michx.] Dry slopes and ridges. 685.

TRISETUM MONTANUM (A. Gray) A. Gray. Open valley bottoms. 578.

TOXICODENDRON RUSBYI (A. Gray) A. Gray. Dry slopes and ridges, narrow canyons. 847.

ANGIOSPERMAE—DICOTYLEDONES

ACER GLABRUM Torr. Mesic slopes and ridges, narrow canyons, burned areas. 821.

AMARANTHACEAE

AMARANTHUS PALMERI S. Watson. Open valley bottoms. 599.

ANACARDIACEAE

RHUS GLABRA L. Mesic slopes and ridges. 1136.

TOXICODENDRON RYDBERGII (Small ex Rydberg) Greene [Rhus radicans L. var. rydbergii (Small ex Rydberg) Rehder]. Dry slopes and ridges, mesic slopes and ridges, open valley bottoms. No voucher.

APIACEAE (UMBELLIFERAE)

ALETES ACAULIS (Tort.) J. M. Coult. & Rose. Mesic slopes and ridges. 979.

LIGUSTICUM PORTERI J. M. Coult. & Rose. Mesic slopes and ridges. 575.

OSMORHIZA DEPAUPERATA Phil. Mesic slopes and ridges. 828.

PSEUDOCYMOPETRUS MONTANUS (A. Gray) J. M. Coult. & Rose. Mesic slopes and ridges, burned areas. 562.

APOCYNACEAE

APOCYNUM CANNABINUM L. Dry slopes and ridges, mesic slopes and ridges, open valley bottoms. 883.

ARALIACEAE

ARALIA RACEMOSA L. Mesic slopes and ridges, narrow canyons. 1178.

ASTERACEAE (COMPOSITAE)

ACHILLEA MILLEFOLIUM L. var. MILLEFOLIUM. Dry slopes and ridges, mesic slopes and ridges, burned areas. Roalson & Allred 530.

AGOSERIS GLAUCA (Pursh) Raf. var. AGRESTIS (Osterh.) Q. Jones ex Cronquist. Mesic slopes and ridges. 1020.

ANTENNARIA PARVIFOLIA Nutt. Mesic slopes and ridges, narrow canyons. 792.

ARTEMISIA CAMPESTRIS L. var. PACIFICA (Nutt.) H. M. Hall & Clem. Mesic slopes and ridges. 1089.

ARTEMISIA FRANZERIOIDES Greene. Mesic slopes and ridges, burned areas. 954.

ARTEMISIA LUDOVICIANA Nutt. ssp. LUDOVICIANA. Dry slopes and ridges, mesic slopes and ridges, burned areas. 906.

ARTEMISIA LATIFOLIA (Willd. ex Spreng.) D. D. Keck. Mesic slopes and ridges, open valley bottoms. 702.

BICKELIA EUPATORIOIDES (L.) Shimm. var. CHLOROLEPIS (Wooton & Standl.) B. L. Turner. Dry slopes and ridges. 756.

CENTAUREA ROTHROCKII Greene. Mesic slopes and ridges. 1135.

CRISANTHEMUM (A. Gray) Pers. Open valley bottoms, high elevation meadows. 914.

CRISIUM PARRYI (A. Gray) Petr. Riparian and aquatic zones, open valley bottoms. 940.

CRISIUM WHEELERI (A. Gray) Petr. Mesic slopes and ridges, narrow canyons, burned areas. 626.

*CYNYA CANADENSIS (L.) Cronquist. Mesic slopes and ridges. 749.


ERIGERON DIVERGENS TORT. & A. Gray. Dry slopes and ridges, mesic slopes and ridges, burned areas. 763.

ERIGERON FLAGELLARIS A. Gray. Dry slopes and ridges, open valley bottoms. 780.

ERIGERON FORMOSISSIMUS Greene var. FORMOSISSIMUS. Dry slopes and ridges, mesic slopes and ridges, burned areas. 553.

ERIGERON NEO-MEXICANUS A. Gray. Mesic slopes and ridges, burned areas. 963.

†ERIGERON SCOPULINUS G. L. Nesom & V.D. Roth. Rock outcrops. 911.

ERIGERON SPECIOSUS (Lindl.) DC. var. MACRANTHUS (Nutt.) Cronquist. Mesic slopes and ridges, burned areas. 973.

EUPATORIUM HERBACEUM (A. Gray) Greene. Rock outcrops. 1141.

*GALINSOGA PARVIFLORA Cav. Dry slopes and ridges, rock outcrops. 757.

GNAPHALIUM MACOUNII Greene. Mesic slopes and ridges. 1138.

GNAPHALIUM STRAMINEUM Kunth. Mesic slopes and ridges, burned areas. 983.

GUTIERREZIA WRIGHTII A. Gray [Xanthocephalum w. (A. Gray) A. Gray]. Dry slopes and ridges, mesic slopes and ridges. 1021.

HELICANTHUS QUINQUENERVII (Hook.) A. Gray. Mesic slopes and ridges, narrow canyons. 1084.

HELIOMERIS MULTIFLORA Nutt. [Viguiera m. (Nutt.) S. F. Blake]. Dry slopes and ridges. 698.

HETEROTHeca CANESCENS (DC.) Shinners [Chrysopsis c. (DC.) Tort. & A. Gray, non DC.] Open valley bottoms. 717.

HIERACIUM PENDIleri Sch. Bip. var. PENDIleri. Mesic slopes and ridges. 845.

HIERACIUM RUBSYI Greene. Mesic slopes and ridges. 1075.

HYMENOPAPPUS MEXICANUS A. Gray. Dry slopes and ridges, mesic slopes and ridges. 670.

HYMENOPTYS HOPEI (A. Gray) Bierner [Helenium h. a. Gray]. Riparian and aquatic zones, mesic slopes and ridges, open valley bottoms. 602.

LAENNECIA SCHIEDEANA (Less.) G. L. Nesom [Coryza s. (Less.) Cronquist]. Open valley bottoms. 1158.

MACAHERANTHERA BIGELOVII (A. Gray) Greene. Mesic slopes and ridges, narrow canyons. 627.

MACAHERANTHERA GRACILIS (Nutt.) Shimmers. Mesic slopes and ridges, open valley bottoms, burned areas. 1092.

MACAHERANTHERA TANACETIFOLIA (Kunth) Nees. Mesic slopes and ridges, burned areas. 1090.

PERICOME CAUDATA A. Gray. Mesic slopes and ridges, narrow canyons, rock outcrops, burned areas. 1143.
PERITYLE STAUROPHYLLA (Barneby) Shinners. Dry slopes and ridges, mesic slopes and ridges. 1027.

RUDEBIA LACINIATA L. Open valley bottoms. 601.

SENECIO ACTINELLA Greene. Open valley bottoms. 834.

SENECIO CYNTHOIDES Greene. Mesic slopes and ridges, high elevation meadows, burned areas. 948.

SENECIO EREMOPHILUS Richardson var. MACDOUGALLI (A. Heller) Cronquist. Dry slopes and ridges, open valley bottoms. 700.

SENECIO FLACCIDUS Less. Mesic slopes and ridges, burned areas. 1096.

SENECIO NEOEXICANUS A. Gray var. MUTABILIS (Greene) T. M. Barkley. Dry slopes and ridges, mesic slopes and ridges. 767.

SENECIO SPARTIOIDES A. Gray. Mesic slopes and ridges, burned areas. 1096.

SENECIO SACRAMENTANUS Roalson. Riparian and aquatic zones, mesic slopes and ridges, narrow canyons. 752.

SENECIO SOLIDAGO PARRYI Roalson. Riparian and aquatic zones, mesic slopes and ridges, burned areas. 948.

SENECIO SOLIDAGO MISSOURIENSIS Roalson. Riparian and aquatic zones, mesic slopes and ridges, burned areas. 937.

SENECIO NEOMEXICANUS S. Watson. Riparian and aquatic zones, mesic slopes and ridges, narrow canyons. 917.

SENECIO SPAR TIOIDES Tort. & A. Gray. Mesic slopes and ridges, burned areas. 806.

SENECIO STREPTANTHIFOLIUS Greene. Mesic slopes and ridges. 769.

SOLIDAGO MISSOURIENSIS Nutt. Dry slopes and ridges, mesic slopes and ridges. 560.


SOLIDAGO SPATHULATA (Wooton & Standl. Open valley bottoms. 909.


STREPTANTHIFOLIUS A. Gray. Mesic slopes and ridges, burned areas. 634.

STRAVIA SERRATA Cav. Dry slopes and ridges. 1100.

SYMPTOTRICHUM FOLIACEUM (Lindl. ex DC.) G. Don var. CANBYI (A. Gray) G. Don. Dry slopes and ridges. 786.

TARAXACUM CERASTIUM (Ledeb.) DC. Mesic slopes and ridges. 1076.

*BEERBERIDACEAE

MAHONIA REPENS (Lindl.) G. Don [Berberis r. Lindl.]. Mesic slopes and ridges, narrow canyons. 917.

BETULACEAE


BORAGINACEAE

HACKELIA FLORIBUNDA (Lehm.) I. M. Johnst. Dry slopes and ridges, mesic slopes and ridges, narrow canyons. 563.

*BRASSICACEAE (CRUCIFERAE)

ARABIS PERENNANS S. Watson. Dry slopes and ridges. 802.

*BRASSICA NAPUS L. Open valley bottoms. 873.

DESCURAINIA INCISA (Engelm. ex A. Gray) Britton ssp. VICOSA (Rydb.) Rollins. Mesic slopes and ridges, burned areas. 955.

*DESCURAINIA SOPHIA (L.) Prantl. Open valley bottoms. 806.


*DRABA MOLLONONICA Greene. Rock outcrops. 776.

Erysimum capitatum (Douglas) Greene. Dry slopes and ridges, mesic slopes and ridges, open valley bottoms. 581.

LEPIDIUM RAMOSISSIMUM A. Nelson. Open valley bottoms. 652.

PENNELLIA LONGIFOLIA (Benth.) Rollins. Dry slopes and ridges, mesic slopes and ridges, open valley bottoms. 748.


*THALAS ARVENSE L. Open valley bottoms. 937.

T. MONTANUM L. var. FENDLERI (A. Gray) P. K. Holmgren. Riparian and aquatic zones, mesic slopes and ridges, narrow canyons. 752.

CAMPANULACEAE

CAMPANULA ROTUNDIFOLIA L. Mesic slopes and ridges. 585.

CANNABACEAE


CAPRIFOLIACEAE

LONICERA ARZONICA Rehder. Mesic slopes and ridges, narrow canyons. 881.


SYMPHORICARPUS ALBUS (L.) S. F. Blake var. ALBUS. Mesic slopes and ridges, burned areas. 882.

SYMPHORICARPUS OREOPHILUS A. Gray. Mesic slopes and ridges, burned areas. 977.

CARYOPHYLLACEAE

CERASTIUM ARVENSE L. Mesic slopes and ridges. 786.

CERASTIUM NUTANS Raf. var. NUTANS. Mesic slopes and ridges. 564.

CERASTIUM NUTANS Raf. var. OBRECTUM Kearney & Peebles. Mesic slopes and ridges, burned areas. 953.

DRYMARIA GLANDULOSA C. Presl. Open valley bottoms. 1070.

DRYMARIA LEPTOPHYLLA (Cham. & Schult.) Fenzl ex Rohrb. Open valley bottoms, high elevation meadows. 1062.

SIENELA LACINIATA Cav. Dry slopes and ridges, mesic slopes and ridges, burned areas. 630.


STELLARIA LONGIFOLIA Muhl. ex Willd. Mesic slopes and ridges. 830.

CELASTRACEAE


CHENOPODIACEAE

CHENOPODIUM RHAMNUS Standl. Dry slopes and ridges, open valley bottoms, burned areas. 744.

*CHENOPODIUM RUBRUM L. Dry slopes and ridges, burned areas. 910.
TELOXYS GRAVEOLENS (Willd.) W. A. Weber. [Chenopodium g. Wild.] Dry slopes and ridges, open valley bottoms, high elevation meadows. 725.

CLUSIACEAE (GUTTIFERAE)

HYPERICUM SCULCERI Hook. ssp. SCULCERI [H. formosum Kunth ssp. s. (Hook.) C.L. Hitchc.]. Riparian and aquatic zones. 970.

CONVOLVULACEAE

IPOMOEA CRISTULATA H.M. Hall. Rock outcrops. 1133.

CORNACEAE

CORNUS SERICEA L. ssp. SERICEA [Cornus stolonifera Michx.]. Riparian and aquatic zones. 762.

CRASSULACEAE


CUCURBITACEAE


ERICACEAE

ARCTOSTAPHYLOS UVA-URSI (L.) Spreng. Mesic slopes and ridges. 878.

CHIMAPHILA UMBELLATA (L.) Nutt. Mesic slopes and ridges. 923.

VACCINUM SCOPARIUM Leiberg. Mesic slopes and ridges, burned areas. 980.

EUPHORBIACEAE


CHAMAESYCE PARRYI (Engelm.) Rydb. [Euphorbia p. Engelm.]. Open valley bottoms, high elevation meadows. 1007.


EUPHORBIA ROBUSTA (Engelm.) Small. Dry slopes and ridges, rock outcrops. 788.

TRAGI RAMOSA Torr. Dry slopes and ridges. 818.

FABACEAE (LEGUMINOSAE)

ASTRAGALUS EGGLESTONI (Rydib.) Kearney & Peebles. Mesic slopes and ridges, open valley bottoms. 646.

ASTRAGALUS GILENSIS Greene. Dry slopes and ridges, mesic slopes and ridges, rock outcrops. 684.

ASTRAGALUS HUMISTRATUS A. Gray var. HUMISTRATUS. Mesic slopes and ridges, open valley bottoms. 653.

CALLIANDRA HUMILIS Benth. Dry slopes and ridges. 1106.

DALEA FILONERIA A. Gray. High elevation meadows. 1124.


DALEA POLYGONOIDES VAR. POLYGONOIDES A. Gray. Open valley bottoms. 734.

DESMODIUM ROEII B. G. Schub. Dry slopes and ridges. 1167.

GALACTIA WRIGHTII A. Gray. Rock outcrops. 608.

LATHYRUS GRAMINIFOLIOS (S. Watson) T. G. White. Dry slopes and ridges, mesic slopes and ridges. 760.

LATHYRUS LANZSZWERTII Kellogg var. ARIZONICUS (Britton) S. L. Welsh. Mesic slopes and ridges, rock outcrops. 743.

LOTUS WRIGHTII (A. Gray) Greene. Dry slopes and ridges, rock outcrops. 610.

LUPINUS NEOMEXICANUS Greene. Dry slopes and ridges, mesic slopes and ridges, rock outcrops. 774.

*MEDICAGO LUPULINA L. Open valley bottoms. 932.

OXYTROPIS LAMBERTI Pursh. Dry slopes and ridges, mesic slopes and ridges, open valley bottoms. 622.

PHASEOLUS ACUTIFOLIUS A. Gray var. TENUIFOLIUS A. Gray. Dry slopes and ridges. 1111.

PHASEOLUS GRAYANUS Wooton & Standl. Dry slopes and ridges, mesic slopes and ridges. 1029.

PHASEOLUS MACULATUS Scheele. Dry slopes and ridges. 1043.

ROBINA NEOMEXICANA A. Gray var. NEOMEXICANA. Dry slopes and ridges, mesic slopes and ridges, burned areas. 893.

THERMOPSIS MONTANA Nutt. Riparian and aquatic zones. 781.

*TRIFOLIUM PRATENSE L. Open valley bottoms. 871.

VICIA AMERICANA Muhl. ex Willd. ssp. AMERICANA. Mesic slopes and ridges. 1128.

VICIA AMERICANA Muhl. ex Willd. ssp. MINOR (Hook.) C.R. Gunn. Mesic slopes and ridges. 837.

VICIA PULCHella Kunth. Mesic slopes and ridges. 621.

FAGACEAE

QUERCUS GAMBEII Nutt. Dry slopes and ridges, mesic slopes and ridges, open valley bottoms, rock outcrops, burned areas. 812.

QUERCUS GRISEA Liebm. Dry slopes and ridges. 813.

QUERCUS X UNDULATA Torr. Dry slopes and ridges. 814.

GENTIANACEAE

FRASERA SPECIOSA Douglas ex Griseb. [Swertia radiata (Kellogg) Kuntze]. Mesic slopes and ridges, narrow canyons. 1176.

GENTIANA AFFINIS Griseb. Open valley bottoms. 699.

GENTIANELLA AMARELLA (L.) Börner ssp. ACUTA (Michx.) J. M. Gillett. Riparian and aquatic zones, mesic slopes and ridges. 696.

HALENIA RECIRVA (Sm.) Allen. Mesic slopes and ridges. 1098.

GERANIACEAE

GERANUM CAESITOSUM E. James var. CAESITOSUM. Mesic slopes and ridges, open valley bottoms. 657.


GROSSULARIACEAE

RIBES PINETORUM Greene. Riparian and aquatic zones, dry slopes and ridges, mesic slopes and ridges, narrow canyons, burned areas. 773.

HYDRANGEACEAE

FENDLEIRA RUICOLICA A. Gray. Dry slopes and ridges. 809.


HYDROPHYLLACEAE

NAMA DICHOTOMUM (Ruiz & Pav.) Choisy. Open valley bottoms, high elevation meadows. 997.

PHACELIA HETEROPHYLLA Pursh. Mesic slopes and ridges, burned areas. 950.

LAMIACEAE (LABIATAE)

AGASTACHE PALLIDIFLORA (A. Heller) Rydib. var. PALLIDIFLORA. Mesic slopes and ridges, narrow canyons, burned areas. 620.

MONARDA AUSTROMONTANA Epling. Open valley bottoms. 1058.

MONARDA MENTHEFOLIA Graham. Mesic slopes and ridges. 580.

MONARDILLA ODORATISSIMA Benth. Mesic slopes and ridges. 971.

PRUNELLA VULGARIS L. Riparian and aquatic zones. 929.
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SALVIA SUBINCISA Benth. Dry slopes and ridges, open valley bottoms. 655.

LINACEAE

LINUM LEWISII Pursh var. LEWISII. Dry slopes and ridges, mesic slopes and ridges, open valley bottoms, burned areas. 625.
LINUM PUBERULUM (Engelm.) A. Heller. Mesic slopes and ridges. 733.

MALVACEAE

SPHAGNUM FENNELI A. Gray var. FENNELI. Dry slopes and ridges, rock outcrops. 615.

NYCTAGINACEAE

MIRABILIS LONGIFLORA 1. Dry slopes and ridges. 1072.
MIRABILIS OBLONGIFOLIA (A. Gray) Heimerl. Dry slopes and ridges, mesic slopes and ridges, burned areas. 613.
MIRABILIS OXYBAPHOIDES (A. Gray) A. Gray. Rock outcrops. 1154.

ONAGRACEAE

EPILOBium ANGuStIFOLiUM L. ssp. CIRCUMVAGUM Mosquin. Riparian and aquatic zones. 967.
EPILOBium CILiATUM Raf. ssp. CILiATUM. Riparian and aquatic zones. 956.
EPILOBium SAXiMONTANUM Hausskn. Riparian and aquatic zones. 573.
GAURA HExANDRA Ortega sp. GRACiLiS (Wooton & Standl.) P. H. Raven & D. P. Greg. Dry slopes and ridges. 639.
OEcOTHERa ELATA Kunth ssp. HERSUiTTiSSiMA (A. Gray ex S. Watson) W. Dietr. Mesic slopes and ridges 576.
OEcOTHERa PALiDA Lindl. ssp. RUCiNATA (Engelm.) Munz & W. M. Klein. Mesic slopes and ridges, burned areas. 691.

OROBANCHACEAE

CONOPHiLIS ALPINA Liebm. var. MEXICANA (A. Gray ex S. Watson) R. R. Haynes. Dry slopes and ridges, mesic slopes and ridges. 867.

OXALIDACEAE

OXALiS ALPiNa (Rose) Rose ex R. Knuth [O. metcalfii (Small) R. Knuth, O. monticola Small]. Mesic slopes and ridges, rock outcrops. 569.
OXALiS DECaPHYLLa Kunth [O. grayi (Rose) R. Knuth]. Riparian and aquatic zones, mesic slopes and ridges. 742.

PAPAVERACEAE

CORYDALiS aUREA Wild. ssp. OCCIDENTALiS (Engelm.) G. B. Owen­bey. Riparian and aquatic zones, mesic slopes and ridges. 766.

PLANTAGINACEAE

PLANTAGo ARGYRAEA Morris. Open valley bottoms. 664.

POLEMONIACEAE

IPOMOPSIS AGGREGATA (Pursh) V. E. Grant. Mesic slopes and ridges, high elevation meadows. 629.
POLEMONiUM FOLiOsiSSiMUm A. Gray var. MOLLE (Greene) Anway. Mesic slopes and ridges. 1081.

POLYGALACEAE

MONiNA WRIGHTII A. Gray. Mesic slopes and ridges. 1137.

POLYGONACEAE

ERiOGONiUM JAMESiB. Benth. var. JAMESiB. Dry slopes and ridges, rock outcrops. 612.
ERiOGONiUM PHARNaCEOiDEs Torr. Dry slopes and ridges, open valley bottoms, rock outcrops. 647.

PORTULACACEAE

TALiNUm CONFiRTiFiLORuM Greene. Rock outcrops. 728.

PRIMULACEAE

ANDROsACE SEPTEnTRiONALiS L. ssp. PUBERULENTA (Rydby.) G. T. Robbins. Mesic slopes and ridges, open valley bottoms. 771.
PRIMuLA RuSiBiYi Greene. Mesic slopes and ridges, rock outcrops. 894.

RANUNCULACEAE

AQuILEGIA CHYRSANThA A. Gray. Mesic slopes and ridges. 715.
AQuILEGIA TRiTERNATa Payson. Mesic slopes and ridges, narrow can­yons. 826.
CLEMATiS COLUMBiANA (Nutt.) Torr. & A. Gray var. COLUMBiANA. Mesic slopes and ridges. 805.
DELPHiNiUM SCOPuLORuM A. Gray. Mesic slopes and ridges. 745.

RHAMNACEAE

CENAOTHiS FENNELI A. Gray. Dry slopes and ridges, mesic slopes and ridges. 1086.
FRANGula BETuLaEFOLiA (Greene) Grubov ssp. BETuLaEFOLiA [Rhamnus b. Greene]. Dry slopes and ridges. 1161.

ROSACEAE

AGRiMONiA GRuPsOSEPALa Wallr. Riparian and aquatic zones, mesic slopes and ridges. 603.
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