

# THE ALPINE FLORA OF SUMMIT LAKE, MOUNT EVANS, COLORADO

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## Introduction

Summit Lake, Mount Evans, Colorado, a high cirque lake in the Colorado Front Range just west of Denver, supports a unique assemblage of alpine plants including a number of rare disjuncts. The area was designated the first Natural History Landmark in Colorado 26 years ago. This paper gives the history of its proposal and designation, a description of the habitats found there, and a catalog of the vascular plants, bryophytes, and lichens this far known to occur.

## History of Landmark Designation

The National Registry of Natural History Landmarks is a program initiated in 1960 by then Secretary of the Interior Stewart Udall. The guidelines for the program were given as follows (Dale 1964).

“Sites eligible for registry must have a high degree of scientific or educational value. They must contain geological or ecological values, or both, of exceptional quality and significance in illustrating the natural history of the United States.

“Sites representing rare or vanishing geological features or phenomena, or types of ecosystems, will generally qualify. Sites may also qualify by being excellent examples of natural history features of common occurrence. But rare or common, they must be natural or reasonably successful re-creations of natural conditions.

“Few sites exist in America which are entirely free from man-caused influences. However, successful re-establishment of natural environments is often possible. Such sites may be considered for designation if owners are sympathetic with, and press toward, that objective.

“The site should be large enough to satisfy a minimum of ecological requirements and must be reasonably invulnerable to deterioration, dilution, or destruction. It is desirable that the site be reasonably easy of access and available for appropriate uses by scientists, conservationists, and educators.

Summit Lake, 12,800 ft. alt., on Mount Evans west of Denver, was the first Colorado site designated by the National Registry. Designation of the first seven Natural History Landmarks was announced on March 17, 1964. I nominated Summit Lake for designation in a letter to the regional Director, Midwest Region, National Park Service in Omaha, Nebraska, on January 9, 1965.

In seeking this designation, I enumerated the following qualifications:

**1. Physical features:** Summit Lake is a unique alpine lake for the following reasons. It is the largest lake of its altitude (12,800 ft) in the region and lies in a protected northeast niche of the arete of Mount Evans. Unlike most alpine cirque lakes, it has an extensive inlet area of gentle slopes, with meandering and anastomosing streamlets, gravel bars, sedge hummocks, frost-push ponds, boulderfields, and a large persistent snowbank at the upper end.

**2. Ecological features:** Summit Lake is unique because here are concentrated a number of extremely rare Arctic-alpine plants occurring here at their only [or few] stations outside the Arctic Circle. A few of these are known in the United States (outside Alaska) only in areas of a few square feet in the lake's inlet area. Other alpine wildlife species are here in goodly numbers: Ptarmigan, mountain sheep, elk, and rosy finches. Although the invertebrate fauna has not been studied much, there are similar rarities in the butterflies and crane flies.

**3. Present and potential uses:** Summit Lake is essentially a scenic area and is served by a paved highway which crosses the outlet en route to the mountain summit. A picnic shelter has existed for some years near the road, and a trail goes from this point to the overlook of the Chicago Basin to the west. With careful development, the picnic area could be maintained without destruction of the natural values in the frost-push ponds across the outlet from the picnic area. With proper interpretive literature, the area could serve at a distance classes from the Denver Metropolitan area. Trampling of the lake margin would have to be prohibited, since this is very destructive at high altitudes. In small numbers, students of the flora and fauna would be able to make a vicarious excursion to the Arctic at a fraction of the cost and time of a real one. Collection should be discouraged or strictly limited to a degree that would not deplete the existing flora. Grazing and other sorts of experimental use should be strictly forbidden. The area is a relict of the Pleistocene and represents one of the only remaining sites in the Southern Rocky Mountains where the Pleistocene alpine flora is preserved at its best.

**4. Vulnerability to destruction or deterioration:** Before the significance of the lake was made clear to the Denver Parks Department, it was possible for cars to drive off the road onto the lake shore. This made tracks in the wetland, cut the turf, and resulted in severe deterioration in the outlet area, and a vegetation-depleted gravelly flat. Fortunately, the massive talus slope that reaches the lake shore makes it impossible for vehicles to reach the far end of the lake from either side. At my suggestion, the Park Board has placed large boulders along the road, and this has kept the vehicular traffic out. The land immediately surrounding the picnic shelter and down to the shore has not been provided with fireplaces and rubbish bins. Much of this shoreline has been degraded by casual fires and moving of boulders to make temporary fireplaces. A little care to facilities will help this situation. It should be pointed out that this particular portion of the area is not of much scientific importance but it should be saved for its aesthetic values.

The lake has been stocked routinely by the Colorado Game and Fish Department (now Division of Wildlife), despite the fact that the lake is of no productivity and cannot support fish for any length of time. Vehicles have driven up to the shore to dump the fish, and fishermen follow suit by driving their vehicles to the lake shore and fishing from the back of their pick-ups. Furthermore, late summer fishing is somewhat dangerous because of the incidence of sudden snowstorms which may strand motorists or put human life in danger generally. Access to Summit Lake is shut off whenever weather conditions become threatening, and the road is not kept open after the first heavy snow of the winter.

The Parks Board has assured me that they will cooperate in helping to protect the area from encroachment of vehicular traffic and from undue use outside of established picnic grounds. They also suggest that the Game and Fish Department may be prevailed upon with little difficulty to cease stocking of Summit Lake.

**5. Other considerations:** Summit Lake is an integral part of a series of scenic and otherwise interesting mountain phenomena reached by the Mount Evans Highway. At timberline on Mount Goliath, part way up, there is an ancient stand of gnarled bristlecone pines (*Pinus aristata*) that is protected from wood-gatherers by prominent signs and, presumably, patrols. [Unfortunately, by 1989 every scrap of loose wood has been removed!] Higher up on Mount Goliath, a spur of Mount Evans, is an area of tundra that has been set aside by the Denver Botanical Garden as a nature trail (named for Walter Pesman) with marked stations. The summit of Mount Evans, at 14,000 feet, commands a view reaching to Pike's Peak, Mountain of the Holy Cross, Long's Peak, Mount Bierstadt, and South Park. An excellent view of Summit Lake and the smaller Ice Lake above it is available from near the summit. A restaurant is operated at the summit (since destroyed; no facilities now exist there except restrooms).

Mount Evans is an example of what can be done in the public interest without overemphasizing the commercial. Pike's Peak, on the other hand, is an object lesson of what can happen when commercialism is unbridled. The addition of Summit Lake to the natural interest points of the mountain would be an important step in the recognition of the natural scene as an educational adjunct to a metropolitan area.

#### **The dedication**

Formal designation of Summit Lake as a Natural History Landmark was made on August 30, 1965. Dedication of the site coincided with a field trip of the VII Congress of the International Association for Quaternary Research, held in Boulder August 3—September 5 (Weber, 1965). The party included James Calder of Agriculture Canada; Áskell and Doris Löve, Nordic cytotaxonomists; Mai-Britt Florin, diatomist, University of Uppsala, Sweden; Ann Connolly, University of Leicester, England; Roland Beschel, pioneer lichenometrist; Misao Tatewaki, University of Hokkaido, Japan; and representatives of the City of Denver Parks Dept. and the National Park Service.

A bronze dedication plaque had been riveted to a granite boulder, but a few days after the installation it was stolen. A new one, fortunately, was in place for the actual dedication. The inscription read:

Summit Lake  
has been designated  
a registered  
Natural Landmark  
under the provisions of the  
Historic Sites Act of 1935.  
This site possesses exceptional value  
in illustrating the natural  
history of the United States.  
U. S. Department of the Interior  
National Park Service.

The official papers dealing with the designation of Summit Lake are housed with the City of Denver Parks Department, which administers the site.

### **Specific Aspects of the Site**

Summit Lake lies in a granitic cirque basin facing northeast. Unlike most alpine tarns of the Southern Rocky Mountains, the lake's upper margin does not directly abut on a rock wall, but is fed by a gently sloping level inlet fed by late-lying snow-banks above. A smaller cirque basin, essentially dry, lies to the south between Summit Lake and the summit of the mountain. The aspect presented by the cirque wall and the summit area ensures that the lake received relatively little direct sunlight and remains in shadow for much of the day. This protection from sun (and wind) results in slow and gradual snow melt and a moister substrate throughout the year. According to scientists from Colorado State University, permafrost is found at a depth of eight feet below the surface.

The steeper part of the inlet contains several swift-flowing rills that end in a level *Carex scopulorum* stand on ice-push hummocks, between which are numerous anastomosing streamlets and ponds. The rills carry water throughout the growing season. Their most notable feature is the abundant patches of the rare aquatic moss, *Hydrogrimmia mollis*. The hummocks have vertical sides with sparse or medium cover of mosses, hepatics, and small vascular plants, the most notable of which is *Spatularia (Saxifraga) foliolosa*, a disjunct from the Arctic. Where the streamlets are wide and shallow enough to contain small gravel bars in the center, small colonies of *Phippisia algida* (Weber 1952), another Arctic disjunct, occur. Along bends in the streamlets, exposed gravels covered with mosses support a third one, *Koenigia islandica*.

The small ponds support dense floating stands of mosses, notably *Sarmentypnum sarmentosum*, *Warnstorfia exannulata*, and *Straminergon stramineum*. Scattered boulders fallen from the surrounding talus support various lichens and bryophytes, among which the rare *Andreaea heinemannii* has been found in depressions between the rocks, and the lichens *Stereocaulon rivulorum* and *Cladonia turgida* occur, along with common mosses of saturated substrates.

The south side of the lake is bounded by a steep slope at the base of which are massive granite boulders forming a stabilized talus extending beyond the water's edge. These are essentially barren. Above the blocky talus are areas that have been filled in by soil, or have the rocks partially exposed and often presenting small overhangs. This is a very rich area, some patches moist and others quite dry. Among the most interesting moss species are the widely world-disjunct *Oreas martiana*, plus *Codriophorus fascicularis*, *Entodon concinnus*, *Imbriobryum mildeanum*, and *Mnium spinosum*.

The north side of the lake is usually quite dry, supporting the usual dry tundra *Trifolium* and *Artemisia* species, but in places where late snowbeds persist there are stands of *Carex micropoda* and *Ranunculus adoneus*.

Even the relatively flat shore below the rest house, where gravel trails are provided, there are a number of species of mosses. The most common will be the hair-cap mosses *Pogonatum urnigerum*, *Polytrichum piliferum*, *P. juniperinum*, and *Polytrichastrum alpinum*. But many of the very rare bryophytes are much less conspicuous and to most people they will commonly form tight low mats differing only by subtle color differences. Among these are *Anthelia juratzkana*,

*Fissidens osmundoides*, *Catoscopium nigratum*, *Tortella arctica*, *Oreas martianus*, *Dicranum elongatum*, *Bartramia subulata*, *Campylopus schimperi*, *Oncophorus wahlenbergii*, and *Ptychostomum pendulum*.

The outlet of the lake is bisected by the motor road. The portion of the outlet adjacent to the lake was once heavily disturbed by access ruts of fishermen and fish-planting vehicles. However, several sites have recovered sufficiently to support a number of interesting alpine plants, including all three species of *Kobresia*: *K. myosuroides*, *K. simpliciuscula*, and *K. sibirica*, and fine stands of the yellow *Hirculus* (*Saxifraga*) *prorepens*. On the drier rocky adjacent slope we find fine stands of the rare moss, *Schistidium strictum*, and the two species of *Lidia*: *L. obtusiloba* and *L. biflora*. The area across the motor road is not particularly noted for rarities, but it is a highly saturated tundra with pools and hummocks supporting many typical wet tundra species, notable *Psychrophila leptosepala*, *Clementsia rhodantha*, and *Tolmachevia integrifolia*.

## The Botanical Discovery of Summit Lake

### *Phippsia algida*

My first acquaintance with Summit Lake came when I had been searching for *Phippsia algida*, a minute grass of Arctic seashores. I spent many seasons looking in vain for this elusive plant, which had been noted and figured by A. S. Hitchcock in his Manual of the Grasses of the United States, as having been found only once, on “the summit of Gray’s Peak.” This was one of the many instances in my work when I forgot to do my homework. I knew what the plant should look like but I had no idea of its ecology. Assuming that the summit of Gray’s Peak would mean a dry tundra, I hunted high and low for it on dry tundra, without success. I was young and inexperienced, but should have been smart and borrowed the specimen in the first place. It had been collected by Harry Patterson, a botanist and printer of botanical labels, who lived in Oquawka, Illinois. The specimen was at the Chicago Field Museum, and finally in 1950, I borrowed it.

The label was a printed one: “Colorado Flora: Mts. about the headwaters of Clear Creek, alt., 11– 14,000 feet. High mountains, Gray’s Peak and vicinity, Sept. 2, 1885.” This then, matched the information used by Hitchcock. However, the name of the plant was printed by hand, along with the following hand-written information: “Wet places, alt. 1,000 feet above (S of) Upper Chicago Lake.” Anyone (especially a Chicagoan) unfamiliar with the area might be excused for citing the specimen as having come from Gray’s Peak, but the Upper Chicago Lake is on Mount Evans, in the lower cirque basin to the west and about a thousand feet below Summit Lake, on Mount Evans, not on Gray’s Peak!

The search should have been at an end then and there, but I was still woefully ignorant of the ecology. So one day, my friend Paul Maslin, our herpetologist, and I skirted the almost vertical upper part of the Chicago Basin cirque, risking our lives on the unstable scree, without any luck. We sat down at the picnic shelter at Summit Lake, ate lunch, and before calling it a day and another wild goose chase, we felt we needed the exercise, so took a walk around the lake before starting down. The rest is history. Or course, we found the plant in the cold, wet gravel bars of the inlet. However, I needed to verify its characters. But the unpreparedness gremlins struck again—the critical characters were in the very tiny spikelets, and I had forgotten my hand lens! In desperation, I attempted to construct a lens by inserting a drop of water in a loop of a grass stem. believe that it worked, because I convinced myself that the characters were correct.

For a number of years, this was the only locality known in Colorado for *Phippsia* (Weber 1952), but the ecological field work done by Vera Komarkova (1979) revealed several additional localities in the Front Range, the Mosquito Range, and the Ten Mile Range, where she discovered a stand occupying one or two acres! The moral is, learn the habitat, superimpose your mental picture of the plant on the landscape, and you will find the species!

### *Koenigia islandica*

On July 23, 1953, George Neville Jones, botanist of the University of Illinois, who was teaching my field course that summer, accompanied me to Summit Lake to see *Phippsia*. As we walked along the inlet area I noticed what appeared to me to be tiny, reddish seedlings a few millimeters high, and passed them off as probably belonging to *Epilobium anagallidifolium*.. I thought no more about the, because at about that moment we happened to discover our first specimen of *Spatularia* (*Saxifraga*) *foliolosa*,

a small, inconspicuous plant with a few basal leaves, and the few flowers replaced by small bulblets, growing on the vertical walls of the tussocks. This of course was new to Colorado, although years later I found that E. L. Greene had collected it on the Mt. Epaulet Saddle in the 1880s, calling it *Saxifraga vreelandii* (specimen in the Iowa State College Herbarium).

The little red 'seedlings' were forgotten. A week later I brought the great Norwegian ecologist and lichenologist, Eilif Dahl, to the lake. On the way up in the car, he asked me, "Well, Bill, and what shall we find today?" Again, having no knowledge or experience with this plant, I simply pulled out of my head the name of an Arctic species I had heard about, and said, "How about *Koenigia islandica*?" We all laughed at such an impossibility and continued on our way. When we reached Summit Lake, Eilif jumped out of the car and went immediately to his knees. "Bill, what did you say about *Koenigia islandica*? For here it is! So much for the little red seedlings of what I thought were *Epilobium*."

But this is not the end of the story. On a visit to Colorado in 1960, my friend Erling Porsild, the preeminent floristic botanist of the American Arctic, on being shown our new find at Summit Lake, remarked that he remembered seeing a Colorado collection of *Koenigia* in the National Herbarium in Copenhagen. It had been collected at a place called 'Severn Lakes', and that I should look at it the next time I visited Denmark. I did pay a visit to the Museum, and I did find the specimen, collected not at any 'Severn Lakes' but at Seven Lakes, 3,300 meters, in the Pikes Peak Watershed. The collector was Ove Paulsen, the Danish plant geographer, on the first International Phytogeographic Excursion, August 19, 1913!

This remarkable two-month excursion, which had much influence on the future blossoming of American plant ecology, was led by Frederick E. Clements, and brought to the Rocky Mountains many noted plant taxonomists and ecologists, among them Adolf Engler, Carl Schröter, E. Rübél, and A. C. Tansley (Tansley, 1914). It is curious that Paulsen never reported *Koenigia*, which would have been a new record for the United States. The herbarium specimen bore a note, 'See alcoholic collections'. At my request, the curator brought me a full liter jar full of pickled material!

### **Oreas martiana**

The third and last anecdote concerns a bryological colleague, Kjeld Holmen of the University of Copenhagen. He came to visit me from North Greenland via Lake Peters, Alaska. Dr. Erling Porsild was with me at the time, and the three of us went to Summit Lake to see all of the choice discoveries. Again, hardly had Kjeld gotten out of the car, he was on his hands and knees, exclaiming, "I can't believe it!" Here is *Oreas martiana*! Last week I was in Peary Land, North Greenland, where I discovered it for the first time, and just yesterday, at Lake Peters, where I discovered it new for America, and now here in Colorado!" And here is a capsule, too! It hardly ever is found fruiting!

Only his intimate acquaintance with this small moss enabled Kjeld to spot it immediately, because *Oreas* does have a superficial resemblance to some other minute alpine turf-forming mosses. But now that I have seen it in the field, its rich golden-green color, extremely dense tufts, and its tiny capsule with its short seta that curves back into the tuft, almost concealing the capsule from view, make it easily recognizable. (Weber 1960a), Again, the field research of Vera Komarkova demonstrated that it is not a rare species at the proper ecological sites in the Colorado Front Range.

Almost every visit to Summit Lake yielded new and exciting plant discoveries, often made possible by the experience and specialties of the botanists, particularly European ones who have come to see this remarkable flora. The list of prominent arctic and alpine botanists who have visited Summit Lake has made the site one of the most popular places in America for alpine rarities. The list includes Ove Almborn, Swedish lichenologist, Lewis Anderson, Duke University bryologist, D. D. Awasthi, my student and now considered the 'Father of Indian lichenology', Eilif Dahl, Norwegian ecologist and lichenologist, Mai-Britt Florin, Swedish diatom specialist, Kjeld Holmen, Danish bryologist, Eric Hultén, Swedish plant geographer, George Neville Jones, University of Illinois, Per Magnus Joergensen, Norwegian lichenologist, Kuldip Khanna, Indian bryologist, Timo Koponen, Finnish bryologist, Áskell and Doris Löve, Erling Porsild, Danish/Canadian Plant Geographer, Antero Vaarama, Finnish bryologist, and C. P. Alexander, world authority on crane flies.

## CATALOG OF HIGH ALTITUDE PLANTS OF MOUNT EVANS

### Mosses

<i>Amblystegium riparium</i>	<i>Eurhynchiastrum pulchellum</i>
<i>Andreaea heinemannii</i>	<i>Meiotrichum lyallii</i>
<i>Andreaea rupestris</i>	<i>Mnium blyttii</i>
<i>Anomobryum julaceum</i>	<i>Mnium spinosum</i>
<i>Atrichum selwynii</i>	<i>Mnium thomsonii</i>
<i>Aulacomnium palustre</i> var. <i>imbricatum</i>	<i>Myurella julacea</i>
<i>Bartramia subulata</i>	<i>Niphotrichum canescens</i>
<i>Blindia acuta</i>	
<i>Brachytheciastrum collinum</i> var. <i>subjulaceum</i>	<i>Oncophorus virens</i>
<i>Brachythecium cirrosium</i>	<i>Oncophorus wahlenbergii</i>
<i>Brachythecium turgidum</i>	<i>Oreas martiana</i>
<i>Bryoerythrophyllum ferruginascens</i>	
<i>Bryoerythrophyllum recurvirostre</i>	<i>Paraleucobryum enerve</i>
<i>Bryum argenteum</i>	<i>Paraleucobryum longifolium</i>
<i>Bucklandiella sudetica</i> (expected)	<i>Philonotis americana</i>
	<i>Philonotis tomentella</i>
<i>Campylopus schimperi</i>	<i>Plagiobryum demissum</i>
<i>Codriophorus fascicularis</i>	<i>Plagiobryum zierii</i>
	<i>Plagiomnium ellipticum</i>
<i>Dichelyma uncinatum</i>	<i>Plagiothecium denticulatum</i>
<i>Dichodontium pellucidum</i>	<i>Pogonatum urnigerum</i>
<i>Dicranoweisia crispula</i>	<i>Pohlia bolanderi</i>
<i>Dicranum elongatum</i>	<i>Pohlia cruda</i>
<i>Dicranum groenlandicum</i>	<i>Pohlia greenii</i>
<i>Didymodon asperifolius</i>	<i>Pohlia longicolla</i>
<i>Distichium capillaceum</i>	<i>Pohlia obtusifolia</i>
<i>Distichium inclinatum</i>	<i>Pohlia prolifera</i>
<i>Ditrichum gracile</i>	<i>Polytrichastrum alpinum</i>
<i>Drepanocladus aduncus</i>	<i>Polytrichastrum longisetum</i>
<i>Drepanocladus longifolius</i>	<i>Ptychostomum bimum</i>
	<i>Ptychostomum knowltonii</i>
<i>Encalypta rhamnoides</i>	<i>Ptychostomum pendulum</i>
<i>Entodon concinnus</i>	<i>Ptychostomum pseudotriquetrum</i>
<i>Eurhynchiastrum pulchellum</i>	
	<i>Rhytidium rugosum</i>
<i>Fissidens osmundoides</i>	
	<i>Sanionia georgico-uncinata</i>
<i>Grimmia alpestris</i>	<i>Sanionia uncinata</i>
<i>Grimmia donniana</i>	<i>Sarmenthypnum sarmentosum</i>
<i>Grimmia elatior</i>	<i>Schistidium agassizii</i>
<i>Grimmia incurva</i>	<i>Schistidium rivulare</i>
<i>Grimmia longirostris</i>	<i>Schistidium flaccidum</i>
<i>Grimmia sessitana</i>	<i>Schistidium frigidum:</i>
	<i>Schistidium strictum</i>
<i>Hydrogrimmia mollis</i>	<i>Scorpidium revolvens</i>
<i>Hylocomium splendens</i>	<i>Stegonia latifolia</i>
<i>Hypnum lindbergii</i>	<i>Straminergon stramineum</i>
<i>Hypnum revolutum</i>	
<i>Imbribryum mildeanum</i>	

Timmia austriaca  
Tortella arctica  
Tortula latifolia  
Tortula laureri  
Tortula leucostoma  
Tortula systylia

Trichostomum tenuirostre  
  
Voitia nivalis  
  
Warnstorfia exannulata

### Hepatics

Anthelia juratzkana  
  
Blepharostoma trichophyllum  
  
Cephaloziella divaricata var. scabra  
  
Gymnocolea inflata  
Gymnomitrium corallioides  
  
Jungermannia exsertifolia  
Jungermannia sphaerocarpa  
Lophozia attenuata

Lophozia barbata  
Lophozia hatcheri  
Lophozia incisa  
  
Plagiochila asplenoides subsp. arctica  
  
Scapania hyperborea  
Scapania mucronata  
  
Tritomaria exsecta  
Tritomaria polita  
Tritomaria quinquedentata

### Lichens

Acarospora fuscata  
Acarospora nitida  
Allocetraria stracheyi  
Aspicilia caesiocinerea  
Aspicilia cinerea  
Aspicilia cf. mazarina  
  
Brodoa oroarctica  
Bryonora castanea  
Buellia geophila  
Buellia papillata  
  
Caloplaca adnexa  
Caloplaca cinnamomea  
Caloplaca jungermanniae  
Caloplaca tetraspora  
Candelariella aurella  
Candelariella placodizans  
Candelariella vitellina  
Catapyrenium cinereum  
Cetraria commixta  
Cetraria ericetorum  
Cetraria islandica  
Cladonia cariosa  
Cladonia chlorophaea  
Cladonia gracilis  
Cladonia pocillum  
Cladonia pyxidata  
Cladonia turgida  
Coelocaulon aculeatum

Dactylina madreporiformis  
Diploschistes scruposus  
  
Ephebe lanata  
  
Flavocetraria cucullata  
Flavocetraria nivalis  
  
Gyalecta foveolaris  
  
Lecanora epibryon  
Lecanora polytropa  
Lecanora pringlei  
Lecanora reagens  
Lecidea atrobrunnea  
Lecidea berengeriana  
Lecidea elata  
Lecidea scrobiculata  
Lecidella wulfenii  
Lecidoma demissum  
Leciographa lamyi  
  
Massalongia carnosa  
Micarea assimilata  
  
Ochrolechia frigida  
Ochrolechia upsaliensis  
  
Pachyospora verrucosa  
Pannaria pezizoides

Pannaria praetermissa  
Parmelia saxatilis  
Peltigera aphthosa  
Peltigera erumpens  
Peltigera lepidophora  
Peltigera malacea  
Peltigera rufescens  
Peltigera erumpens  
Peltigera lepidophora  
Peltigera malacea  
Peltigera rufescens  
Phaeorhiza nimbosea  
Physcia constipata  
Physconia muscigena  
Porina mammillosa  
Pseudephebe pubescens  
Pseudephebe minuscula  
Psoroma hypnorum  
  
Rhizocarpon effiguratum  
Rhizocarpon geographicum  
Rhizoplaca melanophthalma  
Rinodina archaea  
Rinodina mniaraea  
Rinodina turfacea  
  
Solorina bispora  
Solorina crocea  
Solorina octospora  
Sporastatia testudinea

Stereocaulon alpinum  
Stereocaulon rivulorum  
  
Thamnolia vermicularis  
Thrombium epigaeum  
Toninia squalida

Umbilicaria decussata  
Umbilicaria hyperborea  
Umbilicaria krascheninnikovii  
Umbilicaria virginis

Verrucaria sp.  
Vulpicida tilesii  
  
Xanthoparmelia coloradensis  
Xanthoria elegans

### Vascular Plants

#### Apiaceae

Oreoxis alpina

#### Alsiniaceae

Alsinanthe stricta  
Cerastium beeringianum  
Eremogone fendleri  
Lidia biflora  
Lidia obtusifolia  
Paronychia pulvinata  
Sagina caespitosa  
Sagina saginoides  
Stellaria umbellata  
Tryphane rubella

#### Asteraceae

Achillea millefolia  
Artemisia arctica  
Artemisia scopulorum  
Cirsium scopulorum  
Delwicensia pattersonii (Artemisia)  
Erigeron grandiflorus  
Erigeron simplex  
Oligosporus groenlandicus  
Rydbergia grandiflora  
Senecio fremontii  
Senecio taraxacoides ("Ligularia")  
Taraxacum ovinum  
Taraxacum scopulorum  
Tetraneuris brevifolia

#### Boraginaceae

Eritrichum aretioides  
Mertensia lanceolata

#### Brassicaceae

Draba aurea  
Draba breweri var. cana  
Draba crassa  
Draba crassifolia  
Draba exungiculata  
Draba fladnizensis  
Draba grayana  
Draba streptocarpa  
Draba streptobrachia  
Erysimum capitatum

Erysimum pallasii

#### Campanulaceae

Campanula uniflora  
Campanula cf. gieseckiana

#### Caryophyllaceae

Gastrolychnis uralensis  
Silene acaulis

#### Crassulaceae

Clementsia rhodantha  
Tolmachevia stenopetala

#### Cyperaceae

Carex elynoides  
Carex fuliginosa (was misandra)  
Carex haydeniana  
Carex maritima subsp.  
incurviformis  
Carex micropoda (was crandallii)  
Carex nelsonii  
Carex rupestris  
Carex scopulorum  
Kobresia myosuroides  
Kobresia sibirica  
Kobresia simpliciuscula

#### Fabaceae

Trifolium nanum  
Trifolium parryi

#### Gentianaceae

Chondrophylla prostrata  
Gentianodes algida

#### Helleboraceae

Psychrophila leptosepala

#### Hydrophyllaceae

Phacelia hastata  
Phacelia sericea

#### Juncaceae

Juncus biglumis  
Juncus castaneus

Juncus drummondii

Juncus triglumis

Luzula spicata

#### Liliaceae

Lloydia serotina

#### Poaceae

Deschampsia cespitosa  
Deschampsia  
Festuca brachyphylla  
subsp. coloradensis  
Festuca minutiflora  
Phippsia algida  
Poa abbreviata subsp. pattersonii  
Poa alpina  
Poa arctica  
Poa glauca  
Poa lettermanii  
Trisetum spicatum

#### Polygonaceae

Bistorta bistortoides  
Bistorta vivipara  
Koenigia islandica  
Oxyria digyna

#### Portulacaceae

Claytonia megarhiza

#### Primulaceae

Androsace septentrionale  
Primula angustifolia

#### Ranunculaceae

Ranunculus adoneus  
Ranunculus pedatifidus  
Ranunculus pygmaeus

#### Rosaceae

Acomastylis rossii  
Potentilla diversifolia

#### Salicaceae

Salix arctica  
Salix brachycarpa



Salix glauca  
Salix planifolia  
Salix nivalis

**Saxifragaceae**  
Chrysosplenium tetrandrum  
Hirculus platysepalus

Hirculus prorepens  
Micranthes rhomboidea  
Saxifraga cernua  
Saxifraga hyperborea  
Saxifraga rivularis  
Spatularia foliolosa

**Scrophulariaceae**  
Besseyia alpina  
Castilleja occidentalis  
Castilleja puberula  
Castilleja sulphurea

### Postscript

Having felt that we have saved an important ecosystem, we are now confronted with a paradox. The Colorado Division of Wildlife has imported to Mount Evans the Rocky Mountain Goat, native in the Northern Rocky Mountains and never having existed in the wild in Colorado. Old reports were based on the native Bighorn Sheep. Goats are the most destructive animals in the annals of conservation. They have been introduced into the Galápagos Islands, where endless attempts to eradicate them have been only partially successful. On Guadalupe Island, off the coast of Baja California, domestic goats destroyed all higher vegetation within reach of their hooves, leaving only remnants of the flora on inaccessible islets. In New Zealand, the natural ecosystems have been systematically destroyed by the importation of not only domestic sheep but all manner of game animals and some of the common English birds, resulting in numerous extinctions of the wild flora and fauna.

Television advertisements of the Colorado Division of Wildlife say that the Division is “Keeping Colorado Wild.” and feature a drawing of a mountain goat. The introduction of non-indigenous, destructive foragers should not be allowed in sensitive ecosystems. I hope that visitors to Mount Evans will take away with them a determination to protest actively this oxymoron of protecting an endangered ecosystem and fostering its destruction at the same time. Write your congressmen and senators and fight Colorado’s misdirected adoration of furry creatures. Plants are not only beautiful, but they are the ultimate source of nutrition and survival of all life.

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