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ADDITIONS TO THE FLORA OF THE PINALEÑO MOUNTAINS, ARIZONA

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ABSTRACT

The first checklist published for the Pinaleno Mountains listed 423 native, vascular plant species. The current paper documents the occurrence of an additional 395 native plant species for this range. Thirty-two species are excluded from the earlier list, bringing the total known flora to 786 native species. The earlier list was somewhat statistically biased towards widespread floristic elements and those found at higher elevation ranges. The flora of the Pinaleno Mountains still appears to be depauperate in comparison to other ranges in southeastern Arizona. Low topographic diversity, aridity, and lack of substrate complexity probably contribute to the low species diversity of this range. The high-elevation flora is numerically dominated by widespread Cordilleran and more restricted Mogollon species; Madrean and Apachian species dominate at lower elevations.

INTRODUCTION

The Pinaleno Mountains, Graham County, Arizona, extend in elevation from 1150 m at the lower edge of Coronado National Forest at the northern base of the range to 3267 m at the summit of Mt. Graham. Vegetation varies from desert, desert grassland, and oak or juniper woodland at the base to spruce-fir forest at the top. Thus there is a considerable diversity of habitats in this range, which should promote high species diversity (Bowers and McLaughlin 1982).

The first floristic checklist for the Pinaleno Mountains was published by Johnson (1988), who listed 423 native species for the range. Johnson collected in the Pinalenos for two field seasons. His study area was Coronado National Forest north of Stockton Pass. The scope of his project covered plant communities from woodlands at the base of the range up through spruce-fir forests. The deserts and desert grasslands, which are of limited occurrence within the boundaries of Coronado National Forest, were not included. Johnson supplemented his collections with herbarium records from Arizona State University and the Bureau of Land Management Office in Safford. However, most of the early collections from the Pinalenos are located in the University of Arizona Herbarium (ARIZ), which was not examined.

Since many species known to me to occur in the Pinalenos were not on Johnson's checklist, I decided to undertake herbarium and field studies to provide a more complete circumscription of the flora. The objectives of the current study were to: 1) provide a fuller account of the botanical collecting history of the Pinaleno Mountains; 2) search the University of Arizona Herbarium for early plant records from the Pinalenos; 3) make further collections from the Pinalenos, emphasizing the lower elevations; and 4) analyze the floristic plant geography of the Pinalenos. In doing the herbarium and field work, the study area as defined by Johnson (1988) was followed -- that area within the boundaries of Coronado National Forest north of Stockton Pass.

BOTANICAL STUDIES IN THE PINALEÑO MOUNTAINS

J. G. Lemmon in 1882 and R. S. Kellogg in 1902 are the earliest collectors of Pinaleno Mountains plants represented in the University of Arizona Herbarium. The first extensive collections were those of J. J. Thornber and F. Shreve in 1914. Shreve collected in the range again in 1917. The Shreve and Thornber collections span the range from low to high elevations. They ascended the mountain and collected along a

pack trail following Frye Canyon past Chlarson's sawmill to the summit. L. N. Goodding collected sporadically from 1910 to 1961, mostly in the Stockton Pass area.

The automobile road to the top of the mountain, called the "Swift Trail" after former Crook National Forest supervisor T. T. Swift, was started in 1927 and completed as far as Heliograph Peak in 1931. The portion of the road from Heliograph Peak to Clark Peak was built as part of the Civilian Conservation Corps program and was completed in 1938 (USDA Forest Service 1976). The improved access provided by the Swift Trail stimulated further botanical exploration. R. Peebles made collecting trips to the Pinalenos in 1927, 1936, and 1939; T. Kearney and Peebles worked together there in 1934, 1938, and 1939. R. Darrow collected extensively in 1942, 1943, and 1944. Kearney, Peebles, and Darrow all concentrated their efforts on the higher elevations, traveling up the mountain along the Swift Trail.

Much less botanical field work has been done at the lower elevations. Several workers with the Soil Conservation Service (SCS), however, did collect widely at all elevations during 1935 and 1936. Included were D. Anderson, Bryce, Hinckley, Humphrey, Kartchner, Kessler, Maguire, Mendenhall, Moeller, Nelson, O'Donnal, E. Rhinehart, Richardson, and Wilson. I have gleaned these names from herbarium labels but have not been able to learn more about these SCS workers and their projects.

Botanists who have made important collections in more recent years include R. Whittaker and W. Niering in 1962, S. Bingham, and, during the 1980's, K. Adams, J. Bowers, R. Buhrow, R. Felger, C. Jenkins, W. Johnson, S. McLaughlin, J. and C. Reeder, F. Reichenbacher, K. Reichhardt, T. and R. Van Devender, and G. Yatskievych.

ADDITIONS TO THE FLORA

I collected plants in the Pinaleno Mountains during the fall of 1988 at lower elevations and sporadically throughout the range in 1989, 1990, and 1991. The additions and corrections included in the appended checklist resulted from the field work and herbarium search. Many of the ARIZ collections were on loan at the time the herbarium search was done; it is therefore likely that some plants that are documented from the range are not included in the updated checklist. These additions include 395 native species, 14 sub-specific taxa, and 23 introduced species, more than doubling the size of the known flora.

Although the additions reported here come from all altitudes, the lower elevations provided a disproportionate number. Including desert and desert grassland habitats in the current study does not account for the increase in species numbers since the great majority of added species from low elevations occur in both grassland and woodland habitats, and Johnson's (1988) checklist in fact includes many of the species in the flora that are actually restricted to low-elevation habitats other than woodland and forest (e.g., *Cercidium floridum*, *Ephedra* spp., *Fouquieria splendens*, *Larrea divaricata*), especially those herbaceous plants flowering in the spring (e.g., *Amsinckia intermedia*, *Phacelia distans*, *Plagiobothrys tenellus*, *Thysanocarpus curvipes*). Most of the low elevation plants added to the flora are herbaceous plants flowering during the summer and fall (e.g., many *Amaranthaceae*, *Cyperaceae*, *Euphorbiaceae*, *Fabaceae*, *Malvaceae*, *Nyctaginaceae*, and *Poaceae*).

The number of species in local floras from the southwestern United States is most strongly correlated with elevation range, which provides a good indication of the amount of habitat diversity within an area (Bowers and McLaughlin 1982). The Pinalenos, as defined here and in Johnson (1988), extend over an elevation range of 2100 m, greater than any of the other high mountain ranges in southeastern Arizona. When the floras of the Pinaleno Mountains and other southwestern sites are plotted on a graph of number of species vs. elevational range, the flora of Pinalenos appears to be somewhat depauperate, however (Figure 1). Both the Rincon Mountains (Bowers and McLaughlin 1987) and the Huachuca Mountains (Bowers and McLaughlin, in progress) have much larger floras, 959 and 876 native species, respectively, yet span a much narrower elevation range--1730 m and 1360 m. The flora of the Huachucas is still being investigated and likely will exceed 900 native species.

The low species diversity of the Pinaleno Mountains in comparison to other ranges is probably real, i.e., it does not reflect a relative lack of collecting effort. Shreve (1919) pointed out that in the Pinalenos there

are few sharply cut and well-watered canyons, such as Garden Canyon in the Huachuca Mountains or Madera Canyon in the Santa Rita Mountains. Because of their topographic complexity and abundance of moist habitats, such canyons support a large number of species. In comparison to other large southeastern Arizona mountains ranges, the Pinalenos also seem to be somewhat drier (Martin and Fletcher 1943), which would contribute to lower species diversity. Also, the Pinalenos do not have the substrate complexity found in nearby ranges. In particular, the mosaic of limestone and acid substrates that increases habitat diversity in the Santa Catalina, Huachuca, Chiricahua, and Santa Rita Mountains is lacking in the Pinalenos.

Few plant taxa are strictly endemic to the Pinalenos. *Erigeron heliographis* and *Potentilla albifora* are endemic species found at high elevations. *Plummera ambigens* is an endemic occurring at lower elevations; it is weakly differentiated from *P. floribunda*, which occurs elsewhere in southeastern Arizona, and may not merit specific rank. *Rumex orthoneurus*, *Echinocereus ledingii*, *Sophora arizonica*, *Erigeron arizonicus*, and *Eupatorium bigelovii* are species that are rare but not restricted to the Pinalenos.

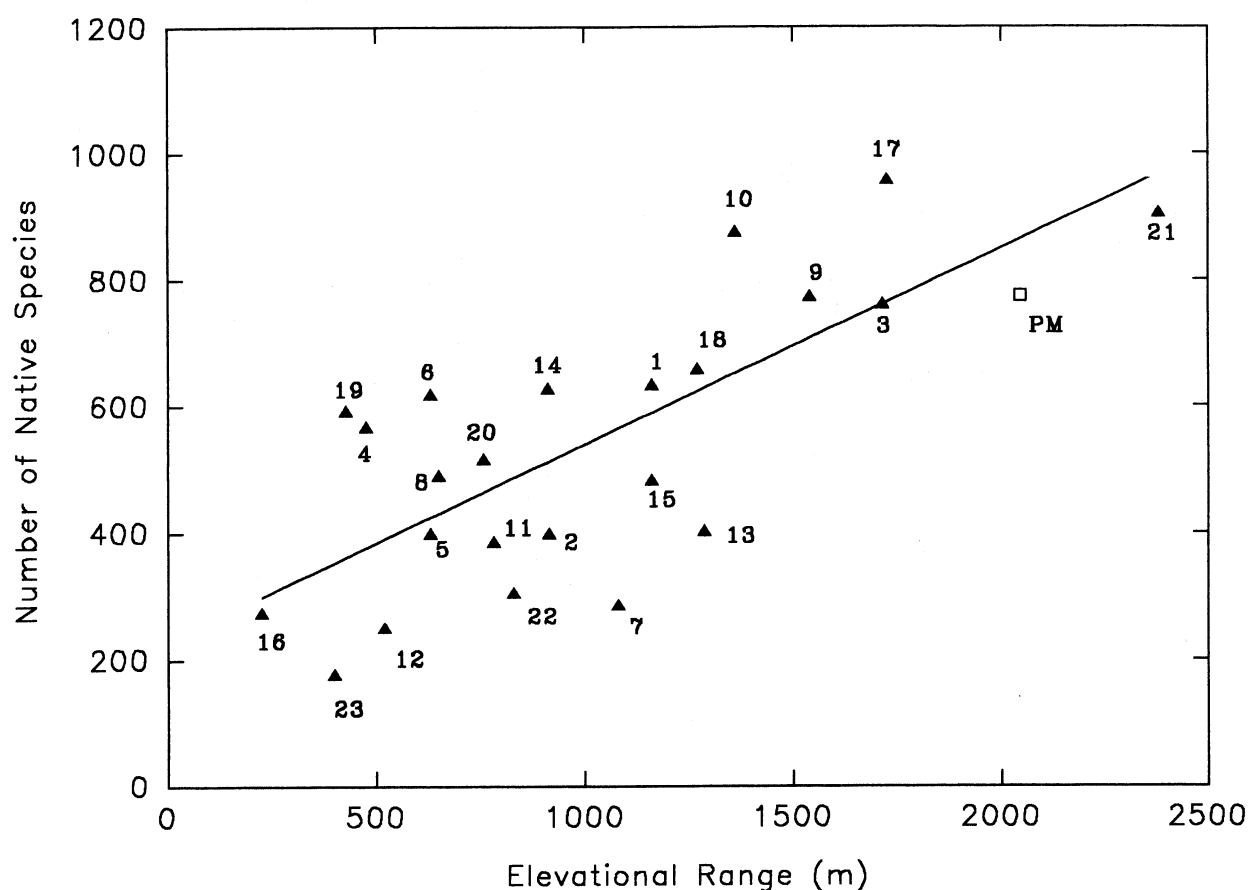


Figure 1. Relationship between number of species and elevational range in 23 local floras from Arizona, New Mexico, and western Texas. Floras included in the figure are: 1, Animas Mountains; 2, Aravaipa Canyon; 3, Big Bend National Park; 4, Buenos Aires National Wildlife Refuge; 5, Canyon de Chelly National Monument; 6, Chiricahua National Monument; 7, Chiricahua Wilderness; 8, Datil Mountains; 9, Guadalupe Mountains/Carlsbad National Parks; 10, Huachuca Mountains; 11, Mule Mountains; 12, Navajo National Monument; 13, Northern Hualapai Mountains; 14, Northern Santa Rita Mountains; 15, Organ Pipe Cactus National Monument; 16, Petrified Forest National Park; 17, Rincon Mountains; 18, Sierra Ancha Experimental Forest; 19, Sycamore Canyon, Santa Cruz County, Arizona; 20, Tucson Mountains; 21, White Mountains, New Mexico; 22, White Tank Mountains; and 23, Wupatki National Monument. The Pinaleno Mountains (□, PM) are plotted but do not contribute to the regression line. In the southwestern United States, elevation range rather than area is the primary determinant of habitat diversity, and hence species diversity (Bowers and McLaughlin 1982).

FLORISTIC ANALYSIS

The floristic affinities of the Pinaleno Mountains are summarized in Table 1. The flora is first broken down by geographic range; species are categorized as widespread, intermediate, or narrow, based on their distributions in the western United States (McLaughlin 1992). These categories are derived from an analysis of plants recorded from 101 local floras scattered throughout the western USA; each category includes approximately 1/3 of the native plant species found in this region. For each of these 3 range categories, floristic areas have been defined--5 for widespread species, 9 for intermediate species, and 20 for narrow species (McLaughlin 1992). Species in the Pinalenos are then assigned to floristic elements using procedures outlined in McLaughlin and Bowers (1990). Columns are given for plants listed by Johnson (1988), for additions to the flora, for the entire flora, and for species found at 2740 m (9000 feet) and above, *i.e.*, in the mixed-conifer and spruce-fir forests.

For the entire flora, intermediate-range Madrean species, narrow-range Apachian species, and widespread Cordilleran species together account for over half of the total number of species. Widespread Madrean species and narrow-range Mogollon species both account for more than 6% of the flora. Found above 2740 m are 222 species (28% of the total). Over one third of the high-elevation flora are widespread Cordilleran species; intermediate-range Madrean and Southern Rocky Mountain/Mogollon species, and narrow-range Mogollon and Apachian species are also important above 2740 m. Species with affinities with desert areas, including widespread and intermediate-range Sonoran species and narrow-range Arizona Upland and Chihuahuan species, occur only at lower elevations and do not constitute a large portion of the flora of the Pinalenos.

In comparing the floristic affinities of the plants on Johnson's (1988) checklist with those of the flora as a whole, Cordilleran species are overrepresented and Apachian species are underrepresented on the former. Widespread species account for 34% of the plants reported in Johnson (1988) and 24% of the additions. Since widespread plants species tend to be more abundant than rarer species (Brown 1984), it is not surprising that they are among the first species encountered in a floristic survey.

DISCUSSION AND CONCLUSIONS

A local flora can never be "completely" collected. Further field work will inevitably result in the discovery of additional taxa. The existence of a species list, in fact, serves to stimulate and focus additional collecting effort. However, for a local flora to be of value for broader phytogeographic analyses, it must be reasonably complete and sample all floristic elements, habitats, and seasons with equal intensity. Johnson's (1988) flora of the Pinaleno Mountains cannot be considered to be reasonably complete or statistically unbiased in its sampling of floristic elements. The additions more than double the size of the flora. Species with narrow ranges, those with more southern affinities (Sonoran, Apachian), and those found at low elevations during the summer and fall are underrepresented in Johnson's flora.

Previous botanical fieldwork in the Pinaleno Mountains has concentrated on the higher elevations because this range has been regarded as the southernmost outpost of an essentially Rocky Mountain or Cordilleran biome, the spruce-fir forest. In Arizona, spruce-fir forests are well developed only on the Kaibab Plateau, San Francisco Peaks, White Mountains, and Pinaleno Mountains. The spruce in the Pinalenos is Engelmann spruce (*Picea engelmannii*). Moir and Ludwig (1979) classify all forests dominated by either spruce, corkbark fir (*Abies lasiocarpa*), or both, as spruce-fir forests. They thus map spruce-fir forests as occurring in the Santa Catalina Mountains, where corkbark fir but not spruce is found on the north slope of Mount Lemmon (Shreve 1915; Whittaker and Niering 1965), and in the Chiricahua Mountains, where spruce (but not corkbark fir) is found on north-facing slopes above 2470 m (Robinson 1968; Sawyer and Kinraide 1980). Neither spruce nor subalpine fir occurs in the Huachuca Mountains (Wallmo 1955), the Rincon Mountains (Bowers and McLaughlin 1987), or the Santa Rita Mountains, the other peaks in southern Arizona which extend above 2440 m in elevation. Both Engelmann spruce and blue spruce (*Picea pungens*) occur on the Kaibab Plateau, where blue spruce occurs primarily at the lower elevational limits of

Table 1. Floristic affinities of the Pinaleno Mountains. Table entries are percentages of the total number of species for each column. Only elements accounting for more than 1 percent of the total flora are listed.

Floristic Elements	Johnson (1988)	Additions	Total Flora	Above 2740 m
Widespread Species				
Cordilleran	20.7	8.6	14.6	34.4
Madrean	8.2	4.8	6.5	2.3
Sonoran	2.8	6.1	4.5	0.0
Intermountain	4.3	2.8	3.6	3.6
Californian	1.5	2.0	1.8	0.0
Intermediate-range				
Madrean	19.9	20.3	20.1	9.0
Southern Rocky Mtn. -Mogollon	4.6	2.5	3.6	9.5
Sonoran	2.6	4.3	3.4	0.0
Californian	2.6	1.8	2.2	0.5
Central Rocky Mtn. -Great Basin	1.3	1.0	1.1	1.8
Others	2.3	3.0	2.7	4.5
Narrow Species				
Apachian	15.3	24.3	19.8	10.0
Mogollon	6.6	6.8	6.7	16.3
Central Arizona	1.8	3.3	2.5	1.4
Arizona Upland (Sonoran Desert)	1.0	2.5	1.8	0.0
Chihuahuan	1.5	2.5	2.0	0.5
Southern Rocky Mountain	1.3	1.0	1.1	3.6
Others	1.6	2.3	1.9	2.7

the spruce-fir forest (Merkle 1954). Of the two spruces, blue spruce seems to be adapted to relatively warmer, drier habitats. It is curious, therefore, that the more mesophytic Engelmann spruce, and not blue spruce, extends south into southern Arizona in the Pinaleno and Chiricahua Mountains.

Floristic affinities of the higher elevations of the Pinaleno Mountains differ significantly from those of the flora as a whole. Above 2740 m, Cordilleran species account for 80% of the widespread plants, there is a high percentage of Southern Rocky Mountain-Mogollon species among the plants of intermediate range, and Mogollon species form the largest group among plants with narrow ranges.

Additional botanical field work is needed in the Pinalenos, particularly at the higher elevations in the red-squirrel refugium, which is now closed to entry without special permit. Even among relatively well-known groups such as the conifers there are several unresolved problems. The Environmental Impact Statement for the Mt. Graham astrophysical observatory (Coronado National Forest 1988) states that there is an undescribed species of spruce in the Pinalenos related to the Mexican spruce, *Picea mexicana*. This may be a misinterpretation of the literature, since a recent study of these spruces considers the Mexican spruce to be a weakly differentiated variety of Engelmann spruce (Taylor and Patterson 1980), *Picea engelmannii* var. *mexicana*. Johnson (1988) and Kearney and Peebles (1960) include limber pine (*Pinus flexilis*) in the flora of the Pinalenos. If limber pine in fact occurs in the Pinalenos, it would represent the southernmost limits of this species. Plants of limber pine could have considerable scientific value, since this species has proved to be a sensitive indicator of climate changes in tree-ring studies. Shreve (1919) writes, however, that "the highest elevation is reached by *Pinus strobiformis*, which occurs on dry ridges at 10,300 feet [in the Pinalenos], where its resemblance to *P. flexilis* is very strong." There are two specimens at

ARIZ identified as limber pine, but both lack cones, needed to distinguish limber pine from southwestern white pine (*P. strobiformis*). It would be of great interest to know whether limber pine does in fact occur in the Pinaleños, and if any plants grow on sites targeted for astrophysical development.

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I thank Richard Felger and Janice Bowers for their help doing the field work. Donald Pinkava and two anonymous reviewers provided helpful critiques. John and Charlotte Reeder examined my collections of grasses, and Miriam Fritts verified collections of *Carex* and provided records of additional collections from the Pinaleño Mountains. Coronado National Forest granted me permission to collect in the red-squirrel refugium (all parts of the mountain range above 3050 m) during 1990.

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CHECKLIST OF THE FLORA OF THE PINALEÑO MOUNTAINS

The following checklist combines the taxa listed by Johnson (1988) with the list of additions to the flora of the Pinaleno Mountains developed during the current study. Plants are grouped into four major taxa: Pterophyta (ferns and fern allies), Pinophyta (gymnosperms), Magnoliophyta-Magnoliopsida (dicotyledons), and Magnoliophyta-Liliopsida (monocotyledons). Those taxa preceded by an asterisk (*) are additions to the flora; up to three specimens from ARIZ or the recent collections of the author are cited for each addition. Specimens cited were selected to represent the ecological range and collection history of the taxon. M, MB, and MF are used to abbreviate the collector's names for McLaughlin, McLaughlin and Bowers, and McLaughlin and Felger, respectively. Nomenclature for species and subspecific taxa follows Lehr (1978) and Lehr and Pinkava (1980, 1982), except for the Euphorbiaceae, which follows Kartesz and Kartesz (1980). In the few cases where a more recent name is used, the synonym found in Lehr (1978) or Lehr and Pinkava (1980, 1982) is given in brackets. Taxa preceded by a dagger (†) are introduced.

PTEROPHYTA

Adiantaceae

- **Bommeria hispida* (Mett.) Underw. *Peebles* 14524, Swift Trail, 4850'; *Eiber s.n.*, Jacobson Canyon, 5250'; *MF* 5129, Marijilda Canyon Rd, 4000'.
- **Cheilanthes eatoni* Baker. *Shreve* 4363, Frye Cañon, 5600'; *Maguire et al.* 11746, Frye Canyon, 6233'; *Eiber s.n.*, Jacobson Canyon, 5250'.
- **Cheilanthes fendleri* Hook. *Thornber & Shreve* 7800, Graham Mtns, below Sawmill; *Peebles* 14532, Noon Creek, 5182'; *Darrow et al.* 2505, Pinaleno Mtns, 9357'.
- **Cheilanthes lindheimeri* Hook. *Kearney & Peebles* 14107, Turkey Flat, 8100'; *Peebles* 14517, Swift Trail, 4600'; *MB* 5306, Stockton Pass, 5300'.
- **Cheilanthes tomentosa* Link. *Darrow et al.* 2514, Wet Canyon, 5775'; *Eiber s.n.*, Jacobson Canyon, 5250'.
- Cheilanthes wootoni* Maxon.
- **Cheilanthes wrightii* Hook. *Peebles* 14522, Swift Trail, 4850'; *MF* 5108, Marijilda Canyon Rd, 4100'.
- Cryptogramma acrostichoides* R. Brown.
- **Notholaena sinuata* (Lag.) Kaulf. *Moeller & Richardson* 153, Marijilda Canyon; *MF* 5155, Marijilda Canyon, 4300'.
- **Pellaea atropurpurea* (L.) Link. *Thornber & Shreve* 8031, Graham Mtns; *Shreve* 4350, Frye Cañon, 6000'; *Eiber s.n.*, Jacobson Canyon, 5250'.
- Pellaea ternifolia* (Cav.) Link. var. *wrightiana* (Hook.) A. F. Tyron.
- Pellaea truncata* Goodding.
- **Pityrogramma triangularis* (Kaulf.) Maxon var. *maxonii* Weatherby. *Thornber & Shreve* 7797, Graham Mtns, 5500'; *Shreve* 4362, Frye Canyon, 5600'; *Maguire et al.* 10207, Frye Canyon, 4500'.

Aspleniaceae

- Asplenium trichomanes* L.
- **Athyrium felix-femina* (L.) Roth. var. *californica* Butters. *Thornber & Shreve* 7920-2, Graham Mtns, high altitudes; *Moeller* 196, Swift Trail below Turkey Flat; *Reichenbacher* 887, High Peak Cienega, 10124'.
- Cystopteris fragilis* (L.) Bernh. var. *fragilis*.
- Dryopteris filix-mas* (L.) Schott.
- **Polystichum lonchitis* (L.) Roth. *Thornber & Shreve* 7767, Graham Mtns, above Sawmill; *Darrow et al.* 2482, Marijilda Canyon, 8300'; *Yatskievych et al.* 81-457, Marijilda Canyon, 8700'.
- **Woodsia mexicana* Fee. *Darrow et al.* 2485, Marijilda Canyon, 8700'.
- **Woodsia plummerae* Lemmon. *Thornber & Shreve* 7918, Graham Mtns; *Shreve* 4383, Ghost Camp, 6500'.

Blechnaceae

- Woodwardia fimbriata* J. E. Smith.

Dennstaediaceae

- Peridium aquilinum* (L.) Kuhn var. *pubescens* Underw.

Equisetaceae

- Equisetum arvense* L.
- Equisetum hiemale* L. var. *affine* (Engelm.) A. A. Eaton.

Marsileaceae

- Marsilea mollis* Robins. & Fernald.

Polypodiaceae

**Polypodium hesperium* Maxon. Barr 67-312, Post Creek, 8500'; Yatskievych et al. 81-459, Marijilda Canyon, 8700'; Yatskievych et al. 82-234, Deadman-Highline Trail, 10100'.

Selaginellaceae

**Selaginella underwoodii* Hieron. Maguire et al. 11745, Frye Canyon, 6500'.

PINOPHYTA**Cupressaceae**

Juniperus deppeana Steud. var. *pachyphlaea* (Torr.) Martinez.

Juniperus erythrocarpa Cory.

Ephedraceae

Ephedra fasciculata A. Nels.

Ephedra trifurca Torr.

Pinaceae

Abies concolor (Gordon and Glendinning) Hoopes.

Abies lasiocarpa (Hook.) Nutt. var. *arizonica* (Merriam) Lemmon.

Picea engelmannii Parry.

Pinus discolor Bailey & Hawksworth.

Pinus flexilis James.

Pinus leiophylla Schiede and Deppe var. *chihuahuana* (Engelm.) Shaw.

Pinus ponderosa Lawson var. *arizonica* (Engelm.) Shaw.

**Pinus ponderosa* Laws. var. *scopulorum* Engelm. Peebles 12992, Mt Graham, 5800'.

Pinus strobiformis Engelm.

Pseudotsuga menziesii (Mirb.) Franco var. *glauca* (Beissn.) Franco.

MAGNOLIOPHYTA--MAGNOLIOPSIDA**Acanthaceae**

Anisacanthus thurberi (Torr.) Gray.

Aceraceae

Acer glabrum Torr. var. *neomexicanum* (Greene) Kearney & Peebles.

Acer grandidentatum Nutt. var. *grandidentatum*.

Acer negundo L. var. *interius* (Britt.) Sarg.

Aizoaceae

†**Mollugo verticillata* L. MF 5127, Marijilda Canyon, 4000'; MF 5172, Marijilda Canyon, 4300'.

Amaranthaceae

†**Amaranthus albus* L. MF 5165, Marijilda Canyon, 4300'; M 5773, Tripp Canyon, 4400'.

**Amaranthus fimbriatus* (Torr.) Benth. MF 5120, Marijilda Canyon Rd, 4050'.

†*Amaranthus hybridus* L.

**Amaranthus palmeri* Wats. MF 5152, Marijilda Canyon, 4300'.

**Amaranthus powellii* Wats. Shreve 5367, Riggs Flat, 8000'; Darrow s.n., Ladybug Saddle, 8500'; Darrow et al. 1179, road above Snow Flat, 8800'.

**Froelichia arizonica* Thornber. Shreve 4437, Grant Cañon, 5000'; MF 5209, Gillespie Wash, 4300'.

**Froelichia gracilis* (Hook.) Moq. M 5780, Tripp Canyon, 4400'.

Gomphrena caespitosa Torr.

**Guilleminea densa* (Willd.) Small. Moeller 105, Swift Trail above Cyclone Hill; Anderson & Rhinehart 659, Stockton Pass, 4000'; MF 5175, Marijilda Canyon, 4300'.

Anacardiaceae

**Rhus glabra* L. Kellogg s.n., Graham Mtns; Thornber & Shreve 7825, Graham Mtns, below sawmill.

Rhus trilobata Nutt. var. *pilosissima* Engler.

Toxicodendron rydbergii (Small ex Rydb.) Greene.

Apiaceae

- **Bowlesia incana* Ruiz & Pavon. MB 5435, Tripp Canyon, 4200'.
**Daucus pusillus* Michx. M 5486, Gillespie Wash, 4300'.
Heracleum lanatum Michx.
Ligusticum porteri Coult. & Rose.
**Lomatium nevadense* (Wats.) Coult. & Rose var. *nevadense*. MB 5450, Tripp Canyon, 4700'.
Lomatium nevadense (Wats.) Coult. & Rose var. *parishii* (Coult. & Rose) Jeps.
Osmorhiza chilense Hook. & Arn.
**Osmorhiza depauperata* Philippi. Shreve 5255, Riggs Flat, 8800'; Darrow et al. 1105, Shannon Camp, 8700'; M 5545, Wet Canyon, 6000 ft'.
Pseudocymopterus montanus (Gray) Coult. & Rose.
Yabea microcarpum (Hook. & Arn.) K.-Pol.

Apocynaceae

- **Amsonia palmeri* Gray. Anderson & Rhinehart 639, Stockton Pass, 4000'; Kearney & Peebles 14229, Frye Mesa, 3500'; MB 2142, Stockton Pass.
Apocynum androsaemifolium L.
**Apocynum cannabinum* L. Thornber & Shreve 7862, Graham Mtns; M 5539, Noon Creek, 5200'.
Macrosiphonia brachysiphon (Torr.) Gray.

Araliaceae

- Aralia racemosa* L.

Aristolochiaceae

- **Aristolochia watsoni* Woot. & Standl. MF 5099, Marijilda Canyon Rd, 3840'.

Asclepiadaceae

- Asclepias asperula* (Decne.) Woodson ssp. *capricornu* (Woodson) Woodson.
**Asclepias elata* Benth. Peebles et al. 4488, Mt Graham; Moeller & Richardson 149, Marijilda Canyon; McLaughlin et al. 1840, Frye Canyon, 5050'.
**Asclepias engelmanniana* Woods. Thornber & Shreve 8018, Graham Mtns.
**Asclepias involucrata* Engelm. Goodding s.n., Fort Grant.
**Asclepias linaria* Cav. Maguire et al. 11732, Frye Canyon; Moeller & Richardson 152, Marijilda Canyon; Peebles 14527, Swift Trail, 4850'.
**Asclepias nyctaginifolia* Gray. MB 5312, Stockton Pass, 5300'.
Asclepias quinqueidentata Gray.
Asclepias tuberosa L. ssp. *interior* Woodson.
**Sarcostemma cynanchoides* Decne. ssp. *hartwegii* (Vail) Holm. MF 5096, Marijilda Canyon Rd, 3840'; MF 5131, Marijilda Canyon, 4000'.

Asteraceae

- Achillea millefolium* L. var. *lanulosa* (Nutt.) Piper.
**Acourtia wrightii* (Gray) Reveal & King. Maguire et al. 10936, foot of Graham Mtns; Maguire et al. 11019, Frye Canyon; M 5502, Marijilda Canyon Rd, 4000'.
**Agoseris arizonica* Greene. Kearney & Peebles 9954, Mt Graham, 9000'.
**Agoseris aurantiaca* (Hook.) Greene. Jenkins & Yakskievych 3099, Snow Flat, 9000'.
Agoseris glauca (Pursh) D. Dietr. var. *parviflora* (Nutt.) Rydb.
Ambrosia confertiflora DC.
Anaphalis margaritacea (L.) Gray.
**Antennaria marginata* Greene. Thornber & Shreve 8004, above Sawmill.
Antennaria parvifolia Nutt.
**Artemisia carruthii* Wood ex Carruth. Kearney & Peebles 9853, Mt Graham, 8850'; Moeller 199, 3 mi W of Ladybug Saddle; Peebles 14533, Swift Trail, 5182'.
Artemisia dracunculus L.
**Artemisia franserioides* Greene. Shreve 4306, Columbine Trail, 10200 ft; Kearney & Peebles 14151, Heliograph Peak, 10030'; Darrow et al. 1082, Marijilda Canyon, 8500'.
**Artemisia ludoviciana* Nutt. ssp. *albula* (Woot.) Keck. Moeller 101, Swift Trail, 4500'; Reichenbacher 179, Swift Trail at Wet Canyon; MF 5118, Marijilda Canyon Rd, 4050'.
**Artemisia ludoviciana* Nutt. ssp. *mexicana* (Willd.) Keck. Darrow s.n., Ladybug Saddle, 8500'.

- **Aster subulatus* Michx. var. *ligulatus* Shinn. MB 5356, Stockton Pass, 4300'.
- **Baccharis brachyphylla* Gray. Thornber & Shreve 7968, foothills.
- Baccharis pteronioides* DC.
- Baccharis salicifolia* (R. & P.) Pers.
- Baccharis sarothroides* Gray.
- **Baccharis thesioides* HBK. MB 6423, Ash Canyon, 8400'.
- **Bahia absinthifolia* Benth. var. *dealbata* Gray. Eggleston 19896, Fry Creek, 1400 m.
- Bahia dissecta* (Gray) Britt.
- **Berlandiera lyrata* Benth. var. *lyrata*. MB 5318, Stockton Pass, 5300'.
- **Bidens bigelovii* Gray. Shreve s.n., Grant Cañon.
- **Bidens heterosperma* Gray. Thornber & Shreve 7965, Graham Mtns.
- **Bidens leptcephala* Sherff. Shreve s.n., Grant Cañon; MF 5195, Gillespie Wash, 4300'.
- **Brickellia betonicaefolia* Gray. Shreve 4404, Goudy Canyon, 6250'; MB 5296, Stockton Pass, 5300'; M 5787, Tripp Canyon, 4700'.
- **Brickellia californica* (Torr. & Gray) Gray. Wilson 718, Graham Mts, 3700'; M 75, Marijilda Canyon, 4200'; MB 5337, Stockton Pass, 5800'.
- **Brickellia chlorolepis* (Woot. & Standl.) Shinn. Darrow et al. 1180, road above Snow Flat, 8800'.
- Brickellia fendleri* Gray.
- **Brickellia grandiflora* (Hook.) Nutt. Kearney & Peebles 14113, Pinaleno Mtns, 8300'; Reichenbacher 166, Swift Trail 2-3 mi N of Ladybug Saddle; Yatskievych & McCrary 84-81, Route 366, 8600'.
- Brickellia rusbyi* Gray.
- **Brickellia venosa* (Woot. & Standl.) Robins. Anderson & Rhinehart 562, Stockton Pass, 4000'; M 5786, Tripp Canyon, 4700'.
- **Carminatia tenuiflora* DC. MB 5334, Stockton Pass, 5800'.
- Carphochaete bigelovii* Gray.
- **Chrysothamnus nauseosus* (Pall.) Britt. ssp. *latisquameus* (Gray) Hall & Clem. Adams 41-83, Stockton Pass; MB 5848, Stockton Pass, 4400'.
- Cirsium neomexicanum* Gray.
- **Cirsium ochrocentrum* Gray. MB 5849, Stockton Pass summit, 5650'.
- Cirsium parryi* (Gray) Petrak.
- **Cirsium rothrockii* (Gray) Petrak. MB 5836-C, Swift Trail, 6600'.
- **Cirsium wheeleri* (Gray) Petrak. M 5807, West Peak, 8650'.
- Conyza canadensis* (L.) Cronq.
- Conyza schiedeana* (Less.) Cronq.
- Dugaldia hoopesii* (Gray) Rydb.
- **Dyssodia acerosa* DC. Maguire et al. 10989, vic. Upper Reservoir, Graham Mtns.
- **Encelia farinosa* Gray. M 5499, Marijilda Canyon Rd, 3800'.
- **Ericameria cuneata* (Gray) McClatchie var. *spathulata* (Gray) Hall. Thornber & Shreve 7781, Graham Mtns, below Sawmill; Shreve 4360, Frye Canyon, 5600'.
- **Ericameria laricifolia* (Gray) Shinn. Anderson & Rhinehart 652, Stockton Pass.
- **Erigeron arizonicus* Gray (incl. *E. rusbyi* Gray). Kearney & Peebles 14154, Mt Graham, 10516'; Williams & Williams 3613, Deadman High Trail, 9100'; MB 5840, CP Flat, 8850'.
- **Erigeron colomexicanus* A. Nels. [*E. nudiflorus* Buckl.]. Thornber & Shreve 7878, Graham Mtns, below Sawmill; Maguire et al. 10592, Tripp Canyon; Spray s.n., Stockton Pass, 5000'.
- Erigeron concinnus* (Hook. & Arn.) Torr. & Gray var. *concinnus*.
- Erigeron concinnus* (Hook. & Arn.) Torr. & Gray var. *condensatus* D. C. Eaton.
- Erigeron divergens* Torr. & Gray.
- **Erigeron formosissimus* Greene var. *viscidis* (Rydb.) Cronq. Darrow et al. 1109, Shannon Camp, 8700'; Darrow et al. 1148, Moonshine Canyon, 8800'.
- Erigeron heliographis* Nesom [*E. pringlei* Gray, in part].
- Erigeron macranthus* Nutt.
- Erigeron oreophilus* Greenm.
- Erigeron platyphyllus* Greene.
- **Erigeron superbus* Greene. Shreve 4310, Columbine Trail, 9900; Darrow et al. 1149A, Moonshine Canyon, 8800'; Niering & Whittaker 432, above Hospital Flat, 9200'.
- **Eupatorium bigelovii* Gray. MB 6495, Arcadia Trail, 9100'.
- **Eupatorium herbaceum* (Gray) Greene. Shreve 4409, Goudy Canyon, 7600'; Loomis & King 7438, Mt Graham; M 5804, West Peak, 8650'.
- Eupatorium pauperculum* Gray.

- **Eupatorium rothrockii* Gray. *Peebles et al.* 4517, Mt Graham.
†*Euryops multifida* (L. f.) DC.
**Galinsoga parviflora* Cav. *Thornber & Shreve* 7785, Graham Mtns, Sawmill; *M* 5822, West Peak, 7600'.
**Gnaphalium grayi* Nels. & Macbr. *Segade & Evitts s.n.*, Hospital Flat; *MB* 6517, Riggs Flat Lake.
**Gnaphalium macounii* Greene. *Shreve* 5368, Riggs Flat, 8000'; *Reichenbacher* 410, Swift Trail, 9670'; *MB* 5808, West Peak, 8650'.
Gnaphalium wrightii Gray.
Gutierrezia microcephala (DC.) Gray.
**Gutierrezia sarothrae* (Pursh) Britt. & Rusby. *Thornber & Shreve* 7907, Graham Mtns, foothills; *Anderson & Rhinehart* 601, Stockton Pass, 3700'.
**Gutierrezia serotina* Greene. *MF* 5179, Stockton Pass, 4280'.
**Haplopappus parryi* Gray. *Shreve* 4315, Columbine Trail, 9900'; *Shreve* 5376, Mt Graham, 10300'; *Jenkins & Yatskievych* 3113, Marijilda Canyon, 8700'.
Helianthella quinquenervis (Hook.) Gray.
**Heterotheca fulcrata* (Greene) Shinn. *Shreve* 4358, Frye Canyon, 6000'; *Peebles et al.* 4516, Mt Graham; *Peebles* 14519, Swift Trail, 4600'.
Heterotheca subaxillaris (Lam.) Britt. & Rusby [*H. psammophila* Wagenkn.].
**Heterotheca villosa* (Pursh) Shinn. var. *villosa*. *M* 5801, Tripp Canyon, 5400'.
**Heterotheca villosa* (Pursh) Shinn. var. *foliosa* (Nutt.) Harms. *M* 69, Marijilda Canyon, 4200'; *MF* 5153, Marijilda Canyon, 4300'; *M* 5802, Tripp Canyon, 5400'.
**Heterotheca villosa* (Pursh) Shinn. var. *hispida* (Hook.) Harms. *Anderson & Rhinehart* 654, Stockton Pass, 4000'.
Hieracium fendleri Schultz Bip. var. *fendleri*.
**Hieracium rusbyi* Greene. *Darrow et al.* 1146, Moonshine Canyon, 8800'.
**Hymenoclea monogyra* Torr. & Gray. *MB* 5847, Stockton Pass, 4400'.
Hymenopappus filifolius Hook. var. *lugens* (Greene) Jeps.
**Hymenopappus mexicanus* Gray. *MB* 5839, NW of Riggs Lake, 8900'.
**Hymenothrix wislizenii* Gray. *MF* 5183, Stockton Pass, 4280'.
**Hymenothrix wrightii* Gray. *Thornber & Shreve* 7890, Graham Mtns; *Reichenbacher* 181, Swift Trail at Wet Canyon, 6037'; *MF* 5176, Stockton Pass, 4280'.
**Isocoma tenuisecta* Greene. *Adams* 42-83, Stockton Pass, 5000'; *MB* 5352, Stockton Pass, 5000'.
Lactuca graminifolia Michx.
**Machaeranthera aquifolius* Greene ex Woot. & Standl. *Shreve* 4356, Pinaleno Mtns, Frye Cañon, 6000'; *McLaughlin et al.* 1823, Wet Canyon, 6200'; *Reichenbacher* 177, Wet Canyon.
Machaeranthera gracilis (Nutt.) Shinn.
**Machaeranthera tagetina* Greene. *Thornber & Shreve* 7889, foothills; *MB* 5313, Stockton Pass, 5300'.
Machaeranthera tephrodes (Gray) Greene.
Malacothrix clevelandii Gray.
**Melampodium leucanthum* Torr. & Gray. *Thornber & Shreve* 7893, Graham Mtns, foothills; *Maguire et al.* 10966, Frye Canyon above reservoir; *Anderson & Rhinehart* 836, Frye Mesa, 4900'.
**Microseris linearifolia* (DC.) Schultz-Bip. *MB* 5433, Tripp Canyon, 4200'.
**Pectis papposa* Harv. & Gray. *MF* 5119, Marijilda Canyon Rd, 4050'.
Pectis longipes Gray.
**Pectis prostrata* Cav. *Thornber & Shreve* 7833, Graham Mtns, foothills; *M* 5789, Tripp Canyon, 5100'.
†**Pentzia incana* (Thunb.) O. Kuntze. *M* 5501, Marijilda Canyon Rd, 3800'.
**Pericoma caudata* Gray. *Shreve* 4324, Frye Cañon, 8100'; *Kearney & Peebles* 9824, Mt Graham, 8500'; *Yatskievych & Windham* 85-283A, Swift Trail, 8800'.
**Perityle coronopifolia* Gray. *Thornber & Shreve* 7783, Graham Mtns, below Sawmill; *Shreve* 4365, Frye Canyon, 5600'; *M* 5819, West Peak, 8200'.
Perityle lemmoni (Gray) Macbride.
Plummera ambigua Blake.
Psilostrophe cooperi (Gray) Greene.
Rudbeckia laciniata L.
**Sanvitalia aberti* Gray. *MB* 5332, Stockton Pass, 5800'; *M* 5770, Tripp Canyon, 4400'.
**Schkuhria wislizenii* Gray var. *frustrata* Blake. *M* 5790, Tripp Canyon, 5100'.
Senecio bigelovii Gray var. *bigelovii*.
**Senecio douglasii* DC. var. *douglasii*. *M* 5497, Marijilda Canyon Rd, 3900'.
**Senecio douglasii* DC. var. *longilobus* (Benth.) Benson. *Anderson & Rhinehart* 650, Stockton Pass, 4800'; *Reichenbacher* 180, Swift Trail, 6037'; *MB* 5321, Stockton Pass, 5300'.
**Senecio macdougalii* Heller. *Thornber & Shreve* 7769, Graham Mtns, high altitudes; *Darrow s.n.*, Ladybug Saddle, 8500'.

Senecio neomexicanus Gray.

Senecio parryi Gray.

Senecio wootonii Greene.

Solidago missouriensis Nutt. var. *missouriensis*.

**Solidago sparsiflora* Gray. Moeller 184, Swift Trail below Wet Canyon; Kartchner & Humphrey 754, Tripp Canyon; MF 5162, Marijilda Canyon, 4300'.

Solidago wrightii Gray var. *adenophora* Blake.

**Stephanomeria pauciflora* (Torr.) Nels. Shreve 4415, Goudy Canyon, 5000'; M 5544-A, Swift Trail, 5800'.

**Stephanomeria tenuifolia* (Torr.) Hall. M 5544-B, Swift Trail, 5800'; M 5769, Tripp Canyon, 4200'.

Stevia serrata Cav. var. *haplopappa* Robins.

†*Taraxacum laevigatum* (Willd.) DC.

†*Taraxacum officinale* Weber.

**Thelesperma megapotamicum* (Spreng.) Kuntze. MB 5293, Stockton Pass, 5300'.

†*Tragopogon dubius* Scop.

Trixis californica Kellogg.

**Verbesina encelioides* (Cav.) Benth. & Hook. Peebles 14536, Swift Trail, 5500'; MB 5328, Stockton Pass, 5800'.

**Viguiera annua* (Jones) Blake. Shreve 4423, Grant Canyon.

**Viguiera cordifolia* Gray. Shreve 4368, Frye Cañon, 6000'; M 5803, West Peak, 6300'; M 5814, West Peak, 8650'.

Viguiera multiflora (Nutt.) Blake var. *multiflora*.

Zinnia acerosa (DC.) Gray.

**Zinnia grandiflora* Nutt. MB 5320, Stockton Pass, 5300'.

Berberidaceae

**Berberis haematocarpa* Wooton. Maguire et al. 10157, sw foothills of Graham Mtns, 4200'.

Berberis repens Lindl.

**Berberis wilcoxii* Kearney. Goodding 1058, Ft Grant, rocky cañons.

Betulaceae

Alnus incana (L.) Moench ssp. *tenuifolia* (Nutt.) Breitung.

**Alnus oblongifolia* Torr. Kellogg s.n., Graham Mtns; Moeller 403, Frye Canyon above dam; Barr 68-569, Swift Trail at Wet Canyon, 6000'.

Bignoniaceae

**Chilopsis linearis* (Cav.) Sweet ssp. *arcuata* (Fosberg) Henrickson. Kellogg s.n., Graham Mtns.

**Tecoma stans* (L.) HBK. Bingham 2042, Ridge above P Ranch, 4500' (BLM, Safford).

Boraginaceae

Amsinckia intermedia Fisch. & Meyer.

**Cryptantha barbigera* (Gray) Greene. M 5503, Marijilda Canyon Rd, 4000'.

**Cryptantha micrantha* (Torr.) Johnst. M 5489, Gillespie Wash, 4300'.

Cryptantha muricata (Hook. & Arn.) Nels. & Macbr. var. *denticulata* (Greene) Jeps.

**Cryptantha nevadensis* Nels. & Kenn. MB 5419, Tripp Canyon, 4200'; MB 5436, Tripp Canyon, 4200'.

**Cryptantha pterocarya* (Torr.) Greene. Anderson & Rhinehart 841, Frye Mesa Rd, 4000'; Goodding 66-58, Stockton Pass; MB 5437, Tripp Canyon, 4200'.

**Hackelia ursina* (Greene ex Gray) Johnst. var. *pustulata* (Macbr.) J. L. Gentry. Peebles et al. 4493, Mt Graham.

**Harpagonella palmeri* Gray. McManus et al. 527, Frye Mesa Rd on switchbacks.

**Heliotropium fruticosum* L. MB 5351, Stockton Pass, 5000'.

Lappula redowskii (Hornem.) Greene var. *cupulatum* (Gray) Jones.

**Lithospermum incisum* Lehm. Bingham 1330, Stockton Pass, 5200'.

**Lithospermum multiflorum* Torr. MB 6425, Ash Canyon, 8600'.

**Macromeria viridiflora* DC. MB 6419, Ash Canyon, 8500'.

Mertensia franciscana Heller.

**Pectocarya platycarpa* (Munz & Johnst.) Munz & Johnst. Maguire et al. 11024, vicinity Frye Canyon plot; MB 5444, Tripp Canyon, 4200'.

**Pectocarya recurvata* Johnst. Maguire et al. 10141, Swift Trail, Cyclone Hill; MB 5445, Tripp Canyon, 4200'.

**Plagiobothrys arizonicus* (Gray) Greene. MB 5410, Tripp Canyon, 4200'.

Plagiobothrys tenellus (Nutt.) Gray.

Brassicaceae

Arabis perennans Wats.

**Athyas pusillus* (Hook.) Greene. *Maguire et al.* 10586, Tripp Canyon.

Barbarea orthoceras Ledeb.

†*Brassica campestris* L.

**Descurainia pinnata* (Walt.) Britt. *Goodding* 80-58, Stockton Pass; *MB* 5424, Tripp Canyon, 4200'.

**Draba aurea* Vahl. *Kessler* 1212, Grant Creek, 9400'.

**Draba cuneifolia* Nutt. var. *cuneifolia*. *MB* 5427, Tripp Canyon, 4200'.

**Draba helleriana* Greene. *Niering & Whittaker* 447, Pinaleno Mtns, 9000; *Van Devender et al. s.n.*, Marjilda Canyon, 8900'.

Draba petrophila Greene var. *petrophila*.

Erysimum capitatum (Dougl.) Greene.

**Lepidium thurberi* Woot. *Shreve* 5212, Ft Grant; *Maguire et al.* 11022, Frye Canyon; *MF* 5197, Gillespie Wash, 4300'.

**Lepidium virginicum* L. var. *medium* (Greene) Hitchc. *Maguire et al.* 10150, east foothills, Graham Mtns, 4265 ft; *MB* 5443, Tripp Canyon, 4200'.

Lesquerella fendleri (Gray) Wats.

†**Nasturtium officinale* L. *Peebles et al.* 4347, Mt Graham.

Pennellia longifolia (Benth.) Rollins.

**Pennellia micrantha* (Gray) Nieuwl. *Thornber & Shreve* 7852, Graham Mtns; *Peebles et al.* 4443, Mt Graham.

**Rorippa obtusa* (Nutt.) Britt. *MB* 6519, Riggs Flat Lake.

Thelypodopsis linearifolia (Gray) Al-Shehbaz.

Thlaspi montanum L. var. *fendleri* (Gray) P. Holmgren.

Thysanocarpus curvipes Hook. var. *elegans* (F. & M.) Robins.

Cactaceae

Echinocereus fasciculatus (Engelm.) L. Benson var. *fasciculatus*.

Echinocereus leidingii Peebles.

Echinocereus triglochidiatus Engelm. var. *neomexicanus* (Standl.) Standl. ex W. T. Marshall.

Ferocactus wislizenii (Engelm.) Britt. & Rose.

Mammillaria heyderi Muehlenfort var. *macdougalii* L. Benson.

Mammillaria viridiflora (Britt. & Rose) Bodeker.

**Mammillaria wrightii* Engelm. var. *wilcoxii* (Toumey) W. T. Marsh. *Nichol s.n.*, Graham Mtns.

Opuntia engelmannii Salm-Dyck. [*O. phaeacantha* Engelm. var. *discata* (Griffiths) Benson & Walkington].

Opuntia phaeacantha Engelm. var. *major* Engelm.

Opuntia spinosior (Engelm.) Toumey.

Callitrichaceae

Callitriche heterophylla Pursh.

Campanulaceae

Campanula rotundifolia L.

Lobelia cardinalis L. ssp. *graminea* (Lam.) McVaugh.

Triodanis perfoliata (L.) Nieuwl.

Capparidaceae

**Polanisia dodecandra* (L.) DC. ssp. *trachysperma* (T. & G.) Iltis. *Goodding s.n.*, Stockton [sic] Pass; *Anderson & Rhinehart* 629, Stockton Pass, 4000'; *MF* 5180, Stockton Pass, 4280'.

Caprifoliaceae

Lonicera arizonica Rehd.

Lonicera involucrata (Richards.) Banks.

Sambucus glauca Nutt.

**Sambucus mexicanus* Presl. *Shreve* 5214, Ft Grant.

Symphoricarpos oreophilus Gray.

**Symphoricarpos rotundifolius* Gray. *Maguire et al.* 11726, Frye Canyon.

Caryophyllaceae

**Arenaria lanuginosa* (Michx.) Rohrd. ssp. *lanuginosa* var. *longipedunculata* Duncan. *Thornber & Shreve* 7945, Graham Mtns; *Kearney & Peebles* 9793, Mt Graham, 7500'.

Arenaria lanuginosa (Michx.) Rohrb. ssp. *saxosa* (A. Gray) Maguire.

**Cerastium nutans* Raf. Kearney & Peebles 9953, Mt Graham, 9000'; Darrow et al. 1131, Treasure Park, 8500'; Reichenbacher 426, east side of Riggs Lake, 8700'.

Cerastium sordidum Robins.

Cerastium texanum Britt.

**Drymaria depressa* Greene. Thornber & Shreve 7942, Graham Mts; Darrow et al. 1115A, Heliograph Peak, 9500'.

**Drymaria fendleri* Wats. MB 5331, Stockton Pass, 5800'.

**Silene antirrhina* L. MB 5413, Tripp Canyon, 4200'.

Silene laciniata Cav. ssp. *greggii* (Gray) Hitchc. & Maguire.

Silene scouleri Hook. ssp. *pringlei* (Wats.) Hitchc. & Maguire var. *pringlei*.

**Stellaria longipes* Goldie. MB 6433, Hospital Flat, 9000'.

Stellaria nitens Nutt.

Celastraceae

Canotia holacantha Torr.

Pachystima myrsinites (Pursh) Raf.

Chenopodiaceae

Atriplex canescens (Pursh) Nutt.

**Atriplex elegans* (Moq.) D. Dietr. ssp. *elegans*. MB 5317, Stockton Pass, 5300'.

Chenopodium fremontii Wats. var. *fremontii*.

Chenopodium graveolens Willd. var. *neomexicanum* (Aellen) Aellen.

Chenopodium incanum (S. Wats.) Heller var. *elatum* Crawford.

Convolvulaceae

Evolvulus arizonicus Gray var. *arizonicus*.

Ipomoea barbatisepala Gray.

**Ipomoea coccinea* L. MF 5177, Stockton Pass, 4280'.

**Ipomoea costellata* Torr. MF 5167, Marijilda Canyon, 4300'; M 5767, Tripp Canyon, 4200'.

**Ipomoea plummerae* Gray. Hope & Duncan 9985, Mt Graham, 7500'.

Cornaceae

Cornus sericea L. ssp. *sericea* [*C. stolonifera* Michx.].

Crassulaceae

**Graptopetalum rusbyi* (Greene) Rose. Bingham 2304, Lower Jacobson Canyon, 4000' (USDA Forest Service, Safford).

Sedum cockerellii Britt.

Cucurbitaceae

**Echinopepon wrightii* (Gray) Wats. MF 5193, Gillespie Wash, 4300'.

Marah gilensis Greene.

Elatinaceae

**Elatine brachysperma* Gray. Goodding & Barney 49-61, Riggs Lake, Pinaleno Mtns.

Ericaceae

Arbutus arizonica (Gray) Sarg.

**Arctostaphylos pringlei* Parry. Thornber & Shreve 7853, Graham Mtns; Shreve 5274, Jesus Canyon, Pinaleno Mtns; Maguire et al. 12089, Swift Trail, 5500'.

Arctostaphylos pungens HBK.

**Chimaphila umbellata* (L.) Bart. Shreve 5270, trail east of Riggs Flat, Graham Mtns; Darrow s.n., Heliograph Peak, 9000'; Darrow et al. 1090, Marijilda Canyon, 8500'.

Pterospora andromeda Nutt.

**Pyrola chlorantha* Sw. Shreve 5268, trail east of Riggs Flat, Graham Mtns; Darrow et al. 1062, Shannon Camp, 8700'; Reichenbacher & Spicer 1600, High Peak Cienega.

**Pyrola minor* L. Shreve 5257, Riggs Flat, Graham Mtns, 8800'.

Pyrola picta J. E. Smith.

Pyrola secunda L.

Vaccinium myrtillus L.

Euphorbiaceae

- **Acalypha neomexicana* Muell.-Arg. MF 5126, Marijilda Canyon, 4000'; MB 5345, Stockton Pass, 5000'; M 5771, Tripp Canyon, 4400'.
- Chamaesyce albomarginata* (Torr. & Gray) Small.
- **Chamaesyce florida* (Engelm.) Millsp. MF 5098, Marijilda Canyon Rd, 3840'.
- **Chamaesyce hyssopifolia* (L.) Small. MF 5134, Marijilda Canyon, 4000 ft'.
- **Chamaesyce indivisa* (Engelm.) Millsp. Peebles 14521, Swift Trail, 4850'; MF 5187, Stockton Pass, 4280'; M 5766, Tripp Canyon, 4200'.
- **Chamaesyce micromera* (Boiss.) Woot. & Standl. MF 5079, Marijilda Canyon Rd, 3840'.
- **Chamaesyce revoluta* (Engelm.) Small. Thornber & Shreve 7808, Graham Mtns.
- **Chamaesyce serpyllifolia* (Pers.) Small. MF 5182, Stockton Pass, 4280'.
- **Chamaesyce setiloba* (Engelm.) Millsp. ex Parish. MF 5184, Stockton Pass, 4280'.
- **Euphorbia bilobata* Engelm. MF 5214, Gillespie Wash, 4300'; M 5793, Tripp Canyon, 5200'.
- **Euphorbia exstipulata* Engelm. MF 5213, Gillespie Wash, 4300'.
- **Euphorbia incisa* Engelm. var. *mollis* (Norton) Wheeler. Shreve 5269, trail east of Riggs Flat, Graham Mtns; McLaughlin et al. 1826, Turkey Flat, 7400'; McLaughlin et al. 1837, 1.3 mi west of Columbine, 9300'.
- **Euphorbia palmeri* Engelm. var. *subpubens* (Engelm.) Wheeler. Shreve 4370, Frye Canyon, near Ghost Camp, 6500'; Niering & Whittaker 427, above Hospital Flat, 9500'.
- Euphorbia robusta* (Engelm.) Small.
- **Poinsettia heterophylla* (L.) Klotzsch. & Garke var. *heterophylla*. MF 5201, Gillespie Wash, 4300'.
- **Tragia ramosa* Torr. MF 5145, Marijilda Canyon, 4000'; M 5785, Tripp Canyon, 4700'.

Fabaceae

- **Acacia angustissima* (Mill.) Kuntze. Thornber & Shreve 8033, foothills; Crider s.n., Graham Mtns; MF 5157, Marijilda Canyon, 4300'.
- Acacia constricta* Benth.
- **Acacia greggii* Gray. MF 5191, Stockton Pass, 4280'.
- Amorpha californica* Nutt.
- Amorpha fruticosa* L. var. *occidentalis* (Abrams) Kearney & Peebles.
- Astragalus allochorus* Gray.
- **Astragalus arizonicus* Gray. Eggleston 19898, Fry [sic] Creek, Crook Forest, 1400 m; Maguire et al. 10995, Upper Reservoir Plot, Graham Mtns; MB 5411, Tripp Canyon, 4200'.
- Astragalus cobrensis* Gray.
- Astragalus nothoxys* Gray.
- **Astragalus nuttallianus* DC. var. *austrinus* (Small) Barneby ex Shreve & Wiggins. Eggleston 19899, Fry [sic] Creek, Crook Forest, 1400 m; MB 5417, Tripp Canyon, 4000'.
- **Astragalus tephrodes* Gray var. *brachylobus* (Gray) Barneby. Eggleston 19904, Fry [sic] Creek, Crook Forest, 1400 m.
- †**Caesalpinia gillesii* Wall. MB 5358, Stockton Pass, 4300'.
- Calliandra eriophylla* Benth.
- **Calliandra humilis* Benth. var. *reticulata* (Gray) L. Benson. MB 5302, Stockton Pass, 5300'.
- **Chamaecrista nictitans* (L.) Greene var. *mensalis* (Greenm.) Irwin & Barneby. Shreve 4413, Goudy Canyon, 5000'; MF 5166, Marijilda Canyon, 4300'.
- Cercidium floridum* Benth.
- **Cologania angustifolia* HBK. Kearney & Peebles 9887, Mt Graham, 9000'.
- **Crotalaria pumila* Ortega. Bryce 552, Stockton Pass; MF 5202, Gillespie Wash, 4300'.
- Dalea albiflora* Gray.
- **Dalea grayi* (Vail) L. O. Williams. MB 5295, Stockton Pass, 5300'.
- Dalea pogonathera* Gray.
- Dalea versicolor* Zucc. ssp. *versicolor* var. *sessilis* (Gray) Barneby.
- Desmanthus cooleyi* (Eaton) Trel.
- **Desmodium batocaulon* Gray. MF 5161, Marijilda Canyon, 4300'; MB 5297, Stockton Pass, 5300'.
- **Desmodium neomexicanum* Gray. Shreve 4433, Grant Canyon; MB 5330, Stockton Pass, 5800'; M 5781, Tripp Canyon, 4400'.
- **Desmodium psilophyllum* Schlecht. MF 5160, Marijilda Canyon, 4300'; MB 5836-A, Noon Creek, 5200'.
- Desmodium retinens* Schlecht.
- **Desmodium rosei* Schubert. M 5783, Tripp Canyon, 4700'.
- **Galactia wrightii* Gray var. *mollissima* Kearney & Peebles. Kearney & Peebles 14103, Noon Creek, 5100'; MF 5135, Marijilda Canyon, 4000'; MB 5350, Stockton Pass, 5000'.
- **Hoffmanseggia glauca* (Ort.) Eifort. MF 5198, Gillespie Wash, 4300'.

- Lathyrus graminifolius* (Wats.) White.
Lathyrus lanszwertii Kellogg var. *arizonicus* (Britt.) Welsh.
Lotus greenei (Woot. & Standl.) Ottley.
 **Lotus humistratus* Greene. Goodding s.n., Pass in Graham Mtns; MB 5438, Tripp Canyon, 4200'.
 **Lotus oroboides* (HBK.) Ottley var. *nanus* (Gray) Isley. Maguire et al. 10973, Frye Mesa; Rhinehart & O'Donnal 986, Stockton Pass, 4800'; M 5508, Marijilda Canyon, 4300'.
 **Lotus oroboides* (HBK.) Ottley var. *oroboides*. Eggleston 19911, Fry [sic] Creek, Mt Graham, 1400 m; MF 5185, Stockton Pass, 4280'.
 **Lotus purshianus* (Benth.) Clements & Clements. MF 5200, Gillespie Wash, 4300'.
 **Lotus rigidus* (Benth.) Greene. Maguire et al. 10165, Stockton Pass; Maguire et al. 10190, Frye Canyon; Anderson & Rhinehart 799, Swift Trail, 5500'.
Lotus wrightii (Gray) Greene.
 **Lupinus brevicaulis* Wats. Eggleston 19903, Fry [sic] Creek, Crook Forest.
 **Lupinus concinnus* Agardh. Eggleston 19918, Stockton Pass, Crook Forest, 1500 m; Anderson et al. 832, Frye Mesa Rd, 4000'; MB 5463, Tripp Canyon, 4460'.
Lupinus neomexicanus Greene.
 **Lupinus sparsiflorus* Benth. Eggleston 19902, Fry [sic] Creek, Crook Forest, 1400 m, May 9-10, 1924; Maguire et al. 10152, Mt Graham foothills, 4265'.
Macroptilium gibbosifolium (Ortega) A. Delgado.
 †*Melilotus officinalis* (L.) Lam.
Mimosa biuncifera (Benth.) Britt. & Rose.
 **Phaseolus acutifolius* Gray var. *tenuifolius* Gray. Thornber & Shreve 7998, Sawmill; MF 5122, Marijilda Canyon Rd, 4000'; MB 5298, Stockton Pass, 5300'.
 **Phaseolus grayanus* Woot. & Standl. Kearney & Peebles 9865, Mt Graham, 8500'; Buhrow 14, south slope, roadside, 7500'; Buhrow 172, Shake Spring Trail, 7250'.
 **Phaseolus metcalfei* Woot. & Standl. Crider s.n., Arcadia Ranger Sta, Graham Mtns.
 **Phaseolus ritensis* Jones. Shreve 4407, Goudy Canyon, Pinaleno Mtns, 6250'.
 **Prosopis glandulosa* Torr. var. *torreyana* (Benson) M. C. Johnst. MB 5288, Stockton Pass, 4950'.
Prosopis velutina Woot.
 **Psoralea tenuiflora* Pursh. MB 5289, Stockton Pass, 4950'.
 **Rhynchosia texana* Torr. & Gray. MB 5325, Stockton Pass, 5300'.
Robinia neomexicana Gray.
Senna bauhinoides (Gray) Irwin & Barneby.
 **Senna covesii* (Gray) Irwin & Barneby. Moeller & Richardson 129, 1 mi south of Marijilda Canyon; Anderson 556, Swift Trail, 4200'.
 **Sophora arizonica* Wats. Kearney & Peebles 14233, escarpment of Frye Mesa; McLaughlin & McManus 633, nw slopes of Frye Mesa, 4400'; MB 2138, ravine on top of Frye Mesa.
Thermopsis rhombifolia Nutt. ex Richards var. *montana* (Nutt.) Isely.
Trifolium pinetorum Greene.
 **Vicia americana* Muhl. ex Willd. var. *americana*. Shreve 5272, Riggs Flat; Darrow et al. 1096, Heliograph Peak, 9500'; Kessler 1208, Grant Creek, 9500'.
Vicia americana Muhl. ex Willd. var. *minor* Hook.
Vicia ludoviciana Nutt.
Vicia pulchella HBK.
- Fagaceae**
 **Quercus arizonica* Sarg. Maguire et al. 10960, Frye Canyon, 4265'; Bryce 606, Noon Creek, 5265'; Perrill 5430, Hwy 366, 7350'.
 **Quercus chrysolepis* Liebm. Thornber & Shreve 7857, Graham Mtns.
Quercus emoryi Torr.
Quercus gambelii Nutt.
 **Quercus grisea* Liebm. Thornber & Shreve 7953, Graham Mtns, below sawmill.
Quercus hypoleucoides Camus.
 **Quercus oblongifolia* Torr. Maguire et al. 12096, Swift Trail.
Quercus rugosa Nee.
 **Quercus turbinella* Greene. Shreve 4391, Upper Trippe [sic] Wash, 4300'; Maguire et al. 10961, Frye Canyon, 4265'; MF 5151-B, Marijilda Canyon, 4300'.

Fouquieriaceae

Fouquieria splendens Engelm. ssp. *splendens*.

Garryaceae

Garrya wrightii Torr.

Gentianaceae

**Centaurium calycosum* (Buckl.) Fern. var. *arizonicum* (Gray) Tidest. Barr 61-226, Grant Creek, 8700'; MF 5216, Gillespie Wash, 4300'.

**Gentiana bigelovii* Gray. Hope & Duncan 9986, Mt Graham; Barr s.n., behind Mt Graham Lodge cabins, 7600'; McLaughlin et al. 1827, Turkey Flat, 7400'.

**Gentianella amarella* (L.) Borner ssp. *acuta* (Michx.) J. M. Gillet. Goodding et al. 1559, Soldiers Creek Forest Camp, 9400'; Darrow et al. 1106, Shannon Camp, 8700 ft'; Bowers & McLaughlin 2063, Hospital Flat.

**Gentianopsis thermalis* (Kuntze) Iltis. Shreve 5370, Riggs Flat, 8000'; Phillips et al. 3380, Treasure Park, 9000'; Jenkins & Yatskievych 3121, Hospital Flats, 9250'.

**Halenia recurva* (J. E. Smith) Allen. Shreve 4312, Columbine Trail, 9900'; Kearney & Peebles 14139, near Hospital Flat, 9600'; Darrow et al. 1081, Marijilda Canyon, 8600'.

Swertia radiata (Kell.) Kuntze.

Geraniaceae

†*Erodium cicutarium* (L.) L'Her.

Geranium caespitosum James var. *parryi* (Engelm.) Weber.

**Geranium eremophilum* Woot. & Standl. Thornber & Shreve 8019, Graham Mtns, sawmill; Moeller 213, 3 mi W of Ladybug Saddle; Darrow et al. 1060, Shannon Camp, 8700'.

Geranium richardsonii Fisch. & Trautv.

Haloragaceae

Myriophyllum exalbescens Fern.

Hydrophyllaceae

**Eriodictyon angustifolium* Nutt. Maguire et al. 11722, Frye Mesa; Kessler & Nelson 1137, below Turkey Flat, 6950'; M 5543, Swift Trail, 5800'.

**Nama hispidum* Gray. Shreve 4367A, near Chlarson's Mill, Pinaleno Mtns, 6500'; Maguire et al. 10980, Hawks Hollow Plot, Graham Mtns.

Phacelia distans Benth. var. *australis* Brand.

Phacelia heterophylla Pursh [*P. magellanica* (Lam.) Cov.].

Hypericaceae

Hypericum anagalloides C. & S.

Hypericum formosum HBK.

Juglandaceae

Juglans major (Torr.) Heller.

Krameriaceae

Krameria parvifolia Benth.

Lamiaceae

Agastache breviflora (Gray) Epling.

Agastache pallidiflora (Heller) Rydb. ssp. *neomexicana* (Briq.) Lint & Epling.

Agastache pallidiflora (Heller) Rydb. ssp. *pallidiflora*.

**Hedeoma dentatum* Torr. Lemmon s.n., Mt Graham; Shreve 4397, Goudy Canyon, 5800'.

Hedeoma hyssopifolium Gray.

**Hedeoma oblongifolium* (Gray) Heller. Thornber & Shreve 7790, Sawmill; MB 5299, Stockton Pass, 5300'; M 5776, Tripp Canyon, 4400'.

Monarda austromontana Epling.

Monarda menthaefolia Graham.

Prunella vulgaris L.

Salvia arizonica Gray.

**Salvia subincisa* Benth. MB 5335, Stockton Pass, 5800'; M 5774, Tripp Canyon, 4400 ft'.

Stachys coccinea Jacq.

Trichostema arizonica Gray.

Linaceae

Linum lewisii Pursh.

Linum neomexicanum Greene.

Linum puberulum (Engelm.) Heller.

Loasaceae

**Mentzelia albicaulis* Dougl. MB 5423, Tripp Canyon, 4200'.

Mentzelia asperula Woot. & Standl.

Lythraceae

**Lythrum californicum* Torr. & Gray. Moeller 321, Stockton Pass; MF 5211, Gillespie Wash, 4300'.

Malpighiaceae

**Janusia gracilis* Gray. Maguire et al. 11010, Lower Reservoir; MF 5101, Marijilda Canyon Rd, 3840'.

Malvaceae

**Abutilon parvulum* Gray. MF 5121, Marijilda Canyon Rd, 4050'.

**Abutilon sonorae* Gray. Anderson & Rhinehart 666, Stockton Pass, 4000'.

**Gossypium thurberi* Todaro. Nelson et al. 1073, Dutch Henry Canyon, 4900'.

Iliamna grandiflora (Rydb.) Wiggins.

**Sida procumbens* Swallen. MF 5150, Marijilda Canyon, 4000'; MB 5336, Stockton Pass, 5800'.

**Sphaeralcea fendleri* Gray var. *venusta* Kearney. MF 5148, Marijilda Canyon, 4000'; MB 5290, Stockton Pass, 5300 ft'.

**Sphaeralcea laxa* Woot. & Standl. Thornber 7894, Foothills; MF 5102, Marijilda Canyon Rd, 3840'.

Martyniaceae

**Proboscidea altheaefolia* (Benth.) Dec. Anderson & Rhinehart 430, Frye Canyon plot, Graham Mtns.

**Proboscidea parviflora* (Woot.) Woot. & Standl. MF 5181, Stockton Pass, 4280'.

Moraceae

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

Morus microphylla Buckl.

Nyctaginaceae

Allionia incarnata L.

**Boerhaavia coccinea* Mill. MF 5081, Marijilda Canyon Rd, 3840'; MB 5319, Stockton Pass, 5300'.

**Boerhaavia coulteri* (Hook. f.) Wats. MF 5170, Marijilda Canyon, 4300'; M 5778, Tripp Canyon, 4400'.

Boerhaavia erecta L.

**Boerhaavia gracillima* Heimerl. Thornber & Shreve 7923, Graham Mtns.

Boerhaavia intermedia Jones.

**Boerhaavia purpurascens* Gray. MB 5346, Stockton Pass, 5000'.

**Commicarpus scandens* L. MF 5109, Marijilda Canyon Rd, 4100'.

**Mirabilis bigelovii* Gray. MF 5117, Marijilda Canyon Rd, 4050'; M 5498, Marijilda Canyon Rd, 3900'.

**Mirabilis coccinea* (Torr.) Benth. & Hook. MF 5208, Gillespie Wash, 4300'.

**Mirabilis linearis* (Pursh) Hiemerl. Kearney & Peebles 9822, Mt Graham, 8500'; MF 5159, Marijilda Canyon, 4300'.

**Mirabilis longiflora* L. var. *wrightiana* (Gray) Kearney & Peebles. Kearney & Peebles 9779, Mt Graham, 7000'; MF 5218, Gillespie Wash, 4300'.

**Mirabilis multiflora* (Torr.) Gray. Maguire et al. 10977, Frye Mesa; Nelson et al. 1075, Dutch Henry Canyon, 4900'; MB 5327, Stockton Pass, 5800'.

Mirabilis oblongifolia (Gray) Hiemerl.

Oleaceae

**Fraxinus anomala* Torr. ex Wats. var. *lowellii* (Sarg.) Little. Goodding 2278, Pass between Safford & Ft. Grant.

Fraxinus pennsylvanica Marsh. ssp. *velutina* (Torr.) G. N. Miller.

Onagraceae

- Circaea alpina* L. ssp. *pacifica* (Asch. & Magnus) M. E. Jones.
Epilobium angustifolium L. ssp. *circumvagum* Mosquin.
Epilobium ciliatum Raf. ssp. *ciliatum* [including *E. californicum* Hausskn.].
**Epilobium ciliatum* Raf. ssp. *glandulosum* (Lehm.) Hoch & Raven. *Maguire et al.* 11763, Frye Canyon.
**Gaura coccinea* Nutt. var. *coccinea*. MB 5322, Stockton Pass, 5300'.
**Gaura gracilis* Woot. & Standl. *Kearney & Peebles* 9904, Mt Graham, 9500'; *Pultz et al.* 1182, above Wet Canyon, 6500'; MF 5205, Gillespie Wash, 4300'.
**Gaura parviflora* Dougl. MF 5199, Gillespie Wash, 4300'.
**Oenothera albicaulis* Pursh. M 5484, Gillespie Wash, 4300'.
Oenothera hookeri Torr. & Gray ssp. *hewettii* Ckll.
Oenothera laciniata Hill. var. *pubescens* (Willd.) Munz.
Oenothera neomexicana (Small) Munz.
**Oenothera primiveris* Gray. MB 5448, Tripp Canyon, 4400'.
**Zauschneria californica* Presl ssp. *latifolia* (Hook.) Keck. MF 5146, Marijilda Canyon, 4000'; MB 5349, Stockton Pass, 5000'.

Orobanchaceae

- Conopholis alpina* Liebm. var. *mexicana* (Gray ex Wats.) Haynes.
Orobanche fasciculata Nutt. var. *lutea* (Parry) Achey.

Oxalidaceae

- **Oxalis albicans* HBK. ssp. *pilosa* (Nutt.) Eiten. *Shreve* 5298, near Ft Grant, 5000'; MF 5136, Marijilda Canyon, 4000'; MB 5347, Stockton Pass, 5000'.
Oxalis alpina (Rose) Kunth.

Papaveraceae

- Corydalis aurea* Willd. ssp. *occidentalis* (Engelm.) Ownbey.
**Eschscholzia californica* Cham. ssp. *mexicana* (Greene) C. Clark. *Goodding s.n.*, Ft Grant; M 5480, Stockton Pass, 5400'.
**Platystemon californicus* Benth. *Maguire et al.* 10203, Frye Canyon, Graham Mtns.

Plantaginaceae

- †*Plantago major* L.
Plantago patagonica Jacq. var. *gnaphalioides* (Nutt.) Gray.
**Plantago virginica* L. M 5481, Gillespie Wash, 4300'.

Platanaceae

- Platanus wrightii* Wats.

Polemoniaceae

- **Eriastrum diffusum* (Gray) Mason. *Shreve* 5211, Ft Grant; *Maguire et al.* 10945, below Frye Mesa, Graham Mtns; M 5490, Gillespie Wash, 4300'.
**Gilia ophthalmoides* Brand ssp. *australis* Grant. MB 5412, Tripp Canyon, 4200'.
Ipomopsis aggregata (Pursh) V. Grant. ssp. *formosissima* (Greene) Wherry.
Ipomopsis multiflora (Nutt.) V. Grant.
Linanthus aureus (Nutt.) Greene var. *aureus*.
**Microsteris gracilis* (Hook.) Greene. *Maguire et al.* 10162, Stockton Pass, Graham Mtns; MB 2139, top of Frye Mesa, Pinaleno Mtns; MB 5434, Tripp Canyon, 4200'.
**Phlox austromontana* Cov. ssp. *vera* Wherry. *Goodding s.n.*, Pass in Graham Mtns.
Polemonium foliosissimum Gray var. *foliosissimum* [Including *P. flavum* Greene].

Polygalaceae

- **Monnina wrightii* Gray. M 5774, Tripp Canyon, 5200'.
Polygala obscura Benth.

Polygonaceae

- Eriogonum abertianum* Torr.
Eriogonum jamesii Benth. var. *jamesii*.
**Eriogonum pharnaceoides* Torr. *Moeller* 405, Frye Canyon above dam, Graham Mtns.

- **Eriogonum polycladon* Benth. MF 5206, Gillespie Wash, 4300'.
 **Eriogonum wrightii* Torr. MF 5091, Marijilda Canyon Rd, 3840'; MB 5287, Stockton Pass, 4950'.
 †*Polygonum aviculare* L.
Polygonum bistortoides Pursh var. *oblongifolium* (Meisn.) St. John.
 †**Polygonum convolvulus* L. Thornber & Shreve 7805, Graham Mtns; Shreve 4377, Ghost Camp, Pinaleno Mtns, 6500'.
 †**Polygonum lapathifolium* L. MB 5357, Stockton Pass, 4300'.
 **Polygonum sawatchense* Small. Jenkins & Yatskievych 3098, Snow Flat, 9000'.
 †*Rumex acetosella* L.
Rumex mexicanus Meisn.
 **Rumex orthoneurus* Rech. f. M 5626, Hospital Flat, 9100'; Van Devender et al. s.n., Big Creek, 9040 ft.

Portulacaceae

- **Calandrinia ciliata* (Ruiz & Pavon) DC. MB 2141, top of Frye Mesa, Pinaleno Mtns; MB 5439, Tripp Canyon, 4200'.
Calyptidium monandrum Nutt.
Claytonia perfoliata Donn.
 †**Portulaca oleracea* L. MF 5154, Marijilda Canyon, 4300'.
 **Portulaca parvula* Gray. Shreve 4434, Grant Canyon; MF 5171, Marijilda Canyon, 4300'.
 **Portulaca retusa* Engelm. MF 5113, Marijilda Canyon Rd, 4100'.
 **Portulaca suffrutescens* Engelm. Moeller & Richardson 127, 1 mi. S of Marijilda Canyon; MF 5114, Marijilda Canyon Rd, 4100'.

Primulaceae

- **Androsace occidentalis* Pursh. MB 5442, Tripp Canyon, 4200'.
Androsace septentrionalis L. var. *subulifera* Gray.
Dodecatheon dentatum Hook. ssp. *ellisiae* (Standl.) H. J. Thompson.
Dodecatheon pulchellum (Raf.) Merrill.
 **Primula rusbyi* Greene. Shreve 4343, Mt Graham, 10300'; Peebles et al. 4490, Mt Graham, 10000'; Barr 62-537, Post Creek, 9000'.

Ranunculaceae

- Actaea rubra* (Ait.) Willd. ssp. *arguta* (Nutt.) Hult.
Anemone tuberosa Rydb.
Aquilegia chrysantha Gray.
Caltha leptosepala DC.
Clematis ligusticifolia Nutt.
Delphinium scaposum Greene.
Delphinium wootonii Rydb.
Ranunculus aquatilis L. var. *capillaceus* DC.
Thalictrum fendleri Engelm. var. *fendleri*.

Rhamnaceae

- Ceanothus fendleri* Gray.
 **Ceanothus greggii* Gray. Shreve 4384, Frye Cañon, 5000'; Adams 28-83, Mt Graham Rd, 5239'; MB 5361, Stockton Pass, 4300'.
 **Ceanothus integerrimus* Hooker & Arnott. Kellogg s.n., Graham Mtns; Peebles et al. 4474, Mt Graham.
Rhamnus betulaeifolia Greene.
Rhamnus californica Esch. ssp. *ursina* (Greene) Wolf.
Rhamnus crocea Nutt. var. *illicifolia* (Kell.) Greene.
 **Zizyphus obtusifolia* (Hook. ex T. & G.) Gray var. *canescens* (Gray) Johnst. MF 5144, Marijilda Canyon, 4000'; MB 5447, Tripp Canyon, 4200'.

Rosaceae

- **Agrimonia striata* Michx. Jenkins & Yatskievych 3096, Snow Flat, 9000'.
Cercocarpus montanus Raf. var. *paucidentatus* (S. Wats.) F. L. Martin.
Cowania mexicana D. Don var. *stansburiana* (Torr.) Jeps.
Fallugia paradoxa (D. Don) Endl.
Fragaria vesca L. ssp. *bracteata* (Heller) Staudt [*F. bracteata* Heller].
Fragaria virginica Duchesne [*F. ovalis* (Lehm.) Rydb.].

- **Geum macrophyllum* Willd. *Peebles et al.* 4452, Mt Graham; *Darrow et al.* 1113, meadow area near Shannon Camp, 8700'.
Holodiscus dumosus (Nutt.) Heller var. *australis* (Heller) Ley.
Physocarpus malvaceus (Greene) Kuntze.
Potentilla albiflora L. O. Williams.
**Potentilla diversifolia* Lehm. *Shreve* 5233, near Columbine Ranger Station, 9400'.
Potentilla hippiana Lehm. var. *diffusa* Lehm.
**Potentilla thurberi* Gray var. *thurberi*. *Thornber & Shreve* 7866, Graham Mtns, sawmill; *Peebles et al.* 4454, Mt Graham; *Hope & Duncan* 9984, Mt Graham, 7500'.
**Potentilla thurberi* Gray var. *atrorubens* (Rydb.) Kearney & Peebles. *Peebles et al.* 4453, Mt Graham; *Moeller* 210, 3 mi W of Ladybug Saddle, 8500'; *Darrow et al.* 1144, above Moonshine Canyon, 8800'.
Prunus emarginata (Dougl.) D. Dietr.
Prunus serotina Ehrh. ssp. *virens* (Woot. & Standl.) McVaugh var. *virens*.
Rosa woodsii Lindl. [Includes *R. arizonica* Rydb., *R. fendleri* Crepin].
Rubus arizonensis Focke.
Rubus neomexicanus Gray.
Rubus parviflorus Nutt. var. *parviflorus*.
Rubus strigosus Michx. var. *arizonicus* (Greene) Kearney & Peebles.
Sorbus dumosus Greene.

Rubiaceae

- Bouvardia glaberrima* Engelm.
**Diodia teres* Walt. *MB* 5344, Stockton Pass, 5800'; *M* 5779, Tripp Canyon, 4400'.
†*Galium aparine* L.
**Galium asperrimum* Gray. *Kearney & Peebles* 9898, Mt Graham, 9500'; *Darrow s.n.*, Shannon Camp, Pinaleno Mtns, 8700'; *Darrow et al.* 1085, Marijilda Canyon, 8500'.
Galium fendleri Gray.
**Galium microphyllum* Gray. *Shreve* 4444, Grant Cañon, 5000'; *Humphrey et al.* 703, Wet Canyon, 6200'; *MF* 5212, Gillespie Wash, 4300'.
Galium pilosum Ait.
Galium triflorum Michx.
**Galium wrightii* Gray var. *wrightii*. *Duncan & Hope* 10001, Mt Graham, 8500'; *Kearney & Peebles* 14121, above Turkey Flat, 8300'; *Niering & Whittaker s.n.*, above road, 9000'.
**Galium wrightii* Gray var. *rothrockii* (Gray) Ehrendorfer. *Thornber & Shreve* 8050, Graham Mtns; *Peebles* 14528, Noon Creek, 5182'; *M* 5810, West Peak, 8650'.
Hedyotis pygmaea R. & S.

Rutaceae

- Ptelea trifoliata* L. ssp. *angustifolia* (Benth.) V. L. Bailey.

Salicaceae

- Populus fremontii* Wats. ssp. *fremontii*.
Populus tremuloides Michx.
Salix bebbiana Sarg.
**Salix exigua* Nutt. *Goodding s.n.*, Pass in Graham Mtns; *McManus & McLaughlin* 322, Frye Canyon; *MB* 5359, Stockton Pass, 4300'.
Salix gooddingii Ball.
**Salix scouleriana* Barratt. *Shreve* 5258, Riggs Flat, Graham Mtns, 8000'; *Anderson et al.* 698, near Heliograph Tower, 9200'; *Kearney & Peebles* 14156, High Peak Trail, 10000'.

Santalaceae

- Comandra umbellata* (L.) Nutt. ssp. *pallida* (A. DC.) Piehl.

Sapindaceae

- Sapindus saponaria* L. var. *drummondii* (H. & A.) Benson.

Saxifragaceae

- Fendlera rupicola* Gray.

**Fendlerella utahensis* (Wats.) Heller var. *cymosa* (Greene) Kearney & Peebles. *Thornber & Shreve* 7814, Graham Mtns, near sawmill; *Shreve* 4364, dry slopes, Frye Canyon, 5600'.

Heuchera glomerulata Rosendahl et al.

Heuchera versicolor Greene var. *versicolor*.

Jamesia americana Torr. & Gray.

Philadelphus microphyllus Gray.

Philadelphus occidentalis A. Nels.

Ribes pinetorum Greene.

Ribes wolfii Rothrock.

**Saxifraga eriophora* Wats. *MB* 6437, Round-the-Mountain Trail, 8600'.

Scrophulariaceae

**Castilleja austromontana* Standl. & Blumer. *Shreve* 5361, Riggs Flat, 8000'; *Kearney & Peebles* 9791, Mt Graham, 7500'; *Darrow s.n.*, Columbine CCC Camp, Mt Graham, 9000'.

**Castilleja integra* Gray. *Shreve* 4443, Grant Canyon; *Goodding* 4892, Graham Mtns; *MB* 5294, Stockton Pass, 5300'.

Castilleja lanata Gray.

Limosella aquatica L.

Linaria texana Scheele.

Maurandya antirrhiniflora Humb. & Bonpl.

**Mimetanthe pilosa* (Benth.) Greene [*Mimulus pilosus* (Benth.) Wats.]. *Maguire et al.* 11754, Frye Canyon, Graham Mtns.

Mimulus cardinalis Dougl. var. *cardinalis*.

**Mimulus floribundus* Dougl. *Eggleston* 19922, Stockton Pass, Crook Forest, 1500 m.

Mimulus guttatus DC. var. *guttatus*.

**Mimulus rubellus* Gray. *Anderson & Rhinehart* 950, above camp at Wet Canyon, 6035'; *Maguire et al.* 10573, Tripp Canyon, Graham Mtns.

Pedicularis grayi A. Nels.

**Penstemon barbatus* (Cav.) Roth. ssp. *barbatus*. *Darrow s.n.*, Ladybug Saddle, 8500'.

Penstemon barbatus (Cav.) Roth. ssp. *torreyi* (Benth.) Keck.

Penstemon deaveri Crosswhite.

**Penstemon linarioides* Gray ssp. *sileri* (Gray) Keck. *Thornber & Shreve* 7903, Graham Mtns; *MB* 5310, Stockton Pass, 5300'; *M* 5791, Tripp Canyon, 5100'.

Penstemon pseudospectabilis Jones ssp. *connatifolius* (A. Nels.) Keck.

**Penstemon ramosus* Crosswhite. *Maguire et al.* 11723, Frye Mesa, Graham Mtns.

**Penstemon subulatus* M. E. Jones. *Maguire et al.* 10564, Tripp Canyon, Graham Mtns; *MB* 5404, Tripp Canyon, 4200'.

Scrophularia parviflora Woot. & Standl.

†*Verbascum thapsus* L.

Veronica peregrina L. ssp. *xalapensis* (HBK) Pennell.

**Veronica serpyllifolia* L. *Shreve* 5253, Riggs Flat, 8800'; *Peebles et al.* 4498, Mt Graham; *M* 5582, Grant Creek, 8500'.

Solanaceae

**Chamaesaracha coronopus* (Dunal) Gray. *Kearney & Peebles* 14231, Frye Mesa escarpment, 3500'; *MF* 5196, Gillespie Wash, 4300'.

Datura meteloides DC.

**Lycium andersonii* Gray. *MF* 5192, Gillespie Wash, 4300'.

**Lycium exsertum* Gray. *MF* 5424, Tripp Canyon, 4200'.

Lycium pallidum Miers.

**Margaranthus solanaceus* Schlecht. *MB* 5360, Stockton Pass, 4300'.

**Nicotiana trigonophylla* Dunal. *Eggleston* 19900, Fry [sic] Creek, 1400 m; *Anderson & Rhinehart* 838, Frye Mesa, 4000'; *MF* 5080, Marijilda Canyon Rd, 3840'.

**Physalis fendleri* Gray. *MF* 5149, Marijilda Canyon, 4000; *MB* 5323, Stockton Pass, 5300'.

†*Salpichroa rhomboidea* (Gill. & Hook.) Miers. *MB* 5461, Tripp Canyon, 4460'.

**Solanum douglasii* Dunal. *Thornber & Shreve* 7859, Sawmill; *MB* 5355, Stockton Pass, 4300'; *M* 5764, Tripp Canyon, 4200'.

Solanum elaeagnifolium Cav.

**Solanum fendleri* Gray. *Buhrow* 173, Alder Spring, Pinaleno Mtns; *Buhrow* 174, Tripp Canyon road near Turkey Spring, 7600'.

Sterculiaceae

**Ayenia pusilla* L. *MF* 5084, Marijilda Canyon Rd, 3840'.

Ulmaceae

Celtis reticulata Torr.

Urticaceae

**Parietaria hespera* Hinton. MB 5431, Tripp Canyon, 4200'.

**Parietaria pensylvanica* Muhl. ex Willd. McManus & McLaughlin 568, N end of Pinaleno Mtns, 3700'.

Urtica dioica L. ssp. *gracilis* (W. Ait.) Selander var. *gracilis*.

Valerianaceae

Plectritis ciliosa (Greene) Jeps. ssp. *ciliosa*.

Valeriana arizonica Gray.

Valeriana edulis Nutt.

Verbenaceae

Aloysia wrightii (Gray) Heller.

Glandularia bipinnatifida (Nutt.) Nutt. var. *bipinnatifida*.

Violaceae

Viola canadensis L. var. *canadensis*.

Viola nephrophylla Greene var. *arizonica* (Greene) Kearney & Peebles.

Viscaceae

**Arceuthobium apachecum* Hawksworth & Wiens. Hawksworth & Lightle 1105, Hospital Flat, 9100'; Gill s.n., Treasure Park, on *Pinus flexilis*.

**Arceuthobium microcarpum* (Engelm.) Hawksworth & Wiens. Kearney & Peebles 9971, Mt Graham, 10000'; Kearney & Peebles 14135, near Hospital Flat, 9600'; Darrow et al. 1173, Webb Peak, Pinaleno Mtns.

Arceuthobium vaginatum (Willd.) Presl ssp. *cryptopodium* (Engelm.) Hawksworth & Wiens.

Phoradendron californicum Nutt.

Phoradendron capitellatum Torr. ex Trel.

Phoradendron villosum (Nutt.) Nutt. ssp. *coryae* (Trel.) Weins.

Vitaceae

Parthenocissus vitacea (Knerr) Hitchc.

Vitis arizonica Engelm. var. *arizonica*.

Zygophyllaceae

**Kallstroemia californica* (Wats.) Vail. MF 5139, Marijilda Canyon, 4000'.

Larrea divaricata Cav. ssp. *tridentata* (Sesse & Moc. ex DC.) Felger & Lowe.

MAGNOLIOPHYTA--LILIOPSIDA**Agavaceae**

**Agave palmeri* Engelm. Peebles et al. 4403, Mt Graham.

**Agave parryi* Engelm. Thornber & Shreve 7930, Graham Mtns, near sawmill.

Dasyllirion wheeleri Wats.

Nolina microcarpa Wats.

Yucca baccata Torr. var. *baccata*.

Yucca elata Engelm. var. *elata*.

Commelinaceae

Commelina dianthifolia Delile.

Tradescantia occidentalis (Britt.) Smyth.

Cyperaceae

**Carex abrupta* Mack. Bingham 2173, Lower Jacobson Canyon, 4000' [ASU].

**Carex agrostoides* Mack. Maguire et al. 11494, Marijilda Canyon, 4921'; Maguire et al. 11767, Frye Canyon, 6500'.

**Carex bella* Bailey. Shreve 5247, Riggs Flat, 8800'; Kearney & Peebles 9968, Mt Graham, 9500'; Smith 14335, Heliograph Peak, 9210'.

**Carex bonplandii* Kunth. Thornber & Shreve 7757, in slough near top; Kearney & Peebles 9966, Mt Graham, 9500'.

Carex chihuahuensis Mack.

**Carex festivella* Mack. Darrow s.n., Treasure Park; Van Devender et al. s.n., High Peaks Cienega, 10240'; M 5612, Highwater Cienega, 10000'.

**Carex foenea* Willd. Whittaker & Niering 431, High Peak Road, 9900'.

**Carex geophila* Mackenz. MB 5458, West Peak, 6900'; M 5549, Swift Trail, 8000'.

**Carex interior* Bailey. MB 6426, 6430, Hospital Flat, 9000'.

Carex lanuginosa Michx.

Carex lenticularis Michx. var. *lipocarpa* (Holm.) L. A. Standley.

**Carex meadii* Dewey. MB 6428, Hospital Flat, 9000'.

Carex occidentalis Bailey.

**Carex praegracilis* W. Boott. M 5541, Ladybug Saddle, 8500'; M 5548, Swift Trail, 8000'.

Carex stipata Muhl.

**Carex subfusca* W. Boott. Shreve 5223, Spring, West Peak, 7800'; Kearney & Peebles 9965, Mt Graham, 9500'; M 5541, Noon Creek, 5200'.

**Carex utriculata* F. Boott. Bingham 2172, Lower Jacobson Canyon, 4000' [ASU].

**Carex vallicola* Dewey var. *vallicola*. Pinkava & Lehto 6563, Riggs Flat Lake [ASU].

**Carex wootoni* Mack. Kearney & Peebles 9967, Mt Graham, 9500'; Darrow s.n., Shannon Camp, 8900'; McLaughlin et al. 1830, Snow Flat, 8750'.

**Cyperus accuminata* Torr. & Hook. M 5777, Tripp Canyon, 4450'.

**Cyperus aristatus* Rottb. MF 5151-A, Marijilda Canyon, 4000'; MF 5163, Marijilda Canyon, 4300'.

**Cyperus esculentus* L. MF 5164, Marijilda Canyon, 4300'; MB 5342, Stockton Pass, 5800'.

**Cyperus fendlerianus* Boeckl. Moeller 357, Columbine Ranger Station, 9200'; Darrow s.n., Shannon Camp, 8900'; Yatskievych & McCrary 84-78, Route 366, 7100'.

**Cyperus flavus* (Vahl) Nees. MB 5303, Stockton Pass, 5300'.

**Cyperus mutisii* (HBK.) Griseb. Kearney & Peebles 14160, Swift Trail, 6900'.

**Cyperus rusbyi* Britt. MB 5309, Stockton Pass, 5300'.

Eleocharis acicularis (L.) R. & S.

**Eleocharis macrostachya* Britt. MB 6521, Riggs Flat Lake.

Scirpus microcarpus Presl.

Iridaceae

Sisyrinchium longipes (Bickn.) Kearney & Peebles.

Juncaceae

Juncus effusus L. var. *exiguus* Fern. & Wieg.

**Juncus badius* Suksd. Van Devender et al. s.n., High Peaks Spring, 10240'.

**Juncus balticus* Willd. Humphrey & Karchner 781, Tripp Canyon, 6000'.

**Juncus bufonius* L. M 5494, Gillespie Wash, 4300'.

Juncus ensifolius Wikstr. var. *brunnescens* (Rydb.) Cronq.

Juncus ensifolius Wikstr. var. *montanus* (Engelm.) C. L. Hitchc.

**Juncus longistylis* Torr. Darrow s.n., Treasure Park, 8500'.

**Juncus marginatus* Rotsk. Darrow s.n., Noon Creek, 4500'; MF 5142, Marijilda Canyon, 4000'; M 5798, Tripp Canyon, 5400'.

**Juncus tenuis* Willd. var. *tenuis* s.l. MF 5140, Marijilda Canyon, 4000'; M 5492, Gillespie Wash, 4300'.

Luzula campestris (L.) DC. var. *multiflora* (Ehrh.) Celak.

Luzula parviflora (Ehrh.) Desr.

Liliaceae

Allium biseptum S. Wats. var. *palmeri* (S. Wats.) Cronq.

**Allium geyeri* Wats. Rondeau & Malusa 91-100, Webb Spring, 9500'.

Allium macropetalum Rydb.

Anthericum torreyi Baker.

Calochortus ambiguus (Jones) Ownbey.

Dichelostemma pulchellum (Salisb.) Heller var. *pulchellum*.

**Disporum trachycarpum* (Wats.) Benth. MB 6436, Round-the-Mountain Trail, 8600'.

Fritillaria atropurpurea Nutt.

Smilacina racemosa (L.) Desf.

Smilacina stellata (L.) Desf.

Veratrum californicum Durand.

Orchidaceae*Corallorhiza maculata* Raf.*Corallorhiza striata* Lindl.*Corallorhiza wisteriana* Conrad.**Goodyera oblongifolia* Raf. Shreve 4301, Inception Trail, 9500'; Darrow et al. 2491, Marijilda Canyon, 8300'; Barr & Welsh 62-523, below Shannon Camp, 8700'.**Malaxis soulei* L. O. Williams. Thornber & Shreve 8005, Graham Mtns, above sawmill; Niering & Whittaker 439, above Hospital Flat, 9000'; Yatskievych & Jenkins 80-570, Hospital Flat, 9250'.*Platanthera hyperborea* (L.) Lindley var. *hyperborea*.**Platanthera sparsiflora* (Wats.) Schlechter var. *sparsiflora*. Kessler 1225, Grant Creek, 9500'; Barr 61-225, Grant Creek, 8500'; Yatskievych & McCrary 84-87, Marijilda Canyon, 7250'.*Platanthera stricta* Lindley.**Spiranthes parasitica* A. Rich. & Gal. Niering & Whittaker s.n., beyond Webb Peak turnoff, 9400'; Niering & Whittaker s.n., beyond Hospital Flat, 9100'; Walker & Walker s.n., Post Creek, 9000'.**Spiranthes romanzoffiana* Cham. Shreve 5374, Riggs Flat, 8000'; Darrow et al. 2478, Marijilda Canyon, 8700'; Barr 61-223, Hospital Flats, 9000'.**Poaceae****Agropyron arizonicum* Scribn. & Sm. Moeller 209, 3 mi W of Ladybug Saddle; Barr 60-228, Shannon Camp, 9000'; Reeder & Reeder 7708, jct to Heliograph Lookout, 2650 m.†*Agropyron desertorum* (Fisch.) Schult. Goodding & Barney 68-61, Riggs Lake; Barr 61-231, Webb Peak burn, 10000'; Van Devender & Van Devender 86-167, Riggs Flat, 8800'.**Agropyron spicatum* (Pursh) Scribn. & Smith. Anderson et al. 1372, Grant Creek, 8600'.*Agropyron trachycaulum* (Link) Malte.**Agrostis exarata* Trin. Shreve 4340, Upper Frye Cañon, 10000'; Maguire et al. 11497, Marijilda Canyon, 4265'; MF 5173, Marijilda Canyon, 4300'.**Agrostis scabra* Willd. Darrow s.n., CCC camp near Columbine, 8500'; Barr et al. 63-458, above Shannon Camp, 9000'; Reichenbacher 171, Mt Graham summit, 10713'.†*Agrostis stolonifera* L. var. *stolonifera*.*Alopecurus aequalis* Sobol.**Alopecurus carolinianus* Walt. M 5493, Gillespie Wash.**Aristida adscensionis* L. Maguire et al. 10939, Frye Mesa, 4000'; Goodding 81-58, Stockton Pass; MF 5189, Stockton Pass, 4280'.**Aristida glabrata* (Vasey) Hitchc. MF 5188, Stockton Pass, 4280'.*Aristida hamulosa* Henr.**Aristida longiseta* Steud. Thornber & Shreve 7900, foothills; Moeller 213, 3 mi W of Lady Bug Saddle; MF 5178, Stockton Pass, 4280'.**Aristida orcuttiana* Vasey. Thornber & Shreve 7794, Graham Mtns, below sawmill; Moeller 190, Swift Trail 1 mi below Wet Canyon, 5500'.**Aristida purpurea* Nutt. Thornber & Shreve 7910, Graham Mtns; Moeller 98, Swift Trail, 4500'; MF 5085, Marijilda Canyon Rd, 3840 ft'.**Aristida ternipes* Cav. Shreve 4430, Grant Cañon; Kessler 495, Frye Mesa, 4800'; Moeller 190, Swift Trail, 5500 ft'.*Blepharoneuron tricholepis* (Torr.) Nash.*Bothriochloa barbinodis* (Lag.) Herter.**Bouteloua aristidoides* (HBK.) Grisb. MF 5097, Marijilda Canyon Rd, 3840 ft'; MB 5362, Stockton Pass, 4300'.**Bouteloua barbata* Lag. MF 5095, Marijilda Canyon Rd, 3840'.**Bouteloua chondrosioides* (HBK.) Benth. MF 5116, Marijilda Canyon Rd, 4100'.*Bouteloua curtipendula* (Michx.) Torr. var. *curtipendula*.**Bouteloua eriopoda* (Torr.) Torr. MB 5324, Stockton Pass, 5300'.**Bouteloua gracilis* (HBK.) Lag. ex Steud. Barr 60-233, Arcadia Forest Camp; Petryszyn s.n., Hwy 366, 7000'; MB 5315, Stockton Pass, 5300'.*Bouteloua hirsuta* Lag. var. *glandulosa* (Cerv.) Gould.**Bouteloua radicata* (Fourn.) Griffiths. Moeller 323, Stockton Pass; Reeder & Reeder 7764, Hwy 266 14.5 km W of Hwy 666, 1645 m.*Bouteloua rothrockii* (Vasey) Gould.**Brachiaria arizonica* (Scribn. & Merr.) S. T. Blake. MF 5106, Marijilda Canyon Rd, 4000'; M 5765, Tripp Canyon, 4200'.**Bromus anomalus* Rupr. ex Fourn. MB 5343-A, Stockton Pass, 5800'.**Bromus arizonicus* (Shear) Stebbins. M 5483, Gillespie Wash, 4300'.

Bromus carinatus Hook. & Arn. [incl. *B. marginatus* Nees ex Steud.].

**Bromus ciliatus* L. Barr 60-226, Swift Trail, 8000'; Williams & Williams 3641, Deadman Highland Trail, 9100'; Reeder & Reeder 7712, 8 km below Shannon Campground, 2740 m.

†*Bromus inermis* Leyss.

**Bromus richardsonii* Link. Kearney & Peebles 9915, Mt Graham, 9500'; Anderson et al. 720, Swift Trail, 8300'; Darrow s.n., Moonshine Canyon, 8900'.

†**Bromus rigidus* Roth. M 5546, Wet Canyon, 6000'.

†*Bromus rubens* L.

Calamagrostis canadensis (Michx.) Beauv.

**Cenchrus incertus* M. A. Curtis. MF 5217, Gillespie Wash, 4300'.

**Chloris virgata* Swartz. MF 5158, Marijilda Canyon, 4300'.

**Cottea pappophoroides* Kunth. MF 5156, Marijilda Canyon, 4300'.

†**Cynodon dactylon* (L.) Pers. MF 5112, Marijilda Canyon Rd, 4100'.

†*Dactylis glomerata* L.

**Danthonia californica* Boland. Moeller 348, Columbine Ranger Station, 9200'; Darrow s.n., Treasure Park, 8700'.

**Deschampsia caespitosa* (L.) Beauv. Darrow s.n., Treasure Park, 8700 ft, M 5613, Highwater Cienega, 10000'.

Deschampsia elongata (Hook.) Munro.

†**Digitaria sanguinalis* (L.) Scop. Moeller 107, Swift Trail above Cyclone Hill; Reeder & Reeder 7765, Hwy 266, 1645 m; MF 5143, Marijilda Canyon, 4000'.

Diplachne dubia (Kunth) Scribn.

†*Echinochloa colonum* (L.) Link.

†**Echinochloa crusgalli* (L.) Beauv. var. *crusgalli*. Moeller & Richardson 132, Marijilda Canyon; Kessler 511, Marijilda Creek, 4000'.

**Elymus canadensis* L. Moeller 114, Swift Trail 2 mi above Cyclone Hill; Darrow s.n., Noon Creek, 4500'.

Elymus glaucus Buckl.

Enneapogon desvauxii Beauv.

†**Eragrostis cilianensis* (All.) Link. Shreve 4427, Grant Cañon, 5000'; MF 5111, Marijilda Canyon Rd, 4100'.

Eragrostis intermedia Hitchc.

†**Eragrostis lehmanniana* Nees. MF 5090, Marijilda Canyon Rd, 3840'.

**Eragrostis mexicana* (Hornem.) Link. Peebles 14535, Swift Trail, 5500'; Darrow s.n., above Ladybug Saddle, 8500'; Darrow et al. 1184, Wet Canyon, 5800'.

**Eragrostis pectinacea* (Michx.) Nees. M 70, Marijilda Canyon, 4200'.

**Eriochloa acuminata* (Presl) Kunth. Nelson et al. 1406, Columbine Camp Grounds, 9200'; MF 5141, Marijilda Canyon, 4000'.

**Erioneuron pulchellum* (HBK.) Tateoka. MF 5107, Marijilda Canyon Rd, 4000'.

Festuca arizonica Vasey.

**Festuca sororia* Piper. Shreve 4334, Upper Frye Cañon, 9000'; McLaughlin et al. 1835, Snow Flat, 8750'; Reichenbacher 173, Mt Graham summit, 10713'.

Glyceria elata (Nash) Hitchc.

**Glyceria striata* (Lam.) A. S. Hitchc. Yatskievych 80-249, Marijilda Canyon, 8200'; Van Devender & Van Devender 84-275, Wet Canyon, 6000'; Van Devender & Van Devender 86-170, Riggs Flat, 8800'.

Heteropogon contortus (L.) Beauv.

Hierochloa odorata (L.) Beauv.

Hilaria belangeri (Steud.) Nash.

Hilaria mutica (Buckl.) Benth.

†*Holcus lanatus* L.

†**Hordeum murinum* (L.) ssp. *glaucum* (Steud.) Tzvel. MB 5426, Tripp Canyon, 4200'.

Koeleria nitida Nutt.

Lycurus setosus HBK. [*L. phleiodes* HBK. sensu Lehr (1978)].

**Melica porteri* Scribn. Shreve 4325, Upper Frye Cañon, 8100'; Anderson et al. 1376, Grant Creek, 8600'; Darrow s.n., above Wet Canyon, 6000'.

**Muhlenbergia andina* (Nutt.) Hitchc. Darrow et al. 1132, Treasure Park, 8500'.

**Muhlenbergia appressa* C. Goodding. Maguire et al. 10553, Marijilda Canyon, 4900'; Anderson et al. 685, Swift Trail, 5000'; Holmgren & Holmgren 7051, Hwy 366 7.1 mi SW of 666, 5200'.

**Muhlenbergia emersleyi* Vasey. Moeller 186, Swift Trail; MF 5125, Marijilda Canyon Rd, 4000'; MB 5304, Stockton Pass, 5300'.

**Muhlenbergia fragilis* Swallen. Kessler 497, Frye Mesa, 5000'; MF 5128, Marijilda Canyon Rd, 4000'; MB 5333, Stockton Pass, 5800'.

Muhlenbergia longiligula Hitchc.

Muhlenbergia montana (Nutt.) Hitchc.

**Muhlenbergia monticola* Buckl. Maguire et al. 12100, Swift Trail, 6500'.

**Muhlenbergia pauciflora* Buckl. Thornber & Shreve 7793, Graham Mtns; Thornber & Shreve 8034, Graham Mtns; Shreve 4366, Frye Cañon, 5600'.

**Muhlenbergia porteri* Scribn. Anderson & Rhinehart 432, Frye Canyon; MF 5087, Marijilda Canyon Rd, 3840'.

Muhlenbergia virescens (HBK) Kunth.

**Muhlenbergia wolfii* (Vasey) Rydb. Shreve 4314, Jesus Canyon Trail, 9900'; Darrow et al. 1118, Shannon Camp, 8700'; M 5811, West Peak, 8650'.

Panicum bulbosum HBK.

**Panicum capillare* L. Moeller & Richardson 131, Marijilda Canyon; MF 5138, Marijilda Canyon, 4000'.

**Panicum hirticaule* Presl. MF 5168, Marijilda Canyon, 4300'.

**Panicum obtusum* HBK. MF 5111, Marijilda Canyon Rd, 4100'; MB 5314, Stockton Pass, 5300'.

**Panicum oligosanthos* Schult. var. *scribnerianum* (Nash) Fernald. Maguire et al. 11752, Frye Canyon, 4265'; Darrow s.n., Noon Creek, 4500'; M 5538, Noon Creek, 5200'.

†*Paspalum dilatatum* Poir. MF 5132, Marijilda Canyon, 4000'.

†*Phleum pratense* L.

**Piptochaetium fimbriatum* (HBK.) Hitchc. Shreve 4436, Grant Canyon; MB 5329, Stockton Pass, 5800'.

†*Poa annua* L.

**Poa bigelovii* Vasey & Scribn. Goodding 84-59, Stockton Pass; MB 5428, Tripp Canyon, 4200'.

†*Poa compressa* L. Peebles et al. 4416, Mt Graham; Moeller 352, vicinity Columbine Ranger Station.

Poa fendleriana (Steud.) Vasey var. *fendleriana*.

**Poa fendleriana* (Steud.) Vasey var. *longiligula* (Scribn. & Will.) Gould. MB 5446, Tripp Canyon, 4200'.

†*Poa palustris* L. Peebles et al. 4413, Mt Graham.

†*Poa pratensis* L. Kearney et al. 14131, Hospital Flat, 9000'; Darrow s.n., Treasure Park, 8700'; Van Devender & Van Devender 84-278, Shannon Camp, 9000'.

†*Polypogon monspeliensis* (L.) Desf. Thornber & Shreve 7839, Sawmill; Maguire et al. 11498, Marijilda Canyon, 4265'; MB 5354, Stockton Pass, 4300'.

**Schizachyrium cirratum* (Hack.) Woot. & Standl. Shreve 4400, Goudy Canyon, 6250'; Anderson & Rhinehart 1332, Tripp Canyon, 4600'; MB 5291, Stockton Pass, 5300'.

**Schizachyrium hirtiflorum* Nees. MB 5300, Stockton Pass, 5300'.

**Setaria grisebachii* Fourn. Thornber & Shreve 7792, Sawmill; Anderson & Rhinehart 1331, Tripp Canyon, 4600'; MF 5186, Stockton Pass, 4280'.

Setaria macrostachya HBK.

Sitanion hystrix (Nutt.) J. G. Smith var. *hystrix*.

**Sphenopholis obtusata* (Michx.) Scribn. Maguire et al. 11771, Frye Canyon, 4265'; M 5495-A, Gillespie Wash, 4300'.

**Sporobolus airoides* Torr. MF 5190, Stockton Pass, 4280'.

**Sporobolus contractus* Hitchc. Anderson & Rhinehart 566, Stockton Pass; MF 5083, Marijilda Canyon Rd, 3840'.

**Sporobolus cryptandrus* (Torr.) Gray. Anderson & Rhinehart 429, Frye Canyon.

Stipa pringlei Scribn.

**Trachypogon secundus* (Presl) Scribn. Moeller 138, Marijilda Canyon, 5000'; MB 5305, Stockton Pass, 5300'.

Trichachne californica (Benth.) Chase.

†*Tragus berteronianus* Schultes. Shreve 4421, Jesus Canyon bajada, Pinaleno Mtns; Kessler 496, Frye Mesa, 5000'.

**Trisetum montanum* Vasey. Kearney & Peebles 9970, Mt Graham, 9500'; Anderson et al. 1374, Grant Creek, 8600'; Niering & Whittaker 417, Mt Graham summit, 10700'.

**Vulpia microstachys* (Nutt.) Benth. var. *pauciflora* (Scribn.) Lonard & Gould. MB 5407, Tripp Canyon, 4200'.

Vulpia octoflora (Walt.) Rydb. var. *octoflora*.

Potamogetonaceae

Potamogeton pusillus L. var. *pusillus*.

EXCLUDED SPECIES

The following taxa cited in Johnson (1988) are based on incorrectly identified specimens or (in one case) from a specimen collected from outside of the Pinaleno Mountains. These taxa have not been documented from the Pinalenos by collections other than those cited in Johnson; they therefore are excluded from the flora of the Pinalenos at this time. The specimens cited in Johnson are either at ASU of the BLM Office in Safford; they have been examined and annotated either by myself or by other workers.

MAGNOLIOPSIDA

Apiaceae	<i>Cicuta douglasii</i> (DC.) Coult. & Rose; <i>Conium maculatum</i> L.
Asteraceae	<i>Erigeron flagellaris</i> Gray; <i>Cirsium calcareum</i> (M. E. Jones) Woot. & Standl.; <i>Viguiera longifolia</i> (Robins. & Greenm.) Blake; <i>Wyethia arizonica</i> Gray.
Boraginaceae	<i>Lithospermum cobrense</i> Greene.
Caryophyllaceae	<i>Pseudostellaria jamesiana</i> (Torr.) Weber & Hartmann.
Ericaceae	<i>Monotropa latisquama</i> (Rydb.) Hulten.
Fabaceae	<i>Lotus utahensis</i> Ottley.
Gentianaceae	<i>Gentianella amarella</i> (L.) Borner ssp. <i>heterosepala</i> (Engelm.) J. M. Gillet.
Lamiaceae	<i>Salvia amissa</i> Epling.
Malvaceae	<i>Sphaeralcea rusbyi</i> Gray var. <i>gilensis</i> Kearney.
Nyctaginaceae	<i>Mirabilis oxybaphoides</i> Gray.
Oleaceae	<i>Menodora scabra</i> Gray.
Polygonaceae	<i>Rumex altissimus</i> Wood.
Ranunculaceae	<i>Clematis drummondii</i> Torr. & Gray.
Rosaceae	<i>Potentilla pulcherrima</i> Lehm.
Saxifragaceae	<i>Ribes inebrians</i> Lindl.
Scrophulariaceae	<i>Castilleja cruenta</i> Standl.; <i>Mimulus nasutus</i> Greene.
Solanaceae	<i>Lycium californicum</i> Nutt.
Verbenaceae	<i>Glandularia gooddingii</i> (Briq.) Solbrig.

LILIOPSIDA

Agavaceae	<i>Agave chrysantha</i> Peebles; <i>Agave deserti</i> Engelm. ssp. <i>simplex</i> Gentry.
Cyperaceae	<i>Carex albo-nigra</i> Mack.; <i>Carex aquatilis</i> Wahl; <i>Carex scoparia</i> Schk.
Poaceae	<i>Agrostis idahoensis</i> Nash; <i>Glyceria grandis</i> Wats.; <i>Muhlenbergia microsperma</i> (DC.) Kunth; <i>Poa interior</i> Rydb.; <i>Poa nevadensis</i> Vasey.