

VASCULAR FLORA OF THE SOUTH SAN JUAN MOUNTAINS (COLORADO, U.S.A.): A FLORISTIC INVENTORY OF TWO SOUTHERN ROCKY MOUNTAINS SLOPES

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ABSTRACT

The vascular plant diversity of the volcanic South San Juan Mountains of southern Colorado (Archuleta and Conejos counties) was inventoried through collection of 1151 voucher specimens during portions of the summers of 2013, 2014 and 2016. A total of 744 species in 84 families were documented in the region across these and historical collections, indicating that nearly one-third of the Colorado flora can be found in these mountains. The most speciose plant families of the study area are the Asteraceae, Poaceae, and Cyperaceae, as is typical of temperate northern hemisphere climates. The most dominant floristic component of the area comprises species with a Western North American distribution, though circumboreal, widespread North American, and Southern Rocky Mountains endemic species also comprise large portions of the flora. The South San Juan Wilderness itself harbors a nearly pristine pre-Columbian flora, though wilderness boundaries currently exclude 170 native species living in the South San Juan Mountains. Ninety-five collections are novel to the study area, and 39 of these represent new county vouchers for either Archuleta or Conejos.

RESUMEN

La diversidad de plantas vasculares de las montañas volcánicas de South San Juan del sureste de Colorado (condados de Archuleta y Conejos) se inventarió mediante la colección de 1151 especímenes testigo durante partes de los veranos de 2013, 2014 y 2016. Se documentaron en la región un total de 744 especies de 84 familias mediante estas colecciones y otras históricas, indicando que se puede encontrar cerca de un tercio de la flora de Colorado en estas montañas. Las familias con más especies en el área de estudio fueron Asteraceae, Poaceae, y Cyperaceae, como es típico en los climas templados del hemisferio norte. El componente florístico dominante del área comprende especies con una distribución en el oeste Norte Americano, hasta el circumboreal, generalizada Norte Americana, y las especies endémicas del sur de las montañas Rocosas también comprenden amplias porciones de la flora. El desierto South San Juan alberga una flora casi prístina pre-Columbina, mediante fronteras del desierto actualmente excluye 170 especies nativas que viven en las montañas South San Juan Mountains. Noventa y cinco colecciones son nuevas para el área de estudio, y 39 de ellas representan nuevos testigos para los condados tanto de Archuleta como Conejos.

INTRODUCTION

Biodiversity inventories are imperative to conduct as soon as possible across all Kingdoms of life and throughout the planet, due in large part to the dramatic nature of habitat loss induced by various pressures of the Anthropocene (Raven & Wilson 1992). Botanical inventories are a significant form of such inventories, as the vascular plant communities present in a region often define what other biota exist in that landscape. Despite a rich history of botanical exploration and a lower amount of biodiversity than in more tropical latitudes, North America north of Mexico is still generating many important baseline floristic inventories (Ertter 2000). Such inventories are still documenting new species in North America annually, but perhaps more critically, botanical inventories produce numerous other scientific resources. These include providing a baseline reference collection for a given area during a given time, contributing distributional and morphological knowledge for regional and other floras, providing raw specimens for systematic study, and otherwise contributing to natural history collections in innumerable ways (Ertter 2000; Funk 2004; Willis et al. 2008).

The South San Juan Mountains comprise the southern subset of the Eastern San Juan Mountains of southern Colorado (Fig. 1, inset). Within these mountains lies the South San Juan Wilderness (henceforth: Wilderness), which was designated as Wilderness by Congress in 1980 (Fig. 1, white line boundaries). The Wilderness is a relatively vast and wild region that harbors large swaths of road- and trail-less terrain and has

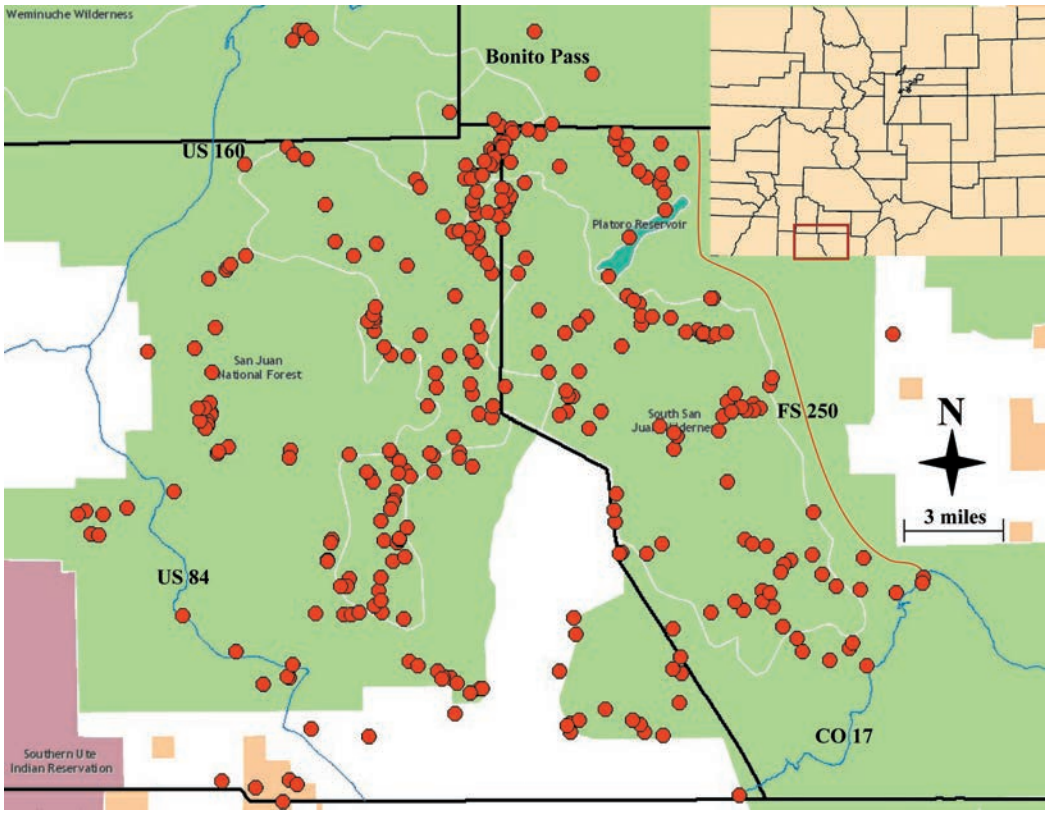


Fig. 1. Map of the South San Juan Mountains. Blue lines represent major highways delimiting the study area. The study area's southern extent is delimited by the New Mexico border, the southernmost horizontal black line. Blue lines follow the tracks of Highways 84 and 160 on the western slope, and Highway 17 on the eastern slope. The red line on the eastern slope approximately follows Rio Grande National Forest Road 250. White lines within the blue and red lines represent the South San Juan Wilderness boundary. The black line vertically bisecting the map depicts the Archuleta (left) and Conejos (right) county border, and this border generally follows the Continental Divide ridge. The upper horizontal black lines delimit Mineral (left) and Rio Grande (right) counties. Red points indicate Sharples' collection localities. Green shading is National Forest Land, white is private land, orange shading is Bureau of Land Management land, and purple shading is Native American land. The inset shows the study area location within Colorado.

only a handful of proximate human settlements: the villages Jasper, Platoro, Chromo, and the sizable town of the area, Pagosa Springs. Despite Colorado's rich history of botanical exploration, the South San Juan Wilderness region has remained underexplored botanically. This is likely attributable to the area's great distance from major metropolitan areas, the loose, unstable, and rugged volcanic rock terrain, and the area's relative inaccessibility as assured through its Wilderness designation.

Although a floristic inventory of all vascular plant species in the South San Juan Wilderness region has never been completed, two previous floristic inventories sampled some portions of the Wilderness (Douglas 1992; Flaig 2007). In 1992, a floristic inventory of the Conejos River basin of Conejos county was completed (Douglas 1992). The headwaters and middle-upper elevations of the Conejos River drainage overlap with some of the eastern part of the study area extent presented here. In 2003 and 2004, inventory work across all of the eastern San Juan Mountains was completed by Flaig (2007), but this inventory did not extensively catalogue the South San Juan Wilderness itself. Lastly, Heil and colleagues collected in parts of the San Juan River drainage included in the study area as part of a regionwide Four Corners Flora treatment throughout the 1990s and 2000s (Heil et al. 2013). The present study therefore builds the most comprehensive inventory of the South San

Juan Wilderness flora to date. As with any floristic survey conducted by a lone individual, both areal and species gaps inevitably exist. However, attempts to mitigate botanical gaps were achieved by conducting extensive herbarium database searches for additional taxa in the study area, and these taxa are mostly attributable to the inventory efforts of the three studies mentioned above combined with the efforts of their colleagues.

Geographical Extent

The study area comprises approximately 158790 acres (=64260 hectares, 248 square miles) in terms of land protected by the boundaries of the South San Juan Wilderness. The Wilderness was the specific area most thoroughly explored and botanized (white lines, Fig. 1). The total study area including land inside and outside of Wilderness comprises approximately 480000 acres (=194400 hectares, 750 square miles), including private lands which nonetheless remain largely-unexplored botanically (e.g., the extensive Tierra Amarilla Land Grant lands in white in the southern portion of the study area map). Elevations range from 7200 ft (2195 m) on the western slope near the junction of the Rio Blanco with U.S. Highway 84 to 13307 ft (4056 m) atop Summit Peak. All taxa in the checklist are found east of U.S. Routes 84 and 160 in Archuleta county, west of Rio Grande National Forest Service Road 250 in Conejos County, as well as west of Colorado State Highway 17 south of where it meets Forest Road 250 (Fig. 1). The northern boundary of the study area is Bonito Pass just south of Wolf Creek Pass and just north of the Wilderness boundary, east to Summitville, and along Wightman Fork to its junction with the Alamosa River and with US Forest Service Road 250, and the southern boundary is the Colorado border with New Mexico. The only land included outside of areas in Archuleta or Conejos County as demarcated by the features and roads listed above is the small portion of the South San Juan Wilderness itself that pokes into Mineral and Rio Grande counties. Few taxa (27) collected under Sharples' numbers just outside of these demarcations, yet found by other investigators' records to reside within these demarcations, are both included under Sharples' collection numbers and are accompanied by a record from another investigator in the checklist. This includes areas just west of U.S. Route 84 and habitats along the lower Alamosa River valley (Fig. 1). Notably, the study area defined here does not include the southern/eastern San Juan Mountains of southwestern Rio Grande County.

The South San Juan Mountains include some of the southernmost extent of the Southern Rocky Mountains, a distinct subregion of the Rocky Mountains Floristic Province (Takhtajan 1986). The Southern Rocky Mountains extend from the Medicine Bow Mountains of southeastern Wyoming in the north to the Sangre de Cristo mountains of northern New Mexico in the south. The western extent of the Southern Rocky Mountains is often delimited as the La Sal Mountains in far eastern Utah, and/or the San Francisco Peaks of Northern Arizona, a notable disjunct station of the Southern Rocky Mountains flora. Notably, the South San Juan Mountains include the southernmost high points of the North American portion of the Continental Divide. The Wilderness protects ca. 42 miles of the Continental Divide's alpine, subalpine and montane habitat.

The South San Juan Mountains are bound by San Luis Park to the east, Wolf Creek Pass and the continuation of the San Juan chain along the continental divide to the north, the San Juan River valley to the west, and the New Mexico border with Colorado to the south; the Continental Divide abruptly drops into a featureless undulation at the New Mexico border. The South San Juan Wilderness encompasses the high mountain core of this broad region. A large portion of the South San Juan Wilderness' protected area is found east of the Continental Divide (Conejos County Wilderness portions, Fig. 1). To the south, the Wilderness boundaries form "pseudopodia" around a significant section of private land known as the Tierra Amarilla Land Grant, which is further subdivided into various hunting ranches and at times has provided novel floristic records (both exotic and native) not found elsewhere in the South San Juans.

Major drainages of the study region are Park Creek, the Alamosa River, the Conejos River, Rio Chama, Rio Blanco, and the Navajo River. Only the Rio Blanco and Navajo rivers flow into the San Juan River; the other four drainages empty into the Rio Grande. Only one of these drainages, the Conejos, has been comprehensively botanized before (Douglas 1992). Thirty-two lakes exist within the Wilderness, all part of the headwaters of these drainages (USDA 2017a).

Modern Climate

The weather station at 10640 feet on Wolf Creek Pass is near the northern end of the study area and its data best represent the climate of the subalpine zone of the region (National Climatic Data Station #059181-5; WRCC; <http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?co9181>; accessed Jan 2017). The climate of the region from 1957–2001 was characterized by frigid winter temperatures (average 18.13°F, Dec–Feb) and mild summer temperatures (average 50.9°F, Jun–Aug), with cold autumns (average 35.47°F, Sep–Nov) and springs (30.4°F, Mar–May) (Fig. 2). The average yearly temperature of the pass was 33.73°F (1°C), and only the months of June–September maintained an average low temperature above freezing. In terms of precipitation, the area is characterized by occasional heavy winter snowfalls as well as regular monsoonal rains and thunderstorms after June and throughout the summer. The average wettest month for 1957–2001 was March, when the area is prone to heavy spring snowstorms, and the average driest month was June, before the regional thunderstorm season begins (Fig. 2). The average yearly precipitation from 1957–2001 was 45.39 in/115.3 cm (high of 58.3" and a low of 29.62"), with the majority of the moisture falling as snow. PRISM data report a range of 57–140 cm/year in the study area, seemingly, but not exclusively, across an elevation gradient from low to high (Blair & Bracksieck 2011).

Orogeny and Glacial History

The Southern Rocky Mountains began attaining their current elevation throughout the Paleogene (ca. 66 to 23 million years ago). Prior to the Paleogene, Colorado was part of an intercontinental seaway, and uplift subsequently helped lead to the dissolving of the seaway during the Laramide orogeny (early Paleogene) (Gonzales & Karlstrom 2011). By the end of the Eocene (ca. 56 to 34 million years ago), vulcanism had spread throughout the southwestern quadrant of Colorado and small parts of northern New Mexico, and thus, the modern South San Juan Mountains are volcanic in origin, sharing a common orogenetic history with the greater San Juan Mountains. The study area is near the southern limit of this San Juan Volcanic Field, although the western limits of the study area start reaching into sedimentary rock dating prior to vulcanism in the area (Lipman & McIntosh 2011). Vulcanism and continued uplift further heightened the ancestral San Juan Mountains during the Laramide orogeny (Blair & Gillam 2011).

Four composite volcanos were active in the South San Juan Mountains around 35 to 30 million years ago (Blair & Bracksieck 2011). They formed andesite across much of the west and north part of the study area. Much of the rest of the study area (particularly parts of the eastern portion) is geologically represented by newer (30 to 23 million years ago) ash (ignimbrite) and lava (basalt) flows that formed atop the base layers of andesite (Lipman & McIntosh 2011). Most of the study area thus has Oligocene volcanic rock as its substrate. Two ancient calderas are found in the northeastern portion of the study area: the Platoro and Summitville Calderas. The former encompasses about 25 kilometers in diameter, is composed of intrusive rock (ancient cooled magma), and is centered around the Platoro town and reservoir; the latter is embedded within the former, and is 10 kilometers in diameter (Bethke 2011). These calderas were active from around 33 million years ago to 28.5 million years ago (Lipman & McIntosh 2011). Much of the current landscape of the South San Juans represents the eroded and eroding remnants of this ancient, uplifted volcanic activity, further dramatized by the subsiding of the San Luis Valley as the Rio Grande Rift formed (Blair & Gillam 2011).

Glaciers are no longer present in the South San Juans, and it is unclear when the first Pleistocene glaciations affected these mountains. There is little evidence of glaciation in the entirety of the San Juan Mountains prior to approximately 650,000 years ago (Blair & Gillam 2011). The last glaciation in the region, ending around 20,000 years ago, covered the ridges, high plateaus, and valleys of the eastern slope of the study area, likely explaining why the high plateaus are covered in rich wetlands (Blair & Gillam 2011). Most of these wetlands are pristine and harbor otherwise rare or absent taxa in the study area. Glaciation was sparse on the west side of the Continental Divide, only present right up against the Divide itself. The Chalk Mountains subrange of the western slope was too low for glaciation (Blair & Gillam 2011). The Chalk Mountains harbor no alpine tundra habitat at present, with a highpoint of only 12,037 feet and with its ridges forested.

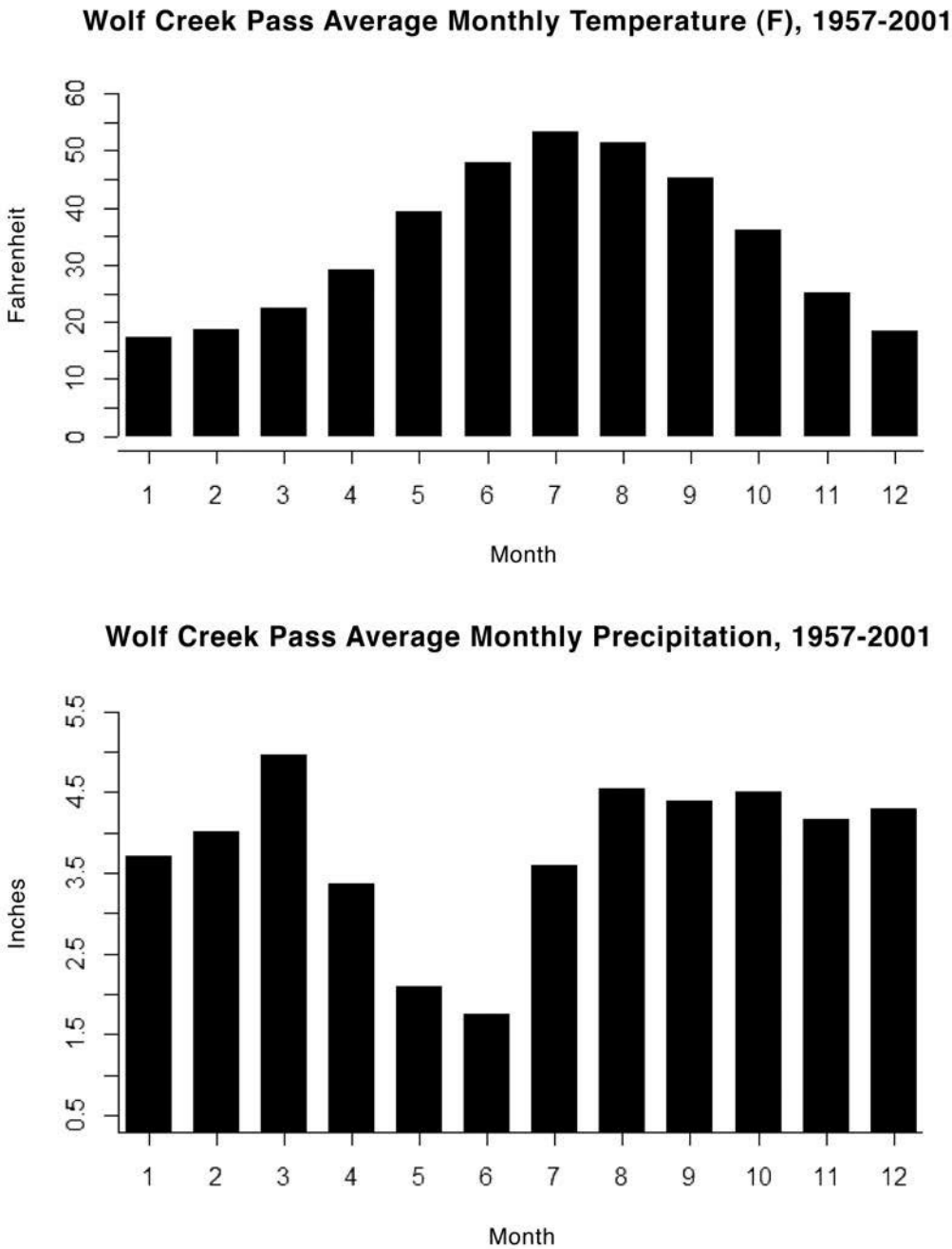


FIG. 2. Climate summary of the late twentieth century at Wolf Creek Pass near the northern end of the study area. Data provided by the Western Regional Climate Center (WRCC, 2017).



FIG. 3. Volcanic tundra adjacent to the Continental Divide.

Habitat Diversity of the South San Juan Mountains

There are several general common habitat types in the South San Juan Mountains, ranging from lowland woodlands to volcanic tundra (Figs. 3 & 4). The range of approximate extent of each habitat is given when appropriate. Elevations are given as approximates, as elevation-based habitat boundaries differ depending on whether they are found on the eastern vs. western side of the Continental Divide, whether they have a north vs. south aspect, and numerous other microclimatic factors, and therefore habitat boundaries inevitably intergrade and vary. While a few taxa are here mentioned explicitly, see the checklist for some more details regarding which plants are common in which habitats.

Ponderosa-Oak Forest.—Much of the lower elevations of the western slope are covered in this high diversity habitat, but only a small portion is protected within the boundaries of Wilderness. This forest type often has a savannah quality to it, with individual trees of *Pinus ponderosa* interspersed throughout, yet rarely forming dense, dark stands. *Quercus gambelii* is a dominant small oak tree found in the ponderosa pine understory and forest openings of the western slope, and it occasionally forms large stands of bright forest without any neighboring ponderosas. Many Eurasian aliens are found along this habitat's roadsides, and indeed within some of the forest understory. This habitat intergrades with the next at elevations in the mid- to upper 8000s (feet), but may stretch above 9000' in pockets. *Pinus ponderosa* forests are found at the lowest elevations of the study area's eastern slope, but *Quercus gambelii* is conspicuously absent on the east side of the Continental Divide, and very little ponderosa pine forest habitat is found within the Wilderness of the eastern slope.

Montane Mixed Forest.—Much of the region's woody plant diversity is found in this habitat, found above



FIG. 4. Some forest types of the South San Juan Mountains. **Top left:** spruce-dominated subalpine forest; **Top right:** subalpine mixed forest; **Bottom right:** ponderosa-oak forest; **Bottom left:** aspen-dominant forest.

yet intergrading with the ponderosa pine zone, and found below and intergrading with the subalpine spruce zone. *Populus tremuloides* and *Pseudotsuga menziesii* are some of the more conspicuous tree species living in this zone, and *Acer glabrum*, *Actaea rubra*, *Aquilegia elegantula*, *Mahonia repens* and *Rubus parviflorus* are a few of the more common forest understory species. *Populus tremuloides* sometimes forms dense swaths of clonally-formed forest and can dominate large areas of elevations ranging from the upper 8000s to the lower 10000s. Truly mixed forests with codominance of many tree species (*Abies* spp., *Picea* spp., *Pinus* spp. in addition to *Populus tremuloides* and *Pseudotsuga menziesii*) are most common below ca. 10000' on the western slope yet above the ponderosa-oak forest.

Subalpine Spruce Forest.—This is the dominant habitat type above 10000' and below the treeline. *Picea engelmannii* is the pervasive tree species in this habitat, occasionally mixed in with patches of *Populus tremuloides* or *Abies* spp. It is one of the lowest plant diversity habitats found in the region, with a rather barren understory present in the drier spruce forests. Extensive areas of subalpine spruce understory are otherwise often covered by continuous stretches of *Vaccinium myrtillus*, *Aconitum columbianum*, *Arnica cordifolia*, *Delphinium barbeyi*, *Pedicularis racemosa*, and *Polemonium pulcherrimum*. Some patches of subalpine forest are exceptionally moist, with pyrolid Ericaceae preferring the understory of the wettest spruce forests.

Barren Montane Slopes.—Such habitats are dry (well-drained and with bare sedimentary soils) and exposed, with sparsely-vegetated slopes occurring intermittently below the middle subalpine elevations (ca. 11000'), and are commonly found on south-facing slopes. *Agastache pallidiflora*, *Aliciella pinnatifida*, and

Penstemon barbatus are notable entities more or less restricted to such habitats.

Lowland Riparian Zones.—This habitat encompasses the borderland areas of the various rivers and their tributaries (see “Geographical Extent”) of the study area as well as more stagnant wetlands such as ponds, marshes, and bogs, generally up to ca. 10000'. *Alnus incana*, *Carex* spp., *Juncus* spp., *Potamogeton* spp., and *Salix* spp. are some common members of the low elevation wetlands.

High Elevation Riparian Zones.—The most common riparian areas near and above treeline are the snow-fed streamlets, along which *Cardamine cordifolia*, *Rhodiola rhodantha*, *Rorippa* spp., *Salix* spp., and *Swertia perennis* can often be found. Small ponds are found interspersed throughout the alpine, but these support low plant diversity. Below treeline, both ponds and streamsides become increasingly more diverse with lower elevation.

Highland Scree & Talus.—This habitat encompasses rockfields from the lower subalpine to the top of Summit Peak. Many taxa are shared between the subalpine and alpine versions of these habitats, but some taxa are only found truly above treeline. Talus constitutes largely unvegetated fields and slopes of medium to large boulders, while screes constitute slopes and ridges of small, loose rock fragments and usually yield higher plant diversity than talus. Alpine screes of San Juan Volcanic Field origin are floristically unique in these mountains. *Angelica grayi*, *Claytonia megarhiza*, *Ligularia soldanella*, *Penstemon hallii*, *Rhodiola integrifolia*, and *Trisetum spicatum* inhabit barren, rocky highland areas. Most such rockfields are found above 11000', and they become increasingly dominant across the landscape on alpine slopes above 12000' close to the Continental Divide.

Stable Tundra.—Stable, grassy tundra begins in openings of the krummholz of *Picea engelmannii*. Krummholz can end as low as 12000', or as high as nearly 12300', depending on aspect and other factors contributing to landscape heterogeneity. Where the treeline ends, stable tundra habitat is contiguous along the Continental Divide in the Wilderness and extends as high as the apex of Summit Peak. Scree and talus also share this distribution, and the two habitats are intermixed along the Divide. *Geum rossii* dominates wide expanses of green, well-drained areas of the tundra, as do many members of the Poaceae.

Persistent Snowfields.—Late-summer snowfields occur on the tundra and are found on steep, often north-facing (or otherwise obliquely-angled) slopes through July, usually August, and sporadically perennially. *Ranunculus macauleyi* is endemic to the barren, sopping ground adjacent to such snowfields, at least in the South San Juans.

Montane Meadows.—Meadow habitats generally below 10500' in elevation, where *Dasiphora fruticosa* comprises the dominant shrubby vegetation and where herbaceous diversity is high, are found sporadically in the South San Juans. These meadows tend to dry out in summer. Expanses of this habitat are especially present in the lower river valleys of the southeastern part of the study area.

Dry Subalpine Meadows.—This habitat is found in small to large sections of forest openings and open river valleys above 10000' and up to the treeline. Such meadows floristically intergrade with tundra at their upper limits. These meadows are renowned across the Southern Rocky Mountains for their picturesque displays of charismatic and diverse flowers. *Castilleja* spp., *Erigeron* spp., *Potentilla* spp., *Senecio* spp., and *Veratrum californicum* are common in such meadows.

Wet Subalpine Meadows.—Marshy subalpine meadows are extensive in Conejos County, particularly on the windswept plateaus extending eastwards from the main Continental Divide ridge. Much ground on these plateaus was formerly covered by glaciers (Blair & Gillam 2011). Sedges and rushes dominate here, with muddy depressions and boggy ponds common throughout. Plants not occurring elsewhere in the study area are found in the diverse wetlands of this region. Particularly exemplary are the vast meadows surrounding Red Lake in the Conejos part of the Wilderness. *Eriophorum* spp. are found solely in such habitats.

Multi-Habitat Generalists.—While best described as a life history strategy rather than a habitat type, some plants are very successful habitat generalists. These tend to occur in both enclosed forests and open meadows across an elongate elevational gradient and across different types of disturbance. *Achillea millefolium* and *Campanula rotundifolia* are noticeably common throughout elevations and habitats.

Natural Disturbance

Historical fire intervals and historical fire intensities of forests in the South San Juans vary according to elevation and the concomitant forest type found at various elevations. Human repression of fire has altered these historical regimes, and reported fire intervals refer to pre-European settlement patterns. The ponderosa-oak and lower mixed forests are subject to frequent events of low-intensity understory conflagrations, with a mean fire interval of every 3 to 11 years (Korb & Wu 2011). Historically savannah-type vegetation in the ponderosa-oak forest prevented high intensity canopy fires, but European settlement and subsequent fire repression have built up high fuel loads in this forest type which will result in more extreme fire intensities someday. This phenomenon also applies to the lower mixed forests, which are dense forests in the region at present; historically they maintained more of a savannah aspect. Aspen forests burn relatively infrequently due to their typically moister character and the low flammability of aspen tissues, but they do experience episodic high intensity burns every 70–100 or more years (Korb & Wu 2011). Aspens quickly regenerate after moderate-intensity fire due to their clonal-rhizomatous nature. Upper mixed forests and subalpine spruce-fir forests burn most infrequently of all the forest types found in the South San Juan Mountains. When they do burn, though, it is a product of both multiple years of drought and decades of build-up of fuel load. These fires are thus high-intensity crown fires and occur every two or more centuries, on account of their ordinarily wet boreal climate (Korb & Wu 2011). The subalpine fire regime is the only one that appears to be unaltered at present, meaning that burn frequency and intensity appear to be similar to what they were before European settlement. Historically, the higher mixed forests could experience moderate severity fires every several decades (14–63 years), or high intensity crown fires once every multiple hundreds of years, as these forests are transitional between the warmer, lower mixed forests and the subalpine boreal forests (Korb & Wu 2011). The highest subalpine boreal forests burn only two or three times per millenium. They are naturally dense and are not subject to frequent surface fires. Understory snow is still present into June during most years in subalpine forests, and the summer is usually characterized by consistent monsoonal rains before the dry autumn cools the weather down significantly, warding off fire throughout the year. Essentially, the South San Juan forests pattern is: the higher the elevation, the longer the mean fire interval, and the higher the intensity of a given burn when it does occur.

There is extensive spruce beetle-kill on the eastern slope of the study area at present, and currently-available public USDA Forest Service aerial survey maps suggest widespread spruce beetle kill of tens of thousands of acres across subalpine forest throughout the Wilderness since 1995 (USDA 2017b); many expanses of the Conejos subalpine zone in particular are becoming subalpine meadows as a result. In the worst-afflicted areas, fewer than 20% of the spruce trees appear to still be living in a given acre, though seedling establishment still seems to be strong (personal observation). Aspen forests in the region have been affected by bark beetles and borers as a consequence of regional drought, and have experienced some decline (Korb & Wu 2011). Historical ranges of variability in regards to extent of booms and busts of such forest pest outbreaks are unknown, and thus it is unclear how abnormal the situation currently is.

Winds can play a role in influencing forest structure in the South San Juans, as anywhere. During the field seasons in which the vascular flora checklist was compiled, a large subalpine forest blowdown was present on the eastern slope of the range in the vicinity of Victoria Lake. Korb and Wu (2011) put forth the idea that subalpine forests are disturbed more often by winds and insect infections than by their rare fire events. Treefall is also influenced by the impact of heavy blizzards in the San Juans. Flooding and mudslides are possible sporadically in the study area after heavy precipitation events during the monsoon season. Evidence of mudslides can be seen along the road to the Fish Creek trailhead and in scattered parts of the western and eastern slopes.

Human Presence and Impacts

The Summitville Superfund site has had the most pernicious environmental impact of all human presence in the region. A former mine sitting near treeline at 11500', its open pits have resulted in extensive metal leaching into the upper portions of the Alamosa River drainage (Bethke 2011). Summitville was an underground mining operation from the late 1800s until the 1980s, when open pits were excavated to extract gold and silver from low-concentration ore with cyanide solutions. The ground water was infiltrated by the cyanide solutions,

and the surface water of the Wightman Fork was also contaminated on multiple occasions. Cyanide is not a long-term contaminant, but more serious contaminants of surface water, groundwater, and soils through acid mine drainage from waste dumps and tunnels include aluminum, cadmium, copper, iron, lead, manganese, nickel, and zinc (Bethke 2011). The deforestation of the area that was necessary to expose minerals has acidified and mobilized heavy metals, the result of which is additional acidic and metallic drainage downstream of the site. Parts of the Alamosa River are unfit for aquatic life. The \$100 million-dollar joint cleanup between the State of Colorado and the Environmental Protection Agency, as well as the decommissioning process, is ongoing at present.

The village of Platoro is the only human settlement within the study area, sitting at 9900' along the upper Conejos River. The Platoro Reservoir above the town dams the river. Platoro is nearly 135 years old but has no census population data. The name Platoro is said to reflect the Spanish words for silver and gold, the discovery of which in the area was the impetus for the founding of the town. It has slowly transitioned from a mining town to a tourist town, with an intermittent period when both mining and tourism were active.

The Wilderness and National Forests encompassing the study area are surrounded by and interspersed with private land, respectively, which takes the form of various ranches and "suburbs" of Pagosa Springs and other small settlements in the region. These properties can be hubs for exotic plant activity, and most of the exotic flora component is found along populated and well-traveled roadsides in the national forest lands. Trailheads also harbor many exotic plants.

All-Terrain Vehicle use is popular and common on Forest Road 250 and along road corridors of the study area's east side generally, and the Platoro and Elwood Pass areas have a noticeably constant ATV presence during the height of summer. The forest and county roads on the western slope are usually terminal and do not provide good looping opportunities for motorists. One manifestation of this contrast is that dispersed, free camping is not allowed along the Conejos River portion of Forest Road 250 at present, and this portion is host to many campgrounds as a result. Only informal campsites exist on the western slope. Fishing is also popular on the eastern slope along the Conejos River, and there is infrastructure that supports this beloved activity. The Alamosa River does not seem to host many fisherpeople, perhaps in part due to the Summitville catastrophe.

In the regions where the Wilderness bounds private lands of the Tierra Amarilla Land Grant, evidence of recent logging both within and without the putative boundaries of the Wilderness was observed. Logging also occurs in the southeastern portion of the study area at present in areas badly affected by spruce beetle kill.

Other than the areas of the Continental Divide from the Summit Peak region north to the Long Trek Mountain area, much of the tundra is found on ridges that are less than 12500' high. With an average starting treeline of 12000', vast areas of tundra are susceptible to disappearance if treeline rises in the region.

Other than backpacking, horsepacking, fishing, hunting, and mountain-climbing, direct anthropogenic impacts within the Wilderness are felt from cattle grazing. This practice continues to occur within the boundaries of the Wilderness and is particularly prevalent throughout the river valleys of the eastern slope, especially in the wide drainages of the various upper Forks and tributaries of the Conejos River. A flora loving disturbance, including native and non-native taxa, tends to congregate at the more heavily-grazed areas.

As mentioned, human presence varies across the Continental Divide slopes of the South San Juans; roads and trails are too terminal on the western slope of the study area—in addition to the fact that many small, highly private "ranches" are common on that slope—for tourist-level recreation to be as prominent as on the eastern slope. Backpacking and horsepacking, however, are still quite popular out of the Fish Lake Trailhead, with dayhiking also being moderately popular in the area. Off-trail recreational hiking seems to be almost non-existent at this time, as no signs of recent human activity were encountered during remote cross-country botanizing excursions.

METHODS

A total of 1151 collections of vascular plants in the study region were made by the author and at times Dr. Erin Tripp (indicated in the checklist by Sharples' collection numbers) throughout the summers of 2013 and 2014,

as well as during a small portion of the summer of 2016. The South San Juan Wilderness itself was the area most comprehensively botanized, but surrounding National Forest land was also extensively botanized (see Fig. 1). On each foray, previously unexplored terrain was covered, although a few sites were visited more than once during distinctly different periods of the growing season to search for taxa with restricted early or late season phenologies. Collections were pressed and subsequently dried at a temperature of 110°F (43°C) for approximately 30 hours. Taxa were identified using the COLO reference collections, guided by Colorado Flora (Weber & Wittman 2012a & b), Flora of Colorado (Ackerfield 2015), the Flora of North America (Flora of North America Editorial Committee 1993+), and other resources as necessary. Species not collected by the author were searched for in the online regional herbarium database SEINet (Southwest Environmental Information Network 2017), and were added to the flora if found to occur in the study area. This was done systematically for each plant family in the two counties of interest, Archuleta and Conejos. Species found only by one investigator at one locality in the study area were studied in person to determine the accuracy of the identification. Foreign ornamental plants restricted to private land and not naturalized in the area were not included in the flora. No collections prior to the twentieth century were included.

The study area map was created in ArcGIS using publicly-available map layers of Colorado's county boundaries, roads, and public lands (Esri 2016). Taxon distributions were determined using the Flora of North America when available, and the USDA Plants Database (USDA 2017c), Colorado Flora (Eastern and Western Slopes), and SEINet were utilized whenever a Flora of North America treatment was still pending, as well as to corroborate distribution information given in the extant Flora of North America treatments. The Flora of U.S.S.R. (Komarov & Shishkin 1936) and the Flora of China (eFloras 2008) were additionally consulted at times when Asia was concerned. The Flora of North America's opinion is reported as concerns the distribution of species inhabiting Europe (inhabiting Europe distinguishes a circumboreal distribution from a North American-Asian distribution). Commonality was ranked qualitatively and quantitatively according to the system described in the checklist portion below.

RESULTS AND DISCUSSION

A total of 744 species of vascular plants in 84 plant families have been identified as occurring in the study area (Table 1). This figure totals about one-third of the Colorado flora (ca. 2300 spp.: Weber & Wittmann 2010a; 2677 spp. in Ackerfield 2015). The flora of the South San Juans is approximately as diverse as the Sangre de Cristo Mountains of Colorado (Hogan, unpublished data). The largest families in the flora are the Asteraceae (131), Poaceae (82), Cyperaceae (50), Brassicaceae (37) and Fabaceae (28), as is typical of temperate northern hemisphere landscapes and of the findings of other floristic work in Colorado (e.g., Flora of U.S.S.R. 1936; Hogan 1992; Flora of North America 1993+; Clark 1996; Weber & Wittmann 2010a & b). *Carex* (41) is by far the largest genus in the South San Juans flora, with the second largest genus, *Erigeron*, numbering only 17 species (Table 2). Nearly all of the species diversity in the flora is attributable to the flowering plants (712 spp.) (Table 3).

Fourteen species are reported here as new to the South San Juan Mountains of Archuleta and Conejos counties (=the study area). These species are not new to either county. Six species included in this figure are only new to the Archuleta portion of the South San Juan Mountains: *Carex echinata*, *Cryptogramma acrostichoides*, *Descurainia californica*, *Plantago lanceolata* and *Tripleurospermum inodorum*. The following 8 species are new in general to the South San Juan Mountains: *Asclepias subverticillata*, *Barbarea vulgaris*, *Chamaesyce serpyllifolia*, *Collinsia parviflora*, *Hordeum jubatum*, *Malva neglecta*, *Polygonum minimum*, and *Ranunculus cardiophyllus*.

Thirty-nine collections were new county occurrence vouchers for various species. Twenty-eight species are new to Archuleta, and 11 are new to Conejos. Their identities can be found in the checklist below and are identified as either "New to AA" or "New to CN" therein. In a few instances, a species was collected newly in both CN and AA counties, and this is indicated when so. Numerous county vouchers are new to the South San Juan Mountains as well but are not listed with the 14 above.

TABLE 1. Number of species in each family in the study area.

| | | | |
|---------------------|---------------------|---------------------|---------------------|
| Asteraceae: 131 | Pinaceae: 10 | Sparganiaceae: 3 | Convolvulaceae: 1 |
| Poaceae: 82 | Caprifoliaceae: 6 | Araceae: 2 | Dennstaedtiaceae: 1 |
| Cyperaceae: 50 | Grossulariaceae: 6 | Asparagaceae: 2 | Elaeagnaceae: 1 |
| Brassicaceae: 37 | Lamiaceae: 6 | Berberidaceae: 2 | Euphorbiaceae: 1 |
| Fabaceae: 28 | Ophioglossaceae: 6 | Betulaceae: 2 | Fagaceae: 1 |
| Ranunculaceae: 26 | Violaceae: 6 | Campanulaceae: 2 | Haloragaceae: 1 |
| Rosaceae: 24 | Amaranthaceae: 5 | Celastraceae: 2 | Hydrangeaceae: 1 |
| Caryophyllaceae: 23 | Hydrophyllaceae: 5 | Cornaceae: 2 | Hydrocharitaceae: 1 |
| Plantaginaceae: 21 | Montiaceae: 5 | Cupressaceae: 2 | Hypericaceae: 1 |
| Polygonaceae: 19 | Amaryllidaceae: 4 | Geraniaceae: 2 | Iridaceae: 1 |
| Salicaceae: 17 | Apocynaceae: 4 | Isoëtaceae: 2 | Lentibulariaceae: 1 |
| Apiaceae: 16 | Dryopteridaceae: 4 | Melanthiaceae: 2 | Linaceae: 1 |
| Juncaceae: 16 | Liliaceae: 4 | Nyctaginaceae: 2 | Nymphaeaceae: 1 |
| Orobanchaceae: 14 | Malvaceae: 4 | Papaveraceae: 2 | Rhamnaceae: 1 |
| Ericaceae: 14 | Potamogetonaceae: 4 | Phrymaceae: 2 | Santalaceae: 1 |
| Onagraceae: 13 | Adoxaceae: 3 | Scrophulariaceae: 2 | Sapindaceae: 1 |
| Polemoniaceae: 13 | Crassulaceae: 3 | Alismataceae: 1 | Selaginellaceae: 1 |
| Saxifragaceae: 13 | Equisetaceae: 3 | Anacardiaceae: 1 | Typhaceae: 1 |
| Boraginaceae: 11 | Primulaceae: 3 | Cactaceae: 1 | Urticaceae: 1 |
| Gentianaceae: 10 | Pteridaceae: 3 | Cannabaceae: 1 | Verbenaceae: 1 |
| Orchidaceae: 10 | Rubiaceae: 3 | Ceratophyllaceae: 1 | Zannichelliaceae: 1 |

TABLE 2. The 8 largest genera in the study area.

| Genus | No. species |
|--------------------------------------|-------------|
| <i>Carex</i> L. | 41 |
| <i>Erigeron</i> L. | 17 |
| <i>Poa</i> L. | 16 |
| <i>Salix</i> L. | 15 |
| <i>Juncus</i> L. | 14 |
| <i>Ranunculus</i> L. | 11 |
| <i>Artemisia</i> L.; <i>Draba</i> L. | 10 |

TABLE 3. Total number of families and species in each Division.

| Division | Families (species) |
|------------------|--------------------|
| Angiospermophyta | 75 (712) |
| Gymnospermophyta | 2 (12) |
| Monilophyta | 5 (17) |
| Lycopodiophyta | 2 (3) |
| All | 84 (744) |

Forty-two collections (45, if *Carex echinata*, *Descurainia californica*, and *Polygonum minimum* above are considered) represented species newly collected from the Wilderness, as opposed to surrounding National Forest lands. Taxa classified this way were already known from the county in which they were collected, but were unknown from within the Wilderness boundaries of that county. Of these, 28 species were new to the Wilderness as a whole (either county), 9 species were new to the Wilderness in Archuleta County, and 5 species were new within the Wilderness in Conejos County. The first category of species new to the Wilderness as a whole is designated by “New to Wilderness (AA or CN)” in the checklist, and the second two categories are designated by “New to AA or CN Wilderness”.

Records located on SEINet were not always accurate. Over 100 species were removed after checking

anomalous SEINet records in person. Such records were removed for three reasons. Sometimes specimens were misidentified. More often, it was found that herbarium label annotations were not up to date. That is, quite a few specimens were originally identified as a species that would have been anomalous in the study area, but had been re-annotated and identified as a more common species in the study area subsequently. The re-annotated concept was not updated on SEINet since the specimen record had originally been uploaded, and thus the original, older species identification was given on the public database. Periodically, records on SEINet were also found to have locality information erroneously translated onto the public database from the original specimen label. These observations highlight the importance of making in-person herbarium visits during the process of conducting biodiversity inventories using public online databases.

Despite anthropogenic disturbance in the region as discussed earlier, the Wilderness boundaries harbor a nearly pristine pre-Columbian vegetation. A total of 533 species of vascular plants are found within its boundaries. Almost all of these (521 spp.) are native to Colorado; 2.25% of the species in the Wilderness are therefore Eurasian aliens. These are almost exclusively confined to the immediate boundaries of footpaths, though *Verbascum thapsus* is found away from trails at times in low, open areas. If a walker leaves the trail, virtually no Eurasian aliens are to be encountered except along the odd section of floodplain or otherwise highly-disturbed drainage. The flora of the broader South San Juans outside of Wilderness boundaries according to Figure 1 includes another 211 species. A total of 41 of these are Eurasian aliens: 19.4% is thus the relative percentage of Eurasian aliens in the flora outside of Wilderness. In the lower elevations outside of Wilderness boundaries, Eurasian aliens are widespread and common along roads and trails, as well as throughout other habitats such as forest understory, meadows, and waterways. This could be due to a synergistic effect of lower elevations (=milder climates) supporting more invasive species by virtue of the relative non-invasibility of more extreme climates of higher elevations in addition to the high level of anthropogenic disturbance to which the lower elevations of the study area are subject. Anthropogenic disturbance is strongest lower on the western slope than in other parts of the study area. Haying, cattle grazing, private residences and ranches, as well as the usual recreational activities are widespread here. Thus, qualitatively, Eurasian aliens are in highest concentration low on the western slope, and it would be worth investigating further which factors exactly contribute to this phenomenon.

Floristic Distributions

Distribution remarks are not to be regarded as static facts, and reflect only the current state of knowledge (Table 4). Sometimes, a given classification may have seemed too arbitrary, and therefore similar classifications are combined in a more general view of floristic affinities (Table 5). That is to say, at times a taxon exhibited a distribution that seemed to have both feet in either a Western United States or a Western North America distribution type, for example, perhaps being found in only the western United States except for a population front extending into southwestern Canada. Until fine-scale distributional extent is mapped across all countries and until taxonomy is fully resolved for all species, there will be a degree of imprecision in making conclusions about distributional extent. The following distributional categories were identified within the South San Juan Mountains flora. Acronyms in bold are found for each species within the checklist.

WNA—Species classified within a *Western North America* distribution typically range from western (northwestern) Mexico throughout the western United States, and into high latitudes of Alaska, Yukon, and/or the Northwest Territories. Sometimes these taxa are not found in Mexico, or they do not quite range up to the northernmost State and/or Provinces, yet are otherwise regionally widespread beyond the boundaries of the western United States.

WUSA—Taxa with a *Western United States* distribution are usually restricted to the mountainous western half of the contiguous United States. At times, though, some of these species will range into the southwestern corner of Canada, and thus tread the line between having a Western United States or a Western North America distribution. Likewise, a species may not range into Canada at all, but will range slightly into northwestern Mexico. Both of these example situations are ordinarily classified as Western United States, as they are greatly restricted outside of the contiguous United States' latitudes.

TABLE 4: Number of species and percentage of the flora classified in each distribution type.

| | | |
|----------------------------------|-----|-----|
| Western North America | 115 | 16% |
| Western United States | 98 | 13% |
| Circumboreal | 91 | 12% |
| Western & Northern North America | 70 | 9% |
| Eurasian Alien | 59 | 8% |
| Temperate North America | 53 | 7% |
| Four Corners | 50 | 7% |
| United States Rocky Mountains | 49 | 7% |
| Southern Rocky Mountains | 43 | 6% |
| North American-Asian | 29 | 4% |
| Temperate Northern Hemisphere | 29 | 4% |
| Southwestern North America | 24 | 3% |
| Cosmopolitan | 16 | 2% |
| Anomalous | 10 | 1% |
| The Rocky Mountains | 8 | 1% |

TABLE 5: A more generalized classification of distributions.

| | | |
|----------------------------|-----|-----|
| Western North America | 213 | 29% |
| North America | 123 | 17% |
| Northern Hemisphere | 120 | 16% |
| Southwestern North America | 74 | 10% |
| Eurasian Alien | 59 | 8% |
| Rocky Mountains | 57 | 7% |
| Southern Rocky Mountains | 43 | 6% |
| North American-Asian | 29 | 4% |
| Cosmopolitan | 16 | 2% |
| Anomalous | 10 | 1% |

WNNA—Species found in *Western and Northern North America* exhibit what could be called a circumboreal distribution that lacks the Eurasian extent. Thus, these are species that occur in the western United States, sometimes western Mexico, large portions of Canada (sometimes all of Canada), and at times large portions of the northeastern United States. The exact boundary of this distribution may in rare cases overlap with what might be considered Temperate North America (see below).

TNA—Widespread or *Temperate North American* species are found throughout Canada, the United States, and often parts of Mexico. Occasionally these species do not range into the farthest northern parts of the continent, or into the warm, subtropical parts of the southeastern United States. When absent from the southeastern United States but found throughout the rest of North America north of Mexico, the range can begin to touch toes with a Western and Northern North America distribution. However, Temperate North American species are widely distributed outside of the boreal climate zones, unlike Western and Northern North American species.

EUA—*Eurasian aliens* are taxa not native to North America, and are usually, but not always, found in disturbed areas (overgrazed meadows, roadsides, car camping areas, trailsides, settled areas, etc.) at lower elevations. Their origin may be from Europe, Asia, both, or unknown. Exotic aliens from the southern hemisphere do not appear to be part of the flora. Aliens are essentially unknown from the alpine.

4CR—*Four Corners* taxa are usually restricted to the states of Arizona, Colorado, New Mexico, and Utah, but one of these states may be absent in the range of a Four Corners species. Sometimes these species are found in the Four Corners states but also extend into one or another neighboring state, such as Texas, Nevada, south-

ern Wyoming, or northern Mexico. If multiple of these are all extended into, the species is more wont to be classified as Southwestern North American (see below). Many of these species are found at lower elevations. Taxa with a distribution closely restricted around the actual Four Corners boundary are classified here.

SWNA—*Southwest North American* species are usually found through the southwestern United States and into northern Mexico, encompassing a much broader area than Four Corners taxa, while often overlapping with a Four Corners distribution. Table 5 combines these distributions.

CIRC—*Circumboreal* species are found in arctic-alpine, boreal, and/or high latitude areas throughout the northern hemisphere and sometimes beyond (e.g., disjunctions in South America). Circumboreal taxa rarely extend into more temperate, southerly, non-mountainous regions of the northern hemisphere. “Circumpolar” species restricted to arctic and alpine areas across the northern hemisphere are also classified here. In the study area, circumboreal species tend to be found above 10,000 feet.

TNH—*Temperate or Widespread Northern Hemisphere* taxa range widely throughout the hemisphere, from arctic to often subtropical latitudes. Though found in much warmer areas than circumboreal taxa, these distributions overlap extensively, and are combined in Table 5.

NAA—*North American – Asian* species are usually found in portions of western North America and eastern Asia, but may be more widespread throughout North America as well. These distributions often look circumboreal sans a presence in western Asia and Europe.

COSM—*Cosmopolitan* species are widespread throughout the northern and southern hemispheres, and tend to be seedless plants or aquatic angiosperms. Most of these taxa are found natively on all continents outside of Antarctica, but may be missing from Africa, Oceania, and/or the lowland tropics.

ANOM—*Anomalous* species are: *Lemna minor*, *Packera tridenticulata*, *Draba crassifolia*, *Erysimum capitatum*, *Arenaria lanuginosa*, *Cerastium arvense*, *Oxytropis lambertii*, *Botrychium pallidum*, *Veronica peregrina*, and *Viola labradorica*.

USRM—A *United States Rocky Mountains* distribution ranges from New Mexico or Colorado up north into Montana and Idaho, and usually does not extend eastwards or westwards from these states. At times, a breach into Alberta, or a disjunction in the Cascades, may still be classified here. These taxa are absent from the Sierra Nevada and the Great Basin, however.

ROMO—Taxa ranging throughout the *Rocky Mountains* extend from throughout the United States Rocky Mountains and up north to nearly the border of the Yukon. They are not found in the Pacific territories. As only a small number of taxa exhibit this distribution, these plants should probably be considered as having an extended United States Rocky Mountains distribution.

SRM—The *Southern Rocky Mountains* encompass as much as parts of four states: the high country of western Colorado, northern New Mexico, southern Wyoming, and eastern Utah. In some cases, northern Arizona (the San Francisco Mountains) is considered part of this range. Taxa categorized as having a Southern Rocky Mountains distribution may be even further narrowly restricted within the Southern Rockies, e.g., found only in parts of Colorado, or otherwise not found through the full extent of the Southern Rockies. A number of taxa here are indeed endemic solely to southwestern Colorado. These narrow endemics are listed below.

Much of the South San Juan flora thus has a species-rank relationship to broad temperate areas of the three northern continents, both natively and through introduction; North American, Northern Hemisphere, Eurasian Alien, and American – Asian taxa comprise almost half of the flora with 331 species (Table 5). Most of the rest of the flora is restricted to part or all of Western North America, totaling 387 species, and this component only sometimes reaches into Canada. The most restricted of taxa are those which exhibit a Four Corners, Southwestern North America or Southern Rocky Mountains distribution, totaling 117 species.

Percentages of distribution indicated in Table 5 are similar to those of the Gore Range of north-central Colorado (Hogan 1992). The Gore Range flora, however, seems to lack the Southwestern North American/Four Corners element, and has a lower percentage of Eurasian aliens (in 1992: 4%). The flora of Mesa de Maya in southeastern Colorado contrasts with the Gore Range and the South San Juans (Clark 1996). A quarter of that

flora has a Great Plains distribution, a distribution so inconspicuous in the South San Juans flora that it is lumped under "Anomalous". The Mesa de Maya flora also has a conspicuous Eastern North America element which is lacking in the South San Juans. The Mesa de Maya has a higher percentage of Eurasian aliens (13%), presumably on account of its lower elevation and higher concentration of roads and ranchlands.

Plants endemic to the greater San Juan Mountains (to include, in some cases, the Elk Mountains, and/or the Sangre de Cristos) and found within the study area include *Corydalis caseana* (disjunct elsewhere), *Draba smithii*, *Ligularia soldanella*, *Penstemon hallii*, *Penstemon harbourii*, *Phlox caryophylla*, *Ranunculus macauleyi*, *Stellaria irrigua* sensu W.A. Weber, *Trautvetteria caroliniensis* (disjunct elsewhere), and *Trifolium brandegeei*.

A few taxa are conspicuously absent from the study area despite occurring nearby. Cactaceae is virtually absent (1 collection). *Arceuthobium* (Viscaceae) is altogether absent. In the alpine, several species appearing in neighboring mountain ranges are conspicuously absent or very uncommon. Some of these taxa include *Dryas octopetala*, *Primula angustifolia*, *Castilleja haydenii*, and *Eremogone fendleri*.

Sensitive Species

The Wilderness and surroundings harbor a flora that is more or less unthreatened across its distribution at present. There are no Federally-Endangered, Threatened, or Proposed species in the flora, and there are only three species in the flora on the Forest Service Regionally Sensitive List (Region 2): *Astragalus proximus* (Fabaceae), *Draba smithii* (Brassicaceae), and *Eriophorum gracile* (Cyperaceae). Sixteen additional species are tracked by the Colorado Natural Heritage Program (www.cnhp.colostate.edu/download/list/vascular.asp; accessed Jan 2017): *Artemisia laciniata*, *Asclepias hallii*, *Botrychium pinnatum*, *Carex limosa*, *Carex oreocharis*, *Carex retrorsa*, *Castilleja lineata*, *Cryptogramma stelleri*, *Draba malpighiacea*, *Draba streptobrachia*, *Grindelia arizonica*, *Luzula subcapitata*, *Minuartia macrantha*, *Phlox caryophylla*, *Townsendia glabella*, and *Trautvetteria caroliniensis*.

Agency Recommendations

A higher amount of vascular plant diversity seems to be found in the ponderosa-oak zone habitats of the western slope of the study area than in the habitats above it. Conversely, these habitats are the most disturbed and least protected of those found in the study area. Only a small portion of the South San Juan Wilderness in Archuleta county extends down into this lowland habitat type. Though this habitat is widespread just west of the study area, none of it is protected from anthropogenic disturbances such as grazing, logging, motorized uses, and settlement activities, and many rare or endemic species are found in the ponderosa-oak savannahs both west and east of Highway 84. A high proportion of the striking ponderosa-oak habitat found on the western slope in this region that harbors lowland Four Corners endemic plant species is covered in private land, tribal land, or disturbed National Forest land. It is therefore recommended that western boundaries of the Wilderness be extended lower in some areas to encompass more of this habitat, particularly in the southwestern parts of the study area, so that it can be preserved as well as possible. An alternate or complementary suggestion may be to protect more of this habitat type west of Highway 84 and/or in far northern New Mexico. It might be furthermore recommended that cattle grazing be more restricted on the western slope of the study area, as this type of disturbance in particular seems to be a very successful vector for the conveyance of Eurasian exotic species into relatively pristine public lands. In effect, the question might be raised as to whether such exotics would be found on public lands in the region (besides by roads or trails) if not for the way that cattle seem to facilitate the spread of exotics into various habitats. On another note, although this work has vouchered many new populations of most species of the South San Juans flora, fewer than 100 species were found to constitute new discoveries of some sort to the region. Cumulatively, this checklist represents a species count resulting from scores of decades' worth of dedicated collecting work in the region, and it should be considered current and nearly complete. Mineral and Rio Grande county portions of the San Juans may yield further new discoveries, however.

CHECKLIST OF THE VASCULAR FLORA OF THE SOUTH SAN JUAN MOUNTAINS

The checklist is alphabetically sorted by family, and within family, sorted alphabetically by genus and species. Elevations and collection numbers match one another respectively if multiple are given. More collections for certain taxa are not necessarily indicative of those taxa being more common. All vouchers cited as *Sharples* or *Sharples & Tripp* are deposited at the University of Colorado Museum Herbarium (COLO), with numerous duplicates deposited at RM and NY. Acronyms found at the end of a species' listing refer back to floristic distributions described above.

Nomenclature.—Genera and specific epithets typically follow the Flora of North America, when available. Inconsistencies with the Flora of North America or taxa not yet treated by the FNA are given based on Colorado Flora or/and Flora of Colorado. Family circumscriptions follow the Angiosperm Phylogeny Group (APG IV 2016). Subspecies are generally not recognized unless they represent a highly distinct entity of a much more widespread species complex.

Rarity.—When the taxon was not personally collected by the author, SEINET and COLO database searches serve as a metric for ranking commonality (more common=more databased collections), but full, unquestioning credence should not be given to this system, due to collector bias. Otherwise, commonness is ranked according to qualitative field observations and by the following system:

Abundant—Dominant and found virtually everywhere in a given life zone.

Common—Widespread and nearly always found throughout a given habitat, yet not quite a dominant species. Usually found often during a given foray into a given habitat. Known from more than 10 populations in the study area.

Occasional/Scattered/Intermittent—Interspersed across a given life zone(s), yet not always found during an extensive excursion into that life zone. Known from 5–10 populations across investigators in the study area.

Uncommon—A surprise to encounter at all; sparsely-distributed across the landscape as a whole or quite restricted to an uncommon habitat type. Known from 2–5 populations in total in the study area, including Sharples' collections.

Rare—One population or one restricted region known.

Checklist Symbols.—An asterisk (*) before the genus and epithet denotes a taxon unknown from within the Wilderness. A (W) after the distribution listing denotes an alien taxon within Wilderness.

Other South San Juans Investigators & Affiliations.—The below investigators have collected species in the study area not collected by me. Collection numbers do not refer to cumulative number of collections made by each investigator throughout the study area, but rather to number of species contributed to the checklist.

Douglas: Patricia Douglas, Colorado State University (CS, RM); 51 collections

Flaig: Jeanette Flaig, University of Wyoming (RM); 37 collections

Harrington: Harold David Harrington, Colorado State University (CS); 6 collections

Hartman: Ronald L. Hartman, University of Wyoming (RM); 5 collections

Heil: Kenneth Heil, San Juan College (SJM); 27 collections

Komarek: Susan Komarek, Fort Lewis College (FLD); 2 collections

Nelson: Burrell E. Nelson, University of Wyoming (RM); 35 collections

O' Kane: Steve O' Kane Jr, San Juan College (SJM); 6 collections

Denver Botanic Gardens: (DBG); 2 collections

Common Additional Acronyms—**AA** = Archuleta County; **AZ** = Arizona; **CA** = California; **CN** = Conejos County; **CO** = Colorado; **E** = Eastern; **MX** = Mexico; **N** = Northern; **NE** = Northeast; **NV** = Nevada; **PNW** = Pacific Northwest; **S** = South; **SSJ** = South San Juan Mountains; **TX** = Texas; **U** = Utah; **W** = Western; **WY** = Wyoming.

ADOXACEAE – 3 species

Adoxa moschatellina L., rare. ~11500', Douglas 1703 (CS). CIRC'
Sambucus caerulea Raf., uncommon. 9200', Hartman 79726 (RM). WUSA.

Sambucus racemosa L. var. *melanocarpa* (A. Gray) McMinn, common in forest understory. 9100 & 11100', Sharples 23 & 478. TNH.

ALISMATACEAE – 1 species

**Alisma triviale* Pursh, rare in low boggy areas. 8700', Sharples 1306. WNNA.

AMARANTHACEAE – 5 species

Chenopodium atrovirens Rydb., common in forest meadows. 10150 & 9250', Sharples 959 & 1082. Essentially WUSA.

Chenopodium capitatum (L.) Ambrosi [C. *overi*], scattered in open areas. 12050', Sharples & Tripp 1128. WNNA natively.

**Chenopodium foliosum* (Moench) Asch., uncommon. 10000', Sharples 150. EUA.

Chenopodium fremontii S. Watson, common in low elevation open areas. 9600 & 8500', Sharples 690 & 950. WNA.

Monolepis nuttalliana (Schult.) Greene, scattered across lowlands. 8750 & 9600', Sharples 246 & 691. New to Wilderness (CN). TNA.

AMARYLLIDACEAE – 4 species

Allium acuminatum Hook., common in the ponderosa-oak zone. 8700', Sharples 803. WUSA.

**Allium cernuum* Roth, uncommon in ponderosa-oak zone openings. 7760–7920', Nelson 58992 (RM). TNA.

Allium geyeri S. Watson, common in open areas. 8000, 7800 & 9300', Sharples 101, 187 & 796. WNA.

Allium rubrum Osterh. [A. *geyeri* var. *tenerum*], common in upper elevation openings. 11500 & 11100', Sharples 316 & 851. WUSA.

ANACARDIACEAE – 1 species

**Toxicodendron rydbergii* (Small ex Rydb.) Greene, rare. O' Kane 3952 (SJNM). WNNA.

APIACEAE – 16 species

Angelica grayi (J.M. Coul. & Rose) J.M. Coul. & Rose, uncommon, restricted to alpine talus. 12600 & 12000', Sharples 925 & 968. SRM.

Angelica pinnata S. Watson, rare in low, forested areas. 8800', Sharples 1077. USRM.

**Cicuta maculata* L., rare in low western slope wetlands. 7400', Sharples 1303. TNA.

Conioselinum scopulorum (A. Gray) J.M. Coul. & Rose, scattered in lower elevation forests. 9200–9240', Nelson 62576 (RM). USRM.

Cymopterus bakeri (J.M. Coul. & Rose) M.E. Jones [Oreoxis], common in high meadows. O Kane 5041 (SJNM). Endemic around 4CR.

Cymopterus lemmonii (J.M. Coul. & Rose) Dorn [Pseudocymopterus *montanus*], abundant in meadows. 10350, 7750, 11100, 9050 & 11100', Sharples & Tripp 12 and Sharples 89, 356, 524 & 850. 4CR.

Heracleum maximum W. Bartram, common in mixed forest understory. 9200, 8750 & 9250', Sharples 448, 543 & 552. TNA.

Ligusticum porteri J.M. Coul. & Rose, common in upper elevation forests and openings. 9800, 10350 & 12050', Sharples 153, 415 & 1059. USRM; N MX.

**Lomatium grayi* (J.M. Coul. & Rose) J.M. Coul. & Rose, scattered in ponderosa-oak lands. 7924', Flaig 3859 (RM). WUSA.

**Orogenia linearifolia* S. Watson, rare in ponderosa-oak lands. Heil 23434 (SJNM). WUSA.

**Osmorhiza chilensis* Hook. & Arn. [O. *berteroii*], uncommon in mixed forest. 8780–9200', Hartman 79699 (RM). WNNA.

Osmorhiza depauperata Phil., common in forested areas. 8600', Sharples 813. WNNA.

Oxypolis fendleri (A. Gray) A. Heller, common in forest understory. 8950, 11550 & 9250', Sharples 304, 398 & 556. 4CR; S WY.

**Pastinaca sativa* L., rare in wet, disturbed areas. 7600', Sharples 1360. EUA.

Podistera eastwoodiae (J.M. Coul. & Rose) Mathias & Constance, scattered on tundra. 12350', Sharples 828. SRM.

**Sium suave* Walter, scattered in wet ground at low elevations on the western slope. 8700', Sharples 1308. TNH.

APOCYNACEAE – 4 species

Apocynum androsaemifolium L., scattered across the mixed forest zone. 9700 & 9500', Sharples 599 & 692. TNA.

Asclepias hallii A. Gray, uncommon. ~10800', Douglas 1702 (RM). 4CR; E NV.

Asclepias speciosa Torr., rare along roads and trails. 9050', Sharples 286. WNA.

**Asclepias subverticillata* (A. Gray) Vail, rare on bare low elevation slopes. 7850', Sharples 1352. New to SSJ, found in AA. SWNA.

ARACEAE – 2 species

**Lemna minuta* Kunth, scattered in lowland bogs and ponds. 8750 & 8950', Sharples 562 & 1314. ANOM: temperate Americas.

**Lemna trisulca* L., rare in low elevation riparian areas. 8720–9200', Nelson 62500 (RM). COSM.

ASPAGACEAE – 2 species

Maianthemum racemosum (L.) Link subsp. *amplexicaule* (Nutt.) LaFrankie, common in mixed forest understory. 9100, 7750 & 9300', Sharples & Tripp 24 and Sharples 119 & 799. WNA.

Maianthemum stellatum (L.) Link, common at lower elevations in forest understory. 10100, 8900 & 10350', Sharples & Tripp 54 and Sharples 64 & 418. TNA.

ASTERACEAE – 131 species

Achillea millefolium L., abundant across open areas. 8650, 9200 & 10250', Sharples 282, 421 & 482. TNH.

Agoseris aurantiaca (Hook.) Greene, common in subalpine meadows. 11600, 11500 & 12800', Sharples 332, 462 & 636. WNA.

Agoseris glauca (Pursh) Raf., scattered in higher meadows. 11400', Sharples 648. WNA.

Amauriopsis dissecta (A. Gray) Rydb. [Bahia], scattered at low elevations. 8800 & 9200', Sharples 659 & 1347. SWNA.

**Ambrosia psilostachya* DC, rare along low elevation roads. Heil 12631 (SJNM). TNA.

Anaphalis margaritacea (L.) Benth. & Hook. f., common in open areas at lower elevations. 10450 & 9500', Sharples 1040 & 1085. Widespread NAA.

**Antennaria anaphaloides* Rydb., uncommon in lowlands. 8650 & 9450', Sharples 298 & 485. New to AA & CN (new to SSJ). WUSA.

Antennaria corymbosa E.E. Nelson, scattered in meadows. 12000', Sharples 340. WUSA.

Antennaria media Greene, scattered in high rocky areas. 12800', Sharples 923. WNA.

Antennaria microphylla Rydb., scattered across lowlands. 9515', Douglas 1248 (CS). WNNA.

Antennaria parvifolia Nutt., common on dry, open ground. 9100', Sharples & Tripp 35. WNA.

Antennaria rosea Greene, uncommon in open areas. 9550', Sharples 163. WNNA.

Antennaria rosulata Rydb., uncommon along roads. Bayer et al. CO-407 (RM). 4CR.

Antennaria umbrinella Rydb., scattered in upper meadows. 11475', Sharples 1362. WNA.

**Arctium minus* (Hill) Bernh., rare along low western slope roads. 8535–8730', Flaig 2909 (RM). EUA.

Arnica cordifolia Hook., common in subalpine forest understory. 9100 & 10350', Sharples 28 & 412. Greater WNA

Arnica latifolia Bong., uncommon. 9700', Sharples 955. New to AA Wilderness. WNA.

- Arnica mollis* Hook. [*A. ovata*], common in subalpine openings. 11800, 11700 & 12550'; *Sharples* 389, 476 & 1132. WNA.
- Arnica parryi* A. Gray, rare in high meadows. 12000', *Douglas* 1369 (CS). WNA.
- **Artemisia biennis* Willd., rare. *Radely* 57 (CS). Provenance unclear; TNH and beyond.
- Artemisia borealis* Pall. [*A. campestris*, *Oligosporus groenlandicus*], common in tundra meadows. 12300, 12400, 12550 & 12150', *Sharples* 351, 875, and *Sharples & Tripp* 1138 & 1140. CIRC.
- Artemisia carruthii* Wood ex Carruth, common along lower elevation roads and openings. 10650 & 7800', *Sharples & Tripp* 1118 and *Sharples* 1358. SWNA.
- Artemisia dracuncululus* L., common on dry mixed forest slopes. 9800 & 8450', *Sharples* 689 & 1076. CIRC; cultivated elsewhere.
- Artemisia franseriae* Greene, common in open areas of lowlands. 10600', *Sharples* 1104. New to AA Wilderness. 4CR.
- Artemisia frigida* Willd., uncommon in open lower elevation sites. 10000', *Sharples* 687. New to Wilderness (CN). TNH.
- Artemisia laciniata* Willd. subsp. *parryi* (A. Gray) W.A. Weber [*A. parryi*], uncommon on bare ground. 9950', *Sharples* 688. Subspecies: SRM; species: CIRC.
- Artemisia ludoviciana* Nutt., scattered in open areas in the ponderosa-oak zone. 8250', *Sharples* 1079. TNA.
- Artemisia michauxiana* Besser, uncommon on rocky sites. 9100, 12050 & 12150', *Sharples* 443, 1060 and *Sharples & Tripp* 1135. New to AA and CN. WNA.
- Artemisia scopulorum* A. Gray, common in subalpine meadows. 12650 & 11900', *Sharples* 863 & 960. USRM.
- **Bidens cernua* L., rare along ponderosa-oak zone roads. 9200', *Sharples* 1346. TNH.
- Brickellia grandiflora* (Hook.) Nutt., common on loose, rocky slopes at mid-elevation. 10200, 9800 & 10600', *Sharples* 614, 670 & 1105. WUSA.
- Carduus nutans* L., infrequent in wilderness, but common along roadsides. 7450 & 8650', *Sharples* 539 & 721. EUA (W).
- Chaenactis alpina* (A. Gray) M.E. Jones, uncommon on loose, volcanic, high ridges. New to AA. 12350, 11950 & 12200', *Sharples* 353, 914 & 1061. WUSA.
- **Chrysothamnus depressus* Nutt., rare along lowland roads. *Heil* 12715 (SJNM). SWNA.
- Cirsium arvense* (L.) Scop., common along roads and other low disturbed areas. 8600', *Sharples* 503. EUA (W).
- **Cirsium canescens* Nutt., common in low disturbed areas on the western slope. 8600', *Sharples* 505. Patchy WUSA.
- Cirsium parryi* (A. Gray) Petr. [*C. pallidum*], common in the mixed forest zone. 9800, 10700 & 9200', *Sharples* 529, 673 & 971. 4CR; not UT.
- **Cirsium scariosum* Nutt., rare. 8130–8535', *Flaig* 2857 (RM). WNA.
- Cirsium scopulorum* (Greene) Cockerell ex Daniels [*C. eatonii* var. *eriocephalum*], common in high elevation openings. 12200', *Sharples* 683. SRM.
- **Cirsium vulgare* (Savi) Ten., uncommon in the ponderosa-oak zone. 8600', *Sharples* 1078. EUA.
- **Conyza canadensis* (L.) Cronquist, rare along lowland roadsides. 8100 & 7900', *Sharples* 189 & 709. TNA natively.
- Crepis nana* Richardson, rare on alpine scree. 12274', *Douglas* 2068 (CS). NAA.
- **Crepis occidentalis* Nutt., common in low, dry sites on the western slope. 8000 & 7800', *Sharples* 105 & 195. WNA.
- **Cyclachaena xanthifolia* (Nutt.) Fresen., rare along low roads of the western slope. 8200', *Sharples* 703. TNA.
- Dieteria bigelovii* (A. Gray) D.R. Morgan & R.L. Hartm. [*Machaeranthera*], common on open slopes. 9500, 8450 & 10700', *Sharples* 662, 1074 and *Sharples & Tripp* 1147. New to CN Wilderness (1147). 4CR.
- **Ericameria nauseosa* (Pall. ex Pursh) G.L. Nesom & G.I. Baird [*Chrysothamnus*], common in low elevation open, dry areas. 8450 & 9600', *Sharples* 1073 & 1112. WNA.
- **Ericameria parryi* (A. Gray) G.L. Nesom & G.I. Baird, uncommon in low elevation meadows. 8800', *Sharples* 658. WUSA.
- Erigeron compositus* Pursh, common on cliffs and rocks at upper elevation. 10050, 10500, 12250 & 11950', *Sharples & Tripp* 53, and *Sharples* 146, 825 & 915. NAA.
- Erigeron coulteri* Porter, common in meadows and open areas. 11600, 9150, 9300 & 11600', *Sharples* 330, 576, 798 & 1113. WUSA.
- **Erigeron divergens* Torr. & A. Gray, scattered across open sites in the ponderosa-oak zone. 7800', *Sharples* 1357. WNA.
- Erigeron elatior* (A. Gray) Greene, uncommon. 8950–9050', *Nelson* 62462 (RM). SRM.
- Erigeron eximius* Greene, scattered in montane forests. 9500–9800', *Flaig* 2980 (RM). 4CR.
- Erigeron flagellaris* A. Gray, common on exposed sites. 8700, 8600, 7800 & 9200', *Sharples & Tripp* 17, and *Sharples* 68, 108 & 423. WNA.
- Erigeron formosissimus* Greene, common in lower elevation openings. 9500', *Sharples* 1084. USRM.
- Erigeron glacialis* (Nutt.) A. Nelson [*E. peregrinus*], common in subalpine open areas. 11100 & 11650', *Sharples* 479 & 587. WNA.
- Erigeron grandiflorus* Hook. [*E. simplex*], common in meadows. 9200 & 12150', *Sharples* 422 & 906. WUSA.
- Erigeron leiomerus* A. Gray, common on rocky sites. 10600, 8600, 12800 & 12700', *Sharples* 776, 809, 921 & 966. WUSA.
- **Erigeron lonchophyllus* Hook., rare in the ponderosa-oak zone. *Heil* & *Mietty* 12700 (SJNM). NAA.
- Erigeron melanocephalus* (A. Nelson) A. Nelson, common in high open areas. 12200 & 12150', *Sharples* 682 & 1364. SRM.
- Erigeron pinnatisectus* (A. Gray) A. Nelson, common in high, rocky sites. 11850, 11700, 11950 & 12700', *Sharples* 214, 471, 916 & 965. SRM.
- Erigeron speciosus* (Lindl.) DC., uncommon in the montane. 8950–9050', *Nelson* 62468 (RM). WNA.
- Erigeron subtrinnervus* Rydb. ex Porter & Britton, common in forest openings. 9500 & 10700', *Sharples* 517 and *Sharples & Tripp* 1378. WUSA.
- Erigeron ursinus* D.C. Eaton, rare in the subalpine. 10250', *Sharples* 1372. New to CN. USRM.
- Erigeron vagus* Payson, rare on tundra. 12900', *Sharples* 861. Restricted WUSA.
- Gnaphalium exilifolium* A. Nelson, scattered in low elevations wetlands. 9200–9240', *Nelson* 62550 (RM). Broader 4CR.
- **Grindelia arizonica* A. Gray, rare in ponderosa-oak forest openings. 7760–7920', *Nelson* 59011 (RM). SWNA.
- **Grindelia decumbens* Greene, rare in lowland gravels. 9023', *Douglas* 1260 (CS). SRM.
- Helianthella parryi* A. Gray, uncommon in the montane. 10000', *Douglas* 1082 (CS). 4CR.
- Helianthella quinquenervis* (Hook.) A. Gray, common in middle elevation openings. 10350 & 9500', *Sharples* 420 & 521. WUSA.
- **Helianthus annuus* L., common along ponderosa-oak zone roads. 7800', *Sharples* 1355. TNA natively.
- **Helianthus pauciflorus* Nutt. [*H. rigidus*], rare along ponderosa-oak zone roads. *Heil* & *Mietty* 28141 (SJNM). TNA.
- Heliomeris multiflora* Nutt., scattered in lowlands. 10000 & 9350', *Sharples* 672 & 999. WUSA.
- **Herrickia glauca* (Nutt.) Brouillet [*Eucephalus*], uncommon in the ponderosa-oak zone. 8450', *Sharples* 1072. USRM.

- Heterotheca pumila* (Greene) Semple, uncommon on high, open slopes. 10950', *Sharples* 582. SRM.
- Heterotheca villosa* (Pursh) Shinners, common in low elevation openings. 8300, 8000 & 7450', *Sharples* 112, 197 & 535. WNNA.
- Hieracium fendleri* Sch. Bip., uncommon in ponderosa-oak forests. 8000', *Sharples* 103. SWNA.
- Hieracium triste* Willd. ex Spreng. [*H. gracile*, *Chlorocrepis tristis*], uncommon in high openings. 11811', *Douglas* 1758 (RM). WNA.
- **Hymenopappus newberryi* (A. Gray) I.M. Johnston., rare in the ponderosa-oak zone. 7300 & 7350', *Harrington* 8072 (CS) and *Sharples* 804. SRM.
- Hymenoxys hoopesii* (A. Gray) Bierner, common in forest openings. 11700, 9450, 9500 & 9400', *Sharples* 376, 486, 514 & 794. WUSA.
- **Hymenoxys richardsonii* (Hook.) Cockerell var. *floribunda* (A. Gray) K.F. Parker, uncommon in lowland openings. 7500, 8700 & 8750', *Kelly* 198 (DGB) and *Sharples* 250 & 608. Species: USRM; variety: 4CR.
- **Lactuca seriola* L., uncommon along low elevation roads. 7800', *Sharples* 1356. EUA.
- Leucanthemum vulgare* Lam., scattered along roadsides. 10450 & 9150', *Sharples* 407 & 565. EUA (W).
- Ligularia amplexens* (A. Gray) W.A. Weber, common in high elevation meadows. 11450 & 12250', *Sharples* 585 & 724. USRM.
- Ligularia bigelovii* (A. Gray) W.A. Weber, common in upper subalpine meadows. 11700', *Sharples* 628. 4CR; S WY.
- Ligularia holmii* (Greene) W.A. Weber, uncommon on loose alpine substrata. 12100', *Sharples* 909. New to AA. Greater USRM.
- Ligularia soldanella* (A. Gray) W.A. Weber, scattered on screes. 11850 & 12350', *Sharples* 388 & 866. SRM: the volcanic ranges.
- Ligularia taraxacoides* (A. Gray) W.A. Weber, scattered on loose alpine terrain. 12000 & 12300', *Sharples* 625 & 631. SRM.
- Madia glomerata* Hook., uncommon in disturbed areas of the ponderosa-oak zone. 8400 & 8650', *Sharples* 714 & 718. WNNA.
- **Mulgedium pulchellum* (Pursh) G. Don [*Lactuca tatarica*], rare in aspen forest. 9150–9400', *Nelson* 62392 (RM). TNA.
- Oreochrysum parryi* (A. Gray) Rydb. [*Solidago*], common at upper elevations. 11700, 11000, 12050, 9600 & 11600', *Sharples* 627, 1042, 1058, 1092, and *Sharples* & *Tripp* 1124. Greater 4CR.
- Packera crocata* (Rydb.) W.A. Weber & Á Löve, uncommon in high meadows. 11600', *Sharples* 1114. Greater USRM.
- Packera dimorphophylla* (Greene) W.A. Weber & Á Löve, common in higher elevation meadows. 11800 & 11200', *Sharples* 344 & 852. Greater USRM.
- Packera neomexicana* (A. Gray) W.A. Weber & Á Löve, common in open lowland areas. 9100, 8000, 9200, 8450 & 9050', *Sharples* & *Tripp* 21, and *Sharples* 104, 450, 746 & 768. SWNA.
- Packera streptanthifolia* (Greene) W.A. Weber & Á Löve, scattered across elevations and habitats. 9250, 12000 & 9600', *Sharples* 548, 626 & 1091. WNA.
- Packera tridenticulata* (Rydb.) W.A. Weber & Á Löve, scattered on the eastern slope; all records are likely a hybrid with *Packera neomexicana*. 9800', *Sharples* 239. ANOM: USA Great Plains.
- Packera wernerifolia* (A. Gray) W.A. Weber & Á Löve, common in high meadows. 10825, 12300, 12000, 12500 & 12050', *Sharples* 219, 347, 822, 922 and *Sharples* & *Tripp* 1365. WUSA.
- **Pericome caudata* A. Gray, rare at exposed low elevation sites. 7900', *Sharples* 705. SWNA.
- Pyrrocoma crocea* (A. Gray) Greene, common in open areas at lower elevations. 8600, 9700 & 7600', *Sharples* 509, 1000 and *Sharples* & *Tripp* 1359. 4CR; S WY.
- **Ratibida columnifera* (Nutt.) Wooton & Standl., rare along ponderosa-oak zone roadsides. 7460', *Heil* 12610 (SJNM). TNA.
- Rudbeckia ampla* A. Nelson, common along corridors at low elevations on the western slope. 8800 & 8650', *Sharples* 512 & 716. Greater USRM.
- **Rudbeckia hirta* L., uncommon in the Conejos valley. 9000', *Douglas* 1070 (CS). TNA.
- Rydbergia grandiflora* (Torr. & A. Gray) Greene, common on stable soils on tundra. 12400 & 11500', *Sharples* 229 & 458. USRM.
- Senecio atratus* Greene, common in open areas. 8700 & 9100', *Sharples* 301 & 442. Greater SRM.
- Senecio crassulus* A. Gray, common in upper elevation openings. 11600, 12250 & 12150', *Sharples* 331, 723 and *Sharples* & *Tripp* 1136. WUSA.
- Senecio eremophilus* Richardson, scattered across lower open areas. 9250, 10300 & 10650', *Sharples* 729, 1002 and *Sharples* & *Tripp* 1119. Greater ROMO.
- Senecio fremontii* Torr. & A. Gray, scattered on gravelly riparian ground below treeline. 11200 & 10200', *Sharples* 367 & 615. WNA.
- **Senecio integerrimus* Nutt., rare on lowland loams. 9000', *Douglas* 1076 (CS). WNA.
- Senecio serra* Hook., uncommon in mixed forest. 9200–9240', *Nelson* 62540 (RM). WUSA.
- Senecio triangularis* Hook., common along wooded subalpine streams. 11550, 10800 & 10150', *Sharples* 401, 686 & 1100. WNA.
- **Senecio wootonii* Greene, scattered in openings below treeline. 10150 & 11000', *Sharples* & *Tripp* 42 and *Sharples* 372. SWNA.
- **Solidago canadensis* L., rare on floodplains. 7990', *M Smith* 94-MS-292 (CS). TNA.
- Solidago multiradiata* Aiton, scattered in high meadows. 11900', *Sharples* & *Tripp* 1145. WNNA.
- Solidago simplex* Kunth [*S. spathulata*], common at lower elevations. 8650, 9250, 11350 & 9550', *Sharples* 278, 547, 1003 & 1089. WNNA.
- Solidago velutina* DC, rare along low roadsides. 7900', *Sharples* 704. WUSA; MX.
- **Symphyotrichum ascendens* (Lindl.) G.L. Nesom [*Aster*, *Virgulus*], uncommon in montane forests. 8535–8730', *Flaig* 2884 (RM). WNA.
- **Symphyotrichum falcatum* (Lindl.) G.L. Nesom, uncommon in the ponderosa-oak zone. 8130–8535', *Flaig* 2865 (RM). WNA.
- Symphyotrichum foliaceum* (DC) G.L. Nesom [*Aster*], common at high elevations. 10200 & 11000', *Sharples* 1012 & 1368. WNA.
- **Symphyotrichum laeve* (L.) Á. Löve & D. Löve, uncommon in the ponderosa-oak zone. 8200', *Sharples* 698. TNA.
- **Symphyotrichum lanceolatum* (Willd.) G.L. Nesom [*Aster hesperius*], uncommon in ponderosa-oak lands. 8700', *Heil* 12646 (CS). TNA.
- Symphyotrichum spathulatum* (Lindl.) G.L. Nesom, uncommon. 10700', *Sharples* 1108. WNA.
- Taraxacum officinale* F.H. Wigg., abundant across elevations. 10350 & 11500', *Sharples* & *Tripp* 8 and *Sharples* 457. EUA (W).
- Taraxacum scopulorum* (A. Gray) Rydb., uncommon on tundra. *Douglas* 2050 (RM). ROMO; Canadian arctic and Greenland.
- **Tetradymia canescens* DC, rare in low, dry areas. 7500 & 8750', *Gilbert* 66 (CS) and *Sharples* 609. WUSA.
- **Tetraneuris ivesiana* Greene, scattered across the lowest western slope elevations. 7300 & 8550', *Harrington* 8080 (CS) and *Sharples* 132. 4CR.
- Tonestus pygmaeus* (Torr. & A. Gray) A. Nelson, common on tundra. 12300', *Sharples* 629 & 680. USRM.
- **Townsendia glabella* A. Gray, uncommon in ponderosa-oak zone openings. 8600' (*Sharples*), *O'Kane* 3742 (SJNM) and *Sharples* 131. SRM.
- Townsendia hookeri* Beaman, rare in low openings. 9100', *Sharples* 760. New to SSJ and Wilderness. WNA.
- **Tragopogon dubius* Scop., infrequent in low, dry sites. 9500–9800 & 9000', *Flaig* 2957 (RM) and *Sharples* 60. EUA.
- Tragopogon pratensis* L., uncommon along low pathways. 9050', *Sharples* 523. EUA (W).
- **Tripleurospermum inodorum* (L.) Sch. Bip., rare along roadsides. 9350', *Sharples* 1345. New to SSJ of AA. EUA.

**Wyethia arizonica* A. Gray, common in ponderosa-oak openings. 7900'; *Sharples* 98. 4CR.

BERBERIDACEAE – 2 species

**Berberis fendleri* A. Gray, common on the lowest slopes. 9100 & 8550'; *Sharples & Tripp* 36 and *Sharples* 134. 4CR; not AZ.

Mahonia repens (Lindl.) G. Don, common in low elevation forest understory and openings. 8900 & 10000'; *Sharples* 65 & 152. WNA.

BETULACEAE – 2 species

Alnus incana (L.) Moench subsp. *tenuifolia* (Nutt.) Breitung, common tree of low riparian zones. 9500, 9100 & 8600'; *Sharples* 164, 772 & 806. Subspecies: WNA; species: CIRC.

**Betula occidentalis* Hook., rare on the western slope. *Heil* 13099 (SJNM). WNNA.

BORAGINACEAE – 11 species

**Cynoglossum officinale* L., rare around cattle tanks. 7650'; *Sharples* 123. Found just west of study area, but new to eastern AA and likely found in the study area on private land. EUA.

Eritrichium nanum (Vill.) Schrad. ex Gaudin, scattered on wind-swept ridges. 12700, 12300 & 12200'; *Sharples* 651, 678 & 868. CIRC.

Hackelia floribunda (Lehm.) I.M. Johnst., uncommon. 8750'; *Sharples* 544. WNA.

Lappula occidentalis (S. Watson) Greene [L. *redowskii*], common in open, low-elevation sites. 7800, 8750, 9100 & 8350'; *Sharples* 194, 253, 445 & 764. TNA.

**Lithospermum incisum* Lehm., common in lowlands. 8600 & 7200'; *Sharples* 72 & 751. TNA.

Lithospermum multiflorum Torr. ex A. Gray, common at lower elevations. 8750 & 9100'; *Sharples* 245 & 453. 4CR.

Mertensia ciliata (James ex Torr.) G. Don, scattered across elevations. 8650'; *Sharples* 279. WUSA.

Mertensia franciscana A. Heller, common in subalpine forests. 9800 & 9450'; *Sharples* 156 & 561. 4CR.

Mertensia lanceolata DC [M. *bakeri*, M. *fusiformis*, M. *viridis*], common across elevations. 10300 & 11800'; *Sharples* 202 & 346. ROMO.

**Myosotis scorpioides* L., rare in low elevation creeklets. 8150'; *Sharples* 951. New to SSJ, AA, and S CO. EUA.

**Plagiobothrys scouleri* (Hook. & Arn.) I.M. Johnst., uncommon in disturbed areas. 7650 & 9000'; *Sharples* 139 & 997. WNNA.

BRASSICACEAE – 37 species

**Arabis pycnocarpa* M. Hopkins [A. *eschscholtziana*, A. *hirsuta*], uncommon in montane openings. 9150–9400'; *Nelson* 62399 (RM). NAA.

**Barbarea vulgaris* W.T. Aiton, rare near creeks. 9500'; *Sharples* 176. New to SSJ (AA). EUA.

Boechera grahamii (Lehm.) Windham & Al-Shehbaz [B. *divaricarpa*], rare on floodplains. 8600 & 9200'; *Sharples* 844 & 1380. New to Wilderness (AA & CN). WNNA.

Boechera spatifolia (Rydb.) Windham & Al-Shehbaz, scattered in lowland openings. 8600'; *Sharples* 811. New to Wilderness (AA). SRM.

Boechera stricta (Graham) Al-Shehbaz [B. *drummondii*], common in open areas. 8700, 10825, 11550, 11200, 9200, 9100 & 12150'; *Sharples & Tripp* 18, *Sharples* 218, 323, 369, 433, 761 and *Sharples & Tripp* 1133. WNNA.

**Camelina microcarpa* DC, uncommon in disturbed sites in the ponderosa-oak zone. 7760–7920'; *Nelson* 59017 (RM). EUA.

**Capsella bursa-pastoris* (L.) Medik., common at lower elevations. 8000'; *Sharples* 82. EUA.

Cardamine cordifolia A. Gray, abundant along streams, particularly throughout the subalpine. 8500, 7600, 9800, 11550 & 12000'; *Sharples* 74, 93, 157, 322 & 1051. WNA.

Descurainia californica (A. Gray) O.E. Schulz, rare in lowlands. 9150'; *Sharples* 573. New to SSJ of AA, and new to Wilderness. WNA.

Descurainia incana (Bernh. ex Fisch. & C.A. Mey.) Dorn [D. *richardsonii*], common in open areas. 11600, 11550, 10250 & 10800'; *Sharples* 312, 321, 481 & 685. WNNA.

Descurainia incisa (Engelm. ex A. Gray) Britton, uncommon on low elevation barren sites. 8500'; *Sharples* 783. WNA.

Descurainia sophia (L.) Webb ex Prantl, scattered in disturbed ground. 7450'; *Sharples* 540. EUA (W).

**Draba albertina* Greene, rare. 11352'; *Douglas & Wilken* 1217 (CS). WNA.

Draba aurea Vahl ex Hornem., common in open areas. 10050, 10250, 9900, 11500 & 12900'; *Sharples & Tripp* 49, 57, and *Sharples* 578, 855 & 860. WNNA.

Draba crassifolia Graham, scattered on bare ground along high creeksides. 12250 & 11500'; *Sharples* 640 & 854. New to AA. ANOM: WNNA, and N Europe.

Draba fladnizensis Wulfen, rare on tundra. *Heil* 12351 (SJNM). CIRC.

Draba helleriana Greene, common in open areas. 12000, 11500 & 8400'; *Sharples* 333, 465 & 755. 4CR; not UT.

**Draba malpighiacea* Windham & Al-Shehbaz, rare in the subalpine. 10663'; *Douglas & Wilken* 1136 (CS). SRM.

Draba smithii Gilg & O.E. Schulz, rare in high openings. 11600'; *Sharples* 1005 & 1109. New to Wilderness (AA). SRM.

Draba spectabilis Greene, scattered on high slopes. 11484'; *Douglas* 1713 (CS). SRM.

Draba streptobrachia R.A. Price, common on high, bare ground. 10750, 11900 & 12400'; *Sharples* 206, 385 & 858. SRM.

Draba streptocarpa A. Gray, uncommon above treeline. 12300'; *Sharples* 677. New to CN. SRM.

Erysimum capitatum (Douglas ex Hook.) Greene, common in open sites of upper elevations. 10250, 10750, 11500, 11400 & 12900'; *Sharples & Tripp* 47 and *Sharples* 204, 460, 817 & 1068. ANOM.

**Erysimum repandum* L., uncommon in the ponderosa-oak zone. 7924'; *Flaig* 3866 (RM). EUA.

**Hesperidanthus linearifolius* (A. Gray) Rydb., restricted to low, dry elevations. 8750'; *Sharples* 605. 4CR; not UT; MX.

**Lepidium alyssoides* A. Gray, rare at the lowest elevations. 8850' (*Sharples*), *Hartwell* 2118 (DBG) and *Sharples* 602. Broader 4CR.

**Lepidium campestre* (L.) W.T. Aiton, uncommon in the ponderosa-oak zone. 7760–7920'; *Nelson* 59010 (RM). EUA.

**Lepidium densiflorum* Schrad., uncommon along roads. 9250'; *Sharples* 870. TNA.

**Lepidium ramosissimum* A. Nelson, scattered along corridors. 8200'; *Sharples* 702. WNNA.

**Lepidium virginicum* L., scattered across disturbed ground. 9500–9800'; *Flaig* 2959 (RM). TNA.

Nocca fendleri (A. Gray) Holub [*Thlaspi montanum*], ubiquitous in the early season. 10350, 11250 & 10150'; *Sharples* 6, 365 & 814. WUSA.

Rorippa alpina (S. Watson) Rydb., scattered. 10350 & 11900'; *Sharples* 837 & 970. New to Wilderness (AA). USRM.

Rorippa curvipes Greene, common in higher, muddy ground. 11400 & 10350'; *Sharples* 645 & 838. WNA.

Rorippa palustris (L.) Besser, common in low, moist areas. 9450, 8600, 9250 & 10150'; *Sharples* 171, 268, 869 & 1101. TNH.

Smelowskia americana Rydb., occasional in rocky tundra areas. 11850, 12300, 11900 & 13100'; *Sharples* 213, 349, 384 & 652. WNA.

**Thlaspi arvense* L., scattered in disturbed sites of the ponderosa-oak zone. 7650 & 7450'; *Sharples* 126 & 537. EUA.

Turritis glabra L., rare in the mixed forest zone. 9200–9240'; *Nelson* 62556 (RM). TNH.

CACTACEAE – 1 species

**Opuntia fragilis* (Nutt.) Haw., rare in the ponderosa-oak zone. *Heil* 11795 (SJNM). WNNA.

CAMPANULACEAE – 2 species

Campanula parryi A. Gray, scattered in low meadows. 9200', *Sharples* 426. USRM.

Campanula rotundifolia L., common in open sites across elevations. 9200 & 11900', *Sharples* 425 & 644. TNH.

CANNABACEAE – 1 species

**Humulus lupulus* L., uncommon in low-elevation screes. 8050 & 1354', *Sharples* 710 & 1354. TNH.

CAPRIFOLIACEAE – 6 species

**Linnaea borealis* L., rare in subalpine forest. 10000', *Gierisch* 1020 (RM). CIRC.

Lonicera involucrata (Richardson) Banks ex Spreng., occasional in the subalpine. 8500 & 11100', *Sharples* 75 & 354. WNA.

Symphoricarpos rotundifolius A. Gray, abundant in the mixed forest zone. 8550, 9700, 9500 & 9900', *Sharples* 116, 292, 518 & 580. SWNA.

Valeriana acutiloba Rydb., common across subalpine forests. 12000, 10350 & 11300', *Sharples* 337, 417 & 592. WUSA.

Valeriana edulis Nutt., scattered in open areas across elevations. 12050, 8800, 9550 & 9000', *Sharples* 236, 511, 526 & 601. WNA.

Valeriana occidentalis A. Heller, uncommon in open sites. 10300', *Sharples* 200. WUSA.

CARYOPHYLLACEAE – 23 species

Arenaria lanuginosa (Michx.) Rohrb. [*Spergulastrum*], common in open areas. 8750, 10650, 9700, 8250, 8950, 11000, 10000 & 9150', *Sharples* 931, *Sharples* & *Tripp* 1120, 1297, 1305, 1310, 1369, 1371 & 1379. ANOM: warm parts of the Americas.

Cerastium arvense L. [*C. strictum*], common in upper elevation openings. 10050, 10825, 12400, 10200 & 10200', *Sharples* 48, 217, 230, 616 & 1020. ANOM: Americas & Europe.

Cerastium beeringianum Cham. & Schltdl., common on tundra. 11950 & 12150', *Sharples* 912 and *Sharples* & *Tripp* 1143. WNA.

Cerastium fontanum Baumg., uncommon. 9150', *Sharples* 571. EUA (W).

**Eremogone fendleri* (A. Gray) Ikonn., rare. 7200 & 9050', *Harrington* 8592 (CS) and *Sharples* 288. 4CR; into WY.

Minuartia macrantha (Rydb.) House [*Alsinanthe*], uncommon on rocky streambanks. 9150 & 10200', *Sharples* 574 & 619. 4CR.

Minuartia obtusiloba (Rydb.) House, common on open subalpine ridges and slopes and throughout the alpine zone. 11850, 12150, 12050, 12000 & 12150', *Sharples* 386, 834, 1066, 1116 & 1141. NAA.

Minuartia rubella (Wahlenb.) Hiern, scattered in dry upper elevation areas. 11350, 11950 & 12150', *Sharples* 221, 913 & 1142. New to AA. CIRC.

**Moehringia macrophylla* (Hook.) Fenzl [*Arenaria*], rare. *Heil et al.* 19915 (SJNM). NAA.

Pseudostellaria jamesiana (Torr.) W.A. Weber & R.L. Hartm., uncommon in lowland forest. 9050', *Sharples* 525. WUSA.

Sagina saginoides (L.) H. Karst., scattered along streams. 8650', *Sharples* 284. CIRC.

Silene acaulis (L.) Jacq., common in the alpine. 11400 & 12900', *Sharples* 223 & 635. CIRC.

Silene drummondii Hook., scattered in understory of montane forests. 8500 & 10150', *Sharples* 779 & 1001. WNA.

Silene hitchguirei Bocquet, rare in gravelly soil at upper elevations. 11418', *Douglas* 1778 (CS). USRM; into Alberta.

**Silene latifolia* Poir., rare along roadsides. *Heil* 12419 (SJNM). EUA.

Silene menziesii Hook., rare. 10150', *Sharples* 815. New to AA Wilderness. WNA.

Silene scouleri Hook., common below treeline. 10900, 8400 & 10000', *Sharples* 1008, 1071 & 1099. WNA.

Spergularia rubra (L.) J. Presl & C. Presl, uncommon on disturbed subalpine ground. 11050', *Sharples* 1361. EUA (W).

Stellaria crassifolia Ehrh., uncommon. 9700' from *Sharples* 1295. CIRC.

Stellaria nom. nov. [*Alsine polygonoides* Greene ex Rydb.; *Stellaria irrigua* Bunge sensu W.A. Weber], scattered on eroded alpine tuffs and screes. 12900, 11950, 12450, 12700, 11900, 12500, 11850, 12200, 12500 & 12200' from *Sharples* 654, 918, 926, 967, 969, 1010, 1036, 1050, 1062 & 1367. SRM; volcanic ranges.

Stellaria longifolia Muhl. ex Willd., scattered in wet meadows. 9550', *Sharples* 1318. CIRC.

Stellaria longipes Goldie, scattered in open areas across elevations. 10850 & 9100', *Sharples* 835 & 872. New to AA Wilderness. CIRC.

Stellaria umbellata Turcz., scattered. 9700 & 10800', *Sharples* 1294 & 1301. NAA.

CELASTRACEAE – 2 species

Parnassia fimbriata K.D. Koenig, rare. 9898', *Flaig* 2510 (RM). WNA.

Paxistima myrsinites (Pursh) Raf., uncommon in mixed forest understory. 10200 & 9600', *Sharples* 216 & 748. WNA.

CERATOPHYLLACEAE – 1 species

**Ceratophyllum demersum* L., rare in low elevation ponds. 8950', *Sharples* 1313. New to AA. COSM.

CONVOLVULACEAE – 1 species

**Convolvulus arvensis* L., scattered along ponderosa-oak zone roads. 7300–7500 & 7200', *Hartman* 77410 (RM) and *Sharples* 143. EUA.

CORNACEAE – 2 species

**Cornus canadensis* L., rare. 9600', *Komarek* 503 (FLD). NAA.

Cornus sericea L., scattered across low elevations. 9200', *Sharples* 306. TNA.

CRASSULACEAE – 3 species

Rhodiola integrifolia Raf. [*Tolmachevia*], common in rocky habitats in middle-high elevations. 13300', *Sharples* 634. NAA.

Rhodiola rhodantha (A. Gray) H. Jacobsen [*Clementsia*], common along high creeks and moist meadows. 10200, 12200 & 10200', *Sharples* 618, 1009 & 1014. USRM.

Sedum lanceolatum Torr., common in rocky, well-drained sites across elevations. 9150', *Sharples* 568. WNA.

CUPRESSACEAE – 2 species

Juniperus communis L., scattered throughout forest understory and open areas. 9100 & 9200', *Sharples* 33 & 434. TNH.

**Juniperus scopulorum* Sarg., scattered in the ponderosa-oak zone. 7600', *Sharples* 137. WNA.

CYPERACEAE – 50 species

Carex albonigra Mack., uncommon in high openings. 11850', *Sharples* 211. WNA.

Carex aquatilis Wahlenb., common in high boggy areas. 11350, 11500, 12250 & 11750', *Sharples* 396, 461/464, 907 & 1027. CIRC.

**Carex athrostachya* Olney, uncommon in wetlands. 11350', *Sharples* 397. WNA.

Carex atosquama Mack., rare in high elevation wetlands. 11100', *Sharples* 357. WNA.

Carex aurea Nutt., uncommon in low elevation wetlands. 9000', *Douglas* 1074 (CS). WNA.

Carex bella L.H. Bailey, scattered in wetlands. 9550', *Sharples* 953. SWNA.

Carex canescens L., scattered in subalpine wetlands. 11557–11814', *Flaig* 7974 (RM). COSM.

Carex chalciolepis Holm [*C. heteroneura*], scattered in high elevation wetlands. 12189', *Douglas* 1722 (CS). Greater USRM.

**Carex disperma* Dewey, rare in seeps. 9442', *Flaig* 4740 (RM). CIRC.

**Carex douglasii* Boott, rare. 8789', *Flaig* 4652 (RM). WNA.

Carex ebenea Rydb., common in high, wet areas. 10200, 11600 & 12000', *Sharples* 728, 1018 & 1053. Greater 4CR.

Carex echinata Murray [C. angustior], rare in moist meadows. 10150', *Sharples* 958. New to SSJ of AA (and Wilderness). CIRC.

**Carex egglestonii* Mack., rare in montane openings. 9800–10200', *Nelson* 62329 (RM). SRM.

Carex elynoides Holm, scattered in high meadows. 11218', *Flaig* 4863 (RM). USRM.

**Carex geyeri* Boott, uncommon along watercourses at lower elevations of the western slope. 8780–9200', *Hartman* 79711 (RM). Mostly WUSA.

Carex haydeniana Olney, common in wet sites and high meadow areas. 11850', *Sharples* 1038. Mostly WUSA.

Carex illota L.H. Bailey, scattered across high wetlands. 11750', *Sharples* 1032. Mostly WUSA.

**Carex inops* L.H. Bailey [C. *pennsylvanica*], uncommon at low elevations. 7924', *Flaig* 3904 (RM). Mostly WUSA.

Carex jonesii L.H. Bailey, scattered in riparian areas. 10900', *Sharples* 624. WUSA.

Carex limosa L., uncommon in high wetlands. 10998', *Harrington* 1830 (CS). CIRC.

Carex micropoda C.A. Mey. [C. *crandallii*, C. *pyrenaica*], common on rocky tundra. 12400 & 12200', *Sharples* 1047 & 1064. NAA.

Carex microptera Mack., uncommon in montane wetlands. 8780–9200', *Hartman* 79617 (RM). WNA.

Carex nelsonii Mack., uncommon in high wetlands. 12274', *Douglas* 2048 (CS). USRM.

Carex nigricans C.A. Mey., scattered in high openings. 12189', *Douglas* 12189 (CS). WNA.

Carex nova L.H. Bailey, common in higher elevation wetlands. 11400', *Sharples* 646. WUSA.

**Carex occidentalis* L.H. Bailey, uncommon in ponderosa-oak zone wetlands. 10111', *Flaig* 3752 (RM). WUSA.

Carex oreocharis Holm, rare on high rock slopes. 11812', *Douglas* 1755 (CS). SRM.

Carex pachystachya Cham. ex Steud., scattered in lower forests. 7600, 8600, 8750 & 9800', *Sharples* 94, 264, 936 & 1095/1096. NAA.

**Carex pellita* Muhl. ex Willd. [C. *lanuginosa*], rare in low wetlands. 9000', *Douglas* 1065 (CS). TNA.

Carex perglobosa Mack., rare on tundra scree. 11850', *Sharples* 1037. New to CN. SRM.

Carex phaeocephala Piper, uncommon in open areas. 11600', *Sharples* & *Tripp* 1121. New to CN. WNA.

Carex praeceptorum Mack., uncommon in high openings. 11814–12237', *Flaig* 7949 (RM). Essentially WUSA.

**Carex praegracilis* W. Boott, rare in montane forests. 9442', *Flaig* 4704 (RM). TNA.

Carex retrorsa Schwein., scattered in ponderosa-oak wetlands. 9400', *Sharples* 789. WNNA.

Carex rossii Boott, uncommon in wetlands below treeline. 11484', *Douglas* 1743 (CS). WNNA.

Carex saxatilis L., scattered in high marshlands. 11750', *Sharples* 1376. CIRC.

Carex scopulorum Holm, scattered in high wetlands. 11400 & 11750', *Sharples* 647 & 1031. WNA.

Carex siccata Dewey [C. *foenea*], scattered in wetlands. 10350', *Sharples* & *Tripp* 9. WNNA.

Carex stevenii (Holm) Kala [C. *norvegica*], rare in high marshes. *Harrington* 1834 (CS). USRM.

Carex utriculata Boott, common in riparian areas. 9500, 9500, 8600 & 9800', *Sharples* 158, 178, 265 & 1093. CIRC.

Carex vernacula L.H. Bailey [C. *foetida*], scattered on high saturated ground. 12250', *Sharples* 908. Parts of WUSA. *Eleocharis acicu-*

laris (L.) Roem. & Schult., uncommon along pond shores. 10200', *Sharples* 663. New to CN Wilderness. TNH.

Eleocharis palustris (L.) Roem. & Schult. [E. *xyridiformis*], occasional in low elevation wetlands. 9450 & 10000', *Sharples* 172 & 1370. New to CN Wilderness. TNH.

Eleocharis quinqueflora (Hartmann) O. Schwarz [E. *pauciflora*], occasional in high marshes. 11800', *Sharples* 1115. CIRC.

Eriophorum angustifolium Honck., uncommon in high bogs. 11500', *Sharples* 1363. CIRC.

Eriophorum gracile W.D.J. Koch ex Roth, uncommon in high bogs. 12200', *Sharples* 1366. CIRC.

Kobresia myosuroides (Vill.) Fiori, uncommon in high meadows. 11850', *Sharples* 215. CIRC.

**Schoenoplectus acutus* (Muhl. ex Bigelow) Á. Löve & D. Löve [Scripus], rare around low ponds. *Heil* 12677 (SJNM). TNA.

Schoenoplectus tabernaemontani (C.C. Gmel.) Palla, rare in low wetlands. 7650', *Sharples* 124. COSM.

**Scirpus microcarpus* J. Presl & C. Presl, uncommon along floodplains. 8720–9200 & 8600', *Nelson* 62496 (RM) and *Sharples* 270. TNA.

DENNSTAEDTIACEAE – 1 species

Pteridium aquilinum (L.) Kuhn, common in understory of open mixed forest on the western slope. 8850', *Sharples* 722. COSM.

DRYOPTERIDACEAE – 4 species

**Athyrium filix-femina* (L.) Roth, uncommon. 9843', *Douglas* 2144 (CS). TNH.

Cystopteris fragilis (L.) Bernh. [C. *reevesiana*], common in rock crevices across elevations. 11600, 10050 & 8600', *Sharples* 328, 667 & 808. COSM.

**Gymnocarpium dryopteris* (L.) Newman, rare in gorges. 9500', S. *Komarek* 480 (FLD). CIRC.

**Woodsia oregana* D.C. Eaton, rare. 9500–9800', *Flaig* 2955 (RM). WNNA.

ELAEAGNACEAE – 1 species

Shepherdia canadensis (L.) Nutt., scattered in mixed forest understory. 9100, 9600 & 9300', *Sharples* 30, 749 & 800. WNNA.

EQUISETACEAE – 3 species

Equisetum arvense L., infrequent along creeks in montane forests. 9100', *Sharples* 786. TNH.

**Equisetum hyemale* L., scattered along riparian corridors. 9500', *Sharples* 491. TNH.

**Equisetum laevigatum* A. Braun, uncommon along low riparian areas. 8780–9200', *Hartman* 79671 (RM). WNA.

ERICACEAE – 14 species

Arctostaphylos uva-ursi (L.) Spreng., scattered in low forest openings. 9150', *Sharples* 770. TNH.

Chimaphila umbellata (L.) W.P.C. Barton, uncommon in ponderosa understory. New to AA Wilderness. 8550', *Sharples* 805. TNH.

Gaultheria humifusa (Graham) Rydb., rare. 11484', *Douglas* 2067 (CS). WNA.

Kalmia microphylla (Hook.) A. Heller, rare. 11484', *Douglas* 2066 (CS). WNA.

Moneses uniflora (L.) A. Gray, scattered in subalpine forest understory. 10850', *Sharples* 594. CIRC.

Orthilia secunda (L.) House, uncommon in moist forest understory. 9700', *Sharples* 734 and *Sharples* & *Tripp* 1296. CIRC.

Pterospora andromedea Nutt., rare. 11000', *Douglas* 1353. WNNA.

Pyrola asarifolia Michx. [P. *rotundifolia*], scattered in wet forest understory. 9700', *Sharples* 597. NAA.

Pyrola chlorantha Sw., scattered in wet forest understory. 9450', *Sharples* 558. CIRC.

Pyrola minor L., scattered in subalpine forest understory. 10850', Sharples 1373. CIRC.

**Pyrola picta* Sm., rare. 9843', Douglas 2143a (CS). Mostly WUSA.

Vaccinium cespitosum Michx., uncommon on stable tundra slopes. 12350 & 12050', Sharples 829 and Sharples & Tripp 1131. New to AA. WNNA.

Vaccinium myrtillus L., abundant in subalpine forest understory and clearings. 10000, 11350, 10800 & 9550', Sharples 151, 777, 928 & 954. CIRC.

Vaccinium scoparium Leiberg ex Coville, common in subalpine openings. 11450 & 11600', Sharples 1029 and Sharples & Tripp 1125. WNA.

EUPHORBACEAE – 1 species

**Chamaesyce serpyllifolia* (Pers.) Small, rare along low roadsides. 8200', Sharples 701. New to SSJ. TNA.

FABACEAE – 28 species

**Astragalus agrestis* Douglas ex G. Don, uncommon. 8789', Flaig 4591 (RM). NAA.

Astragalus alpinus L., common in forest understory. 9100, 10350, 9150 & 10200', Sharples & Tripp 27 and Sharples 416, 771 & 1023. CIRC.

**Astragalus bisulcatus* (Hook.) A. Gray, common in the ponderosa-oak zone. 7750', Sharples 753. Mostly WUSA.

**Astragalus lonchocarpus* Torr., common in the ponderosa-oak zone. 8600, 7200 & 8500', Sharples 129, 750 & 781. 4CR; NV.

Hedysarum occidentale Greene, occasional on eroded slopes and other openings. 10800, 8600, & 10200', Sharples 406, 807 & 1041. New to AA Wilderness. Greater USRM.

Lathyrus leucanthus Rydb., common in forest understory. 8000 & 10850', Sharples 76 & 531. New to Wilderness (AA). 4CR; S WY.

**Lotus wrightii* (A. Gray) Greene, scattered in the ponderosa-oak zone. 7721 & 7950', Flaig 4924 (RM) and Sharples 778. 4CR.

Lupinus argenteus Pursh, common in open areas below treeline. 9200', Sharples 427. WUSA.

**Lupinus kingii* S. Watson, scattered in ponderosa-oak savannah. 7750', Sharples 86. 4CR; E NV.

**Lupinus polyphyllus* Lindl. [including *L. ammophilus*], uncommon at low elevation. 8730 & 8150', Flaig 3779 (RM) and Sharples 758. WNNA.

Lupinus sericeus Pursh, common in the ponderosa-oak zone. 7800', Sharples 111. Mostly WUSA.

**Medicago lupulina* L., uncommon on disturbed ground of the western slope. 7750 & 8250', Sharples 87 & 700. EUA.

**Medicago sativa* L., rare. 8130–8535', Flaig 2858 (RM). EUA.

**Melilotus albus* Medik., rare along ponderosa-oak zone roads. Heil 12603 (SJNM). EUA.

**Melilotus officinalis* L., scattered along roadsides. 8730, 8400 & 9500', Flaig 3781 (RM) and Sharples 136 & 257. EUA.

Oxytropis lambertii Pursh, uncommon at low elevation dry sites. 8750 & 9100', Sharples 610 & 769. ANOM: central North America.

Oxytropis podocarpa A. Gray, rare. 12274', Douglas 2070 (CS). WNNA.

Oxytropis splendens Douglas ex Hook., rare. 9200', Sharples 428. New to Wilderness (CN). WNNA.

Thermopsis montana Nutt., common in mixed forest zone. 8700, 8000 & 9200', Sharples & Tripp 16 and Sharples 101 & 451. WUSA.

Trifolium attenuatum Greene, common in the upper subalpine and on tundra. 10750, 12050, 11900, 12900 & 12050', Sharples 203, 235, 534, 1067 & 1282. New to AA Wilderness. SRM.

Trifolium brandegeei S. Watson, scattered in the upper subalpine and on tundra. 10750, 12050, 11250 & 12800', Sharples 205, 234, 363 & 637. SRM.

**Trifolium hybridum* L., uncommon. 8780–9200 & 8650', Hartman 79625 (RM) and Sharples 1283. EUA.

**Trifolium longipes* Nutt., common in lowlands. 8000 & 9550', Sharples 77 & 159. WUSA.

Trifolium nanum Torr., uncommon on barren tundra. 12050', Sharples 238. USRM.

Trifolium parryi A. Gray, uncommon on tundra. 12400', Sharples 1046. USRM.

Trifolium pratense L., common along low disturbed corridors, e.g. floodplains and trails. 8650, 9250 & 9300', Sharples 280, 557 & 802. EUA (W).

Trifolium repens L., common along disturbed ground in the mixed forest zone. 8650, 9200, 9250 & 9500', Sharples 281, 447, 549 & 1087. EUA (W).

Vicia americana Muhl. ex Willd., common in mixed forest understory. 7750, 9100 & 9100', Sharples 85, 452 & 788. New to CN Wilderness. TNA.

FAGACEAE – 1 species

Quercus gambelii Nutt., a dominant tree of the western slope lowlands. 8000 & 8600', Sharples 83 & 715. Greater 4CR.

GENTIANACEAE – 10 species

Fraseria speciosa Douglas, scattered on the western slope at low-middle elevations. 8600 & 9500', Sharples 502 & 513. WUSA.

Gentiana algida Pall., common in high, open areas. 11650 & 12500', Sharples 1006 & 1011. NAA.

**Gentiana fremontii* Torr. [*G. aquatica*], rare. 8789', Flaig 4623 (RM). Mostly WUSA.

Gentiana parryi Engelm., common in high meadows. 11900', Sharples 643. SRM.

Gentiana prostrata Haenke, uncommon in "understory" of tundra vegetation. 12450, 12450 & 12700', Sharples 650, 1044 & 1144. New to AA (MS 1044). CIRC.

Gentianella acuta (Michx.) Hiitonen [*G. amarella*], common in high openings. 11600, 11800, 11900 & 12400', Sharples 674, 1007, 1043 & 1063. CIRC.

Gentianella heterosepala (Engelm.) Holub [*G. amarella*], uncommon in forest openings. 9000', Sharples 944. 4CR; WY.

Gentianella tenella (Rottb.) Börner, rare on tundra. 12400', Sharples 1049. New to AA. CIRC.

Gentianopsis thermalis (Kuntze) Iltis, common in open areas. 11250 & 8750', Sharples 666 & 996. USRM.

Swertia perennis L., common in moist subalpine meadows. 11900 & ~11600', Sharples 642 & 725. CIRC.

GERANIACEAE – 2 species

Geranium caespitosum E. James, scattered in low areas. 9000, 8900, 8750 & 9300', Sharples 61, 67, 244 & 289. Greater SRM.

Geranium richardsonii Fisch. & Trautv., common in open areas. 9800, 8600, 11600 & 9500', Sharples 155, 273, 311 & 516. WNA.

GROSSULARIACEAE – 6 species

**Ribes inermis* Rydb., uncommon in lowlands. 10050', Sharples & Tripp 52. WNA.

Ribes lacustre (Pers.) Poir., rare. 11850', Sharples 831. WNNA.

Ribes laxiflorum Pursh [*R. coloradense*], rare. 10992–12569', Flaig 2478 (RM). NAA.

**Ribes leptanthum* A. Gray, uncommon at low elevation. 9100', Sharples & Tripp 38. 4CR.

Ribes montigenum McClatchie, scattered in forest understory, openings, and subalpine ridges. 9500' & 12000', Sharples 175 & 821. Essentially WUSA.

Ribes wolfii Rothr., common at low elevations. 9100, 10500, 10300 & 9300', Sharples & Tripp 26 and Sharples 149, 773 & 801. 4CR; disjunct in PNW.

HALORAGACEAE – 1 species

**Myriophyllum sibiricum* Kom., scattered in low lakes. 9600', *Heil* 12742 (SJNM). NAA.

HYDRANGEACEAE – 1 species

Jamesia americana Torr. & A. Gray, rare. 10400', *Sharples* 774. New to Wilderness (CN). SWNA.

HYDROCHARITACEAE – 1 species

**Elodea canadensis* Michx., uncommon in lakes. *O'Kane et al.* 6911 (SJNM). TNA.

HYDROPHYLLACEAE – 5 species

**Hydrophyllum capitatum* Douglas ex Benth., rare. 9515', *Douglas* 1899 (CS). WUSA.

Hydrophyllum fendleri (A. Gray) A. Heller, common in montane forests and openings. 9800 & 9200', *Sharples* 154 & 840. Essentially WUSA.

**Phacelia bakeri* (Brand) J.F. Macbr., rare. 9250 & 10450', *Heil* 24980 (SJNM) and *Sharples* 613. SRM

Phacelia heterophylla Pursh, common in low forests. 9600 & 9150', *Sharples* 488 & 566. WUSA.

Phacelia sericea (Graham) A. Gray, common on and around unstable rock slopes. 11600, 8600 & 12000', *Sharples* 314, 820 & 843. WNA.

HYPERICACEAE – 1 species

**Hypericum scouleri* Hook., rare on rocky floodplains. 7850', *Sharples* 496. WNA.

IRIDACEAE – 1 species

Iris missouriensis Nutt., common in open sites from low-middle elevations. 9200', *Sharples* 15 & 441. Essentially WUSA.

ISOËTACEAE – 2 species

Isoëtes bolanderi Engelm., scattered in subalpine ponds. 11650, 11500 & 11450', *Sharples* 402, 1026 & 1030. USRM.

Isoëtes echinospora Durieu, uncommon in high eastern slope lakes. 11484', *Douglas* 2072 (CS). CIRC.

JUNCACEAE – 16 species

Juncus arcticus Willd. [*J. balticus*], uncommon at low elevations. 9200', *Sharples* 432. New to Wilderness (CN). TNH; beyond.

Juncus bufonius L., rare in lower riparian areas. 9020', *M. Smith* 94MS-96 (CS). COSM.

Juncus castaneus Sm., rare in montane wetlands. 9020', *M. Smith* 94MS-87 (CS). CIRC.

Juncus confusus Coville, occasional in mixed forest wetlands. 9160–9560', *Nelson* 62436 (RM). WNA.

Juncus drummondii E. Mey., common on tundra. 12000, 11600 & 12400', *Sharples* 336, 727 & 1048. WNA.

**Juncus dudleyi* Wiegand, rare. *Heil* 11485 (SJNM). TNA.

Juncus ensifolius Wikstr. [*J. saximontanus*, *J. tracyi*], uncommon along streamcourses. 9250 & 7900', *Sharples* 550 & 708. CIRC.

**Juncus hallii* Engelm., uncommon in riparian areas. *Heil* 12452 (SJNM). Greater USRM.

Juncus interior Wiegand, rare in marshy areas. 9200–9240', *Nelson* 62606 (RM). TNA.

**Juncus longistylis* Torr., rare. 10000–10080 & 8600', *Nelson* 62295 (RM) and *Sharples* 271. WNA.

Juncus mertensianus Bong., common in higher wet areas. 11600', *Sharples* 726. WNA.

Juncus nevadensis S. Watson, uncommon in low wetlands. 9200–9240', *Nelson* 62557 (RM). WNA.

Juncus parryi Engelm., scattered in subalpine meadows. 11250', *Sharples* 361. WUSA.

Luzula parviflora (Ehrh.) Desv., common in subalpine forests. 11550 & 11000', *Sharples* 399 & 848. CIRC.

Luzula spicata (L.) DC, common on tundra. 12000 & 11850', *Sharples* 335 & 1034. CIRC.

Luzula subcapitata (Rydb.) H.D. Harr., rare in bogs. *Lundquist & Rink* L72 (SJNM). SRM.

LAMIACEAE – 6 species

Agastache pallidiflora (A. Heller) Rydb., common in openings of the western slope. 10950, 9000, 9650 & 8500', *Sharples* 581, 600, 946 & 1350. 4CR; TX.

Dracocephalum parviflorum Nutt., common in meadows. 8800', *Sharples* 1081. TNA.

**Glechoma hederacea* L., rare in low, wet soils. 7800', *Sharples* 113. New to AA (and SSJ). EUA.

Mentha arvensis L., scattered on disturbed ground on the western slope. 8600 & 9200', *Sharples* 504 and *Sharples & Tripp* 1348. CIRC.

Prunella vulgaris L., occasional in wet areas of lower elevations. 9200, 8150 & 8900', *Sharples* 429, 952 & 974. Native range unclear; TNH and beyond.

**Stachys pilosa* Nutt., uncommon along stream courses. 7850', *Sharples* 497. New to SSJ of AA. TNA.

LENTIBULARIACEAE – 1 species

Utricularia macrorhiza Leconte [*U. vulgaris*], uncommon in lower elevation ponds. 10000', *Douglas* 2077 (CS). NAA.

LILIACEAE – 4 species

Calochortus gunnisonii S. Watson, common in the ponderosa-oak zone. 8600', *Sharples* 500. USRM.

Lloydia serotina (L.) Salisb. ex Rchb., rare on subalpine ridges. 11484', *Douglas* 2092 (CS). CIRC.

Prosartes trachycarpa S. Watson, common at low elevations. 9100', *Sharples & Tripp* 22. WUSA.

Streptopus amplexifolius (L.) DC [*S. fassettii*], uncommon in dense forest understory. 9550', *Sharples* 1317. CIRC.

LINACEAE – 1 species

Linum lewisii Pursh, scattered in low openings. 8000, 9500 & 9250', *Sharples* 495, 519 & 1083. WNA.

MALVACEAE – 4 species

**Malva neglecta* Wallr., rare along roads. 9350', *Sharples* 1344. New to SSJ. EUA.

Sidalcea candida A. Gray, common in the ponderosa-oak zone. 9100, 8600 & 9500', *Sharples* 494, 508 & 522. Aberrant 4CR.

Sidalcea neomexicana A. Gray, common in the ponderosa-oak zone. 7450 & 8200', *Sharples* 538 & 697. SWNA.

**Sphaeralcea fendleri* A. Gray, rare. *Heil* 12635 (CS). Aberrant 4CR.

MELANTHIACEAE – 2 species

Veratrum californicum Durand, abundant in subalpine meadows. 10350 & 8800', *Sharples* 414 & 510. WUSA.

Zigadenus elegans Pursh, common in openings across elevations. 7600, 11600, 10850 & 12500', *Sharples* 138, 329, 530 & 859. TNA.

MONTIACEAE – 5 species

**Claytonia lanceolata* Pursh, uncommon on the western slope. *Heil* & *Heil* 21879 (SJNM). WUSA.

Claytonia megarrhiza (A. Gray) Parry ex S. Watson, abundant across alpine scree and talus. 11850, 12100 & 12300', *Sharples* 387, 823 and *Sharples & Tripp* 1139. WNA.

**Lewisia nevadensis* (A. Gray) B.L. Rob., uncommon in ponderosa-oak understory. 8000', *Sharples* 81. Patchy WUSA.

Lewisia pygmaea (A. Gray) B.L. Rob., uncommon in subalpine openings. 11850', *Sharples* 962. New to AA Wilderness. WNA.

Montia chamissoi (Ledeb. ex Spreng.) Greene, rare. 9200', *Sharples* 439. New to Wilderness (CN). WNA.

NYCTAGINACEAE – 2 species

Mirabilis linearis (Pursh) Heimerl, rare. 9023', *Douglas* 1252 (CS). TNA.

**Mirabilis melanotricha* (Standl.) Spellensb., uncommon on low screes and outcroppings. 8050 & 8500', *Sharples 711 & 1351*. New to AA and SSJ. SWNA.

NYMPHAEACEAE – 1 species

Nuphar polysepalum Engelm., uncommon in ponds. 11000', *Sharples 403*. WNA.

ONAGRACEAE – 13 species

Chamerion angustifolium (L.) Holub, common on open ground. 9000, 9000 & 9250', *Sharples 305, 483 & 554*. TNH.

Chamerion latifolium (L.) Holub, uncommon on rocky ground. New to AA. 8650, 9100 & 12150', *Sharples 275, 871 & 910*. CIRC.

Epilobium anagallidifolium Lam. [*E. alpinum*], uncommon in alpine riparian zones. 11850', *Sharples 964*. CIRC.

Epilobium brachycarpum C. Presl, scattered in low meadows. 9200–9240', *Nelson 62544* (RM). WNNA.

Epilobium ciliatum Raf., common in low open areas. 9550 & 8750', *Sharples 527 & 545*. TNA; beyond.

Epilobium clavatum Trel., rare in high, rocky areas. 10350', *Sharples 836*. New to the South San Juans counties (found in AA). WNA.

Epilobium halleuanum Hausskn., uncommon. *Heil & Mietty 13274* (SJNM). Mostly WUSA.

Epilobium hornemannii Rchb. [including *E. lactiflorum*], common at middle elevations. 10350', *Sharples 1286*. CIRC.

Epilobium saximontanum Hausskn., common in riparian areas. 11350, 9250 & 8600', *Sharples 395, 551 & 810*. Mostly WUSA.

**Gayophytum diffusum* Torr. & A. Gray, uncommon low on the western slope. 8130–8535', *Flaig 2861* (RM). Essentially WUSA.

**Oenothera caespitosa* Nutt., common in low openings. 8950' (*Sharples*), *Heil 13301* and *Sharples & Tripp 58*. Essentially WUSA.

**Oenothera flava* (A. Nelson) Garrett, uncommon in low areas. 9100', *Sharples & Tripp 39*. Essentially WUSA.

**Oenothera villosa* Thunb., uncommon in lowlands. 7850 & 7900', *Sharples 498 & 706*. TNA native.

OPHIGLOSSACEAE – 6 species

**Botrychium hesperium* (Maxon & R.T. Clausen) W.H. Wagner & Lellinger, rare. 10500', *Root 91-27* (DBG). Mostly WNA.

Botrychium lanceolatum (S.G. Gmel.) Angstr. subsp. *lanceolatum*, uncommon. ~12100', *Douglas 2010* (CS). CIRC.

Botrychium lunaria (L.) Sw., uncommon. ~12100', *Douglas 2011* (CS). COSM.

**Botrychium minganense* Vict., rare. *Reeves 10662* (SJNM). WNNA.

**Botrychium pallidum* W.H. Wagner, rare. 10200', *Root 1206* (DBG). ANOM: disjunct from eastern/central Canada.

**Botrychium pinnatum* H. St. John, uncommon. *Heil et al. 12456* (SJNM). WNA; Greenland.

ORCHIDACEAE – 10 species

**Calypso bulbosa* (L.) Oakes, rare in montane forests. 8600', *Heil & Mietty 13277* (SJNM). CIRC.

Corallorhiza maculata Raf., common forest understory. 8000, 9600, 9900 & 10850', *Sharples 100, 487, 579 & 595*. TNA.

Corallorhiza trifida Châtel., rare. 9187', *Douglas 2016a* (CS). CIRC.

Corallorhiza wisteriana Conrad, uncommon. *Heil & Mietty 13278* (SJNM). TNA.

Goodyera oblongifolia Raf., scattered in lowland forest understory. 9500', *Sharples 1086*. WNNA.

Listera cordata (L.) R. Br., uncommon in subalpine forest. 10200', *Sharples 874*. CIRC.

Platanthera huronensis (Nutt.) Lindl. [*P. aquilonis*, *P. hyperborea*], scattered in moist forests. 10550, 8950 & 9550', *Sharples 596* and *Sharples & Tripp 1311 & 1329*. WNNA.

Platanthera obtusata (Banks ex Pursh) Lindl., rare. 11198', *Douglas 1343* (CS). CIRC.

Platanthera purpurascens (Rydb.) Sheviak & W.F. Jennings [*P. saccata*, *P. stricta*], common in low meadows. 9350 & 10150', *Sharples 795 & 956*. SWNA.

Spiranthes romanzoffiana Cham., uncommon in riparian meadows. 8750 & 11000', *Sharples 994 & 1024*. New to AA. WNNA.

OROBANCHACEAE – 14 species

Castilleja linariifolia Benth., scattered across lowlands. 9200', *Sharples 449*. WUSA.

Castilleja lineata Greene, uncommon in montane meadows. 9200', *Sharples 430*. 4CR; not UT.

Castilleja miniata Douglas ex Hook., common below treeline. 9550, 10300 & 10200', *Sharples 167, 201* and *Sharples & Tripp 1117*. WNA.

Castilleja occidentalis Torr., common in high meadows. 11500', *Sharples 318*. USRM.

Castilleja rhexifolia Rydb., common in openings. 8650, 11500, 11800 & 11450', *Sharples 296, 320, 341, 583 & 584*. USRM.

Castilleja sulphurea Rydb., common. 8650 & 9650', *Sharples 277 & 949*. USRM.

Orthocarpus luteus Nutt., scattered across lowland savannah. 8400 & 8650', *Sharples 712 & 719*. New to Wilderness (AA). WNA.

Pedicularis bracteosa Benth. subsp. *paysoniana* (Pennell) W.A. Weber, scattered in the subalpine zone. 11650', *Sharples 589*. New to AA. Mostly WUSA.

Pedicularis groenlandica Retz., common in wet, open areas below treeline. 8950, 9650, & 11650', *Sharples 303, 307 & 586*. WNNA.

Pedicularis parryi A. Gray, common on loose ground in the subalpine zone. 11200 & 11700', *Sharples 366 & 472*. Greater USRM.

Pedicularis procera A. Gray, scattered throughout mixed forests. 9600', *Sharples 598*. Greater 4CR.

Pedicularis racemosa Douglas ex Benth. subsp. *alba* Pennell, common in dry areas of subalpine forests. 11500, 10350 & 10850', *Sharples 375, 411 & 532*. Mostly WUSA.

Pedicularis scopulorum A. Gray, rare on tundra. New to AA. 12650', *Sharples 862*. SRM.

**Rhinanthus minor* L., uncommon, in the Chama valley. 8750', *Sharples 995*. EUA.

PAPAVERACEAE – 2 species

Corydalis aurea Willd., scattered in low, dry areas. 9100', *Sharples & Tripp 37*. TNA.

Corydalis caseana A. Gray subsp. *brandegeei* (S. Watson) G. Ownbey, scattered, mostly in moist meadows. 9100 & 9150', *Sharples 493 & 570*. Patchy WUSA; subspecies: SRM.

PHRYMACEAE – 2 species

Mimulus guttatus DC, common near flowing water. 8600, 8700, 11500 & 10550', *Sharples 266, 300, 400 & 1102*. WNA.

Mimulus tilingii Regel, scattered in high areas by flowing water. 11500', *Sharples 319*. WNA.

PINACEAE – 10 species

Abies bifolia A. Murray, uncommon mixed forest component. 10700', *Sharples & Tripp 1148*. New to CN. ROMO.

Abies concolor (Gordon & Glend.) Lindl. ex Hildrebr., uncommon mixed forest component. 8750', *Sharples 930*. New to Wilderness (AA). WUSA.

Picea engelmannii Parry ex Engelm., abundant/dominant tree of higher elevations. 10500 & 9550', *Sharples 145 & 166*. WNA.

Picea pungens Engelm., scattered along montane drainages. 8600', *Sharples 272*. 4CR.

**Pinus aristata* Engelm., rare on barren subalpine slopes. 11000', *Sharples 373*. SRM.

Pinus contorta Douglas ex Loudon, rare in subalpine forest. 10450', *Sharples 408*. WNA.

Pinus flexilis E. James, scattered on open ridges. 11100 & 10600', Sharples 391 & 775. New to Wilderness (AA). Essentially WUSA.
Pinus ponderosa Douglas ex P. Lawson & C. Lawson, abundant component of the lowest forests. 7900 & 9200', Sharples 99 & 438. Essentially WUSA.
Pinus strobiformis Engelm., uncommon in the subalpine zone. 10700', Sharples 1106. New to Wilderness (AA). Greater 4CR.
Pseudotsuga menziesii (Mirb.) Franco, common component of lower forests. 8950 & 9800', Sharples 59 & 241. WNA.

PLANTAGINACEAE – 21 species

Besseyia alpina (A. Gray) Rydb., uncommon in alpine cliffs and talus. 12250, 13000 & 12350', Sharples 826, 833 & 864. New to AA. SRM.
Callitriche palustris L. [C. verna], scattered in ponds. 9450 & 11475', Sharples 168 and Sharples & Tripp 1375. COSM.
Chionophila jamesii Benth., scattered on tundra. New to AA. 12900', Sharples 639. SRM.
**Collinsia parviflora* Lindl., uncommon in the ponderosa-oak zone. 7900 & 8400', Sharples 97 & 756. New to SSJ. WNNA.
Hippuris vulgaris L., occasional in semi-stagnant waters. 8750 & 9400', Sharples 563 & 790. New to AA Wilderness. TNH.
**Linaria vulgaris* Mill., uncommon roadside weed. 8200', Sharples 696. EUA.
Penstemon barbatus (Cav.) Roth, scattered on arid ground at low elevation. 7800 & 9500', Sharples 191 & 661. 4CR; TX.
Penstemon crandallii A. Nelson [P. caespitosus, P. teucroides], common on arid, low sites. 8100, 9700, 8500 & 9050', Sharples 117, 294, 612 & 766. New to Wilderness (CN). 4CR.
Penstemon hallii A. Gray, scattered across semi-barren portions of the tundra. 12300, 11700 & 12300', Sharples 350, 474 & 630. SRM.
Penstemon harboursii A. Gray, infrequent on unstable tuff slopes and alpine cliffs. New to SSJ; new to CN and AA (and Wilderness). 11700, 11650 & 12100', Sharples 657, 819 & 911. SRM: volcanic ranges.
Penstemon rydbergii A. Nelson, scattered at low elevation. 9100', Sharples 455. New to Wilderness (CN). WUSA.
Penstemon strictus Benth. [P. strictiformis], common in low, open areas. 7650, 8100 & 9200', Sharples 142, 181 & 431. Greater 4CR.
Penstemon whippleanus A. Gray, scattered across open areas of upper elevations. 11200', Sharples 368. USRM.
**Plantago lanceolata* L., scattered along roads. 8200', Sharples 699. New to SSJ of AA. EUA.
Plantago major L., common along disturbed corridors. 8250 & 9150', Sharples 542 & 567. EUA (W).
Plantago tweedyi A. Gray, uncommon. 11352', Douglas & Wilken 1221 (CS). USRM.
Veronica americana Schwein. ex Benth., common in low riparian areas. 8600, 9200 & 9400', Sharples 267, 440 & 791. NAA.
**Veronica anagallis-aquatica* L. [V. catenata], scattered in low wetlands. 8950', Sharples 1309. COSM; native status unclear.
**Veronica peregrina* L., rare. 10171', Douglas 2121 (CS). ANOM: Americas natively.
Veronica serpyllifolia L., common in low riparian areas. 7600 & 9550', Sharples 92 & 161. COSM.
Veronica wormsjoldii Roem. & Schult. [V. nutans], ubiquitous on tundra and high meadows. 12000, 11650 & 11600', Sharples 334, 588 & 675. WNNA.

POACEAE – 82 species

Achnatherum hymenoides (Roem. & Schult.) Barkworth, occasional at low elevation. 8550 & 8400', Sharples 130 & 784. WNA.
Achnatherum lettermanii (Vasey) Barkworth, uncommon in the montane zone. 9800–10200', Nelson 62330 (RM). WUSA.
Achnatherum nelsonii (Scribn.) Barkworth, uncommon. 10400', Sharples 620. WNA.

Achnatherum pinetorum (M.E. Jones) Barkworth, rare. 10171', Douglas 2093 (CS). WUSA.
**Agropyron cristatum* (L.) Gaertn., uncommon along roadsides. 7924 & 8700', Flaig 3885 (RM) and Sharples 252. EUA.
Agrostis exarata Trin., uncommon near water. 8950–9050', Nelson 62466 (RM). WNA.
Agrostis gigantea Roth, uncommon along western slope corridors. 8950–9050', Nelson 62467 (RM). EUA (W).
Agrostis idahoensis Nash, uncommon. 11557–11814', Flaig 7979 (RM). WUSA.
Agrostis scabra Willd., scattered. 9200–9240', Nelson 62622 (RM). NAA.
**Agrostis stolonifera* L., scattered in low disturbed sites. 8535–8730', Flaig 2897 (RM). EUA.
Alopecurus aequalis Sobol., common in wet, muddy areas. 8700', Sharples 299. TNH.
**Alopecurus pratensis* L., scattered in low disturbed areas. 8000', Sharples 84. EUA.
Anthoxanthum hirtum (Shrank) Y. Schouten & Veldkamp [Hierochloë hirta; H. odorata], uncommon in meadows. 11200', Sharples 853. New to Wilderness (AA). CIRC.
Beckmannia syzigachne (Steud.) Fernald, uncommon along roads and trails. 8700', Sharples 1307. NAA.
Blepharoneuron tricholepis (Torr.) Nash, scattered. 10400', Sharples 622. SWNA.
Bromus carinatus Hook. & Arn., uncommon in montane forests. 9000', Sharples 942. New to Wilderness (AA). WNA.
Bromus ciliatus L., scattered in the montane. 8950–9050', Nelson 62489 (RM). TNA.
**Bromus inermis* Leyss., common along low roads. 7650, 8600 & 8200', Sharples 125, 507 & 695. EUA.
**Bromus japonicus* Thunb., rare along ponderosa-oak zone roads. 7760–7920', Nelson 59013 (RM). EUA.
**Bromus lanatipes* (Shear) Rydb., rare. 9800–10200', Nelson 62334 (RM). SWNA.
Bromus porteri (J.M. Coulter) Nash [B. anomalus], uncommon in open areas. 10400 & 9800', Sharples 621 & 1098. New to Wilderness (CN & AA). WNA.
Bromus pumpellianus Scribn., rare in high meadows. 11700', Sharples 378. NAA.
**Bromus tectorum* L., scattered in disturbed lowlands. 8745 & 7650', Flaig 3910 (RM) and Sharples 122. EUA.
Calamagrostis canadensis (Michx.) P. Beauv., common in clearings and riparian areas. 9000', Sharples 940. NAA.
Calamagrostis purpurascens R. Br., rare. 12107', Douglas 1717 (CS). NAA.
**Calamagrostis scopulorum* M.E. Jones, uncommon. 10171', Douglas 2119 (CS). USRM.
Dactylis glomerata L., uncommon along disturbance corridors. 8750', Sharples 937. EUA (W).
Danthonia intermedia Vasey, occasional in high meadows. 11600', Sharples 676. WNNA.
Danthonia parryi Scribn., uncommon in open areas. 9800', Douglas 1098 (CS). USRM.
Deschampsia cespitosa (L.) P. Beauv., common in moist areas. 12150, 10200 & 11700', Sharples 903, 1021 & 1381. CIRC.
Elymus elymoides (Raf.) Swezey, common in dry, open areas at low elevation. 8100 & 9800', Sharples 182 & 1097. WNA.
Elymus glaucus Buckley, scattered in wet areas of low western slope forests. 8600, 8750 & 9000', Sharples 812, 934 & 943. WNNA.
**Elymus repens* (L.) Gould [Elytrigia], rare. 8720–9200', Nelson 62520 (RM). EUA.
Elymus scribneri (Vasey) M.E. Jones, common on tundra. 13300, 12350, 12100 & 11850', Sharples 633, 867, 917 & 1055. WUSA.

- Elymus trachycaulus* (Link) Gould ex Shinnars, common in open areas. 11700, 11900, 10200 & 11600', *Sharples* 379, 961, 1015 and *Sharples & Tripp* 1126. WNNA.
- **Festuca arizonica* Vasey, scattered in lowlands. 7760–7920', *Nelson* 58994 (RM). SWNA.
- Festuca brachyphylla* Schult. & Schult. f., common on alpine tundra. 12150, 12800, 11450 & 11600', *Sharples* 900, 920, 1028 and *Sharples & Tripp* 1122. CIRC.
- Festuca idahoensis* Elmer, rare. 9800', *Douglas* 1094 (RM). Mostly WUSA.
- Festuca minutiflora* Rydb., occasional on loose alpine slopes. 11900', *Sharples* 380. WNA.
- **Festuca rubra* L., rare. 8789', *Flaig* 4669 (RM). TNH.
- Festuca saximontana* Rydb., uncommon in high, wet openings. 11850', *Sharples* 1035. WNNA.
- Festuca sororia* Piper, uncommon on the lower western slope. 8750', *Sharples* 935. 4CR.
- Festuca thurberi* Vasey, common in low openings. 8400 & 8650', *Sharples* 713 & 719. SRM.
- **Glyceria borealis* (Nash) Batch., rare in low riparian areas. *O Kane et al.* 6915 (SJNM). WNNA.
- Glyceria elata* (Nash) M.E. Jones, scattered in the montane zone of the western slope. 9000', *Sharples* 941. Mostly WUSA.
- Glyceria grandis* S. Watson, uncommon in low ponds. 8700', *Sharples* 1349. WNNA.
- Glyceria striata* (Lam.) Hitchc., scattered in low wetlands. 9020', *M. Smith* 94MS-91 (CS). TNA.
- **Hesperostipa comata* (Trin. & Rupr.) Barkworth, uncommon in ponderosa-oak savannah. 7924 & 8100', *Flaig* 3884 (RM) and *Sharples* 180. WNNA.
- **Hordeum brachyantherum* Nevski, uncommon in the ponderosa-oak zone. 7721', *Flaig* 4943 (RM). Mostly WNA.
- **Hordeum jubatum* L., scattered along roads. 8600', *Sharples* 501. New to SSI. NAA.
- Koeleria macrantha* (Ledeb.) Schult., common in low openings. 8500', *Sharples* 780. TNH.
- Melica porteri* Scribn., uncommon on floodplains. 9250', *Sharples* 730. SWNA.
- **Muhlenbergia andina* (Nutt.) Hitchc., rare on floodplains. 7990', 94MS-299 (CS). Mostly WUSA.
- **Muhlenbergia asperifolia* (Nees & Meyen ex Trin.) Parodi, rare in low talus. *Heil & Heil* 14045 (SJNM). WNNA.
- **Muhlenbergia montana* (Nutt.) Hitchc., rare in rocky openings of mixed forest. 8730–9500', *Flaig* 2946 (RM). Greater SWNA.
- **Oryzopsis asperifolia* Michx., rare in montane forest. 9100', *Sharples & Tripp* 19. WNNA.
- **Pascopyrum smithii* (Rydb.) Barkworth & D.R. Dewey [*Elymus*], uncommon at low elevation. 7924', *Flaig* 3883 (RM). TNA.
- Phleum commutatum* Gaudin [*P. alpinum*], common in higher open sites. 11250, 12800 & 10200', *Sharples* 362, 638 & 1017. CIRC.
- Phleum pratense* L., common in disturbed lowlands. 8200 & 8750', *Sharples* 694 & 938. EUA (W).
- Poa abbreviata* R. Br. [*P. pattersonii*], uncommon at and above treeline. 11850', *Sharples* 1404. New to AA. CIRC.
- Poa alpina* L., common at and above treeline. 11100, 12600, 10200 & 11850', *Sharples* 849, 924, 1019 & 1056. CIRC.
- Poa arctica* R. Br., scattered in moist, high openings. 11850', *Sharples* 1033. CIRC.
- **Poa bulbosa* L., rare along ponderosa-oak zone roads. *Heil* 13116 (SJNM). EUA.
- **Poa compressa* L., uncommon at low elevation. 7721', *Flaig* 4942 (RM). EUA.
- Poa cusickii* Vasey [*P. epilis*], rare in the alpine. 12150', *Sharples* 902. WNA.
- Poa fendleriana* (Steud.) Vasey, scattered in open areas. 9100 & 10150', *Sharples* 762 & 816. WNA.
- Poa glauca* Vahl, uncommon above treeline. 10350 & 13300', *Sharples & Tripp* 14 and *Sharples* 632. CIRC.
- Poa interior* Rydb. [*P. nemoralis*], scattered. 11814–12237', *Flaig* 7964 (RM). WNNA.
- Poa leptocoma* Trin., uncommon at high elevation. 12150', *Sharples & Tripp* 1134. Mostly WNA.
- Poa lettermanii* Vasey, rare in tundra meadows. 11814–12237', *Flaig* 7959 (RM). WUSA.
- Poa palustris* L., scattered in low, moist areas. 9160–9560', *Nelson* 62428 (RM). CIRC.
- Poa pratensis* L. [*P. agazizensis*], common in open low elevation areas. 8550, 9100, 8750 & 8750', *Sharples* 115, 787, 932 & 933. TNH.
- Poa reflexa* Vasey & Scribn., scattered in forests. 11458–11557', *Flaig* 7997 (RM). Greater USRM.
- Poa secunda* J. Presl, uncommon. 10350', *Sharples* 839. WNNA; disjunct elsewhere.
- Poa wheeleri* Vasey [*P. nervosa*], rare. 10000–10080', *Nelson* 62293 (RM). WNA.
- **Psathyrostachys juncea* (Fisch.) Nevski, rare in disturbed sites of western slope lowlands. 7650', *Sharples* 140. Found west of study area, but constitutes a new AA record. EUA.
- **Schedonorus arundinaceus* (Schreb.) Dumort. [*Festuca*], uncommon along ponderosa-oak zone roads. 7924', *Flaig* 3888 (RM). EUA.
- **Thinopyrum intermedium* (Host) Barkworth & D.R. Dewey [*Elymus hispidus*], uncommon. 10000–10080', *Nelson* 62293 (RM). EUA.
- Torreyochloa pallida* (Torr.) G.L. Church, uncommon in wet montane soils. 9160–9560', *Nelson* 62431 (RM). Sporadic TNA.
- Trisetum spicatum* (L.) K. Richt. [*T. montanum*], common on high, barren areas and screes. 12150, 12100, 10200, 11850 & 12550', *Sharples* 899, 919, 1022, 1057 and *Sharples & Tripp* 1137. CIRC.
- Trisetum wolfii* Vasey, rare in high marshes. 11000', *Harrington* 1836 (CS). WUSA.
- **Triticum aestivum* L., rare in moist river valley areas. 9000', *Douglas* 1066 (CS). EUA.

POLEMONIACEAE – 13 species

- Aliciella pinnatifida* (Nutt. ex A. Gray) J.M. Porter, uncommon on barren substrates. 9300, 9800 & 11300', *Sharples* 290, 669 & 1110. New to AA and CN Wilderness. USRM.
- Collomia linearis* Nutt., common in the lowlands. 8000, 8000, 9450 & 9500', *Sharples* 79, 80, 170 & 520. WNNA.
- Ipomopsis aggregata* (Pursh) V.E. Grant, common in low, open, dry areas. 9800, 9200 & 9450', *Sharples* 240, 424 & 484. WNA.
- Leptosiphon nuttallii* (A. Gray) J.M. Porter & L.A. Johnson, common on dry slopes and ridges in the subalpine. 12150 & 9500', *Sharples* 345 & 489. WUSA.
- **Phlox caryophylla* Wherry, uncommon on low, barren slopes. 7750', *Sharples* 752. SRM: SW CO/NW NM endemic.
- Phlox condensata* (A. Gray) E. E. Nelson, common on tundra. 12050 & 11700', *Sharples* 237 & 473. Patchy SWNA.
- Phlox pulvinata* (Wherry) Cronquist, uncommon on cliffs. 9400', *Sharples & Tripp* 44. WUSA.
- **Polemonium brandegeei* (A. Gray) Greene, rare; discovered on one inaccessible rock outcropping. 9400', *Sharples & Tripp* 41. New to CN and SSI. SRM.
- Polemonium confertum* A. Gray, uncommon on tundra. 12250', *Sharples* 824. SRM. Questionably distinct from *P. viscosum*.
- Polemonium foliosissimum* A. Gray, scattered across lowlands. 9500', *Sharples* 490 & 515. Greater USRM.
- **Polemonium occidentale* Greene [*P. caeruleum*], uncommon in low boggy areas. 9550', *Sharples* 1319. New to AA. WUSA.
- Polemonium pulcherrimum* Hook., abundant in subalpine spruce shade. 10050, 11200 & 11500', *Sharples* 50, 220 & 459. WNA.

Polemonium viscosum Nutt., common on tundra. 12050 & 11600', Sharples 233 & 469. WUSA.

POLYGONACEAE – 19 species

Bistorta bistortoides (Pursh) Small, common in upper elevation openings. 11500 & 11100', Sharples 317 & 358. Mostly WUSA.

Bistorta vivipara (L.) Delarbre, common in upper elevation openings. 9650 & 12200', Sharples 309 & 649. CIRC.

**Eriogonum alatum* Torr., scattered across low elevations. 8000', Sharples 106. SWNA.

**Eriogonum lonchophyllum* Torr. & A. Gray, common low on the western slope. 7200 & 7800', Rink 2353 (FLD) and Sharples 192. 4CR; not AZ.

**Eriogonum racemosum* Nutt., common in the ponderosa-oak zone. 8600, 8850, & 8450', Sharples 506, 604 & 1075. 4CR; NV.

**Eriogonum umbellatum* Torr., uncommon in the ponderosa-oak zone. 7721 & 8000', Flaig 4953 (RM) and Sharples 196. WUSA. *Oxyria digyna* (L.) Hill, common in rocky higher elevation areas. 11200 & 10200', Sharples 370 & 617. CIRC.

**Persicaria amphibia* (L.) Gray, uncommon in lower lakes. 9550', Sharples 1316. TNH.

**Persicaria lapathifolia* (L.) Gray, rare along ponds. 10171', Douglas 2114 (CS). COSM.

**Polygonum argyrocoleon* Steud. ex Kunze, uncommon at low elevation on the western slope. 8535–8730', Flaig 2894 (RM). EUA. *Polygonum aviculare* L., common weed of low grazed roadsides and trailsides. 8650 & 9250', Sharples 720 & 998. EUA (W).

Polygonum douglasii Greene [*P. sawatchense*], common on open ground in the lowlands. 9650 & 9250', Sharples 945 & 1088. WNNA.

Polygonum minimum S. Watson, rare or overlooked. 9150', Sharples 575. New to SSJ (AA Wilderness). WNA.

Polygonum polygaloides Meisn., uncommon in low, barren, rocky areas. 9650', Sharples 1288. New to Wilderness (AA). WNA.

Rumex acetosella L., uncommon in open areas. 11100, 8750 & 9650', Sharples 480, 546 & 948. New to CN. EUA (W).

Rumex crispus L., common in lowlands. 7200 & 9200', Sharples 144 & 436. EUA (W).

Rumex densiflorus Osterh., common in high open areas. 11600, 11500, 11050 & 11600', Sharples 327, 463, 1025 and Sharples & Tripp 1123. SRM.

Rumex occidentalis S. Watson, rare in low moist meadows. 9200–9240', Nelson 62575 (RM). WNNA.

Rumex triangulivalvis (Danser) Rech. f., common in low openings. 8550, 7450 & 9000', Sharples 255, 541 & 939. TNA.

POTAMOGETONACEAE – 4 species

Potamogeton alpinus Balb., rare in higher lakes. Lundquist & Rink 141 (SJNM). CIRC.

Potamogeton gramineus L., uncommon in stagnant waters. 9450', Sharples 169. New to AA. CIRC.

**Potamogeton natans* L., rare along subalpine ponds. 10170', Douglas 2124 (RM). CIRC.

**Potamogeton pusillus* L., uncommon in ponds. 8950', Sharples 1312. New to AA. COSM.

PRIMULACEAE – 3 species

Androsace septentrionalis L., common throughout. 10325, 8000, 9150 & 12250', Sharples 1, 78, 569 & 641. CIRC.

**Dodecatheon pulchellum* (Raf.) Merr., rare in wet meadows. 9500', Sharples 179. WNA.

Primula parryi A. Gray, common along high streamsides. 11600', Sharples 326. USRM.

PTERIDACEAE – 3 species

**Cheilanthes feei* T. Moore, rare in low cliff walls. 9050', Sharples 287. Found east of study area, but new to CN. WNA.

Cryptogramma acrostichoides R. Br., common on cliffs. 9400 & 9450', Sharples & Tripp 45 & Sharples 559. New to SSJ of AA (559). NAA.

**Cryptogramma stelleri* (S.G. Gmel.) Prantl, rare. 9843', Douglas 2137 (CS). CIRC.

RANUNCULACEAE – 26 species

Aconitum columbianum Nutt., common in understory and openings of high forest. 11500 & 10350', Sharples 315 & 409. WUSA.

Actaea rubra (Aiton) Willd., scattered in mixed forest understory. 9100 & 9200', Sharples 29 & 841. WNNA.

**Anemone cylindrica* A. Gray, rare. Heil 12636 (SJNM). WNNA.

Anemone multifida Poir., rare on well-drained ridgetops. New to Wilderness (AA). 11900', Sharples 533. WNNA; disjunct elsewhere.

**Anemone patens* L. [*Pulsatilla*], uncommon in lowlands. 9100', Sharples & Tripp 32. CIRC.

Aquilegia coerulea E. James, occasional across habitats. 9450 & 11700', Sharples 173 & 475. Greater USRM.

Aquilegia elegantula Greene, common component of mixed forest understory. 9100 & 10350', Sharples 20 & 410. 4CR.

Caltha leptosepala DC, abundant in higher riparian areas. 10350 & 11500', Sharples & Tripp 2 and Sharples 456. WNA.

**Clematis columbiana* (Nutt.) Torr. & A. Gray, uncommon in low forest. 9100', Sharples & Tripp 25. Greater USRM.

**Clematis hirsutissima* Pursh, uncommon in the ponderosa-oak zone. 8730 & 8400', Flaig 3773 (RM) and Sharples 785. Greater USRM.

Delphinium barbeyi (Huth) Huth, common in forest understory and clearings. 11200 & 10350', Sharples 310 & 413. 4CR; S WY.

**Delphinium nuttallianum* Pritz., common in ponderosa-oak woodlands. 8000 & 8500', Sharples 71 & 759. WNA.

Ranunculus alismifolius Geyer ex Benth., common in wet subalpine areas. 10350, 11100, 11800, 11500 & 11300', Sharples & Tripp 3 and Sharples 207, 343, 466 & 590. Mostly WUSA.

Ranunculus aquatilis L., uncommon aquatic. 7850 & 10200', Sharples 499 & 664. CIRC.

**Ranunculus cardiophyllum* Hook., uncommon in mid-elevation wetlands. 10350', Sharples & Tripp 10. New to SSJ. Greater ROMO.

Ranunculus flammula L. [*R. reptans*], rare in subalpine wetlands. 11250', Sharples 665. New to Wilderness (CN). CIRC.

Ranunculus gmelinii DC, common around beaver ponds. 9160–9560', Nelson 62419 (RM). CIRC.

Ranunculus hyperboreus Rottb., scattered in lowland riparian habitats. 8600 & 9400', Sharples 263 & 792. CIRC.

Ranunculus inamoenus Greene, common in moist middle elevation areas. 10350, 10050 & 9300', Sharples & Tripp 11, 51 and Sharples 797. WNA.

Ranunculus macauleyi A. Gray, common downslope of persistent snowfields in barren areas. 11100, 11500 & 12200', Sharples 208, 467 & 681. SRM; S CO/N NM endemic.

Ranunculus macounii Britton, uncommon. 9160–9560', Nelson 62422 (RM). WNNA.

Ranunculus pensylvanicus L. f., uncommon. 8720–9200', Nelson 62497 (RM). WNNA.

Ranunculus uncinatus D. Don ex G. Don, uncommon. 11218', Flaig 4807 (RM). WNA.

Thalictrum fendleri Engelm. ex A. Gray (*T. occidentale*, *T. venulosum*), common in mixed forest understory. 10250 & 10350', Sharples & Tripp 55 and Sharples 419. Mostly WUSA.

Trautvetteria carolinensis (Walter) Vail, occasional in subalpine understory communities. 11100, 9250 & 10500', Sharples 477, 555 & 623. NAA.

Trollius albiflorus (A. Gray) Rydb., uncommon in marshy snowmelt. 10450 & 12100', Sharples & Tripp 43 and Sharples 832. ROMO.

RHAMNACEAE – 1 species

Ceanothus fendleri A. Gray, common in dry, low areas. 8000', *Sharples* 198. SWNA.

ROSACEAE – 24 species

**Amelanchier alnifolia* (Nutt.) Nutt. ex M. Roem., common in lowlands. 7750', *Sharples* 88. WNA.

**Amelanchier utahensis* Koehne, scattered across lowlands. 7924 & 8900', *Flaig* 3865 (RM) and *Sharples* 63. WUSA.

**Crataegus erythropoda* Ashe, rare along roads. 7300 & 7650', *Sharples* 1321 & 1322. SRM.

Dasiphora fruticosa (L.) Rydb., common in dry, open areas. 8900, 11000 & 9200', *Sharples* 62, 405, 435. CIRC.

Fragaria virginiana Mill., common across the forested elevations. 10350 & 11250', *Sharples* 13 & 364. TNA.

Geum macrophyllum Willd., common in mixed forest riparian areas. 9500, 8600 & 9400', *Sharples* 177, 269 & 793. CIRC.

Geum rossii (R. Br.) Ser., ubiquitous on high slopes and tundra. 11850, 11800 & 12300', *Sharples* 210, 342 & 679. NAA.

Geum triflorum Pursh [*Erythrocoma*], uncommon. 7650', *Sharples* 141. WNNA.

Holodiscus dumosus (S. Watson) A. Heller, scattered across low, open areas. 9200 & 9800', *Sharples* 660 & 671. SWNA.

Ivesia gordonii (Hook.) Torr. & A. Gray, rare on tundra. 12350', *Sharples* 352. New to CN. WUSA.

Potentilla anserina L., uncommon at low elevations. 8650', *Sharples* 276. COSM.

Potentilla concinna Richardson, common in bare, rocky areas. 9400, 11850, 11400 & 12400', *Sharples* & *Tripp* 40 and *Sharples* 212, 818 & 827. New to Wilderness (AA and CN). Essentially WUSA.

Potentilla glaucophylla Lehm. [*P. diversifolia*], scattered near wetlands. 9650', *Sharples* 1281. WNA; Greenland.

Potentilla hippiana Lehm., common at low elevations. 7800 & 9050', *Sharples* 107 & 767. WNNA.

Potentilla nivea L., rare on alpine tundra. 12999', *Harrington* 1789 (RM). CIRC.

Potentilla pulcherrima Lehm. [*P. gracilis*], common in mixed forest zone openings. 7800 & 9650', *Sharples* 185 & 308. WNA.

Potentilla subjuga Rydb., scattered across higher elevations. 11814–12237', *Flaig* 7939 (RM). SRM; disjunct in Alberta.

**Prunus virginiana* L., common at the lowest elevations. 8730 & 8900', *Flaig* 3778 (RM) and *Sharples* 66. TNA.

**Rosa acicularis* Lindl. [*R. sayi*], scattered across low elevations. *Heil* & *Mietty* 28142 (SJNM). CIRC.

Rosa woodsii Lindl., common across lower elevations. 8600, 7450 & 9200', *Sharples* 128, 188 & 437. WNNA.

Rubus parviflorus Nutt., common in mixed forest understory. 9100 & 9800', *Sharples* 492 & 528. WNNA.

Rubus idaeus L., scattered at lower elevations. 8650 & 9600', *Sharples* 283 & 668. New to CN Wilderness. TNH.

Sibbaldia procumbens L., common on stable tundra and high meadows. 12000, 11100 & 11600', *Sharples* 339, 359 and *Sharples* & *Tripp* 1127. CIRC.

Sorbus scopulina Greene, scattered across lower elevations. 7750', *Sharples* 121. WNA.

Sorbus scopulina Greene, scattered across lower elevations. 7750', *Sharples* 121. WNA.

RUBIACEAE – 3 species

Galium boreale L. [G. septentrionale], common in lowlands. 9100 & 9250', *Sharples* 454 & 553. CIRC.

**Galium trifidum* L., scattered across low wet areas. 9550', *Sharples* 162. CIRC.

Galium triflorum Michx., uncommon at lower elevations. 9150', *Sharples* 572. TNH.

SALICACEAE – 17 species

**Populus angustifolia* E. James, common in low river valleys. 8800 & 8750', *Sharples* 1299 & 1302. WNA.

Populus tremuloides Michx., abundant hardwood tree of middle elevations and higher. 9200', *Sharples* 842. TNA.

**Salix bebbiana* Sarg., rare along pond borders. 8800', *Sharples* 1298. NAA.

**Salix boothii* Dorn, uncommon in riparian areas. 10350 & 9100', *Sharples* & *Tripp* 4 & 31. Essentially WUSA.

Salix brachycarpa Nutt., common in high openings and wetlands. 11650, 11550 & 12150', *Sharples* 226, 325 & 904. WNNA.

Salix drummondiana Barratt ex Hook., common along low waterways. 8450, 9150 & 8750', *Sharples* 747, 973 & 1284. WNA.

Salix eriocephala Michx. [including *S. ligulifolia*, *S. lutea*], rare along streamcourses. 9150', *Sharples* 972. WUSA.

**Salix exigua* Nutt., scattered by low streams. 7800 & 7450', *Sharples* 110 & 536. WNA.

Salix geyeriana Andersson, uncommon along creeks. 9100', *Sharples* 763. WUSA.

Salix glauca L., uncommon in high boggy areas. 11100 & 11300', *Sharples* 355 & 593. CIRC.

Salix lasiandra Benth., scattered across lower elevation creeksides. 7800 & 8750', *Sharples* 109 & 929. New to Wilderness (AA). WNA.

Salix monticola Bebb, common in riparian areas. 9550, 8600, 9650, 10550 & 10200', *Sharples* 165, 274, 947, 1103 & 1287. 4CR; WY.

Salix petrophila Rydb. [*S. arctica*], scattered on tundra. 11600', *Sharples* 470. Mostly WUSA.

Salix planifolia Pursh, common in high openings. 11550, 12450 & 12150', *Sharples* 324, 865 & 901. WNNA.

Salix reticulata L. [*S. nivalis*], common in high grassy areas. 11650 & 12350', *Sharples* 228 & 830. CIRC.

Salix scouleriana Barratt ex Hook., scattered along creeksides. 10200', *Sharples* 1013. WNA.

**Salix wolfii* Bebb, uncommon in riparian areas. 11550', *Sharples* 1285. WUSA.

SANTALACEAE – 1 species

**Comandra umbellata* (L.) Nutt., common in the ponderosa-oak zone. 7650 & 8100', *Sharples* 96 & 183. TNA.

SAPINDACEAE – 1 species

Acer glabrum Torr., scattered in lower forests. 10500 & 9450', *Sharples* 148 & 560. WNA.

SAXIFRAGACEAE – 13 species

Heuchera parvifolia Nutt., common in high rocky areas. 11650' & 12050', *Sharples* 371 & 1130. Essentially WUSA.

**Lithophragma tenellum* Nutt., uncommon in dry, open lowlands of the western slope. 8700' (*Sharples*), *Heil* 23432 (SJNM) and *Sharples* 757. Essentially WUSA.

Micranthes odontoloma (Piper) A. Heller, scattered in the subalpine near water. 11600 & 12000', *Sharples* 468 & 1052. WNA.

Micranthes rhomboidea (Greene) Small, common in open subalpine areas. 10350, 11850 & 11100', *Sharples* 5, 209 & 360. Greater USRM.

Mitella pentandra Hook., scattered. 10998', *Harrington* 1823 (CS). WNA.

Mitella stauropetala Piper, common in forest understory. 7750 & 10200', *Sharples* 118 & 873. USRM; PNW.

Saxifraga adscendens L. [*Muscaria*], rare. COJ 01-960 (SJNM). CIRC.

Saxifraga bronchialis L. subsp. *austromontana* (Wiegand) Piper [*Ciliaria austromontana*], common across altitudes on rock walls. 9100, 12300, 9900 & 12050', *Sharples* 34, 348, 577 & 1129. ROMO.

Saxifraga cernua L., uncommon on tundra. 13100', *Sharples* 653. CIRC.

Saxifraga cespitosa L. [*Muscaria*], uncommon on tundra. 12274', Douglas 2064 (CS). CIRC.

Saxifraga chrysanthia A. Gray, rare on tundra. 13000', Harrington 1792 (CS). USRM.

Saxifraga flagellaris Willd. subsp. *crandallii* (Gand.) Hultén, uncommon on high, unstable, loose substrata. 12900 & 11850', Sharples 655 & 1054. MS 1054 is new to AA. CIRC. Subspecies: USRM.

Saxifraga hyperborea R. Br. [*S. rivularis*], uncommon in high riparian rock crevices. 12050 & 12200', Sharples 927 & 1065. CIRC.

SCROPHULARIACEAE – 2 species

Scrophularia lanceolata Pursh, uncommon. 10826', Douglas 1700 (RM). TNA.

Verbascum thapsus L., common along low roadsides. 7850 & 8250', Sharples 693 & 1080. EUA (W).

SELAGINELLACEAE – 1 species

Selaginella densa Rydb., common on tundra and rock crevices. 10250 & 12150', Sharples & Tripp 56 and Sharples 905. Greater ROMO.

SPARGANIACEAE – 3 species

Sparganium angustifolium Michx., scattered in ponds and bogs. 8750', Sharples 564. COSM.

**Sparganium emersum* Rehmman, rare in low elevation waters. 8950', Sharples 1315. New to AA. COSM.

Sparganium natans L. [*S. minimum*], uncommon in lakes. Lundquist & Rink 136 (SJNM). COSM.

TYPHACEAE – 1 species

**Typha latifolia* L., uncommon in low elevation riparian areas. 7900', Sharples 707. COSM.

URTICACEAE – 1 species

Urtica dioica L. subsp. *gracilis* (Aiton) Selander, scattered in rocky areas below treeline. 9100', Sharples 444. TNA.

VERBENACEAE – 1 species

**Verbena macdougallii* A. Heller, rare at low elevations. 8750' (Sharples), Penland 4651 (COLO) and Sharples 254. 4CR.

VIOLACEAE – 6 species

Viola adunca Sm., common in lowlands. 10350 & 7650', Sharples 7 & 90. WNNNA.

Viola canadensis L., common in low forests. 7650 & 8450', Sharples 91 & 745. TNA.

Viola labradorica Schrank, common in high elevation openings. 11650, 12000 & 11850', Sharples 227, 338 & 963. ANOM: disjunct from E North America.

**Viola nuttallii* Pursh, rare. O Kane 3740 (SJNM). Greater USRM.

Viola palustris L. [*V. macloskeyi*], uncommon. O Kane 7348 (SJNM). CIRC.

Viola nephrophylla Greene [*V. soraria*], uncommon in riparian areas. 9550', Sharples 160. WNNNA.

ZANNICHELLIACEAE – 1 species

Zannichellia palustris L., rare in subalpine ponds. 10007', Douglas 2076 (CS). COSM.

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