

A checklist of the vascular flora of Aztec Ruins National Monument, San Juan County, New Mexico¹

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RINK, G. (Northern Arizona University, Flagstaff, AZ 86001) AND A. CULLY (National Park Service Southern Colorado Plateau Network, Northern Arizona University, Flagstaff, AZ 86011). A checklist of the vascular flora of Aztec Ruins National Monument, San Juan County, New Mexico. *J. Torrey Bot. Soc.* 135: 571–584. 2008.—Three hundred and forty eight vascular plant taxa were documented for Aztec Ruins National Monument, San Juan County, New Mexico. These include 13 new records for San Juan County, New Mexico. New records for Aztec Ruins National Monument include *Sclerocactus cloveriae* K. Heil subspecies *cloveriae*. This work was part of a biological inventory throughout the National Park Service as part of the Natural Resource Challenge, a legislative and administrative mandate.

Key words: Aztec Ruins, biological inventory, flora, New Mexico, rare plants, San Juan County.

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Aztec Ruins National Monument (AZRU) is located in San Juan County in northwestern New Mexico in the Animas River Valley (Fig. 1). The monument was established in 1923 to preserve structures and artifacts of ancestral Pueblo people dating from the late (A.D.) 1000s to the late 1200s. These people were strongly influenced by Chaco Canyon culture to the south. They persisted during times of drought and cultural change through the (A. D.) 1200s (Nichols 2003, Thybony 1992). Aztec Ruins was designated a World Heritage Site in 1987 (NPS 2007a).

The inventory reported here includes a total of 130 ha (318 ac), though the monument presently administers just 104 ha. The study area falls within latitudes 36° 49' 40" and 36° 50' 35" N and longitudes 107° 59' 30" and 108° 00' 37" W. The area lies within sections 4, 5, and 9 of Township 30 North, Range 11 West. United States Geological Survey 7-½ minute topographic quadrangles Flora Vista and Aztec cover the study area, which ranges in elevation from 1,707 m to 1,768 m (Fig. 2).

The population of San Juan County was 113,801 in 2000 and 126,473 in 2006; 8.9 people per square km in 2006 (U. S. Census

ative agreement with the Cooperative Ecosystem Studies Unit, NAU. Tina Ayers of NAU administered the funds for the later phase of the project. This research was conducted under research permit number AZRU-2006-SCI-0002.

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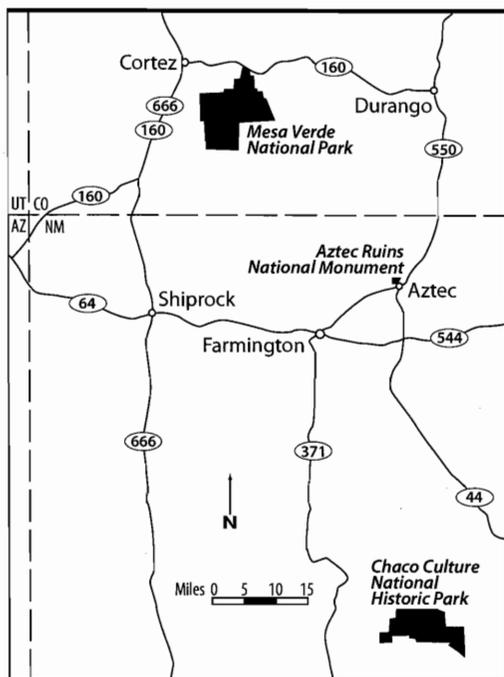


FIG. 1. The regional context of Aztec Ruins National Monument.

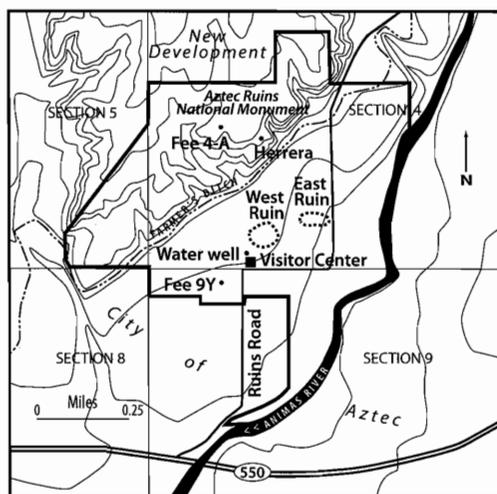


FIG. 2. Aztec Ruins National Monument.

Bureau 2007a). The population of the town of Aztec, New Mexico was 6,378 in 2000; 7,056 in 2006 (U. S. Census Bureau 2007b). Visitation to Aztec Ruins has fluctuated over the years, averaging 64,960 visitors per year from 1987 to 2006 (NPS 2007b).

Aztec Ruins National Monument is underlain by the Paleocene Nacimiento Formation, composed of gray, olive-green, and purple shales which grade upward into gray-white to yellow sandstones (Brown and Stone 1979, Christensen 1979, Ward 1990). The Nacimiento is exposed on the edges of the terraces in the northern part of the monument.

Gillam (1998) studied the Cenozoic history of the lower Animas River Valley and described three terraces of the Animas River that make up the surface of AZRU. Gillam's mapping unit *t7u* includes two related terraces that are distinct but close in elevation at AZRU, a lower one, which borders the Animas River, and an upper one on which the East and West Ruins were built. The lower *t7u* terrace, which borders the Animas River, is not of great areal extent at AZRU, but contains important riparian diversity. The upper *t7u* terrace, where the East and West Ruins were built, is the terrace of greatest

human disturbance, supporting the greatest diversity of invasive plants. The least disturbed part of the monument can be seen on the uppermost terraces *t6a* and *t5a*, to the north of the Visitor Center. The Farmer's Ditch bisects AZRU at the base of the uppermost terraces. The canal was built in 1892 for irrigation in the Farmington area and it continues to supply most of Farmington's water needs (Paul Montoya, Farmington Water Resource Specialist, pers. comm.). Each terrace at AZRU is covered with several kinds of unconsolidated deposits including (from bottom to top) outwash from the Animas Glacier in the San Juan Mountains to the north (mostly sandy gravels, locally overlain by thinner sandy to clayey layers), alluvium deposited by local streams (mostly fine-grained, but gravelly in places), and loess (Gillam 1998). The Animas Glacier expanded during Pleistocene glacial stages, and the deposits at AZRU range in age from the middle Pleistocene to Holocene.

Christensen's (1979) hydrology work at AZRU supplied the following information. The log for the AZRU water well (used as the AZRU water source from 1931 to 1958) shows an upper 3.05 m thick alluvial layer of silt and clay underlain by 20.42 m of sand and gravel. This upper layer of silt and clay acts as an aquitard, preventing water in the underlying sand and gravel from rising to the surface. Soil above the alluvium is perhaps no thicker than 152 cm and consists of weakly stratified yellowish-brown clay loams, silty clay loams

and loams. This water well penetrated two ft of the Nacimiento Formation.

Much of the Four Corners Region has a bimodal, winter/summer precipitation pattern, with the winter precipitation being a more reliable source of moisture than summer. In contrast, at AZRU, each of the months of July, August, and September, on average, enjoy about twice the precipitation of any other months. The average annual precipitation at AZRU was 25.27 cm for the period of record 1914–2005 (WRCC 2007). Minimum temperatures for the period of record ranged from near -10°C in the winter to the mid 30°C in the summer. Aztec Ruins has an average frost-free period of 144 days (WRCC 2007).

Precipitation during 2000, 2001, and 2002, relevant to the first period of field work, was below average; 21.64 cm, 21.69 cm, and 19.48 cm, respectively. Precipitation during 2005, 2006, and 2007, relevant to the second period of field work, varied. A particularly wet winter during 2005 resulted in 30.48 cm total precipitation. Below average precipitation in 2006, 19.1 cm, contrasted with the above average precipitation of 2007, which had 23.67 cm by the end of September. Much of the 2007 precipitation came during the winter (NPS 2005, 2006, 2007c).

Upland vegetation at AZRU is characteristic of Great Basin shrub-steppe dominated by Utah juniper (*Juniperus osteosperma* (Torr.) Little), saltbrush (*Atriplex canescens* (Pursh) Nutt.), big sage (*Artemisia tridentata* Nutt.), and galleta grass (*Pleuraphis jamesii* Torr.). Gullies within the upland terraces provide the greatest diversity of native vegetation within the monument. Lowland vegetation consists largely of herbaceous invasive species. Areas of the East Ruin are less-disturbed, and are covered with saltbrush, greasewood (*Sarcobatus vermiculatus* (Hook.) Torr.), and seepweed (*Suaeda moquinii* (Torr.) Greene). Riparian areas along the Animas River and the Farmer's Ditch are dominated by tamarisk (*Tamarix chinensis* Lour.), coyote willow (*Salix exigua* Nutt.), and Fremont cottonwood (*Populus fremontii* S. Wats.). Of the non-native plants, which make up a significant component of the vegetation throughout, some are invasive, weedy species, and others were introduced for agricultural or landscape purposes (Salas et al. 2007).

As KellerLynn (2007) has noted, "Human activities have modified, impacted, or affected

nearly every square foot of the national monument, from ancestral Puebloan through historic time and into the present. These activities include grazing, crop production, irrigation, orchards and their care, habitation, ceremonial use, tourist businesses, park operations, raising livestock, hunting and fishing, archaeological exploration and mitigation, road and fence building, and installation of utilities." Residential development, natural gas development, an elevated water table, and road reclamation also impact AZRU. The upper *7tu* terrace has suffered the greatest level of disturbance, since it was farmed for field crops and tree fruit since the late 1870s (and probably in prehistoric times). Though the old fields and orchards are no longer cultivated or maintained, they are inhabited almost exclusively by invasive plants. Several ruin mounds dot the upper terraces (*t6a* and *t5a*), which are less-disturbed, at least in historical times. Lateral ditches from the Farmer's Ditch supply water to the orchard and riparian areas to the north and west of the visitor center. Seepage from the canal has caused an elevated water table that is a cryptic impact of human activity on vegetation at AZRU (Fillippone et al. 2007). Sometime in the 1940s or 1950s, a 438 m drain pipe was buried from 2.1 to 6.4 m beneath ground level across the northern edge of the West Ruins and between the East Ruins and Earl Morris Ruins to reduce possible negative impacts of this seepage on the ruins (Christensen 1979).

Three active natural gas wells (one west of the visitor center (Fee 9Y) and the other two on the upper terraces (Fee 4A and Bobbie Herrera #1) (Fig. 2)) are permitted within the monument and will likely produce gas for 50 years or more (KellerLynn 2007). Two of these wells were drilled in the early 1980s, and with their maintenance roads, have direct impacts on 1.0 ha of the monument (NPS 2004). KellerLynn (2007) noted that "In addition, the monument contains two active gathering pipelines, maintained by Enterprise Products, and two abandoned wells." Private mineral ownership for all but the original 11 ha of the monument means that undeveloped oil and gas resources could be tapped by future drilling (KellerLynn 2007). According to O'Dell (2001, as cited in KellerLynn 2007), existing well operations account for localized and relatively minor impacts to natural resources;

vegetation and soils appear to be the most impacted natural resources.

During April through September, 1935, the Civilian Conservation Corps graded, graveled, and landscaped the rear patio behind the administration building; reworked old farm fields and replanted them with native trees and shrubs; and constructed a 53.4 m long adobe wall from 0.9 to 2.7 m. high around the residential area. In 1961, the pond in the patio was filled and converted into a patch of lawn (Lister and Lister 1990).

The monument is bordered by residences to the south, and by farms and the perennial Animas River that runs for 1.7 km on the east. The National Park Service (2004) reported that "A 400–600 unit residential development is proposed for the mesa immediately north of the park, with associated grading, drainage modification, road construction, and subsurface utility lines. Initial construction on the development has begun. Additional residential development within the City of Aztec north and west of the park is likely." Ruins Road, a major Aztec artery, runs through and along the east border of AZRU. This road, the canal, and other roads and development in the area act as major conduits for the arrival of exotic species. Future development surrounding the monument will increase the risk of encroachment from invading plant species and the risk of flood events through increased runoff during storm events (KellerLynn 2007). The National Park Service occupies at least seven buildings on the property. Each has been landscaped with both native and non-native plants. National Park Service employees routinely mow portions of the monument to lower the height of weedy species and reduce the fire hazard. The Fire Management Plan for AZRU (NPS 2005) calls for brush removal in the East Ruin and an area north of the East Ruin, a project that was implemented during 2007 (Theresa Nichols, Chief Ranger, email correspondence).

Ida Clark collected plants at AZRU in the 1950s. Her specimens were stored in the basement at the Visitor Center, but are now missing (Nichols, AZRU Chief Ranger, pers. comm.). Ecosphere Environmental Services, Inc. (1996) surveyed for sensitive, threatened, and endangered species in a 1.61 ha portion of Aztec Ruins National Monument on July 15, 1996. Heil and O'Kane (2003) made a checklist of the vascular plants of San Juan County, as

part of their work on the larger, regional San Juan River basin flora. Salas et al. (2007) reported 14 National Vegetation Classification plant associations at AZRU.

We designed this project as one piece of a biological inventory throughout the National Park Service called the Natural Resource Challenge, a legislative and administrative mandate (<http://www.nature.nps.gov/challenge/challengedoc/>). The goals of the project were based on the Southern Colorado Plateau Network plan for biological inventory (Stuart 2000). These goals were to document through existing, verifiable data and targeted field investigations, the occurrence of at least 90% of the species of vascular plants estimated to occur in AZRU, and to describe the distribution and relative abundance of species of special concern, such as threatened and endangered species, exotics, and other species of special management interest.

Methods. The inventory plan for AZRU involved 1) a review of previous work and herbaria specimens, and 2) a complete survey within existing AZRU boundaries.

National Park Service researchers, A. Cully, R. Taylor, J. Adams, H. Nelson, and J. Paige visited AZRU on May 29 and 30, and August 8 and 21, 2001. A. Cully, J. Adams, and H. Nelson revisited the area June 10 and 11, and August 8, 14, and 15 in 2002 (Cully 2002). Northern Arizona University botanist, G. Rink, invested 100 field hours seeking additional plant records during August 25–27, and Oct. 4 and 5 of 2006, and May 5–7, 25–26, June 28, and August 4 of 2007.

Flora of New Mexico (Martin and Hutchins 2001) was the primary source used for determinations, along with the reference collections at ASC and UNM. Other manuals consulted include *Manual of the Plants of Colorado* (Harrington 1954), *Flora of New Mexico* (Wootton and Standley 1915), *Intermountain Flora* (Cronquist 1994, Cronquist et al. 1977, 1984, 1994, 1997, and Holmgren et al. 2005), *Flora of North America*, Volumes 2, 3, 4, 5, 19, 20, 21, 22, 23, 24, and 25 (1993–2007), *Seed Plants of Northern Arizona* (McDougall 1973), *Utah Flora* (Welsh et al. 1993), and *Colorado Flora, Western Slope* (Weber and Wittman 1996). The determination of specific groups of plants was aided by *Manual of the Grasses of the United States* (Hitchcock 1935), *Grasses of the Southwestern United States*

(Gould 1951), *Fabales*, as Volume 3B of the *Intermountain Flora* (Barneby 1989), *Atlas of North American Astragalus* (Barneby 1964) and *The Cruciferae of Continental North America* (Rollins 1993). The identification of cultivated plants was aided by the *Manual of Cultivated Plants* (Bailey 1949) and the *Manual of Cultivated Trees and Shrubs* (Rehder 1987). Some specimens were determined by H. D. Hammond (ASC), and K. Heil (SJNM). S. O'Kane, of the University of Northern Iowa (ISTC), Andrew Salywon, of the Desert Botanical Garden (DES), and I. A. Al-Shehbaz, of the Missouri Botanical Garden (MO), provided *Brassicaceae* determinations. Robert Dorn supplied *Salix* determinations.

We followed the standards for floras as identified by Palmer et al. (1995), where appropriate. We used the abundance scale developed by Palmer et al. (1995) and followed the nomenclature of the Integrated Taxonomic Information System (ITIS 2007) or the US Department of Agriculture Plants Database (USDA 2007).

Results. A search of UNM yielded 20 plant collections from AZRU; neither New Mexico State University at Las Cruces (NMC) nor SJNM yielded any records. The 2001 and 2002 collecting trips resulted in 448 specimens. These were collected for determination; many were not suitable for use as vouchers. The 2006 and 2007 trips resulted in 533 plant specimens. Duplicates of these specimens are primarily curated at the University of New Mexico Herbarium, Albuquerque, New Mexico (UNM), secondarily at the Deaver Herbarium, NAU, Flagstaff, Arizona (ASC), and also at San Juan College Herbarium, Farmington, New Mexico (SJNM). These collections are curated as National Park Service Accession AZRU-327. Vouchered specimens in the checklist include 57 families, 213 genera, 344 species, two subspecies, one variety, and one hybrid. Of the non-horticultural records, 13 are new records for San Juan County (Heil and O'Kane 2003, INRAM 2007) and are in bold font in the annotated checklist. One hundred and seven (31%) of the vouchered taxa were introduced, 34 as horticultural introductions. After discounting horticultural introductions, 23% of the vouchered taxa are exotic, the highest percentage for any park in the region known by the authors (Rink 2003).

Thirty three taxa found during the 2001 and 2002 effort were not found during the 2006 and 2007 effort. We assume that at least this many more taxa remain to be found at AZRU, and thus, estimate that the checklist is now 85% complete.

We found *Sclerocactus cloveriae* subsp. *cloveriae* Heil & Porter, a recently described species that is nearly endemic to New Mexico, on the upper terraces. *Penstemon breviculus* (Keck) Nisbet & R.C. Jackson (shortstem beardtongue), considered for New Mexico Natural Heritage Program tracking, was reported for AZRU, based on incorrectly determined specimens from the 2001/2002 field work. Rink reviewed these specimens and annotated them to *Penstemon ophianthus* Pennell.

Other species tracked by the New Mexico Natural Heritage Program known for San Juan County (NMRPTC 1999) that may one day be found at AZRU are listed in Appendix A. Natureserve (2007) compiles tracking lists "to define the set of Elements that are of sufficient conservation concern to warrant the accumulation and maintenance of detailed locational and status data on some or all occurrences. Element Occurrences tracked by Natural Heritage Programs and Conservation Data Centers serve as the foundation for environmental review, conservation planning, and conservation action, including land management."

Recommendations. We recommend that when reclamation efforts are planned at AZRU (i.e., gas wells are ready to be plugged and the areas reclaimed), that AZRU staff consult with qualified reclamation botanists to assure that appropriate reclamation approaches and locally-derived seed sources are used. Horticulturalists are not a reliable source for this information. Considering the narrow endemism of *Sclerocactus cloveriae* subsp. *cloveriae*, future park development of the upper terraces should avoid disturbing areas where the *Sclerocactus* grow. Future plant surveys should focus on attempting to find the species listed in Appendix A.

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Appendix A

Ten taxa that are tracked by the New Mexico Natural Heritage Program are known to occur in San Juan County and could be found at AZRU. Taxa noted with an asterisk are the most likely of these to be found at AZRU (NMRPTC 1999). Key: Species name; authority; common name; Federal status; Global Rank: priority ranking (1 to 5) based on the number of occurrences throughout the entire range of the element, G1 = very rare: 1 to 5 occurrences or very few individuals or acres, G2 = rare: 6 to 20 occurrences or few individuals or acres, G3 = uncommon or restricted: 21 to 100 occurrences, rather rare throughout a fairly wide range, or fairly common in a rather restricted range, G4 = apparently secure: more than 100 occurrences, though it could be quite rare in some parts of its range, G5 = demonstrably secure: more than 100 occurrences, G#T# = subspecies: numeric designations based on same criteria as those for global ranks, G#? = uncertain: insufficient information to give a definitive ranking, confidence of numeric rank is plus or minus one rank; State Status, SoC = Species of Concern, E = Endangered; SRank: priority ranking (1 to 5) based on the number of occurrences of an element within the state, S1 = very rare: 1 to 5 occurrences in the state or very few individuals or acres within the state, S2 = rare: 6 to 20 occurrences in the state or few individuals or acres within the state, S3 = uncommon or restricted: 21 to 50 occurrences in the state, either rather rare throughout a fairly wide range, or fairly common in a rather restricted range within the State; element occurrences; notes.

**Aliciella formosa* (Greene ex Brand) J.M. Porter, Aztec gilia, none, G2, E, S2, 148, grows on the Nacimiento Formation close to Aztec. *Astragalus humillimus* Gray, Mancos milkvetch, Listed Endangered, G1, E, S1, 14. *Astragalus micromerius* Barneby, Chaco milkvetch, none, G2G3, SoC, S2S3, 1. *Astragalus naturitensis* Payson, Naturita milkvetch, none, G2G3, SoC, S2, 2. **Astragalus oocalycis* M.E. Jones, Arboles milkvetch, none, G4, SoC, S3, 9, first collected near Aztec. *Pediocactus knowltonii* L. Benson, knowlton cactus, Listed Endangered, G1, E, S1, 3. *Proatriplex pleiantha* (W.A. Weber) Stutz & Chu, Mancos shadscale, none, G3, SoC, S3?, 14. *Puccinellia parishii* A.S. Hitchc., bog alkaligrass, none, G2, E, S1, 1. **Sclerocactus cloveriae* subsp. *brackii* Heil and Porter, Brack's hardwall cactus, none, G3T1, E, S1, 7, grows on Nacimiento Formation close to Aztec. *Sclerocactus mesae-verdae* (Boissevain ex Boissevain & C. Davids.) L. Benson, Mesa Verde fishhook cactus, Listed Endangered, G2, E, S2, 56.

Appendix B

Species reported but not vouchered.

Juniperus monosperma (Engelm.) Sarg., one seed juniper, cited in Stein and McKenna (1988). *Juniperus monosperma* is reported for San Juan County. *Koeleria macrantha* (Ledeb.) J.A. Schultes, junegrass, cited in Stein and McKenna (1988) as *K. cristata*. *Koeleria macrantha* is reported for San Juan County. *Leucanthemum vulgare* Lam., oxeye daisy, (NPS 2005) cited in fire mgmt plan as *Chrysanthemum leucanthemum*. *Leucanthemum vulgare* is reported for San Juan County. *Opuntia erinacea* Engelm. & Bigelow ex Engelm., Mohave pricklypear cactus, reported by Salas et al (2007). *Opuntia erinacea* is now considered to be a variety of *O. polyacantha* (Flora of North America Vol. 4). While *O. p.* var. *polyacantha* occurs at AZRU, *O. p.* var. *erinacea* apparently does not. *Opuntia erinacea* is reported for San Juan County. *Opuntia fragilis* Nutt., brittle cactus, (NPS 2005). *Opuntia fragilis* is reported for San Juan County. *Penstemon breviculus* (Keck) Nisbet & R.C. Jackson (shortstem beardtongue). These specimens have been annotated *Penstemon ophianthus* Pennell. *P. breviculus* was considered for the New Mexico Natural Heritage Program tracking list, and may still be found at AZRU.

Polygonum hydropiperoides Michx., swamp smartweed, (Ecosphere Environmental Services 1996), known for San Juan County according to Heil and O'Kane (2003), not known for San Juan County according to INRAM (2007). *Rorippa islandica* (Oeder) Borbas, northern marsh yellowcress, (Ecosphere Environmental Services 1996); not likely; only known from the Washington, D.C. area (USDA 2007).

Checklist of Vascular Plants of Aztec Ruins National Monument

Checklist is arranged alphabetically by family. Species name and authorities (ITIS 2007, NMRPTC 1999) are followed by collector (A = J. Adams, C = A. Cully, c = O. Clark (specimens at UNM), R = G. Rink, T = R. Taylor); collector number; nativity, N = native, E = exotic, H = horticultural introductions (ITIS, 2007); 1-5 abundance scale (Palmer et al. 1995). New records (according to Heil and O'Kane (2003) and INRAM (2007)) for San Juan County are in bold font.

Aceraceae

Acer glabrum var. *glabrum* Torr., Rocky Mountain maple, R5535, N, 2
Acer negundo L., box elder, R5883, N, 4
Acer saccharinum L., silver maple, R5880, H, 2

Agavaceae

Yucca angustissima Engelm. ex Trel, narrowleaf yucca, R5922, N, 2
Yucca baccata Torr., banana yucca, R5917, N, 3
Yucca elata (Engelm.) Engelm., soap tree yucca, R6329, H, 1

Amaranthaceae

Amaranthus albus L., white pigweed, R5493b, N, 2
Amaranthus blitoides S. Wats., prostate pigweed, R5493a, E, 1
Amaranthus hybridus L., smooth pigweed, R5458, N, 3

Amaranthus powellii S. Wats., Powell pigweed, R5459, N, 3

Anacardiaceae

Rhus trilobata Nutt., skunkbush, R4980, N, 3

Apiaceae

Cicuta maculata L., water hemlock, C89, N, 1

Cymopterus acaulis var. *fendleri* (Gray) Goodrich, Fendler spring parsley, R5856, N, 2

Cymopterus bulbosus A. Nels., bulbous spring parsley, R5865, N, 2

Cymopterus cf. *newberryi* (S. Wats.) M.E. Jones, sweetroot spring parsley, C327, N, 1

Apocynaceae

Apocynum L., dogbane, R5537, N, 2

Vinca minor L., common periwinkle, R5872, H, 1

Asclepiadaceae

Asclepias asperula (Dcne.) Woods., antelope horns, R5957, N, 2

Asclepias speciosa Torr., showy milkweed, R5013, N, 2

Asclepias subverticillata (Gray) Vail, horsetail milkweed, R5025, N, 2

Asteraceae

Achillea millefolium L., western yarrow, R6146, N, 2

Achillea tagetes Boiss. & Heldr., R5071, H, 1

Acroptilon repens (L.) DC., Russian knapweed, R5006, E, 4

Ambrosia acanthicarpa Hook., annual bursage, R4994, N, 3

Ambrosia confertiflora DC., ragweed, R5505, N, 2

Arctium minus Benth., burdock, R6314, E, 2

Artemisia campestris var. *scouleriana* (Hook.) Cronq., field sagewort, R5063, N, 2

Artemisia dracunculus L., false tarragon, R5041, N, 3

Artemisia filifolia Torr., sand sagebrush, R5005, N, 2

Artemisia ludoviciana subsp. *albula* (Woot.) Keck, white sagebrush, R6315, N, 2

Artemisia ludoviciana subsp. *ludoviciana* Nutt., Louisiana sagewort, T300, N, 2

Artemisia ludoviciana subsp. *mexicana* (Willd. ex Spreng.) Keck, Mexican sagewort, R5534, N, 3

Artemisia tridentata Nutt., big sage, R5474, N, 4

Bidens cernua L., bur marigold, R5491, N, 1

Bidens frondosa L., bur marigold, A532, N, 2

Brickellia oblongifolia Nutt., narrowleaf brickellbush, R5951, N, 3

Carduus nutans L., musk thistle, R4940, E, 4

Chaenactis stevioides Hook. & Arn., Steve's dustymaiden, R5958, N, 3

Chaetopappa ericoides (Torr.) Nesom, smallflower aster, R5821, N, 3

Chrysothamnus greenei (Gray) Greene, Greene's rabbitbrush, R5051, N, 3

Chrysothamnus linifolius Greene, spearleaf rabbitbrush, R4982, N, 3

Chrysothamnus viscidiflorus subsp. *viscidiflorus* (Hook.) Nutt., yellow rabbitbrush, R5476, N, 3

Cichorium intybus L., chicory, R5464, E, 3

Cirsium arvense (L.) Scop., Canada thistle, R4941, E, 3

Cirsium neomexicanum Gray, New Mexico thistle, R5973, N, 3

Cirsium vulgare (Savi) Ten., bull thistle, R5102, E, 2

Conyza canadensis (L.) Cronq., horseweed, R4952, N, 3

Ericameria nauseosa var. *glabrata* (Gray) Nesom & Baird, rubber rabbitbrush, R5475, N, 4

Erigeron concinnus (Hook. & Arn.) Torr. & Gray, Navajo daisy, R5848b, N, 3

Erigeron divergens Torr. & Gray, spreading fleabane, R5029, N, 3

Erigeron flagellaris Gray, trailing fleabane, R5996, N, 3

Euthamia occidentalis Nutt., R5092b, N, 3

Gaillardia pinnatifida Torr., blanketflower, R5819, N, 3

Grindelia nuda var. *aphanactis* (Rydb.) Nesom, curlytop gumweed, R4962, N, 2

Grindelia squarrosa var. *squarrosa* (Pursh) Dunal, gumweed, R4962, N, 3

Gutierrezia sarothrae (Pursh) Britt. & Rusby, snakeweed, R5093, N, 4

Helianthus annuus L., annual sunflower, R4989, N, 3

Heterotheca villosa (Pursh) Shinnery, hairy goldenaster, R5991, N, 3

Heterotheca villosa var. *foliosa* (Nutt.) Harms, hairy false goldenaster, R5494, N, 2

Hymenopappus filifolius var. *cinereus* (Rydb.) I.M. Johnston, fineleaf hymenopappus, R5946, N, 2

Lactuca serriola L., wild lettuce, R4955, E, 2

Machaeranthera canescens (Pursh) Gray, purple aster, R5540, N, 3

Machaeranthera parviflora Gray, small flower tansy aster, R6334, N, 2

Machaeranthera pinnatifida subsp. *pinnatifida* (Hook.) Shinnery, lacy tansyaster, R5948, N, 2

Machaeranthera tanacetifolia (Kunth) Nees, tansyleaf aster, R5539, N, 2

Onopordum acanthium L., Scotch thistle, R5900, E, 3

Packera multilobata (Torr. & Gray ex Gray) W.A. Weber & A. Löve, lobeleaf groundsel, R5974, N, 3

Picrothamnus desertorum Nutt., bud sagebrush, R5842a, N, 2

Ratibida columnifera (Nutt.) Woot. & Standl., prairie coneflower, R6141, N, 1

Scorzonera laciniata L., cutleaf vipergrass, R5933, E, 1

Senecio flaccidus Less., threadleaf groundsel, R5054, N, 3

Senecio spartioides var. *multicapitatus* (Greenm. ex Rydb.) Welsh, broomlike ragwort, R5509, N, 2
Solidago canadensis L., Canada goldenrod, R5511, N, 3
Solidago velutina DC., sparse goldenrod, R5018, N, 3
Sonchus asper (L.) Hill, prickly sowthistle, C178a, E, 1
Sonchus cf. *olereaceus* L., annual sowthistle, C219, E, 1
Stephanomeria pauciflora (Torr.) A. Nels., brownplume wirelettuce, R5956, N, 2
Symphotrichum falcatum var. *commutatum* (Torr. & Gray) Nesom, white prairie aster, R5016, N, 3
Symphotrichum lanceolatum subsp. *hesperium* (Gray) Nesom, white panicle aster, R5516, N, 3
Taraxacum officinale G.H. Weber ex Wiggers, dandelion, R5064, N, 3
Tetradymia spinosa Hook. & Arn., spiny horsebrush, R5816, N, 3
Tetranervis ivesiana Greene, Ive's four-nerve-daisy, R5920, N, 2
Thelesperma megapotamicum (Spreng.) Kuntze, Hopi tea greenthread, R5095, N, 2
Townsendia annua Beaman, annual Townsend daisy, R5855, N, 2
Tragopogon dubius Scop., goat's beard, R5979, E, 2
Verbesina encelioides var. *exauriculata* (Robins. & Greenm.) J.R. Coleman, golden crownbeard, R5525, N, 3
Xanthium L., cocklebur, R5519, N, 1
Xanthium strumarium L., Canada cocklebur, R5081, N, 2

Boraginaceae

Cryptantha bakeri (Greene) Payson, Baker catseye, A41, N, 1
Cryptantha cinerea var. *jamesii* Cronq., James catseye, C39 & C111, N, 1
Cryptantha crassisejala (Torr. & Gray) Greene, deertongue, R5838, N, 3
Cryptantha flava (A. Nels.) Payson, Plateau yellow catseye, R5815, N, 2
Cryptantha fulvocanescens (S. Wats.) Payson, tawny catseye, R5966, N, 2
Lappula occidentalis var. *cupulata* (Gray) Higgins, flatspine sheepsbur, R5805, N, 3
Lithospermum incisum Lehm., fringed puccoon, R5829, N, 2

Brassicaceae

Alyssum desertorum Stapf, desert alyssum, R5803, E, 1
Alyssum minus (L.) Rothm., alyssum, R5826, E, 3
Arabis pulchra var. *pallens* M.E. Jones, pale rockcress, R5853, N, 2
Arabis selbyi (Rydb.) W.A. Weber, Selby's rockcress, R5818, 5943, N, 2
Camelina microcarpa DC., false flax, R5982, E, 2
Capsella bursa-pastoris (L.) Medik, R5978, E, 1
Cardamine debilis D. Don, roadside bittercress, T356, E, 1
Cardaria chalapensis (L.) Hand.-Maz., whitetop, R5994, E, 2
Cardaria draba (L.) Desv., whitetop, R5792, E, 2
Cardaria pubescens (C.A. Mey.) Jarmolenko, whitetop, R5989, E, 1
Chorispora tenella (Pallas) DC., blue mustard, R5801, E, 3
Descurainia pinnata subsp. *ochroleuca* (Woot. & Standl.) Detling, western tansymustard, R5812, N, 2
Descurainia pinnata (Walt.) Britt., western tansymustard, R5804, N, 3
Descurainia sophia (L.) Webb ex Prantl, flaxweed tansymustard, R5797, E, 3
Dimorphocarpa wislizenii (Engelm.) Rollins, spectaclepod, C101, N, 1
Draba cuneifolia Nutt. ex Torr. & Gray, wedgeleaf draba, R5864, N, 2
Erysimum repandum L., repand wallflower, R5809, E, 2
Lepidium densiflorum Schrad., pepperweed, N, 2
Lepidium lasiocarpum Nutt., hairy pod pepperweed, R5839, N, 2
Lepidium latifolium L., broadleaf pepperweed, R5515, E, 2
Lepidium perfoliatum L., clasping pepperweed, R5874, E, 2
Physaria acutifolia var. *acutifolia* Rydb., sharpleaf twinpod, C332, C50, N, 1
Sisymbrium altissimum L., tumble mustard, R5796, E, 3
Sisymbrium irio L., rocket mustard, R5941, E, 2
Stanleya pinnata (Pursh) Britt., desert prince's plume, A557a, N, 1
Streptanthella longirostris (S. Wats.) Rydb., longbeak fiddlemustard, R5850b, N, 2
Streptanthus cordatus Nutt., heartleaf twistflower, R5843b, N, 1

Buxaceae

Buxus microphylla Siebold & Zucc., littleleaf boxwood, R5870, H, 1

Cactaceae

Echinocereus fendleri (Engelm.) F. Seitz, Fendler hedgehog cactus, R5963, N, 2
Echinocereus triglochidiatus Engelm., claretcup hedgehog cactus, R5926, N, 2
Escobaria vivipara (Nutt.) Buxbaum, spinystar, R5524, N, 2
Opuntia phaeacantha Engelm., brownspine pricklypear, R5977, N, 3
Opuntia polyacantha var. *polyacantha* Haw., hairspine pricklypear, R5975, N, 3
Opuntia whipplei Engelm. & Bigelow, Whipple's cholla, R5976, N, 3
Sclerocactus cloveriae K. Heil subsp. *cloveriae*, Clover sclerocactus (NMRPTC 1999), R5060, C240, N, 2

Capparaceae

Cleome serrulata Pursh, Rocky Mountain beeplant, R5520, N, 2
Polanisia dodecandra subsp. *trachysperma* (Torr. & Gray) Iltis, clammyweed, A553, N, 1

Caprifoliaceae

Lonicera cf. ruprechtiana Regel, Manchurian honeysuckle, R4984, H, 2
Lonicera morrowii Gray, Morrow's honeysuckle, R5807, H, 2

Caryophyllaceae

Arenaria fendleri var. *tweedyi* (Rydb.) Maguire, Tweedy's sandwort, R5825, N, 2
Silene antirrhina L., catchfly, R5837, N, 2

Chenopodiaceae

Atriplex canescens (Pursh) Nutt., fourwing saltbush, R4993, N, 4
Atriplex confertifolia (Torr. & Frém.) S. Wats., shadscale, R5854, N, 4
Atriplex micrantha Ledeb., twoscale saltbush, R5500, E, 2
Atriplex obovata Moq., mound saltbush, R5019, N, 2
Chenopodium atrovirens Rydb., pinyon goosefoot, R5548, N, 2
Chenopodium fremontii S. Wats., Fremont goosefoot, R6317, N, 2
Chenopodium pratericola Rydb., desert goosefoot, R5451, N, 3
Kochia scoparia (L.) Schrad., kochia, R6333, E, 4
Krascheninnikovia lanata (Pursh) A.D.J. Meeuse & Smit, winterfat, R5527, N, 3
Monolepis nuttalliana (J.A. Schultes) Greene, Nuttall's poverty weed, R5806, N, 2
Salsola tragus L., prickly Russian thistle, R5447, E, 4
Sarcobatus vermiculatus (Hook.) Torr., greasewood, R5023, N, 5
Suaeda moquinii (Torr.) Greene, alkali seepweed, R5508, N, 4

Convolvulaceae

Convolvulus arvensis L., field bindweed, R4947, E, 3
Evolvulus nuttallianus J.A. Schultes, prostrate evolvulus, R5835, N, 3

Cupressaceae

Juniperus chinensis L., Chinese juniper, R5030, H, 2
Juniperus communis L., common juniper, R5919, H, 2
Juniperus deppeana Steud., alligator juniper, R4978, H, 2
Juniperus osteosperma (Torr.) Little, Utah juniper, R5015, N, 5
Juniperus scopulorum Sarg., Rocky Mountain juniper, R5911, H, 3

Cuscutaceae

Cuscuta indecora Choisy, pretty dodder, R6338, N, 2

Cyperaceae

Carex aquatilis Wahlenb., water sedge, R5878, N, 3
Cyperus odoratus L., fragrant flatsedge, R5099, N, 2
Eleocharis palustris (L.) Roemer & J.A. Schultes, common spikerush, C98, N, 3
Eleocharis parishii Britt., Parish spikerush, R5088, N, 3
Schoenoplectus acutus var. *acutus* (Muhl. ex Bigelow) A. & D. Löve, hardstem bulrush, R5482a, N, 2
Schoenoplectus americanus (Pers.) Volk. ex Schinz & R. Keller, American bulrush, R5496, N, 2
Schoenoplectus maritimus (L.) Lye, cosmopolitan bulrush, R5482b, N, 2

Elaeagnaceae

Elaeagnus angustifolia L., Russain olive, R5936, E, 4

Ephedraceae

Ephedra cutleri Peebles, Cutler's ephedra, R5057, N, 3
Ephedra torreyana S. Wats., torrey ephedra, C212, N, 3
Ephedra viridis Coville, Mormon tea, R5831, 5849a, N, 2

Equisetaceae

Equisetum arvense L., western horsetail, R5091, N, 3
Equisetum hyemale L., horsetail, R6319, N, 3
Equisetum laevigatum A. Braun, horsetail, R5034, N, 2

Euphorbiaceae

Chamaesyce chaetocalyx var. *chaetocalyx* (Boiss.) Woot. & Standl., bristlecup sandmat, R5950, N, 2
Chamaesyce missurica (Raf.) Shinnars, prairie sandmat, R6310, N, 2
Chamaesyce serpyllifolia (Pers.) Small, thymeleaf sandmat, R4938, N, 3
Euphorbia cuphosperma (Engelm.) Boiss., spurge, R5048, N, 2
Euphorbia spathulata Lam., roughpod spurge, R5861, N, 2

Fabaceae

Astragalus missouriensis var. *amphibolus* Barneby, Missouri milkvetch, R5852, 5961, N, 2
Astragalus mollissimus var. *thompsoniae* (S. Wats.) Barneby, Thompson's woolly milkvetch, R5851, N, 2
Astragalus nuttallianus var. *micranthiformis* Barneby, turkeypeas, R5836, N, 3
Gleditsia triacanthos L., honeylocust, R5916, H, 2
Glycyrrhiza lepidota Pursh, licorice, R5078, N, 2
Lupinus ammophilus Greene, sand lupine, R5972, N, 1
Lupinus brevicaulis S. Wats., shortstem lupine, R5971, N, 2
Medicago lupulina L., black medic, R5929, E, 3
Medicago sativa L., alfalfa, R4966, E, 3
Melilotus officinalis (L.) Lam., yellow sweet clover, R4967, E, 3
Robinia cf. pseudoacacia L., black locust, R5550, H, 2

Trifolium pratense L., red clover, R5981, E, 3

Trifolium repens L., white clover, R5980, E, 3

Fumariaceae

Corydalis curvisiliqua subsp. *occidentalis* (Engelm. ex Gray) W.A. Weber, curvepod fumewort, c11030, N, 0

Geraniaceae

Erodium cicutarium (L.) L'Hér. ex Ait., filaree, R5959, E, 3

Grossulariaceae

Ribes aureum Pursh, golden currant, R5876, H, 1

Hydrophyllaceae

Phacelia crenulata var. *corrugata* (A. Nels.) Brand, caterpillarweed, R5824, N, 3

Juncaceae

Juncus saximontanus A. Nels., Rocky Mountain rush, R5074, N, 3

Juncus tenuis Willd., field rush, A48, N, 2

Lamiaceae

Dracocephalum parviflorum Nutt., American dragonhead, A82, N, 1

Lycopus americanus Muhl. ex W. Bart., American bugleweed, C245b, N, 1

Marrubium vulgare L., horehound, R4990, E, 2

Mentha arvensis L., field mint, R5485, N, 2

Liliaceae

Allium macropetalum Rydb., largeflower onion, R5848a, N, 2

Asparagus officinalis L., asparagus, R5992, E, 2

Calochortus aureus S. Wats., sego lily, R5830, N, 3

Zigadenus paniculatus (Nutt.) S. Wats., foothill deathcamas, R5841b, N, 3

Linaceae

Linum lewisii Pursh, blue flax, R5868, H, 2

Linum puberulum (Engelm.) Heller, desert flax, R5960, N, 2

Loasaceae

Mentzelia albicaulis (Dougl. ex Hook.) Dougl. ex Torr. & Gray, white blazingstar, R5832, N, 2

Mentzelia humilis (Gray) J. Darl., gypsum blazingstar, R6151, N, 1

Mentzelia multiflora var. *multiflora* (Nutt.) Gray, Adonis blazingstar, R5049, N, 2

Mentzelia pumila var. *pumila* Nutt. ex Torr. & Gray, dwarf blazingstar, R5049, N, 2

Malvaceae

Alcea rosea L., hollyhock, R6139, H, 1

Malva neglecta Wallr., cheeseweed, R4957, E, 3

Sphaeralcea coccinea subsp. *elata* (E.G. Baker) Kearney, scarlet globemallow, R5528, N, 3

Sphaeralcea digitata (Greene) Rydb., juniper globemallow, R5993, N, 2

Sphaeralcea fendleri subsp. *fendleri* Gray, Fendler's globemallow, R6318, N, 4

Sphaeralcea incana subsp. *cuneata* Kearney, soft globemallow, R5529, N, 4

Moraceae

Morus alba L., white mulberry, R5850a, E, 4

Morus cf. *nigra* L., black mulberry, R4935, E, 2

Nyctaginaceae

Abronia fragrans Nutt. ex Hook., sweet sandverbena, R5867, N, 3

Mirabilis linearis (Pursh) Heimerl, narrowleaf four-o'clock, R5087, N, 2

Mirabilis multiflora (Torr.) Gray, Colorado four-o'clock, R5970a, N, 3

Oleaceae

Forestiera pubescens var. *pubescens* Nutt., desert olive, R5506, N, 4

Fraxinus velutina Torr., velvet ash, R5873, H, 3

Syringa cf. *vulgaris* L., lilac, R4979, H, 2

Onagraceae

Epilobium ciliatum Raf., fringed willowherb, A563, N, 3

Gaura coccinea Nutt. ex Pursh, scarlet gaura, R5905, N, 3

Gaura mollis James, velvetweed, R4958, N, 2

Oenothera albicaulis Pursh, white-stem evening primrose, R5860, N, 2

Oenothera elata subsp. *hirsutissima* (Gray ex S. Wats.) W. Dietr., Hooker's evening primrose, R5089, N, 2

Oenothera pallida subsp. *runciniata* (Engelm.) Munz & W. Klein, pale evening primrose, A558, N, 3

Oenothera villosa subsp. *strigosa* (Rydb.) W. Dietr. & Raven, hairy evening primrose, A560, N, 1

Pinaceae

Picea abies (L.) Karst., Norway spruce, R5869, H, 1

Pinus edulis Engelm., pinyon pine, R5471, N, 4

Plantaginaceae

Plantago lanceolata L., lanceleaf plantain, R5514, E, 3

Plantago major L., broadleaf plantain, R5075, N, 3

Plantago patagonica Jacq., wooly plantain, R5952, N, 3

Poaceae

Achnatherum hymenoides (Roemer & J.A. Schultes) Barkworth, Indian ricegrass, R5022, N, 3

Aegilops cylindrica Host, goatgrass, C199, E, 1

- Agropyron cristatum* (L.) Gaertn., crested wheatgrass, R5906, E, 2
Agrostis exarata Trin., spike bentgrass, R5517b, N, 2
Agrostis stolonifera L., redtop, R6145, 6156, N, 2
Alopecurus pratensis L., meadow foxtail, R5931, E, 2
Aristida purpurea var. *longiseta* (Steud.) Vasey, fendler 3-awn R4970, N, 3
Bouteloua curtipendula (Michx.) Torr., side oats gramma, R5045, N, 2
Bouteloua gracilis (Willd. ex Kunth) Lag. ex Griffiths, blue gramma, R5449, N, 3
Bromus catharticus Vahl, rescue brome, R5000, E, 2
Bromus inermis Leyss., smooth brome, R5533, E, 2
Bromus japonicus Thunb. ex Murr., Japonese brome, C28, C104, T351, E, 2
Bromus tectorum L., cheat grass, R5799, E, 3
Buchloe dactyloides (Nutt.) Engelm., buffalo grass, R5480, N, 4
Chloris verticillata Nutt., tumble windmill grass, R4945, N, 2
Chloris virgata Sw., feather windmill grass, R5450, N, 3
Dactylis glomerata L., orchard grass, R5027, E, 3
Digitaria sanguinalis (L.) Scop., crabgrass, R4976, N, 2
Distichlis spicata (L.) Greene, saltgrass, T247, N, 1
Echinochloa crus-galli (L.) Beauv., barnyard grass, R5454, E, 1
Echinochloa muricata var. *microstachya* Wieg., rough barnyard grass, R5007, N, 1
Elymus canadensis L., Canada wildrye, R4988, N, 2
Elymus elymoides subsp. *brevifolius* (J.G. Sm.) Barkworth, squirreltail, R5798, N, 2
Elymus lanceolatus subsp. *lanceolatus* (Scribn. & J.G. Sm.) Gould, streambank wheatgrass, R5904, N, 2
Eragrostis pectinacea (Michx.) Nees ex Steud., purple lovegrass, R5452, N, 2
Eremopyrum triticeum (Gaertn.) Nevsky, annual wheatgrass, R5813, E, 2
Erioneuron pilosum (Buckl.) Nash, hairy tridens, R5827, N, 2
Hesperostipa comata (Trin. & Rupr.) Barkworth, needle and thread, R5787, N, 2
Hesperostipa neomexicana (Thurb. ex Coult.) Barkworth, New Mexico needlegrass, C235, N, 1
Hordeum jubatum L., little barley, R4999, N, 4
Hordeum murinum subsp. *glaucum* (Steud.) Tzvelev, smooth barley, R5884, E, 4
Hordeum pusillum Nutt., hare barley, R5910, N, 3
Muhlenbergia asperifolia (Nees & Meyen ex Trin.) Parodi, alkali muhly, R6321, N, 2
Panicum capillare L., witchgrass, R4960, N, 2
Phalaris arundinacea L., reed canary grass, R5070, N, 2
Pleuraphis jamesii Torr., galleta, R4959, N, 4
Poa bigelovii Vasey & Scribn., Bigelow bluegrass, R5937, N, 2
Poa compressa L., flatstem bluegrass, R5985, E, 3
Poa pratensis L., Kentucky bluegrass, R5939, E, 3
Polygonum monspeliensis (L.) Desf., rabbit's foot grass, A534, A37, E, 2
Schedonorus arundinaceus (Schreb.) Dumort., tall fescue, R5069, E, 2
Schedonorus pratensis (Huds.) P. Beauv., meadow fescue, R5517a, E, 2
Setaria viridis (L.) Beauv., bottlegrass, R6328, E, 3
Sporobolus airoides (Torr.) Torr., alkali sacaton, R5901, N, 2
Sporobolus contractus A.S. Hitchc., spike dropseed, R5028, N, 3
Sporobolus cryptandrus (Torr.) Gray, sand dropseed, R4950, N, 3
Thinopyrum intermedium (Host) Barkworth & D.R. Dewey, intermediate wheatgrass, R5497, E, 2
Thinopyrum ponticum (Podp.) Z.-W. Liu & R.-C. Wang, rush wheatgrass, T353, E, 1
Vulpia octoflora (Walt.) Rydb., six-weeks fescue, R5843a, N, 2
Zea mays L., corn, R5486, H, 1
- Polemoniaceae**
- Gilia ophthalmoides* Brand, eyed gilia, R5840, N, 2
Ipomopsis aggregata (Pursh) V. Grant, scarlet gilia, C96, N, 1
Ipomopsis longiflora (Torr.) V. Grant, white-flowered gilia, A555, R43, N, 1
Ipomopsis pumila (Nutt.) V. Grant, dwarf gilia, R5841a, N, 3
Leptodactylon pungens (Torr.) Torr. ex Nutt., common prickly gilia, R5965, N, 2
Phlox austromontana Coville, desert phlox, R5877, N, 2
- Polygalaceae**
- Polygala obscura* Benth., velvet seed milkwort, C311, N, 1
- Polygonaceae**
- Eriogonum cernuum* Nutt., nodding buckwheat, R6308, N, 1
Eriogonum ovalifolium Nutt., cushion buckwheat, R5844b, N, 1
Polygonum aviculare L., prostrate knotweed, R5468, E, 2
Polygonum lapathifolium L., smartweed, R6340, N, 3
Polygonum pensylvanicum L., Pennsylvania knotweed, T258, N, 2
Polygonum persicaria L., spotted knotweed, A539, N, 2
Rumex crispus L., curly dock, R5033, E, 3
Rumex hymenosepalus Torr., canaigre dock, R5802, N, 2
Rumex salicifolius var. *mexicanus* (Meisn.) C.L. Hitchc., Mexican dock, R5100, N, 2

Portulacaceae

Portulaca oleracea L., common purslane, R5043, N, 2

Ranunculaceae

Ceratocephala testiculata (Crantz) Bess., bur buttercup, R5785, E, 2

Clematis ligusticifolia Nutt., virgin's bower, R5047, N, 2

Delphinium nuttallianum Pritz. ex Walp., low larkspur, R5962, N, 2

Ranunculus cymbalaria Pursh, alkali buttercup, A36, N, 1

Ranunculus macounii Britt., Macoun's buttercup, A85, N, 1

Ranunculus sceleratus var. *multifidus* Nutt., blister buttercup, R5940, N, 2

Rosaceae

Cercocarpus montanus Raf., mountain mahogany, R5066, N, 2

Cotoneaster lacteus W.W. Sm., milkflower cotoneaster, R5470, R6140, H, 1

Chaenomeles speciosa (Sweet) Nakai, flowering quince, R5871, H, 1

Malus cf. *prunifolia* (Willd.) Borkh., plumleaf crabapple, R5457, H, 4

Prunus armeniaca L., apricot, R5479, H, 3

Purshia tridentata (Pursh) DC., antelope bitterbrush, R5842b, N, 2

Pyracantha cf. *coccinea* M. Roemer, scarlet firethorn, R5504, H, 2

Pyrus L., pear, R4997b, 5808, H, 2

Rosa multiflora Thunb. ex Murr., multiflora rose, R5935, H, 1

Rosa woodsii var. *ultramontana* (Hook.) Cronq., Wood's rose, R5938, N, 2

Rosa × *borboniana* Desportes (pro sp.), Bourbon rose, R5954, H, 1

Spiraea virgata Franch., virgate spirea, R5914, H, 1

Spiraea × *vanhouttei* (Briot) Carr., Van Hout's spirea, R5915, H, 1

Salicaceae

Populus angustifolia James, narrowleaf cottonwood, R5020, N, 2

Populus deltoides subsp. *wislizeni* (S. Wats.) Eckenwalder, Rio Grande cottonwood, R6155, N, 2

Populus fremontii S. Wats., Fremont cottonwood, R5478, H, 4

Populus × *acuminata* Rydb. (pro sp.), lanceleaf cottonwood, R5810, N, 2

Salix amygdaloides Anderss., peachleaf willow, R5918, N, 2

Salix exigua Nutt., coyote willow, R5811, N, 4

Salix matsudana Koidz., globe (or Navajo) willow, R4974, H, 2

Salix × *rubens* Schrank (pro sp.) hybrid crack willow, R5881, E, 2 (*S. alba* L. × *S. fragilis* L.)

Scrophulariaceae

Castilleja integra Gray, squawfeather, R5817, N, 3

Castilleja linariifolia Benth., Wyoming paintbrush, A533, N, 1

Penstemon cf. *lentus* Pennell, handsome penstemon, R5790, N, 1

Penstemon ophianthus Pennell, Arizona beardtongue, R5823, N, 3

Verbascum thapsus L., common mullein, R4965, E, 2

Veronica anagallis-aquatica L., water speedwell, R6336, N, 2

Solanaceae

Chamaesaracha coronopus (Dunal) Gray, green false nightshade, R5970b, N, 2

Lycium pallidum Miers, pale wolfberry, R5866, N, 3

Physalis hederifolia Gray, ivyleaf groundcherry, C121, N, 3

Physalis longifolia Nutt., common groundcherry, R5532, N, 3

Solanum elaeagnifolium Cav., white horsenettle, C156, N, 2

Solanum physalifolium Rusby, hairy nightshade, R5042, N, 2

Solanum rostratum Dunal, buffalobur, R5067, N, 1

Tamaricaceae

Tamarix chinensis Lour., saltcedar, R5044, E, 4

Typhaceae

Typha latifolia L., broadleaf cattail, R4997, N, 2

Ulmaceae

Ulmus pumila L., Siberian elm, R4944, H, 3

Verbenaceae

Verbena bracteata Lag. & Rodr., prostrate verbena, R5009, N, 2

Vitaceae

Parthenocissus quinquefolia (L.) Planch., Virginia creeper, R4971, T261, N, 2

Vitis cf. *vulpina* L., wild grape, R5551, H, 2

Zygophyllaceae

Tribulus terrestris L., puncturevine, R5453, E, 2