Survey of Plants of Special Concern in Long Canyon, Panther Canyon, Greenman Springs Area, and Tributary Canyons and Gulches in the City of Boulder Mountain Parks, Boulder, Colorado

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A Survey of Plants of Special Concern in Long Canyon, Panther Canyon, Greenman Springs Area, and Tributary Canyons and Gulches in the City of Boulder Mountain Parks, Boulder, Colorado

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University of Colorado Herbarium

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Introduction

The City of Boulder Mountain Parks exists as a uniquely managed landscape along the Front Range of Colorado. The foresight of the Boulder community has protected this land from development, preserving a scenic vista and an area that thousands use annually as a source of recreation. In addition to these benefits, the Parks serve as habitat for a rich array of plants and animals.

The easternmost extension of the Rocky Mountains is near Boulder, where there occurs an abrupt rise of nearly 3000 feet (ca. 1000 m). This rise produces an orographic effect, which provides the mountains above Boulder with greater precipitation than surrounding areas. Greater moisture also results due to Boulder's position in a topographic arc that opens to the east, serving to funnel upslope storm systems against the hills. Botanists have commented on the ameliorated conditions along the mountain front (Vestal, 1917, 1919) and have pointed to the cloud veil that forms on the mountains, creating locally humid environments (Weber, 1965). These conditions are best developed in the deep, north-facing canyons. The cool, moist environs of these canyons serve as refugia for eastern woodland species, Pleistocene relicts, and species more common to higher altitudes and latitudes. Perhaps the best-known example of this is the occurrence of Paper Birch (*Betula papyrifera*) in Long Canyon, the southernmost extension of this boreal species. These canyons on the north side of Green Mountain represent a unique area in the foothills of the entire Colorado Front Range (Cooper, 1984).

Although excellent studies have documented the vegetation of the Front Range (Marr, 1961; Peet, 1981), relatively little floristic work has been accomplished for specific sites. In the present survey, we conducted a detailed floristic investigation of Long Canyon, Panther Canyon, the Greenman Springs area, and their tributary canyons and gulches. Although our principal goal was to document plants of special concern, an annotated list of all species found in the area is included in this report.

The study was conducted throughout the active growing season of 1989, from May 15 through the end of September. The author was ably assisted by Harold Dahnke, an amateur botanist intimately familiar with the site. Approximately 600 field hours were devoted to the survey.

At the end of this report are general and specific recommendations aimed at preserving, for the present and future generations, this delicate region of the Rocky Mountain Front Range. Together they intend to cultivate a practical and philosophical awareness of the balance between careful, deliberate human intervention in parks management stratagems and the unimpeded evolution of natural forces.

Site

The study site was northwest of Green Mountain in the City of Boulder Mountain Parks, Colorado. It is situated on the Eldorado Springs U.S.G.S. quadrangle at the junction of sections 1, 2, 11, and 12: T.IS: R.71W. The latitude is 40°00′, the longitude 105°22′. The area of the site was slightly less than one square mile (640 acres or 256 ha) in extent (see figure).

The site ranged in elevation from 6,400′ (1,930 m), near the falls in lower Greenman Creek, to 8,144′ (2,450 m), at the summit of Green Mountain approximately one mile (1.5 km) away. Along with this steep gradient, the area is characterized by its north-facing aspect and a dissected topography with spring-fed drainages and concomitant divides.

Topography. Greenman Springs lies on the north slopes of Green Mountain at 7,200′ (2,180 m). It is the source of a botanically rich stream that has its confluence with Long Creek just below the study area in Gregory Canyon. Greenman is separated from the more complex drainage system of Long Canyon by a northwesterly ridge that runs from the summit to the Green Mountain shelter at 6,800′ (2,050 m). Long Creek is fed by a spring in its upper reaches, as well as by Panther Creek and two lesser tributaries to the west of Panther Canyon. Each of these drainages harbors springs at an equivalent contour of approximately 7,200′ (2,180 m). As one approaches the upper reaches of these small canyons the terrain steepens and the drainages become less distinct. Surface moisture is lost above the springs. These drier forests below the West Ridge of Green Mountain are particularly rich in Ericoid species.

Climate. The city of Boulder has an annual precipitation of 18 inches (45 cm), with the maximum moisture occurring in April and May. Upslope storms occur in spring and autumn when air masses from the Gulf of Mexico are forced up against the mountain front. Convective storms are common on late summer afternoons (Barry, 1974; Marr, 1961).

The mean annual temperature is 51°F (10.5°C) with July being the warmest month (74°F/23°C) and January the coldest (32°F/0°C). There are approximately 150 frost-free days per year. Winds are predominantly from the west, with strong, warm, dry chinooks occurring in

the winter months.

The study area lay 2000´ (600 m) above the city. A normal lapse rate would indicate temperatures 5° to 10°F (ca. 5°C) cooler at the site. Data from local stations at equivalent elevations agree with this (Marr, 1961). The forested nature of the study area also served to moderate the heat of the summer months.

Without data from the site it is not possible to quantify a moisture budget, but there is evidence that indicates the area is more mesic than the surrounding landscape. Data from stations less than five miles (9 km) to the north and at an equivalent altitude show an average annual precipitation of 21" (52.5 cm) (Marr, 1961). In conjunction with this normal altitudinal increase, the isolated position of Green Mountain lends itself to an even greater augmentation; this is seen in the often-observed cloud veil that rests on the high peaks of the Mountain Parks while areas of similar elevation to the west are clear. Many of the species we observed above the influence of the springs are associated with cooler, more mesic habitats, an indication that these upper slopes may indeed be more moist than the available data indicate.

Geology/Soils. The study area was underlain almost entirely by the Boulder Creek granite, a dark grey, faintly banded granodiorite of Precambrian age. A narrow band of the Fountain Formation, a Pennsylvanian arkose sandstone and conglomerate, was exposed near the summit of Green Mountain as a result of faulting (Chronic & Chronic, 1972; Lovering & Goddard, 1950).

Although a study of the soils is beyond the scope of this survey, certain inferences can be made from published information (Johnson & Cline, 1965; Soil Survey Staff, 1975) and field observations. The *Soil Survey of Boulder County* (1975) places two complexes in the study area, the Juget-Rock outcrop and the Fern Cliff-Allens Park rock outcrop. These complexes are dominated by Ustolls and cryoborolls and frequent areas of lithic orthents where bedrock approaches the surface. Alluvial soils are found in the stream bottoms (Peet, 1981).

Vegetation. The study site was in the montane zone (Marr, 1961), which is characterized by a mixed forest of Ponderosa Pine (*Pinus ponderosa*) and Douglas Fir (*Pseudotsuga menziesii*),

the latter being more dominant on north-facing slopes. Limber Pine (*Pinus flexilis*) is also present on xeric sites at higher elevations. Important deciduous species in the forests include Aspen (*Populus tremuloides*) and the shrubs Waxflower (*Jamesia americana*), Ninebark (*Physocarpus monogynus*), and Wild Raspberry (*Rubus idaeus*).

The perennial springs of the area feed rivulets that serve as narrow ribbons of rich habitat for plants and wildlife. The richness of this habitat is accentuated by the often depauperate, xeric forest floor that borders the stream margins. It is at the springs and along their drainages that many of the special orchids, ferns, and plants of special concern, such as Wild Sarsaparilla (*Aralia nudicaulis*) and Black Snakeroot (*Sanicula marilandica*), are found. Important woody species in these areas are Hazelnut (*Corylus cornuta*), River Birch (*Betula fontinalis*), and the less frequent Mountain Ash (*Sorbus scopulina*). The more rank herbage of Cow Parsnip (*Heracleum sphondylium*) and Bracken Fern (*Pteridium aquilinum*) is often dominant along the water courses by midsummer.

Another important habitat in the study area was the rocky outcrops. These craggy areas were scattered throughout the site and were often the locality for such ferns as *Cryptogramma acrostichoides*, *Polypodium amorphum*, and *Woodsia scopulina*.

Finally, disturbed areas near trailheads and at certain areas along the West Ridge of Green Mountain and lower Long Canyon were the sites for many of the weedy species documented in the survey.

Methods

Prior to our field work a list of expected species was developed. For those species of special concern we attempted to determine known localities and habitats, as well as phenological data. The site has long been recognized as an especially rich area by local naturalists, and a wealth of information is anecdotally known as well as documented in the University Herbarium (COLO) and in various publications (Cooper, 1984; Daniels, 1911; Weber, 1976).

As an operational definition for our field work, we defined plants of special concern as those species that are rare or endangered, relicts, those that are infrequent in the study area even though they may be abundant elsewhere, and those locally common species that are otherwise restricted. The most critical of these plants were photographed, accurately located, and described in terms of habitat, abundance, and associated species.

A complete inventory of all the vascular plants in the area was compiled. It was our opinion that species of special concern would more likely be found by keeping a complete species list and the value of the study thereby enhanced (Henifin et al., 1981; Nelson, 1987).

Historical records and our own experience indicated that the richest localities were to be found in the riparian habitat of the study area. The first four weeks of the survey were concentrated in the principal drainages. These included the length of Long Canyon, the Greenman drainage from its junction with Gregory Canyon to the Green Mountain summit, Panther Canyon, the tributary canyons that lie to the west of Panther Canyon, and the small drainage that comes into lower Long Canyon from the Flagstaff road. We made a methodical inspection of the water courses that define these drainages, staying as close to the water as possible during this initial phase. In addition, we explored the drier upland areas at the head of these drainages, as well as the areas along the Greenman and Ranger trails and the Green Mountain summit.

After this initial stage in which several species-rich sites were identified, we expanded our coverage into lesser tributaries and began a systematic coverage of the wooded slopes above

the riparian habitats. In the course of the field season each ridge between the drainages was walked at least once and a traverse perpendicular to the Long Canyon tributary canyons was accomplished.

As the summer progressed we regularly returned to those riparian sites that proved to be especially rich. At this point we were less concerned with staying in the water courses every step of the way, and felt more free to search the drier slopes adjacent to the drainages. In addition, we regularly employed the Greenman-Ranger loop as an efficacious way of covering the 1,800 ' (540 m) of elevation gain in the study area.

Due to Mountain Parks policy the collection of voucher specimens was not permitted. Consequently, a photographic record was made as documentation of the most critical species of special concern (Appendix III). One copy of this record is deposited at COLO and another has been submitted to the City of Boulder Mountain Parks. Although most of the plants were familiar or readily keyed in the field, diagnostic parts were collected when it was necessary to determine an identification in the herbarium. This was necessary most often with the grasses and sedges.

Results and Discussion

Three hundred and fifty species of vascular plants in 247 genera and 81 families, of which 38 species were adventive (non-native), were documented in this survey (Appendix I). This represents an exceptional richness for an area of less than one square mile (2.5 km^2). Florissant Fossil Beds National Monument, a montane area ten times the size and with much greater variety of habitats, has 430 species (Edwards & Weber, in press). The entire alpine area of the Indian Peaks Wilderness has a flora of 253 species (Komárková, 1979).

The richest habitats in the study area were along the spring-fed rivulets that drain the site. It was along these threads of moisture that most of the plants of special concern were found. Another area of special import was the higher elevation, north-facing slopes.

In compiling our species list and evaluating the status of the individual plants that make up the flora of the northwest slopes of Green Mountain, we were confronted with the problems surrounding the concepts and definitions of "rare and endangered." There is a wealth of literature (Ayensu, 1981; Fiedler, 1986) demonstrating that rarity is not a singular condition, but a multifaceted product of diverse causes with a multitude of genetic and population consequences (Rabinowitz, 1981). A plant of localized special concern may be common elsewhere (Harper, 1981). Different species can be rare and endangered for different reasons related to distribution, abundance, reproductive biology, and other factors (DuMond, 1973).

A species may be of special concern if it is found out of its expected geographic context. Subalpine species, such as the Bog Orchids (*Limnorchis* spp.) and Monkshood (*Aconitum columbianum*), fall into this category. Species found only in a very specific habitat of limited occurrence, such as the cool ravines along the foothills of the Front Range, is another type of rarity. This latter criterion can overlap with a form of rarity in which species are thought to be relics of a no longer extant vegetation association. Some of the most characteristic species, such as Wild Sarsaparilla (*Aralia nudicaulis*) and Snakeroot (*Sanicula marilandica*), are important for these reasons. A species such as Adder's-mouth (*Malaxis monophyllos*) is rare because it is

widely disjunct from its center of distribution in northern Canada. Paper Birch (*Betula papyrifera*) was rare in our area because the southern limit of its range is represented by the small population in Long Canyon.

None of the plants on Green Mountain is on the federal list of rare and endangered plant species. The Endangered Species Act defines endangered as "those species of plants in danger of extinction throughout all or a significant portion of their ranges, through destruction of habitat, overexploitation, disease, grazing, or even unknown reasons" (Smithsonian Institute, 1975). Because all the plants in this survey are more abundant elsewhere they do not fit the legal criteria for federal listing. It must be emphasized, however, that this is a legal distinction, not a biological one. A species at the edge of its range often is the storehouse of great genetic diversity and may play a critical role in the evolution of that species (Stebbins, 1974). Federal law recognizes the endangered status of the grizzly bear (*Ursus arctos*) in the Northern Rockies, even though it is abundant in Alaska, but the law does not confer on plants the same benefits.

At the state level, six of the plants on Green Mountain are Colorado Plant Species of Special Concern as recognized by the Colorado Natural Areas Program (CONAP, 1989). These are *Betula papyrifera, Botrypus virginianus, Lilium philadelphicum, Listera convallarioides, Malaxis monophyllos,* and *Pyrola picta* (Appendix II).

A second group of plants was recognized as one serving to characterize the northern slopes of Green Mountain as a rare habitat—a habitat containing cool, mesic pockets where species with eastern woodland affinities and/or a relictual history are found (Appendix II). Their distribution is characterized by an eastern concentration, which extends westward across the cooler environs of Canada before dropping south along the western cordillera. Small concentrations of these species are found in such areas as the Black Hills and Long Canyon. The previously mentioned *Aralia nudicaulis* and *Sanicula marilandica* characterize this phytogeographic pattern. Also included in this group of mesic-montane indicator species are those plants that are endemic to these habitats. The Mountain Ash (*Sorbus scopulina*) is an example of a species restricted to these areas. Many of the species listed in this second group

represent a lineage that extends to the Pleistocene period and earlier (Appendix II).

A third category of plants deserving the status of special concern in the study area are those species that are common at higher elevations, but are found on Green Mountain due to an ecological compensation in which the temperature and moisture of the area are within the species requirements (Appendix II).

Each of these categories—state-listed species of special concern, relictual/woodland species of mesic-montane habitats, sub-alpine species—represents plants that serve as indicators of a unique habitat condition. Indeed, it is often the rarer plants of a biological community rather than the common dominants that serve as the best indicators of special conditions.

Recommendations

Although the following recommendations are specifically addressed to the situation on the northwest slopes of Green Mountain, they may be more generally applied to the Mountain Parks as a whole. It is recognized that management decisions are rarely made solely on ecological criteria, but that social and economic considerations are usually important factors. The recommendations attempt to present a balanced perspective in which difficult management decisions are based on accurate environmental information.

Streamside habitats should be protected from human disturbance. Any thinning operations or other forestry-related practices should be managed so as to prevent impact upon these areas. Dropping trees in the drainages should be prohibited, and awareness of erosion from upslope areas should be kept in mind when planning any operations. Any future trail construction and/or maintenance should be cognizant of the special nature of these habitats.

An area of particular interest is the drainage below Green Mountain Lodge. Many plants of special concern grow in this short stretch of Long Creek, and its proximity to the Lodge, as well as the Flagstaff road, makes it vulnerable. To the extent that it is possible, large groups should be discouraged from using this site and, when appropriate, should be advised to avoid the stream area.

Perhaps the anonymity of the streamside habitats is their best protection. The Mountain Parks has been wise in not publicizing its riches, and most visitors have little interest in entering areas where plants of special concern grow. In this case the best management is simply to do nothing: no trails, no signs, no brochures.

The north-facing slopes below the West Ridge Trail on Green Mountain is another area of critical importance. In this region is most easily found the state-listed *Pyrola picta*, as well as other species in the Ericaceae group. The orchids *Calypso bulbosa* and *Goodyera oblongifolia* grow here, as well as the ferns *Polypodium amorphum* and *Woodsia scopulina*. This area is readily accessed from the West Ridge Trail, and any plans for rerouting or developing it should

include an awareness of the rich flora that lie within a hundred meters of the present trail.

The Mountain Parks is subject to a variety of pressures to manage its forests. Some of this originates in popular notions of what a forest should look like. The public sector often demands management of its woodlands that in the final analysis is a matter not so much of conservation as esthetics. The forest must be forever a thing of beauty, forever pristine—but this is at the expense of the very processes out of which the beauty arose.

Another source of pressure comes from the realization that suppression of fire leads to the establishment of an unnatural forest. Fire control produces a forest that is less diverse and more susceptible to catastrophic disturbance than the presettlement forest.

Rocky Mountain forests are disturbance forests (Peet, 1988). Many signs of past fires were evident in the study site, and the recent history of insect epidemics is well known. Logging and roads associated with mining have affected the area. These disturbances, both natural and human, have served to influence the forest we see today. The forest of the study area was not a homogeneous unit, but rather a patchwork mosaic of different age structures and development. This heterogeneity is the result of a complex disturbance history, and belies the idea of a stable equilibrium in nature (Connell & Slayter, 1977).

The administration of the Mountain Parks, with the City and County Open Space, must evaluate its long-range fire management policy. It may be appropriate to begin looking at the use of carefully controlled burns. If fire is unacceptable as a management tool due to the area's proximity to Boulder, it may become necessary to practice selective thinning. The greatest potential for destructive impact in such an operation would be in removing the downed logs. Alternatives such as burning the slash in the winter months might be investigated. Heavy equipment should be prohibited. A combination of controlled burns and selective thinning with a willingness to accept natural disturbance will maximize vegetation diversity and reduce the chances of catastrophic fires and insect outbreaks.

The Mountain Parks should continue to be creative in its educational programs with the public in conveying the importance of allowing natural processes to continue unabated. The

role of disturbance should be stressed. The value of a heterogeneous landscape to birds and other wildlife could be emphasized. A carefully planned management policy and an articulate educational program are necessary steps toward maintaining the diversity of the Mountain Parks.

The foundation of any conservation program must rest upon an informed knowledge of just what is to be preserved. As more natural areas are lost to human encroachment, the need for accurate information on these areas becomes increasingly imperative. Thus, detailed studies should continue in the Mountain Parks. Lost Gulch and Bear Canyon are two areas that undoubtedly harbor plants of special concern that should be documented. The most critical plants of special concern, i.e., those on the state list, should be monitored periodically. Accurate records of their numbers, location, and distribution should be maintained.

Work on the forest structure in the Mountain Parks also is necessary. This would provide information on the disturbance history of the area and help locate any pockets of old growth forest that might exist in the Mountain Parks. An accurate description of the forests could be combined with floristic studies to provide insight into the distribution and abundance of the flora.

Guidelines for future studies should be carefully laid out so as to minimize the impact of the work. Concomitantly, the studies should be carried out in accordance with accepted scientific standards. This may involve the collection of specimens or the coring of trees. The methods of each study should be evaluated on a case-by-case basis.

Conclusions

The position of the Boulder Mountain Parks along the interface of the Great Plains and the Rocky Mountains provides the basis for a diversity of plants, animals, and landscapes deserving the utmost concern and protection. The northern slopes of Green Mountain, with its steep gradient, spring-fed streams and shaded forests, is an area of particular richness. A fundamental conclusion of this survey is that, while this area harbors a wealth of rare and special plants, it is the habitat as a whole that is the rarest entity and the most deserving of protection. "Preservation of rare species of plants requires the preservation and protection of the habitats upon which they depend for growth and reproduction. *In situ* perpetuation of sufficient populations of endangered and threatened plants is required to ensure their survival" (Smithsonian Institute, 1975). It is the consensus of all conservationists that preservation of habitat is the most important step to save species.

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APPENDIX I

Annotated Species List

Nomenclature follows Weber (Wittmann and Weber, 1989). If other names are considered to be more familiar, these are provided. State-listed species of special concern (***), relictual/woodland species of mesic-montane habitats (**), and subalpine species of special concern (*) are noted. Species for which photographic documentation has been submitted are marked (•).

In addition to the local manual (Weber, 1976), other works used in compiling this list include the *Flora of the Great Plains* (Great Plains Flora Association, 1986), *Intermountain Flora* (Cronquist et al., 1977), *Manual of the Plants of Colorado* (Harrington, 1954), *Native Orchids of the United States and Canada* (Luer, 1975), and *Vascular Plants of Wyoming* (Dorn, 1988).

FERNS and FERN ALLIES

ASPIDIACEAE Shield Fern Family

Dryopteris filix-mas (L.) Schott. MALE FERN.
A handsome fern; infrequent in moist, shaded sites. •

ATHYRIACEAE Lady Fern Family

Athyrium filix-femina (L.) Roth. LADY FERN.
Infrequent in moist, shaded sites; often found with *Dryopteris filix-mas.* •

Cystopteris fragilis (L.) Bernh. BRITTLE FERN.
Most common fern of the area; extremely variable.

CRYPTOGRAMMACEAE Rock Brake Family

Cryptogramma acrostichoides R. Brown. AMERICAN ROCK BRAKE.
C. crispa (L.) R. Br. ssp. *acrostichoides* (R. Br.) Hultén.
Not infrequent in rocky sites. •

EQUISETACEAE Horsetail Family

Equisetum arvense L. FIELD HORSETAIL.
Locally abundant in moist sites.

Hippochaete hyemalis (L.) Bruhin. TALL SCOURING-RUSH.
Equisetum hyemale L.
Locally abundant in moist sites.

Hippochaete laevigata (A. Braun) Farwell. SMOOTH SCOURING-RUSH.
Equisetum laevigatum A. Braun.
Less common than *H. hyemalis*; similar sites.

HYPOLEPIDACEAE Bracken Family

Pteridium aquilinum (L.) Kuhn ssp. **lanuginosum** (Bongard) Hultén. BRAKEN FERN.

Common, rank fern of wet sites.

OPHIOGLOSSACEAE Adder's Tongue Family

***Botrypus virginianus** (L.) Holub. RATTLE-SNAKE FERN
Botrychium virginianum L.
Very rare. Population of less than twenty plants observed in the vicinity of Greenman Springs. Although growing near the water, many plants were found on somewhat drier sites. A woodland species, nowhere common.•

POLYPODIACEAE Polypody Family

Polypodium amorphum Suksdorf. POLYPODY.
P. hesperium Maxon.
Infrequent on rocks in the canyons.•

SELAGINELLACEAE Little Club-moss Family

Selaginella densa Rydb.
Dry, gravelly soils in forests; scattered, never abundant.

Selaginella underwoodii Hieronymus.
Less common, more mesic sites than *S. densa*.

WOODSIACEAE Woodsia Family

Woodsia oregana Eaton. OREGON WOODSIA.
Scattered throughout area on rocky slopes; less common than *W. scopulina*.•

Woodsia scopulina Eaton. ROCKY MOUNTAIN WOODISA.
The more common *Woodsia*, usually found on rock ledges.•

GYMNOSPERMS

CUPRESSACEAE Cypress Family

Juniperus communis L. ssp. **alpina** (Smith) Celak. COMMON JUNIPER.
Scattered throughout area.

Sabina scopulorum (Sargent) Rydb. ROCKY MOUNTAIN JUNIPER.
Juniperus scopulorum Sargent.
Scattered throughout area.

PINACEAE Pine Family

Picea pungens Engelmann. BLUE SPRUCE.
One tree observed in upper Long Canyon; more common in Bear Canyon on the south side of Green Mountain.

Pinus flexilis James. LIMBER PINE.
Scattered throughout site at higher elevations; most common in upper Greenman.

Pinus ponderosa Douglas ssp. **scopulorum** (Watson) Weber. PONDEROSA PINE.
Common pine of the area.

Pseudotsuga menziesii (Mirbel) Franco. DOUGLAS FIR.
Codominant with *Pinus ponderosa*; more common on north-facing slopes.

ANGIOSPERMS

ACERACEAE Maple Family

Acer glabrum Torrey. MOUNTAIN MAPLE.
Frequent. Trees with more deeply dissected leaves, some appearing compound (forma *trisectum* Sargent), were observed in Long Canyon.

Negundo aceroides (L.) Moench. BOX ELDER.
Acer negundo L.
Infrequent on the margins of the study area.

AGAVACEAE Agave Family

Yucca glauca Nuttall. SPANISH BAYONET.
Drier hillslopes.

ALLIACEAE Onion Family
(Liliaceae)

Allium cernuum Roth. NODDING ONION.
Woodland species in study area; common.

Allium geyeri Watson. WILD ONION.
Woodland species.

ALSINACEAE Chickweed Family
(Caryophyllaceae)

Cerastium strictum L. MOUSE EARS.
C. arvense of Colorado literature.
Common weedy species throughout area.

Cerastium nutans Raf. NODDING MOUSE EARS.
Frequent in moist areas.

Paronychia jamesii T & G. JAMES' NAILWORT.
Infrequent in granitic grus along upper Greenman Trail.

Pseudostellaria jamesiana (Torrey) Weber & Hartman. TUBER STARWORT.
Stellaria jamesiana Torrey.
Common woodland species, blooming in early season.

ANACARDIACEAE Sumac Family

Rhus glabra L. SMOOTH SUMAC.

Shrub of disturbed site.

Toxicodendron rydbergii (Small) Greene. POISON IVY.
Occasional along trails in moist sites at lower elevations.

APIACEAE/UMBELLIFERAE Parsley Family

Aletes acaulis (Torrey) C & R. MOUNTAIN CARAWAY.
Common in rocky areas.

Angelica ampla Nelson. GIANT ANGELICA.
Uncommon along streambanks.

Harbouria trachypleura (Gray) C & R. WHISKBROOM PARSLEY.
Frequent on dry, open slopes; a Front Range endemic.

Heracleum sphondylium L. ssp. **montanum** (Schleicher) Biquet. COW PARSNIP.
Common rank herb of streambanks.

Ligusticum porteri C & R. PORTERS' LOVAGE, OSHA.
Common herb of streambanks; popular among herbalists.

Lomatium orientale C & R. SALT & PEPPER.
Early blooming species of open sites.

Osmorhiza depauperata Philippi. SWEET CICELY.
Frequent in mesic sites.

****Sanicula marilandica** L. BLACK SNAKEROOT.
Locally common in cool, mesic sites near streams. An eastern woodland species.•

APOCYNACEAE Dogbane Family

Apocynum androsaemifolium L. SPREADING DOGBANE.
Weedy species along trails.

ARALIACEAE Ginseng Family

****Aralia nudicaulis** L. WILD SARSAPARILLA.
Cool, moist sites along streams. An eastern woodland species restricted to mesic habitats in western North America. Although not common in the study area, it was relatively frequent along the streambanks. Curiously, it was not observed in uppermost Long Canyon.•

ASCLEPIADACEAE Milkweed Family

Asclepias speciosa Torrey. SHOWY MILKWEED.
Road below Green Mountain Lodge.

ASPARAGACEAE Asparagus Family

Asparagus officinale L. ASPARAGUS.
Infrequent in study area; adventive.

ASTERACEAE/COMPOSITAE Sunflower Family

Achillea lanulosa Nuttall. YARROW.
Common.

Acosta diffusa (Lam.) Sojak. KNAPWEED, CORNFLOWER.
Centaurea diffusa Lam.
Along road below Green Mountain Lodge; a rampant colonizer; adventive.

Agoseris aurantiaca (Hooker) Greene. FALSE DANDELION.
Infrequent.

Ambrosia psilostachya DC. WESTERN RAGWEED.
Weedy species of disturbed sites.

Anaphalis margaritacea (L.) Bentham & Hooker. PEARLY EVERLASTING.
Infrequent; usually found in more mesic sites.

Antennaria neodioica Greene. NORTHERN PUSSYTOES.
A. neglecta of Colorado literature.
A taxonomically difficult group, this species was relatively common in Long Canyon.

Antennaria parvifolia Nuttall. MOUNTAIN PUSSYTOES.
Not always easy to distinguish from *A. rosea*; both of these species were widely distributed throughout the study area.

Antennaria rosea Greene. PINK PUSSYTOES.

Arctium minus Bernh. BURDOCK.
Adventive species, often near streams.

Arnica cordifolia Hooker. HEARTLEAF ARNICA.
Common woodland species blooming in early season.

Artemisia frigida Willd. SILVER SAGE.
Widespread throughout study area.

Artemisia ludoviciana Nuttall. PRAIRIE SAGE.
Very common; more widespread than *A. frigida.*

Aster laevis L. var. **geyeri** Gray. SMOOTH ASTER.
Common blue aster of late summer.

Aster porteri Gray. PORTER'S ASTER.
Common white aster of late summer; endemic to east slope.

Bahia dissecta (Gray) Britton. BAHIA.
Handsome plant of open sites; infrequent; flowering in late summer.

Brickellia grandiflora (Hooker) Nuttall. BRICKELLIA.
Frequent on rocky slopes.

Carduus nutans L. ssp. **macrolepis** (Peterman) Kazmi. PLUMELESS THISTLE.
Disturbed areas; adventive.

Chlorocrepis albiflora (Hooker) Weber. WHITE HAWKWEED.
Hieracium albiflora Hooker.
Common.

***Chlorocrepis fendleri** (Schultz-Bip.) Weber. FENDLER'S HAWKWEED.
Hieracium fendleri Schultz-Bip.
Only a few plants observed in lower Panther Canyon growing with *C. albiflora;* nowhere abundant.

Cichorium intybus L. CHICORY.
Adventive; disturbed areas.

Cirsium arvense (L.) Scop. CANADA THISTLE.
Invasive throughout the study area; adventive.

Cirsium vulgare (Savi) Tenore. BULL THISTLE.
Infrequent weedy species; adventive.

Conyza canadensis (L.) Cronquist. HORSEWEED.
Weedy, trailsides.

Erigeron colo-mexicanus Nelson. FLEABANE.
Occasional.

Erigeron compositus Pursh. CUTLEAF FLEABANE.
Occasional.

Erigeron divergens T & G. SPREADING FLEABANE.
Occasional.

***Erigeron eximius** Greene. PALE FLEABANE.
Scattered throughout study area; most populations with white ray flowers.

Erigeron flagellaris Gray. WHIPLASH FLEABANE.
Most common *Erigeron* of study area.

Erigeron speciosus (Lindley) DC. SHOWY FLEABANE.
Infrequent; scattered throughout study area.

Gaillardia aristata Pursh. BLANKET FLOWER.
Open sites.

Gnaphalium viscosum H.B.K. CUDWEED.
Common; adventive.

Grindelia subalpina Greene. MOUNTAIN GUMWEED.
Dry slopes; late summer.

Helianthus pumilus Nuttall. SUNFLOWER.
Common.

Heterotheca fulcrata (Greene) Shinners. GOLDEN ASTER.
Chrysopsis fulcrata Greene.

Common; larger-flowered than *H. villosa*.

Heterotheca villosa (Pursh) Shinners. GOLDEN ASTER.
Chrysopsis villosa (Pursh) Nuttall.
More abundant and flowering earlier than *H. fulcrata*.

****Lactuca biennis** (Moench) Fernald. TALL BLUE LETTUCE.
Uncommon; two sites in Long Canyon. Like many of the plants of special concern, this and *L. canadensis* have affinities with woodlands to the east.

****Lactuca canadensis** L. CANADIAN WILD LETTUCE.
Uncommon; one site in Long Canyon.

Lactuca serriola L. PRICKLY LETTUCE.
Common *Lactuca* of study area, disturbed sites; adventive.

Liatris punctata Hooker. BLAZING STAR.
Common in open sites in late summer.

***Machaeranthera pattersonii** (Gray) Greene. TANSY ASTER.
M. bigelovii (Gray) Greene.
Aster pattersonii Gray.
Infrequent at higher elevations.

Oligosporus campestris (L.) Cassini ssp. **caudatus** (Michaux) Weber. WESTERN SAGEWORT.
Artemisia campestris L.
Open sites, locally abundant.

Oreochrysum parryi (Gray) Rydb. PARRY GOLDENROD.
Haplopappus parryi Gray.
Infrequent at higher elevations.

Packera fendleri (Gray) Weber & Löve. FENDLER'S SENECIO.
Senecio fendleri Gray.
Common woodland species, highly variable.

****Packera pseudaurea** (Rydb.) Weber & Löve.
Senecio pseudaurea Rydb.
Rare; observed only in drainage below Green Mountain Lodge.•

Psilochenia acuminata (Nuttall) Weber. HAWKSBEARD.
Crepis acuminata Nuttall.
Dry, open hillside below the West Ridge of Green Mountain.

Rudbeckia ampla Nelson. TALL CONEFLOWER.
Common along streams.

Rudbeckia hirta L. BLACK-EYED SUSAN.
One plant below Green Mountain Lodge; possibly an escaped cultivar.

***Senecio eremophilus** Richardson ssp. **kingii** (Rydb.) Doublas & Ruyle-Douglas. WESTERN GOLDEN SENECIO.
Scattered woodland species at higher elevations.

Senecio integerrimus Nuttall. SPRING SENECIO.
Common *Senecio* of early season.

Senecio rapifolius Nuttall. TURNIPLEAVED SENECIO.
Uncommon; observed west of Green Mountain summit; a Front Range endemic.

Senecio spartioides T & G. BROOM SENECIO.
Marginally entering study area from lower elevations.

Solidago missouriensis Nuttall. SMOOTH GOLDENROD.
Common and widespread.

Solidago serotinoides Löve & Löve. LATE GOLDENROD.
S. gigantea Aiton.
Occasional in moist areas.

Solidago spathulata DC. var. **neomexicana** (Gray) Cronquist.
West Ridge of Green Mountain.

Stenactis strigosa (Muhlenberg) DC. DAISY FLEABANE.
Erigeron strigosus Muhl.
Moist sites in Long Canyon during late summer.

Taraxacum officinale G.H. Weber. COMMON DANDELION.
Occasional; adventive.

Townsendia grandiflora Nuttall. SHOWY EASTER DAISY.
Occasional on dry sites.

Tragopogon dubius Scopoli ssp. **major** (Jacquin) Vollmann. SALSIFY.
Scattered throughout study area; adventive.

BERBERIDACEAE Barberry Family

Mahonia repens (Lindley) Don. OREGON GRAPE.
Common.

BETULACEAE Birch Family

Betula fontinalis Sargent. RIVER BIRCH.
Common along streambanks and other moist sites.

***Betula papyrifera** Marshall. PAPER BIRCH.
B. andrewsii Nelson.
Long Canyon and the lower reaches of Panther Canyon. This is the southernmost population of this species in North America and is one of the true rarities of the Mountain Parks. It hybridizes with *B. fontinalis*, and many intermediates occur where the two grow together. Disjunct from the Black Hills (Froiland, 1952). •

Corylus cornuta Marshall. HAZELNUT.
Common along streambanks in the study area, but not abundant elsewhere in Colorado. These thickets provide important wildlife habitats.

BORAGINACEAE Borage Family

Cynoglossum officinale L. HOUND'S TONGUE.
Weeds; common in disturbed areas; adventive.

Lithospermum incisum Lehmann. NARROW-LEAVED PUCCOON.
Common species of early season; open sites.

Lithospermum multiflorum Torrey. MANY-FLOWERED PUCCOON.
Later flowering than *L. incisum*; somewhat less frequent.

Mertensia lanceolata (Pursh) DC. BLUEBELLS.
Common species of early season.

Onosmodium mollee Michx. var. **occidentale** (Mack.) Cochrane. FALSE GROMWELL.
Occasional in dry areas.

Oreocarya virgata (Porter) Greene. MINERS CANDLE.
Cryptantha virgata (Porter) Payson.
Occasional in dry areas.

BRASSICACEAE/CRUCIFERAE Mustard Family

Alyssum alyssoides L. ALYSSUM.
Weed of disturbed sites; adventive.

Alyssum minus (L.) Rothmaler. ALYSSUM.
Weed of disturbed sites; adventive.

Arabis hirsuta (L.) Scopoli. HAIRY ROCK CRESS
Scattered; our observations in Long Canyon.

Boechera fendleri (Watson) Weber. FENDLER'S ROCK CRESS.
Arabis fendleri Watson.
Occasional; dry sites.

Descurainia richardsonii (Sweet) Schultz. WESTERN TANSY MUSTARD.
Two observations in Long Canyon.

Erysimum capitatum (Douglas) Greene. WESTERN WALLFLOWER.
Common; flowers in this region tend toward orange as opposed to the yellow varieties of lower elevations.

Lesquerella montana (Gray) Watson. MOUNTAIN BLADDER-POD.
An early season species of drier sites.

Noccaea montana (L.) Meyer. WILD CANDYTUFT.
Thlaspi montanum L.
Common white mustard of early season.

Physaria vitulifera Rydb. DOUBLE BLADDER-POD.
Occasional on dry sites; a variable species deserving further study; endemic to East Slope.

Sisymbrium altissimum L. JIM HILL MUSTARD.
Weedy species observed on West Ridge Trail; adventive.

Turritis glabra L. TOWER MUSTARD.
Arabis glabra (L.) Bernh.
Scattered; our observations in Long Canyon; adventive.

CACTACEAE Cactus Family

Opuntia macrorhiza Engelmann. PRICKLY PEAR CACTUS.
O. compressa (Salisb.) Macbr.
Dry sites.

CALOCHORTACEAE Mariposa Family (Liliaceae)

Calochortus gunnisonii Watson. MARIPOSA LILY.
Beautiful flower of grassy hillsides.

CAMPANULACEAE Bell Flower Family

Campanula rotundifolia L. HAREBELL.
Common.

Triodanis perfoliata (L.) Nieuwland. VENUS LOOKING GLASS.
A few plants observed in Long Canyon; adventive.

CAPRIFOLIACEAE Honeysuckle Family

Distegia involucrata (Banks) Cockerell. BUSH HONEYSUCKLE.
Lonicera involucrata (Rich.) Banks.
Frequent shrub along streams.

***Sambucus microbotrys** Rydb. ELDERBERRY.
S. racemosa.
A few plants observed above Greenman Springs; a plant more common at higher elevations.•

Symphoricarpos albus (L.) Blake. SNOWBERRY.
Frequent.

Viburnum lantana L. WAYFARING TREE.
Infrequent; observed in Panther Canyon and lower Greenman drainage; adventive.

CARYOPHYLLACEAE Pink Family (see also Alsinaceae)

Gastrolychnis drummondii (Hooker) Löve & Löve. CAMPION.
Melandrium drummondii (Hooker) Hultén.
Silene drummondii (Hooker).
Scattered species of dry woodlands.

Saponaria officinalis L. SOAPWORT, BOUNCING BET.
Road beneath Green Mountain Lodge; adventive.

CHENOPODIACEAE Goosefoot Family

Chenopodium album L. PIGWEED.
Roadside weed; adventive.

Chenopodium fremontii Watson. FREMONT GOOSEFOOT.
Disturbed sites.

Chenopodium gigantospermum Aellen. MAPLELEAVED GOOSEFOOT.
C. hybridum L.
Roadside.

COMMELINACEAE Spiderwort Family

Tradescantia occidentalis (Britton) Smyth. SPIDERWORT.
Dry, gravelly sites.

CONVALLARIACEAE Mayflower Family (Liliaceae)

Maianthemum amplexicaule (Nuttall) Weber. FALSE SOLOMON SEAL.
Smilacina racemosa of Colorado literature.
Common in cool, shaded sites.

Maianthemum stellatum (L.) Link. FALSE SOLOMON SEAL.
Smilacina stellata (L.) Desf.
Common, in sites similar to those of *M. amplexicaule*.

COPTACEAE Meadow Rue Family (Ranunculaceae)

Thalictrum fendleri Engelmann. MEADOW RUE.
Forests and shaded ravines.

CORNACEAE Dogwood Family

Swida sericea (L.) Holub. RED OSIER DOGWOOD.
Cornus stolonifera Michx.
Infrequent along streambanks.

CRASSULACEAE Stonecrop Family

Amerosedum lanceolatum (Torrey) Löve & Löve. STONECROP.
Sedum lanceolatum Torrey.
Common.

CYPERACEAE Sedge Family

Carex brevior (Dewey) Mack.
Occasional along streambanks.

Carex deweyana Schweinitz.
Infrequent in shaded sites near streams.

Carex foenea Willd.

Dry slopes above Panther Canyon.

Carex geophila Mack.
Scattered throughout dry woodlands.

Carex geyeri Boott. ELK SEDGE.
Common understory in forests.

Carex hassei Bailey.
Unobserved in this survey; specimen in COLO (Weber 14097).

Carex microptera Mack.
Frequent along streams.

Carex nebrascensis Dewey.
Observed in lower Long Canyon in gravel flat near stream.

Carex occidentalis Bailey.
Unobserved in this survey; specimen in COLO (Weber 3986) from Greenman Springs.

Carex pennsylvanica Lamarck ssp. **heliophila** (Mack) Weber.
C. heliophila Mack.
Early flowering sedge of drier sites.

Carex rossii Boott.
Scattered throughout woodlands.

Carex saximontana Mack.
Unobserved in this survey; specimen in COLO (Weber 12977) from upper Long Canyon.

Carex utriculata Boott.
Observed with *C. nebrascensis* in gravel flat near stream along lower Long Canyon.

ERICACEAE Heath Family
(see also Monotropaceae, Pyrolaceae)

Arctostaphylos uva-ursi (L.) Sprengel ssp. **adenotricha** (Fern. & Macbr.) Calder & Taylor.
KINNIKINNIK, BEARBERRY.
Scattered throughout study area.

Vaccinium myrtillus L. ssp. **oreophilum** (Rydb.) Löve. MYRTLE BLUEBERRY.
One site in upper Panther Canyon where it is extensive.•

FABACEAE/LEGUMINOSAE Pea Family

Astragalus canadensis L. CANADA MILK VETCH.
Infrequent; vincinity of Green Mountain Lodge.•

Astragalus flexuosus (Hooker) Don. WIRY MILK VETCH.
Infrequent; upper Long Canyon.

Astragalus parryi Gray. PARRY'S MILK VETCH.
Infrequent; drier sites.

Glycyrrhiza lepidota Pursh. WILD LICORICE.
Vicinity of Green Mountain Lodge.

Lupinus argenteus Pursh. COMMON LUPINE.
Common; scattered throughout area.

Medicago lupulina L. BLACK MEDIC.
Weed of disturbed sites; adventive.

Melilotus alba Medicus. WHITE SWEET CLOVER.
Disturbed sites; adventive.

Melilotus officinalis (L.) Pallas. YELLOW SWEET CLOVER.
Disturbed sites; adventive.

Thermopsis divaricarpa Nelson. GOLDEN BANNER.
Common.

Trifolium repens L. WHITE DUTCH CLOVER.
Disturbed sites; adventive.

Trifolium pratense L. RED CLOVER.
Disturbed sites; adventive.

FAGACEAE Oak Family

Quercus borealis Michaux. RED OAK.
One tree near Green Mountain Lodge; adventive.

Quercus gambelii Nuttall. SCRUB OAK.
Introduced species; scattered throughout Long Canyon and apparently regenerating successfully.•

FUMARIACEAE Fumitory Family

Corydalis aurea Willd. GOLDEN SMOKE.
Common colonizer of tree fall mounds and animal-disturbed soil.

GENTIANACEAE Gentian Family

Frasera speciosa Douglas. MONUMENT PLANT, GREEN GENTIAN.
Scattered throughout area.

Gentianella acuta (Michx.) Hiitonen. LITTLE GENTIAN.
G. amarella (L.) Boern.
Infrequent; Long Canyon.

GERANIACEAE Geranium Family

Erodium cicutarium (L.) L'Heritier. STORKSBILL.
Early bloomer of disturbed sites; common; adventive.

Geranium caespitosum. COMMON GERANIUM.
Frequent; drier sites.

*Geranium **richardsonii**. WHITE GERANIUM.
Cool, moist sites; a species more common to higher altitudes.

GROSSULARIACEAE Currant or Gooseberry Family

Ribes cereum Douglas. WAX CURRANT.
Common *Ribes* of study area; often found in shade of *Pinus ponderosa*.

Ribes inerme. COMMON GOOSEBERRY.
Infrequent; moist sites.

HELLEBORACEAE Hellebore Family (Ranunculaceae)

*Aconitum **columbianum** Nuttall. MONKSHOOD.
Infrequent; streambanks; a subalpine species.•

*Actaea **rubra** (Aiton) Willd. ssp. **arguta** (Nuttall) Hultén. BANEBERRY.
Infrequent; cool, mesic sites.•

Aquilegia chrysantha Gray. YELLOW COLUMBINE.
One plant in upper Long Canyon; possibly introduced; deserves close monitoring.•

*Aquilegia **coerulea** James. BLUE COLUMBINE.
Scattered; usually in shaded sites. Protected by state law.•

Delphinium nuttallianum Pritzel. BLUE LARKSPUR.
D. nelsonii Green.
Common in early season

HYDRANGEACEAE Hydrangea Family

Jamesia americana T & G. WAXFLOWER.
Important understory shrub of forests; a relictual species common to this area.

HYDROPHYLLACEAE Waterleaf Family

Hydrophyllum fendleri (Gray) Heller. WATERLEAF.
Common to moist sites.

Phacelia heterophylla Pursh. SCORPION WEED.
Common to dry sites.

IRIDACEAE Iris Family

Iris missouriensis Nuttall. WILD IRIS.
Infrequent; lower elevations of study area.

Sisyrinchium montanum Greene.
Infrequent; moist sites at lower elevations.

JUNCACEAE Rush Family

Juncus arcticus Willd. ssp. **ater** (Rydb.) Hultén.
Most common *Juncus* of study area; moist sites.

Juncus dudleyi Wiegand.
Uncommon; Long Canyon.

Juncus saximontanus Nelson.
Uncommon; Long Canyon.

Juncus tracyi Rydberg.
Infrequent.

Luzula parviflora (Ehrhart) Desv. WOOD RUSH.
Scattered; streambanks.

LAMIACEAE/LABIATAE Mint Family

Mentha arvensis L. FIELD MINT.
Streambanks.

Monarda fistulosa L. var. **menthifolia** (Graham) Fernald. PINK BERGAMOT.
Common; open sites.

Nepta cataria L. CATNIP.
Scattered; adventive.

Prunella vulgaris L. HEAL-ALL.
Common; streambanks.

Scutellaria brittonii Porter. BRITTON SKULLCAP.
Frequent in drier sites.

LILIACEAE Lily Family
(see also Alliaceae, Convallariaceae, Calochortaceae, Melanthiaceae, and Uvulariaceae)

Leucocrinum montanum Nuttall. SAND LILY.
Dry sites; a beautiful wildflower of the early season.

***Lilium philadelphicum** L. WOOD LILY
A plant of utmost concern due to its attractiveness and rarity; may not flower every year. One plant observed below the confluence of Panther and Long Canyons; another small population of three plants seen in upper Long Canyon.•

LINACEAE Flax Family

Adenolinum lewisii (Pursh) Löve & Löve. WILD FLAX.
Linum lewisii Pursh.
Frequent in drier sites.

MELANTHIACEAE False Hellebore Family
(Liliaceae)

Toxicoscordion venenosum (Wats.) Rydb. DEATH CAMAS.
Zigadenus venenosus Wats.

Occasional; dry sites.

MONOTROPACEAE Pinesap Family (Ericaceae)

Pterospora andromedea Nuttall. PINEDROPS.
Infrequent in forests.

NYCTAGINACEAE Four-o'clock Family

Oxybaphus hirsutus (Pursh) Sweet. HAIRY UMBRELLA-WORT.
Dry sites.

OLEACEAE Olive Family

Fraxinus pennsylvanica Marshall. GREEN ASH.
Introduced; below Green Mountain Lodge.

ONAGRACEAE Evening-primrose Family

Chamerion danielsii Löve. FIREWEED.
Chamerion angustifolium of Colorado literature.
Epilobium angustifolium of Colorado literature.
Scattered; drier sites.

****Circaea alpina** L. ssp. **pacifica** (Asch & Magnus) Raven. ENCHANTERS NIGHTSHADE.
Locally abundant along streambanks; restricted to this habitat.•

Epilobium brachycarpum Presl. ANNUAL WILLOW HERB.
E. paniculatum Nutt.
Weedy; drier sites.

Epilobium ciliatum Raf. ssp. **glandulosum** (Lehmann) Hoch & Raven. NORTHERN WILLOW HERB.
Most common *Epilobium* of the area; moist sites.

***Epilobium hornemannii** Reichenbach.
Uncommon; streamsides.

***Epilobium lactiflorum** Haussknecht.
Uncommon; streamsides.

Gayophytum diffusum T & G ssp. **parviflorum** Lewis & Szweykowski.
Occasional; drier sites.

Oenothera caespitosa Nuttall. WHITE STEMLESS EVENING-PRIMROSE.
Dry, open sites; early season.

Oenothera villosa Thunberg ssp. **strigosa** (Rydb.) Dietrich & Raven. COMMON EVENING PRIMROSE.
Oenothera strigosa (Rydb.) Mack & Bush.
Scattered.

ORCHIDACEAE Orchid Family

***Calypso bulbosa** (L.) Oakes. FAIRY SLIPPER.

North slopes of Green Mountain at higher elevations; flowering in early season. Although not particularly rare in Colorado, it deserves protection in the Mountain Parks. In this survey, 20 to 30 groups of plants were observed in the zone between the springs and the West Ridge.•

Corallorhiza maculata Raf. SPOTTED CORAL ROOT.
Frequent species of dry woodlands.

****Corallorhiza striata** Lindley. STRIPED CORAL ROOT.
Rare in study area; two sites (five plants) observed in lower Greenman drainage.•

****Corallorhiza wisteriana** Conrad. SPRING CORAL ROOT.
Rare in study area; two sites in lower Panther Canyon. A southeastern species that flowers early in the season.•

Goodyera oblongifolia Raf. RATTLESNAKE PLANTAIN.
Occasional; scattered throughout deeper woods. Often associated with Doug Fir (*Pseudotsuga menziesii*).•

Limnorchis dilatata (Pursh) Rydb. WHITE BOG ORCHID.
Habenaria dilatata (Pursh) Hooker.
Platanthèra dilatata (Pursh) Lindl.
One plant observed in tributary canyon west of Panther Canyon. The individual appeared white, but was in the later stages of flowering. This identification is thus tentative.•

***Limnorchis saccata** (Greene) Löve & Simon. NORTHERN BOG ORCHID.
Habenaria saccata Greene.
Platanthera saccata (Greene) Hultén.
Found only in moist sites; several populations noted in the drainage below Green Mountain Lodge, Greenman Spring area, Panther Canyon, Long Canyon. Some authors recognize two species in this group, *L. saccata* and *L. hyperborea* (L.) Rydb.•

*****Listera convallarioides** (Schwartz) Nuttall. BROAD-LIPPED TWAYBLADE.
A true rarity of the Mountain Parks; always found along streambanks, often on small benches. Although there are only four known localities for this species in Colorado, it is locally abundant where found in the study area, often forming large mats of over a hundred plants. Populations in Long Canyon, Panther Canyon, Greeman Springs, and several of the tributary canyons.•

*****Malaxis monophyllos** (L.) Schwartz ssp. **brachypoda** (Gray) Löve & Löve. WHITE ADDERS-MOUTH.
M. brachypoda (Gray) Fernald.
The rarest orchid in Colorado! Seven plants observed in the vicinity of Greenman Springs, usually growing on rocks covered with the moss *Brachythecium rivulare*. Although other plants were not found elsewhere, collections from lower Panther Canyon are in COLO.•

****Piperia unalascensis** (Sprengel) Rydb. ALASKAN ORCHIS.
A rare woodland species; our observations on the wooded slopes south of Green Mountain Lodge.•

OXALIDACEAE Wood-sorrel Family

Oxalis dillenii Jacquin. WOOD-SORREL.

Weedy species of disturbed sites.

PLANTAGINACEAE Plantain Family

Plantago lanceolata L. ENGLISH PLANTAIN.
Weedy species of disturbed sites; adventive.

Plantago major L. COMMON PLANTAIN.
Similar sites; adventive.

POACEAE/GRAMINEAE Grass Family

Agrostis gigantea Roth. RED TOP.
Common in Long Canyon; scattered throughout area in more mesic sites; adventive.

Agrostis scabra Willd. TICKLEGRASS.
The native counterpart of *A. gigantea;* less common; similar sites.

Anisantha tectorum (L.) Nevski. CHEAT GRASS.
Bromus tectorum L.
Dry, disturbed sites; adventive.

Bouteloua gracilis (H.B.K.) Lag. BLUE GRAMA.
Open, south-facing slopes in Long Canyon.

Bromopsis inermis (Leysser) Holub. SMOOTH BROME.
Bromus inermis Leysser.
Adventive; common below Green Mountain Lodge.

Bromopsis lanatipes (Shear) Holub. BROME.
Bromus lanatipes Shear.
Most common *Brome* of study area.

Bromopsis pubescens (Muhl.) Holub. HAIRY BROME.
Bromus pubescens Muhl.
The taxonomy of this species is not settled. It is a larger plant than *B. lanatipes,* growing in more moist sites. Our few observations were in Long Canyon. It is probably a relictual species of the eastern woodlands.•

Bromus brizaeformis Fischer & Meyer. RATTLESNAKE GRASS.
Disturbed south-facing slopes in Long Canyon; adventive.

Bromus japonicus Thunberg. JAPANESE BROME.
Disturbed sites; adventive.

Dactylis glomerata L. ORCHARD GRASS.
Common; adventive.

Danthonia spicata (L.) Beauvois. POVERTY OATGRASS.
Frequent along trails at lower elevations.

Dichanthelium oligosanthes (Schultes) Gould.
Panicum oligosanthes Schultes.
Growing in rocky trails.

Elymus canadensis L. CANADA WILD RYE.
Lower elevations of study area.

Elymus glaucus Buckley. BLUE WILD RYE.
Frequent in study area; woodland species.

Elymus longifolius (Smith) Gould. SQUIRREL TAIL.
Sitanion longifolium Smith.
Open sites, often disturbed.•

Elymus trachycaulus (Link) Gould. SLENDER WHEATGRASS.
Agropyron trachycaulum (Link) Malte.
Woodland species; scattered.

Elytrigia repens (L.) Nevski. QUACK GRASS.
Agropyron repens (L.) Beauvois.
Disturbed areas below Green Mountain Lodge; adventive.

Festuca pratensis Hudson. MEADOW FESCUE.
Adventive; scattered.

Festuca rubra L. RED FESCUE.
Upper slopes of Green Mountain.

*__Glyceria elata__ (Nash) Hitchcock. TALL MANNA GRASS.
Moist areas.

Glyceria striata (Lamarck) Hitchcock. FOWL MANNA GRASS.
Moist areas.

Koeleria macrantha (Ledebour) Schultes. JUNE GRASS.
Scattered throughout study area.

Leucopoa kingii (Watson) Weber. SPIKE FESCUE.
Hesperochloa kingii (Watson) Rydb.
Pine forests.•

Leymus ambiguus (Vasey & Scribner) Dewey. COLORADO WILD RYE.
Elymus ambiguus Vasey & Scribner.
Infrequent; growing as extensive mat.

Muhlenbergia montana (Nuttall) Hitchcock. MOUNTAIN MUHLY.
Dry, gravelly sites.

Muhlenbergia racemosa (Michaux) B.S.P.
Scattered; less common than *M. montana*.

**__Oryzopsis asperifolia__ Michaux. ROUGH-LEAVED RICEGRASS.
Infrequent; in the shade of streambank vegetation.•

Oryzopsis micrantha (Trin & Rupr.) Thurber. LITTLESEED RICEGRASS.
Shaded sites at higher elevations; not common.

Phleum pratense L. TIMOTHY.
Common along trails at lower elevations.

Poa agassizensis Boivin & D. Löve. BLUEGRASS.
Occasional in open forests.

Poa compressa L. CANADA BLUEGRASS.
Most common *Poa* of area.

Poa palustris L. SWAMP BLUEGRASS.
Wet areas.

****Schizachne purpurascens** (Torrey) Swallen. FALSE MELIC.
A boreal species, rare in the study area. Growing in protected sites near streams in Long and Panther Canyons.•

Schizachyrium scoparium (Michaux) Nash. LITTLE BLUESTEM.
Andropogon scoparius Michaux.
Dry, open sites; prairie species.

****Sphenopholis obtusata** (Michaux) Scribner. PRAIRIE WEDGE GRASS.
Moist sites; one site near Greenman Falls.

Stipa lettermanii Vasey. NEEDLEGRASS.
Drier woodland sites; less common than *S. nelsonii.*

Stipa nelsonii Scribner. NEEDLEGRASS.
S. columbiana Macoun.
Common *Stipa* of area.

POLEMONIACEAE Phlox Family

Collomia linearis Nuttall. NARROWLEAVED COLLOMIA.
Common in dry woods.

Gilia pinnatifida Nuttall var. **calcarea** Brand. SMALL FLOWERED GILIA.
Our observations at open sites near trailheads.

Ipomopsis aggregata (Pursh) Grant ssp. **candida** (Rydb.) Grant. GILIA.
A white *Gilia,* occasional in the canyons.

Microsteris gracilis (Doug.) Greene ssp. **humilis** (Greene) Grant.
Frequent in early season, often associated with *Collinsia parviflora.*

Phlox multiflora Nelson. MANY-FLOWERED PHLOX.
Abundant on open slopes in early season.

POLYGONACEAE Buckwheat Family

Acetosella vulgaris (Koch) Fourreau. SHEEP SORREL.
Rumex acetosella L.
Weedy; common along trails; adventive.

Eriogonum umbellatum Torrey. SULPHUR FLOWER.

Common in dry, open sites.

Fallopia convolvulus (L.) Holub. BLACK BINDWEED.
Polygonum convolvulus L.
Infrequent; Long Canyon; adventive.

Polygonum douglasii Greene. DOUGLAS KNOTWEED.
Common in dry sites, openings and forest.

Pterogonum alatum (Torrey) Gross. WINGED BUCKWHEAT.
Eriogonum alatum Torrey.
Frequent on drier sites.

Rumex crispus L. CURLY DOCK.
Weed of trail sides and disturbed sites; adventive.

PORTULACEAE Purslane Family

Claytonia rosea Rydb. SPRING BEAUTY.
C. lanceolata Pursh.
Common in early season; a Foothills endemic.

Crunocallis chamissoi (Ledeb.) Rydb. WATER SPRING BEAUTY.
Montia chamissoi (Ledeb.) D. & J.
Wet sites.

PRIMULACEAE Primrose Family

Androsace septentrionalis L. ROCK PRIMROSE.
Scattered throughout area; drier sites.

Dodecatheon pulchellum (Raf.) Merrill. SHOOTING STAR.
Locally abundant along streams in early season.

Steironema ciliata (L.) Raf. FRINGED LOOSESTRIFE.
Lysimachia ciliata L.
An eastern woodland species infrequent in the study area; vicinity of Green Mountain Lodge.

PYROLACEAE Wintergreen Family (Ericaceae)

Chimaphila umbellata (L.) Barton ssp. **occidentalis** (Rydb.) Hultén. PIPSISSEWA.
Frequent in forests at higher elevations.•

Orthilia secunda (L.) House. ONE-SIDED WINTERGREEN.
Ramischia secunda (L.) Garcke.
Pyrola secunda L.
Common in forests at higher elevations.•

Pyrola chlorantha Schwartz. GREEN-FLOWERED PYROLA.
P. virens Schweigg.•
Frequent *Pyrola* of study area, but never abundant.

***Pyrola picta** Smith. WHITE VEINED PYROLA.
Known from only three other localities in Colorado, this beautiful *Pyrola* was usually found at higher elevations in the study area. Approximately twenty plants were observed in each of the drainages—Greenman, Panther, tributaries west of Panther—for an estimate of one hundred plants overall. It is often associated with *Chimaphila umbellata* and grows in the duff of pine needles (*Pinus ponderosa*).•

Pyrola rotundifolia L. ssp. **asarifolia** (Michaux) Löve. ROUND-LEAVED PYROLA.
P. asarifolia Michaux.
Uncommon; cool, moist sites.•

RANUNCULACEAE Buttercup Family
(see also Helleboraceae)

Anemone cylindrica Gray. THIMBLEWEED.
Frequent in study area at lower elevations.

Atragene columbianum Nuttall. ROCKY MOUNTAIN CLEMATIS.
Clematis columbiana (Nutt.) T. & G.
Less frequent than its near relative, *A. occidentalis.*

Atragene occidentalis Hornemann. BLUE CLEMATIS.
Clematis occidentalis (Horn.) DC.
Occasional in study area; found climbing on trees and shrubs.

Cyrtorhyncha ranunculina Nuttall. NUTTALL'S BUTTERCUP.
Ranunculus ranunculinus (Nutt.) Rydb.
One site, a ledge above falls in lower Greenman. A southern Rocky Mountain endemic.•

Pulsatilla patens (L.) Miller ssp. **multifida** (Pritzel) Zamels. PASQUE FLOWER.
Anemone patens L.
Occasional in study area; more common at lower elevations. A harbinger of the flowering season.

Ranunculus abortivus L. ssp. **acrolasius** (Fernald) Kapoor. SMALL-FLOWERED CROWFOOT.
Infrequent along streams in early summer; a species with eastern woodland affinities.•

Ranunculus glaberrimus Hooker var. **ellipticus** Greene. SAGEBRUSH BUTTERCUP.
Hillside beneath Green Mountain Lodge that holds late snow; an early season flower. Uncommon on the East Slope of Colorado.•

Ranunculus macounii Britton. MACOUN'S BUTTERCUP.
Occasional; streamsides.

RHAMNACEAE Buckthorn Family

Ceanothus fendleri Gray. BUCKBRUSH.
Common, an important component of the forest understory.

Ceanothus velutinus Douglas. STICKY LAUREL.
Less common than *C. fendleri.*

ROSACEAE Rose Family

Amelanchier alnifolia Nuttall. SERVICEBERRY.
Occasional shrub or small tree of study area.

Argentina anserina (L.) Rydb. SILVERWEED.
Potentilla anserina L.
Infrequent; dry sites.

****Cerasus pennsylvanica** (L.) Loiseleur. PIN CHERRY.
Prunus pennsylvanica L.
One small tree observed on the lower part of the Ranger Trail, about one km above its junction with the Greenman Trail.

Cotoneaster sp.
An escaped cultivar, probably spread by birds; several plants seen in the canyons.

Crategus macracantha Loddiges var. **occidentalis** (Britton) Eggleston HAWTHORN.
Road beneath Green Mountain Lodge.

****Cylactis pubescens** (Raf.) Weber. DWARF RASPBERRY.
Rubus pubescens Raf.
A plant of special concern found in small populations at Greenman Springs, the spring in upper Panther Canyon, and in the tributary canyons to the west of Panther Canyon.•

Drymocallis fissa (Nutt.) Rydb.
Potentilla fissa Nuttall.
Common Cinquefoil of the study area.

Fragaria vesca L. ssp. **bracteata** (Heller) Staudt. STRAWBERRY.
F. americana (Porter) Britton.
Infrequent, cooler sites.

Fragaria virginiana Miller ssp. **glauca** (Watson) Staudt. STRAWBERRY.
F. ovalis (Lehm.) Rydb.
Common; scattered throughout study area.

Geum aleppicum Jacquin. YELLOW AVENS.
Unobserved, but previously reported from area (COLO).

Geum macrophyllum Willd. LARGE-LEAVED AVENS.
Frequent in moist sites.

Oreobatus deliciosus (James) Rydb. BOULDER RASPBERRY.
Rubus deliciosus James.
Occasional; drier sites.

Padus virginiana (L.) Miller ssp. **melanocarpa** (Nelson) Weber. CHOKE CHERRY.
Prunus virginiana L.
Common shrub of area.

Physocarpus monogynus (Torrey) Coulter. NINEBARK.
Common shrub of hillsides.

Physocarpus opulifolius (L.) Maxim. NINEBARK.
A larger species than *P. monogynus* with eastern affinities. Although the extreme forms of

these two species can be readily distinguished, there appears to be a large spectrum in which they hybridize and intermediate characters are present.

Potentilla hippiana Lehmann. WOOLY CINQUEFOIL.
Drier sites; occasional.

Rubacer parviflorum (Nutt.) Rydb. THIMBLEBERRY.
Rubus parviflorus Nuttall.
Infrequent; cool ravines.

Rubus idaeus L. ssp. **melanolasius** (Dieck) Focke. WILD RASPBERRY.
Abundant in area, often forming thickets.

Rosa sayi Schweinitz.
R. acicularis Lindl.
More prickly and less frequent than *R. woodsii.*

Rosa woodsii Lindl. WILD ROSE.
The common wild rose of the area, but never abundant.

****Sorbus scopulina** Greene. MOUNTAIN ASH.
Infrequent along streams; a beautiful tree that seems to be maintaining itself based on the many seedlings and saplings observed. A Rocky Mountain endemic.•

RUBIACEAE Madder Family

Galium septentrionale R & S. NORTHERN BEDSTRAW.
G. boreale of Colorado literature.
Common *Galium* of area, an understory herb.

Galium spurium L. FALSE CLEAVERS.
Occasional; cooler sites; adventive.

Galium triflorum Michaux. FRAGRANT BEDSTRAW.
Frequently found along streams and moist areas.

SALICACEAE Willow Family

Populus augustifolia James. NARROWLEAF COTTONWOOD.
Drainage beneath Green Mountain Lodge.

Populus deltoides Marshall ssp. **monilifera**(Aiton) Eckenwalder. PLAINS COTTONWOOD.
P. sargentii Dode.
Beneath Green Mountain Lodge.

Populus tremuloides Michaux. ASPEN.
Scattered throughout study area, often forming a significant substratum in forests of Douglas Fir at higher elevations.

Salix bebbiana Sargent. BEAKED WILLOW.
S. depressa of Colorado literature.
The most common willow of streambanks, but nowhere abundant in area.•

Salix exigua Nuttall. SANDBAR WILLOW.

Scattered along streams; infrequent.

Salix fragilis L. CRACK WILLOW.
Two trees at Green Mountain Lodge; adventive.

Salix irrorata Andersson. BLUESTEM WILLOW.
Beneath Green Mountain Lodge; a southwestern species.

SANTALACEAE Sandalwood Family

Comandra umbellata (L.) Nuttall. BASTARD TOADFLAX.
Scattered throughout area on drier sites.

SAXIFRAGACEAE Saxifrage Family

Heuchera bracteata (Torrey) Seringe. BRACTED ALUM ROOT.
Common among rocky areas in forests.

Heuchera parvifolia Nuttall. COMMON ALUM ROOT.
Similar sites as *H. bracteata*, apparently not as common in study area.

Micranthes rhomboidea (Greene) Small. SNOWBALL SAXIFRAGE.
Saxifraga rhomboidea Greene.
Infrequent; cooler sites.

SCROPHULARIACEAE Figwort Family

Castilleja linariifolia Bentham. WYOMING PAINTBRUSH.
Infrequent on drier slopes at higher elevations.

Castilleja miniata Douglas. SCARLET PAINTBRUSH.
The more common *Castilleja*, but never abundant.

Collinsia parviflora Douglas. BABY-BLUE-EYES.
A common annual scattered throughout area; small, but very pretty.

Mimulus floribundus Douglas. MONKEY FLOWER.
Often growing in seeps perched on bedrock; not common.

Orthocarpus luteus Nuttall. YELLOW OWL CLOVER.
Infrequent; drier hillsides.

Penstemon glaber Pursh. SMOOTH PENSTEMON.
P. alpinus Torrey.
Occasional throughout study area in midsummer.

Penstemon secundiflorus Bentham. ONE-SIDED PENSTEMON.
Common in early summer in woodlands and meadows.

Penstemon virens Pennell. LOW PENSTEMON.
Most common and widespread *Penstemon* of this area.

Verbascum thapsus L. MULLEIN.
Adventive; disturbed sites; common.

Veronica americana (Raf.) Schweintz. AMERICAN BROOKLIME.
Frequent in and along streams.

SOLANACEAE Nightshade Family

Physalis virginiana Miller. GROUND CHERRY.
Open sites in Long Canyon.

ULMACEAE Elm Family

Ulmus pumila L. CHINESE ELM.
Adventive; lower Greenman.

UVULARIACEAE Bellwort Family (Liliaceae)

Disporum trachycarpum (Watson) B. & H. FAIRYBELLS
Shaded woods.

Streptopus fassettii Löve & Löve. TWISTED STALK.
S. amplexifolius of Colorado literature.
Frequent along streams.

VERBENACEAE Vervain Family

Verbena bracteata Lagasca & Rodriguez. VERVAIN.
Weed of disturbed sites; road below Green Mountain Lodge.

VIOLACEAE Violet Family

*__Viola adunca__ Smith. BLUE VIOLET.
One site, confluence of Panther and Long Canyons; about twenty plants observed.

Viola nuttalli Pursh. YELLOW VIOLET.
Early season flower; common.

Viola rydbergii Greene.
V. rugulosa of Colorado literature.
V. canadensis of Colorado literature.
This and the next species grew together, *V. scopulorum* seeming to be more widespread on slightly drier ground; they were abundant in the early season in the understory of cooler forests.•

Viola scopulorum (Gray) Greene.
V. canadensis L. var. *scopulorum*.
This species has smaller leaves and flowers, and lacks hairs on the petiole and leaf midvein as in *V. rydbergii*.•

VITACEAE Grape Family

Parthenocissus inserta (Kerner) Fritsch. VIRGINIA CREEPER.
Lower Greenman.

Vitis riparia Michaux. WILD GRAPE.
Lower Greenman.

APPENDIX II

Species of Special Concern

State-listed Species

Botrypus virginianum
Betula papyrifera
Lilium philadelphicum
Listera convallarioides
Malaxis monophyllos
Pyrola picta

Relictual, Woodland Species and/or Species Restricted to Mesic Montane Habitats

Antennaria neodioca
Aralia nudicaulis
Astragalus canadensis
Athyrium filix-femina
Bromopsis pubescens
Carex deweyana
Carex saximontana
Cerasus pennsylvanica
Circaea alpina
Corallorhiza striata
Corallorhiza wisteriana
Corylus cornuta
Cylactis pubescens
Cyrtorhyncha ranunculina
Dryopteris filix-mas
Lactuca biennis
Lactuca canadensis
Oryzopsis asperifolia
Packera pseudaurea
Piperia unalascensis
Polypodium amorphum
Ranunculus abortivus
Sanicula marilandica
Schizachne purpurascens
Sorbus scopulina
Sphenopholis obtusata
Steironema ciliata

Infrequent Species Present in Study Area more common to Higher Altitudes/Latitudes

Aconitum columbianum
Actaea rubra
Aquilegia coerulea
Calypso bulbosa
Chlorocrepis fendleri
Epilobium hornemannii

Epilobium lactiflorum
Erigeron eximius
Geranium richardsonii
Glyceria elata
Limnorchis dilatata
Limnorchis saccata
Machaeranthera pattersonii
Oreochrysum parryi
Sambucus microbotrys
Senecio eremophilus
Vaccinium myrtillus
Viola adunca

42. *Calypso bulbosa*
43. *Calypso bulbosa*
44. *Carex deweyana*
45. *Chimaphila umbellata*
46. *Circaea alpina*
47. *Corallorhiza striata*
48. *Corallorhiza wisteriana*
49. *Corallorhiza wisteriana*
50. *Corallorhiza wisteriana*
51. *Cryptogramma acrostichoides*
52. *Cryptogramma acrostichoides*
53. *Cylactis pubescens*
54. *Cyrtorhyncha ranunculina*
55. *Cyrtorhyncha ranunculina*
56. *Dryopteris filix-mas*
57. *Elymus longifolius*
58. *Goodyera oblongifolia*
59. *Leucopoa kingii*
60. *Limnorchis dilatata* ?
61. *Limnorchis saccata*
62. *Limnorchis saccata*
63. *Orthilia secunda*
64. *Oryzopsis asperifolia*
65. *Packera pseudaurea*
66. *Piperia unalascensis*
67. *Piperia unalascensis*
68. *Polypodium amorphum*
69. *Polypodium amorphum*
70. *Pyrola chlorantha*
71. *Pyrola rotundifolia*
72. *Quercus gambelii*
73. *Ranunculus abortivus*
74. *Ranunculus abortivus*
75. *Ranunculus glaberrimus*
76. *Salix bebbiana*
77. *Sambucus racemosa*
78. *Sanicula marilandica*
79. *Sanicula marilandica*
80. *Schizachne purpurascens*
81. *Sorbus scopulina*
82. *Sorbus scopulina*
83. *Vaccinium myrtillus*
84. *Viola rydbergii*
85. *Viola scopulorum*
86. *Woodsia oregana*
87. *Woodsia scopulina*

APPENDIX III

Photographic Documentation

Habitat

1. Cloud veil
2. Cloud veil
3. Cloud veil
4. Greenman drainage
5. Riparian habitat
6. Riparian habitat
7. Mesic-xeric border
8. Mesic-xeric border
9. Crowded forest
10. *Monarda* meadow
11. Long Canyon
12. Long Canyon
13. Long Canyon
14. South view from West Ridge
15. Continental Divide from West Ridge
16. Forest floor
17. Microhabitat, streamside

State-listed Plants of Special Concern

18. *Betula papyrifera*
19. *Betula papyrifera*, bark
20. *Betula papyrifera*
21. *Botrypus virginianus*
22. *Lilium philadelphicum*
23. *Lilium philadelphicum*
24. *Listera convallarioides*
25. *Listera convallarioides*
26. *Listera convallarioides*
27. *Malaxis monophyllos*
28. *Malaxis monophyllos*
29. *Pyrola picta*
30. *Pyrola picta*

Additional Photographs

31. *Aconitum columbianum*
32. *Actaea rubra*
33. *Antennaria neodioica*
34. *Aquilegia chrysantha*
35. *Aquilegia coerulea*
36. *Aralia nudicaulis*
37. *Astragalus canadensis*
38. *Athyrium filix-femina*
39. *Athyrium filix-femina*
40. *Bromopsis pubescens*
41. *Calypso bulbosa*

42. *Calypso bulbosa*
43. *Calypso bulbosa*
44. *Carex deweyana*
45. *Chimaphila umbellata*
46. *Circaea alpina*
47. *Corallorhiza striata*
48. *Corallorhiza wisteriana*
49. *Corallorhiza wisteriana*
50. *Corallorhiza wisteriana*
51. *Cryptogramma acrostichoides*
52. *Cryptogramma acrostichoides*
53. *Cylactis pubescens*
54. *Cyrtorhyncha ranunculina*
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61. *Limnorchis saccata*
62. *Limnorchis saccata*
63. *Orthilia secunda*
64. *Oryzopsis asperifolia*
65. *Packera pseudaurea*
66. *Piperia unalascensis*
67. *Piperia unalascensis*
68. *Polypodium amorphum*
69. *Polypodium amorphum*
70. *Pyrola chlorantha*
71. *Pyrola rotundifolia*
72. *Quercus gambelii*
73. *Ranunculus abortivus*
74. *Ranunculus abortivus*
75. *Ranunculus glaberrimus*
76. *Salix bebbiana*
77. *Sambucus racemosa*
78. *Sanicula marilandica*
79. *Sanicula marilandica*
80. *Schizachne purpurascens*
81. *Sorbus scopulina*
82. *Sorbus scopulina*
83. *Vaccinium myrtillus*
84. *Viola rydbergii*
85. *Viola scopulorum*
86. *Woodsia oregana*
87. *Woodsia scopulina*