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Flora and Vegetation
of the
Sierra Ancha Experimental
Forest, Arizona

by CHARLES P. PASE
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FOREST SERVICE

Raymond Price, Director
U. S. DEPARTMENT OF AGRICULTURE

Flora and Vegetation
of the
Sierra Ancha Experimental Forest,¹ Arizona

By

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and

R. Roy Johnson, Associate Professor³

¹A portion of the Tonto National Forest, set aside for experimental purposes in 1932, under authority of the Secretary of the U. S. Department of Agriculture, and administered by the Rocky Mountain Forest and Range Experiment Station.

²Rocky Mountain Forest and Range Experiment Station, with central headquarters maintained in cooperation with Colorado State University at Fort Collins; Pase is located at Tempe in cooperation with Arizona State University.

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Charles P. Puse and R. Roy Johnson

The Sierra Ancha Experimental Forest, a field unit of the Rocky Mountain Forest and Range Experiment Station devoted primarily to watershed research, lies in Sierra Ancha, a mountainous area about midway between Globe and Young in Gila County, central Arizona. Although only 12,820 acres in size, its broad elevational range—from 3,550 to 7,724 feet—covers a variety of vegetation types.

This Paper summarizes the physical environment of the Forest, with a brief description of each of the major plant associations, and a catalog of species listing all known vascular plants collected since the Forest was established in 1932.

Physical Characteristics

Climate

Upper elevations in Sierra Ancha are characterized by cold moist winters, dry warm springs, and hot moist summers (fig. 1). The fall dry season so characteristic of much of the State is less pronounced here. Precipitation averages 33.4 inches per year, 11.0 inches (33 percent) of which fall from June through September. Annual precipitation has varied from 18.6 to 49.9 inches. Much of the winter precipitation falls as snow above 6,000 feet. Winter snowpack in the upper Workman Creek area, at 7,000 feet, often exceeds 4 feet.

In the intermediate elevation zone, between 4,800 and 6,000 feet, temperatures are much higher and relatively little winter precipitation occurs as snow, except in occasional years. Annual rainfall at the Sierra Ancha headquarters, at 5,100 feet elevation, averages 24.7 inches of which 7.5 inches (30 percent) falls from June through September. Annual rainfall has varied from 13.1 to 42.0 inches. A moderate secondary dry season usually begins as temperatures begin to drop, but is commonly of short duration (fig. 1).

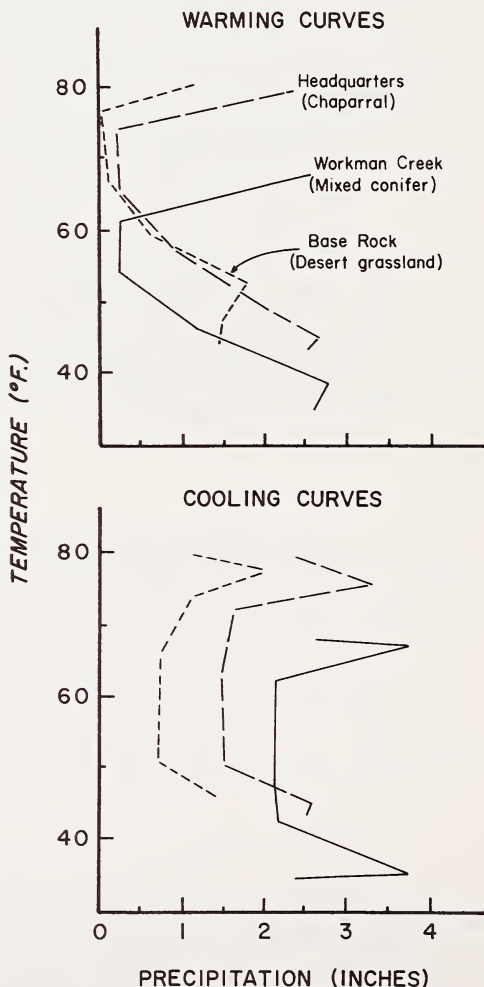


Figure 1.--Mean monthly temperatures plotted against median monthly precipitation at three climatic stations, Sierra Ancha Experimental Forest. End points of curves for Workman Creek are July and February; for other stations, August and January.

In the lower elevation zone at the south end of the Forest, low rainfall and high temperatures combine to make a hot, desertlike climate. Mean rainfall is 16.2 inches, but rainfall has varied from 10.2 to 22.6 inches. Rainfall distribution is not greatly different from that in the upper two zones, as 5.7 inches (35 percent) falls from June through September. A spring drought, more severe than in the higher elevation zones, usually extends from mid-April to mid-July. A less severe but still critical drought period occurs after the end of the summer rainy season, when temperatures are descending, yet still adequate for plant growth.

The striking differences in environments are apparent in the warming and cooling curves for the three elevation zones at Sierra Ancha based on median precipitation⁴ and mean temperatures (fig. 1). The Workman Creek station is in a small mountain park completely surrounded with ponderosa pine (*Pinus ponderosa*)⁵ and mixed conifer forest; Headquarters Station is well within the chaparral type, and on the edge of a strip of oak-woodland; the Base Rock Station is in the semidesert grassland, but only a quarter mile from elements of the southern desert shrub formation.

Geology

The Forest lies along the crest of the Sierra Ancha, a mountain range carved from sedimentary, metamorphic, and igneous rocks uplifted in a domelike structure. Several poorly to well defined faults cut the mountain mass.

Exposed formations within the Experimental Forest generally belong to the Apache Group of later Precambrian age. In descending order, these consist of Troy Sandstone and Quartzite, Mescal Limestone, Dripping Springs Quartzite,

⁴ Plant distribution is apt to be more responsive to median rather than mean precipitation, especially in arid or semiarid climates (Daubermire 1956). Where rainfall is low, a single large storm can greatly affect the mean rainfall value for many years, yet have little ecological effect on plant populations. Median values tend to be less distorted by these rare rainfall events, and presumably are more closely correlated with vegetation.

⁵ Authors of scientific names are given in the checklist.

Barnes Conglomerate, Pioneer Shale, and Scanlon Conglomerate. Vesicular basalt flows of Tertiary and/or Quaternary age (Darton 1925, Granger and Raup 1964) are present in some of the higher basins. Intruded within these formations at various horizons are sills of diabase, often deeply weathered where exposed. The Apache Group as a whole has been subjected to low-grade metamorphism, with the addition of silica which has increased the resistance of the rocks to mechanical and chemical weathering.

The Dripping Springs Quartzite, one of the most conspicuous geologic features, is dissected by numerous gorges at the extreme south end of the Forest. According to Shride, (1962) the thickness of the quartzite beds (including the basal member, Barnes Conglomerate) varies from 550 to 700 feet. Shallow weathering of this formation restricts moisture penetration to the shallow, fine-textured soil. As a consequence, normally deep-rooted shrubs and trees do poorly on this formation except where local topographic features permit deeper soil formation, as in pockets and at the toe of slopes. A large part of Parker and Pocket Creek watersheds lies in this formation, which helps explain the low retention storage capacity and unusually high water yields from these areas.

Soils

In the high-elevation zone at the north end of the Forest, surface soils are mostly of loam or clay-loam texture, with granular or crumb structure. Soil depth may vary from a few inches to more than 18 feet. Subsoils are mostly layered, and vary in texture from clay loams to clays. The area is primarily in conifer forest, and tree roots have been found to extend to a depth of at least 18 feet.

Soils in the intermediate elevation zone are mostly derived from deeply weathered medium- to coarse-grained diabase, locally mixed with talus from the steep Mescal Limestone and Dripping Springs Quartzites above. Horizons are ill defined, organic matter content is low, and the soils are almost structureless. Subsoils tend to be much lower in clay than soils derived from granites. Deep weathering permits shrub roots to penetrate to considerable depths. In a recent root distribution study, 13 grams of chaparral roots per cubic foot of soil were found at the 12-foot level, the maximum depth sampled. This was a substantially higher root

concentration than was found under conifer trees at the same depth, and suggests that chaparral shrubs probably send roots considerably deeper (U. S. D. A. Forest Service 1957). Root studies conducted in the chaparral of California also showed that dominant shrubs were rooted to a depth of 28 feet (Hellmers et al. 1955).

Soils developed on the lower elevation Dripping Springs Quartzite, Barnes Conglomerate, and Pioneer formations are shallow and fine textured, and probably fall within the reddish chestnut great soil group. The soil horizons are poorly defined. The entire profile contains a large amount of disintegrated quartzite rock, is noncalcareous and slightly acid, and contains a high percentage of silt and clay (Martin and Rich 1948).

Vegetation Types

Eight vegetation types are found on the Experimental Forest (fig. 2). From high elevation to low these are: mixed conifer, mountain park, ponderosa pine, chaparral, oak-woodland, desert grassland, and desert shrub. The riparian type is adjacent to the major streams, and cuts across all the other types. General descriptions of four of these have been published recently in connection with a wildlife habitat study (Reynolds and Johnson 1964). Vegetation types used here agree generally with Nichol (1952). Botanical nomenclature follows Hitchcock (1950) for grasses, Little (1953) for trees, and Kearney and Peebles (1960) for all others. Common names generally follow Kelsey and Dayton (1942). Because of intimate

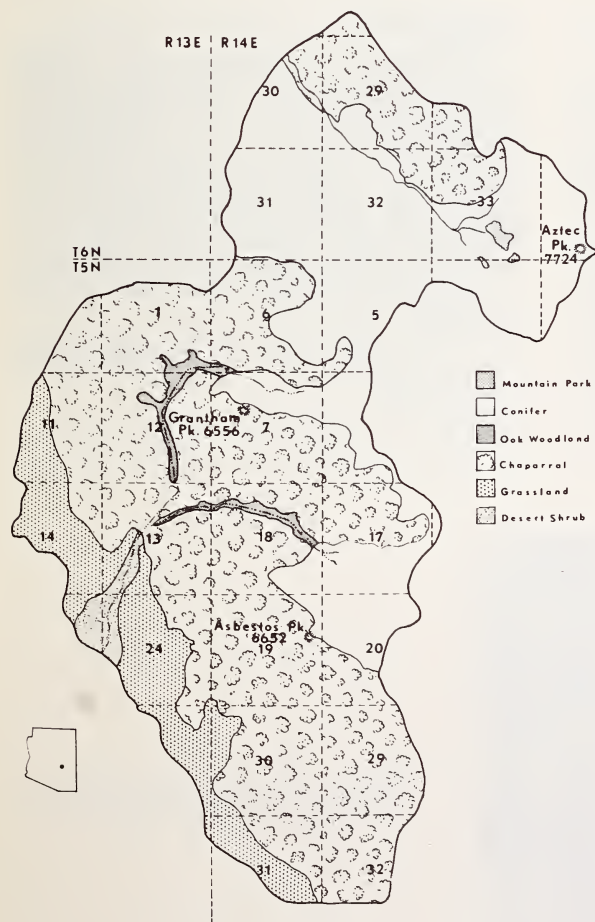


Figure 2.--Vegetation types on the Sierra Ancha Experimental Forest.

intermingling of types, the "conifer" type on the vegetation map (fig. 2) includes both mixed conifer and ponderosa pine. Acreage of the types is given below:

Type:	Experimental Forest (acres)	Forest (percent)
Conifer ¹	3,776	29.5
Mountain park	30	.2
Oak-woodland	131	1.0
Chaparral	7,302	57.0
Desert grassland	1,351	10.5
Desert shrub	162	1.3
Riparian ²	68	.5
Total	12,820	100.0

¹Includes both pine-fir and ponderosa pine types.

²Based on estimated average width of 66 feet.

Mixed Conifer

Mixed conifer ranges from below 6,000 feet on cool, moist slopes to more than 7,500 feet in Workman Creek and Parker Creek drainages. The dominant trees are Douglas-fir (Pseudotsuga menziesii), white fir (Abies concolor), and ponderosa pine (fig. 3). Individual ponderosa pines usually attain greater size in the mixed conifer than in the pure ponderosa pine type. Understory trees are Gambel oak (Quercus gambelii) and New-Mexican locust (Robinia neomexicana). Quaking aspen (Populus tremuloides) commonly occurs at edges of clearings and in old burns. The main shrub scat-

tered along the forest floor is mountain snowberry (Symphoricarpos oreophilus).

The few herbaceous species which grow under the large trees are shade-tolerant species such as Canadian violet (Viola canadensis), several species of orchids including western rattlesnake-plantain (Goodyera oblongifolia), and nonphotosynthetic species such as coral-roots (Corallorhiza maculata, C. wisteriana and C. striata). During the summer rainy season fungi are common in decaying organic matter, such as old logs and duff, and mosses grow on rocks, soil, and logs. Species more common in small clearings and along roadsides include figwort (Scrophularia parviflora), red raspberry (Rubus strigosus), and strawberry (Fragaria ovalis).

Mountain Park

The major park is found on the Middle Fork of Workman Creek, in the mixed conifer vegetation type (fig. 4). Deep, fine soils and high rainfall contribute to a diverse flora. Clearings are bordered by dense stands of ponderosa pine, white fir, and Douglas-fir, interspersed with quaking aspen and Gambel oak. Clumps of Arizona walnut (Juglans major) are scattered within the park. Arroyo willow (Salix lasiolepis) forms dense colonies along washes. Thickets of Gambel oak, mountain snowberry, and roses (Rosa spp.) and the apple orchard (at the deserted Peterson Ranch) provide good wildlife cover.



Figure 3.--Mixed conifer stand at the head of Workman Creek. Dense shade restricts herbaceous understory.

Figure 4.--Small mountain park in the Middle Fork of Workman Creek.



Herbaceous plants are abundant. Grasses include Kentucky bluegrass (*Poa pratensis*), redtop (*Agrostis palustris*), and orchardgrass (*Dactylis glomerata*). Common bindweed (*Convolvulus arvensis*), skyrocket (*Gilia aggregata*), and several composites, including the common sunflower (*Helianthus annuus*) and ragleaf bahia (*Bahia dissecta*) grow throughout the clearings. Seeps and springs are surrounded by *Juncus* spp., *Cyperus* spp., *Carex* spp., and prairiemallow (*Sidalcea neomexicana*).

Ponderosa Pine

The ponderosa pine type ranges from approximately 5,500 feet on cool, moist slopes and in shaded canyons to 7,000 feet on drier

sites such as west-facing slopes or in shallow, rocky soils (fig. 5). Ponderosa pine is the dominant tree. On drier sites, New-Mexican locust, Emory oak (*Quercus emoryi*), and alligator juniper (*Juniperus deppeana*) are the main understory species. In cooler, moist areas, New-Mexican locust and Gambel oak occur as an understory. Herbaceous plants are few. Bracken (*Pteridium aquilinum*) is common locally following summer rains. Plants common along roadsides and in clearings include the colorful scarlet bugler (*Penstemon barbatus*), Fendler ceanothus (*Ceanothus fendleri*), and red and yellow pea (*Lotus wrightii*). Sparse grasses, usually most common in clearings, include mountain muhly (*Muhlenbergia montana*), bulb panicum (*Panicum bulbosum*), and Pringle needlegrass (*Stipa pringlei*).

Figure 5.--Ponderosa pine stand at Workman Creek.





Figure 6.--Dense oak-woodland community near Headquarters. Dominant tree is *Quercus arizonica*.

Oak-woodland

A small area of oak-woodland occurs in Parker and Pocket Creeks between 4,800 and 5,300 feet elevation. Treelike oaks dominate the overstory, while understory shrubs, where present, are mainly those common in the adjacent chaparral type. Arizona white oak (*Quercus arizonica*) and Emory oak are particularly abundant, while southwestern black cherry (*Prunus serotina* var. *rufula*) is common usually on the more mesic sites (fig. 6). California buckthorn (*Rhamnus californica*), rarely found in the adjacent chaparral, is fairly common on the cooler slopes. The attractive but

dangerous poison-ivy (*Rhus radicans*) is both widespread and abundant.

The herbaceous understory is rather sparse, except on the lower slopes adjacent to stream channels. Common plants include California brome (*Bromus carinatus*), fringed brome (*B. ciliatus*), blue wildrye (*Elymus glaucus*), deergrass (*Muhlenbergia rigens*), and purple geranium (*Geranium eremophilum*).

Chaparral

Chaparral reaches its best development on diabase-derived soils between 4,500 and 6,000 feet elevation (fig. 7). Where soils are thin,



Figure 7.--Dense mature stand of chaparral near western edge of Experimental Forest. *Quercus turbinella* is the dominant species.

overlying massive unfractured quartzite, chaparral stands become more open, with interspersed islands of grassland and forbs.

With few exceptions, characteristic chaparral shrubs are evergreen, broad sclerophylls. Most have deep, extensive root systems and the ability to resprout vigorously after fire. The few nonsprouting shrubs produce abundant seeds which germinate readily after fire (Pase 1965).

Shrub live oak (*Quercus turbinella*) is the most abundant shrub throughout the chaparral type on the Experimental Forest, often comprising 60 percent or more of the woody cover. Toward the upper elevations, common associated shrubs are true mountainmahogany (*Cercocarpus montanus*), Emory oak, Wright silktassel (*Garrya wrightii*), and Pringle manzanita (*Arctostaphylos pringlei*). Crown cover is usually high, and few understory forbs and grasses are present. At lower elevations where the type borders the desert grassland and desert shrub associations, common associated shrubs are skunkbush (*Rhus trilobata*), catclaw acacia (*Acacia greggii*), wait-a-bit (*Mimosa biuncifera*), Wright buckwheat (*Eriogonum wrightii*), and pointleaf manzanita (*Arctostaphylos pungens*). Shrubs are more scattered, and understory grasses and forbs, especially annuals, are fairly common. Scattered plants of pinyon (*Pinus edulis*), and one-seed and alligator junipers (*Juniperus monosperma* and *J. deppeana*) are sprinkled throughout the type, but are nowhere dominant.

Although the chaparral type is well adapted to fire, no large fires have occurred here for many years. Ring counts from occasional pine trees in the swales suggest an age of 78 years or more.

Desert Grassland

The grassland type lies mostly on the large area of Dripping Springs Quartzite near the south end of the Forest (fig. 8). Elevations range between 4,000 and 4,800 feet. Occasional plants of velvet mesquite (*Prosopis juliflora* var. *velutina*) are scattered throughout. The most abundant half-shrub is broom snakeweed (*Gutierrezia sarothrae*). Both pricklypears and chollas (*Opuntia* spp.) are common. *Mammillaria arizonica* is common but inconspicuous. Most perennial grasses are summer growing, and usually do not begin growth until the onset of the summer rains. Several species of annual grasses, and annual and perennial forbs, however, are abundant especially after late winter rains. Common perennial grasses include side-oats, hairy, and black gramas (*Bouteloua curtipendula*, *B. hirsuta*, and *B. eriopoda*), three-awns (*Aristida* spp.) and curly-mesquite (*Hilaria belangeri*) on upland sites. Where additional moisture is available, as in swales and rocky areas, coarser grasses such as cane bluestem (*Andropogon barbinodis*), green sprangletop (*Leptochloa dubia*), and Arizona cottontop (*Trichachne californica*) may be locally abundant.

Desert Shrub

The desert shrub area is largely confined to the breaks of the canyons and the steep sides of Parker Creek Canyon, mostly between 3,550 and 4,500 feet elevation (fig. 9).

Unlike the desert floor outside the Forest, perennial grasses are fairly common on the steep, rocky slopes in the protection of the



Figure 8.--Desert grassland on shallow, quartzite-derived soils near Base Rock.



Figure 9.--Desert shrub on rocky soils near the south end of the Experimental Forest.

canyon. Common species are generally those encountered in the desert grassland above. Yellow paloverde (Cercidium microphyllum) is a characteristic tree. Common shrubs include Fremont wolfberry (Lycium fremontii) and jojoba (Simmondsia chinensis). Saguaros (Cereus giganteus) occur in protected niches in the canyon walls, but are nowhere abundant. Pricklypears and chollas are common.

Riparian

One perennial stream (Workman Creek) and two intermittent streams (Parker and Pocket Creeks) originate in the Forest. The combined length of these channels is approximately 8.5 miles; they traverse all vegetative types on the Forest. Flow in Parker and Pocket Creeks is intermittent during most summers, but even when flow is interrupted scattered pools of

water remain in the channels, and some sub-surface water is available to plants along the streams (fig. 10).

In Workman Creek and in the upper half of Parker and Pocket Creeks, arborescent vegetation is dominated by Arizona alder (Alnus oblongifolia), bigtooth maple (Acer grandidentatum), and Arizona walnut. Shade-tolerant herbaceous plants form a lush understory. Common plants include fowl mannagrass (Glyceria striata), false-Solomonseal (Smilacina racemosa), and wanderer violet (Viola nephrophylla). Common lianas are canyon grape (Vitis arizonica) and thicket creeper (Parthenocissus inserta).

In the lower reaches of Parker and Pocket Creeks, growing conditions are more severe during most summers and few truly riparian herbaceous species from upper reaches thrive here. Arizona sycamore (Platanus wrightii) and Arizona walnut are dominant. Shrubs and



Figure 10.--Riparian vegetation along Parker Creek, within the chaparral type.

trees characteristic of the adjacent oak-woodland and chaparral zones encroach almost to the water's edge. Common herbaceous plants include spike bent (Agrostis exarata), water bent (A. semiverticillata), Rocky Mountain rust (Juncus saximontanus), and inland rush (J. interior var. neomexicana).

Plant Collections

Extensive plant collections have been made in the Sierra Ancha since the Experimental Forest was established. Most of these collections are deposited in the Forest Service Herbarium, Washington, D. C., and in herbaria at the Forest Hydrology Laboratory, Tempe, Arizona; Arizona State University at Tempe; and The University of Arizona at Tucson. Collectors who have added significantly to botanical exploration of the area in addition to the authors include Frank W. Gould, Elbert L. Little, Jr., Jerry M. Johnson, Barnard A. Hendricks, and Charles K. Cooperrider. Of these collections, only the ferns and fern allies have been reported (Little 1938). Liverworts of hepatics of the Sierra Anchas have also been reported by Little (1939), but are not included in the present paper. A preliminary checklist covering Sierra Ancha has been prepared by Johnson.⁶

Additions to the Known Arizona Flora

Two introduced species of grasses in the present checklist are not previously reported from the State. Collector's name and number follow in parentheses.

Agropyron intermedium introduced at Workman Creek. (C. P. Pase 1766).

Poa bulbosa introduced at Parker Creek. (C. P. Pase 1183).

Poa bulbosa was established in a trial planting about 1938, and has persisted, without spreading, to the present. Agropyron intermedium appears well established in clearcut or otherwise disturbed sites in the mixed conifer and ponderosa pine types on Workman Creek.

⁶Johnson, R. Roy. *The biota of Sierra Ancha, Gila County, Arizona. Master's Thesis, Univ. Ariz., Tucson. 114 pp. 1960.*

Distribution of Species

Distribution of species of the Sierra Ancha Experimental Forest was taken from floras by Kearney and Peebles (1960) and Tidestrom and Kittell (1941). The 726 species and 9 varieties reported fall into the following seven more-or-less natural geographic groups. Varieties are considered as separate taxa in this classification.

1. **Arizonan.**—Species of local range known only from Arizona. The following 13 endemic species and varieties comprise 1.8 percent of the flora:

Agave chrysantha
Agave toumeyana
Cimicifuga arizonica
Cupressus glabra
Echeveria collomae
Echeveria rusbyi
Echinocereus boyce-thompsoni var.
boyce-thompsoni
Echinocereus boyce-thompsoni var.
bonkeriae
Erigeron pringlei
Perityle ciliata
Phlox tenuifolia
Rumex orthoneurus
Sporobolus interruptus

Of these, Cimicifuga arizonica is particularly interesting, as it is known from only two other locations, both in central Arizona. Rumex orthoneurus, known otherwise only from two collections in the Chiricahua Mountains of southeastern Arizona, has been found on rich, moist soil in Workman Creek.

2. **Californian.**—Species confined primarily to California. The following 8 species or 1.1 percent, fall in this group:

Calyptridium monandrum
Harpagonella palmeri
Lupinus bicolor
Muhlenbergia rigens
Pholistoma auritum
Plectritis ciliosa
Quercus chrysolepis
Thelypodium longifolium

3. **Southwestern.**—Species extending from west Texas to Arizona, and south into northern Mexico, or occasionally slightly beyond into the drier parts of southern Colorado, Utah, Nevada, and southeastern California. These are generally plants

of the arid Southwest. Examples are Bouteloua eriopoda, B. aristoides, and Hilaria belangeri. The largest number of species, 292 or 39.7 percent, falls in this group.

4. **Western United States.**—Species ranging widely throughout the western half of the United States, including the Great Plains, Rocky Mountains, and the Great Basin of Utah and Nevada. Typical examples are snakeweed, Gambel oak, ponderosa pine, and white fir. This second largest group contains 220 species or 29.9 percent.

5. **North American.**—Species widely distributed throughout temperate North America. These plants are usually, but not always, of mesic habitats. Examples are Corydalis aurea, red raspberry, and roadside agrimony (Agrimonia striata). This is the third largest group, with 152 species or 20.7 percent.

6. **Tropical.**—Species that extend from South or Central America and Mexico northward into the warmer parts of Texas, New Mexico, and Arizona. Only 3, or 0.4 percent, fall into this group: Cyperus flavus, Boerhaavia erecta, and tanglehead (Heteropogon contortus).

7. **Introduced.**—Species introduced by man from other regions of the new or old world, that have become successfully established in the area. These are usually plants of disturbed areas, (road shoulders, and so forth) but may include others that have spread far from such areas. Examples include red brome (Bromus rubens), Kentucky bluegrass, and shepherds-purse (Capsella bursa-pastoris). Forty-seven species, or 6.4 percent, are in this group.

The flora of the Sierra Ancha Experimental Forest is distinctly southwestern and western; approximately 70 percent of all known species fall in these two groups. This is perhaps not surprising, as the chaparral, desert grassland, and southern desert shrub formations represent types that extend well into northern Mexico. Few species in these associations are found north of Arizona. In addition, a large number of Rocky Mountain species extend south into Sierra Ancha, especially in the mixed conifer and chaparral types.

Checklist

In the following plant list, the authors attempted to place each species in its appropriate vegetation type, characteristic site where found, and abundance class. Such data were often missing from collection sheets, and the authors were forced to rely on their familiarity with the species concerned. Often a plant was collected in one vegetation type, when it might in fact be more representative of an adjacent type; in such cases, the more representative location was used in the list. While much of this information must of necessity be subjective, it is thought to be sufficiently reliable to be of some assistance to future students of the local flora.

Acknowledgments

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Celastraceae	17	Polygalaceae	16
Chenopodiaceae	15	Polygonaceae	15
Commelinaceae	14	Polypodiaceae	13
Compositae	19	Portulacaceae	15
Convolvulaceae	18	Primulaceae	17
Cornaceae	17		
Crassulaceae	15	Ranunculaceae	15
Cruciferae	15	Rhamnaceae	17
Cucurbitaceae	19	Rosaceae	16
Cyperaceae	14	Rubiaceae	19
		Rutaceae	16
Equisetaceae	13	Salicaceae	14
Ericaceae	17	Santalaceae	14
Euphorbiaceae	16	Sapindaceae	17
		Scrophulariaceae	18
		Saxifragaceae	15
Fagaceae	14	Selaginellaceae	13
Fouquieriaceae	17	Solanaceae	18
		Sterculiaceae	17
Gentianaceae	18		
Geraniaceae	16	Tamaricaceae	17
Gramineae	13	Typhaceae	13
Guttiferae	17		
Hydrophyllaceae	18	Ulmaceae	14
		Umbelliferae	17
Iridaceae	14	Urticaceae	14
Juglandaceae	14	Valerianaceae	19
Juncaceae	14	Verbenaceae	18
		Violaceae	17
Labiatae	18	Vitaceae	17
Leguminosae	16		
Liliaceae	14	Zygophyllaceae	16

SIERRA ANCHA PLANT CHECKLIST

Types:

- SDS - southern desert shrub
- G - desert grassland
- C - chaparral
- OW - oak woodland
- PP - ponderosa pine
- PF - pine-fir
- MP - mountain parks & meadows

Sites:

- u - dry uplands
- c - cool moist slopes
- s - swales & lower slopes
- f - flood plains
- r - riparian

Abundance:

- r - rare
- o - occasional
- f - frequent
- a - abundant
- va - very abundant

Type Site Abundance

SELAGINELLACEAE

Selaginella arizonica Maxon G u f

EQUISETACEAE

Equisetum arvense L. PP r f
Equisetum hyemale L. var. *affine* (Engelm.) A.A. Eaton PP r f
Equisetum laevigatum A. Braun PP r o
Equisetum palustre L. PP r r

POLYPODIACEAE

Adiantum capillus-veneris L. OW c r
Asplenium resiliens Kunze OW c o
Bormeria hispida (Matt.) Underw. C c f
Cheilanthes eatoni Baker - - -
Cheilanthes feei Moore C c o
Cheilanthes fendleri Hook. OW c f
Cheilanthes linheimeri Hook. OW u o
Cheilanthes parryi (D.C. Eaton) Domin C c o
Cheilanthes wootoni Maxon G c o
Cheilanthes wrightii Hook. - - -
Cyrtomium auriculatum (Underw.) Morton s o
Cystopteris fragilis (L.) Bernh. PF s o
Dryopteris arguta (Kaulf.) Nutt. OW c r
Notholaena aurea (Poir.) Desv. G u r
Notholaena standleyi Maxon - - -
Notholaena sinuata (Lag.) Kaulf. var. *sinuata* - - -
Notholaena sinuata (Lag.) Kaulf. var. *integerrima* Hook. - - -
Pellaea atropurpurea (L.) Link OW c r
Pellaea intermedia Mett. C u o
Pellaea limitanea (Maxon) Morton G c o
Pellaea longimucronata Hook. C u f
Pellaea ternifolia (Cav.) Link var. *wrightiana* (Hook.) A. F. Tryon C u o
Pityrogramma triangularis (Kaulf.) Maxon G u r
Polystichum scopulinum (D.C. Eaton) Maxon C c r
Pteridium aquilinum var. *pubescens* Underw. PP c f
Woodia mexicana Fée PP u o
Woodwardia fimbriata J. E. Smith OW c r

Pinaceae

Abies concolor (Gord. & Glend.) Lindl. PF c va
Cupressus glabra Sudw. OW c r
Juniperus monosperma (Engelm.) Sarg. C u o
Juniperus deppeana Steud. OW u f
Pinus edulis Engelm. C u o
Pinus ponderosa Laws. PP u va
Pseudotsuga menziesii (Mirb.) Franco var. *glauca* (Beissn.) Franco PF u va

TYPHACEAE

Typha domingensis Pers. C r o

GRAMINEAE

Agropyron desertorum (Fisch.) Schult. PP u f
Agropyron intermedium (Host) Beauv. PP u f
Agropyron smithii Rydb. MP s o
Agropyron trachycaulum (Link) Malte PP c o
Agrostis ezarata Trin. OW r o
Agrostis palustris Huds. MP s f
Agrostis semiverticillata (Forsk.) C. Christ. OW r o
Andropogon barbinodis Lag. C u f
Andropogon cirratus Hack. C u f
Aristida adscensionis L. C u o
Aristida arizonica Vasey C u f
Aristida fendleriana Steud. C u f
Aristida glabrata (Vasey) Hitchc. G u o
Aristida glauca (Nees) Walp. G u o
Aristida hamulosa Henr. G u o
Aristida oligantha Michx. - - -
Aristida orcuttiana Vasey C u o
Aristida pansa Woot. & Standl. C u o
Aristida parishii Hitchc. G u o
Aristida purpurea Nutt. G u f
Avena fatua L. G u o
Bouteloua aristidoidea (H.B.K.) Griseb. C u f
Bouteloua barbata Lag. G u f
Bouteloua curtipendula (Michx.) Torr. C u va
Bouteloua eriopoda Torr. G u o
Bouteloua gracilis (H.B.K.) Lag. C u f
Bouteloua hirsuta Lag. G u a
Bouteloua rothrockii Vasey G u f
Blepharoneuron tricholepis (Torr.) Nash PP u o
Bromus anomalus Rupr. PF s o
Bromus brevistaratus Buckl. OW s o
Bromus carynatus Hook. & Arn. OW c r
Bromus ciliatus L. OW c o
Bromus frondosus (Shear) Woot. & Standl. OW c o
Bromus japonicus Thunb. MP u o
Bromus marginatus Nees PF u o
Bromus rubens L. G u va
Bromus tectorum L. MP u o
Chloris verticillata Nutt. OW s o
Chloris virgata Swartz OW u r
Dactylis glomerata L. MP s f
Digitaria sanguinalis (L.) Scop. OW s -
Elymus canadensis L. PF s o
Elymus glaucus Buckl. OW c o
Eriopogon desvauxii Beauv. G u o
Eragrostis cilianensis (All.) Lutati C u o
Eragrostis diffusa Buckl. SDS u o
Eragrostis intermedia Hitchc. C u f
Eragrostis lutescens Scribn. PF s o
Eragrostis mexicana (Hornem.) Link C c f
Eriochloa gracilis (Pourn.) Hitchc. SDS u o
Festuca octoflora Walt. G u f
Festuca pacifica Piper C u f
Glyceria grandis Wats. PF r o
Glyceria striata (Lam.) Hitchc. PF r o
Heteropogon contortus (L.) Beauv. G u f
Hilaria belangeri (Steud.) Nash G u a
Hordeum stebbinsii Covas G u o
Koeleria cristata (L.) Pers. PF u f
Leptoloma cognatum (Schult.) Chase C u o
Leptochloa dubia (H.B.K.) Nees C u o

Type Site Abundance

Type	Site	Abundance	Type	Site	Abundance
<i>Leptochloa filiformis</i> (Lam.) Beauv.	G	u	f		
<i>Lycurus phleoides</i> H.B.K.	C	u	o		
<i>Melica porteri</i> Scribn.	PF	s	o		
<i>Muhlenbergia emersleyi</i> Vasey	C	c	f		
<i>Muhlenbergia fragilis</i> Swallen	G	u	f		
<i>Muhlenbergia longiligula</i> Hitchc.	C	u	f		
<i>Muhlenbergia montana</i> (Nutt.) Hitchc.	PP	u	o		
<i>Muhlenbergia monticola</i> Buckl.	C	u	r		
<i>Muhlenbergia pauciflora</i> Buckl.	C	c	o		
<i>Muhlenbergia porteri</i> Scribn.	G	u	o		
<i>Muhlenbergia rigens</i> (Benth.) Hitchc.	OW	s	f		
<i>Muhlenbergia simosa</i> Swallen	G	c	o		
<i>Panicum arizonicum</i> Scribn. & Merr.	G	u	o		
<i>Panicum bulbosum</i> H.B.K. var. <i>minus</i>					
Vasey	PP	s	o		
<i>Panicum capillare</i> L. var. <i>occidentale</i>					
Rydb.	PP	s	o		
<i>Panicum hirticaule</i> Presl	G	s	o		
<i>Panicum huachucae</i> Ashe	OW	s	o		
<i>Panicum obtusum</i> H.B.K.	G	s	o		
<i>Phleum pratense</i> L.	MP	s	r		
<i>Poa bigelovii</i> Vasey & Scribn.	G	u	f		
<i>Poa bulbosa</i> L.	C	s	r		
<i>Poa compressa</i> L.	PP	s	o		
<i>Poa longiligula</i> Scribn. & Williams	C	c	o		
<i>Poa pratensis</i> L.	MP	s	va		
<i>Polygonum monspeliense</i> (L.) Desf.	C	s	o		
<i>Setaria macrostachya</i> H.B.K.	G	s	o		
<i>Sitanion hystrix</i> (Nutt.) J. G. Smith	PP	u	a		
<i>Sporobolus contractus</i> Hitchc.	C	u	o		
<i>Sporobolus cryptandrus</i> (Torr.) Gray	C	u	f		
<i>Sporobolus interruptus</i> Vasey	PP	u	r		
<i>Stipa neomexicana</i> (Thurb.) Scribn.	C	u	o		
<i>Stipa pringlei</i> Scribn.	PP	u	f		
<i>Stipa speciosa</i> Trin. & Rupr.	G	u	o		
<i>Trichachne californica</i> (Benth.) Chase	C	u	f		
<i>Tridens muticus</i> (Torr.) Nash	G	u	f		
<i>Tridens pilosus</i> (Buckl.) Hitchc.	C	u	o		
<i>Tridens pulchellus</i> (H.B.K.) Hitchc.	C	u	o		
CYPERACEAE					
<i>Bulbostylis capillaris</i> (L.)					
C. B. Clarke	OW	s	-		
<i>Bulbostylis funckii</i> (Steud.)					
C. B. Clarke	G	s	-		
<i>Carex chihuahuensis</i> Mackenz.	PP	s	f		
<i>Carex geophila</i> Mackenz.	C	u	f		
<i>Carex occidentalis</i> Bailey	PF	u	f		
<i>Carex praegracilis</i> W. Boott	OW	c	o		
<i>Carex rossii</i> W. Boott	PF	u	f		
<i>Carex subfusca</i> W. Boott	-	-	-		
<i>Carex thurberi</i> Dewey	OW	s	o		
<i>Cyperus aristatus</i> Rottb.	G	s	o		
<i>Cyperus esculentus</i> L.	G	s	o		
<i>Cyperus fendlerianus</i> Boeckl.	PF	s	f		
<i>Cyperus flavus</i> (Vahl) Nees	G	s	-		
<i>Cyperus parishii</i> Britt.	OW	s	-		
<i>Cyperus pringlei</i> Britt.	OW	s	-		
<i>Cyperus spectabilis</i> Link	-	-	-		
<i>Cyperus uniflorus</i> Torr. & Hook.	-	-	-		
<i>Scirpus microcarpus</i> Presl.	PF	r	o		
COMMELINACEAE					
<i>Commelina dianthifolia</i> Delile	PF	s	o		
<i>Tradescantia occidentalis</i> (Britt.)					
Smyth var. <i>scopolorum</i> (Rose)					
Anderson & Woodson	OW	c	f		
<i>Tradescantia pinetorum</i> Greene	PF	c	f		
JUNCACEAE					
<i>Juncus balticus</i> Willd. var. <i>montanus</i>					
Engelm.	PP	c	u		
<i>Juncus interior</i> Wieg. var.					
<i>neomexicanus</i> (Wieg.) Hermann	OW	s	o		
<i>Juncus saximontanus</i> A. Nels. var.					
<i>saximontanus</i>	PP	s	f		
<i>Juncus saximontanus</i> A. Nels. forma					
<i>brunnescens</i> (Rydb.) Hermann	PP	c	f		
<i>Juncus tenuis</i> Willd. var. <i>dudleyi</i>					
(Wieg.) Hermann	OW	r	o		
LILIACEAE					
<i>Allium palmeri</i> Wats.	OW	c	o		
<i>Anthericum torreyi</i> Baker	PP	u	o		
<i>Calochortus ambiguus</i> (Jones) Owenby	G	u	o		
<i>Calochortus flexuosus</i> Wats.	G	u	f		
<i>Calochortus gunnisoni</i> Wats.	C	u	o		
<i>Dasyllium wheeleri</i> Wats.	C	u	f		
<i>Nolina microcarpa</i> Wats.	G	u	f		
<i>Smilacina racemosa</i> (L.) Desf.	PF	c	o		
<i>Yucca baccata</i> Torr.	C	u	a		
<i>Yucca elata</i> Engelm.	G	u	f		
AMARYLLIDACEAE					
<i>Agave chrysantha</i> Peebles	G	u	o		
<i>Agave toumeyana</i> Trel. (A. <i>toumeyana</i>					
var. <i>bella</i> Breitung)	G	u	f		
<i>Agave palmeri</i> Engelm.	G	u	o		
<i>Agave parryi</i> Engelm.	C	u	o		
IRIDACEAE					
<i>Iris missouriensis</i> Nutt.	MP	s	o		
ORCHIDACEAE					
<i>Corallorhiza maculata</i> Raf.	PF	c	r		
<i>Corallorhiza striata</i> Lindl.	PP	c	r		
<i>Corallorhiza wisteriana</i> Conrad	PP	c	r		
<i>Goodyera oblongifolia</i> Raf.	PF	c	r		
<i>Habenaria sparsiflora</i> Wats.	PF	r	r		
SALICACEAE					
<i>Populus angustifolia</i> James	OW	r	f		
<i>Populus fremontii</i> Wats.	G	r	-		
<i>Populus tremuloides</i> Michx.	PF	c	o		
<i>Salix gooddingii</i> Ball	C	r	o		
<i>Salix laevigata</i> Bebb	PVC	r	o		
<i>Salix lasiolepis</i> Benth.	OW	r	o		
<i>Salix scouleriana</i> Barratt	OW	s	o		
JUGLANDACEAE					
<i>Juglans major</i> (Torr.) Heller	OW	s	f		
BETULACEAE					
<i>Alnus oblongifolia</i> Torr.	OW	r	a		
FAGACEAE					
<i>Quercus arizonica</i> Sarg.	OW	u	va		
<i>Quercus chrysolepis</i> Liebm.	OW	u	o		
<i>Quercus emoryi</i> Torr.	OW	u	va		
<i>Quercus dumii</i> Kellogg	C	u	o		
<i>Quercus gambelii</i> Nutt.	PP	u	va		
<i>Quercus turbinella</i> Greene	C	u	va		
ULMACEAE					
<i>Celtis reticulata</i> Torr.	C	s	o		
MORACEAE					
<i>Morus microphylla</i> Buckl.	C	c	r		
URTICACEAE					
<i>Parietaria floridana</i> Nutt.	SDS	c	o		
<i>Urtica gracilenta</i> Greene	PP	c	o		
<i>Urtica gracilis</i> Ait.	PP	u	o		
LORANTHACEAE					
<i>Arceuthobium douglasii</i> Engelm.	PF	c	r		
<i>Arceuthobium vaginatum</i> (H.B.K.) Eichler	PP	u	f		
<i>Phoradendron californicum</i> Nutt.	C	u	f		
<i>Phoradendron corvae</i> Trel.	C	u	-		
<i>Phoradendron juniperinum</i> Engelm.	C	u	o		
SANTALACEAE					
<i>Commandra pallida</i> DC.	C	c	f		

	Type	Site	Abundance		Type	Site	Abundance
ARISTOLOCHACEAE				RANUNCULACEAE			
<i>Aristolochia watsoni</i> Woot. & Standl.	G	u	r	<i>Anemone tuberosa</i> Rydb.	C	u	o
POLYGONACEAE				<i>Aquilegia caerulea</i> James	PF	r	r
<i>Eriogonum abertianum</i> Torr.	G	u	o	<i>Aquilegia chrysantha</i> Gray	PF	c	o
<i>Eriogonum alatum</i> Torr.	PF	u	o	<i>Cimicifuga arizonica</i> Wats.	PF	c	o
<i>Eriogonum cernuum</i> Nutt.	C	u	o	<i>Clematis ligusticifolia</i> Nutt.	OW	s	f
<i>Eriogonum fasciculatum</i> Benth.	SDS	u	f	<i>Delphinium amabile</i> Tidestrom	SDS	u	o
<i>Eriogonum jamesii</i> Benth.	OW	c	f	<i>Delphinium scopulorum</i> Greene	OW	u	o
<i>Eriogonum pharnaceoides</i> Torr.	PP	u	o	<i>Delphinium scopulorum</i> Gray	MP	u	o
<i>Eriogonum thurberi</i> Torr.	C	u	o	<i>Myosurus cupulatus</i> Wats.	C	u	o
<i>Eriogonum vimineum</i> Dougl.	C	u	f	<i>Ranunculus hydrocharoides</i> Gray	PP	r	o
<i>Eriogonum wrightii</i> Torr.	C	u	va	<i>Ranunculus inaequalis</i> Greene	-	-	-
<i>Polygonum convolvulus</i> L.	PP	c	o	<i>Ranunculus macdonii</i> Britt.	PF	r	o
<i>Polygonum sawatchense</i> Small	OW	u	o	<i>Thalictrum fendleri</i> Engelm.	OW	c	f
<i>Pterostegia drymaroides</i> Fisch. & Meyer	SDS	c	r	BERBERIDACEAE			
<i>Rumex acetosella</i> L.	PP	s	o	<i>Berberis haematocarpa</i> Wooton	C	u	f
<i>Rumex crispus</i> L.	PP	s	o	<i>Berberis repens</i> Lindl.	PF	r	f
<i>Rumex hymenosepalus</i> Torr.	SDS	s	o	PAPAVERACEAE			
<i>Rumex orthoneurus</i> Rech. f.	PP	s	r	<i>Argemone platyceras</i> Link & Otto	G	u	o
CHENOPODIACEAE				<i>Corydalis aurea</i> Willd.	OW	c	f
<i>Chenopodium fremontii</i> Wats.	C	u	a	<i>Eschscholzia mexicana</i> Greene	G	u	o
<i>Chenopodium graveolens</i> Willd. var. <i>neomezicarianum</i> (Aellen) Aellen	C	u	o	<i>Platystemon californicus</i> Benth.	SDS	s	o
<i>Salsola kali</i> L.	PP	u	o	CRUCIFERAE			
AMARANTHACEAE				<i>Arabis glabra</i> (L.) Bernh.	PP	u	-
<i>Amaranthus graecizans</i> L.	C	c	-	<i>Arabis perennis</i> Wats.	C	u	a
<i>Amaranthus hybridus</i> L.	PP	u	r	<i>Athysanus pusillus</i> (Hook.) Greene	C	c	o
<i>Amaranthus powellii</i> Wats.	PP	u	-	<i>Brassica nigra</i> (L.) Koch	C	u	r
<i>Froelichia arizonica</i> Thornber	G	u	o	<i>Capsella bursa-pastoris</i> (L.) Medic.	C	u	f
<i>Froelichia gracilis</i> (Hook.) Moq.	PP	u	-	<i>Descurainia obtusa</i> (Greene)			
NYCTAGINACEAE				<i>O. E. Schulz</i>	C	u	o
<i>Boerhavia erecta</i> L.	G	u	f	<i>Descurainia pinnata</i> (Walt.) Britt.	C	u	o
<i>Boerhavia intermedia</i> Jones	G	u	f	<i>Descurainia sophia</i> (L.) Webb.	C	u	o
<i>Boerhavia spicata</i> Choisy	C	u	f	<i>Draba cuneifolia</i> Nutt.	C	s	f
<i>Boerhavia torreyana</i> (Wats.) Standl.	OW	u	o	<i>Draba reptans</i> (Lam.) Fern.	C	s	o
<i>Mirabilis bigelovii</i> Gray	SDS	u	o	<i>Erysimum capitatum</i> (Dougl.) Greene	PP	u	f
<i>Mirabilis longiflora</i> L.	PP	u	o	<i>Lepidium medium</i> Greene var. <i>pubescens</i> (Greene) Robinson	PP	u	o
<i>Mirabilis multiflora</i> (Torr.) Gray	C	u	f	<i>Lepidium lasiocarpum</i> Nutt.	SDS	u	f
<i>Mirabilis oxybaphoides</i> Gray	PF	u	o	<i>Lesquerella gordonii</i> (Gray) Wats.	SDS	u	f
<i>Oxybaphus oocineus</i> Torr.	C	u	o	<i>Rorippa nasturtium-aquaticum</i> (L.) Schinz & Thell. (<i>Nasturtium officinale</i> R. Br.)	PF	r	f
<i>Oxybaphus ocnatus</i> (Small) Weatherby	PP	c	o	<i>Sisymbrium linearifolium</i> (Gray)			
<i>Oxybaphus linearis</i> (Pursh) Robins	C	u	o	<i>Payson</i>	PP	u	o
<i>Oxybaphus pumilus</i> (Standl.) Standl.	C	u	o	<i>Sisymbrium irio</i> L.	C	u	r
AIZOACEAE				<i>Thelypodium longifolium</i> (Benth.) Wats.	PP	c	r
<i>Mollugo cervina</i> (L.) Seringe	C	u	f	<i>Thelypodium wrightii</i> Gray	C	u	r
<i>Mollugo verticillata</i> L.	C	u	o	<i>Thlaspi fendleri</i> Gray	PP	c	o
PORTULACACEAE				<i>Thysanocarpus amplexans</i> Greene	C	u	f
<i>Calandrinia ciliata</i> (Ruiz & Pavon) DC.	G	u	f	CAPPARIDACEAE			
<i>Calyptridium monandrum</i> Nutt.	G	u	r	<i>Cleome lutea</i> Hook.	C	s	r
<i>Claytonia rosea</i> Rydb.	OW	c	o	<i>Cleome serrulata</i> Pursh	C	u	o
<i>Lewisia brachyoclyx</i> Engelm.	PP	u	f	<i>Polanisia trachysperma</i> Torr. & Gray	G	s	o
<i>Montia perfoliata</i> (Donn) Howell	OW	s	a	CRASSULACEAE			
<i>Portulaca oconata</i> Small	G	u	o	<i>Echeveria collomae</i> (Rose) Kearney & Peebles	G	u	o
<i>Portulaca oleracea</i> L.	C	u	o	<i>Echeveria rusbyi</i> (Greene) Nels. & Macbr.	OW	u	r
<i>Portulaca suffrutescens</i> Engelm.	G	u	o	<i>Sedum griffithsii</i> Rose	OW	c	r
<i>Talinum parviflorum</i> Nutt.	G	c	o	SAXIFRAGACEAE			
CARYOPHYLLACEAE				<i>Fendlera rupicola</i> Gray var. <i>wrightii</i> Gray	C	c	o
<i>Arenaria confusa</i> Rydb.	PP	u	o	<i>Heuchera rubescens</i> Torr.	PF	c	r
<i>Arenaria saxosa</i> Gray var. <i>cinerascens</i> Robins.	PF	s	o	<i>Heuchera versicolor</i> Greene	PF	c	f
<i>Cerastium texanum</i> Britt.	OW	s	o	<i>Phyladelphus microphyllus</i> Gray	C	c	r
<i>Silene laciniata</i> Cav.	PE	c	o	PLATANACEAE			
<i>Stellaria longifolia</i> Muhl.	-	-	-	<i>Platanus wrightii</i> Wats.	OW	r	a
<i>Stellaria media</i> (L.) Cyrillo	C	c	o				

	Type	Site	Abundance		Type	Site	Abundance
ROSACEAE							
<i>Agrimonia gryposepala</i> Wallr.	MP	u	f	<i>Phaseolus angustissimus</i> Gray	PP	u	-
<i>Agrimonia striata</i> Michx.	PF	r	o	<i>Phaseolus ritensis</i> Jones	OW	c	o
<i>Amelanchier utahensis</i> Koehne (<i>A. mormonica</i> C. K. Schneid.)	PP	u	o	<i>Prosopis juliflora</i> (Swartz) DC. var. <i>velutina</i> (Woot.) Sarg.	G	u	f
<i>Cercocarpus betuloides</i> Nutt.	C	u	r	<i>Psoralea tenuiflora</i> Pursh	C	u	f
<i>Cercocarpus montanus</i> Raf.	C	u	va	<i>Rhynchosia texana</i> Torr. & Gray	C	-	-
<i>Cowania mexicana</i> D. Don	C	u	r	<i>Robinia neomeicana</i> Gray	PP	u	a
<i>Fallugia paradoxa</i> D. Don	C	u	r	<i>Thermopsis pinetorum</i> Greene	PP	u	o
<i>Fragaria bracteata</i> Heller	PP	c	o	<i>Trifolium albopurpureum</i> Torr. & Gray	G	u	f
<i>Fragaria ovalis</i> (Lehm.) Rydb.	PF	c	o	<i>Trifolium gracilentum</i> Torr. & Gray	G	u	f
<i>Holodiscus dimosus</i> (Nutt.) Torr.	PP	u	o	<i>Vicia americana</i> Muhl. var. <i>americana</i> (Nutt.) Wats.	PP	u	o
<i>Potentilla diversifolia</i> Lehm.	PP	u	f	<i>Vicia americana</i> Muhl. var. <i>truncata</i> (Nutt.) Brewer	PP	u	o
<i>Potentilla glandulosa</i> Lindl.	PP	u	o	<i>Vicia exigua</i> Nutt.	OW	c	f
<i>Potentilla subviscosa</i> Greene	PP	u	f	GERANIACEAE			
<i>Potentilla thurberi</i> Gray	PF	u	o	<i>Erodium cicutarium</i> (L.) L'Her.	G	u	va
<i>Potentilla viscidula</i> Rydb.	PP	u	o	<i>Erodium texanum</i> Gray	SDS	u	o
<i>Prunus emarginata</i> (Dougl.) D. Dietr.	PP	c	o	<i>Geranium carolinianum</i> L.	OW	s	o
<i>Prunus serotina</i> Ehrh. var. <i>rufula</i> (Woot. & Standl.) McVaugh	PP	s	o	<i>Geranium eremophilum</i> Woot. & Standl.	OW	c	f
<i>Prunus virginiana</i> L.	PP	c	o	<i>Geranium richardsonii</i> Fisch. & Trautv.	PP	c	o
<i>Rosa arizonica</i> Rydb.	PP	s	o	OXALIDACEAE			
<i>Rosa fendleri</i> Crépin	OW	s	o	<i>Oxalis albicans</i> H.B.K.	OW	c	o
<i>Rubus leucodermis</i> Doug.	PF	c	o	<i>Oxalis grayi</i> (Rose) Knuth	-	-	-
<i>Rubus neomeicanus</i> Gray	PF	c	o	<i>Oxalis metaolfei</i> (Small) Knuth	PP	c	o
<i>Rubus procerus</i> P. J. Muell.	PP	s	o	<i>Oxalis pilosa</i> Nutt.	PP	s	o
<i>Rubus strigosus</i> Michx.	PP	s	o	<i>Oxalis stricta</i> L.	PP	-	-
<i>Sanguisorba annua</i> Nutt.	C	s	o	LINACEAE			
LEGUMINOSAE							
<i>Acacia angustissima</i> (Mill.) Kuntze var. <i>hirta</i> (Nutt.) Robins.	C	u	o	<i>Linum lewisii</i> Pursh	C	u	o
<i>Acacia constricta</i> Benth.	SDS	u	r	<i>Linum neomeicanum</i> Greene	PP	c	o
<i>Acacia greggii</i> Gray	SDS	u	f	ZYGOPHYLLACEAE			
<i>Amorpha fruticosa</i> L. var. <i>occidentalis</i> (Abrams) Kearney & Peebles	OW	s	o	<i>Kallstroemia grandiflora</i> Torr.	C	u	o
<i>Astragalus allochrous</i> Gray	-	-	-	<i>Kallstroemia parviflora</i> Norton	C	u	-
<i>Astragalus famelicus</i> Sheldon	-	-	-	<i>Tribulus terrestris</i> L.	C	u	r
<i>Astragalus nothoxyis</i> Gray	C	u	f	RUTACEAE			
<i>Astragalus nuttallianus</i> DC.	C	u	o	<i>Ptelea angustifolia</i> Benth.	PP	u	r
<i>Astragalus tephrodes</i> Gray	C	u	o	POLYGALACEAE			
<i>Astragalus wootoni</i> Sheldon	C	u	o	<i>Polygala obscura</i> Benth.	G	s	o
<i>Calliandra reticulata</i> Gray	PP	u	o	EUPHORBIACEAE			
<i>Calliandra eriophylla</i> Benth.	C	u	o	<i>Acalypha neomeicana</i> Muell.-Arg.	C	s	o
<i>Cassia bahinioides</i> Gray	G	u	-	<i>Croton lindheimerianus</i> Scheele	G	u	f
<i>Cassia leptadenia</i> Greenm.	C	u	f	<i>Euphorbia dentata</i> Michx.	C	-	-
<i>Cercidium microphyllum</i> (Torr.) Rose & Johnston.	SDS	u	va	<i>Euphorbia hyssopifolia</i> L.	G	u	f
<i>Cercis occidentalis</i> Torr.	OW	d	r	<i>Euphorbia inaisa</i> Engelm. var. <i>mollis</i> (Norton) L. C. Wheeler	C	u	f
<i>Clitoria mariana</i> L.	-	-	-	<i>Euphorbia lurida</i> Engelm.	PP	-	-
<i>Cologania longifolia</i> Gray	G	u	-	<i>Euphorbia melanadenia</i> Torr.	C	u	f
<i>Dalea albiflora</i> Gray	C	c	f	<i>Euphorbia palmeri</i> Engelm. var. <i>palmeri</i> (Engelm.) L. C. Wheeler	PP	-	-
<i>Dalea filiformis</i> Gray	PP	u	o	<i>Euphorbia palmeri</i> Engelm. var. <i>subpubens</i> (Engelm.) L. C. Wheeler	-	-	-
<i>Dalea ordiae</i> Gray	PP	-	-	<i>Euphorbia revoluta</i> Engelm.	C	u	o
<i>Deemanthus coolleyi</i> (Eaton) Trel.	C	u	-	<i>Euphorbia serpyllifolia</i> Pers.	-	-	-
<i>Desmodium arizonicum</i> Wats.	PP	-	-	<i>Tragia nepetaefolia</i> Cav.	OW	u	o
<i>Desmodium grahamsi</i> Gray	OW	u	o	<i>Tragia stylaris</i> Muell. Arg.	-	-	-
<i>Desmodium procumbens</i> (Mill.) A. S. Hitchc.	C	u	f	BUXACEAE			
<i>Galactia wrightii</i> Gray	C	s	o	<i>Simmondsia chinensis</i> (Link) Schneid.	SDS	u	f
<i>Krameria parvifolia</i> Benth. var. <i>glandulosa</i> (Rose & Painter) Macbr.	C	u	o	ANACARDIACEAE			
<i>Lathyrus arizonicus</i> Britt.	PP	u	o	<i>Rhus glabra</i> L.	OW	c	o
<i>Lathyrus graminifolius</i> (Wats.) White	PP	u	o	<i>Rhus ovata</i> Wats.	C	u	o
<i>Lathyrus laetivirens</i> Greene	MP	s	f	<i>Rhus radicans</i> L.	OW	u	a
<i>Lathyrus pauciflorus</i> Fern.	OW	u	o	<i>Rhus trilobata</i> Nutt. var. <i>anisophylla</i> (Greene) Jepson	C	u	a
<i>Lotus humistratus</i> Greene	G	u	a	<i>Rhus trilobata</i> Nutt. var. <i>pilosissima</i> Engler	C	u	f
<i>Lotus saluuginosus</i> Greene	SDS	u	r				
<i>Lotus rigidus</i> (Benth.) Greene	G	u	a				
<i>Lotus wrightii</i> (Gray) Greene	C	u	f				
<i>Lupinus argenteus</i> Pursh	-	-	-				
<i>Lupinus arizonicus</i> Wats.	SDS	u	a				
<i>Lupinus bicolor</i> Lindl.	G	u	a				
<i>Lupinus concinnus</i> Agardh	C	u	f				
<i>Lupinus palmeri</i> Wats.	C	u	f				
<i>Medicago hispida</i> Gaertn.	SDS	u	f				
<i>Medicago lupulina</i> L.	PP	u	o				
<i>Melilotus albus</i> Desr.	MP	u	o				
<i>Melilotus officinalis</i> (L.) Lam.	MP	u	o				
<i>Mimosa biuncifera</i> Benth.	C	u	f				

	Type	Site	Abundance		Type	Site	Abundance
CELASTRACEAE				<i>Echinocereus triglochidiatus</i> Engelm. var. <i>melanacanthus</i> (Engelm.) L. Benson	G	u	o
<i>Ceanothus holacantha</i> Torr.	SDS	u	f	<i>Echinocereus triglochidiatus</i> Engelm. var. <i>polyacanthus</i> (Engelm.) L. Benson	G	u	f
<i>Pachystima myrsinites</i> (Pursh) Raf.	PF	c	f	<i>Mammillaria arizonica</i> Engelm.	G	u	o
ACERACEAE				<i>Mammillaria microcarpa</i> Engelm.	G	u	o
<i>Acer grandidentatum</i> Nutt.	PF	s	f	<i>Opuntia acanthoarpa</i> Engelm. & Bigel.	SDS	u	o
<i>Acer negundo</i> L.	OW	r	f	<i>Opuntia chlorotica</i> Engelm. & Bigel.	C	s	r
SAPINDACEAE				<i>Opuntia engelmannii</i> Salm-Dyck	SDS	u	f
<i>Dodonaea viscosa</i> Jacq.	SDS	c	o	<i>Opuntia macrocentra</i> Engelm.	G	u	o
<i>Sapindus drummondii</i> Hook. & Arn. (<i>S.</i> <i>saponaria</i> L. var. <i>drummondii</i> (Hook. & Arn.) L. Benson)	G	u	r	<i>Opuntia phaeacantha</i> Engelm.	SDS	u	f
				<i>Opuntia plumbea</i> Rose	PP	u	o
				<i>Opuntia spinosior</i> (Engelm. & Bigel.) Toumey	C	u	o
RHAMNACEAE				LYTHRACEAE			
<i>Ceanothus fendleri</i> Gray	PP	u	f	<i>Lythrum californicum</i> Torr. & Gray	-	-	-
<i>Ceanothus greggii</i> Gray	C	u	a	ONAGRACEAE			
<i>Ceanothus integerrimus</i> Hook. & Arn.	PP	u	o	<i>Epilobium californicum</i> Hausskn.	PF	s	-
<i>Rhamnus californica</i> Esch.	OW	c	o	<i>Gaura gracilis</i> Woot. & Standl.	MP	u	o
<i>Rhamnus crocea</i> Nutt.	C	u	a	<i>Gaura parviflora</i> Dougl.	C	u	o
VITACEAE				<i>Oenothera caespitosa</i> Nutt.	C	s	o
<i>Parthenocissus inserta</i> (Kerner) K. Fritsch	PF	s	o	<i>Oenothera clavata</i> Torr. & Frém.	SDS	u	f
<i>Vitis arizonica</i> Engelm.	PP	s	f	<i>Oenothera hookeri</i> Torr. & Gray	MP	s	r
				<i>Oenothera laciniata</i> Hill	PP	s	-
				<i>Zauschneria latifolia</i> (Hook.) Greene	PP	c	r
MALVACEAE				ARALIACEAE			
<i>Abutilon parvulum</i> Gray	C	u	f	<i>Aralia racemosa</i> L.	PF	s	o
<i>Anoda cristata</i> (L.) Schlecht.	PP	-	-	UMBELLIFERAE			
<i>Hibiscus coulteri</i> Harv.	SDS	u	r	<i>Bowlesia inaeana</i> Ruiz & Pavon	SDS	c	o
<i>Iliama grandiflora</i> (Rydb.) Wiggins	OW	s	r	<i>Caucalis microcarpa</i> Hook. & Arn.	C	c	f
<i>Malva neglecta</i> Wallr.	MP	c	o	<i>Daucus pusillus</i> Michx.	C	u	o
<i>Sida procumbens</i> Sw.	G	u	f	<i>Lomatium dissectum</i> (Nutt.) Mathias & Constance	G	c	o
<i>Sidaloea neomesica</i> Gray	MP	c	r	<i>Lomatium nevadense</i> (Wats.) Coult. & Rose	G	u	o
<i>Sphaeralcea ambigua</i> Gray	SDS	u	f	<i>Lomatium nevadense</i> (Wats.) Coult. & Rose var. <i>parishii</i> (Coult. & Rose) Jepson	C	c	f
<i>Sphaeralcea rusbyi</i> Gray var. <i>rusbyi</i>	-	-	-	<i>Osmorhiza chilensis</i> Hook. & Arn.	PF	-	-
<i>Sphaeralcea rusbyi</i> Gray var. <i>gilensis</i> Kearney	C	u	o	<i>Osmorhiza obtusa</i> (Coult. & Rose) Fern.	PF	-	-
STERCULIACEAE				<i>Pteridaria parishii</i> (Coult. & Rose) Nels. & Macbr.	PP	c	o
<i>Ayenia pusilla</i> L.	G	u	o	<i>Pseudocymopterus montanus</i> (Gray) Coult. & Rose	PP	u	f
GUTTIFERAE				CORNACEAE			
<i>Hypericum formosum</i> H.B.K.	PP	s	r	<i>Cornus stolonifera</i> Michx.	PF	r	o
TAMARICACEAE				<i>Garrya flavescens</i> Wats.	C	u	o
<i>Tamarix pentandra</i> Pall.	SDS	r	o	<i>Garrya wrightii</i> Torr.	C	u	va
VIOLACEAE				ERICACEAE			
<i>Hybanthus verticillata</i> (Ortega) Baill.	G	u	r	<i>Arctostaphylos pringlei</i> Parry	C	u	a
<i>Viola canadensis</i> L.	PP	s	f	<i>Arctostaphylos pungens</i> H.B.K.	C	u	a
<i>Viola nephrophylla</i> Greene	PF	s	o	<i>Chimaphila maculata</i> (L.) Pursh	PF	s	o
<i>Viola aurea</i> Kellogg subsp. <i>arizonensis</i> Baker & Clausen	OW	c	r	<i>Monotropa latissuama</i> (Rydb.) Hultén	PP	c	o
				<i>Pterospora andromedea</i> Nutt.	PP	u	o
LOASACEAE				PRIMULACEAE			
<i>Mentzelia albicaulis</i> Dougl.	C	u	f	<i>Androsace occidentalis</i> Pursh	PP	u	f
<i>Mentzelia pumila</i> (Nutt.) Torr. & Gray	C	u	o	FOUQUIERIACEAE			
CACTACEAE				<i>Fouquieria splendens</i> Engelm.	SDS	u	a
<i>Cereus giganteus</i> Engelm. (<i>Carnegiea</i> <i>gigantea</i> (Engelm.) Britt. & Rose)	SDS	u	o	OLEACEAE			
<i>Echinocereus boyce-thompsoni</i> Orcutt. var. <i>boyce-thompsoni</i>	G	u	f	<i>Fraxinus velutina</i> Torr. var. <i>coriacea</i> (Wats.) Rehder	PP	s	o
<i>Echinocereus boyce-thompsoni</i> Orcutt. var. <i>bonkeriae</i> (Thorner & Bonker) Peebles	G	u	o	<i>Menodora scabra</i> Gray	G	u	a
<i>Echinocereus fendleri</i> (Engelm.) Rumpler	G	u	f	<i>Menodora scoparia</i> Engelm.	C	u	o

	Type	Site	Abundance		Type	Site	Abundance
GENTIANACEAE							
<i>Centaurium calycosum</i> (Buckl.) Fern.	-	-	-	<i>Lamium amplexicaule</i> L.	OW	s	r
<i>Gentiana affinis</i> Griseb.	MP	s	r	<i>Marrubium vulgare</i> L.	PP	u	o
<i>Svertia radiata</i> (Kellogg) Kuntze	PP	u	f	<i>Moldavica parviflora</i> (Nutt.) Britt.	PP	u	o
APOCYNACEAE				<i>Monarda austromontana</i> Epling	PP	s	o
<i>Apocynum androsaemifolium</i> L.	OW	s	o	<i>Monarda menthaefolia</i> Graham	PP	c	o
ASCLEPIDACEAE				<i>Salvia columbariae</i> Benth.	SDS	u	f
<i>Asclepias asperula</i> (Decne.) Woodson	C	u	f	<i>Scutellaria potosina</i> T.S. Brandeg.	C	u	f
<i>Asclepias engelmanniana</i> Woodson	PP	u	o	<i>Stachys coccinea</i> Jacq.	OW	c	o
<i>Asclepias linaria</i> Cav.	G	u	r	SOLANACEAE			
<i>Asclepias nyctaginifolia</i> Gray	G	-	-	<i>Datura meteloides</i> DC.	OW	u	r
<i>Asclepias subverticellata</i> (Gray) Vail	C	s	r	<i>Lycium fremontii</i> Gray	SDS	u	f
<i>Asclepias tuberosa</i> L.	PP	u	o	<i>Margaranthus solanaceus</i> Schlecht.	C	u	o
CONVOLVULACEAE				<i>Nicotiana attenuata</i> Torr.	OW	u	o
<i>Convolvulus arvensis</i> L.	MP	u	o	<i>Nicotiana glauca</i> Graham	SDS	s	r
<i>Convolvulus inaeuus</i> Vahl	OW	s	r	<i>Physalis crassifolia</i> Benth.	C	u	f
<i>Cuscuta indeoora</i> Choisy	G	u	o	<i>Physalis fendleri</i> Gray	PP	u	o
<i>Cuscuta umbellata</i> H.B.K.	C	u	o	<i>Physalis hederasfolia</i> Gray	PP	u	o
<i>Evolvulus sericeus</i> Swartz	G	u	o	<i>Physalis versicolor</i> Rydb.	C	u	o
<i>Ipomoea barbatisepala</i> Gray	C	u	f	<i>Solanum douglasi</i> Dunal	OW	u	o
<i>Ipomoea coccinea</i> L.	OW	u	f	<i>Solanum fendleri</i> Gray	OW	c	o
<i>Ipomoea costellata</i> Torr.	C	u	f	<i>Solanum xanti</i> Gray	OW	u	o
<i>Ipomoea hirsutula</i> Jacq. f.	OW	u	f	SCROPHULARIACEAE			
<i>Ipomoea leptoloma</i> Torr.	-	-	-	<i>Castilleja austromontana</i> Standl. &			
<i>Ipomoea plummerae</i> Gray	PP	u	o	Blumer	PP	u	r
POLEMONIACEAE				<i>Castilleja confusa</i> Greene	PP	-	-
<i>Eriastrum diffusum</i> (Gray) Mason	C	u	f	<i>Castilleja integra</i> Gray	C	u	o
<i>Eriastrum eremicum</i> (Jepson) Mason	G	u	o	<i>Castilleja linariaefolia</i> Benth.	C	u	o
<i>Gilia aggregata</i> (Pursh) Spreng.	MP	u	a	<i>Castilleja minor</i> Gray	C	c	o
<i>Gilia giliioides</i> (Benth.) Greene	C	s	o	<i>Cordylanthus wrightii</i> Gray	PP	u	-
<i>Gilia multiflora</i> Nutt.	PP	u	o	<i>Linaria texana</i> Scheele	C	u	o
<i>Gilia sinuata</i> Dougl.	C	u	f	<i>Mauvandyia antirrhiniflora</i> Humb. &			
<i>Gilia tenuiflora</i> Benth.	G	u	f	Bonpl.	C	u	f
<i>Linanthus aureus</i> (Nutt.) Greene	G	u	f	<i>Mimulus guttatus</i> DC.	PP	r	o
<i>Linanthus bigelovii</i> (Gray) Greene	C	u	o	<i>Mimulus nasutus</i> Greene	C	s	f
<i>Microsteris gracilis</i> (Hook.) Greene	G	u	o	<i>Mimulus rubellus</i> Gray	C	u	o
<i>Phlox tenuifolia</i> E. Nels.	C	u	o	<i>Orthocarpus purpurascens</i> Benth.	SDS	u	f
HYDROPHYLLACEAE				<i>Pedicularis centranthera</i> Gray	PP	f	f
<i>Eriodictyon angustifolium</i> Nutt.	C	u	o	<i>Penstemon ambiguus</i> Torr.	C	u	f
<i>Hydrophyllum occidentale</i> (Wats.) Gray	PP	c	r	<i>Penstemon barbatus</i> (Cav.) Roth	OW	u	f
<i>Phacelia distans</i> Benth.	SDS	u	f	<i>Penstemon bridgesii</i> Gray	PP	c	o
<i>Phacelia magellanica</i> (Lam.) Cov.	C	c	o	<i>Penstemon linarioides</i> Gray subsp.			
<i>Phacelia ramosissima</i> Dougl.	C	c	r	<i>sileri</i> (Gray) Keck	C	u	o
<i>Pholistoma auritum</i> (Lindl.) Lilja	SDS	s	o	<i>Penstemon linarioides</i> Gray var.			
BORAGINACEAE				<i>viridis</i> Keck	OW	u	f
<i>Amsinckia intermedia</i> Fisch. & Meyer	SDS	u	a	<i>Penstemon pseudospectabilis</i> Jones			
<i>Amsinckia tessellata</i> Gray	SDS	u	a	subsp. <i>connatifolius</i> (A. Nels.)			
<i>Cryptantha decipiens</i> (Jones) Heller	SDS	u	f	Keck	C	u	-
<i>Cryptantha fendleri</i> (Gray) Greene	C	u	a	<i>Penstemon thurberi</i> Torr.	C	u	f
<i>Harpagonella palmeri</i> Gray	SDS	u	a	<i>Schistophragma intermedia</i> (Gray)			
<i>Heliotropium phyllostachyum</i> Torr.	G	s	o	Pennell	C	u	-
<i>Lithospermum incisum</i> Lehm.	C	u	o	<i>Scrophularia parviflora</i> Woot. &			
<i>Lithospermum multiflorum</i> Torr.	PP	u	o	Standl.	PP	s	o
<i>Pectocarya linearis</i> (Ruiz. & Pav.) DC.	SDS	u	f	<i>Verbascum thapsus</i> L.	PP	u	o
<i>Pectocarya platycarpa</i> Munz & Johnst.	G	u	f	<i>Veronica americana</i> (Raf.) Schwein.	MP	s	o
<i>Plagiobothrys arizonicus</i> (Gray) Greene	G	u	a	<i>Veronica anagallis-aquatica</i> L.	PP	r	o
<i>Plagiobothrys tenellus</i> (Nutt.) Gray	G	u	f	<i>Veronica peregrina</i> L.	C	r	r
VERBENACEAE				BIGNONIACEAE			
<i>Aloysia wrightii</i> (Gray) Heller	C	c	o	<i>Chilopsis linearis</i> (Cav.) Sweet	SDS	s	o
<i>Verbena wrightii</i> Gray	C	u	o	MARTYNIACEAE			
LABIATAE				<i>Proboscidea parviflora</i> (Woot.) Woot. &			
<i>Agastache wrightii</i> (Greenm.) Woot. &				Standl.	C	s	f
Standl.	PP	u	o	OROBANCHACEAE			
<i>Hedeoma hyssopifolium</i> Gray	PP	u	f	<i>Conopholis mexicana</i> Gray	OW	u	o
<i>Hedeoma drummondii</i> Benth.	C	u	o	<i>Orobanche fasciculata</i> Nutt.	C	u	o
<i>Hedeoma oblongifolium</i> (Gray) Heller	C	u	o	<i>Orobanche ludoviciana</i> Nutt. var.			
				<i>cooperi</i> (Gray) G. Beck	OW	c	r
				ACANTHACEAE			
				<i>Anisacanthus thurberi</i> (Torr.) Gray	G	c	r

Type	Site	Abundance	Type	Site	Abundance
PLANTAGINACEAE					
			<i>Chrysopsis foliosa</i> Nutt.	G	u o
<i>Plantago lanceolata</i> L.	MP	u o	<i>Cirsium arizonicum</i> (Gray) Petrak	PP	u o f
<i>Plantago purshii</i> Roem. & Schult.	SDS	u va	<i>Cirsium neomexicanum</i> Gray	PP	u o
<i>Plantago rhodosperma</i> Decne.	C	s r	<i>Cirsium pulchellum</i> (Greene) Woot. & Standl.	MP	c f
RUBIACEAE					
<i>Galium aparine</i> L.	OW	c f	<i>Cirsium wheeleri</i> (Gray) Petrak	MP	u o
<i>Galium fendleri</i> Gray	C	c -	<i>Conyza sophiaefolia</i> H.B.K.	PP	u o
<i>Galium microphyllum</i> Gray	C	u f	<i>Encelia frutescens</i> Gray var. <i>virginensis</i> (A. Nels.) Blake	SDS	u o
<i>Galium rothrockii</i> Gray	C	- -	<i>Erigeron canadensis</i> L.	PP	u o
<i>Galium stellatum</i> Kellogg	SDS	u o	<i>Erigeron concinnum</i> (Hook. & Arn.) Torr. & Gray	PP	u f
<i>Galium wrightii</i> Gray	C	- -	<i>Erigeron divergens</i> Torr. & Gray	C	u f
<i>Houstonia wrightii</i> Gray	PP	u o	<i>Erigeron flagellaris</i> Gray	PP	c o
CAPRIFOLIACEAE					
<i>Lonicera arizonica</i> Rehder	PF	u o	<i>Erigeron macranthus</i> Nutt.	PP	c o
<i>Lonicera interrupta</i> Benth.	OW	u f	<i>Erigeron neomexicanus</i> Gray	PP	u f
<i>Sambucus neomexicana</i> Wooton	PP	u o	<i>Erigeron oreophilus</i> Greenm.	-	- -
<i>Symphoricarpos oreophilus</i> Gray	PF	c f	<i>Erigeron pringlei</i> Gray	G	c o
<i>Symphoricarpos rotundifolius</i> Gray	PF	c o	<i>Eupatorium herbaceum</i> (Gray) Greene	OW	c o
<i>Symphoricarpos utahensis</i> Rydb.	PP	c o	<i>Franseria confertiflora</i> (DC.) Rydb.	G	u f
VALERIANACEAE					
<i>Plectritis ciliosa</i> (Greene) Jeps.	G	s o	<i>Gaillardia pinnatifida</i> Torr.	G	u o
<i>Valeriana arizonica</i> Gray	PF	c o	<i>Gnaphalium macounii</i> Greene	PP	u o
<i>Valeriana edulis</i> Nutt.	MP	s o	<i>Gnaphalium pringlei</i> Gray	PF	u o
CUCURBITACEAE					
<i>Apodanthera undulata</i> Gray	SDS	s r	<i>Gnaphalium wrightii</i> Gray	C	u o
<i>Cucurbita digitata</i> Gray	SDS	u r	<i>Grindelia squarrosa</i> (Pursh) Dunal	MP	u o
<i>Cucurbita foetidissima</i> H.B.K.	PP	u r	<i>Gutierrezia sarothrae</i> (Pursh) Britt. & Rusby	G	u va
<i>Marah gilensis</i> Greene	SDS	c o	<i>Haplopappus acradentus</i> (Greene) Blake	G	u o
CAMPANULACEAE					
<i>Lobelia cardinalis</i> L.	OW	s o	<i>Haplopappus cuneatus</i> Gray	C	u o
<i>Triodanis perfoliata</i> (L.) Nieuwl.	OW	s o	<i>Haplopappus gracilis</i> (Nutt.) Gray	C	u o
COMPOSITAE					
<i>Achillea lanulosa</i> Nutt.	MP	u o	<i>Haplopappus heterophyllus</i> (Gray) Blake	G	u o
<i>Ambrosia psilostachya</i> DC.	G	s o	<i>Haplopappus lariciifolius</i> Gray	G	u a
<i>Antennaria aprica</i> Greene	PP	u r	<i>Helianthus annuus</i> L.	MP	u f
<i>Aplopappus</i> see <i>Haplopappus</i>			<i>Heterotheca subaxillaris</i> (Lam.) Britt. & Rusby	C	u r
<i>Artemisia dracunculoides</i> Pursh	C	u f	<i>Hieracium fendleri</i> Schultz Bip.	PP	u o
<i>Artemisia ludoviciana</i> Nutt. subsp. <i>sulcata</i> (Rydb.) Keck	C	u f	<i>Hymenoclea monogyra</i> Torr. & Gray	G	s o
<i>Artemisia pacifica</i> Nutt.	C	u o	<i>Hymenothrix wrightii</i> Gray	C	u f
<i>Aster aquifolius</i> (Greene) Blake	OW	u o	<i>Hymenoxys bigelovii</i> (Gray) K. F. Parker	PP	u o
<i>Aster bigelovii</i> Gray	C	u o	<i>Kuhnia rosmariniifolia</i> Vent.	G	u o
<i>Aster commutatus</i> (Torr. & Gray) Gray	PP	u o	<i>Lactuca graminifolia</i> Michx.	OW	u o
<i>Aster erilis</i> Ell.	PP	- -	<i>Lactuca ludoviciana</i> (Nutt.) DC.	OW	u o
<i>Baccharis glutinosa</i> Pers.	SDS	r r	<i>Lactuca serriola</i> L. var. <i>serriola</i>	OW	u o
<i>Baccharis pteronioides</i> DC.	G	u f	<i>Lactuca serriola</i> L. forma <i>integriifolia</i> Bogenhard	OW	u o
<i>Baccharis sarothroides</i> Gray	OW	s o	<i>Malacothrix clevelandi</i> Gray	C	u f
<i>Baeria chrysostoma</i> Fisch. & Mey.	SDS	u a	<i>Melampodium leucanthum</i> Torr. & Gray	C	u f
<i>Bahia biternata</i> Gray	C	u o	<i>Microroseris linearifolia</i> (DC.) Schultz Bip.	C	u f
<i>Bahia dissata</i> (Gray) Britt.	MP	u f	<i>Pectis papposa</i> Harv. & Gray	C	u f
<i>Baileya multiradiata</i> Harv. & Gray	G	u f	<i>Perezia wrightii</i> Gray	SDS	u o
<i>Bidens bigelovii</i> Gray	OW	u o	<i>Perityle ciliata</i> (L.H. Dewey) Rydb.	OW	u f
<i>Bidens leptoccephala</i> Sherff	OW	c o	<i>Rafinesquia neomexicana</i> Gray	SDS	u f
<i>Brickellia betonicifolia</i> Gray	OW	c o	<i>Rudbeckia laciniata</i> L.	PP	s f
<i>Brickellia californica</i> (Torr. & Gray) Gray	OW	c o	<i>Senecio macdougalii</i> Heller	PP	u o
<i>Brickellia grandiflora</i> (Hook.) Nutt.	PP	u o	<i>Senecio monoensis</i> Greene	C	u f
<i>Brickellia rusbii</i> Gray	OW	c o	<i>Senecio multicaпитatus</i> Greenm.	OW	u o
<i>Carminata tenuiflora</i> DC.	OW	c o	<i>Senecio neomexicanus</i> Gray	C	u f
<i>Carpophoaete bigelovii</i> Gray	C	u o	<i>Senecio wootonii</i> Greene	PP	u o
			<i>Solidago missouriensis</i> Nutt.	OW	u o
			<i>Solidago sparsiflora</i> Gray	OW	u f
			<i>Solidago wrightii</i> Gray	OW	u o
			<i>Sonchus asper</i> (L.) Hill	PP	u o
			<i>Stephanomeria exigua</i> Nutt.	C	u o
			<i>Stephanomeria tenuifolia</i> (Torr.) H. M. Hall	C	u o
			<i>Taraxacum officinale</i> Weber	MP	s f
			<i>Townsendia exscaapa</i> (Richards.) Porter	G	u f
			<i>Trixis californica</i> Kellogg	SDS	u o
			<i>Tragopogon pratensis</i> L.	PP	u o
			<i>Viguiera annua</i> (Jones) Blake	PP	c f
			<i>Wyethia arizonica</i> Gray	PP	u o

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Vegetation types on the 12,820-acre Forest range from desert shrub to mixed conifer. Distinct temperature-precipitation patterns at lower, middle, and high elevations parallel the changes in plant cover.

A checklist of 726 species and 9 varieties of vascular plants collected since 1933 is included. Examination of the ranges of these species indicates that approximately 70 percent are distinctly southwestern or western in origin. Only 13 species, or 1.8 percent, are endemic to Arizona. Two introduced species are new to the Arizona flora.

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