

White River National Forest Rare Plant Survey 2006



Prepared for White River National Forest
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Acknowledgments

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Executive Summary

The White River National Forest contracted with Colorado State University in 2005 to have the Colorado Natural Heritage Program (CNHP) conduct a survey of sensitive plants on the forest. Preparation was begun in 2005, with field surveys carried out during the summer of 2006.

Field work was completed in September, 2006, with 24 areas surveyed. From one to four days were spent at each area. Element occurrence records were prepared for each tracked species located, and sent to the Science Information Department of CNHP, where they were entered in the BIOTICS data system. Potential Conservation Areas (PCAs) for each element documented in 2006 were designed or revised as needed. This final report includes descriptions and results of each area surveyed, profiles of each plant species documented, descriptions of PCAs, species lists of areas surveyed, and discussion of 2006 findings. A GIS coverage of all new and updated element occurrences and PCAs will be furnished to the Forest Service.

Results of the survey include the documentation of 61 new or updated rare plant occurrences. Twenty-five of these were completely new. Thirty-six were updated records of previously documented occurrences that were found within separation distances of 1 km across unsuitable habitat or 3 km across suitable habitat from the original mapped location. The updates include more precise location mapping, ranking, and the addition of new sub-occurrences. Also included in this report are -- new element occurrences located in 2006 by White River NF staff and Colorado Natural Areas Program and Colorado Native Plant Society members.

Literature cited:

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Spackman, S., J. Siemers, K. Murrell and M. Sherman. 1999. Roaring Fork Watershed Biological Inventory for Pitkin County, The Aspen Wilderness Workshop, and the Roaring Fork Valley Audubon Society. Available online at www.cnhp.colostate.edu/reports.html

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Chapter One

Introduction: As demands for recreation, resource extraction and other developments increase, updating known occurrences of sensitive species – especially historic and general records – and surveying new areas is of amplified importance. Formerly “sensitive” species are sometimes found to be more widely distributed or abundant than previously determined, surveys may produce new species for concern as well as species previously unknown in the White River National Forest, and often provide more exact location, size and condition data. These actions provide more accurate information for management and planning and help assess actual rarity and need for concern. Species lists of areas surveyed further characterize plant associations and communities and are an aid in future searches for sensitive plants.

Need for the survey: With an upcoming revision of the Forest Plan for the White River NF, it is important to have up to date information on plant species that are known to be sensitive or of special concern, or that may be considered as sensitive in the future when more information is available. In addition to the species on the R2 sensitive species list, which were our top priority, there are many plant species that were identified in the 2002 forest plan as “of viability concern” or “needing more baseline inventory and evaluation to determine status on the White River National Forest.” These species were also given special consideration.

As of the beginning of this survey, there were 227 element occurrence records with fairly precise location information (seconds or minutes records) in the CNHP database for lands managed by the White River National Forest. Of these, 124 were ranked “historic” (more than 20 years since the last observation), “extant” (known to be present, but with insufficient information to rank) or were unranked. A major goal of the survey, in addition to locating new occurrences, was to update the known occurrences with more accurate mapping, and rank them according to size, condition and landscape context (See Appendix II for details on CNHP ranks).

Much of the information on rare plants that was already known from the White River NF was the result of county wide surveys in Summit and Eagle counties, funded by Great Outdoors Colorado, and a survey of the Roaring Fork Valley (Spackman et al 1997, *ibid.*1999, Fayette 2000). Other sources include surveys by White River NF staff and herbarium specimens.

Methods: In preparation for the field season, CNHP reviewed existing information, including the CNHP database, Forest Service Sensitive Species Lists, and previous reports. We consulted with White River NF personnel to determine specific survey needs. We researched the targeted plant species known to occur on the forest, obtaining descriptions, photographs, phenology and habitat information. We then selected targeted inventory areas and used topographic maps to plan access to these locations.

Field work was begun in late April, at the lowest elevations on the forest, where the primary target was *Phacelia submutica*, an annual plant, which failed to appear in 2006 in known locations. In June, we continued up in elevation to the Flat Tops, and beginning on July 4, concentrated on alpine areas along the Continental Divide. Even in July, some areas were inaccessible due to snow cover. Constraints to covering areas along the Divide are the extremely short growing season, limited access, and afternoon thunderstorms that occur almost daily. Since it is not advisable to camp along ridges above timberline, we were limited to day trips from the nearest safe camping area.

Alpine areas contain numerous targeted species, so rather than survey for a single species, we recorded all species found within an area surveyed, and were open to the possibility of finding any of a number of rare alpine plants. Within the matrix of tundra vegetation, we paid special attention to microsites such as rock outcrops, wet areas and exposed summits and ridges.

Although we found many occurrences of targeted species, when mapped, many of them turned out to be within separation distance (1 km across unsuitable habitat, 3 km across suitable habitat) of occurrences already recorded, so that our “new” locations are mapped as sub-occurrences of existing records. However, even when the occurrence was an update of a known occurrence, we were able in many cases to map more specific locations, add to the site description, and rank the size, condition and landscape context of the population.

When a targeted species tracked by CNHP was located, a census or estimate of number of individuals was made. GPS was used to record point locations or the perimeter of a population, depending on size. Element Occurrence Records were completed, including exact location, directions to site, a rank for size, condition and landscape context and an overall occurrence rank, descriptions of the site with associated species, and any comments regarding management and protection needs. At each area visited, we also prepared a list of all plant species observed. Following the field season, questionable identifications were confirmed at the University of Colorado Herbarium. Potential Conservation Areas (PCAs) were then updated or new PCAs designed, representing the area believed to be essential for the continuation of each rare plant occurrence.

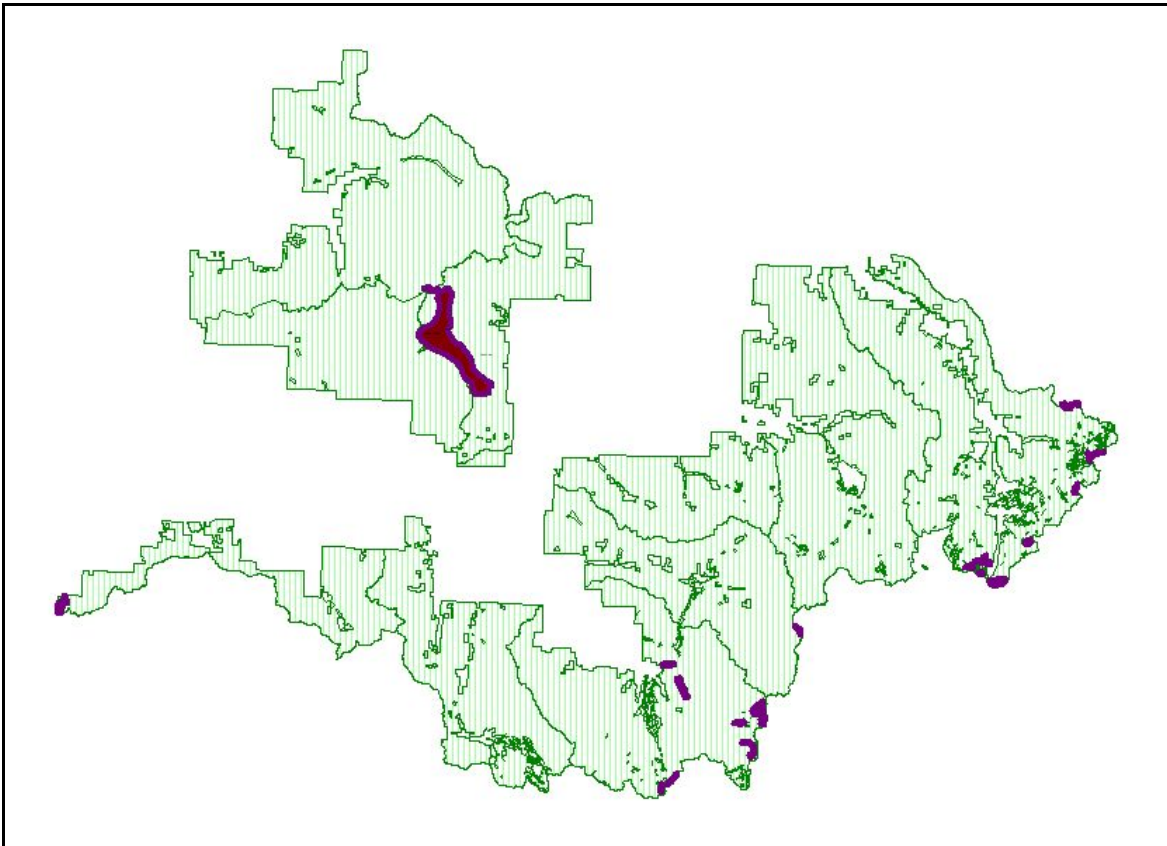
Results: Twenty-four areas in the White River National Forest were surveyed by CNHP in 2006. An additional 22 areas were surveyed for *Carex diandra*, *Listera borealis* and *Eriophorum* sp. by WRNF personnel. Sixty-one new or updated element occurrences were documented. An updated coverage including these records will be furnished to the Forest Service in September 2007. These represent 27 species that are tracked by CNHP, of which 10 are currently listed as Forest Service sensitive species (2002 R2 list). Two additional species documented are on the list of species of viability concern. Nine species are on the R2 list of species for which more information is needed. Another five species that are not tracked by CNHP were observed, and information is included in this report, but they will not appear in the CNHP database. See table Appendix II for status of each species included on any list. Five new Potential Conservation Areas (PCAs) were

established, in addition to the 138 existing PCAs, and will also be included in the updated GIS coverage that will be provided in September.

Chapter Two - Areas surveyed

Priorities for choosing areas to survey were dependent on the season, the phenology of target species, and ease of access. We also surveyed several areas at the request of the White River National Forest, including the Warren Lakes area, a section of the Continental Divide scheduled for trail building and several mine sites that are to be closed. We started at the lowest elevations on the forest, with the earliest blooming species (*Phacelia submutica*), then moved to the Flat Tops, at medium elevations below timberline, and then to the alpine zone, which was a top priority, since many of the targeted species occur above timberline. At high elevations all rare alpine species were considered potential targets.

Negative data: Although it would be desirable to be able to say that an area that was surveyed did not include targeted plants, there is a risk in assuming this. The targeted species may not have been found, or other species equally important may be present but not detectable at the time of year the survey was completed. However, we present below the areas surveyed, targeted species for each, and whether each was found or not, with the caveat that this does not represent true negative data. The surveyed areas are cross-referenced to the element occurrence records, PCAs, and species lists.



Overview of areas surveyed in 2006.

Areas Surveyed 2006:

Horsethief Canyon
Battlement Mesa from Horsethief
Flat Tops
 Buck Creek
 Budges Resort
 Coffee Pot Road
 Coffee Pot Springs
 Heart Lake
 Indian Camp
Continental Divide
 Blue Lakes
 Boreas Pass
 Crystal Lake, Magnolia Mine
 Hoosier Ridge
 Independence Pass
 Loveland Pass
 Revenue Peak
 Santa Fe Peak
 Silver Mountain
 Taylor Pass
 Webster Pass
 Iron Quarry
 Town of Independence North
 Town of Independence South
 Hunter Creek
 Hagerman Pass
 Quandary Peak
 Upper Lost Man Trail
 McCullough Gulch
 Grizzly Lake Trail
 Warren Lakes

(Note: primary targets are in bold type, secondary targets in regular type. Species are followed by CNHP ranks, and current Forest Service (R2) status. (S= Sensitive; V = species of viability concern; N = species needing more baseline information). See Appendix – for other FS status.

Horsethief Canyon



Habitat of *Cirsium perplexans* at Horsethief Canyon.

Date surveyed: April 24-26, 2006

Surveyors: Peggy Lyon and Georgia Doyle

Primary target:

Phacelia scopulina var. submutica (G4T2 S2) S not found (annual, apparently did not germinate in 2006)

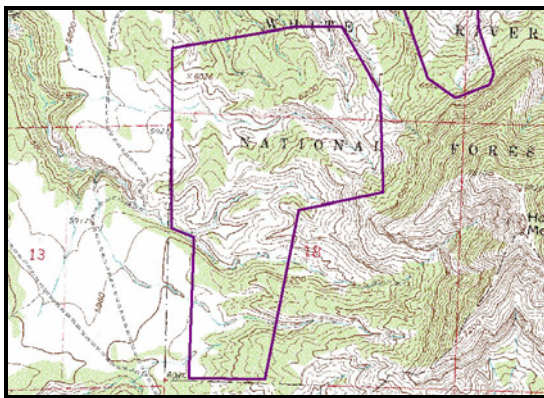
Secondary targets:

Cirsium perplexans (G2 S2) S

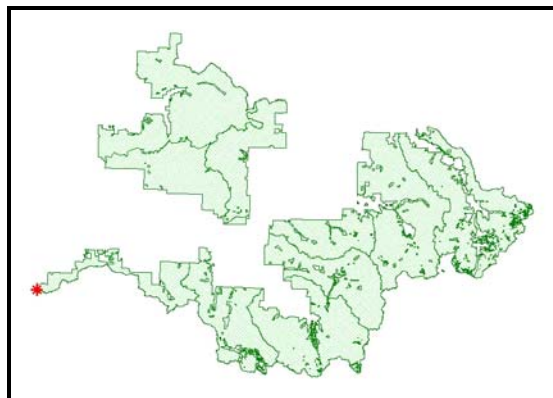
found

Astragalus wetherillii (G3 S3) S

not found



Horsethief Canyon, area surveyed April 2006.



White River NF, * marks area enlarged on left.

Directions to site: From the DeBeque exit from I-70, go east on V00 Road (Horsethief Creek). At intersection stay right, continue south about 3 miles, then walk east.

Potential Conservation Areas: *Phacelia* and *Cirsium* occurrences are included within the “Rare Plants of the Wasatch” PCA, ranked B1 (extremely high biological significance).

Species list: see Appendix I, Horsethief



Cirsium perplexans rosette.



Collecting a *Cirsium perplexans* specimen.

Battlement Mesa from Horsethief Canyon



View from area surveyed, Battlement Mesa

Date surveyed: April 25, 2006
Surveyors: Peggy Lyon and Georgia Doyle

Directions to site: From the DeBeque exit from I-70, go east on V00 Road (Horsethief Creek). At intersection stay left, continue east about 0.5 miles, then walk south to forest boundary and continue to base of shale cliffs.

Potential Conservation Areas: Northern half of area surveyed in "Rare Plants of the Wasatch PCA, B1."

Species list: see Appendix I, Horsethief

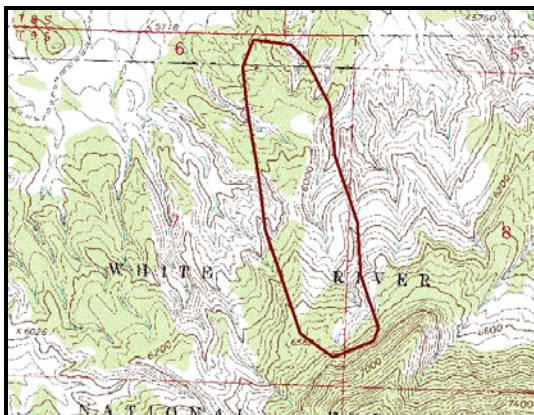
Targets:

Lesquerella parviflora

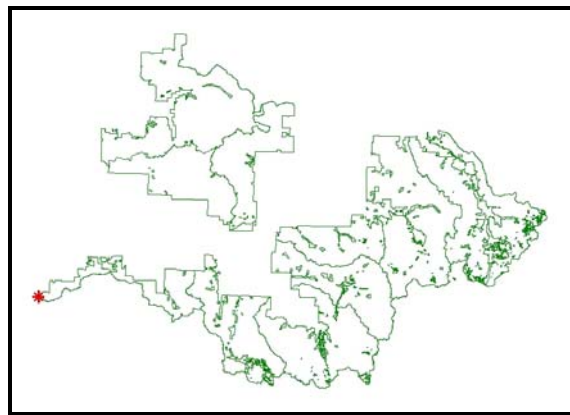
not found (unable to access completely)

***Thalictrum heliophilum* S, V**

not found (unable to access completely)



Battlement Mesa, area surveyed April 2006.



White River NF, * marks area enlarged on left.

Flat Tops



Heart Lake, June 2006.

Date surveyed: June 26 to 29, 2006

Surveyors: Peggy Lyon and Janis Huggins

Areas surveyed include Heart Lake, Wagonwheel Road, Snowmelt ponds at Wagonwheel, Meadows at Budes Resort, Coffee Pot Spring, Indian Camp, Road 621, Heart Lake area, Buck Creek, Buck Creek wetland, Bison Lake, Coffee Pot Road, and Coffee Pot Spring.

Primary targets:

Carex diandra not found

Other potential targets:

Ipomopsis tenuituba found (recommended 2006 for “need more information”)

Carex limosa not found

Carex viridula not found

Carex concinna not found

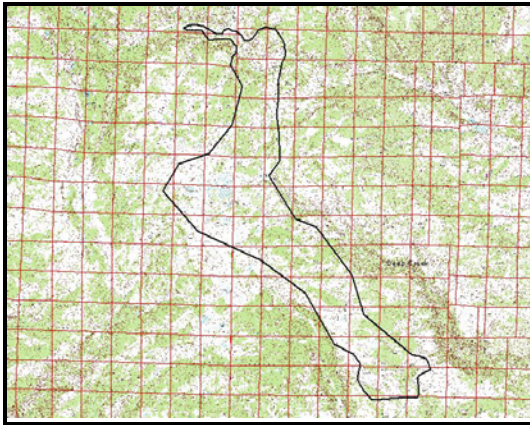
Listera borealis, N not found

Listera convallarioides, N not found

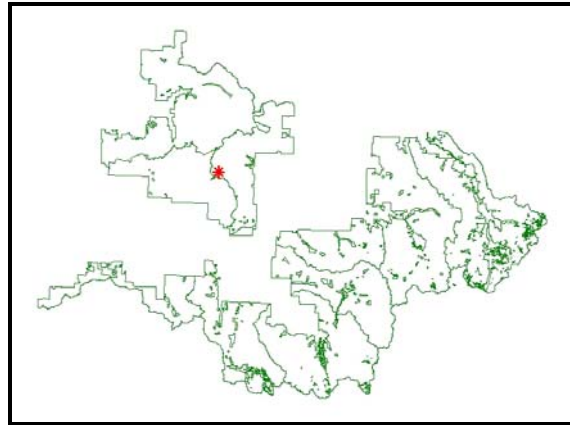


Ipomopsis tenuituba

Directions to site: From Dotsero, take Coffee Pot Road to top of mesa.



Flat Tops, area surveyed April 2006.



White River NF, * marks area enlarged on left.

Potential Conservation Areas:

None.

Species lists: see Appendix I

- Heart Lake
- Flat Tops, Spruce-fir forest
- Bison Lake
- Coffee Pot Spring
- Wagonwheel Road
- Buck Creek wetland
- Buck Creek
- Road 621
- Indian Camp
- Meadows, Budesges Resort
- Near Heart Lake



Lush meadows along Coffee Pot Road. *Ipomopsis tenuituba* is abundant here. Although not tracked by CNHP, this species has been recommended as one needing more information (2006).



Extensive spruce-fir forests, meadows, lakes and wetlands characterize the Flat Tops.

Blue Lakes



View of Blue Lakes, July, 2006. Survey sites are above dam and at far end of upper lake, on left side.

Date surveyed: July 20, August 15, 2006

Surveyors: Peggy Lyon, Georgia Doyle, Janis Huggins

Primary targets:

***Ptilogrostis porteri* S, V found**

***Draba weberi** found**

* on recommended list of species needing more information, 2006

Other targets:

Draba crassa, N found

Draba streptobrachia N found

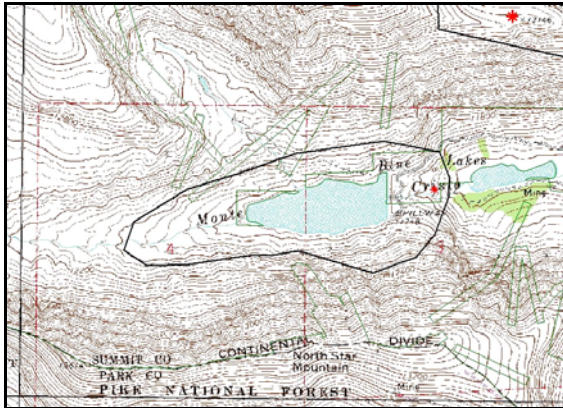
Draba fladnizensis N found

Saussurea weberi N found

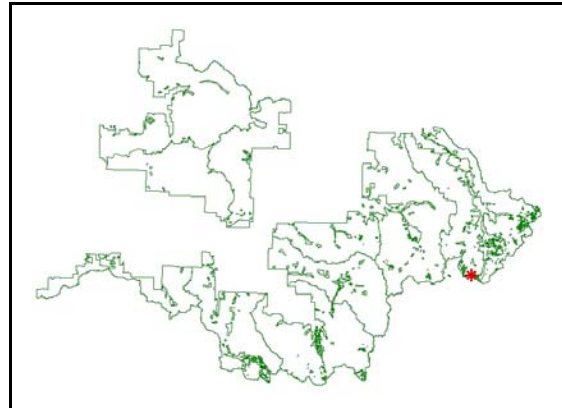
Ipomopsis globularis S, N not found

Cystopteris montana N found

Parnassia kotzebui S, V found



Blue Lakes, area surveyed April 2006.



White River NF, * marks area enlarged on left.

Directions to site: 7.5 miles south of Breckenridge. Turn west off Colorado 9 onto Summit CR 850 and drive 2.2 miles to the parking lot below Upper Blue Lake Reservoir. The site of *Draba weberi*, *D. crassa*, and *D. streptobrachia* is in the small canyon below the outflow pipe from the dam. To reach the *Ptilogrostis*, *Saussurea*, *Draba fladnizensis* and *Cystopteris* sites, cross the outflow creek just below the spillway and walk east up the hill. The *Parnassia* site is on the west side of the valley at the north of the upper lake.

Potential Conservation Areas: Mosquito Range, B1.

Species lists: see Appendix I, Blue Lakes *Ptilogrostis porteri* site, Blue Lakes rocky ledges and talus above dam, Blue Lakes talus slopes above upper end of lake; Blue Lakes, valley bottom above upper lake.



Habitat of several rare plants at Blue Lakes.

Boreas Pass



Boreas Pass, habitat of *Ipomopsis globularis*.
Flags mark plants for counting and GPS-ing perimeter of population.

Date surveyed: July 20, 2006

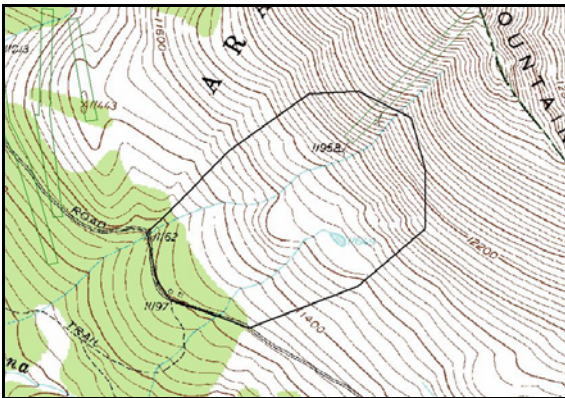
Surveyors: Peggy Lyon, Janis Huggins, Georgia Doyle

Primary targets:

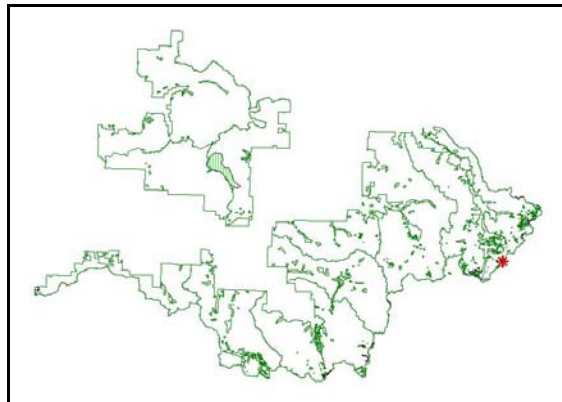
Ipomopsis globularis S, N **found**

Other potential targets:

All alpine species



Boreas Pass, area surveyed 2006.



White River NF, * marks area enlarged on left.

Directions to site: From Boreas Pass, drive about 1 mile north on Boreas Pass Road to a two-track road on the east side of the road (or about 2 miles south of the old railroad water tank). Take the two-track up the hill (4WD) about a half mile and park and walk uphill.

Potential Conservation Areas: Mosquito Range, B1

Species list: see Appendix I, Boreas Pass



Ipomopsis globularis at Boreas Pass.

Crystal Lake, Magnolia Mine



Crystal Lake, 2006. *Parnassia kotzebui* is most abundant under willows on far side of lake.

Date surveyed: August 16, 2006

Surveyors: Peggy Lyon, Janis Huggins

Primary targets:

Parnassia kotzebui found, update

Saussurea weberi found, update

Other potential targets:

Draba porsildii N found, new

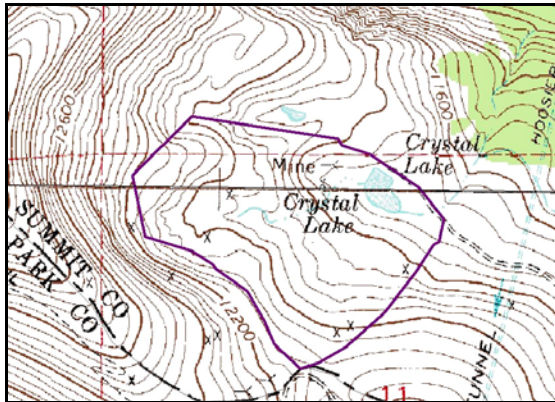
Draba crassa N found, update

Braya humilis * found, update

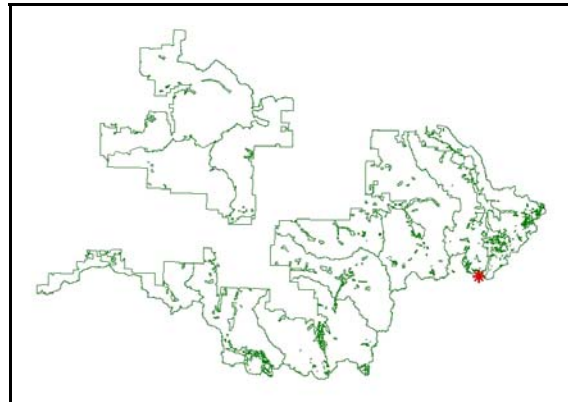
Ipomopsis globularis S, N not found

All alpine species

*Recommended for “other emphasis” 2006



Crystal Lake, Magnolia Mine, area surveyed 2006.



White River NF, * marks area enlarged on left.

Directions to site: Take Highway 9 to the top of Hoosier Pass. Pull into parking area and find 4-wheel drive road toward North Star Peak and Magnolia Mine. Drive 1/8 mile, look uphill for another road that heads north around the other side of the ridge. Follow road 1 mile to lake. Population is on the west side of the lake.

Potential Conservation Areas: Mosquito Range, B1

Species list: see Appendix I, Crystal Lake, Crystal Lake Fen, Magnolia Mine



Habitat of *Parnassia kotzebui* at Crystal Lake.



Habitat of *Braya humilis* and *Draba porsildii* between Magnolia Mine and Crystal Lake.



Habitat of *Sausurrea weberi* at Magnolia Mine.

Hoosier Ridge



Flagging *Ipomopsis globularis*, Hoosier Ridge, 2006.

Date surveyed: July 18, 19, 21

Surveyors: Peggy Lyon, Georgia Doyle, Janis Huggins, CONPS and CNAP

Primary targets:

Armeria maritima S, V found, update

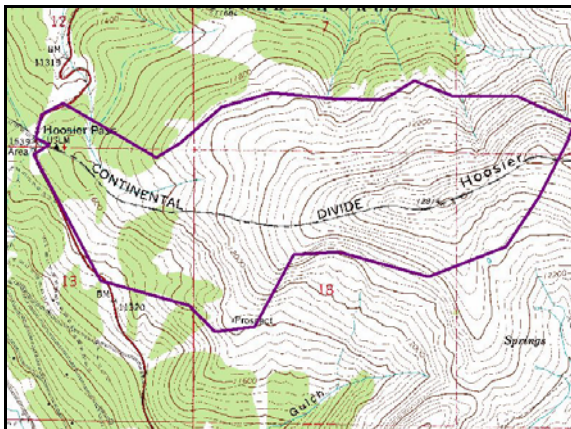
Ipomopsis globularis S, N found, update

Other targeted species:

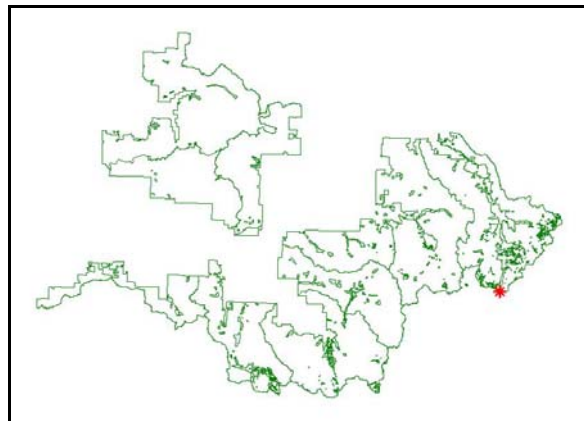
Draba grayana S, N found, new

Draba crassa N found, update

All other alpine species



Hoosier Ridge, area surveyed 2006.



White River NF, * marks area enlarged on left.

Directions to site: Take Highway 9 to the top of Hoosier Pass, hike up ridge from the east side of the highway.

Potential Conservation Areas: Mosquito Range, B1

Species list: see Appendix I, Hoosier Ridge



Draba habitat, Hoosier Ridge.

Independence Pass



Independence Pass, July 2006. *Draba* species are primarily in rock outcrops at top.

Date surveyed: July 4, 2006; August 2, 2006

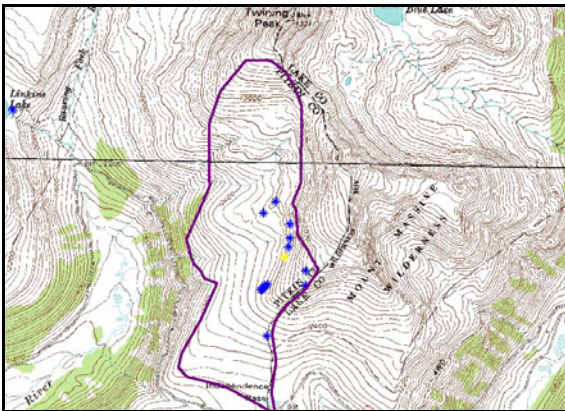
Surveyors: Peggy Lyon and Janis Huggins; Janis Huggins

Primary targets:

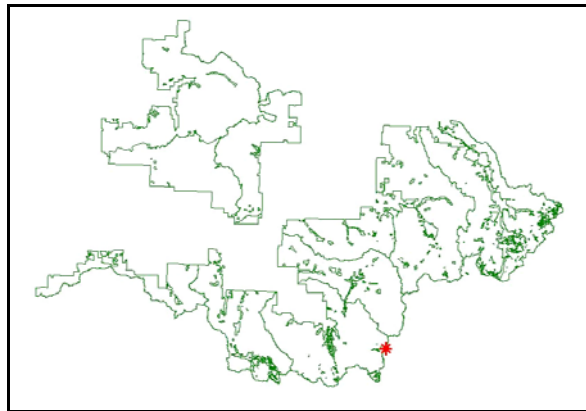
All alpine species

<i>Draba globosa</i> *	found
<i>Draba crassa</i> N	found
<i>Draba borealis</i> N	found
<i>Draba streptobrachia</i> N	found

* recommended for “needs more information” list 2006



Independence Pass, area surveyed 2006.



White River NF, * marks area enlarged on left.

Directions to site: From Aspen, take Highway 82 east to the top of Independence Pass. Park and hike up ridge on north side of road toward Twining Peak.

Potential Conservation Areas: Twining Peak, B2

Species list: see Appendix I, Independence Pass



View from ridge, Independence Pass, 2006.

Loveland Pass



Loveland Pass, *Draba* habitat, July 2006.

Date surveyed: July 17 and 18

Surveyors: Janis Huggins, Georgia Doyle

Primary targets:

***Draba exunguiculata* found**

Other potential targets:

Draba grayana S, N found

Draba globosa * found

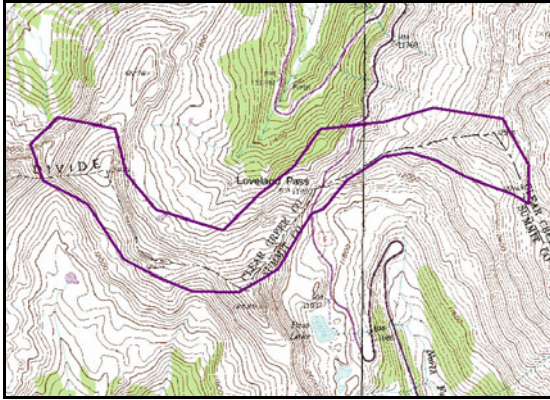
Draba borealis N found

Draba fladnizensis N found

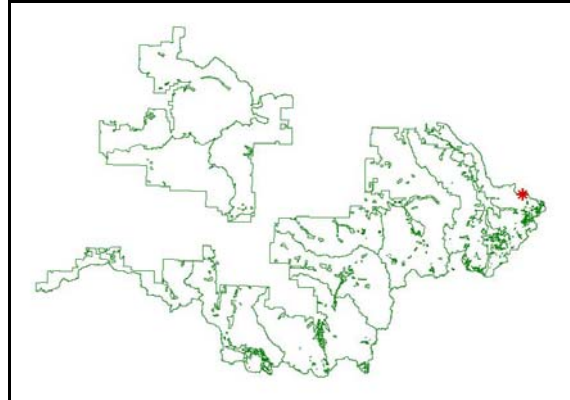
Draba streptobrachia N found

All alpine rare plants

* recommended for “needs more information” list 2006



Loveland Pass, area surveyed 2006.



White River NF, * marks area enlarged on left.

Directions to site: From I-70 take Hwy 6 (Loveland Pass) at Silverthorn, through Dillon to top of Loveland Pass. Hike trails east and west of highway to top of Continental Divide

Potential Conservation Areas: Loveland Pass, B3.

Species list: see Appendix I, Loveland Pass East; Loveland Pass West



Draba species require close examination in the field.

Revenue Mountain



Revenue Mountain, from Silver Mountain Summit.

Date surveyed: July 28, 2006

Surveyors: Peggy Lyon and Janis Huggins

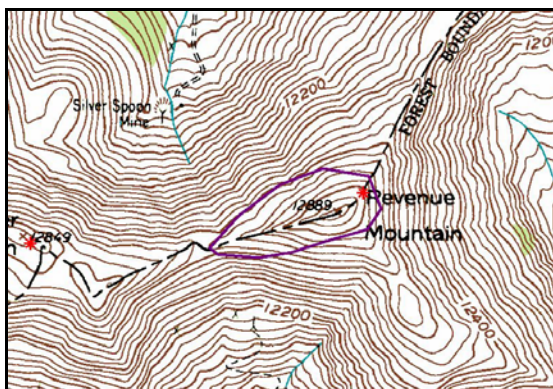
Primary targets:

Draba exungiculata S, N found

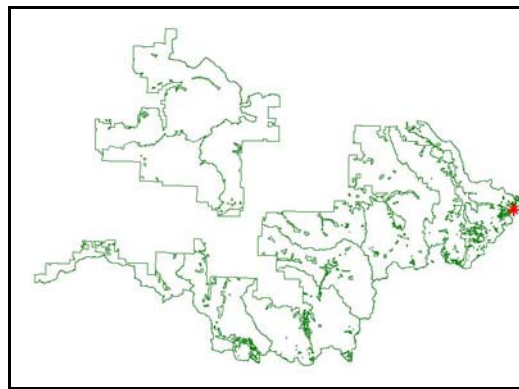
Other potential targets:

Draba crassa N found

All alpine species



Revenue Mountain, area surveyed 2006.



White River NF, * marks area enlarged on left.

Directions to site: Access from Montezuma, take 4 WD road on north side of town to near Continental Divide, then walk northeast along divide.

Potential Conservation Areas: Continental Divide from Santa Fe Peak to Revenue Mt., B2. (New, replaces former Collier Mt. PCA)

Species list: see Appendix I, Silver Mountain-Revenue Mountain saddle, old mines.

Santa Fe Peak



Cushion plant community at Santa Fe Peak.

Date surveyed: July 27, 2007

Surveyors: Peggy Lyon and Janis Huggins

Primary targets: All alpine sensitive species

Draba exunguiculata S, N found

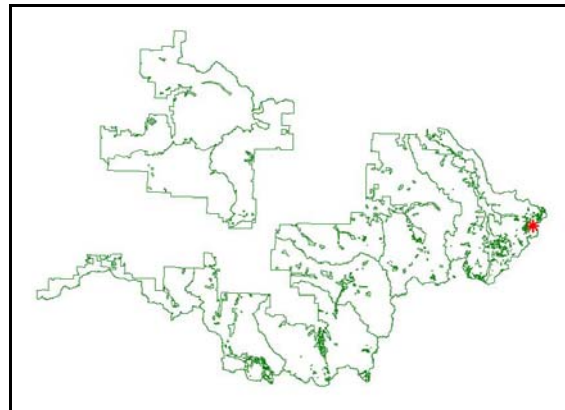
Draba grayana S, N found

Draba globosa * found

*recommended for “needs more information” list 2006



Santa Fe Peak, area surveyed 2006.



White River NF, * marks area enlarged on left.

Directions to site: Access from Montezuma, take 4 WD road on north side of town to Continental Divide, then walk south along divide to Santa Fe Peak

Potential Conservation Areas: Continental Divide from Santa Fe Peak to Revenue Mountain (new); B2

Species list: see Appendix I, Santa Fe Peak-Silver Mountain



Summit of Santa Fe Peak.

Silver Mountain



Silver Mountain, *Draba* habitat on south facing slope.

Date surveyed: July 27 and 28, 2006

Surveyors: Peggy Lyon and Janis Huggins

Primary targets:

Draba exunguiculata **found**

Other potential targets:

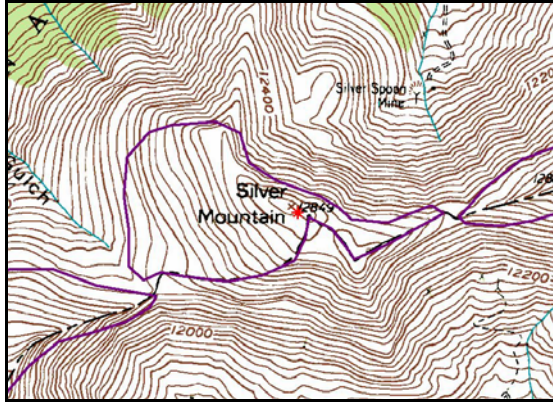
All alpine species

Draba crassa N found

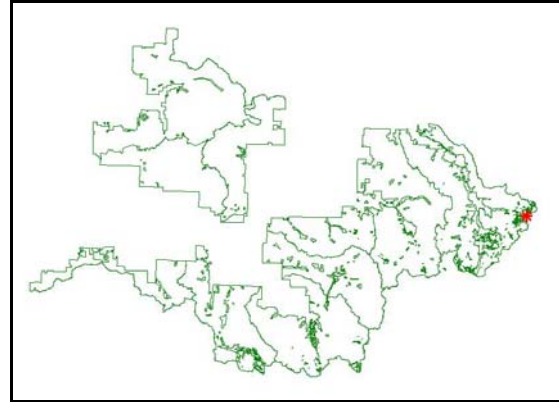
Draba fladnizensis N found

Draba species to be identified* found

*This specimen, representing a large population on the south slope of Silver Mountain, keys to *D. grayana*, but does not conform to other characteristics. A specimen has been sent to Berkeley for ID by Dr. James Reveal. Additional collections should be made in 2007, as this could be a previously unknown species.



Silver Mountain, area surveyed 2006.



White River NF, * marks area enlarged on left.

Directions to site: Access from Montezuma, take 4 WD road on north side of town to near Continental Divide, then walk northeast along divide.

Potential Conservation Areas: Continental Divide from Santa Fe Peak to Revenue Mt., B2. (Replaces former Collier Mt. PCA)

Species list: see Appendix I, Silver Mountain South slope.

Taylor Pass



Taylor Pass, July 2006. *Machaeranthera coloradoensis* site is at top of area shown.

Date surveyed: July 5, 2006; August 3, 2006

Surveyors: Peggy Lyon and Janis Huggins; Janis Huggins and Dee Malone

Primary targets:

***Machaeranthera coloradoensis* found**

Other potential targets:

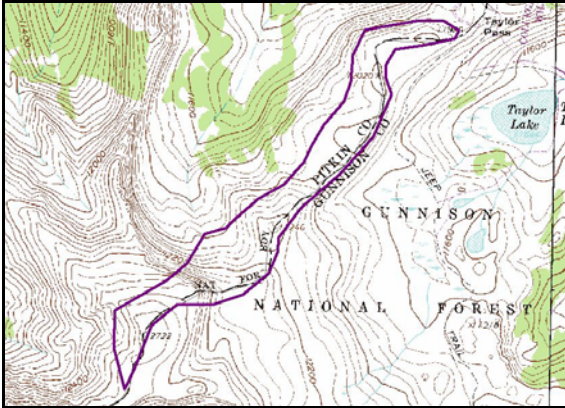
All alpine species

*Physaria alpina** found

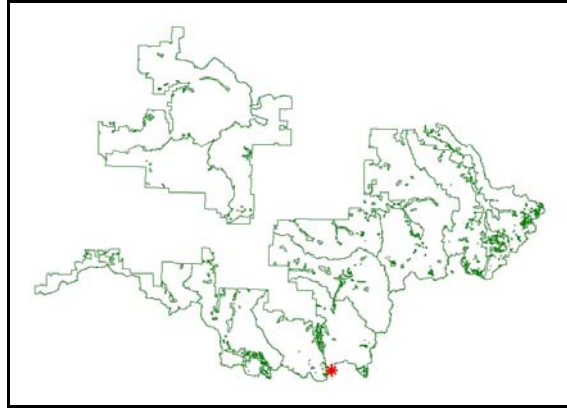
Draba oligosperma N found

Draba crassa N found

* recommended for “needs more information” list 2006



Taylor Pass, area surveyed 2006.



White River NF, * marks area enlarged on left.

Directions to site: From Aspen, take Castle Creek Road toward Ashcroft, turn left on Express Creek Road, and continue on rough 4WD to top of pass. Park, and walk southwest along Continental Divide on the Pitkin/Gunnison county line on an old mining road which disappears at the first hill. Continue up very steep scree/talus hillside (old mine area) onto tundra area and turn right along ridge with cliffs on your right to flat area at top of cliff area.

Potential Conservation Areas: Taylor Pass, B2

Species list: see Appendix I, Taylor Pass



Typical afternoon thunderstorm at Taylor Pass.

Webster Pass



Webster Pass *Armeria maritima* habitat.

Date surveyed: August 7, 2006

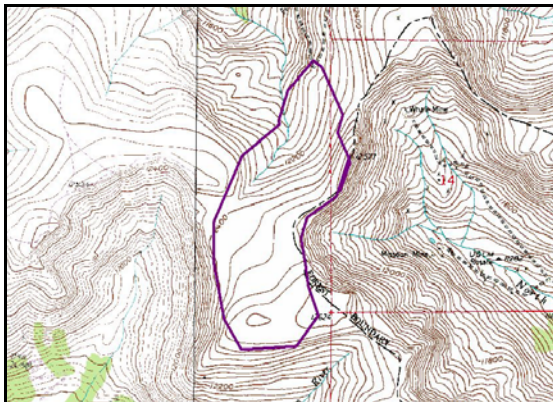
Surveyors: Georgia Doyle

Primary targets:

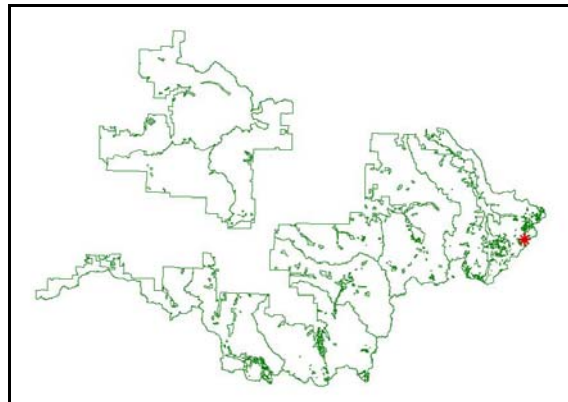
***Armeria maritima* S, V** **found**

Other potential targets:

All alpine species



Webster Pass, area surveyed 2006.



White River NF, * marks area enlarged on left.

Directions to site: From Montezuma, take Radical Mountain Road (4 WD), continue 4.5 miles to end of road, park and walk south.

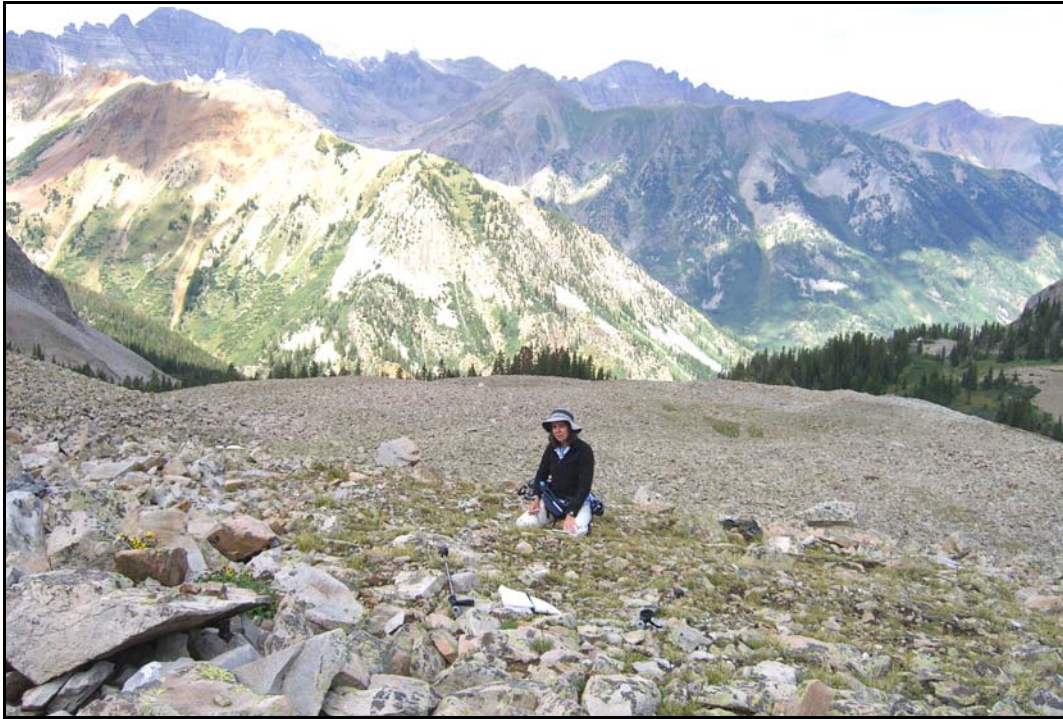
Potential Conservation Areas: Teller Mountain, B3

Species list: see Appendix I, Webster Pass



Webster Pass *Armeria* habitat.

Iron Quarry



Iron Quarry near Ashcroft, *Draba* habitat, August 2006.

Date surveyed: August 8, 2006

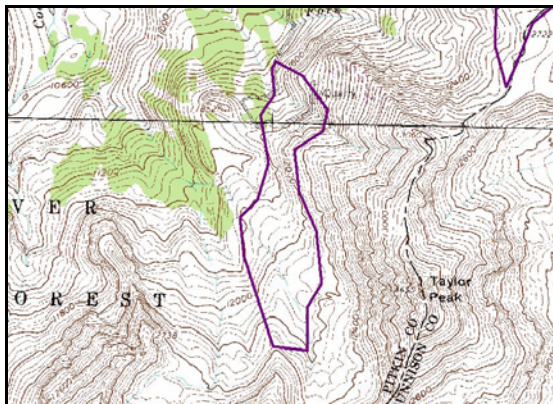
Surveyors: Janis Huggins and Georgia Doyle

Primary targets:

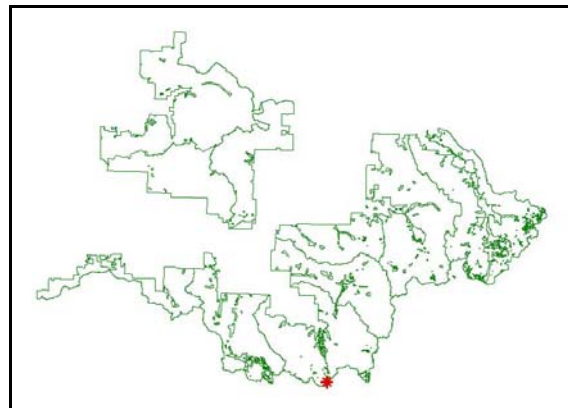
All alpine species

Draba globosa *	found
Draba porsildii N	found
Draba crassa N	found

* recommended for “needs more information” list 2006



Iron Quarry, area surveyed 2006.



White River NF, * marks area enlarged on left.

Directions to site: Drive Castle Creek Road to Ashcroft, go through locked gate (with permission) to Iron Mine.

Potential Conservation Areas: Taylor Pass, B2 (boundary enlarged to include this site)

Species list: see Appendix I, Iron Quarry



Town of Independence, North



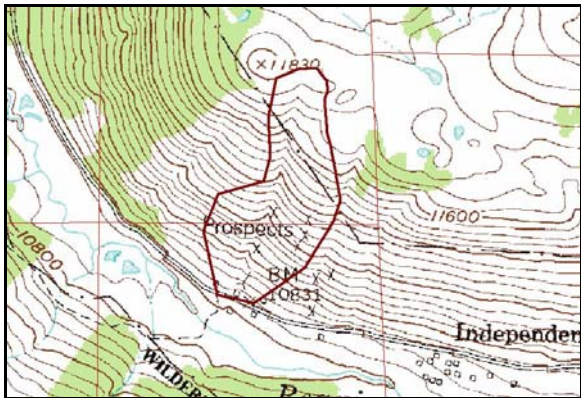
Town of Independence, North, August 2006

Date surveyed: August 10, 2006

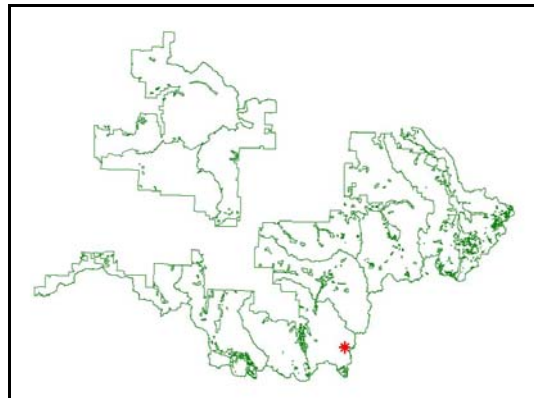
Surveyors: Janis Huggins and Georgia Doyle

Targets: Botrychium spp.

Botrychium echo N	found
Botrychium minganense	found
Botrychium hesperium	found
Botrychium lanceolatum N	found
Botrychium pinnatum	found



Town of Independence North, area surveyed 2006.



White River NF, * marks area enlarged on left.

Directions to site: From Aspen, drive to town of Independence. Park at pullout on left by first old buildings of Town. Site is a large area located on steep hillside of the Independence diggings, north of the old stamp mill (on L hillside as you head up the Pass). Be careful of the potential to stumble into a random mine shaft. There are multiple species of *Botrychium* across the hillside from the top waypoint in tailings to the lower elevations in an old logged area.

Potential Conservation Areas: Upper Roaring Fork Valley, B2.

Species list: see Appendix I, Town of Independence mine sites



Botrychium pinnatum at Town of Independence North.

Town of Independence South



Town of Independence South, habitat of *Eriophorum altaicum* ssp. *neogaena*.

Date surveyed: September 4, 2006

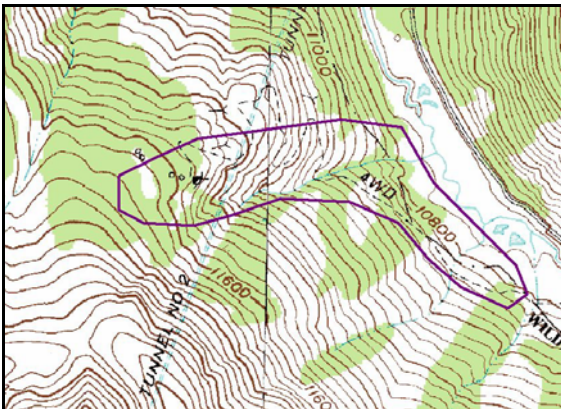
Surveyors: Janis Huggins

Primary targets:

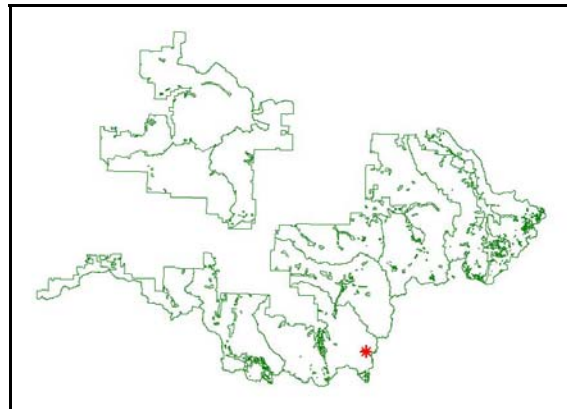
Eriophorum altaicum* ssp. *neogaena

***Botrychium* spp.**

**S, V found
not found**



Town of Independence South, area surveyed 2006.



White River NF, * marks area enlarged on left.

Directions to site: From, Aspen, drive to Town of Independence. Park and walk along old mining road on south side of Highway 82 toward Green Mountain. Cross Roaring Fork River. Road ends near this fen/marshy area. About a 30 minute walk.

Potential Conservation Areas: Partially included in Upper Roaring Fork PCA, B2.

Species list: Town of Independences South, Appendix I.

Hunter Creek



Hunter Creek, habitat of *Cystopteris montana*.

Date surveyed: September 17, 2006

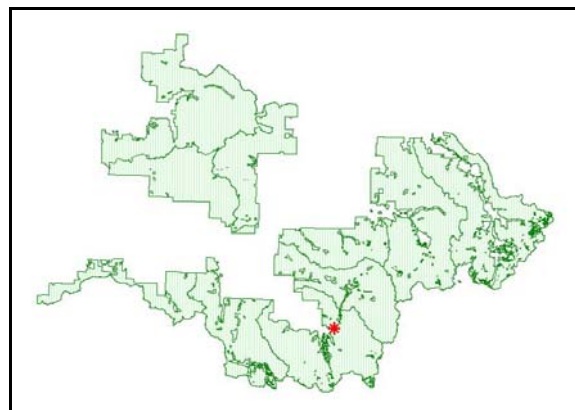
Surveyors: Janis Huggins

Prime targets:

Cystopteris montana N found



Hunter Creek, area surveyed 2006.



White River NF, * marks area enlarged on left.

Directions to site: From Aspen, take Mill Street to Red Mountain Road and follow signs into an area signed as private (but you are actually staying on public road) to the gate for the Hunter Creek Trail. You must go inside the gate to park. It is also possible to park at

the lower entrance to the trail, but there is just a long uphill. It may be easier to find as you can follow signs from the Red Mountain Road to this access. Hike up valley until beaver ponds appear ahead and on the right. Take the bridge that goes over Hunter Ck. There is an old trail to the site area, but it may be hard to locate. The site is on the south side of these first beaver ponds where the spruce-fir intersects with the willows. These ponds are easy to spot on the quad.

Potential Conservation Areas: Hunter Creek, B4

Species list: See Appendix I, Hunter Creek

Hagerman Pass



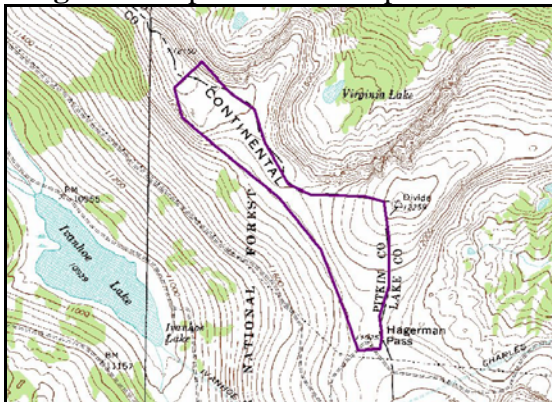
Hagerman Pass, August 2006.

Date surveyed: August 9, 2006

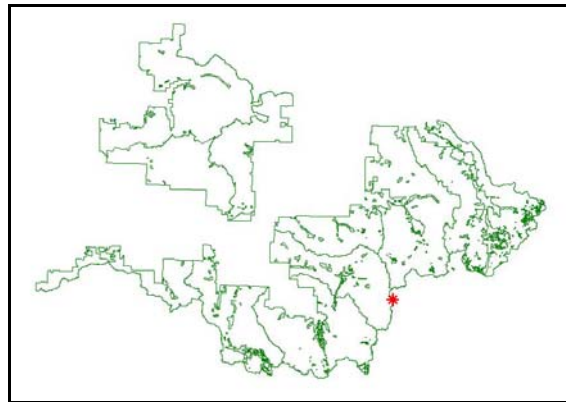
Surveyors: Janis Huggins and Georgia Doyle

Targets: all alpine sensitive species

not found



Hagerman Pass, area surveyed 2006.



White River NF, * marks area enlarged on left.

Directions to site: Take the Frying Pan road from Basalt along the Frying Pan River (which is basically a continuation of Main Street) and follow it past Reudi Reservoir, and past Thomasville, until you see the sign on the left for Hagerman Pass and Leadville just before the pavement ends. This is an easy 2-wheel drive road for the first few miles, then an easy 4-wheel drive to the top of the pass.

Potential Conservation Areas: none

Comments: Area looks promising, with extensive rolling tundra and embedded boulders with piles of fractured bedrock along the Divide, but no sensitive or tracked species were found.

Species list: see Appendix I, Hagerman Pass

Quandary Peak



Quandary Peak, August 2006.

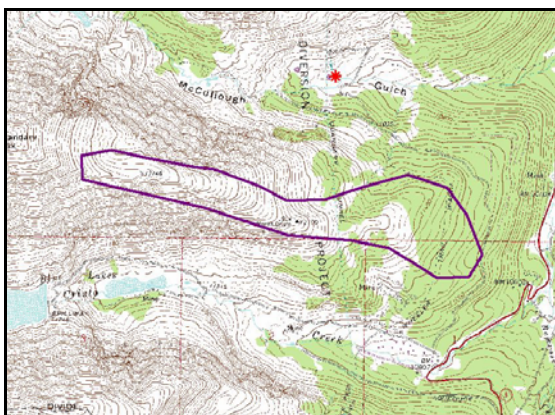
Date surveyed: August 17, 2006

Surveyors: Peggy Lyon and Janis Huggins

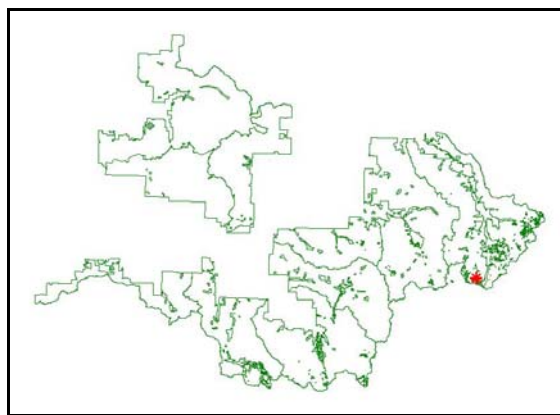
Targets:

All alpine species

none found



Quandary Peak, area surveyed 2006.



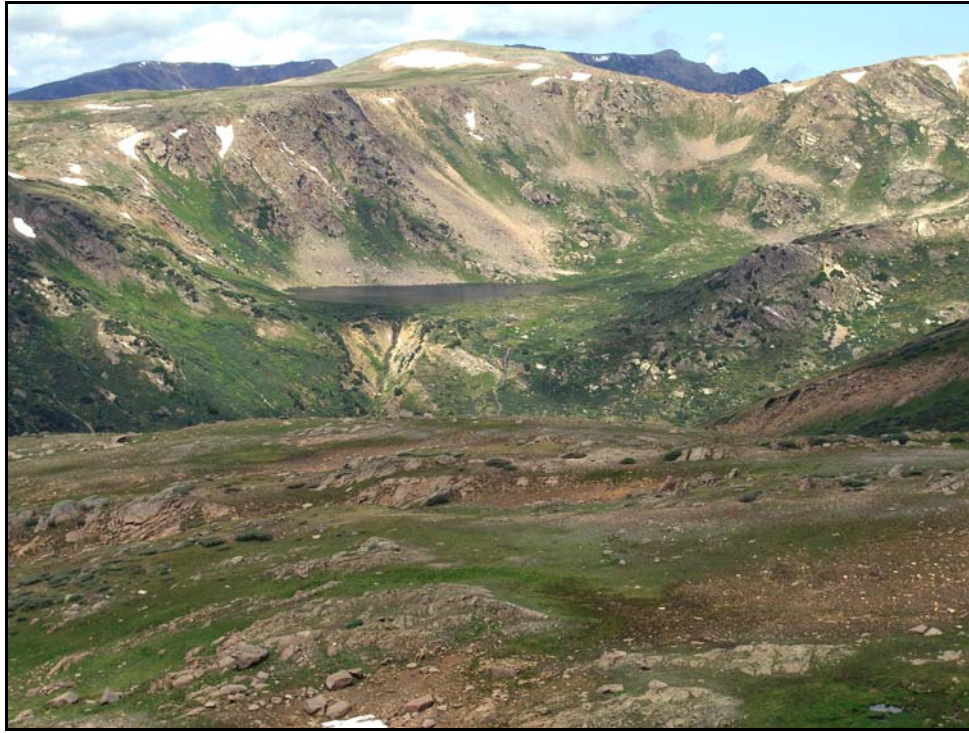
White River NF, * marks area enlarged on left.

Directions to site: From Highway 9 about 1 mile north of Hoosier Pass, turn on road to Blue Lakes, then make first right to trailhead.

Potential Conservation Areas: Mosquito Range, B1

Species list: see Appendix I, Quandary Peak

Upper Lost Man Trail



Upper Lost Man, Linkins Lake.

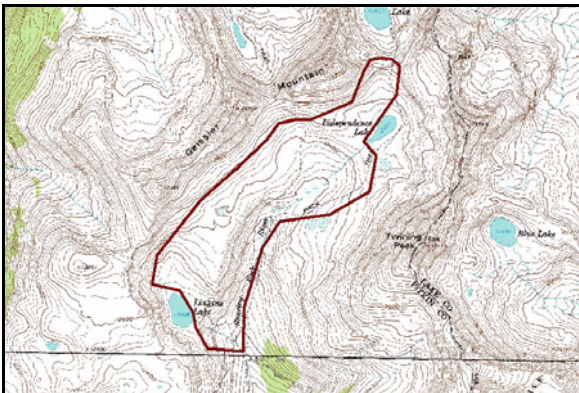
Date surveyed: July 22, 2006

Surveyors: Janis Huggins

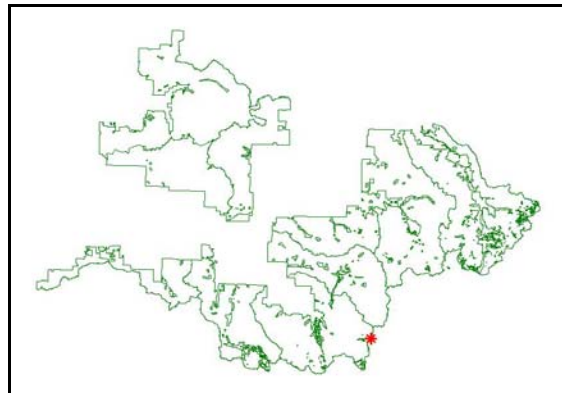
Targets:

All alpine species

Draba crassa N found



Upper Lost Man Trail, area surveyed 2006.



White River NF, * marks area enlarged on left.

Directions to site: Take Hwy 82 east from Aspen; pass Lost Man Campground, Lower Lost Man Trail and Town of Independence. On next sharp curve toward top of pass, park

on left at Trailhead for Linkins Lake and Independence Lake (upper Lost Man Trail). Hike to top of saddle above Independence Lake. Site of *Draba crassa* is to left of trail just over the top in fairly flat gravelly area with boulders.

Potential Conservation Areas: Upper Roaring Fork River, B2.

Species list: see Appendix I, Upper Lost Man Trail.

Potential Conservation Areas: Mosquito Range, B1

Species list: see Appendix I, McCullough Gulch

Grizzly Lake Trail



Grizzly Lake, August 2006.

Date surveyed: August 11, 2006

Surveyors: Janis Huggins and Georgia Doyle

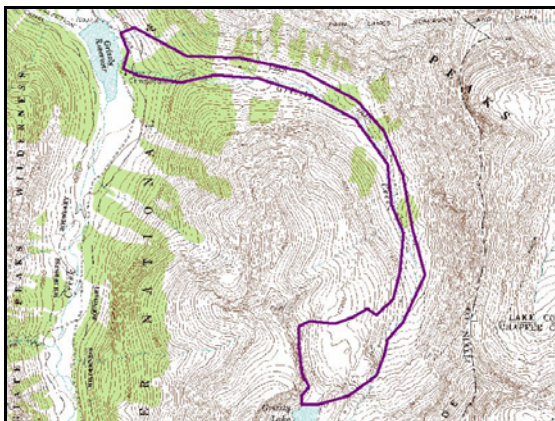
Primary targets:

Botrychium minganense

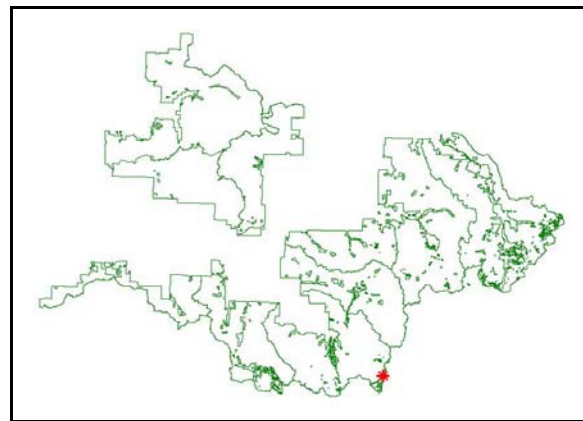
found

Other *Botrychium* spp.

not found



Grizzly Lake Trail, area surveyed 2006.



White River NF, * marks area enlarged on left.

Directions to site: From Grizzly Lake trailhead at Grizzly Reservoir, hike about 3 miles up trail toward lake. Flat rocky area about 1/4 mile below the lake.

Potential Conservation Areas: Grizzly Creek, B4

Species list: see Appendix I, Grizzly Lake Trail



Botrychium minganense



Castilleja sp. along Grizzly Lake Trail.



Mine site at Grizzly Creek.

Warren Lakes



Warren Lakes, *Eriophorum* habitat, August 2006.

Date surveyed: August 6, 2006

Surveyors: Janis Huggins and John Chapman (WRNF volunteer)

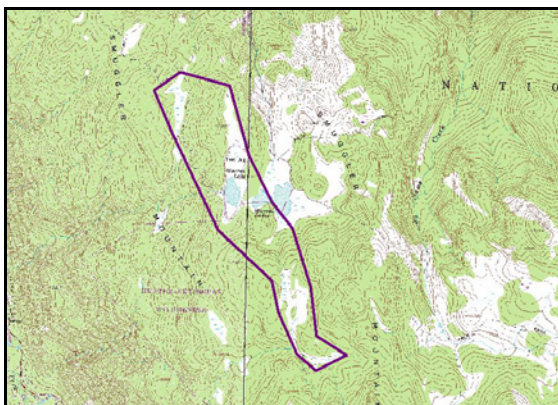
Primary targets:

***Eriophorum altaicum* ssp. *neogaeum* S, V**

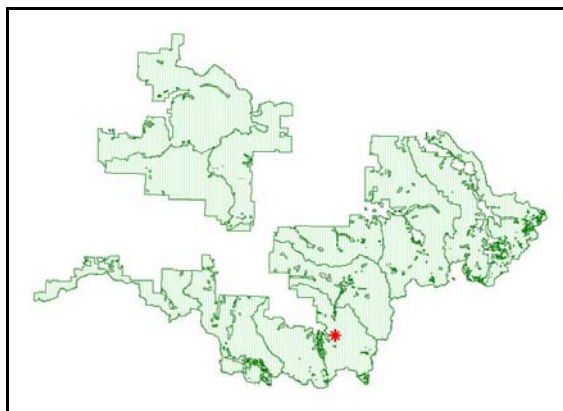
found

***Eriophorum chamissonis* S**

found



Warren Lakes, area surveyed 2006.



White River NF, * marks area enlarged on left.

Directions to site: From Aspen, drive up Smuggler Mt. on 4-wheel drive road to Warren Lakes. Need combo to get through gate or park there and follow old road to right around lake - may have to cross ditch, but stay above lake. Look for very old road at 4336765/348512 (NAD 27) that is almost obliterated (lots of downed trees) that will lead

you to the next large open, marshy area slightly southeast of the lakes. Walk through the forest about 1/2 to 2/3 of a mile on the road/trail. There is a sub to this EO that does not appear to be on the original one. The coordinates are in the comments below. You have to walk across both dry and very wet areas to the southeast just before entering the forest again to find the second location that has another 300+ individuals. _____

Potential Conservation Areas: none.

Species list: see Appendix I, Warren Lakes General; Warren Lakes *Eriophorum altaicum* site; Warren Lakes *Eriophorum chamissonis* site.

Chapter Three - Species profiles of rare plants documented in 2006

Sixty-one occurrences of rare plants were documented by CNHP in 2006, representing 28 species, listed below. (Bold type – FS sensitive)

Armeria maritima

Botrychium echo

Botrychium minganense

Botrychium pinnatum

Braya humilis

Carex diandra

Cirsium perplexans

Cystopteris montana

Draba borealis

Draba crassa

Draba exunguiculata

Draba fladnizensis

Draba globosa

Draba grayana

Draba oligosperma

Draba porsildii

Draba streptobrachia

Draba weberi

Eriophorum altaicum var. neogaeum

Eutrema penlandii

Ipomopsis globularis

Listera borealis

Machaeranthera coloradoensis

Parnassia kotzebuei

Physaria alpina

Ptilagrostis porteri

Ranunculus gelidus

Saussurea weberi

Additional species, not sensitive or tracked by CNHP

Papaver radicum ssp. kluanense

Ipomopsis tenuituba

Erigeron pinnatisectus

Lomatogonium rotatum

Ligusticum tenuifolium

Besseya alpina

Crataegus saligna

Botrychium lanceolatum

Menyanthes trifoliata

***Armeria maritima* (P. Mill.) Willd. ssp. *sibirica* (Turcz. ex Boiss.) Nyman
(Sea pink; Siberian sea thrift)**

Taxonomy

Class: Magnoliopsida
Order: Plumbaginales
Family: Plumbaginaceae (Limoniaceae)

Taxonomic Comments:

Synonymy includes *Statice maritima*, *A. scabra* ssp. *sibirica*, *A. maritima* var./ssp. *arctica*, *labradorica*, and *purpurea* apparently separated based on leaf tip shape, an inconsistent character. Separated into two distinguishable groups, one containing European subspecies and the other an American-circumpolar subspecies.



Photo by Georgia Doyle, 2006

CNHP Ranking: G5T5 S1

State/Federal Status: 2002 Region 2 Forest Service sensitive species list; 2002 White River National Forest Plan species of viability concern; recommended for the sensitive species list in the next Forest Service Region 2 revision.



Colorado Distribution

Description and Phenology: Evergreen perennial from tufts of flat linear basal leaves 2 to 6 cm in length and 2.5 mm wide, somewhat fleshy and red-tipped. Inflorescence is a ball of pink flowers above an involucre of pink papery bracts. Flowers in two to three flowered spikelets, the petals much longer than the calyx. Flowers occur from June to August; fruiting in August.

Habitat Comments: Grows on wet solifluction lobes, dry tundra, gravelly tundras, flood plains and sparsely vegetated rivulets, animal burrows, and two-track roads, lake and sea shores, and in alpine meadows from sea level to 13,000 feet (3,962 meters) elevation.

Global Range: Greenland; Eurasia; Labrador, Manitoba, Newfoundland, North West Territories, Nunavut, Ontario, Quebec, Yukon Territory; Alaska, and a huge range extension in Colorado (Harrington,1957).

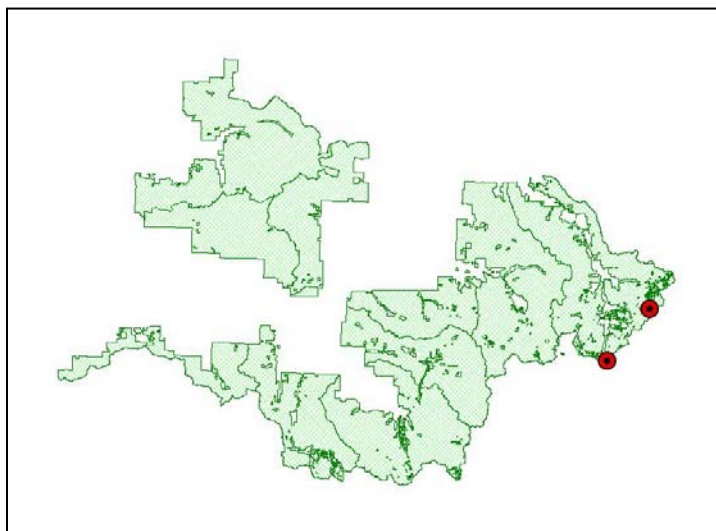
State Range: Known from the Mosquito Range at Hoosier Ridge and Teller Mountain at Webster Pass. Found in 2006 on the White River NF side of Webster Pass.

Distribution/Abundance: The abundance of this species outside the continental United States is unknown, but apparently it is common, based on its global rank. Estimates of abundance at the Colorado sites have varied with observers. When first observed at Hoosier Ridge in 1933, no estimates of population size were given. In subsequent visits to that site, estimates ranged from 1 or 2 individuals to 186. In 2006, a total of 158 individuals were counted in two locations. The site at Webster Pass was first documented in 1997, with an estimate of 120 individuals. In 2006, the area was extended to the west side of the pass in the White River National Forest, and CNHP counted over 600 plants, and estimates that there are over 1000 individuals at that site, making it by far the largest population known in the lower 48 states.

Known Threats and Management Issues: Threats include off-road motor vehicle activity, grazing by native ungulates and domestic sheep, recreational use and mining.

The 2002 White River National Forest plan calls for monitoring the distribution, size, and number of individuals of this species every 5 years. The plan also calls for the survey of this species prior to any activities that might impact it.

White River NF: Known from two locations in the Dillon Ranger District. In 2006, both the Hoosier Ridge site and the Webster Pass site were visited. The White River NF at Webster Pass contains by far the largest population known in the U. S., with an estimated 1000 individuals. Locations of these sites are shown below. They are included in the Teller Mountain and Mosquito Range PCAs.



Distribution of *Armeria maritima* in the White River National Forest.

References:

Flora of North America Vol. 5 [online]

http://www.efloras.org/florataxon.aspx?flora_id=1&taxon_id=250033128 [Accessed 01/16/2007]

Harrington, H. 1957. *Manual of the Plants of Colorado: For The Identification Of The Ferns And Flowering Plants Of The State*. Sage Books. Denver.

Hultén, E. 1968. *Flora of Alaska and Neighboring Territories: A Manual of the Vascular Plants*. Stanford University Press, CA.

NatureServe. 2006. NatureServe Explorer: An online encyclopedia of life [web application]. Version 6.1. NatureServe, Arlington, Virginia. Available <http://www.natureserve.org/explorer>. (Accessed: January 17, 2007).

USDA, NRCS. 2007. The PLANTS Database (<http://plants.usda.gov>, 11 January 2007). National Plant Data Center, Baton Rouge, LA 70874-4490 USA.

Weber, W. 1987. *Colorado Flora Western Slope*. Colorado Associated University Press.

***Botrychium echo* W.H. Wagner (reflected grapefern; reflected moonwort)**

Taxonomy

Class: Filicopsida

Order: Ophioglossales

Family: Ophioglossaceae

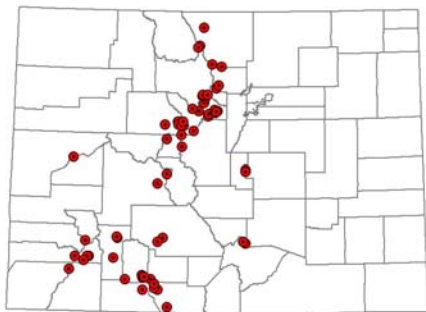
Taxonomic Comments: *Botrychium echo* was described in 1983 by Drs. Herb and Florence Wagner along with *B. hesperium* (Wagner and Wagner 1983). Before this, specimens of this species were usually identified as *B. matricariifolium* ssp. *hesperium* or *B. lanceolatum*. This species hybridizes with *B. hesperium* (Lellinger, 1985).

CNHP Ranking: G3 S3

State/Federal Status: None; formerly listed Region 2 Forest Service Sensitive. Currently on list of species considered for inclusion on Forest Service sensitive species list for Region 2, but for which more information is needed.



Photo Copyright Scott Smith



Colorado distribution

Description and Phenology: A perennial fern that produces a shiny green leaf (the trophophore) and a taller, erect spore-bearing spike (the sporophore). Both arise from a common stalk and can be thought of as a single, highly modified fern frond. Mature plants are 3-15 cm tall. This species has glabrous buds with the sterile blade inserted above the middle of the reddish brown striped common stalk. The sterile blades are ovate-oblong in shape. Produces clusters of minute, spheric gemmae at the root bases. Leaves appear in June and die in September.

Habitat Comments: Found on grassy slopes and meadows, roadsides and disturbed areas, edges of lakes in rocky soil, and on rocky hillsides from 8,200 to 12,140 feet (2,499 to 3,700 meters) elevation. Soil parent material is most often granitic, but also found in extrusive volcanics, such as tuff and andesite, and on sedimentary derived soils.

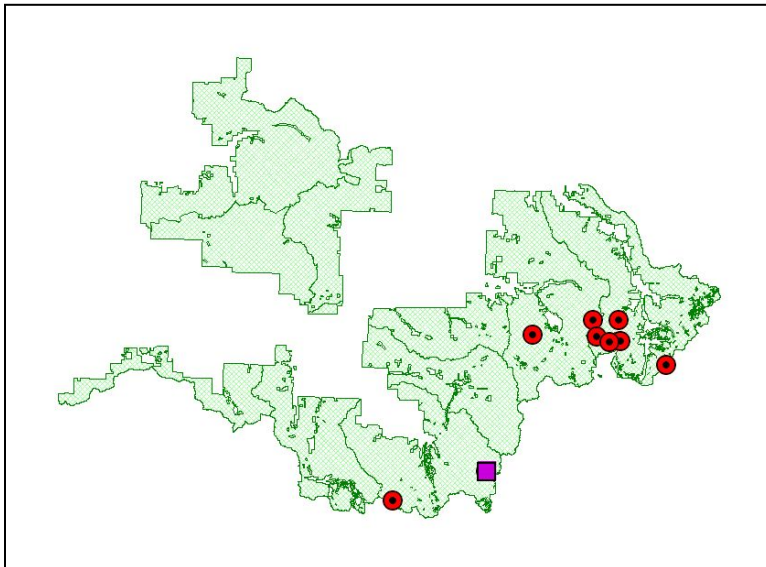
Global Range: Known from Northern Arizona, Northern Utah, and Central Colorado.

State Range: Known from Archuleta, Boulder, Clear Creek, Conejos, Custer, Delta, Dolores, Eagle, Gilpin, Grand, Gunnison, Hinsdale, Huerfano, Jackson, Lake, Larimer, Mineral, Montezuma, Park, Pitkin, Rio Grande, Saguache, San Juan, San Miguel, Summit, and Teller Counties.

Distribution/Abundance: Known from northern Utah and central Colorado; There are 60 known occurrences in Colorado, of which nine occur on the Whiter River NF. A report for northern Arizona needs verification. Many occurrences consist of fewer than ten individuals and the total number of individuals documented at all extant sites is less than 50.

Known Threats and Management Issues: The primary threats are habitat loss, recreation, succession, overgrazing, effects of small population size, sedimentation, timber harvest, exotic species invasion, global climate change, and pollution. However, these threats and their hierarchy are highly speculative because there is very little known about this species in Colorado. Because most of the known occurrences are small, they are also threatened by stochastic processes (Anderson and Cariveaum, 2004).

White River NF: Known from the Aspen, Holy Cross and Dillon Ranger Districts. Anderson and Cariveau (2004) report this species from the White River National Forest at Boreas Pass, Breckenridge Ski Area, Copper Mountain, Keystone Ski Area, and Vail Pass. A new occurrence was found in the White River NF in 2006 at the Town of Independence, growing with several other *Botrychium* species.



Location of *Botrychium echo* in the White River NF.
Square indicates new occurrence found in 2006.

References:

Anderson, D.G. and D. Cariveaum July 22, 2004, *Botrychium echo* W.H. Wagner (reflected grapefern): A Technical Conservation Assessment A report prepared for the USDA Forest Service, Rocky Mountain Region, Species Conservation Project.

Flora of North America Vol. 2 [online]

http://www.efloras.org/florataxon.aspx?flora_id=1&taxon_id=233500276[Accessed 01/16/2007]

Lellinger, D. 1985. A Field Manual of the Ferns and Fern-Allies of the United States and Canada. Smithsonian Institution Press.

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Spackman, S., B. Jennings, J.C. Dawson, M. Minton, A. Kratz, and C. Spurrier. 1997. Colorado Rare Plant Field Guide. Prepared for the Bureau of Land Management, the U.S. Forest Service and the U.S. Fish and Wildlife Service by the Colorado Natural Heritage Program, Fort Collins, CO.

USDA, NRCS. 2007. The PLANTS Database (<http://plants.usda.gov>, 11 January 2007). National Plant Data Center, Baton Rouge, LA 70874-4490 USA.

Wagner, W.H. and F.S. Wagner. 1983. Two moonworts of the Rocky Mountains - *Botrychium hesperium* and a new species formerly confused with it. American Fern Journal 73:53-62.

Weber, W. 1987. Colorado Flora Western Slope. Colorado Associated University Press.

***Botrychium minganense* Victorin (Mingan's moonwort)**

Taxonomy

Class: Filicopsida

Order: Ophioglossales

Family: Ophioglossaceae

Taxonomic Comments: Synonymy includes: *Botrychium lunaria* ssp. *minganense* and *B. lunaria* var. *minganense*. Has sometimes been misidentified as the South American *B. dusenii*.

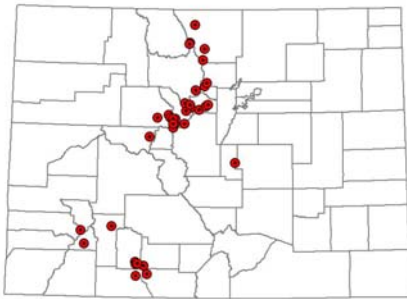
CNHP Ranking: G4 S1

State/Federal Status: None



Photo copyright ADA Hayden
Herbarium, Iowa State University

Colorado Distribution



Description and Phenology: A perennial fern that produces a dull green sterile frond (the trophophore) and a taller, erect fertile spore-bearing spike (the sporophore). Both arise from a common hollow, fleshy, stalk and can be thought of as a single, highly modified fern frond. Fan-shaped (moon-shaped) pinnae or lobes are folded together, the lowermost clasping the stalk, the sides at a 90 degree angle. These pinnae are separately spaced and do not usually overlap like other species. Yellow color of lamina and stalk are also characteristic. The sterile blades are inserted below the middle of the common stalks and over three times longer than wide. The plant is usually less than 6 inches tall with large spores in pendant clusters at the tip of the fertile frond appearing between July and October.

Habitat Comments: Found in moist meadows and reported in scattered areas in the mountainous part of the state up to 12,000 feet (3658 meters) elevation. Reported from sea level to 12,139 feet (3700 meters) elevation. Also found in prairies, woods, on sand dunes, and riverbanks in acid to circumneutral soil.

Global Range: Iceland; Alberta, British Columbia, Manitoba, New Brunswick, Newfoundland, North West Territories, Nova Scotia, Ontario, Prince Edward Island, Quebec, Saskatchewan, Yukon Territory; Alaska, Arizona, California, Colorado Idaho, Maine, Michigan, Minnesota,

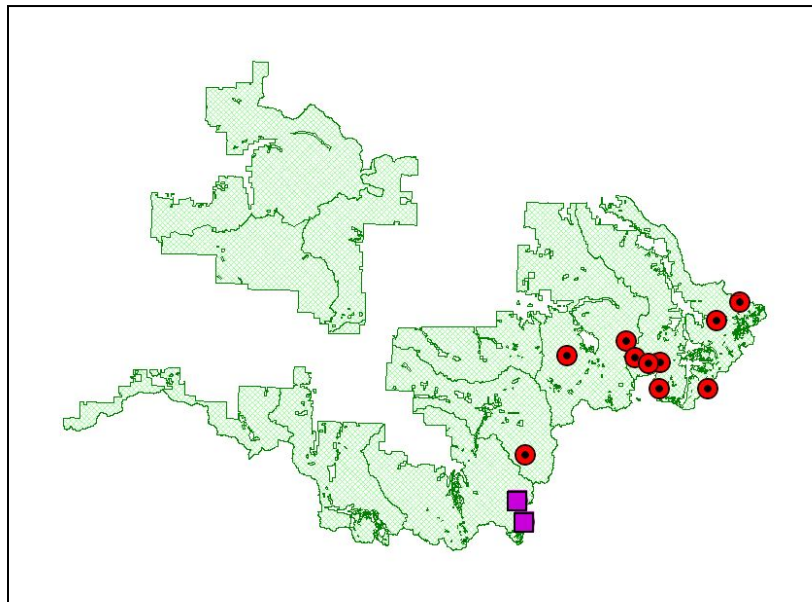
Montana, Nevada, New Hampshire, New York, North Dakota, Oregon, Utah, Vermont, Washington, Wisconsin, and Wyoming.

State Range: Known from Archuleta, Boulder, Clear Creek, Conejos, Eagle, Grand, Hinsdale, Jackson, Lake, Larimer, Mineral, Pitkin, Rio Grande, San Juan, San Miguel, Summit, and Teller Counties.

Distribution/Abundance: There are 36 occurrences in Colorado in the CNHP database. Twelve of these are in the White River NF. The majority of occurrences recorded by CNHP contain no information on abundance, probably due to the difficulty in seeing the tiny plants, and the fact that populations tend to fluctuate drastically from year to year. Small populations of less than 50 plants each seem to be the norm.

Known Threats and Management Issues: Threats include potential snowmaking operation and associated soil disturbance, mining and trampling by recreationists.

White River NF: Known from fourteen occurrences in the Aspen, Holy Cross and Dillon Ranger Districts. In 2006, new occurrences of *Botrychium minganense* were found at the Town of Independence and Grizzly Lake Trail.



Location of *Botrychium minganense* in the White River NF. Squares indicate new occurrences found in 2006.

References:

Flora of North America Vol. 2 [online]

http://www.efloras.org/florataxon.aspx?flora_id=1&taxon_id=233500283 [Accessed 01/16/2007]

Harrington, H. 1957. Manual of the Plants of Colorado: For The Identification Of The Ferns And Flowering Plants Of The State. Sage Books. Denver.

Hultén, E. 1968. Flora of Alaska and Neighboring Territories: A Manual of the Vascular Plants. Stanford University Press, CA.

Klinkenberg, Brian. (Editor) 2006. E-Flora BC: Electronic Atlas of the Plants of British Columbia [www.eflora.bc.ca]. Lab for Advanced Spatial Analysis, Department of Geography, University of British Columbia, Vancouver. [Accessed: 1/16/2007 1:17:38 PM]

NatureServe. 2006. NatureServe Explorer: An online encyclopedia of life [web application]. Version 6.1. NatureServe, Arlington, Virginia. Available <http://www.natureserve.org/explorer>. (Accessed: January 17, 2007).

USDA, NRCS. 2007. The PLANTS Database (<http://plants.usda.gov>, 11 January 2007). National Plant Data Center, Baton Rouge, LA 70874-4490 USA.

***Botrychium pinnatum* St. John (northern moonwort)**

Taxonomy

Class: Filicopsida

Order: Ophioglossales

Family: Ophioglossaceae

Taxonomic Comments: Synonymy includes *Botrychium boreale* ssp. *obtusilobum* and *B. boreale* var. *obtusilobum*; both misapplied. *B. boreale* is a Eurasiatic species as compared to this American species. This species is not found in Harrington (1957).

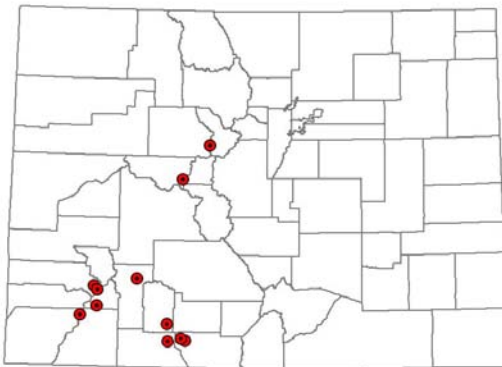
CNHP Ranking: G4? S1

State/Federal Status: None



Photo copyright 1989, Clayton J. Antieau

Colorado Distribution



Description and Phenology: A perennial fern that produces a shiny green leaf (the trophophore) and a taller, erect spore-bearing spike (the sporophore). Both arise from a common stalk and can be thought of as a single, highly modified fern frond. Pinnae with numerous lobes and a distinct midvein, the segments oblong to obovate and the margins entire. Leaves appear in June to August.

Habitat Comments: Found in grassy slopes, streambanks, and woods in moist to wet soil from sea level to 8,202 feet (2,500 meters) elevation.

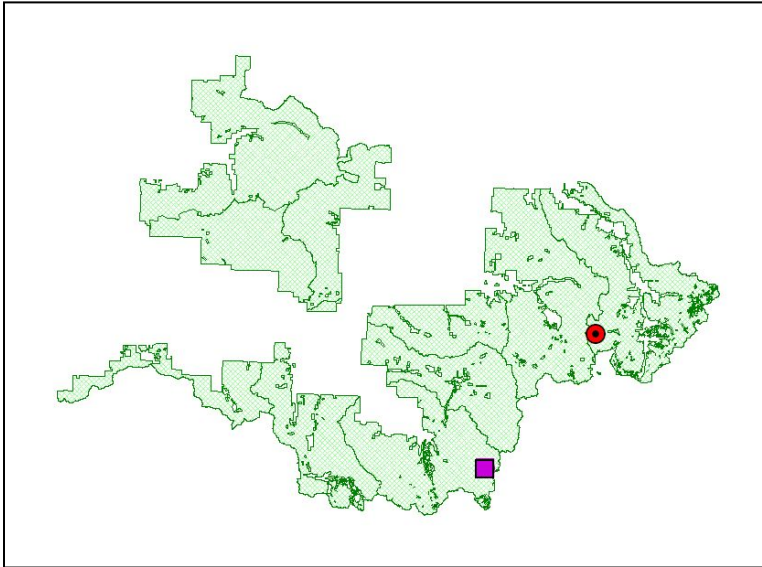
Global Range: Alberta, British Columbia, North West Territories, Yukon Territory; Alaska, California, Colorado, Idaho, Montana, Nevada, Oregon, Utah, Washington, and Wyoming.

State Range: Known from Archuleta, Conejos, Hinsdale, La Plata, Mineral, Montezuma, Pitkin, San Juan, San Miguel, and Summit Counties.

Distribution/Abundance: There are currently 12 element occurrences in the CNHP database, including a new one from the White River NF at the Town of Independence, located in 2006. One occurrence, ranked B (good) had an estimated 200 individuals. Most do not have any information on abundance, probably due to the difficulty in seeing the tiny plants, and the fact that populations tend to fluctuate drastically from year to year.

Known Threats and Management Issues: Threats may include mining, trampling by recreationists and small mammal predation.

White River NF: Known from two occurrences in the Aspen and Dillon Ranger Districts. In 2006 a new occurrence was found at the Town of Independence, growing with several other *Botrychium* species.



Location of *Botrychium pinnatum* in the White River NF. Square indicates new occurrence found in 2006.

References: Flora of North America Vol. 2 [online]
http://www.efloras.org/florataxon.aspx?flora_id=1&taxon_id=233500291 [Accessed 01/16/2007]

Harrington, H. 1957. Manual of the Plants of Colorado: For The Identification Of The Ferns And Flowering Plants Of The State. Sage Books. Denver.

Hultén, E. 1968. Flora of Alaska and Neighboring Territories: A Manual of the Vascular Plants. Stanford University Press, CA.

Klinkenberg, Brian. (Editor) 2006. E-Flora BC: Electronic Atlas of the Plants of British Columbia [www.eflora.bc.ca]. Lab for Advanced Spatial Analysis, Department of Geography, University of British Columbia, Vancouver. [Accessed: 1/16/2007 1:20:48 PM]

NatureServe. 2006. NatureServe Explorer: An online encyclopedia of life [web application]. Version 6.1. NatureServe, Arlington, Virginia. Available <http://www.natureserve.org/explorer>. (Accessed: January 17, 2007).

Root , P. and J. Montgomery. 1987. *Botrychium pinnatum* in Colorado. American Fern Journal 77(2): 68-69.

USDA, NRCS. 2007. The PLANTS Database (<http://plants.usda.gov>, 11 January 2007). National Plant Data Center, Baton Rouge, LA 70874-4490 USA.

***Braya humilis* (C.A. Mey.) B.L. Robins (low northern-rockcress)**

Taxonomy

Class: Dilleniidae
Order: Capparales
Family: Brassicaceae

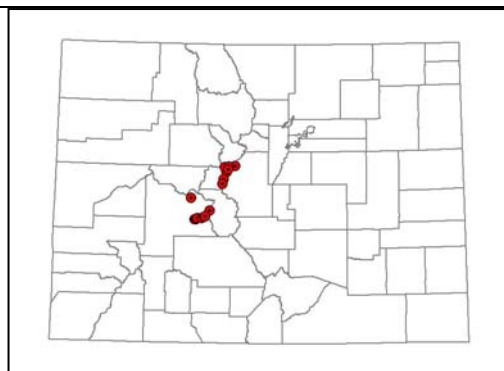
Taxonomic Comments: Accepted name in USDA Plants Database is *Neotorularia humilis*. This species has a great deal of synonymy: *Arabidopsis intermedia*, *A. novae-angliae*, and *A. richardsonii*; *Braya humilis* and its four subspecies and seven varieties, *B. intermedia*, *B. novae-angliae* and two varieties, and *B. richardsonii*; *Pilosella novae-angliae* and *P. richardsonii*; *Sisymbrium humile*; and *Torularia arctica*, *T. humilis*, and *T. humilis* ssp *arctica*. Hultén (1968) states that the plants found in Colorado are a different subspecies which also occurs in eastern North America.



Photo copyright J.S. Paterson

CNHP Ranking: G5 S2

State/Federal Status: None



Colorado Distribution

Description and Phenology: Biennial or perennial species branching from the base and with densely pubescent coarse, forked hairs on the oblanceolate toothed basal leaves. Flowers are white to purple occurring in July with long linear siliques appearing in late July to August. Superficially resembles *B. glabella* which has white to purple tinged flowers, short thick capsules, and a leafless stem.

Habitat Comments: Known from calcareous soils (namely Leadville Limestone) of exposed slopes, solifluction lobes, scree slopes, and disturbed microsites from 11,400 to 12,800 feet (3,475 to 3,901 meters) elevation.

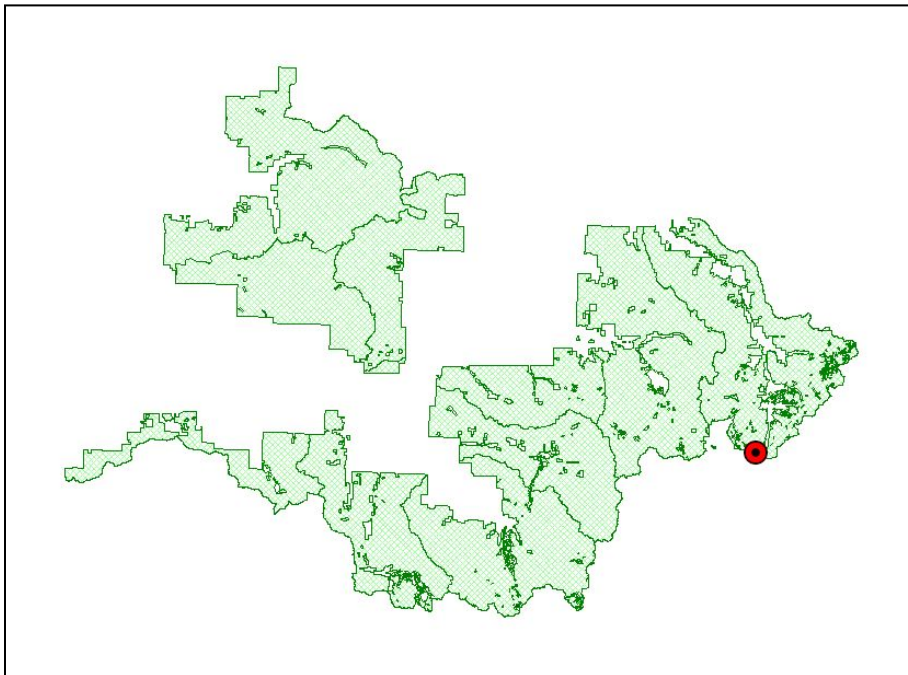
Global Range: Greenland; Alberta, British Columbia; Newfoundland, Northwest Territories, Yukon Territory; Alaska, and Vermont. Disjunct in central Colorado.

State Range: Known from Chaffee, Gunnison, Lake, Park, Pitkin, and Summit Counties.

Distribution/Abundance: There are roughly 20 populations with an estimated 4,000 individuals; population size varies from a few individuals to over 500 (USDA, 2007a). There are eighteen occurrences in Colorado in the CNHP database, of which one is in the White River NF.

Known Threats and Management Issues: Threats include recreational activities such as off-road vehicles and trampling from trail walkers.

White River NF: First documented in 1948, the single known site in the White River National Forest at Magnolia Mine in the Dillon Ranger District was revisited in 2006, and given a rank of B (good). It is included in the Mosquito Range PCA.



Location of *Braya humilis* in the White River NF.

References: Hultén, E. 1968. Flora of Alaska and Neighboring Territories: A Manual of the Vascular Plants. Stanford University Press, CA.

Klinkenberg, Brian. (Editor) 2006. E-Flora BC: Electronic Atlas of the Plants of British Columbia [www.eflora.bc.ca]. Lab for Advanced Spatial Analysis, Department of Geography, University of British Columbia, Vancouver. [Accessed: 1/16/2007 12:48:16 PM]

NatureServe. 2006. NatureServe Explorer: An online encyclopedia of life [web application]. Version 6.1. NatureServe, Arlington, Virginia. Available <http://www.natureserve.org/explorer>. (Accessed: January 17, 2007).

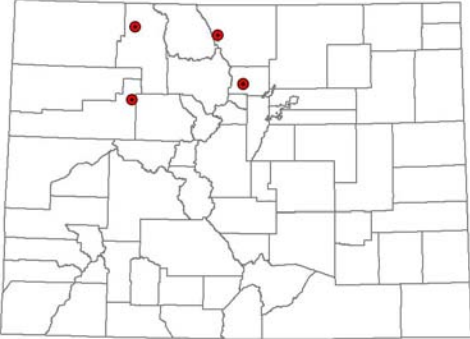
USDA-Forest Service R2. 2007a. Sensitive Species Evaluation Form – *Braya humilis*. (<http://www.fs.fed.us/r2/projects/scp/evalrationale/evaluations/dicots/brayahumilisone.pdf>) [Accessed 01/17/ 2007].

USDA, NRCS. 2007b. The PLANTS Database (<http://plants.usda.gov>, 11 January 2007). National Plant Data Center, Baton Rouge, LA 70874-4490 USA.

Carex diandra Schrank (lesser panicled sedge)

<p>Taxonomy Class: Liliopsida Order: Cyperales Family: Cyperaceae</p> <p>Taxonomic Comments: No known synonymy.</p> <p>CNHP Ranking: G5 S1</p>	 <p>Photos copyright Steve Matson 2002</p>
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State/Federal Status: Currently on the 2002 Region 2 sensitive species list.

 <p>Colorado Distribution</p>	<p>Description and Phenology: Perennial tufted sedge with a short rhizome and obtuse-angled culms that are terete at the base. The leaves are gray-green and 1-2 mm in width, with brown-spotted sheaths. Heads are 3-4 cm long with 10 or more sessile spikes per head. The staminate flowers occur at the tip of the spike with the pistillate flowers at the base. The scales are light brown and acute; the perigynia are dark brown and broadly ovate and long-beaked. Flowering and fruiting occur from July through August.</p>
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Habitat Comments: Found in swamps, mires, peaty pond edges, especially wet meadows, fens, muskegs, floating mats and logs, and in shallow, sometimes brackish water; found less often in swales, springy thickets, ditches, and wet sandy beaches of non-alkaline lakes. This species occurs from sea level to 9600 feet (9,226 meters) elevation.

Global Range: Eurasia; Iceland; Canary Islands; Pacific Islands; Alberta, British Columbia, Labrador, Manitoba, New Brunswick, Newfoundland, North West Territories, Nova Scotia, Nunavut, Ontario, Prince Edward Island, Quebec, Saskatchewan, and the Yukon Territory; Alaska, California, Colorado, Connecticut, Illinois, Indiana, Iowa, Maine, Maryland, Massachusetts, Michigan, Minnesota, Montana, Nebraska, New Hampshire, New Jersey, New York, North Dakota, Ohio, Oregon, Pennsylvania, Rhode Island, Utah, Vermont, Washington, Wisconsin, Wyoming.

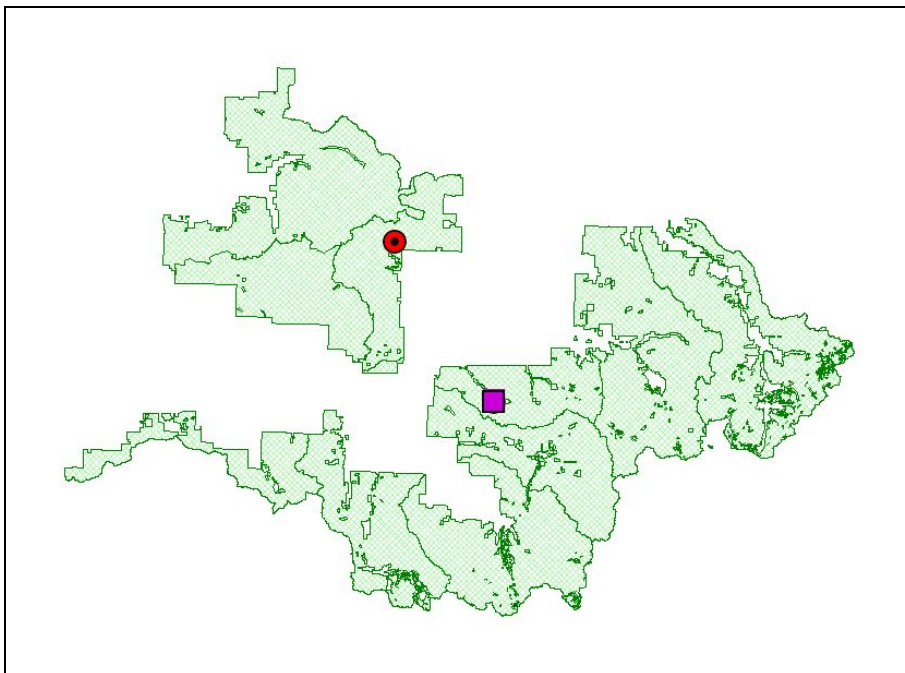
State Range: Known from Routt, Boulder, Garfield, and Larimer Counties.

Distribution/Abundance: There are approximately ten occurrences in Wyoming, two in Nebraska, and eight in Colorado; typically locally abundant within a small area of suitable

habitat (USDA, 2007a). Of the four Colorado occurrences in the CNHP database, two are in the White River NF.

Known Threats and Management Issues: Calcareous fens and bogs in good condition are not common; a more widespread and complete inventory of wetlands and their improved management are necessary (USDA, 2007).

White River NF: Known from two locations in the Eagle Ranger District, about 31 air miles apart. The species was first found at Turret Creek in the Flat Tops Wilderness. In 2006, Joe Doerr of the White River NF found a new population at Mucky Lake. Surveys were conducted at a number of other potential sites in 2006, but no other occurrences were found.



Location of *Carex diandra* in the White River NF. Square indicates new occurrence found in 2006 by Joe Doerr of White River NF..

References:

Flora of North America Vol. 23 [online]

http://www.efloras.org/florataxon.aspx?flora_id=1&taxon_id=242101043 [Accessed 01/16/2007]

Harrington, H. 1957. Manual of the Plants of Colorado: For The Identification Of The Ferns And Flowering Plants Of The State. Sage Books. Denver.

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NatureServe. 2006. NatureServe Explorer: An online encyclopedia of life [web application]. Version 6.1. NatureServe, Arlington, Virginia. Available <http://www.natureserve.org/explorer>. (Accessed: January 17, 2007).

USDA-Forest Service R2. 2007a. Sensitive Species Evaluation Form - *Carex diandra*. (<http://www.fs.fed.us/r2/projects/scp/evalrationale/evaluations/monocots/carexdiandratwo.pdf>) Accessed on January 1, 2007.

USDA, NRCS. 2007b. The PLANTS Database (<http://plants.usda.gov>, 11 January 2007). National Plant Data Center, Baton Rouge, LA 70874-4490 USA.

***Cirsium perplexans* (Rydb.) Petrak (Rocky Mountain thistle; adobe thistle)**

Taxonomy

Class: Asteridae
Order: Asterales
Family: Asteraceae

Taxonomic Comments: First classified in the genus *Carduus*, this species changed names several times (*Carduus americanus*, *C. perplexans* sp. nov., and *C. americanus perplexans*) before its final change in 1917 to the genus *Cirsium* and species *perplexans*.

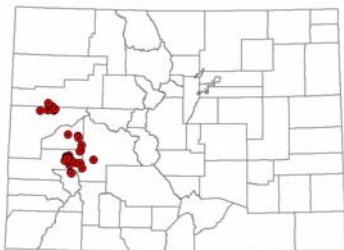
May be confused with the exotic species *Cirsium arvense* which is leafier, has no spines on the bracts of the flower heads, has a rhizome rather than a tap-root, and grows in more moist areas.



Photo by the USDA Forest Service

CNHP Ranking: G2G3 S2S3

State/Federal Status: 2002 Region 2 Forest Service sensitive species list; recommended for the sensitive species list in the next Forest Service Region 2 revision.



Colorado Distribution

Description and Phenology: An erect tap-rooted perennial or biennial, 2 to 6 dm tall with purplish, slightly tomentose stems. Toothed leaves have short weak spines that are smooth above and tomentose below. The upper leaves clasp at the base. The purple to red flower heads are solitary on the stem or branches, may have spines on the fringe-tipped involucre bracts, and are 2.5 to 3.5 cm across. Flowers appear from May to early July.

Habitat Comments: Found in dry, sparsely vegetated or disturbed areas, as well as adjacent to drainages and roads from 5,800 to 8,060 feet (1,768 to 2,457 meters) elevation. This species has been found in sagebrush, pinyon/juniper, Gambel oak, saltbush-greasewood, and shadscale communities and reported from dry cracked clay soils with open exposure.

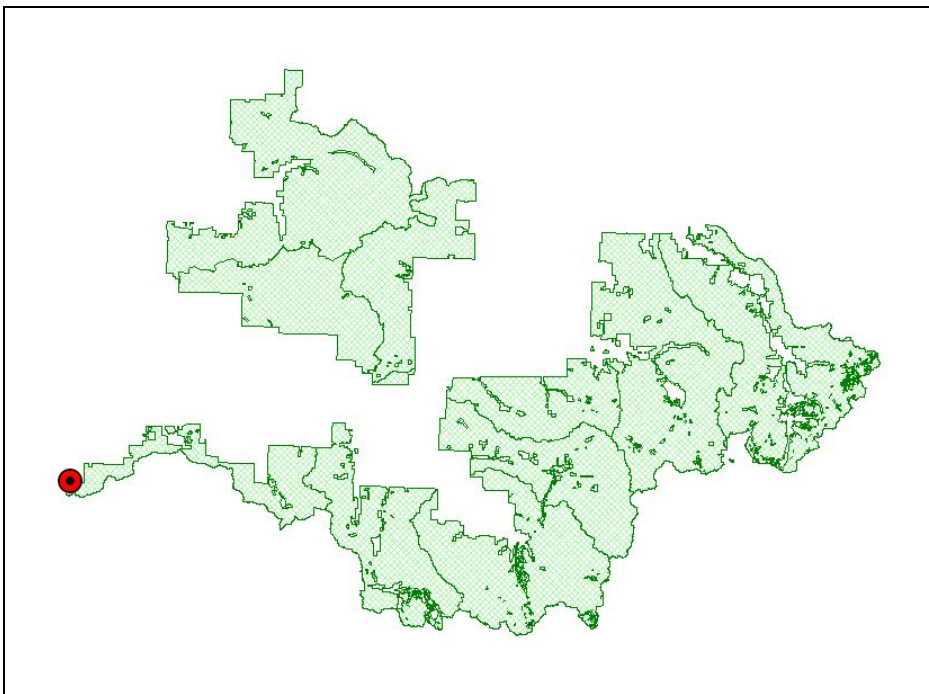
Global Range: This species is a Colorado endemic.

State Range: Found in the Colorado and Gunnison river valleys of Delta, Garfield, Gunnison, Mesa, Montrose, and Ouray counties. The majority of the known occurrences are in Montrose County, with the largest occurrences at Cedar Mesa in Delta County and at Logan Wash in Garfield County.

Distribution/Abundance: Known from 29 principal locations on privately owned lands or on lands managed by the BLM representing approximately 3,000 individuals total. The first occurrence on National Forest land was documented in 2006 at Horsethief Canyon.

Known Threats and Management Issues: Primary threats include the use of biological control and herbicides in the management of non-native *Cirsium* species, invasions of non-native plant species, trampling by livestock, roadside disturbances, and general impacts from recreational, agricultural, industrial, and residential land uses.

White River NF: In 2006, this species was documented at Horsethief Canyon, in the Rifle Ranger District, both on BLM and National Forest land. It was locally abundant with an estimated 400 individuals in naturally disturbed areas on reddish-brown soils of the Wasatch Formation. This is the first occurrence known for the White River NF.



Location of *Cirsium perplexans* in the White River NF.

References:

Flora of North America Vol. 19, 20, and 21 [online]
http://www.efloras.org/florataxon.aspx?flora_id=1&taxon_id=250066391[Accessed 01/16/2007]

Harrington, H. 1957. Manual of the Plants of Colorado: For The Identification Of The Ferns And Flowering Plants Of The State. Sage Books. Denver.

NatureServe. 2006. NatureServe Explorer: An online encyclopedia of life [web application]. Version 6.1. NatureServe, Arlington, Virginia. Available <http://www.natureserve.org/explorer>. (Accessed: January 17, 2007).

USDA, NRCS. 2007. The PLANTS Database (<http://plants.usda.gov>, 11 January 2007). National Plant Data Center, Baton Rouge, LA 70874-4490 USA.

Weber, W. 1987. Colorado Flora Western Slope. Colorado Associated University Press.

***Cystopteris montana* (Lam.) Bernh. ex Desv. (mountain bladderfern)**

Taxonomy

Class: Filicopsida

Order: Polypodiales

Family: Dryopteridaceae

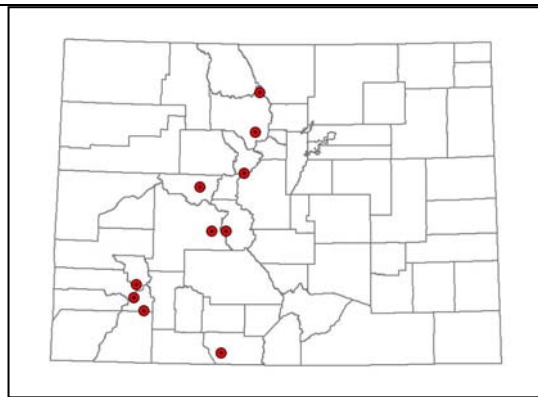
Taxonomic Comments: Synonymy includes *Filix Montana*, *Rhizomatopteris montana*, and *Polypodium montanum*.

CNHP Ranking: G5 S1



Photo by Janis Huggins

State/Federal Status: None. Currently on list of species considered for inclusion on Forest Service sensitive species list for Region 2, but for which more information is needed.



Colorado Distribution

Description and Phenology: Herbaceous perennial up to 40 cm tall with fronds in a row from cord-like, creeping, blackish rhizomes. The stipes are longer than the blade and darker at the base. Frond is broadly triangular with three main branches. Scales are light brown with glands in the margin. The sori and indusium are round.

Habitat Comments: Known from wet woods, moist rocky slopes, cracks in rocks, in moss, and in wet humus along streams in the subalpine at around 10,800 feet (3,292 meters) elevation. Noted from rocky soils with some organic matter and from calcareous soils. Mostly found in shade.

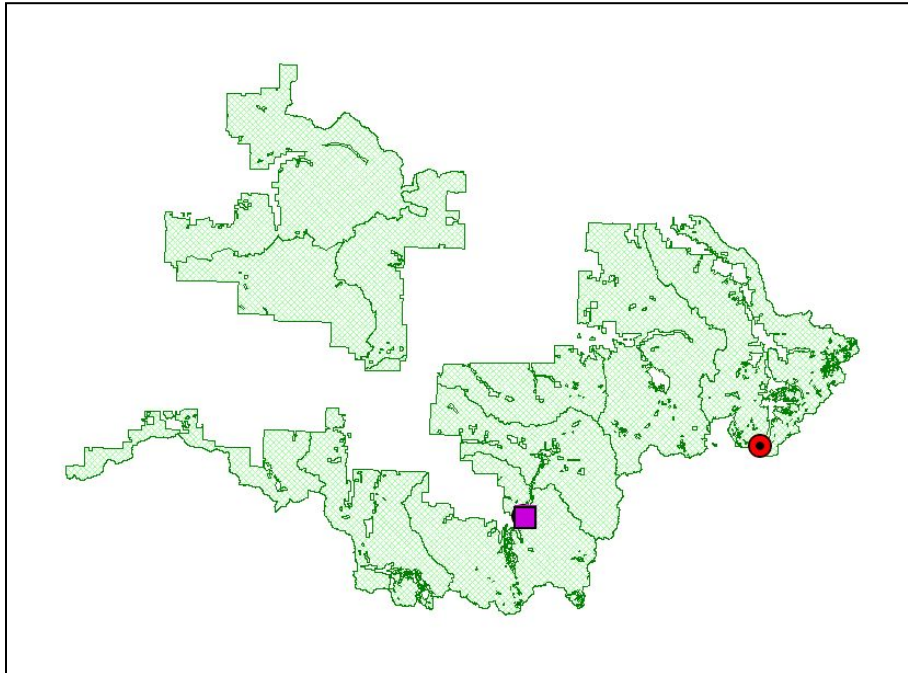
Global Range: Eurasia; Alberta, British Columbia, Labrador, Newfoundland, Northwest Territories, Ontario, Quebec, Saskatchewan, Yukon Territory; Alaska, Colorado, and Montana.

State Range: Known from Conejos, Grand, Gunnison, Pitkin, San Juan, and Summit Counties. Harrington (1957) states that this species is widely distributed over the western two-thirds of the state and that it is rather common.

Distribution/Abundance: There are currently nine element occurrences in Colorado, including a new occurrence documented in 2006 at Hunter Creek, and a new sub-occurrence found at Blue Lakes. The Blue Lakes site had over 100 fronds, while the Hunter Creek site contained over 1000 stems.

Known Threats and Management Issues: Susceptible to trampling, logging, and general impacts from recreational, agricultural, industrial, and residential land uses.

White River NF: There are two occurrences in the White River NF. In 2006, this species was documented at Hunter Creek in the Aspen Ranger District, and at Blue Lakes in the Dillon Ranger District.



Location of *Cystopteris montana* in the White River NF. Square indicates new occurrence found in 2006. The other occurrence was updated with a new sub-population added in 2006.

References:

Flora of North America Vol. 2 [online]

http://www.efloras.org/florataxon.aspx?flora_id=1&taxon_id=200003874 [Accessed 01/16/2007]

Harrington, H. 1957. Manual of the Plants of Colorado: For The Identification Of The Ferns And Flowering Plants Of The State. Sage Books. Denver.

Hultén, E. 1968. Flora of Alaska and Neighboring Territories: A Manual of the Vascular Plants. Stanford University Press, CA.

Klinkenberg, Brian. (Editor) 2006. E-Flora BC: Electronic Atlas of the Plants of British Columbia [www.eflora.bc.ca]. Lab for Advanced Spatial Analysis, Department of Geography, University of British Columbia, Vancouver. [Accessed: 1/16/2007 1:40:14 PM]


Lellinger, D. 1985. A Field Manual of the Ferns and Fern-Allies of the United States and Canada. Smithsonian Institution Press.

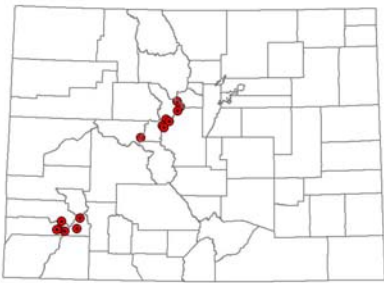
NatureServe. 2006. NatureServe Explorer: An online encyclopedia of life [web application]. Version 6.1. NatureServe, Arlington, Virginia. Available <http://www.natureserve.org/explorer>. (Accessed: January 17, 2007).

USDA, NRCS. 2007. The PLANTS Database (<http://plants.usda.gov>, 11 January 2007). National Plant Data Center, Baton Rouge, LA 70874-4490 USA.

Weber, W. 1987. Colorado Flora Western Slope. Colorado Associated University Press.

***Draba borealis* DC. (boreal whitlow-grass; northern rockcress)**

<p>Taxonomy Class: Magnoliopsida Order: Capparales Family: Brassicaceae</p> <p>Taxonomic Comments: Synonymy includes <i>Draba borealis</i> DC. var. <i>maxima</i> (Hultén) Welsh, <i>Draba maxima</i> Hultén, and <i>Draba mccallae</i> Rydb. This species is not found in Harrington (1957).</p> <p>CNHP Ranking: G4 S2</p> <p>State/Federal Status: None. Currently on list of species considered for inclusion on Forest Service sensitive species list for Region 2, but for which more information is needed.</p>	 <p>Photo copyright CNHP</p>
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 <p>Colorado distribution</p>	<p>Description and Phenology: Herbaceous perennial with one to several leafy stems, erect to drooping, pubescent with simple or branched hairs. Basal leaves are obovate-oblong and entire or sometimes coarsely toothed, and pubescent. Stem leaves broad and coarsely toothed. Pedicels densely pubescent with divaricate, long, simple hairs. Flowers are white or pale yellow with four petals. Silicles are ovate-oblong to elliptic, densely pubescent, and often twisted. Flowering from June to August fruiting July to September.</p> <p>Habitat Comments: Known from moist, north-facing limestone slopes and cliffs and shady streamsides at elevations from 6,200 to 8,600 feet (1,890 to 2,621 meters) elevation. In Dolores County, it was found growing in soil pockets in cliffs and in shallow soils of tundra ridges at 12,000 to 12,500 feet (3,658 to 3,810 meters) elevation.</p>
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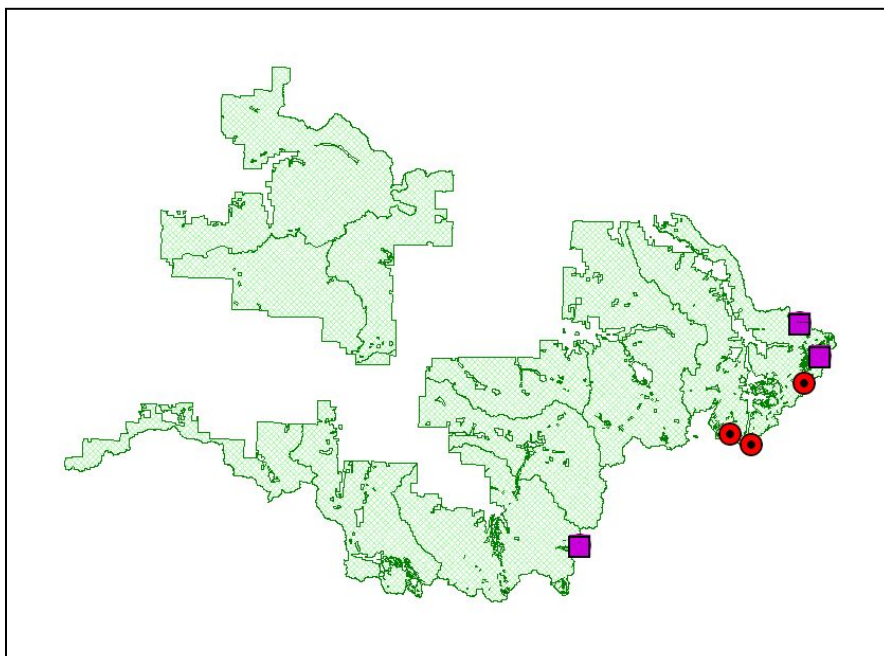
Global Range: East Asia; Alberta, British Columbia, Northwest Territories, Yukon Territory; Alaska, Colorado, and Wyoming.

State Range: Known in Colorado from the central Rockies in Summit, Pitkin and Park counties, and the San Juan Mountains in Ouray, San Juan and Dolores counties (first located in 2004).

Distribution/Abundance: There are now 14 Colorado occurrences in the CNHP database, including three new occurrences documented in 2006. There are four specimens at the University of Colorado Herbarium, from Summit and Park counties. Populations tend to be small, with fewer than 50 individuals.

Known Threats and Management Issues: Hiking, horse packing and sheep grazing may pose threats at sites along alpine ridges.

White River NF: Six of the eleven Colorado occurrences are in the White River NF. In 2006, this species was documented on Twining Peak at Independence Pass in the Aspen Ranger District, on Loveland Pass, and between Santa Fe Peak and Silver Mountain on the Continental Divide in the Dillon Ranger District. There were approximately 10 plants counted at each of the three sites.



Location of *Draba borealis* in the White River NF. Squares indicate new occurrences found in 2006.

References:

- Harrington, H. 1957. Manual of the Plants of Colorado: For The Identification Of The Ferns And Flowering Plants Of The State. Sage Books. Denver.
- Hultén, E. 1968. Flora of Alaska and Neighboring Territories: A Manual of the Vascular Plants. Stanford University Press, CA.

Klinkenberg, Brian. (Editor) 2006. E-Flora BC: Electronic Atlas of the Plants of British Columbia [www.eflora.bc.ca]. Lab for Advanced Spatial Analysis, Department of Geography, University of British Columbia, Vancouver. [Accessed: 1/16/2007 1:02:43 PM]

NatureServe. 2006. NatureServe Explorer: An online encyclopedia of life [web application]. Version 6.1. NatureServe, Arlington, Virginia. Available <http://www.natureserve.org/explorer>. (Accessed: January 17, 2007).

USDA, NRCS. 2007. The PLANTS Database (<http://plants.usda.gov>, 11 January 2007). National Plant Data Center, Baton Rouge, LA 70874-4490 USA.

***Draba crassa* Rydb. (thickleaf whitlow-grass)**

Taxonomy

Class: Magnoliopsida

Order: Capparales

Family: Brassicaceae

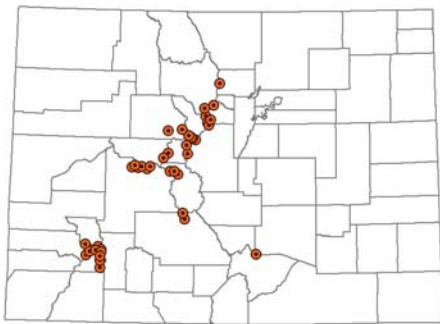
Taxonomic Comments: Synonymy includes *D. chrysantha*,

CNHP Ranking: G3 S3

State/Federal Status: None. Currently on list of species considered for inclusion on Forest Service sensitive species list for Region 2, but for which more information is needed.



Photo by Peggy Lyon



Colorado distribution

Description and Phenology: Herbaceous perennial from 8 to 18 cm tall arising from a thickened, leaf-base-covered caudex and fleshy root. Stems sometimes decumbent and moderately pubescent with short, simple or branched hairs. Leaves are thick and semi-succulent; the basal are long-petioled, elliptic to oblanceolate, and glabrous or ciliate. Cauline leaves ovate to elliptic or obovate and usually glabrous. Pedicels softly villous, the sepals greenish with purple and pubescent. The yellow flowers with obovate and rounded petals bloom in July; fruiting begins in mid-late July.

Habitat Comments: Found in alpine tundra in talus or rock stripes, and in grasslands and alpine meadows at 11,700 to 13,009 feet (3,355 to 3,965 meters) elevation.

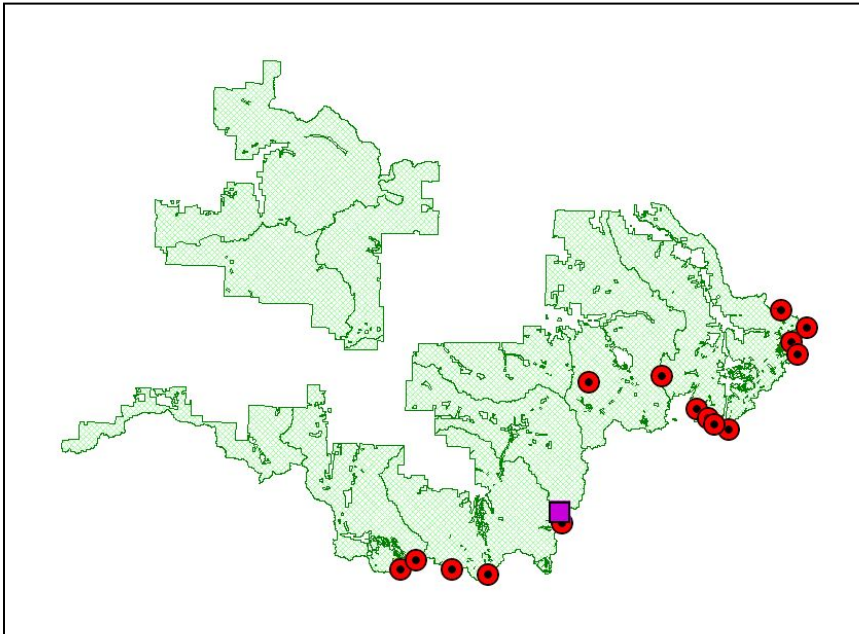
Global Range: Harrington (1957) states this species is known from Greenland to Alaska, south to Colorado, Arizona, and Washington, however this species is not found in numerous representative floras such as Aiken *et. al.* (1999 onwards), Hultén (1968), Kearney and Peebles (1964), or Klinkenberg (2007). Within the United States known from Colorado, Montana, Utah, and Wyoming (USDA Plants, 2007; Hitchcock and Cronquist, 1991).

State Range: Known from Chaffee, Clear Creek, Eagle, Grand, Gunnison, Huerfano, Lake, Ouray, Park, Pitkin, Pueblo, Saguache, San Juan, San Miguel, and Summit Counties on the Arapaho-Roosevelt, Pike-San Isabel, White River, and San Juan National Forests.

Distribution/Abundance: There are 41 Colorado occurrences in the CNHP database. Populations may be locally abundant, although they are often restricted to suitable microhabitats (USDA, 2007a).

Known Threats and Management Issues: Susceptible to mining activity.

White River NF: Fifteen of the 41 Colorado occurrences are on the White River NF, in the Sopris, Aspen, Holy Cross and Dillon Ranger Districts. In 2006, 9 new or updated occurrences of this species were documented on the White River NF, including at Twining Peak at Independence Pass; near Taylor Pass; in the Mosquito Range at Blue Lakes, Hoosier Pass, and the Magnolia Mine; and near Collier Mountain on the Continental Divide.




Location of *Draba crassa* in the White River NF. Square indicates new occurrence found in 2006. Eight other occurrences were updated, several with revised ranks and new sub-populations

References:

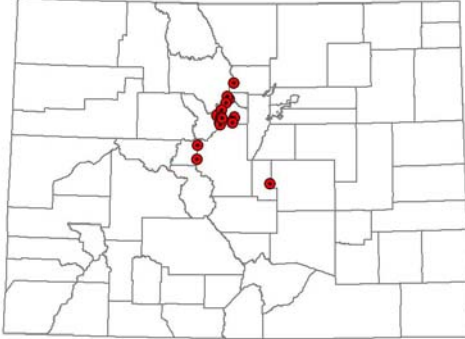
Aiken, S.G., M.J. Dallwitz, L.L. Consaul, C.L. McJannet, L.J. Gillespie, R.L. Boles, G.W. Argus, J.M. Gillett, P.J. Scott, R. Elven, M.C. LeBlanc, A.K. Brysting and H. Solstad. 1999 onwards. Flora of the Canadian Arctic Archipelago: Descriptions, Illustrations, Identification, and Information Retrieval. Version: 29th April 2003. <http://www.mun.ca/biology/delta/arcticf/>.

- Harrington, H. 1957. Manual of the Plants of Colorado: For The Identification Of The Ferns And Flowering Plants Of The State. Sage Books. Denver.
- Hitchcock, L. and A. Cronquist. 1991. Flora of the Pacific Northwest; An Illustrated Manual. University of Washington Press.
- Hultén, E. 1968. Flora of Alaska and Neighboring Territories: A Manual of the Vascular Plants. Stanford University Press, CA.
- Kearney, T. and R. Peebles. 1964. Arizona Flora. University of California Press.
- Klinkenberg, Brian. (Editor) 2006. E-Flora BC: Electronic Atlas of the Plants of British Columbia [www.eflora.bc.ca]. Lab for Advanced Spatial Analysis, Department of Geography, University of British Columbia, Vancouver. [Accessed: 1/16/2007 1:02:43 PM]
- NatureServe. 2006. NatureServe Explorer: An online encyclopedia of life [web application]. Version 6.1. NatureServe, Arlington, Virginia. Available <http://www.natureserve.org/explorer>. (Accessed: January 17, 2007).
- USDA-Forest Service R2. 2007a. Sensitive Species Evaluation Form – *Draba crassa*. (<http://www.fs.fed.us/r2/projects/scp/evalrationale/evaluations/dicots/drabacrassa.pdf>) Accessed on January 1, 2007.
- USDA, NRCS. 2007b. The PLANTS Database (<http://plants.usda.gov>, 11 January 2007). National Plant Data Center, Baton Rouge, LA 70874-4490 USA.
- Weber, W. 1987. Colorado Flora Western Slope. Colorado Associated University Press.

***Draba exunguiculata* (O.E. Schulz) C.L. Hitchc. (clawless draba)**

<p>Taxonomy Class: Magnoliopsida Order: Capparales Family: Brassicaceae</p> <p>Taxonomic Comments: Synonymy includes <i>Draba chrysantha</i> var. <i>exunguiculata</i>, though it is reported to be easily distinguishable as a unique species.</p> <p>CNHP Ranking: G2 S2</p>	 <p>Photo by Janis Huggins</p>
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State/Federal Status: 2002 Region 2 Forest Service sensitive species list.

 <p>Colorado Distribution</p>	<p>Description and Phenology: Herbaceous perennial to 7 cm tall, with persistent, sparsely hairy, leaves forming thick basal tufts. Cauline leaves 1 to 4. Racemes are 5 to 20 flowered; petals scarcely exceed the sepals and are clawless. Yellow flowers occur from late June through August; fruits from mid-July through August.</p> <p>Habitat Comments: Known from fellfields, gravel slopes, and alpine tundra from 11,700 to 13,700 feet (3,566 to 4,176 meters) elevation.</p>
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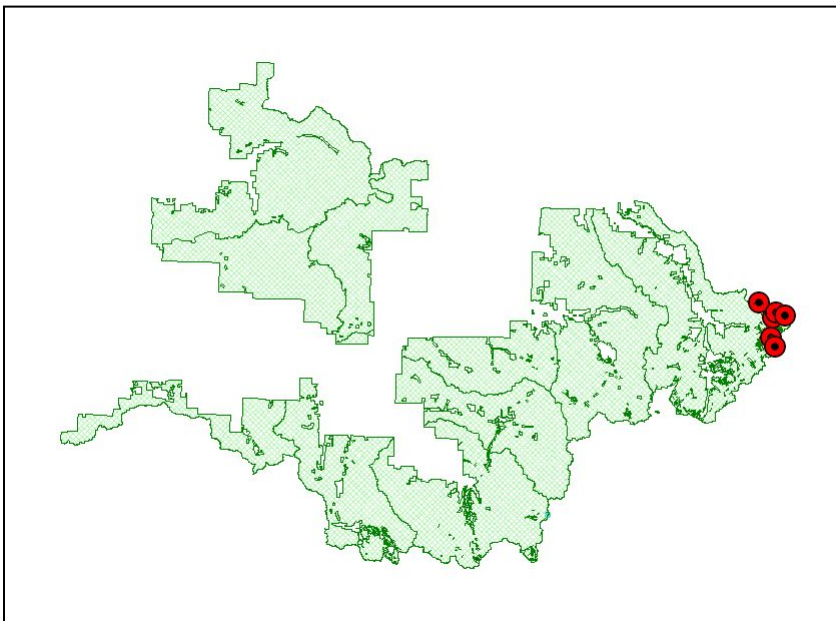
Global Range: Endemic to Colorado.

State Range: Known from Boulder, Clear Creek, El Paso, Gilpin, Grand, Lake, Park, and Summit Counties.

Distribution/Abundance: Seventeen occurrences have been documented in Colorado for this species. Most occur on the Pike-San Isabel and Arapaho-Roosevelt National Forests. Although rare in its range, it is locally common near Gray's Peak. Known mostly from small patches with three to twenty individuals, two observations reported more than a thousand individuals each (USDA, 2007a).

Known Threats and Management Issues: Trampling of individual plants through recreational use of habitat and mountain goat grazing is a direct threat to this species (Ladyman, 2004). Mining activities are likely to have impacted populations that are observed in the vicinity of existing mines (USDA, 2007a). Acid rain and air pollution also pose a threat, and both introduced species and global warming are potential threats. Disturbance concentrated in areas of high population density would have a great impact on this species.

White River NF: There are six occurrences in the White River NF in the Dillon Ranger District. In 2006, this species was documented on Loveland Pass and near Collier Mountain on the Continental Divide.



Location of *Draba exunguiculata* in the White River NF.

References:

Harrington, H. 1957. Manual of the Plants of Colorado: For The Identification Of The Ferns And Flowering Plants Of The State. Sage Books. Denver.

Ladyman, J.A.R. (2004, July 14). *Draba exunguiculata* (O.E. Schulz) C.L. Hitchcock (Garys Peak draba): a technical conservation assessment. [Online]. USDA Forest Service, Rocky Mountain Region. Available: <http://www.fs.fed.us/r2/projects/scp/assessments/drabaexunguiculata.pdf> [January 1, 2007].

NatureServe. 2006. NatureServe Explorer: An online encyclopedia of life [web application]. Version 6.1. NatureServe, Arlington, Virginia. Available <http://www.natureserve.org/explorer>. (Accessed: January 17, 2007).

USDA-Forest Service R2. 2007a. Sensitive Species Evaluation Form - *Draba exunguiculata*, <http://www.fs.fed.us/r2/projects/scp/evalrationale/evaluations/dicots/drabaexunguiculata.pdf> accessed January 1, 2007.

USDA, NRCS. 2007b. The PLANTS Database (<http://plants.usda.gov>, 11 January 2007). National Plant Data Center, Baton Rouge, LA 70874-4490 USA.

Weber, W. 1987. Colorado Flora Western Slope. Colorado Associated University Press.

***Draba fladnizensis* Wulfen (White Arctic Whitlow-grass)**

Taxonomy

Class: Magnoliopsida

Order: Capparales

Family: Brassicaceae

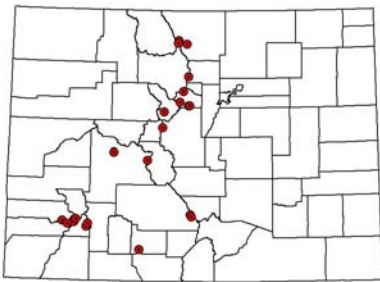
Taxonomic Comments: Synonymy includes *D. allenii* and *D. fladnizensis* var. *heterotricha*. Also synonymous with *D. lactea*, a unique species both morphologically and genetically for which *D. fladnizensis* forms hybrid swarms (Aiken *et. al.* 1999 onwards; Hulten, 1968).

CNHP Ranking: G4 S2S3

State/Federal Status: None. Currently on list of species considered for inclusion on Forest Service sensitive species list for Region 2, but for which more information is needed.



Illustration by Jeanne R. Janish



Colorado Distribution

Description and Phenology: A caespitose perennial 1 to 9 cm in height. The basal leaves are 3 to 10 mm long, oblanceolate, with long simple hairs and markedly ciliate. Stems are glabrous and leafless or rarely with 1 or 2 small leaves. Flowers are white and occur in July and August. Oblong-ovate silicles form in late July.

Habitat Comments: Found in alpine tundra, meadows, rock, scree slopes, between boulders, and on dry open rocky ridges from 10,700 to 14,000 feet (3,261 to 4,267 meters) elevation.

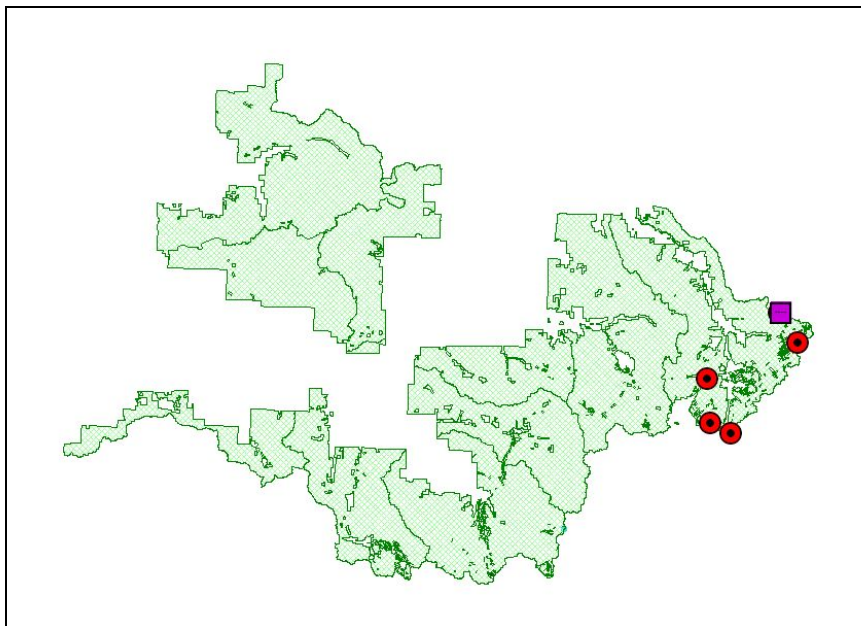
Global Range: Eurasia; Norden; Siberia; Asia; Alberta, British Columbia, Canadian Arctic Archipelago, Greenland, New Brunswick, Nova Scotia, North West Territories, Ontario, Saskatchewan, Yukon Territory; Alaska, Colorado, Idaho, Montana, Utah, and Wyoming.

State Range: Known from Boulder, Chaffee, Clear Creek, Custer, Larimer, Ouray, Park, Rio Grande, Saguache, San Juan, San Miguel, Summit, and Teller Counties on the Arapaho-Roosevelt, White River, Pike-San Isabel, Routt, Grand Mesa-Uncompahgre-Gunnison, and San Juan and Rio Grande National Forests.

Distribution/Abundance: There are 33 occurrences in Colorado. Two are ranked A (excellent): one in Grand County has an estimated 10,000 individuals in 2 acres, while one in the Roosevelt NF, adjacent to the White River NF on the trail to Gray's Peak is estimated at several hundred individuals. Most documented occurrences are much smaller.

Known Threats and Management Issues: Threats are similar to those of other alpine species: trampling by hikers, grazing and global climate change.

White River NF: There are five occurrences in the White River NF, in the Dillon Ranger District. In 2006, this species was documented on Loveland Pass, in the Mosquito Range at Blue Lakes, and at Silver Mountain on the Continental Divide.



Location of *Draba fladnizensis* in the White River NF. Square indicates new occurrence found in 2006. Two other occurrences were updated in 2006.

References:

Aiken, S.G., M.J. Dallwitz, L.L. Consaul, C.L. McJannet, L.J. Gillespie, R.L. Boles, G.W. Argus, J.M. Gillett, P.J. Scott, R. Elven, M.C. LeBlanc, A.K. Brysting and H. Solstad. 1999 onwards. Flora of the Canadian Arctic Archipelago: Descriptions, Illustrations, Identification, and Information Retrieval. Version: 29th April 2003. <http://www.mun.ca/biology/delta/arcticf/> Accessed January 2, 2007.

Harrington, H. 1957. Manual of the Plants of Colorado: For The Identification Of The Ferns And Flowering Plants Of The State. Sage Books. Denver.

Hultén, E. 1968. Flora of Alaska and Neighboring Territories: A Manual of the Vascular Plants. Stanford University Press, CA.

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NatureServe. 2006. NatureServe Explorer: An online encyclopedia of life [web application]. Version 6.1. NatureServe, Arlington, Virginia. Available <http://www.natureserve.org/explorer>. (Accessed: January 17, 2007).

USDA-Forest Service R2. 2007a. Sensitive Species Evaluation Form – *Draba fladnizensis*. (<http://www.fs.fed.us/r2/projects/scp/evalrationale/evaluations/dicots/drabafladnizensisone.pdf>) Accessed on January 17, 2007.

USDA, NRCS. 2007b. The PLANTS Database (<http://plants.usda.gov>, 11 January 2007). National Plant Data Center, Baton Rouge, LA 70874-4490 USA.

Weber, W. 1987. Colorado Flora Western Slope. Colorado Associated University Press.

Draba globosa Payson (rockcress draba)

Taxonomy

Class: Magnoliopsida

Order: Capparales

Family: Brassicaceae

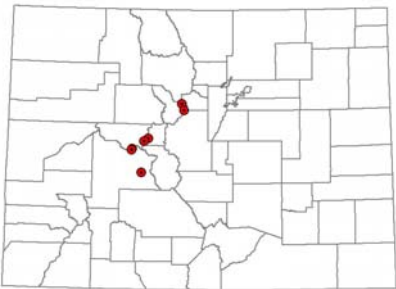
Taxonomic Comments: Synonymy includes *Draba apiculata* and *D. densifolia* var. *apiculata*. Recent genetics work shows a close relation with *D. maguirei* var. *burkei* (may soon be recognized as *D. burkei* (Windham and Beilstein 1998)) and a clear separation from *D. densifolia*.

CNHP Ranking: G3 S1



Photo Copyright © 1999 by P. Lehr

State/Federal Status: None. Currently on list of species considered for inclusion on Forest Service sensitive species list for Region 2, but for which more information is needed.



Colorado distribution

Description and Phenology: Herbaceous perennial mat or cushion forming species. Leaves glabrous to pubescent with few forked or dendritic hairs and coarse simple hairs on the margins. The yellow flowers appear in June; silicles are formed in August. The leaf apex terminates in a stiff, short hair.

Habitat Comments: Found in rocky stripes, talus, or meadows of calcareous or granitic soils in alpine tundra and sub-alpine spruce-fir forests above 9,000 feet (2743 meters) elevation.

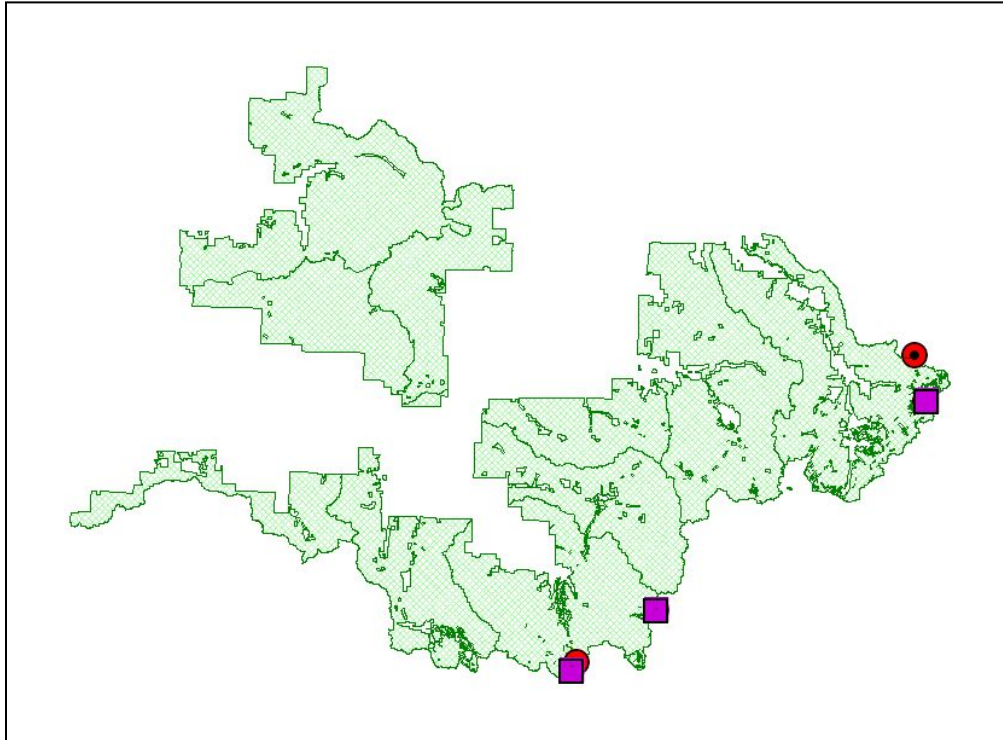
Global Range: A regional endemic of western Wyoming, central Colorado, southwestern Montana, south central Idaho, and northwestern Utah (Ladyman, 2004).

State Range: Known from Clear Creek, Gunnison, Lake, and Pitkin Counties on the Arapaho-Roosevelt, Grand Mesa, Uncompahgre, Gunnison, Pike-San Isabel, and White River National Forests.

Distribution/Abundance: Seven occurrences have been documented in Colorado for this species.

Known Threats and Management Issues: Recreational use of habitat and introduced species pose the greatest threats to this species, with acid rain, air pollution, and global warming all potential threats. The 2002 White River National Forest plan calls for monitoring this species every 5 years.

White River NF: Five of the seven Colorado occurrences are on the White River NF, in the Dillon and Aspen Ranger Districts. These include three new occurrences first documented in 2006 on Twining Peak at Independence Pass, near Taylor Pass, and at Santa Fe Peak. Two occurrences at Loveland Pass were updated in 2006.



Location of *Draba globosa* in the White River NF. Squares indicate new occurrences found in 2006.

References:

Ladyman, J.A.R. (2004, February 27). *Draba globosa* Payson (beavertip draba): a technical conservation assessment. [Online]. USDA Forest Service, Rocky Mountain Region. Available: <http://www.fs.fed.us/r2/projects/scp/assessments/drabaglobosa.pdf> [January 2, 2007].

NatureServe. 2006. NatureServe Explorer: An online encyclopedia of life [web application]. Version 6.1. NatureServe, Arlington, Virginia. Available <http://www.natureserve.org/explorer>. (Accessed: January 17, 2007).

USDA-Forest Service R2. 2007a. Sensitive Species Evaluation Form – *Draba globosa*. (<http://www.fs.fed.us/r2/projects/scp/evalrationale/evaluations/dicots/drabaglobosa.pdf>) Accessed on January 17, 2007.

USDA, NRCS. 2007b. The PLANTS Database (<http://plants.usda.gov>, 11 January 2007). National Plant Data Center, Baton Rouge, LA 70874-4490 USA.

Windham, M.D. and M. Beilstein. 1998. A taxonomic study of *Draba maguirei* and allied taxa (Brassicaceae). Unpublished report. USDA Forest Service, Wasatch-Cache National Forest, Ogden, UT. [Not reviewed]

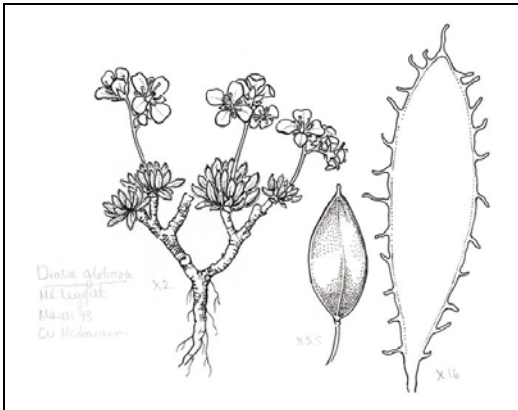


Illustration copyright © 1993 by M. Leggitt

***Draba grayana* (Rydb.) C.L. Hitchc. (Gray's Peak Whitlow-grass)**

Taxonomy

Class: Magnoliopsida

Order: Capparales

Family: Brassicaceae

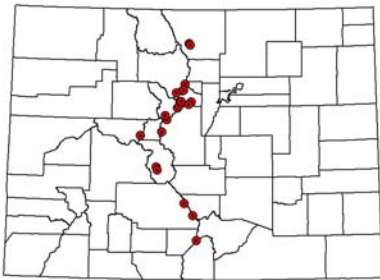
Taxonomic Comments: Synonymy includes *D. streptocarpa* var. *grayana* (Rydberg 1904), *D. chrysantha* var. *hirticaulis* forma *perhumilis*, and wrongly recognized as *D. alpicola*, a species of western China. Differs from *D. streptocarpa* in type and level of hairiness and shorter styles. In 1941, it was formally described as the unique taxon, *D. grayana*. It is perhaps most closely related to *D. aurea*.

CNHP Ranking: G2 S2

State/Federal Status: Currently on the 2002 Region 2 sensitive species list.



Photo Copyright © 1999 by L. Yeatts



Colorado distribution

Description and Phenology: Densely tufted perennial to 5 cm tall, with conspicuously dense simple and forked hairs. Caudex is branched and thickened with old leaves. Basal leaves linear-oblongate and ciliate, 5 to 15 mm long. The stem has one to three small leaves. Yellow flowers have claws that exceed the sepals in length; occur from June through late August. Silicles are produced in late August; mature fruit production is low.

Habitat Comments: Found in rocky, gravelly soils of granitic origin in the subalpine and alpine. Often among granitic-gneiss boulders, on fellfields, and on talus slopes from 12,467 to 13,123 feet (3,800 and 4,000 meters) elevation.

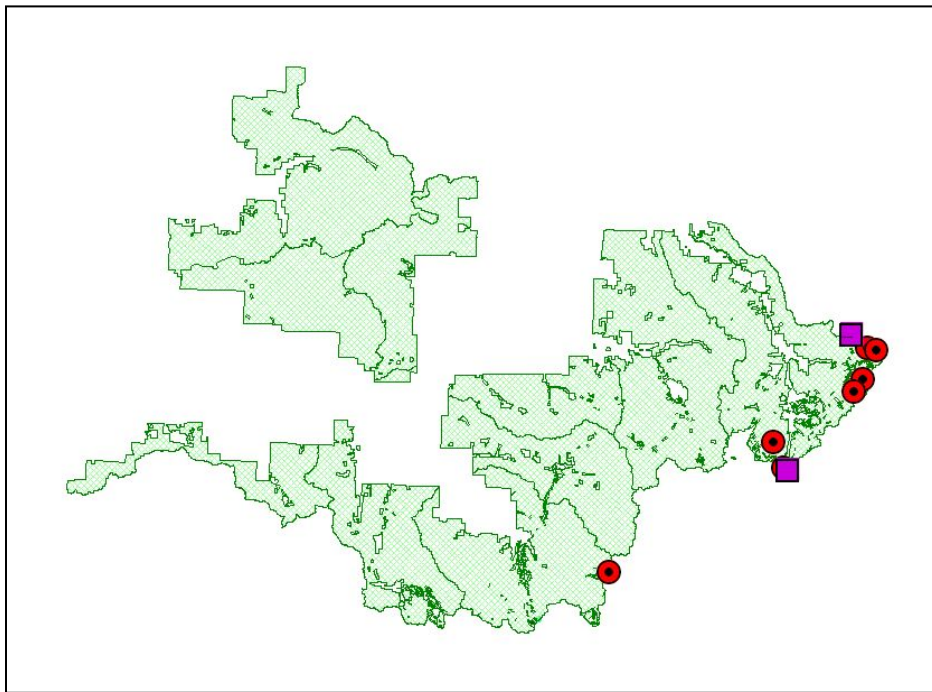
Global Range: Endemic to central and north-central Colorado.

State Range: Known from Chaffee, Clear Creek, Gilpin, Grand, Huerfano, Larimer, Park, Pitkin, Saguache, and Summit Counties.

Distribution/Abundance: There are 21 occurrences in the CNHP database; the majority of these are within 4 miles of Gray’s Peak, the type location. Although many occurrences are small, the population located at Santa Fe Peak in 2006 had over 100 individuals. Plants documented at Silver Mountain key to and are tentatively identified as *D. grayana*, but we are awaiting expert opinion from the University of California, as they do not completely conform to the characteristics of this species.

Known Threats and Management Issues: Trampling of individual plants through recreational use of habitat is a direct threat to this species. Mountain goats, introduced species, acid rain, air pollution, and global warming are also potential threats (Ladyman, 2004).

White River NF: Nine of the 21 Colorado occurrences are in the White River NF, in the Dillon and Aspen Ranger Districts. In 2006, a new occurrence of this species was documented at Loveland Pass, and an existing occurrence was updated at Santa Fe Peak.



Location of *Draba grayana* in the White River NF. Squares indicate new occurrences found in 2006. One other occurrence was updated in 2006.

References:

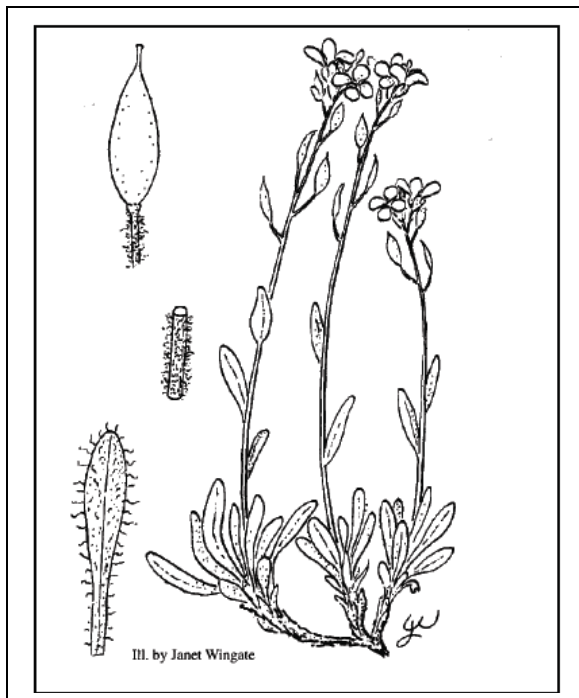
Harrington, H. 1957. Manual of the Plants of Colorado: For The Identification Of The Ferns And Flowering Plants Of The State. Sage Books. Denver.

Ladyman, J.A.R. (2004, July 28). *Draba grayana* (Rydb.) C.L. Hitchcock (Gray’s draba): a technical conservation assessment. [Online]. USDA Forest Service, Rocky Mountain Region. Available: <http://www.fs.fed.us/r2/projects/scp/assessments/drabagrayana.pdf> [January 2, 2007].

NatureServe. 2006. NatureServe Explorer: An online encyclopedia of life [web application]. Version 6.1. NatureServe, Arlington, Virginia. Available <http://www.natureserve.org/explorer>. (Accessed: January 17, 2007).

USDA, NRCS. 2007. The PLANTS Database (<http://plants.usda.gov>, 11 January 2007). National Plant Data Center, Baton Rouge, LA 70874-4490 USA.

Weber, W. 1987. Colorado Flora Western Slope. Colorado Associated University Press.



Draba grayana, illustration by Dr. Janet Wingate

***Draba oligosperma* Hook. (fewseed whitlow-grass; woods draba)**

Taxonomy

Class: Magnoliopsida

Order: Capparales

Family: Brassicaceae

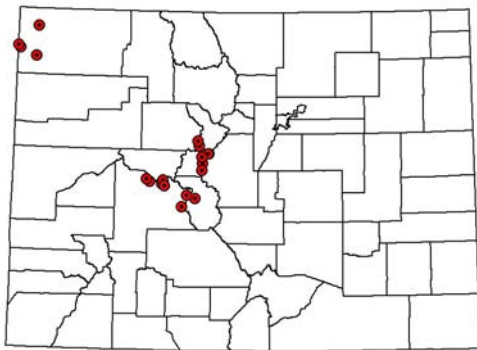
Taxonomic Comments: Synonymy includes *D. juniperina*, *D. pectinipila*, *D. subsessilis*, *D. saximontana*, *D. andina*, *D. oligosperma* ssp. *subsessilis*, and *D. oligosperma* vars. *Juniperina*, *oligosperma*, *pectinipila*, and *subsessilis*.

CNHP Ranking: G5 S2



NPS Photo

State/Federal Status: None. Currently on list of species considered for inclusion on Forest Service sensitive species list for Region 2, but for which more information is needed.



Colorado distribution

Description and Phenology: Densely tufted herbaceous tap-rooted perennial to 10 cm in height. Stems branched and glabrous or with stellate hairs; leafless. Leaves basal and narrowly oblanceolate to oblong with stellate hairs on the margins and undersides; midribs are prominent (Klinkenberg, 2006). Hultén (1968) states that the leaves are keeled and sessile with branched hairs concentrated toward the tip. Yellow flowers appear from May through July on leafless, glabrous stems; Siliques are elliptic, pubescent, and with a short style; they are developed in August. The pedicels about twice the length of the siliques; siliques often with a conspicuous style (Aiken *et. al.* 1999 onwards).

Habitat Comments: Known from dry rocky slopes, cliffs, meadows, fellfields, and scree slopes in the alpine and sub-alpine communities from 7,006 to 12,516 feet (2,135 to 3,815 meters) elevation (Klinkenberg, 2006; Welsh *et. al.* 1993).

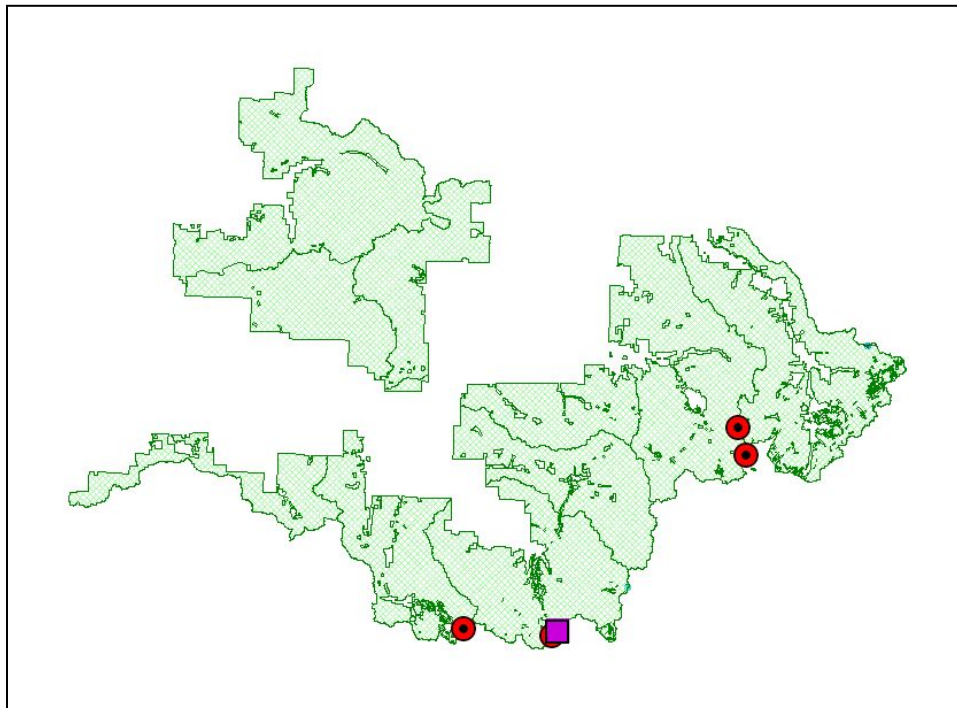
Global Range: Alberta, British Columbia, Northwest Territories, Yukon Territory;, Alaska, California, Colorado, Idaho, Montana, Nevada, Oregon, Utah, Washington, and Wyoming.

State Range: Known from Chaffee, Eagle, Gunnison, Lake, Moffat, Park, and Pitkin Counties.

Distribution/Abundance: There are 19 occurrences in Colorado in the CNHP database. One occurrence in Eagle County has several hundred plants. The new occurrence located at Taylor Pass in 2006 was estimated to contain over 50 individuals.

Known Threats and Management Issues: Potential threats include trampling and herbivory by bighorn sheep and mountain goats, and mining activity.

White River NF: Four of the nineteen Colorado occurrences are in the White River NF, in the Sopris, Aspen, Holy Cross and Dillon Ranger Districts.. In 2006, a new occurrence of this species was documented on Taylor Pass, and another updated.



Location of *Draba oligosperma* in the White River NF. Square indicates new occurrence found in 2006 at Taylor Pass. Another nearby occurrence was updated in 2006.

References:

Aiken, S.G., M.J. Dallwitz, L.L. Consaul, C.L. McJannet, L.J. Gillespie, R.L. Boles, G.W. Argus, J.M. Gillett, P.J. Scott, R. Elven, M.C. LeBlanc, A.K. Brysting and H. Solstad. 1999 onwards. Flora of the Canadian Arctic Archipelago: Descriptions, Illustrations, Identification, and Information Retrieval. Version: 29th April 2003. <http://www.mun.ca/biology/delta/arcticf/> Accessed on January 2, 2007

Harrington, H. 1957. Manual of the Plants of Colorado: For The Identification Of The Ferns And Flowering Plants Of The State. Sage Books. Denver.

Hultén, E. 1968. Flora of Alaska and Neighboring Territories: A Manual of the Vascular Plants. Stanford University Press, CA.

Klinkenberg, Brian. (Editor) 2006. E-Flora BC: Electronic Atlas of the Plants of British Columbia [www.eflora.bc.ca]. Lab for Advanced Spatial Analysis, Department of Geography, University of British Columbia, Vancouver.

NatureServe. 2006. NatureServe Explorer: An online encyclopedia of life [web application]. Version 6.1. NatureServe, Arlington, Virginia. Available <http://www.natureserve.org/explorer>. (Accessed: January 17, 2007).

USDA, NRCS. 2007. The PLANTS Database (<http://plants.usda.gov>, 11 January 2007). National Plant Data Center, Baton Rouge, LA 70874-4490 USA.

Weber, W. 1987. Colorado Flora Western Slope. Colorado Associated University Press.

Welsh, S.L., N.D. Atwood, S. Goodrich, and L.C. Higgins. 1993. A Utah Flora. Brigham Young University.

***Draba porsildii* G. Mulligan (Porsild's whitlow-grass)**

Taxonomy

Class: Magnoliopsida

Order: Capparales

Family: Brassicaceae

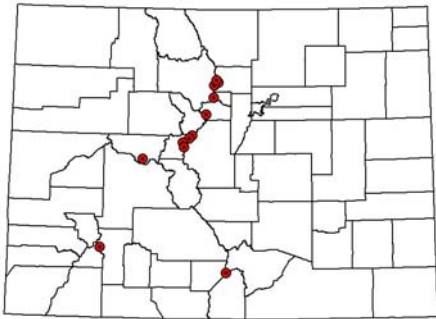
Taxonomic Comments: Two varieties are recognized by the USDA Plants Database (2007): *brevicula* reported from Montana and Wyoming and *porsildii* reported from Colorado and Wyoming. Weber (1987) does not recognize any varieties. This species does not occur in Harrington (1957) or in Hultén (1968).



Photo courtesy of Bob Skowron

CNHP Ranking: G3G4 S1

State/Federal Status: None. Currently on list of species considered for inclusion on Forest Service sensitive species list for Region 2, but for which more information is needed.



Colorado distribution

Description and Phenology: Herbaceous caespitose, perennial up to 6 cm in height. Lance-shaped basal leaves have entire margins and a mixture of simple and forked hairs. Stems have no or reduced leaves. White flowers top the stems in a nearly flat inflorescence that is produced in July. Fruit is a glarous obovate silique produced in July through August.

Habitat Comments: Found in alpine tundra in loose rock slides and on rocky summits at 12,000 to 13,600 feet (3,658 to 4,145 meters) elevation.

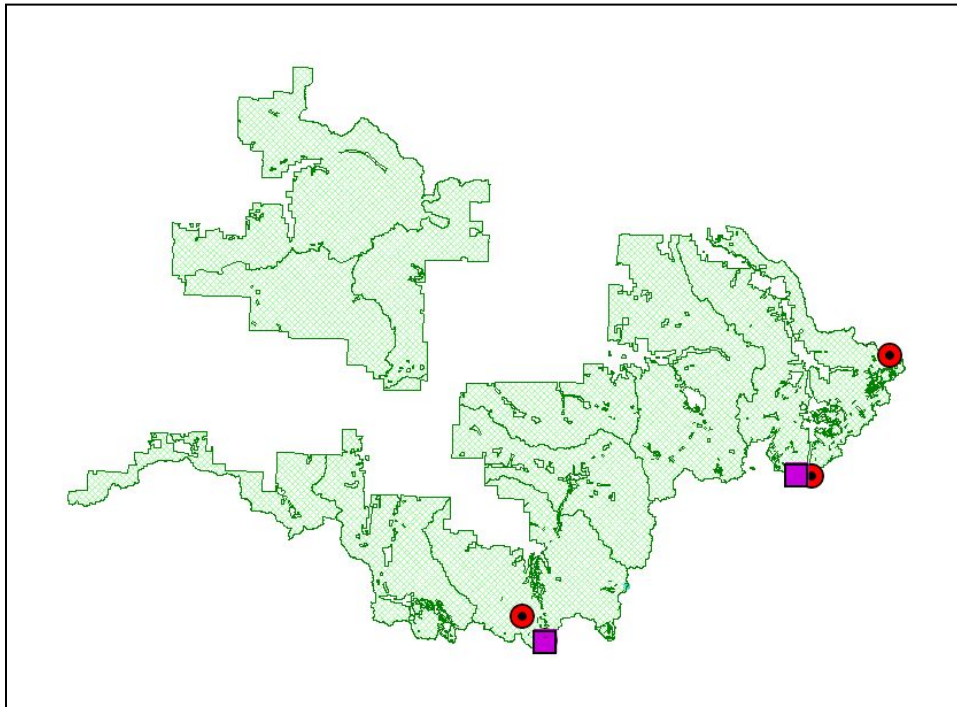
Global Range: Alberta, British Columbia, Northwest Territories, Yukon Territory; Alaska, Colorado, Montana, and Wyoming.

State Range: Found in Boulder, Chaffee, Clear Creek, Costilla, Gilpin, Grand, Gunnison, Huerfano, Lake, Park, Pitkin, San Juan, and Summit Counties.

Distribution/Abundance: Twelve populations of this species have been found in Colorado. Five of these are in the White River NF. The population found at Magnolia Mine in 2006 had over 100 individuals.

Known Threats and Management Issues: Trampling of individual plants through recreational use of habitat is a direct threat to this species. Mountain goats, introduced species, acid rain, air pollution, and global warming are also potential threats (Ladyman, 2004).

White River NF: In 2006, this species was documented at the iron quarry near Taylor Pass in the Aspen Ranger District, and at Magnolia Mine in the Dillon Ranger District.



Location of *Draba porsildii* in the White River NF. Squares indicate new occurrences found in 2006.

References:

Harrington, H. 1957. Manual of the Plants of Colorado: For The Identification Of The Ferns And Flowering Plants Of The State. Sage Books. Denver.

Hultén, E. 1968. Flora of Alaska and Neighboring Territories: A Manual of the Vascular Plants. Stanford University Press, CA.

NatureServe. 2006. NatureServe Explorer: An online encyclopedia of life [web application]. Version 6.1. NatureServe, Arlington, Virginia. Available <http://www.natureserve.org/explorer>. (Accessed: January 3, 2007).

USDA-Forest Service R2. 2007a. Sensitive Species Evaluation Form – *Draba porsildii*. (<http://www.fs.fed.us/r2/projects/scp/evalrationale/evaluations/dicots/drabaporsildiione.pdf>)

Accessed on January 17, 2007.

USDA, NRCS. 2007b. The PLANTS Database (<http://plants.usda.gov>, 11 January 2007). National Plant Data Center, Baton Rouge, LA 70874-4490 USA.

Weber, W. 1987. Colorado Flora Western Slope. Colorado Associated University Press. <http://www.fs.fed.us/r2/projects/scp/evalrationale/evaluations/dicots/drabaporsildiione.pdf>



Draba porsildii at Magnolia Mine. Photo by Janis Huggins

***Draba streptobrachia* Price (Colorado Divide whitlow-grass; alpine tundra draba)**

Taxonomy

Class: Magnoliopsida

Order: Capparales

Family: Brassicaceae

Taxonomic Comments: Previously confused with *D. chrysantha* var. *hirticaulis* and more recently with *D. spectabilis* and *D. spectabilis* var. *dasycarpa*, this species was not described until 1980 when it was separated from *D. spectabilis* based on characteristics of their four-armed trichomes on the basal and cauline leaves (Price, 1980). *D. spectabilis* has sessile cruciform trichomes with unequal arm lengths, whereas in *D. streptobrachia* these are short-stalked with contorted arms of equal length.

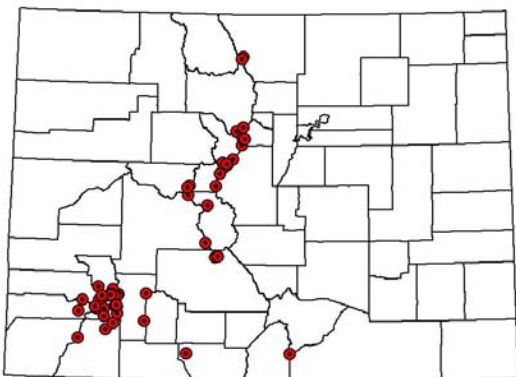
Resembles *D. graminea*, but can be distinguished from it by the absence of bracts below the flowers, and the presence of stellate hairs on the leaves.

CNHP Ranking: G3 S3



Photo copyright CNHP by P. Lyon

State/Federal Status: None. Currently on list of species considered for inclusion on Forest Service sensitive species list for Region 2, but for which more information is needed.



Colorado distribution

Description: A tap-rooted perennial to 40 cm in height with a rosette of stellate-pubescent, non-succulent, basal leaves. Basal leaves are 15 to 40 mm long, 1 to 4 mm wide, petiolate, and spatulate-oblongate or spatulate-obovate in shape. The one to three cauline leaves are entire, sessile, ovate to lanceolate, and 5 to 20 mm long. Style less than 1mm long. Yellow flowers appear in July and August. Fruit is ovate to elliptic-ovate.

Habitat Comments: Found in rocky outcrops, scree, fellfields, mine tailings, weathered rock, and loose soil in the alpine tundra from 10,800 to 13,500 feet (3,292 to

4,115 meters) elevation.

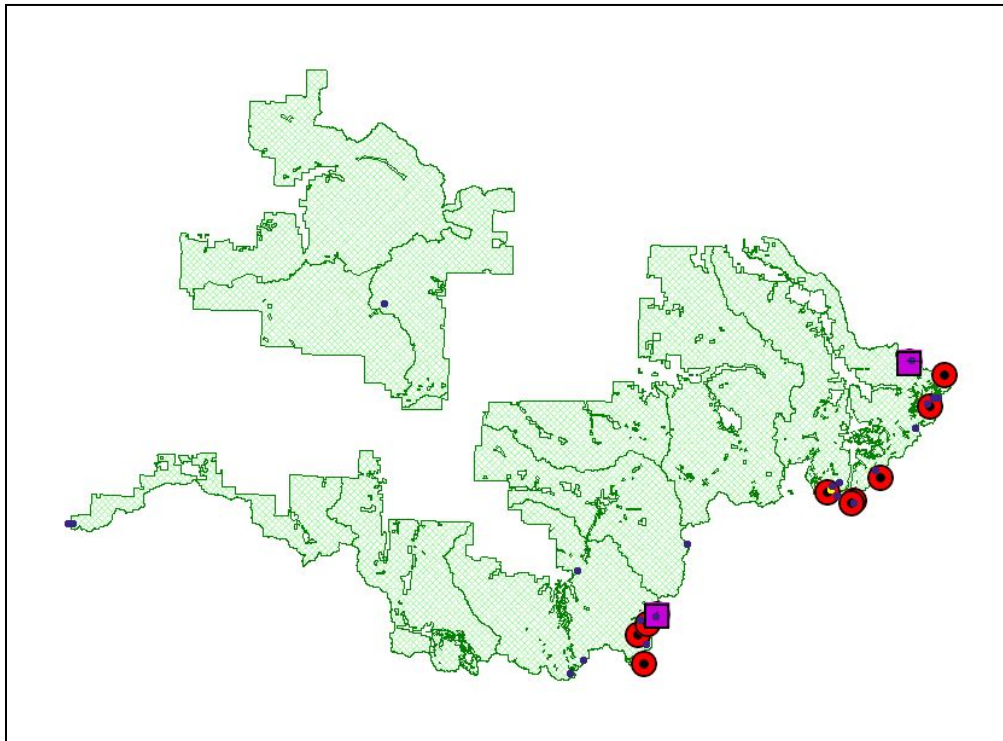
Global Range: Endemic to Colorado.

State Range: Found in Chaffee, Clear Creek, Conejos, Costilla, Dolores, Gunnison, Hinsdale, Huerfano, La Plata, Lake, Larimer, Mineral, Ouray, Park, Pitkin, Saguache, San Juan, San Miguel, and Summit Counties on the Arapaho, White River, San Juan, Rio Grande, Pike-San Isabel National Forests and the Thunder Basin National Grassland (NatureServe, 2006; USDA 2007a).

Distribution/Abundance: There are 42 known occurrences in Colorado. Several have over 1000 individuals, although a typical location usually has fewer than 200 (USDA, 2007a).

Known Threats and Management Issues: Most occurrences are in National Forests, with several in designated wilderness areas. This species is found at high elevations, often in fairly inaccessible locations, and therefore enjoys some natural protection. However, some plants are still vulnerable to direct disturbances such as trampling.

White River NF: There are eleven known occurrences in the White River NF, in the Aspen and Dillon Ranger Districts. In 2006, this species was documented for the first time on Twining Peak at Independence Pass and at Loveland Pass, and an existing record was updated at Blue Lakes.



Location of *Draba streptobrachia* in the White River NF. Squares indicate new occurrences found in 2006. One other occurrence was updated in 2006.

References:

Price, R.A. 1980. *Draba streptobrachia* (Brassicaceae), a new species from Colorado. *Brittonia* 32(2):160-169.

NatureServe. 2006. NatureServe Explorer: An online encyclopedia of life [web application]. Version 6.1. NatureServe, Arlington, Virginia. Available <http://www.natureserve.org/explorer>. (Accessed: January 17, 2007).

USDA-Forest Service R2. 2007a. Sensitive Species Evaluation Form – *Draba streptobrachia*. (<http://www.fs.fed.us/r2/projects/scp/evalrationale/evaluations/dicots/drabastreptobrachia.pdf>) Accessed on January 17, 2007.

USDA, NRCS. 2007b. The PLANTS Database (<http://plants.usda.gov>, 11 January 2007). National Plant Data Center, Baton Rouge, LA 70874-4490 USA.

Weber, W. 1987. Colorado Flora Western Slope. Colorado Associated University Press.

Draba weberi Price & Rollins (Weber's draba)

Taxonomy

Class: Magnoliopsida

Order: Capparales

Family: Brassicaceae

Taxonomic Comments: This species was first collected in 1969, misidentified as *D. grayana*, and in 1991 described as a new species.

CNHP Ranking: 1 S1

State/Federal Status: None. Currently on list of species considered for inclusion on Forest Service sensitive species list for Region 2, but for which more information is needed.



Photo by Steve Olson



Colorado Distribution

Description and Phenology: Caespitose, rosette-forming, perennial up to 10 cm tall. Basal leaves are narrowly oblanceolate with hair on the margin and with sparse simple and short-stalked forked hairs. One to three cauline leaves are narrowly oblong. Five to 15 flowers per stem are formed from June to July. Siliques are sessile, ascending, ovate, glabrous, are 4 to 8 mm long, and 2 to 3 mm wide. Petals are clawed, exceeding the sepals. Stem pubescence is not are not dense and tangled as in *D. grayana*.

Habitat Comments: The known location is just above treeline, between 11,500 and 11,600 feet elevation in crevices of rocks containing moist soils below the outlet of the upper Blue Lake Reservoir.

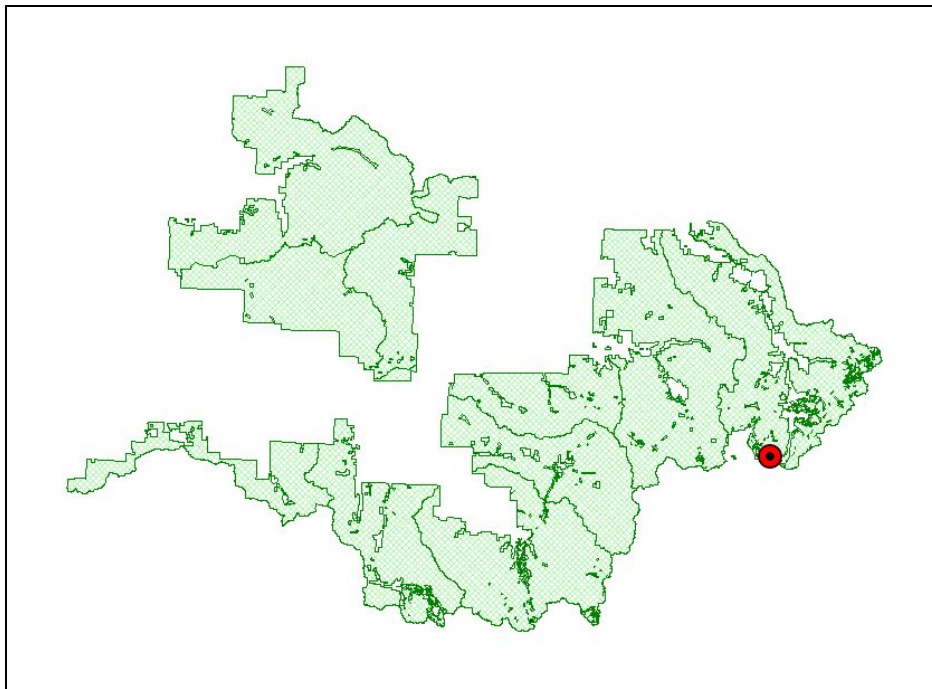
Global Range: An extremely narrow endemic of Colorado.

State Range: Known only from the Monte Cristo Creek drainage in Summit County on land administered by Colorado Springs Utilities for the City of Colorado Springs. The occurrence is surrounded by National Forest System land administered by the Dillon Ranger District of the White River National Forest.

Distribution/Abundance: Originally reported to contain approximately 100 individuals, recent surveys suggest the presence of only 31 individuals.

Known Threats and Management Issues: If the known population is unique, it is extremely vulnerable and a catastrophic event could extirpate the population. Additional threats include road and dam construction and maintenance, recreation, mining, spread of exotic species, and global climate change.

White River NF: In 2006, the single known occurrence of this species was updated at Blue Lakes in the Dillon Ranger District. *Draba weberi* is currently not found on the forest; however the known location, on land administered by the Colorado Springs Utilities, is surrounded by the White River National Forest. Additional populations may be present in the vicinity.



Location of *Draba weberi* at Blue Lakes, near the White River NF. The occurrence was updated in 2006.

References:

Decker, K. (2006, July 31). *Draba weberi* Price & Rollins (Weber's draba): a technical conservation assessment. [Online]. USDA Forest Service, Rocky Mountain Region. Available: <http://www.fs.fed.us/r2/projects/scp/assessments/drabaweberi.pdf> [Accessed 11/20/2006].

NatureServe. 2006. NatureServe Explorer: An online encyclopedia of life [web application]. Version 6.1. NatureServe, Arlington, Virginia. Available <http://www.natureserve.org/explorer>. (Accessed: January 17, 2007).

USDA, NRCS. 2007. The PLANTS Database (<http://plants.usda.gov>, 11 January 2007). National Plant Data Center, Baton Rouge, LA 70874-4490 USA.

***Eriophorum altaicum* Meinsh. var. *neogaeum* Raymond (Altai cottongrass)
and *E. chamissonis* (Russet cottongrass)**

Taxonomy

Class: Liliopsida
Order: Cyperales
Family: Cyperaceae

Taxonomic Comments: In the new Flora of North America treatment this species has been placed into synonymy with *E. chamissonis*, a rare species of the US and Canada (Ladyman, 2004). In the Flora of British Columbia, Klinkenberg (2006) includes this species as synonymous with *Eriophorum chamissonis* var. *chamissonis* a species of the Northwest Territories, Newfoundland, Yukon Territory; Alaska, Colorado, Minnesota, North Dakota, Oregon, and Wisconsin. However this species is not found in numerous representative floras.

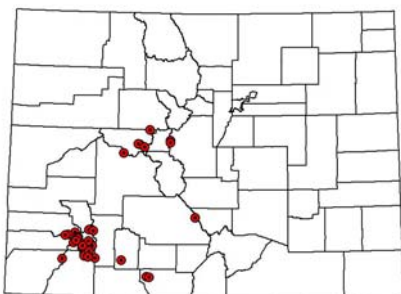


Photo copyright CNHP by P. Lyon

A more common, closely related plant, *E. angustifolia*, has multiple heads and leaf blades nearly as long as the stems.

CNHP Ranking: G4?T3T4 S3

State/Federal Status: 2002 Region 2 Forest Service sensitive species list; 2002 White River National Forest Plan species of viability concern.



Colorado distribution

Description: A rhizomatous, perennial, grass-like species with solitary heads having small hairs in the young flowers, which become a conspicuous silvery-white ball at maturity. The culms are solitary or with a few together and lack well-developed leaf blades. Basal sheaths are persistent and are brown to purple-brown in color. Flowering begins in late spring with seed production occurring from late July through August.

Habitat Comments: Grows in wet meadows, fens, around ponds, and in bogs at or above treeline.

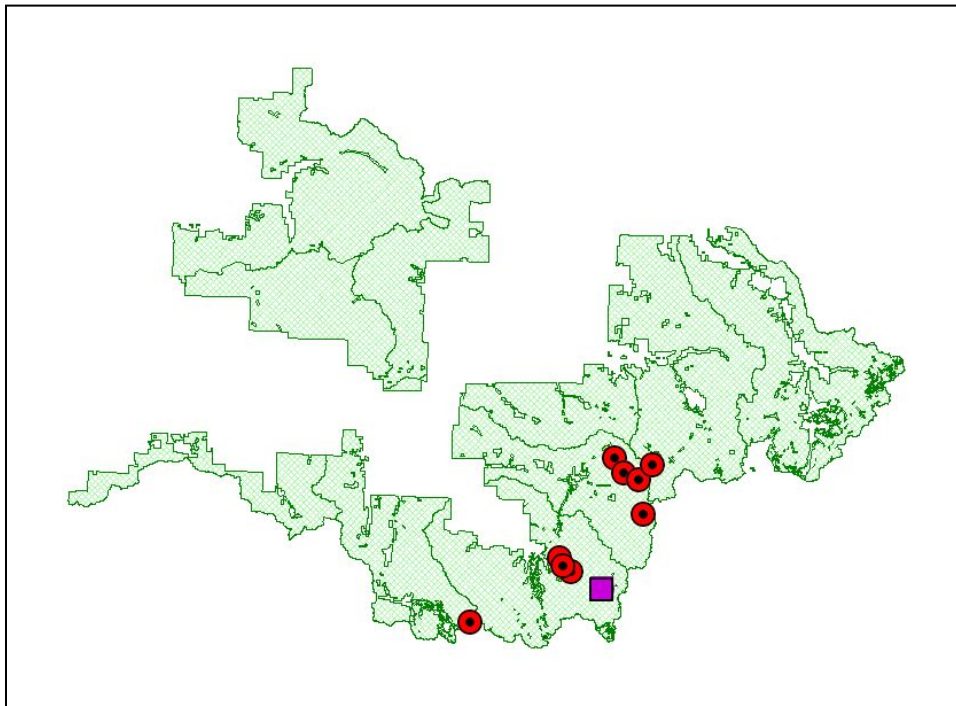
Global Range: British Columbia; Colorado, Montana, Utah, and Wyoming.

State Range: Known from Conejos, Dolores, Eagle, Gunnison, Hinsdale, La Plata, Mineral, Montezuma, Park, Pitkin, Saguache, San Juan, and San Miguel Counties.

Distribution/Abundance: There are 35 known occurrences of *Eriophorum altaicum* and seven of *E. chamissonis* in Colorado; several locations have over a thousand individuals.

Known Threats and Management Issues: Threats appear to be limited for this species; however, local trampling may affect easily accessed occurrences. The primary management issue is maintaining the natural hydrologic regime of the wetlands in which it occurs. The 2002 White River National Forest plan calls for monitoring the distribution, size, and number of individuals of *E. altaicum* every 5 years. The 2002 White River National Forest plan calls for the survey of this species prior to any activities that might impact it.

White River NF: There are five occurrences identified as each, *E. altaicum* and *E. chamissonis* in the White River NF, although they may all prove be the same species. They are located in the Aspen and Sopris Ranger Districts. In 2006, single-headed *Eriophorum* sp. were documented at the town of Independence and at Warren Lakes.



Location of *Eriophorum altaicum* ssp. *neogaena* and *E. chamissonis* in the White River NF. Because of the taxonomic questions associated with these two species, the occurrences of both are shown together. Square indicates new occurrence found in 2006. Another occurrence was updated in 2006.

References:

Ladyman, J.A.R. (2004, October 29). *Eriophorum altaicum* Meinshausen var. *neogaeum* Raymond (whitebristle cottongrass): a technical conservation assessment. [Online]. USDA Forest Service, Rocky Mountain Region. Available:

<http://www.fs.fed.us/r2/projects/scp/assessments/eriophorumaltaicumvarneogaeum.pdf> [Accessed January 3, 2007]

NatureServe. 2006. NatureServe Explorer: An online encyclopedia of life [web application]. Version 6.1. NatureServe, Arlington, Virginia. Available <http://www.natureserve.org/explorer>. (Accessed: January 17, 2007).

USDA, NRCS. 2007. The PLANTS Database (<http://plants.usda.gov>, 11 January 2007). National Plant Data Center, Baton Rouge, LA 70874-4490 USA.

Weber, W. 1987. Colorado Flora Western Slope. Colorado Associated University Press.

Eutrema penlandii Rollins (Penland's alpine fen mustard)

Taxonomy

Class: Magnoliopsida

Order: Capparales

Family: Brassicaceae

Taxonomic Comments: Synonymous with *Eutrema edwardsii* ssp. *penlandii*. This genus is not found in Harrington (1957).

Looks similar to a) *Noccaea Montana*, which has obcordate fruit and long styles (1-3 mm), b) *Draba borealis*, *D. cana*, *D. porsildii* and *D. lonchocarpa* which are pubescent.



Photograph copyright 1999 by B. Jennings

CNHP Ranking: G1G2 S1S2

State/Federal Status: Federally listed Threatened; Bureau of Land Management Sensitive Species; 2002 White River National Forest Plan species of viability concern.



Colorado Distribution

Description and Phenology: An herbaceous perennial with long-petioled, ovate, glabrous basal leaves. Flowers in late June to early July; glabrous fruit produced July to August.

Habitat Comments: Found in alpine tundra, peat fens with perennial water, stream banks, and wetlands. Previously believed to be restricted to calcareous substrates of limestone or dolomite, recent research has found that substrate is not a determining factor, but rather that the species depends on the presence of bryophytes and the availability of wet, low angle, low competition, high elevations sites (Kelso 1993). It should be looked for on all substrates. Found from 12,300 to 13,100 feet (3,749 to 3,993 meters) elevation.

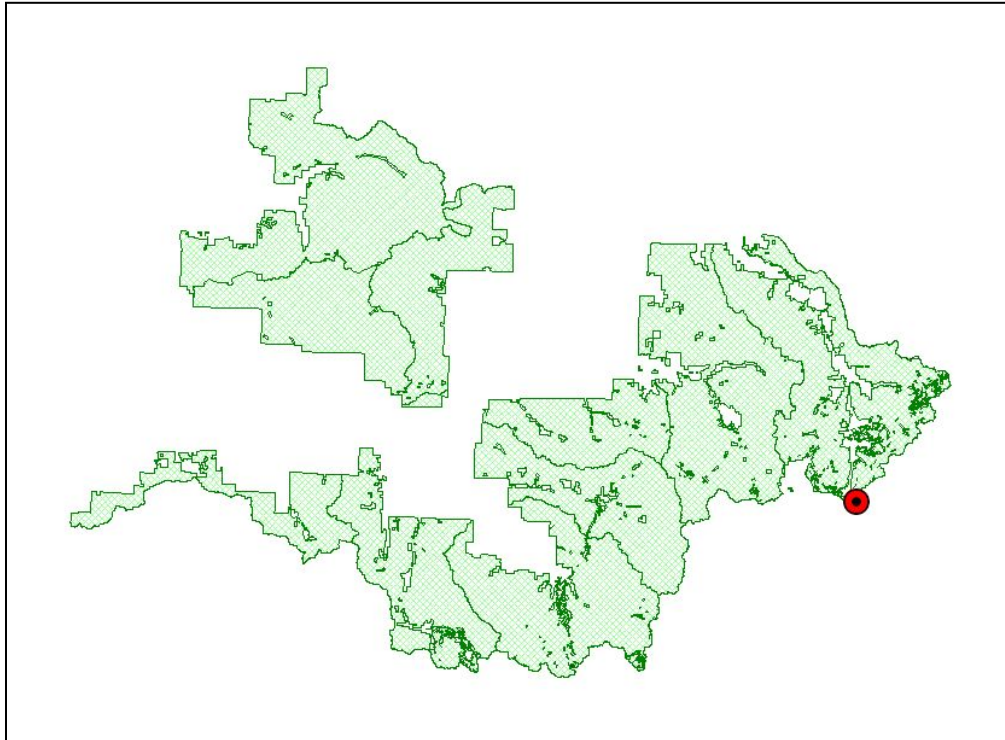
Global Range: The species is believed to be an ice age relict. It is endemic to the Mosquito Range in central Colorado (Spackman 1997).

State Range: Known from Lake, Park, and Summit Counties.

Distribution/Abundance: Known from eleven principal occurrences with 20 sub-occurrences, all in central Colorado along the Continental Divide. Estimates of the population size of the single occurrence in the White River NF range from over 2000 to only a few individuals.

Known Threats and Management Issues: Off-road vehicles, mining activities, ground water acidification or alteration, or ditch construction are the largest threats to this species.

White River NF: There is one occurrence in the White River NF, from Hoosier Ridge, in the Dillon Ranger District. This was updated by CNAP 2006.



Location of *Eutrema penlandii* in the White River NF. The single occurrence at Hoosier Ridge was updated in 2006.

References:

Harrington, H. 1957. Manual of the Plants of Colorado: For The Identification Of The Ferns And Flowering Plants Of The State. Sage Books. Denver.

Spackman, S., J. Coles, C. Dawson, M. Minton, A. Kratz, C. Spurrier, C. Johnson, and M. Barry. 1997. Colorado Rare Plant Field Guide. Available online at <http://www.cnhp.colostate.edu/reports.html>

Roy, G., S. Kelso, and *A. Tonnesen. 1993. Habitat characteristics of *Eutrema penlandii* (Brassicaceae) in the Colorado Rockies: a study of alpine endemism. *Madroño* 40: 236-245.


Kelso, S., *G. Roy, and *A. Tonnesen. 1993. Habitat requirements of *Eutrema penlandii* (Brassicaceae): a rare endemic of the Mosquito Range, central Colorado. Proc. Southwest Rare Plant Conference, Santa Fe, NM.

NatureServe. 2006. NatureServe Explorer: An online encyclopedia of life [web application]. Version 6.1. NatureServe, Arlington, Virginia. Available <http://www.natureserve.org/explorer>. (Accessed: January 17, 2007).

USDA, NRCS. 2007. The PLANTS Database (<http://plants.usda.gov>, 11 January 2007). National Plant Data Center, Baton Rouge, LA 70874-4490 USA.


Weber, W. 1987. Colorado Flora Western Slope. Colorado Associated University Press.

Ipomopsis globularis (Brand) W.A. Weber (Globe *gilia*)

<p>Taxonomy Class: Magnoliopsida Order: Solanales Family: Polemoniaceae</p> <p>Taxonomic Comments: Several authors (Wilken and Hartman,1991; Porter and Johnson, 2000; Porter <i>et. al.</i>, 2003, and the new treatment to be developed for the Flora of North America Project) recognize this species as <i>Ipomopsis spicata</i> ssp. <i>capitata</i>. However, Weber and Wittmann, 2001; Kartesz, 1999, and NatureServe, 2003 recognize it as <i>I. globularis</i>. These names are considered synonymous. Also previously known as both <i>Gilia spicata</i> ssp. <i>capitata</i> and <i>G. globularis</i>.</p>	 <p>Photograph copyright CNHP by Susan Spackman</p>
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CNHP Ranking: G2 S2

State/Federal Status: 2002 Region 2 Forest Service sensitive species list.

 <p>Colorado Distribution</p>	<p>Description and Phenology: Perennial herb up to 15 cm tall with long narrow basal leaves, densely woolly stems with a few pinnately-dissected leaves. The inflorescence is over 1 cm across, capitate or ball-shaped, with long, silky calyx hairs. Pale purple, heavily scented, flowers occur from July through early August; fruits by late August.</p> <p>Habitat Comments: Dry gravelly soils underlain with heavily mineralized Leadville limestone or Manitou dolomite at 10,500 to 13,800 feet (3,200 to 4,206 m). In talus and scree slopes and in flat alpine tundra; found on all aspects and in both disturbed or barren land, and in climax vegetation.</p>
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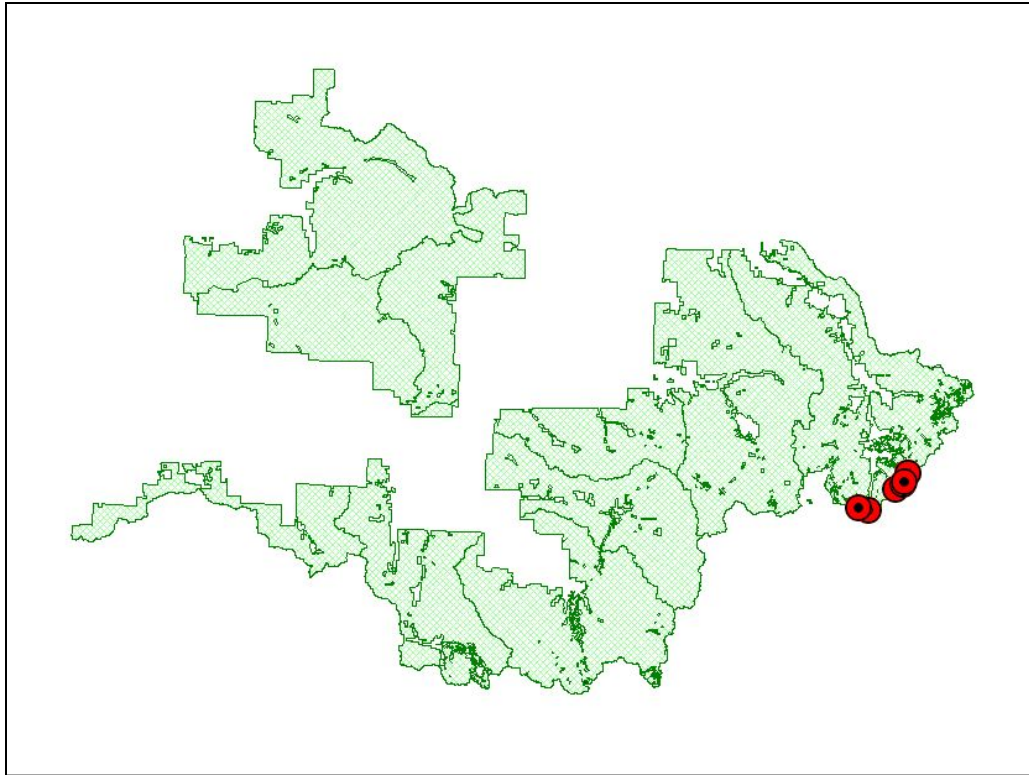
Global Range: A narrow endemic of Colorado

State Range: Limited to an approximately 20 by 30 mile (32 by 48 km) area in the Mosquito Range and adjacent Hoosier Ridge of Lake, Park, and Summit Counties. Land is administered by the Pike-San Isabel and Arapaho-White River National Forests, as well as by private landowners.

Distribution/Abundance: There are 13 populations containing between 6,000 and 11,000 plants; known from a 20 by 30 mile (32 by 48 km) area in the Mosquito Range and adjacent Hoosier Ridge of Colorado in Lake, Park, and Summit counties. One portion of one occurrence is currently protected within the Hoosier Ridge Research Natural Area in the Pike San Isabel National Forest.

Known Threats and Management Issues: In order of decreasing priority, threats are motorized recreation, mining activities, exotic species invasion, effects of small population size, collection for horticultural trade, non-motorized recreation, global climate change, and pollution (Panjabi and Anderson, 2005). Grazing from native ungulates may also have a negative effect.

White River NF: There are seven known occurrences in the Dillon Ranger District of the White River NF. In 2006, records for this species were updated and new sub-populations documented at Boreas Pass and Hoosier Pass.



Location of *Ipomopsis globularis* in the White River NF.
Occurrences at Hoosier Ridge and Boreas Pass were updated in 2006.

References:

Harrington, H. 1957. Manual of the Plants of Colorado: For The Identification Of The Ferns And Flowering Plants Of The State. Sage Books. Denver.

Kartesz, J.T. 1999. A synonymized checklist and atlas with biological attributes for the vascular flora of the United States, Canada, and Greenland. First Edition. *In*: J.T. Kartesz and C.A. Meacham. Synthesis of the North American Flora [computer program]. Version 1.0. North Carolina Botanical Garden, Chapel Hill, NC.

NatureServe. 2006. NatureServe Explorer: An online encyclopedia of life [web application]. Version 6.1. NatureServe, Arlington, Virginia. Available <http://www.natureserve.org/explorer>. (Accessed: January 17, 2007).

Panjabi, S.S. and D.G. Anderson (2005, March 15). *Ipomopsis globularis* (Brand) W.A. Weber (Hoosier Pass ipomopsis): a technical conservation assessment. [Online]. USDA Forest Service, Rocky Mountain Region. Available: <http://www.fs.fed.us/r2/projects/scp/assessments/ipomopsisglobularis.pdf> [Accessed 11/20/2006].

Porter, J.M. and L.A. Johnson. 2000. A phylogenetic classification of Polemoniaceae. *Aliso* 19:55-91.

Porter, J.M., L.A. Johnson, and D. Wilken. 2003. Phylogenetics and systematics of *Ipomopsis* (Polemoniaceae) I: Phylogenetic estimates using chloroplast and nuclear DNA sequences. Manuscript to be published in *Aliso*. 62 pp.

USDA, NRCS. 2007. The PLANTS Database (<http://plants.usda.gov>, 11 January 2007). National Plant Data Center, Baton Rouge, LA 70874-4490 USA.

Weber, W.A. and R.C. Wittmann. 2001. Colorado Flora: Eastern Slope. University Press of Colorado, Niwot, CO.

Weber, W. 1987. Colorado Flora Western Slope. Colorado Associated University Press.

Wilken, D. and R.L. Hartman. 1991. A revision of the *Ipomopsis spicata* complex (Polemoniaceae). *Systematic Botany* 16(1):143-161.

Listera borealis Morong (northern twayblade)

Taxonomy

Class: Liliopsida

Order: Orchidales

Family: Orchidaceae

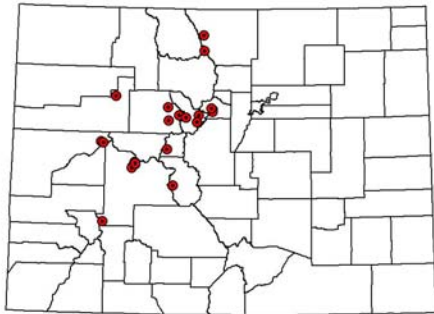
Taxonomic Comments: Synonymous with *Neottia borealis* (Morong) Szlach and *Ophrys borealis* (Morong) Rydberg. Looks similar to *L. cordata* ssp. *nephrophylla* but this species has a lip that is cleft more than half its length into two lobes.

CNHP Ranking: G4 S2

State/Federal Status: Bureau of Land Management Sensitive Species; Currently on list of species considered for inclusion on Forest Service sensitive species list for Region 2, but for which more information is needed.



Photo by Scott Smith



Colorado Distribution

Description and Phenology: Herbaceous perennial from 4 to 26 cm tall with succulent green stems and two dark green, opposite, elliptic to lanceolate leaves. The leaves are obtuse to rounded at the tip and are up to 6 cm long and 3 cm wide. Inflorescence is a loose, few-flowered raceme. Pale green flowers have darker veins and strongly reflexed petals and sepals (Flora of North America, 2007). Flower lip is rectangular or oblong and shallowly two-cleft. Flowering occurs from late June through July (August).

Habitat Comments: Found in rich humus of coniferous or mixed hardwood forests, swamps, and along cold streams. Most commonly found in soils with high acidity from 4,921 to 9,843 feet (1,500 to 3,000 meters) elevation.

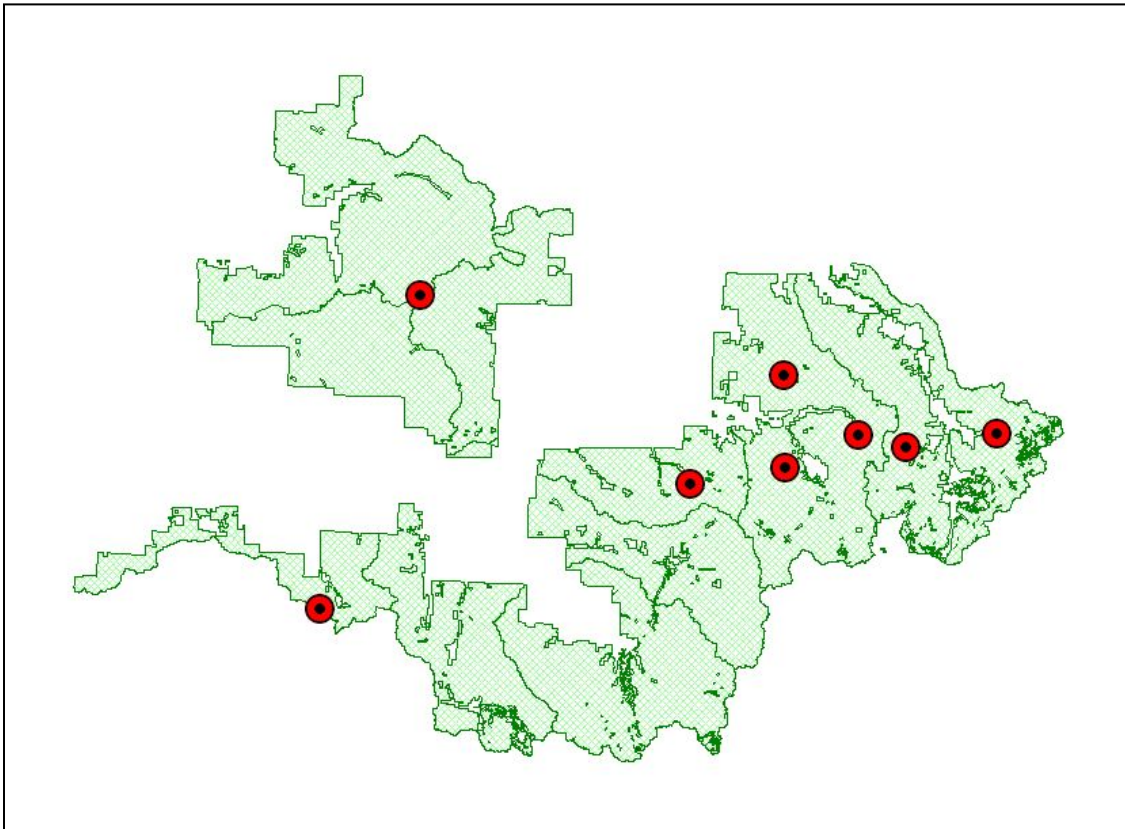
Global Range: Alberta, British Columbia, Labrador, Manitoba, Newfoundland, North West Territories, Nunavut, Ontario, Quebec, Saskatchewan, Yukon Territory; Alaska, Colorado, Idaho, Montana, Oregon, Utah, Washington, and Wyoming.

State Range: Known from Chaffee, Clear Creek, Eagle, Garfield, Grand, Gunnison, Lake, Larimer, Mesa, and Summit Counties. Weber (1987) reports this species known from the Gunnison Basin.

Distribution/Abundance: There are 21 known occurrences in Colorado. Eight of these are on the White River NF. The number of individuals in the sites surveyed in 2006 ranged from one to 94, with a total of 262 in nine sites.

Known Threats and Management Issues: Recreation, trail building, roads and logging are potential threats.

White River NF: There are eight known locations within the White River National Forest in the Eagle, Holy Cross, and Dillon Ranger Districts, including on private property surrounded by national forest. In a survey of five of the seven known populations, 262 individuals were located (Doerr, 2006). Found in the areas of Vassar Meadows, Yeoman Park, Fremon Creek, Upper Fremon Creek, Keystone, Jones Gulch, North Ten Mile, and Timber Creek.



Location of *Listera borealis* in the White River NF. Five occurrences were updated in 2006 (See Appendix VI).

References:

Doerr, J. 2006 Surveys for *Listera borealis* (Northern Twayblade) on the East Side of the White River National Forest. December 11, 2006 Report to White River NF. See Appendix VI for full report.

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http://www.efloras.org/florataxon.aspx?flora_id=1&taxon_id=242101750 [Accessed 01/09/2007]

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Hultén, E. 1968. Flora of Alaska and Neighboring Territories: A Manual of the Vascular Plants. Stanford University Press, CA.

Klinkenberg, Brian. (Editor) 2006. E-Flora BC: Electronic Atlas of the Plants of British Columbia [www.eflora.bc.ca]. Lab for Advanced Spatial Analysis, Department of Geography, University of British Columbia, Vancouver. [Accessed: 1/16/2007 3:09:51 PM]

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USDA, NRCS. 2007. The PLANTS Database (<http://plants.usda.gov>, 11 January 2007). National Plant Data Center, Baton Rouge, LA 70874-4490 USA.

Weber, W. 1987. Colorado Flora Western Slope. Colorado Associated University Press.

***Machaeranthera coloradoensis* (Gray) Osterhout (Colorado tansyaster)**

Taxonomy

Class: Magnoliopsida

Order: Asterales

Family: Asteraceae

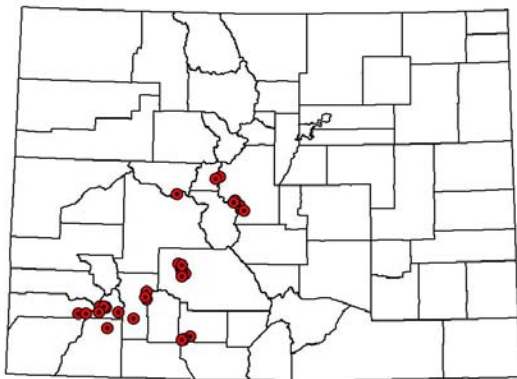
Taxonomic Comments: Synonymy includes *Aster coloradoensis*, *Xylorrhiza coloradoensis*, *X. brandegei*, and *Haplopappus coloradoensis*. Two varieties, *brandegei* and *coloradoensis*, are no longer considered distinct by many experts (Beatty *et. al.* 2004), although they are still recognized by the USDA Plants Database (USDA, 2007) among others. Reclassification of the genus to *Xanthisma* has been proposed (Morgan and Hartman, 2004). It is similar in appearance to *M. tanacetifolia* whose leaves are twice pinnately lobed, unlike *M. coloradoensis* which has toothed leaves.



Photograph copyright CNHP by P. Lyon

CNHP Ranking: G2 S2

State/Federal Status: 2002 Region 2 Forest Service sensitive species list.



Colorado distribution

Description and Phenology: Herbaceous, perennial to 10 cm in height, with a large taproot, woody caudices, and short stems. Leaves are shallowly to coarsely toothed. The large head of rose-colored ray flowers appears in early July through mid-August; seed set occurs from August through September.

Habitat Comments: Found in gravelly places or rock outcrops, often on sandstone or limestone, from ponderosa pine communities to alpine tundra in both moist and dry sites (Beatty *et. al.* 2004). It is reported from elevations between 7,675 and 12,940 feet (2,339 and 3,944 meters).

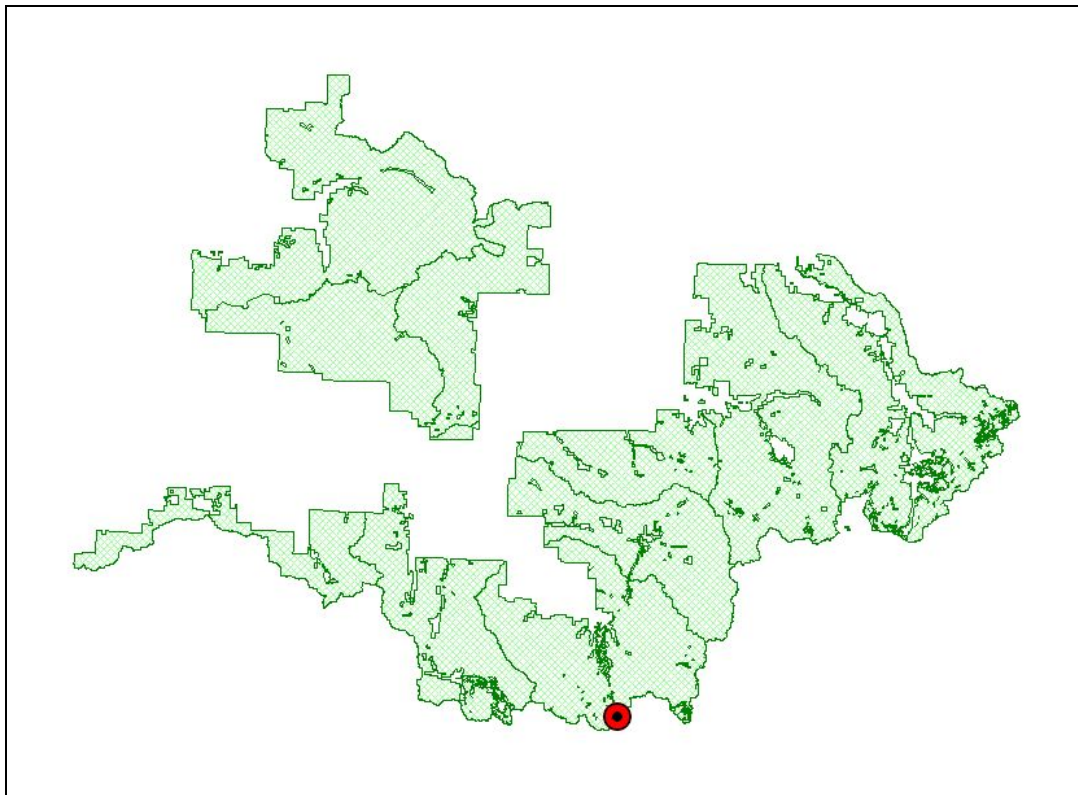
Global Range: Restricted to the Rocky Mountains in south-central Wyoming and western Colorado.

State Range: In Colorado it is known from Dolores, Gunnison, Hinsdale, Lake, La Plata, Park, Pitkin, Rio Grande, Saguache, and San Juan counties.

Distribution/Abundance: There are 25 known occurrences in Colorado, several with over 1000 individuals. There are 18 specimens at the University of Colorado Herbarium.

Known Threats and Management Issues: No immediate threats are known. Potential threats include trampling and herbivory by domestic sheep or direct disturbance by recreationists. Invasion of non-native species could threaten some habitats. The population at Taylor Pass on the White River NF receives only intermittent activity from hikers and is not accessible to motorized vehicles. The 2002 White River National Forest plan calls for monitoring this species every 5 years and for the survey of this species prior to any activities that might impact it.

White River NF: There is one known occurrence in the White River NF, in the Aspen Ranger District near Taylor Pass. In 2006, this record was updated, and estimated to have over 300 individuals.



Location of *Machaeranthera coloradoensis* in the White River NF. The single occurrence was updated in 2006.

References:

Beatty, B.L., W.F. Jennings, and R.C. Rawlinson (2004, January 30). *Machaeranthera coloradoensis* (Gray) Osterhout (Colorado tansyaster): a technical conservation assessment. [Online]. USDA Forest Service, Rocky Mountain Region. Available: <http://www.fs.fed.us/r2/projects/scp/assessments/machaerantheracoloradoensis.pdf> [Accessed 01/09/2007].

Harrington, H. 1957. Manual of the Plants of Colorado: For The Identification Of The Ferns And Flowering Plants Of The State. Sage Books. Denver.

Morgan, D.R. and R.L. Hartman. 2004. A synopsis of *Machaeranthera* (Asteraceae, Asterae), with recognition of segregate genera. *Sida* 20(4):1387-1416.

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USDA, NRCS. 2007. The PLANTS Database (<http://plants.usda.gov>, 11 January 2007). National Plant Data Center, Baton Rouge, LA 70874-4490 USA.

Weber, W. 1987. Colorado Flora Western Slope. Colorado Associated University Press.

***Parnassia kotzebuei* Cham. ex Spreng. (Kotzebue's grass of Parnassus)**

Taxonomy

Class: Magnoliopsida

Order: Rosales

Family: Saxifragaceae (Parnassiaceae)

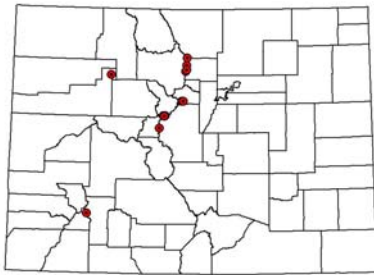
Taxonomic Comments: No known synonymy. This species does not appear in Harrington (1957). Similar in appearance to *P. fimbriata* and *P. parviflora* which have larger petals with 5-13 veins, and a bract-like leaf on the stem.

CNHP Ranking: G5 S2

State/Federal Status: 2002 Region 2 Forest Service sensitive species list; 2002 White River National Forest Plan species of viability concern.



Photo Copyright 1999 by R. Powell



Colorado Distribution

Description and Phenology: Caespitose herbaceous perennial to 20 cm tall, from a short rootstock and fibrous root. Usually with a single, naked stem that is either bractless or with a near-basal bract. Basal leaves are up to 2.5 cm wide, glabrous, ovate, elliptic, or deltoid-ovate, and abruptly tapered at the base with petioles up to 10 cm long. The inflorescence is of single terminal 5-petaled white flowers with 1 to 3 veins. Flowers appear from June to July. Numerous seeds are set from July to August in egg-shaped capsules up to 1 cm long (Klinkenberg, 2006).

Habitat Comments: Found in wet to moist meadows, streambanks, and mossy ledges from the sub-alpine to the alpine from 10,000 to 12,000 feet (3,048 to 3,658 meters) elevation (USDA, 2007a). The occurrence of this species is indicative of damp depressions such as lake shores and snow patch areas (Aiken *et. al.* 1999 onwards).

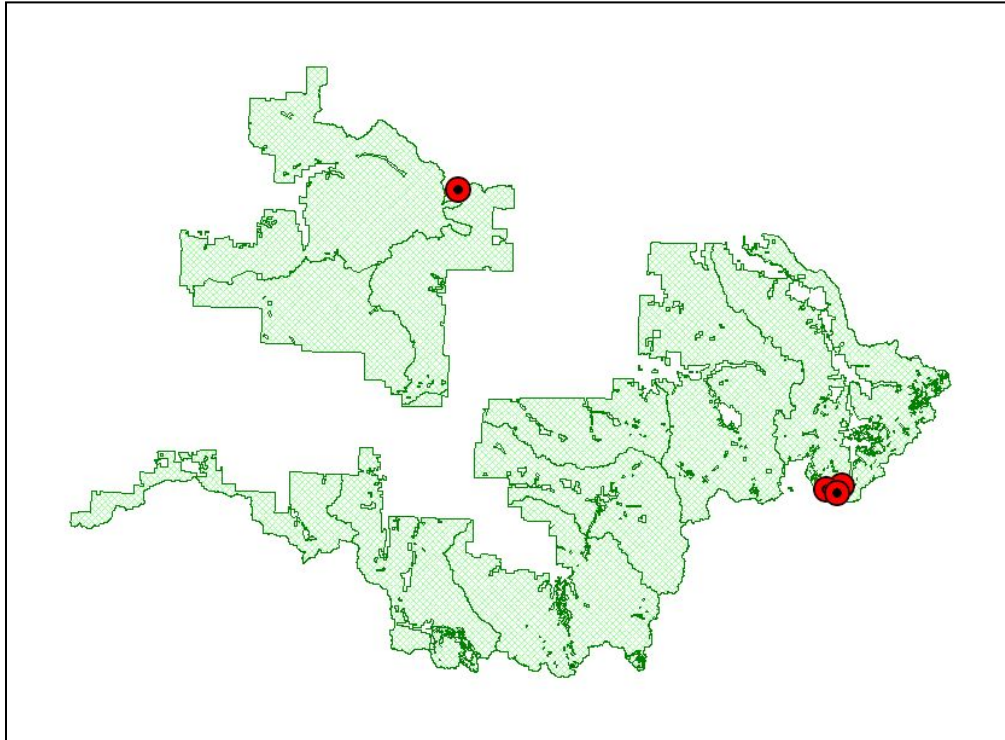
Global Range: Northeast Asia; Siberia; Greenland; British Columbia, Labrador, Northwest Territories, Yukon Territory; Alaska, Colorado, Idaho, Montana, Nevada, Washington, and Wyoming.

State Range: Known from Clear Creek, Garfield, Grand, Larimer, Park, San Juan, and Summit Counties on the Arapaho-Roosevelt, Grand Mesa, Gunnison, Pike-San Isabel, San Juan, and Uncompahgre National Forests.

Distribution/Abundance: There are 12 Colorado occurrences in the CNHP database. Four of these are in the White River NF.

Known Threats and Management Issues: Threats to this species include mining activity and over-collection (WNHP, 2003). The 2002 White River National Forest plan calls for monitoring the distribution, size, and number of individuals of this species every 5 years, and for the survey of this species prior to any activities that might impact it.

White River NF: There are four occurrences in the White River NF, in the Blanco and Dillon Ranger Districts. In 2006, this species was documented at Crystal and Blue Lakes.



Location of *Parnassia kotzebui* in the White River NF. Two occurrences were updated in 2006.

References:

Aiken, S.G., M.J. Dallwitz, L.L. Consaul, C.L. McJannet, L.J. Gillespie, R.L. Boles, G.W. Argus, J.M. Gillett, P.J. Scott, R. Elven, M.C. LeBlanc, A.K. Brysting and H. Solstad. 1999 onwards. Flora of the Canadian Arctic Archipelago: Descriptions, Illustrations, Identification, and Information Retrieval. Version: 29th April 2003. <http://www.mun.ca/biology/delta/arctic/> [Accessed 12/05/2006].

Harrington, H. 1957. Manual of the Plants of Colorado: For The Identification Of The Ferns And Flowering Plants Of The State. Sage Books. Denver.

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Klinkenberg, Brian. (Editor) 2006. E-Flora BC: Electronic Atlas of the Plants of British Columbia [www.eflora.bc.ca]. Lab for Advanced Spatial Analysis, Department of Geography, University of British Columbia, Vancouver. [Accessed: 1/9/2007]

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USDA-Forest Service R2. 2007a. Sensitive Species Evaluation Form - *Parnassia kotzebuei* (<http://www.fs.fed.us/r2/projects/scp/evalrationale/evaluations/dicots/parnassiakotzebuei.pdf>) [Accessed 01/09/ 2007].

USDA, NRCS. 2007b. The PLANTS Database (<http://plants.usda.gov>, 11 January 2007). National Plant Data Center, Baton Rouge, LA 70874-4490 USA.

Washington Natural Heritage Program Field Guide to Selected Rare Plants, 2003. Produced as part of a cooperative project between the Washington Department of Natural Resources, Washington Natural Heritage Program, and the U.S.D.I. Bureau of Land Management.

Weber, W. 1987. Colorado Flora Western Slope. Colorado Associated University Press.

Physaria alpina Rollins (Avery Peak twinpod)

Taxonomy

Class: Magnoliopsida

Order: Capparales

Family: Brassicaceae

Taxonomic Comments: No known synonymy. This species does not appear in Harrington (1957).

Most closely related to *P. rollinsii*, a species from sagebrush habitats; they are distinguished by the shape of the fruit valve.

CNHP Ranking: G2 S2

State/Federal Status: None. Currently on list of species considered for inclusion on Forest Service sensitive species list for Region 2, but for which more information is needed.



Photo by Mary Ellen Harte

www.forestryimages.org



Colorado Distribution

Description and Phenology: Herbaceous tap-rooted perennial up to 8 cm in height forming a crown of silvery leaves at the apex of the caudex. Leaf bases persistent; the leaves broadly ovate to deltoid narrowing to a slender petiole. Flowering stems with up to 5 oblanceolate to spatulate shaped leaves arise from below the basal leaves. Up to 3 flowers per stem arise in June and July; petals are large (up to 12 mm long), yellow, and erect. Pubescent siliques appear in August and are purplish when mature.

Habitat Comments: Known from rocky tundra at over 11,000 feet (3,353 meters) elevation.

Global Range: Endemic to west-central Colorado.

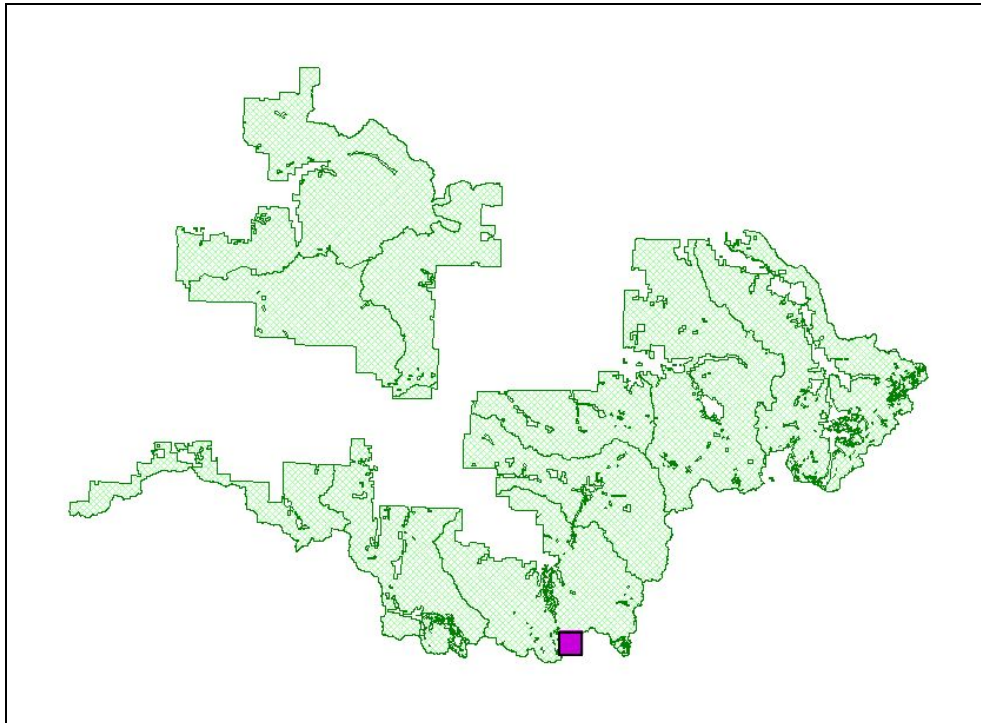
State Range: Known from Lake (Weston Pass), Gunnison (Avery Peak, Cumberland Pass, and the Virginia Basin area), Pitkin, and Park (Weston Pass) Counties; estimated range is 70 square kilometers (Neuhaus and Handwerk, 2006; Rollins, 1981). Also known from Gunnison Basin and the Mosquito Range (Weber, 1987).

Distribution/Abundance: There are 7 principal occurrences documented in the Colorado Natural Heritage Program database, including a new one from 2006. Two of the occurrences have not been observed in over 20 years. Total estimated sum of individuals from 3 of the 6

occurrences is 4000. The remaining occurrences do not report the number of individuals (Neuhaus and Handwerk, 2006).

Known Threats and Management Issues: Threats include off-road vehicle use, recreational hiking, and potential resumption of mining in the vicinity of the species habitat (Neuhaus and Handwerk, 2006).

White River NF: In 2006, this species was found near Taylor Pass in the Aspen Ranger District. There was a previous record based on a specimen collected at this site in 1980 that was identified as *P. rollinsii*, which does not grow in alpine habitats. A check at the CU herbarium confirmed that it was *P. alpina*.



Location of *Physaria alpina* in the White River NF. This is the only known occurrence in the forest.

References:

Harrington, H. 1957. Manual of the Plants of Colorado: For The Identification Of The Ferns And Flowering Plants Of The State. Sage Books. Denver.

NatureServe. 2006. NatureServe Explorer: An online encyclopedia of life [web application]. Version 6.1. NatureServe, Arlington, Virginia. Available <http://www.natureserve.org/explorer>. (Accessed: January 17, 2007).

Neuhaus, K. and J. Handwerk. 2006. Revision. Element Global Rank Report *Physaria alpina*.

Rollins, R.C, 1981. Studies in the genus *Physaria* (Cruciferae). *Brittonia* 33(3):332-341

USDA-Forest Service R2. 2007a. Sensitive Species Evaluation Form – *Physaria alpina*. (<http://www.fs.fed.us/r2/projects/scp/evalrationale/evaluations/dicots/physariaalpinaone.pdf>) [Accessed 01/17/ 2007].

USDA, NRCS. 2007b. The PLANTS Database (<http://plants.usda.gov>, 11 January 2007). National Plant Data Center, Baton Rouge, LA 70874-4490 USA.

Weber, W. 1987. *Colorado Flora Western Slope*. Colorado Associated University Press.



Physaria alpina at Taylor Pass, 2006.
Photo by Janis Huggins

***Ptilagrostis porteri* (Rydb.) W.A. Weber (Porter's feathergrass)**

Taxonomy

Class: Liliopsida

Order: Cyperales

Family: Poaceae

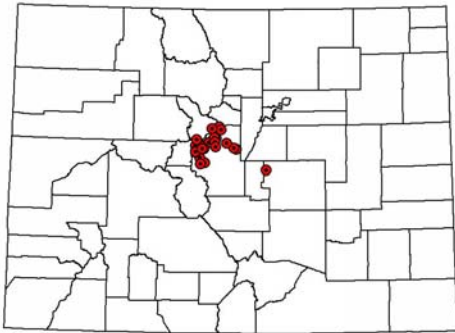
Taxonomic Comments: Synonymy includes *Ptilagrostis mongholica* ssp. *porteri*, *P. mongholica* ssp. *minutiflora*, and *Stipa porteri*; *Ptilagrostis mongholica* is otherwise an Asiatic species (Barkworth, 1983, 2007).

CNHP Ranking: G2 S2

State/Federal Status: 2002 Region 2 Forest Service sensitive species list; 2002 White River National Forest Plan species of viability concern; Bureau of Land Management Sensitive Species. Petition for Federal listing denied in 2005.



Photo by CNHP



Colorado Distribution

Description and Phenology: Perennial graminoid from 25 to 40 cm in height. Characterized by geniculately awned lemma with plumose hair less than 2mm long. The lemma is less than 7 mm long, while the awn can be twice that length. Leaves are involute, scabrous, and up to 12 cm in length. Florets up to 4mm in length on open panicles to 12 cm long; spikelets one-flowered. Callus is short with no tuft of hairs at base of floret. Flowers in late August and September, fruit matures from September to October.

Habitat Comments: Found in alpine and subalpine forests, bogs, fens, and willow carrs at elevations between 9,200 and 12,000 feet (2,776 to 3,701 meters).

Global Range: Endemic to central Colorado.

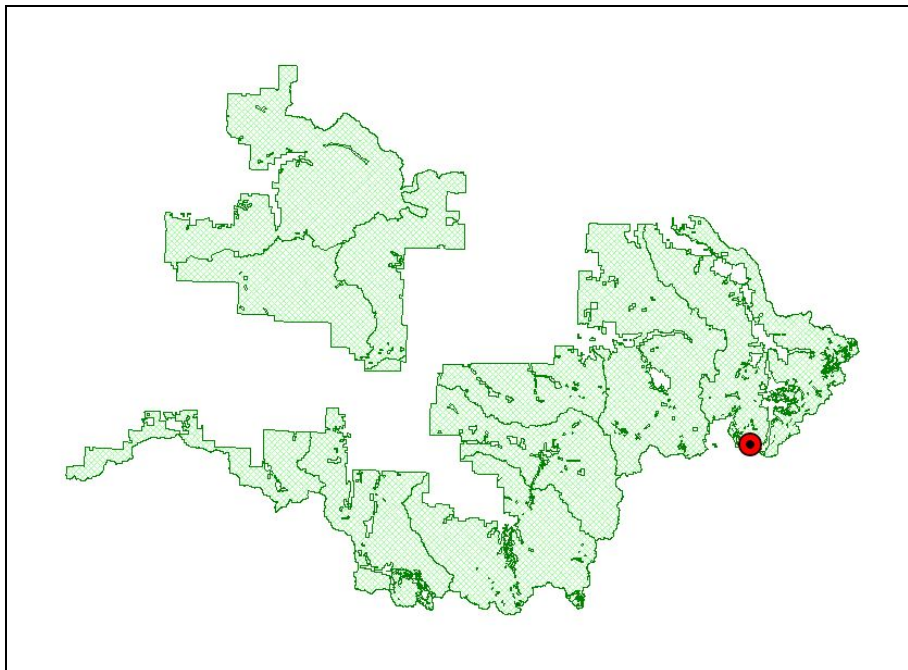
State Range: Known from El Paso, Lake, Park, and Summit Counties; in the vicinity of Monte Cristo – Blue Lakes. Weber (1987) reports known only from Hoosier Pass. Weber (1976) reports known from Guanella Pass.

Distribution/Abundance: Twenty-seven occurrences have been documented in Colorado for this species, but many of these have likely been extirpated.

Known Threats and Management Issues: Peat mining, wetland ditching, and other hydrological alterations to its habitat pose the greatest threat to this species. Recreational hiking could also impact this species.

The 2002 White River National Forest plan calls for the survey of this species prior to any activities that might impact it.

White River NF: The single known White River National Forest occurrence at Blue Lakes in the Dillon Ranger District was updated in 2006, and a larger sub-population was found above the previously documented site. At this new site, we counted 164 bunches with 846 flowering culms, and estimate the total to be more than 200 bunches with more than 1000 stems. This enabled a change in the Element Occurrence rank from C (Fair) to B (good). Another occurrence of this species is mapped near Webster Pass in the Teller Mountain PCA, just on the eastern side of the Continental Divide in the Pike National Forest, Park County, and should be watched for in the adjacent White River NF.



Location of *Ptilagrostis porteri* in the White River NF.

References:

Barkworth, M. 1983. *Ptilagrostis* in North America and its relationship to other Stipeae (Gramineae). *Systematic Botany* 8(4):395-419.

Barkworth, M. 2007. Manual of the Grasses for North America – *Ptilagrostis* Treatment – Flora of North America North of Mexico volumes 24 and 25. On-line SeDR. Intermountain Herbarium, Utah State University. [Accessed 1/10/07]

http://herbarium.usu.edu/webmanual/info2.asp?name=Ptilagrostis_porteri&type=treatment

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USDA, NRCS. 2007. The PLANTS Database (<http://plants.usda.gov>, 11 January 2007). National Plant Data Center, Baton Rouge, LA 70874-4490 USA.

Weber, W. 1987. Colorado Flora Western Slope. Colorado Associated University Press.

Ranunculus gelidus Karelin & Kirilov. (Arctic buttercup)

Taxonomy

Class: Magnoliopsida

Order: Ranunculales

Family: Ranunculaceae

Taxonomic Comments: The USDA Plants Database recognizes *R. karelinii* as the more current name for *R. gelidus*. Synonymous with *R. gelidus*, ssp. *grayi*, and the variety *shumaginensis*; also with *R. grayi* and *R. verecundus*. There is disagreement whether *R. grayi* is synonymous (Weber, 1987).

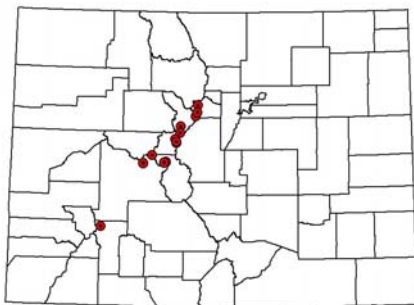
Superficially similar to *Ranunculus pygmaeus* which has significantly smaller flowers (petals 1-3.5 mm long and 1-2.8 mm wide) and petals the same length as sepals. Also similar to *R. pedatifidus* which is a larger plant and has stem leaves with linear divisions.



Photo copyright 1999 by S. Spackman

CNHP Ranking: G4G5 S2

State/Federal Status: 2002 Region 2 Forest Service sensitive species list; 2002 White River National Forest Plan species of viability concern.



Colorado Distribution

Description and Phenology: Fibrous rooted herbaceous perennial growing to 9 cm in height and forming a cluster. The basal leaves are cordate or reniform, petioled, and 3-parted; the segments again cleft and lobed. Sepals grayish=[pubescent on back, purple-tinged, and half the length of the petals; flowering stems almost scapose and often bent at a right angle just above the soil surface. One to three yellow flowers form in July; stout-beaked achenes in an ovoid-cylindric cluster are formed in August.

Habitat Comments: Found among rocks, in scree and on talus slopes; also noted from alpine meadows and in tundra sedge communities from 12,000 to 14,100 feet (3,658 to 4,298 meters) elevation.

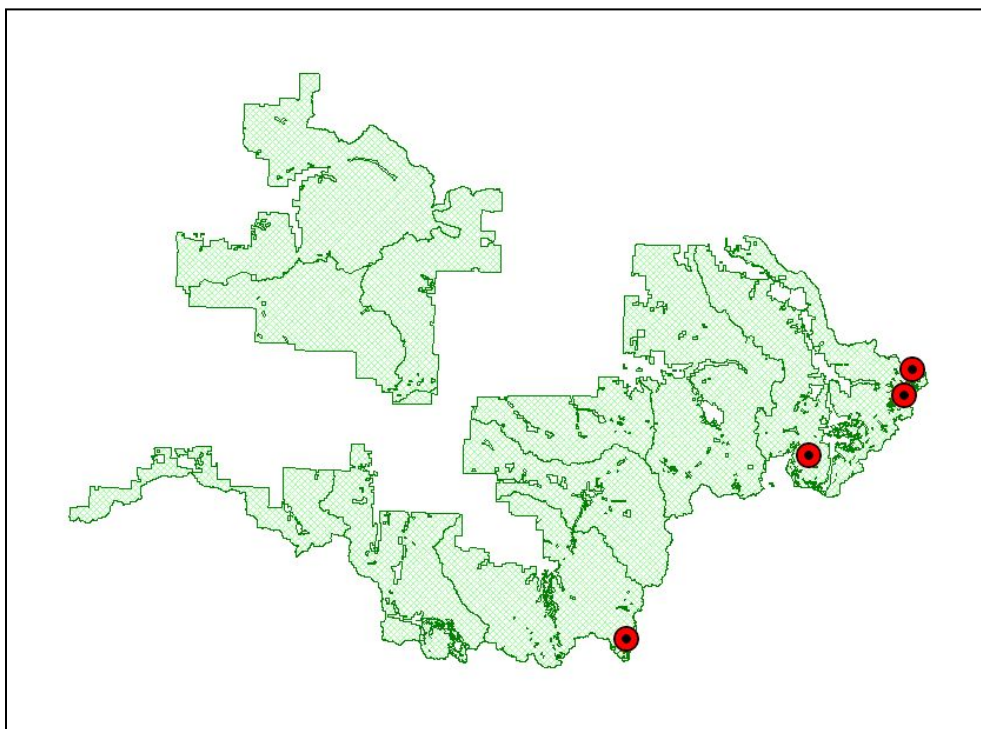
Global Range: Eastern Siberia; Asia; Alberta, British Columbia, Northwest Territories, Yukon Territory; Alaska, Colorado, Idaho, Montana, Oregon, Utah, Washington, and Wyoming.

State Range: Known from Boulder, Chaffee, Clear Creek, Gunnison, Hinsdale, Lake, Park and Summit Counties.

Distribution/Abundance: There are thirteen known locations of this species in Colorado. Four of these are on the White River NF. All populations appear to be small, with a few to 50 individuals.

Known Threats and Management Issues: Threats to this species include disturbance from mining activity and road expansion. The 2002 White River National Forest plan calls for monitoring the distribution, size, and number of individuals of this species every 5 years. The 2002 White River National Forest plan calls for the survey of this species prior to any activities that might impact it.

White River NF: There are four occurrences known on the White River NF in the Aspen and Dillon Ranger Districts. This species was not observed in 2006.



Location of *Ranunculus gelidus* in the White River NF. This species was not observed in 2006.

References:

Harrington, H. 1957. Manual of the Plants of Colorado: For The Identification Of The Ferns And Flowering Plants Of The State. Sage Books. Denver.

Hultén, E. 1968. *Flora of Alaska and Neighboring Territories: A Manual of the Vascular Plants*. Stanford University Press, CA.

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Weber, W. 1987. *Colorado Flora Western Slope*. Colorado Associated University Press.

Saussurea weberi Hultén (Weber's saw-wort)

Taxonomy

Class: Magnoliopsida

Order: Asterales

Family: Asteraceae

Taxonomic Comments: Previously treated as a synonym of *S. densa*; now recognized as distinct by Kartesz, 1999.

CNHP Ranking: G2G3 S2

State/Federal Status: Currently on list of species considered for inclusion on Forest Service sensitive species list for Region 2, but for which more information is needed; Bureau of Land Management Sensitive Species.



Photograph by Peggy Lyon.



Colorado Distribution

Description and Phenology: Rhizomatous perennial herb to 20 cm in height with 3-5 cm long lance-shaped leaves having sparse cobwebby hairs. Leaves alternate, entire, 5 to 10 cm long and broadly to narrowly lanceolate. The upper leaves are sessile. Both the deep purple stamens and the style protrude from the corolla. Tightly clustered purple flower heads appear from July through August.

Habitat Comments: Exposed, but stable, sites with poorly developed soils derived from Leadville limestone and Manitou dolomite, as well as on alpine solifluction lobes and gravelly tundra slopes.

Global Range: Colorado, Montana, Wyoming; known from 24 occurrences throughout its range. Roughly 8,000 individuals are known from Colorado and 10,000 from Wyoming. The Montana population has not been relocated since 1978 and its status or population size is unknown at this time.

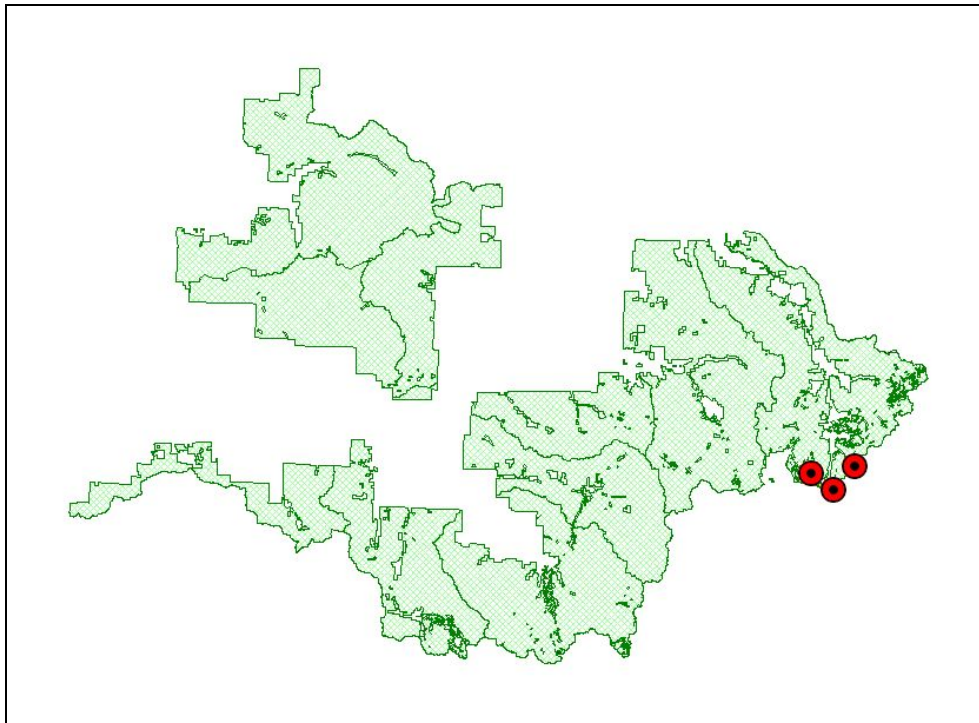
State Range: Known from Lake, Park, and Summit Counties. Roughly 8,000 individuals known from 18 reported occurrences in Colorado: seven on the Arapaho National Forest (administered by White River National Forest), nine from the Pike National Forest, one from private land on the Pike National Forest, and one from BLM's Royal Gorge Field Office.

Distribution/Abundance: Known from 24 occurrences across its range including the Pike and Arapaho (administered by the White River National Forest) National Forests of Colorado, the

Bridger-Teton and Shoshone National Forests of Wyoming, and the Beaverhead-Deerlodge National Forest of Montana. Populations in Wyoming are much larger than those found in Colorado, which are the most southerly occurrences in North America.

Known Threats and Management Issues: Primary threats include potential climate change, environmental stochasticity, off-road vehicle use, mining activities, livestock trampling and possibly herbivory, non-motorized recreational activities such as hiking, and other construction, including residential development on private land.

White River NF: Three of the 24 known occurrences are in the White River National Forest. *Saussurea weberi* is reported from Arapaho National Forest, administered by the White River National Forest at: Hoosier Ridge Research Natural Area (12,080 to 12,640 feet elevation), Blue Lakes (11,720 feet elevation), Mosquito Range (12,000 feet elevation and 12,400 feet elevation), Boreas Pass (12,400 feet elevation), and North Star Mountain (11,960 to 12,000 feet elevation and 12,000 feet elevation). The occurrences at Hoosier Ridge and Blue Lakes were updated in 2006.



Location of *Saussurea weberi* in the White River NF. Occurrences at Blue Lakes and Hoosier Ridge were updated in 2006.

References:

Harrington, H. 1957. Manual of the Plants of Colorado: For The Identification Of The Ferns And Flowering Plants Of The State. Sage Books. Denver.

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Kartesz, J.T. 1999. A synonymized checklist and atlas with biological attributes for the vascular flora of the United States, Canada, and Greenland. First Edition. *In*: J.T. Kartesz and C.A. Meacham. Synthesis of the North American Flora [computer program]. Version 1.0. North Carolina Botanical Garden, Chapel Hill, NC.

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Weber, W. 1987. Colorado Flora Western Slope. Colorado Associated University Press.

Additional species of interest observed in 2006, not sensitive and not tracked by CNHP, but on other FS lists

Papaver radicum ssp. *kluanense*

Ipomopsis tenuituba

Erigeron pinnatisectus

Lomatogonium rotatum

Ligusticum tenuifolium

Besseyia alpina

Crataegus saligna

Botrychium lanceolatum

Menyanthes trifoliata (not observed in 2006, but found in 2005 near Twin Lakes, Flat Tops)



Papaver radicum ssp. *kluanense*, on list of species recommended for other emphasis, 2006, found at Hoosier Pass



Ipomopsis tenuituba, on recommended list of species needing more information, found in abundance at Coffee Pot Road, Flat Tops.



Erigeron pinnatisectus, on list of species recommended for other emphasis, 2006. Found at: Magnolia Mine, Heart Lake, Independence Pass, Taylor Pass, Loveland Pass, Hoosier Ridge, Upper Lost Man Trail, Silver Mountain, Blue Lakes, Quandary Peak.



Lomatogonium rotatum, on recommended list of species needing more information, 2006, found at Crystal Lake fen.



Ligusticum tenuifolium, on list of species recommended for other emphasis, 2006, found at McCullough Gulch, Warren Lakes, Upper Blue Lake Valley, Crystal Lake, Hagerman Pass.



Besseyia alpina, on list of species recommended for other emphasis, 2006. Found at: Blue Lakes, Iron Quarry, Silver Mountain, Independence Pass, Magnolia mine, Hoosier Ridge, Boreas Pass, Upper Lost Man Trail, Santa Fe Peak.



Crataegus saligna, on recommended list of species needing more information, 2006. Found on private land adjacent to WRNF, at Frying Pan River.

Botrychium lanceolatum, on list of species needing more information, 2002. Found at Town of Independence North.



Menyanthes trifoliata, photo courtesy of CONPS.org., observed at small ponds south of Twin Lakes, Flat Tops Wilderness, 2005.

Appendix I. Species observed at survey sites.

Species lists were prepared at each site surveyed. They are shown below both as a list for each site and following that, in a spreadsheet (Excel file on CD). In the individual species lists by area, bold type signifies that element occurrence records were prepared. Non-native species are shown in regular type (not italics). It is noteworthy that, other than common dandelion (*Taraxacum officinale*) with 10 occurrences, and 2 occurrences of Canada thistle (*Cirsium arvense*), all the areas surveyed were remarkably free of exotic species. The few other non-native species encountered were primarily at lower elevations. They are: purple mustard, spreading wallflower and cranesbill (*Chorispora tenella*, *Erysimum repandum*, and *Erodium cicutarium*) at Horsethief Canyon; and smooth brome and white clover (*Bromus inermis* and *Trifolium repens*) at McCullough Gulch.

R2 web Citation:

USDA Forest Service. 2007. Sensitive Species List. Available online at <http://www.fs.fed.us/r2/projects/scp/sensitivespecies/index.shtml>

Species lists by area

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Horsethief (including Battlement Mesa from Horsethief)

Allium geyeri
Amelanchier utahensis
Androsace septentrionalis
Antennaria dimorpha
Arabis lignifera
Artemisia tridentata ssp tridentata
Artemisia tridentata ssp. wyomingensis
Astrag wingatanus
Astragalus amphioxys
Astragalus asclepiadoides
Astragalus flavus,
Astragalus lentiginosus
Astragalus missouriensis
Atriplex brandegii
Atriplex confertifolia
Atriplex gardneri
Balsamorhiza sagittata
Bromus tectorum
Castilleja chromosa.
Cercocarpus montanus
Chaenactis douglassii
Chorisopora tenella
Chrysothamnus depressus
Chrysothamnus nauseosus
Chrysothamnus viscidiflorus
Cirsium perplexans
Cirsium tracyi
Comandra umbellata
Cryptantha humilis
Cryptantha gracilis
Cryptantha suffruticosa
Cymopterus bulbosus
Cymopterus fendleri
Cymopterus purpurascens
Draba cuneifolia
Elymus elymoides
Ephedra torreyana
Ephedra viridis
Eremogone kingii
Eriogonum corymbosum
Eriogonum microthecum
Eriogonum ovalifolium
Erisymum repandum
Erodium cicutarium
Galium coloradense
Gutierrezia sarothrae
Hedysarum boreale
Heuchera parviflora
Hilaria jamesii
Hymenopappus filifolius
Juniperus osteosperma
Koeleria macrantha
Lepidium montanum
Lesquerella rectipes
Leymus salina
Lomatium eastwoodiae
Machaeranthera bigelovoi
Machaeranthera grindelioides
Mertensia ciliata
Mirabilis multiflora
Oenothera caespitosa
Opuntia polyacantha
Oryzopsis hymenoides
Pediomelum megalanthum.
Penstemon watsonii
Petradoria pumila
Phlox hoodii
Phlox longifolia
Physaria acutifolia
Pinus edulis
Plantago elongata
Platyschkuhria integrifolia
Poa fendleriana
Pseudoroegneria spicata
Pseudotsuga menziesii
Psilochenia sp.
Quercus gambellii
Ranunculus testiculatus
Sarcobatus vermiculatus
Symphoricarpos oreophilus
Tetraneuris ivesiana
Thelypodopsis elegans
Townsendia incana
Toxicoscordion venenosum
Yucca harrimanniae

Flat Tops, Heart Lake

Achillea lanulosa
Alsinanthe macrantha
Androsace septentrionalis
Anemone multifida var. *multifida*
Antennaria rosea
Aquilegia coerulea
Arabis drummondii
Bistorta bistortoides
Carex ebenea
Carex utriculata
Castilleja miniata
Castilleja occidentalis
Cirsium hesperium
Delphinium ramosum var. *alpestre*
Deschampsia cespitosa
Draba aurea
Draba spectabilis
Dugaldia hoopesii
Elymus trachycaulus
Erigeron pinnatisectus
Erigeron simplex
Eriogonum umbellatum
Erysimum capitatum
Erythronium grandiflorum
Festuca brachyphylla
Fragaria virginiana
Frasera speciosa
Gastrolychnis drummondii
Geum rossii
Geum triflorum
Hackelia floribunda
Helianthella quinquenervis
Ligusticum porteri
Linum lewisii
Lupinus argenteus
Noccaea montana
Oxytropis deflexa ssp. *deflexa*
Penstemon whippleanus
Phacelia sericea
Picea engelmannii
Pneumonanthe parryi
Poa alpina
Poa fendleriana
Polemonium foliosissimum
Potentilla hippiana
Potentilla pulcherrima
Potentilla subjuga
Pseudocymopterus montanus
Ribes montigenum
Salix brachycarpa
Salix planifolia
Sedum lanceolatum
Sibbaldia procumbens
Taraxacum officinale
Trisetum spicatum
Vaccinium caespitosum
Vaccinium myrtillus var. *oreophilus*
Valeriana edulis
Valeriana occidentalis
Veronica nutans
Viola adunca
Viola praemorsa
Zigadenus elegans

Flat Tops, Spruce-Fir Forest

Aquilegia coerulea
Dugaldia hoopesii
Geranium richardsonii
Heracleum sphondylium var. *lanatum*
Lathyrus leucanthus
Ligusticum porteri
Osmorhiza occidentalis
Pedicularis bracteosa
Pseudocymopterus montanus
Sambucus racemosa var. *microbotrys*
Thalictrum fendleri
Valeriana occidentalis
Veratrum tenuipetalum

Flat Tops, Bison Lake

Caltha leptosepala
Carex aquatilis
Carex ebenea
Carex illota
Carex nigricans
Carex utriculata
Cerastium beeringianum
Chamerion danielsii
Deschampsia cespitosa
Hierochloa odorata
Hydrophyllum capitatum
Micranthes rhomboidea
Osmorhiza occidentalis
Pedicularis groenlandica
Podistera eastwoodiae
Polemonium pulcherrimum
Pseudocymopterus montanus
Ranunculus alismifolius
Rumex densiflorus
Salix planifolia
Sambucus racemosa var. *microbotrys*
Veronica nutans
Viola adunca

Flat Tops, Coffee Pot Spring

Abies lasiocarpa
Aconitum columbianum
Cardamine cordifolia
Carex disperma
Carex norvegica
Chamerion danielsii
Cirsium arvense
Cirsium centaureae
Cirsium clavatum var. *osterhoutii*
Corallorhiza trifida
Delphinium barbeyi
Distegia involucrata
Dugaldia hoopesii
Fragaria virginiana
Geranium richardsonii
Geum macrophyllum
Habenaria hyperborea
Heracleum sphondylium var. *lanatum*
Lathyrus leucanthus
Ligusticum porteri
Luzula parviflora
Maianthemum amplexicaulis
Mertensia ciliata
Micranthes odontoloma
Moneses uniflora
Noccaea montana
Osmorhiza depauperata
Osmorhiza occidentalis
Pedicularis bracteosa
Picea engelmannii
Poa reflexa
Polemonium foliosissimum
Populus tremuloides
Potentilla pulcherrima
Prosartes trachycarpa
Pseudocymopterus montanus
Pseudostellaria jamesiana
Pyrola rotundifolia ssp. *asarifolia*
Ribes montigenum
Ribes wolfii
Rumex densiflorus
Salix monticola
Senecio triangularis
Streptopus fassettii
Taraxacum officinale

Thalictrum fendleri
Trollius albiflorus
Vaccinium myrtillus var. *oreophilum*
Valeriana occidentalis
Viola Canadensis

Flat Tops, Wagonwheel Road

Achillea lanulosa
Androsace septentrionalis
Anemone multifida var. *multifida*
Antennaria rosea
Aquilegia coerulea
Arabis drummondii
Dugaldia hoopesii
Erysimum capitatum
Frasera speciosa
Geum triflorum
Ligularia bigelovii
Lupinus argenteus
Oreobroma pygmaea
Oxytropis deflexa ssp. *deflexa*
Penstemon whippleanus
Phacelia sericea
Phleum commutatum
Poa alpina
Pseudocymopterus montanus
Ranunculus inamoenus
Ribes montigenum
Sedum lanceolatum
Sibbaldia procumbens
Taraxacum officinale
Trisetum spicatum
Valeriana edulis
Viola praemorsa

Flat Tops, Buck Creek Wetland

Aconitum columbianum
Androsace septentrionalis
Angelica grayi
Arabis drummondii
Bistorta bistortoides
Caltha leptosepala
Cardamine cordifolia
Carex aurea
Carex norvegica
Carex nova
Carex utriculata
Cirsium clavatum var. *osterhoutii*
Delphinium barbeyi
Deschampsia cespitosa
Draba spectabilis
Dugaldia hoopesii
Epilobium hornemannii
Fragaria virginiana
Frasera speciosa
Geum macrophyllum
Geum triflorum
Lupinus argenteus
Luzula parviflora
Luzula spicata
Melica porteri
Mertensia ciliata
Micranthes odontoloma
Mimulus guttatus
Mitella pentandra
Pedicularis bracteosa
Pedicularis groenlandica
Plantanthera dilatata
Potentilla fruticosa
Rhodiola integrifolia
Rorippa sp.
Salix brachycarpa
Salix planifolia
Senecio triangularis
Trollius albiflorus
Valeriana occidentalis
Veronica americana
Veronica nutans

Flat Tops, Buck Creek

Achillea lanulosa
Aconitum columbianum
Androsace septentrionalis
Angelica grayi
Arabis drummondii
Astragalus alpinus
Bistorta bistortoides
Caltha leptosepala
Cardamine cordifolia
Carex aquatilis
Carex aurea
Carex ebenea
Carex nigricans
Carex norvegica
Carex nova
Carex utriculata
Castilleja sulphurea
Cerastium strictum
Cirsium sp. (osterhoutii?)
Deschampsia cespitosa
Draba spectabilis
Dugaldia hoopesii
Epilobium hornemannii
Erigeron peregrinus
Fragaria virginiana
Frasera speciosa
Geum macrophyllum
Hackelia floribunda
Lathyrus leucanthus
Ligusticum porteri
Lithophragma glabrum
Lupinus argenteus
Luzula parviflora
Melica spectabilis
Mertensia ciliata
Micranthes odontoloma
Mitella pentandra
Parnassia fimbriata
Pedicularis bracteosa
Pedicularis groenlandica
Plantanthera dilatata
Potentilla diversifolia
Potentilla fruticosa
Pseudocymopterus montanus

Rhodiola integrifolia
Salix brachycarpa
Salix monticola
Senecio triangularis
Spergularia rubra
Thalictrum fendleri
Trollius albiflorus
Valeriana occidentalis
Veronica americana

Flat Tops, Road 7

Achillea lanulosa
Aconitum columbianum
Androsace septentrionalis
Arabis drummondii
Bistorta bistortoides
Caltha leptosepala
Cardamine cordifolia
Carex aquatilis
Carex ebenea
Carex norvegica
Carex nova
Carex raynoldsii
Carex utriculata
Castilleja occidentalis
Cirsium centaureae
Delphinium barbeyi
Deschampsia cespitosa
Draba spectabilis
Dugaldia hoopesii
Epilobium hornemannii
Erigeron peregrinus
Festuca thurberi
Fragaria virginiana
Geranium richardsonii
Hackelia floribunda
Lathyrus leucanthus
Ligusticum porteri
Lupinus argenteus
Luzula parviflora
Melica spectabilis
Mertensia ciliata
Noccaea montana
Pedicularis bracteosa
Pedicularis groenlandica
Phleum commutatum
Polemonium foliosissimum
Polemonium pulcherrimum
Potentilla fruticosa
Potentilla pulcherrima
Rhodiola integrifolia
Ribes montigenum
Rorippa sp.
Rumex densiflorus
Salix brachycarpa
Salix planifolia
Senecio crassulus
Senecio triangularis
Taraxacum officinale
Thalictrum fendleri
Vaccinium myrtilus var. oreophilum
Valeriana capitata
Valeriana occidentalis
Veratrum tenuipetalum
Veronica americana
Veronica nutans
Vicia Americana

Flat Tops, Indian Camp

Acer glabrum
Achillea lanulosa
Amelanchier alnifolia
Amelanchier utahensis
Androsace septentrionalis
Anemone multifida var. *multifida*
Anemone patens var. *multifida*
Antennaria rosea
Arabis drummondii
Artemisia frigida
Carex geyeri
Castilleja linariifolia
Collinsia parviflora
Cystopteris fragilis
Delphinium ramosum var. *alpestre*
Draba aurea
Draba spectabilis
Dugaldia hoopesii
Eremogone fendleri
Erigeron flagellaris
Eriogonum subalpinum
Eriogonum umbellatum
Erysimum capitatum
Festuca brachyphylla
Festuca thurberi
Heliomeris multiflora
Heterotheca villosa
Ipomopsis tenuituba
Ipomopsis aggregata
Juniperus communis
Lathyrus leucanthus
Mahonia repens
Maianthemum racemosum var. *amplexicaule*
Maianthemum stellatum
Melica spectabilis
Noccaea montana
Oxytropis deflexa ssp. *deflexa*
Packera wernerifolia
Paxistima myrsinites
Penstemon glaber
Penstemon watsonii
Penstemon whippleanus
Phacelia hastata
Phacelia sericea
Phleum commutatum
Poa fendleriana
Populus tremuloides
Potentilla diversifolia
Potentilla fruticosa
Potentilla hippiana
Potentilla pulcherrima
Potentilla sp.
Pulsatilla patens
Ribes cereum
Rosa woodsii
Sedum lanceolatum
Selaginella sp.
Senecio wernerifolia
Taraxacum officinale
Thalictrum alpinum
Valeriana edulis
Vicia americana
Viola adunca

The Meadows, Budes Resort

Angelica pinnata
Cardamine cordifolia
Carex aquatilis
Carex ebenea
Dugaldia hoopesii
Epilobium hornemannii
Equisetum arvense
Galium septentrionalis
Geranium richardsonii
Heracleum sphondylium var. *lanatum*
Mertensia ciliata
Micranthes odontoloma
Mitella pentandra
Mitella stauropetala
Penstemon confertus subsp. *procerus*
Polemonium foliosissimum
Salix brachycarpa
Salix geyeriana
Salix monticola
Senecio triangularis
Taraxacum officinale

Flat Tops, Heart Lake area

Abies lasiocarpa
Androsace septentrionalis
Arabis drummondii
Arnica cordifolia
Arnica parryi
Bistorta bistortoides
Caltha leptosepala
Carex ebenea
Carex nova
Carex rossii
Castilleja rhexifolia
Castilleja sulphurea
Chamerion danielsii
Delphinium barbeyi
Deschampsia cespitosa
Draba spectabilis
Erigeron peregrinus
Fragaria virginiana
Gaultheria humifusa
Juncus drummondii
Ligusticum porteri
Lupinus argenteus
Luzula parviflora
Lycopodium sp.
Micranthes odontoloma
Mitella stauropetala
Noccaea montana
Oreobroma pygmaea
Osmorhiza depauperata
Pedicularis bracteosa
Pedicularis groenlandica
Pedicularis racemosa
Penstemon whippleanus
Phleum commutatum
Picea engelmannii
Podistera eastwoodiae
Polemonium pulcherrimum
Potentilla diversifolia
Ranunculus alismifolius
Ranunculus inamoenus
Ribes montigenum
Ribes wolfii
Salix brachycarpa
Salix monticola

Saxifraga hyperborea subsp. debilis
Senecio crassulus
Senecio dimorphophyllus
Sibbaldia procumbens
Taraxacum officinale
Trollius albiflorus
Vaccinium myrtillus var. oreophilum
Veronica americana
Veronica nutans
Viola adunca

Blue Lakes, *Ptilogrostis porteri* site

Anemone narcissiflora var. *zephra* *Picea engelmannii*
Angelica grayi *Poa alpina*
Artemisia scopulorum *Polemonium viscosum*
Besseyia alpina *Potentilla fruticosa*
Betula glandulosa *Potentilla nivea*
Bistorta bistortoides *Potentilla subjuga*
Bistorta vivipara *Potentilla uniflora*
Campanula uniflora *Primula parryi*
Cardamine cordifolia ***Ptilogrostis porteri***
Carex aquatilis *Rhodiola integrifolia*
Carex capillaris *Ribes wolfii*
Carex elynoides *Rydbergia grandiflora*
Carex nova *Salix brachycarpa*
Carex rupestris *Salix planifolia*
Carex scopulorum *Salix reticulata*
Cilaria austromontana ***Saussurea weberi***
Cirsium scopulorum *Silene acaulis*
Claytonia megarhiza *Smelowskia calycina*
Condrophylla prostrata *Swertia perennis*
Cystopteris fragilis *Thalictrum alpinum*
Cystopteris montana *Tonestus pygmaeus*
Danthonia intermedia *Trifolium dasyphyllum*
Deschampsia cespitosa *Trifolium nanum*
Draba aurea *Trisetum spicatum*
Draba crassa *Zigadenus elegans*
Draba fladnizensis
Draba streptobrachia
Draba streptocarpa
Dryas octopetala
Erigeron peregrinus
Erigeron pinnatisectus
Eriophorum angustifolium
Gentianopsis algida
Geum rossii
Heuchera parvifolia var. *nivalis*
Hierochloe odorata
Lidia obtusiloba
Ligularia holmii
Luzula spicata
Oreoxis alpina
Oxyria digyna
Parnassia kotzebuei
Paronychia pulvinata
Pedicularis groenlandica

Blue Lakes, rocky ledges and talus slopes above dam

Angelica grayi
Besseya alpina
Cilaria austromontana
Cystopteris fragilis
Cystopteris montana
Draba crassa
Draba streptobrachia
Gentiana thermalis
Oxyria digyna
Packera tridenticulata
Picea engelmannii
Poa rupicola
Ribes wolfii
Salix brachycarpa
Silene acaulis
Smelowskia calycina

Blue Lakes, talus slopes above upper end of lake

Angelica grayi
Bistorta vivipara
Carex chalciolepis
Carex elynoides
Cirsium scopulorum
Cystopteris fragilis
Deschampsia cespitosa
Draba crassa
Oxyria digyna
Parnassia kotzebuei
Salix arctica
Saxifraga hyperborea subsp. debilis

Blue Lakes, valley bottom above upper lake

Achillea lanulosa
Angelica grayi
Aquilegia coerulea
Arabis drummondii
Arnica mollis
Artemisia scopulorum
Bistorta bistortoides
Bistorta vivipara
Calamagrostis canadensis
Caltha leptosepala
Cardamine cordifolia
Castilleja rhexifolia
Cerastium beeringianum
Chamerion danielsii
Cirsium hesperium
Cirsium scopulorum
Clementsia rhodantha
Comastoma tenellum
Danthonia intermedia
Deschampsia cespitosa
Erigeron peregrinus
Erigeron pinnatisectus
Erigeron simplex
Festuca brachyphylla
Gentianopsis algida
Geum rossii
Heterotheca villosa
Juncus drummondii
Ligusticum tenuifolium var. *filicinum*
Mertensia ciliata
Micranthes odontoloma
Oreoxis alpina
Pedicularis groenlandica
Phleum commutatum
Pneumonanthe parryi
Poa alpina
Poa fendleriana
Poa reflexa
Potentilla diversifolia
Rhodiola integrifolia
Ribes wolfii
Salix brachycarpa
Salix planifolia
Senecio amplexans var. *holmii*
Senecio crassulus
Senecio fremontii
Senecio triangularis
Sibbaldia procumbens
Silene acaulis
Solidago multiradiata
Swertia perennis
Taraxacum officinale
Trisetum spicatum
Vaccinium caespitosum
Veronica nutans

Boreas Pass

Achillea lanulosa
Agoseris aurantiaca
Agoseris glauca
Alsinanthe macrantha
Anaphalis margaritaceae
Androsace septentrionalis
Antennaria media
Antennaria rosea
Antennaria umbrinella
Arabis drummondii
Arnica mollis
Arnica parryi
Artemisia arctica subsp. saxicola
Besseya alpina
Bistorta bistortoides
Campanula rotundifolia
Campanula uniflora
Carex chalciolepis
Carex ebenea
Carex microptera
Castilleja linariifolia
Cerastium beeringianum
Chaenactis alpina
Chamerion angustifolium
Cirsium hesperium
Cirsium scopulorum
Cystopteris fragilis
Delphinium barbeyi
Deschampsia cespitosa
Draba crassifolia
Elymus trachycaulus
Eremogone fendleri
Erigeron elatior
Erigeron melanocephalus
Erigeron peregrinus
Erigeron simplex
Erigeron ursinus
Festuca brachyphylla
Fragaria virginiana
Geum rossii
Heterotheca villosa
Heuchera parvifolia var. nivalis
Hieracium gracile
Ipomopsis globularis
Juncus drummondii
Ligularia holmii
Ligularia soldanella
Luzula spicata
Micranthes rhomboidea
Noccaea montana
Oreobroma pygmaea
Oreoxis alpina
Oxyria digyna
Packera cana
Packera tridenticulata
Pedicularis parryi
Penstemon hallii
Penstemon whippleanus
Phacelia sericea
Phleum commutatum
Phlox pulvinata
Poa alpina
Poa fendleriana
Podistera eastwoodiae
Polemonium pulcherrimum
Potentilla diversifolia
Potentilla fruticosa
Potentilla sp.
Potentilla uniflora
Pseudocymopterus montanus
Rhodiola integrifolia
Ribes montigenum
Rydbergia grandiflora
Sedum lanceolatum
Senecio crassulus
Sibbaldia procumbens
Thalictrum alpinum
Trifolium attenuatum
Trifolium nanum
Trifolium parryi
Trisetum spicatum
Vaccinium caespitosum
Vaccinium myrtilus var. oreophilum
Valeriana capitata
Veronica nutans

Crystal Lake

Achillea lanulosa
Antennaria rosea
Artemisia scopulorum
Bistorta vivipara
Cardamine cordifolia
Carex aquatilis
Cirsium hesperium
Cystopteris fragilis
Deschampsia cespitosa
Dryas octopetala
Erigeron peregrinus
Erigeron simplex
Gentiana acuta
Gentianopsis algida
Geum macrophyllum
Juncus drummondii
Juncus sp.
Ligusticum tenuifolium var. filicinum
Luzula parviflora
Orthilia secunda
Packera dimorphophylla var. dimorphophylla
Parnassia kotzebuei
Pedicularis groenlandica
Potentilla diversifolia
Potentilla subjugata
Salix brachycarpa
Salix planifolia
Salix reticulata
Sibbaldia procumbens
Swertia perennis
Thalictrum alpinum
Trifolium dasyphyllum

Crystal Lake Fen

Achillea lanulosa
Bistorta vivipara
Carex aquatilis
Carex sp.
Chondrophylla prostrata
Clementsia rhodantha
Deschampsia cespitosa
Eleocharis quinqueflora
Gentianopsis algida
Geum macrophyllum
Hirculus prorepens
Juncus balticus
Lomatigonium rotatum subsp. tenuifolium
Pedicularis groenlandica
Potentilla fruticosa
Ranunculus hyperboreas subsp. intertextus
Salix planifolia

Magnolia Mine

Anemone narcissiflora var. *zephra*
Angelica grayi
Arabis drummondii
Artemisia scopulorum
Aster foliaceus
Besseya alpina
Betula glandulosa
Braya humilis
Carex chalciolepis
Carex nigricans
Carex nova
Carex rupestris
Castilleja rhexifolia
Cerastium beeringianum
Cystopteris fragilis
Deschampsia cespitosa
Draba crassa
Draba porsildii
Dryas octopetala
Elymus trachycaulus
Erigeron peregrinus
Erigeron pinnatisectus
Erigeron vetensis
Gentiana acuta
Gentiana thermalis
Gentianopsis algida
Lidia obtusiloba
Ligularia amplexans
Ligularia holmii
Mertensia lanceolata
Noccaea montana
Oxyria digyna
Oxytropis podocarpa
Paronychia pulvinata
Pedicularis groenlandica
Phlox condensata
Poa alpina
Poa reflexa
Poa rupicola
Potentilla diversifolia
Rydbergia grandiflora
Salix arctica
Salix brachycarpa
Salix planifolia
Salix reticulata
Saussurea weberi
Saxifraga hyperborea subsp. *debilis*
Silene acaulis
Smelowskia calycina
Solidago multiradiata
Trifolium dasyphyllum
Trifolium parryi
Trisetum spicatum
Zigadenus elegans

Hoosier Ridge

<i>Achillea lanulosa</i>	<i>Draba fladnizensis</i>	<i>Potentilla diversifolia</i>
<i>Agoseris glauca</i>	<i>Draba grayana</i>	<i>Potentilla fruticosa</i>
<i>Androsace septentrionalis</i>	<i>Elymus trachycaulus</i>	<i>Potentilla nivea</i>
<i>Anemone multifida</i> var. <i>multifida</i>	<i>Epilobium hornemannii</i>	<i>Primula angustifolia</i>
<i>Anemone narcissiflora</i> var. <i>zephra</i>	<i>Eremogone fendleri</i>	<i>Primula parryi</i>
<i>Angelica grayi</i>	<i>Erigeron melanocephalus</i>	<i>Rhodiola integrifolia</i>
<i>Antennaria media</i>	<i>Erigeron peregrinus</i>	<i>Ribes montigenum</i>
<i>Antennaria rosea</i>	<i>Eritrichum aretoides</i>	<i>Rorippa</i> sp.
<i>Armeria maritima</i> ssp. <i>sibirica</i>	<i>Festuca brachyphylla</i>	<i>Salix brachycarpa</i>
<i>Arnica cordifolia</i>	<i>Gastrolychnis drummondii</i>	<i>Salix planifolia</i>
<i>Artemisia arctica</i> subsp. <i>saxicola</i>	<i>Geum rossii</i>	<i>Salix reticulata</i>
<i>Artemisia scopulorum</i>	<i>Geum triflorum</i>	<i>Sedum lanceolatum</i>
<i>Aster foliaceus</i>	<i>Heterotheca villosa</i>	<i>Senecio amplectens</i> var. <i>holmii</i>
<i>Astragalus alpinus</i>	<i>Hirculus platysepalus</i> ssp. <i>crandallii</i>	<i>Senecio crassulus</i>
<i>Besseyia alpina</i>	<i>Ipomopsis globularis</i>	<i>Senecio fremontii</i>
<i>Bistorta bistortoides</i>	<i>Lidia obtusiloba</i>	<i>Sibbaldia procumbens</i>
<i>Bistorta vivipara</i>	<i>Ligusticum porteri</i>	<i>Solidago canadensis</i>
<i>Bromus</i> sp.	<i>Luzula spicata</i>	<i>Solidago multiradiata</i>
<i>Calochortus gunnisonii</i>	<i>Mertensia lanceolata</i>	<i>Stellaria umbellata</i>
<i>Caltha leptosepala</i>	<i>Micranthes rhomboidea</i>	<i>Taraxacum officinale</i>
<i>Campanula rotundifolia</i>	<i>Oreobroma pygmaea</i>	<i>Thalictrum alpinum</i>
<i>Campanula uniflora</i>	<i>Oxytropis borealis</i>	<i>Tonestus pygmaeus</i>
<i>Carex albonigra</i>	<i>Oxytropis sericea</i>	<i>Trifolium attenuatum</i>
<i>Carex aurea</i>	<i>Packera cana</i>	<i>Trifolium dasyphyllum</i>
<i>Carex chalciolepis</i>	<i>Packera dimorphophylla</i> var. <i>dimorphophylla</i>	<i>Trifolium nanum</i>
<i>Carex microptera</i>	<i>Paronychia pulvinata</i>	<i>Trifolium parryi</i>
<i>Carex perglobosa</i>	<i>Pedicularis groenlandica</i>	<i>Trisetum spicatum</i>
<i>Carex rupestris</i>	<i>Pedicularis parryi</i>	<i>Viola labradorica</i>
<i>Carex scopulorum</i>	<i>Penstemon confertus</i> subsp. <i>procerus</i>	<i>Zigadenus elegans</i>
<i>Castilleja occidentalis</i>	<i>Penstemon watsonii</i>	
<i>Cerastium beeringianum</i>	<i>Penstemon whippleanus</i>	
<i>Chaenactis alpina</i>	<i>Phacelia sericea</i>	
<i>Chondrophylla prostrata</i>	<i>Phleum commutatum</i>	
<i>Cirsium hesperium</i>	<i>Phlox condensata</i>	
<i>Claytonia megarhiza</i>	<i>Poa alpina</i>	
<i>Deschampsia cespitosa</i>	<i>Poa fendleriana</i>	
<i>Draba exungulata</i>	<i>Polemonium viscosum</i>	

Independence Pass

Achillea lanulosa
Androsace septentrionalis
Anemone narcissiflora var. *zephra*
Antennaria rosea
Artemisia scopulorum
Besseyia alpina
Bistorta bistortoides
Bistorta vivipara
Caltha leptosepala
Campanula uniflora
Carex chalciolepis
Carex ebenea
Carex scopulorum
Castilleja occidentalis
Cerastium beeringianum
Claytonia megarhiza
Clemensia rhodantha
Cystopteris fragilis
Deschampsia cespitosa
Draba borealis
Draba crassa
Draba crassifolia
Draba streptobrachia
Elymus trachycaulus
Erigeron melanocephalus
Erigeron pinnatisectus
Erigeron simplex
Eritrichum aretoides
Erysimum capitatum
Festuca brachyphylla
Geum rossii
Heuchera parvifolia var. *nivalis*
Hirculus platysepalus ssp. *crandallii*
Hirculus serpyllifolius subsp. *chrysanthus*
Lidia obtusiloba
Lloydia serotina
Luzula spicata
Mertensia lanceolata
Micranthes oregana
Micranthes rhomboidea
Oreobroma pygmaea
Oreoxis alpina
Oxyria digyna
Paronychia pulvinata
Pedicularis groenlandica
Pedicularis parryi
Pedicularis scopulorum
Penstemon whippleanus
Phacelia sericea
Poa alpina
Podistera eastwoodiae
Polemonium viscosum
Potentilla sp.
Potentilla uniflora
Pseudocymopterus montanus
Rhodiola integrifolia
Rydbergia grandiflora
Salix brachycarpa
Salix planifolia
Saxifraga hyperborea subsp. *debilis*
Sedum lanceolatum
Senecio dimorphophyllus
Sibbaldia procumbens
Silene acaulis
Smelowskia calycina
Tonestus pygmaeus
Trifolium dasyphyllum
Trifolium parryi
Trisetum spicatum
Vaccinium caespitosum
Veronica nutans
Viola labradorica

Loveland Pass East

Achillea lanulosa
Agoseris glauca
Alsinanthe macrantha
Androsace septentrionalis
Antennaria media
Antennaria rosea
Artemisia arctica subsp. *saxicola*
Artemisia scopulorum
Besseyia alpina
Bistorta bistortoides
Bistorta vivipara
Campanula uniflora
Carex chalciolepis
Carex rupestris
Carex scopulorum
Castilleja occidentalis
Castilleja rhexifolia
Cerastium beeringianum
Chionophila jamesii
Claytonia megarhiza
Deschampsia cespitosa
Draba aurea
Draba borealis
Draba crassa
Draba spectabilis
Draba grayana
Eremogone fendleri
Erigeron melanocephalus
Erigeron pinnatisectus
Erysimum capitatum
Festuca brachyphylla
Geum rossii
Heuchera parvifolia var. *nivalis*
Hirculus platysepalus ssp. *crandallii*
Lidia obtusiloba
Lloydia serotina
Luzula spicata
Mertensia lanceolata
Micranthes rhomboidea
Noccaea montana
Oreobroma pygmaea
Oreoxis alpina
Oxyria digyna
Packera cana
Packera dimorphophylla var. *dimorphophylla*
Paronychia pulvinata
Penstemon whippleanus
Phacelia sericea
Poa alpina
Poa sp.
Polemonium viscosum
Polygonum sp.
Potentilla diversifolia
Potentilla rubricaulis
Potentilla subjuga
Potentilla uniflora
Ranunculus adoneus
Rhodiola integrifolia
Rydbergia grandiflora
Salix arctica
Salix reticulata
Sedum lanceolatum
Senecio crassulus
Senecio fremontii
Sibbaldia procumbens
Silene acaulis
Smelowskia calycina
Solidago multiradiata
Stellaria umbellata
Taraxacum officinale
Tonestus pygmaeus
Trifolium dasyphyllum
Trifolium nanum
Trifolium parryi
Trisetum spicatum
Tryphane rubella

Loveland Pass West

Achillea lanulosa
Aquilegia coerulea
Artemisia scopulorum
Besseyia alpina
Bistorta bistortoides
Campanula uniflora
Carex chalciolepis
Carex rupestris
Carex scopulorum
Castilleja occidentalis
Cerastium beeringianum
Chamerion angustifolium
Chionophila jamesii
Cilaria austromontana
Claytonia megarhiza
Deschampsia cespitosa
Draba aurea
Draba fladnizensis
Draba globosa
Draba streptobrachia
Dryas octopetala
Eremogone fendleri
Erigeron pinnatisectus
Eriogonum flavum subsp. *cholorantha*
Erysimum capitatum
Geum rossii
Juncus drummondii
Juniperus communis
Lidia obtusiloba
Luzula spicata
Mertensia lanceolata
Oreobroma pygmaea
Oreoxis alpina
Oxyria digyna
Packera cana
Paronychia pulvinata
Pedicularis groenlandica
Penstemon whippleanus
Phacelia sericea
Poa alpina
Poa sp.
Polemonium viscosum
Potentilla diversifolia
Potentilla subjuga

Potentilla uniflora
Primula angustifolia
Rumex crispus
Salix arctica
Salix brachycarpa
Salix reticulata
Sedum lanceolatum
Senecio fremontii
Sibbaldia procumbens
Silene acaulis
Smelowskia calycina
Tonestus pygmaeus
Trifolium dasyphyllum
Trifolium nanum
Trifolium parryi
Trisetum spicatum
Tryphane rubella
Vaccinium scoparium

Revenue Mountain

(area between Silver Mountain, to top of Revenue Mountain, additions to Silver Mountain list)

Antennaria rosea
Carex albonigra
Carex phaeocephala
Claytonia megarhiza
Deschampsia cespitosa
Draba exungiculata
Eremogone fendleri
Ligularia holmii
Polemonium viscosum
Saxifraga cernua
Saxifraga hyperborea subsp. debilis
Trisetum spicatum

Santa Fe Peak

Artemisia scopulorum
Besseyia alpina
Bistorta bistortoides
Bistorta vivipara
Carex chalciolepis
Carex elynoides
Carex microptera
Carex nova
Carex perglobosa
Carex rupestris
Castilleja occidentalis
Cirsium scopulorum
Claytonia megarhiza
Draba crassa
Draba crassifolia
Draba exungiculata
Draba fladnizensis
Draba globosa
Draba grayana
Dryas octopetala
Eremogone fendleri
Festuca brachyphylla
Gastrolychnis drummondii
Gentianopsis algida
Geum rossii
Hirculus platysepalus ssp. crandallii

Hirculus serpyllifolius subsp. chrysanthus
Lidia obtusiloba
Ligularia holmii
Ligularia soldanella
Luzula spicata
Packera cana
Paronychia pulvinata
Penstemon hallii
Potentilla uniflora
Rydbergia grandiflora
Salix reticulata
Sedum lanceolatum
Silene acaulis
Tonestus pygmaeus
Trifolium nanum

Silver Mountain
(south facing slope and summit)

<i>Angelica grayi</i>	<i>Senecio fremontii</i>
<i>Artemisia scopulorum</i>	<i>Silene acaulis</i>
<i>Besseyia alpina</i>	<i>Smelowskia calycina</i>
<i>Bistorta bistortoides</i>	<i>Tonestus pygmaeus</i>
<i>Bistorta vivipara</i>	<i>Trifolium nanum</i>
<i>Campanula rotundifolia</i>	<i>Trifolium parryi</i>
<i>Carex albonigra</i>	<i>Tryphane rubella</i>
<i>Carex chalciolepis</i>	
<i>Carex elynoides</i>	
<i>Castilleja occidentalis</i>	
<i>Cerastium beeringianum</i>	
<i>Chondrophylla prostrata</i>	
<i>Claytonia megarhiza</i>	
<i>Deschampsia cespitosa</i>	
<i>Draba aurea</i>	
<i>Draba crassifolia</i>	
Draba sp. (similar to <i>grayana</i> , to be identified)	
<i>Dryas octopetala</i>	
<i>Elymus trachycaulus</i>	
<i>Erigeron pinnatisectus</i>	
<i>Erigeron simplex</i>	
<i>Eritrichum aretoides</i>	
<i>Festuca brachyphylla</i>	
<i>Gentianopsis algida</i>	
<i>Geum rossii</i>	
<i>Hirculus platysepalus</i> ssp. <i>crandallii</i>	
<i>Juniperus communis</i>	
<i>Lidia obtusiloba</i>	
<i>Luzula spicata</i>	
<i>Mertensia lanceolata</i>	
<i>Micranthes rhomboidea</i>	
<i>Noccaea montana</i>	
<i>Oreoxis alpina</i>	
<i>Paronychia pulvinata</i>	
<i>Poa alpina</i>	
<i>Potentilla diversifolia</i>	
<i>Potentilla fruticosa</i>	
<i>Potentilla nivea</i>	
<i>Rhodiola integrifolia</i>	
<i>Rydbergia grandiflora</i>	
<i>Salix reticulata</i>	
<i>Sedum lanceolatum</i>	

Taylor Pass

<i>Achillea lanulosa</i>	<i>Erysimum capitatum</i>	<i>Senecio crassulus</i>
<i>Alsinanthe macrantha</i>	<i>Festuca brachyphylla</i>	<i>Sibbaldia procumbens</i>
<i>Androsace septentrionalis</i>	<i>Fragaria virginiana</i>	<i>Silene acaulis</i>
<i>Anemone narcissiflora</i> var. <i>zephra</i>	<i>Gentiana acuta</i>	<i>Smelowskia calycina</i>
<i>Antennaria rosea</i>	<i>Gentianodes algida</i>	<i>Solidago multiradiata</i>
<i>Aquilegia coerulea</i>	<i>Geum rossii</i>	<i>Tonestus pygmaeus</i>
<i>Arabis drummondii</i>	<i>Heterotheca pumila</i>	<i>Trifolium dasyphyllum</i>
<i>Artemisia scopulorum</i>	<i>Hieracium gracile</i>	<i>Trifolium nanum</i>
<i>Astragalus alpinus</i>	<i>Juncus drummondii</i>	<i>Trifolium parryi</i>
<i>Bistorta bistortoides</i>	<i>Lidia obtusiloba</i>	<i>Trisetum spicatum</i>
<i>Bistorta vivipara</i>	<i>Ligularia holmii</i>	<i>Trollius albiflorus</i>
<i>Caltha leptosepala</i>	<i>Lloydia serotina</i>	<i>Tryphane rubella</i>
<i>Campanula uniflora</i>	<i>Luzula spicata</i>	<i>Vaccinium caespitosum</i>
<i>Cerastium beeringianum</i>	<i>Machaeranthera</i>	<i>Vaccinium myrtillus</i> var. <i>oreophilum</i>
	<i>coloradoensis</i>	<i>Veronica nutans</i>
<i>Carex brevipes</i>	<i>Mertensia lanceolata</i>	<i>Viola labradorica</i>
<i>Carex chalciolepis</i>	<i>Micranthes rhomboidea</i>	
<i>Carex ebenea</i>	<i>Oreobroma pygmaea</i>	
<i>Carex elynoides</i>	<i>Oxytropis podocarpa</i>	
<i>Carex periglobosa</i>	<i>Pedicularis groenlandica</i>	
<i>Carex rupestris</i>	<i>Pedicularis parryi</i>	
<i>Carex scopulorum</i>	<i>Penstemon whippleanus</i>	
<i>Castilleja occidentalis</i>	<i>Phacelia sericea</i>	
<i>Cerastium beeringianum</i>	<i>Phleum commutatum</i>	
<i>Cilaria austromontana</i>	<i>Physaria alpina</i>	
<i>Cystopteris fragilis</i>	<i>Picea engelmannii</i>	
<i>Deschampsia cespitosa</i>	<i>Poa alpina</i>	
<i>Draba aurea</i>	<i>Polemonium</i>	
	<i>pulcherrimum</i>	
<i>Draba crassa</i>	<i>Polemonium viscosum</i>	
<i>Draba crassifolia</i>	<i>Potentilla diversifolia</i>	
<i>Draba oligosperma</i>	<i>Potentilla subjuga</i>	
<i>Draba spectabilis</i>	<i>Potentilla uniflora</i>	
<i>Draba streptobrachia</i>	<i>Pseudocymopterus</i>	
	<i>montanus</i>	
<i>Dryas octopetala</i>	<i>Pulsatilla patens</i>	
<i>Eremogone congesta</i>	<i>Ranunculus adoneus</i>	
<i>Eremogone fendleri</i>	<i>Rhodiola integrifolia</i>	
<i>Erigeron melanocephalus</i>	<i>Ribes montigenum</i>	
<i>Erigeron pinnatisectus</i>	<i>Rydbergia grandiflora</i>	
<i>Erigeron simplex</i>	<i>Salix reticulata</i>	
<i>Erigeron vetensis</i>	<i>Sedum lanceolatum</i>	
<i>Eritrichum aretoides</i>	<i>Selaginella</i> sp.	

Webster Pass

Antennaria media
Armeria maritima ssp. *sibirica*
Artemisia scopulorum
Bistorta bistortoides
Bistorta vivipara
Caltha leptosepala
Campanula uniflora
Carex chalciolepis
Carex scopulorum
Castilleja occidentalis
Cerastium beeringianum
Chondrophylla prostrata
Clemensia rhodantha
Deschampsia cespitosa
Draba aurea
Draba crassifolia
Dryas octopetala
Eremogone fendleri
Erigeron melanocephalus
Eritrichum aretoides
Gentianopsis algida
Geum rossii
Hirculus platysepalus ssp. *crandallii*
Hirculus serpyllifolius subsp. *chrysanthus*
Lidia obtusiloba
Luzula spicata
Mertensia lanceolata
Micranthes rhomboidea
Noccaea montana
Oxyria digyna
Packera cana
Paronychia pulvinata
Poa alpina
Polemonium viscosum
Potentilla diversifolia
Primula parryi
Ranunculus adoneus
Rhodiola integrifolia
Rydbergia grandiflora
Salix planifolia
Salix reticulata
Sedum lanceolatum
Senecio crocatus
Sibbaldia procumbens

Silene acaulis
Smelowskia calycina
Stellaria longipipes
Thalictrum alpinum
Tonestus pygmaeus
Trifolium nanum
Trifolium parryi
Trisetum spicatum

Iron Quarry
(Road 88 above Ashcroft)

Angelica grayi
Antennaria media
Aquilegia coerulea
Artemisia scopulorum
Astragalus alpinus
Besseyia alpina
Bistorta vivipara
Carex elynoides
Carex microptera
Carex perglobosa
Carex phaeocephala
Carex rupestris
Chaenactis alpina
Cirsium hesperium
Claytonia megarhiza
Cystopteris fragilis
Draba crassa
Draba crassifolia
Draba porsildii
Dryas octopetala
Erigeon leiomerus
Erigeron compositus
Erigeron melanocephalus
Gentiana acuta
Gentianopsis algida
Geum rossii
Hirculus platysepalus ssp. *crandallii*
Juncus drummondii
Micranthes rhomboidea
Oxyria digyna
Packera dimorphophylla var.
dimorphophylla
Packera tridenticulata
Pedicularis racemosa
Penstemon harbouri
Penstemon whippleanus
Phacelia sericea
Picea engelmannii
Potentilla sp.
Primula parryi
Saxifraga hyperborea subsp. *debilis*
Senecio atratus
Senecio fremontii

Trifolium nanum
Trisetum spicatum
Vaccinium scoparium
Valeriana edulis
Veronica nutans
Viola labradorica

Town of Independence (north)

Achillea lanulosa
Antennaria rosea
Aquilegia coerulea
Botrychium echo
Botrychium hesperium
Botrychium lanceolatum
Botrychium lunaria
Botrychium minganense
Botrychium pinnatum
Castilleja sulphurea
Chaenactis alpina
Chamerion danielsii
Cirsium hesperium
Fragaria virginiana
Gentiana thermalis
Heterotheca villosa
Juniperus communis
Ligularia holmii
Potentilla fruticosa
Sedum lanceolatum
Senecio atratus
Vaccinium myrtillus var. *oreophilum*
Valeriana edulis
Zigadenus elegans

Hunter Creek

Abies lasiocarpa
Alnus incana susp. *tenuifolia*
Cystopteris montana
Equisetum arvense
Galium septentrionale
Geum macrophyllum
Heracleum spondylium var. *lanatum*
Distegia involucrata
Micranthes odontoloma
Picea engelmannii
Pyrola rotundifolia ssp. *asarifolia*
Salix drummondiana
Streptopus fassettii
Thalictrum fendleri
Urtica gracilis

Hagerman Pass

Achillea lanulosa
Agoseris glauca
Androsace septentrionalis
Anemone narcissiflora var. *zephra*
Angelica grayi
Antennaria rosea
Aquilegia coerulea
Arabis drummondii
Arnica latifolia
Artemisia scopulorum
Aster foliaceus
Besseya alpina
Bistorta bistortoides
Bistorta vivipara
Carex chalciolepis
Carex elynoides
Castilleja occidentalis
Cilaria austromontana
Claytonia megarhiza
Cystopteris fragilis
Deschampsia cespitosa
Draba aurea
Draba crassa
Draba crassifolia
Dryas octopetala
Eremogone fendleri
Erigeron elatior
Erigeron melanocephalus
Erigeron peregrinus
Erigeron pinnatisectus
Eritrichum aretoides
Festuca brachyphylla
Gentiana acuta
Gentianopsis algida
Geum rossii
Heuchera parvifolia
Hieracium gracile
Juncus drummondii
Lidia obtusiloba
Ligusticum tenuifolium var. *filicinum*
Luzula spicata
Mertensia lanceolata
Micranthes rhomboidea
Noccaea montana
Oreobroma pygmaea
Oreoxis alpina
Oxyria digyna
Pedicularis parryi
Penstemon whippleanus
Phleum commutatum
Picea engelmannii
Pinus contorta
Pneumonanthe parryi
Poa fendleriana
Polemonium viscosum
Potentilla diversifolia
Potentilla pulcherrima
Primula angustifolia
Ribes montigenum
Salix brachycarpa
Salix reticulata
Saxifraga hyperborea subsp. *debilis*
Sedum lanceolatum
Senecio fremontii
Sibbaldia procumbens
Silene acaulis
Smelowskia calycina
Stellaria longipipes
Tonestus pygmaeus
Trifolium dasyphyllum
Trifolium nanum
Trifolium parryi
Trisetum spicatum
Vaccinium myrtillus var. *oreophilum*

Quandary Peak

Agoseris aurantiaca
Angelica grayi
Antennaria media
Artemisia arctica subsp. *saxicola*
Artemisia scopulorum
Besseyia alpina
Bistorta bistortoides
Bistorta vivipara
Bromus ciliatus
Campanula rotundifolia
Carex albonigra
Carex capillaris
Carex chalciolepis
Carex perglobosa
Carex rupestris
Castilleja occidentalis
Cerastium beeringianum
Cirsium scopulorum
Claytonia megarhiza
Cystopteris fragilis
Danthonia intermedia
Deschampsia cespitosa
Draba crassifolia
Elymus trachycaulus
Eremogone fendleri
Erigeron peregrinus
Erigeron pinnatisectus
Eritrichum aretoides
Festuca brachyphylla
Gentiana acuta
Gentianopsis algida
Geum rossii
Heuchera parvifolia var. *nivalis*
Hieracium gracile
Hirculus platysepalus ssp. *crandallii*
Juniperus communis
Lidia obtusiloba
Luzula spicata
Mertensia lanceolata
Micranthes rhomboidea
Oreoxis alpina
Oxyria digyna
Packera tridenticulata
Pedicularis parryi
Penstemon whippleanus
Phacelia sericea
Pneumonanthus parryi
Poa fendleriana
Poa rupicola
Potentilla diversifolia
Potentilla nivea
Salix brachycarpa
Salix reticulata
Sedum lanceolatum
Senecio fremontii
Sibbaldia procumbens
Silene acaulis
Solidago multiradiata
Stellaria umbellata
Tonestus pygmaeus
Trifolium dasyphyllum
Trifolium nanum
Trifolium parryi
Trisetum spicatum
Vaccinium scoparium

Upper Lost Man

<i>Achillea lanulosa</i>	<i>Cystopteris fragilis</i>	<i>Pedicularis bracteosa</i>
<i>Aconitum columbianum</i>	<i>Delphinium barbeyi</i>	<i>Pedicularis groenlandica</i>
<i>Agoseris aurantiaca</i>	<i>Deschampsia cespitosa</i>	<i>Pedicularis parryi</i>
<i>Agoseris glauca</i>	<i>Draba aurea</i>	<i>Pedicularis sudetica</i> subsp. <i>scopulorum</i>
<i>Alsinanthe macrantha</i>	<i>Draba crassa</i>	<i>Penstemon whippleanus</i>
<i>Androsace septentrionalis</i>	<i>Draba crassifolia</i>	<i>Phacelia sericea</i>
<i>Anemone multifida</i> var. <i>multifida</i>	<i>Eremogone fendleri</i>	<i>Phleum commutatum</i>
<i>Anemone narcissiflora</i> var. <i>zephra</i>	<i>Erigeron</i> <i>melanocephalus</i>	<i>Picea engelmannii</i>
<i>Angelica grayi</i>	<i>Erigeron peregrinus</i>	<i>Pneumonanthe parryi</i>
<i>Antennaria media</i>	<i>Erigeron pinnatisectus</i>	<i>Polemonium viscosum</i>
<i>Antennaria rosea</i>	<i>Eritrichum aretoides</i>	<i>Potentilla diversifolia</i>
<i>Aquilegia coerulea</i>	<i>Erysimum capitatum</i>	<i>Potentilla fruticosa</i>
<i>Arabis drummondii</i>	<i>Festuca brachyphylla</i>	<i>Potentilla nivea</i>
<i>Arnica parryi</i>	<i>Geum rossii</i>	<i>Potentilla pulcherrima</i>
<i>Artemisia scopulorum</i>	<i>Heterotheca villosa</i>	<i>Potentilla uniflora</i>
<i>Aster foliaceus</i>	<i>Heuchera parvifolia</i>	<i>Primula angustifolia</i>
<i>Besseya alpina</i>	<i>Heuchera parvifolia</i> var. <i>nivalis</i>	<i>Primula parryi</i>
<i>Bistorta bistortoides</i>	<i>Hirculus platysepalus</i> ssp. <i>crandallii</i>	<i>Pseudocymopterus</i> <i>montanus</i>
<i>Bistorta vivipara</i>	<i>Hirculus serpyllifolius</i> subsp. <i>chrysanthus</i>	<i>Ranunculus inamoenus</i>
<i>Caltha leptosepala</i>	<i>Juniperus communis</i>	<i>Rhodiola integrifolia</i>
<i>Campanula rotundifolia</i>	<i>Lidia obtusiloba</i>	<i>Rydbergia grandiflora</i>
<i>Campanula uniflora</i>	<i>Lloydia serotina</i>	<i>Salix arctica</i>
<i>Cardamine cordifolia</i>	<i>Luzula spicata</i>	<i>Salix brachycarpa</i>
<i>Carex aurea</i>	<i>Lycopodium</i> spp.	<i>Salix planifolia</i>
<i>Carex chalciolepis</i>	<i>Mertensia ciliata</i>	<i>Salix reticulata</i>
<i>Carex microptera</i>	<i>Mertensia lanceolata</i>	<i>Saxifraga cernua</i>
<i>Carex rupestris</i>	<i>Micranthes odontoloma</i>	<i>Saxifraga hyperborea</i> subsp. <i>debilis</i>
<i>Carex scopulorum</i>	<i>Micranthes oregana</i>	<i>Sedum lanceolatum</i>
<i>Castilleja occidentalis</i>	<i>Micranthes rhomboidea</i>	<i>Senecio amplexens</i> var. <i>holmii</i>
<i>Castilleja rhexifolia</i>	<i>Mimulus guttatus</i>	<i>Senecio crassulus</i>
<i>Cerastium beeringianum</i>	<i>Noccaea montana</i>	<i>Senecio fremontii</i>
<i>Chamerion angustifolium</i>	<i>Oreobroma pygmaea</i>	<i>Sibbaldia procumbens</i>
<i>Chionophila jamesii</i>	<i>Oreoxis alpina</i>	<i>Silene acaulis</i>
<i>Cirsium hesperium</i>	<i>Oxypolis fendleri</i>	<i>Smelowskia calycina</i>
<i>Claytonia megarhiza</i>	<i>Packera dimorphophylla</i> var. <i>dimorphophylla</i>	<i>Solidago multiradiata</i>
<i>Clementsia rhodantha</i>	<i>Paronychia pulvinata</i>	<i>Stellaria longipipes</i>

Upper Lost Man – continued

Swertia perennis
Tetranneuris grandiflora
Tonestus pygmaeus
Trifolium dasyphyllum
Trifolium nanum
Trifolium parryi
Trisetum spicatum
Trollius albiflorus
Vaccinium caespitosum
Vaccinium scoparium
Valeriana edulis
Veronica nutans
Viola labradorica
Zigadenus elegans

McCullough Gulch

Achillea lanulosa
Aconitum columbianum
Antennaria rosea
Arnica mollis
Aster foliaceus
Astragalus alpinus
Bistorta vivipara
Bromus ciliatus
Bromus inermis
Calamagrostis canadensis
Caltha leptosepala
Cardamine cordifolia
Carex aquatilis
Carex aurea
Carex canescens
Carex microptera
Carex nova
Carex scopulorum
Carex utriculata
Castilleja occidentalis
Chamerion danielsii
Cirsium arvense
Cirsium hesperium
Cirsium osterhoutii
Clementsia rhodantha
Conioselinum scopulorum
Danthonia intermedia
Delphinium barbeyi
Deschampsia cespitosa
Distegia involucrata
Eleocharis quinqueflora
Epilobium hornemannii
Equisetum arvense
Erigeron eximius
Erigeron speciosus
Festuca thurberi
Fragaria virginiana
Gaultheria humifusa
Gentiana thermalis
Geum macrophyllum
Habenaria hyperborea
Heracleum sphondylium var. *lanatum*
Heterotheca villosa
Juncus drummondii
Juncus sp.
Ligularia bigelovii
Ligusticum tenuifolium var. *filicinum*
Luzula parviflora
Micranthes odontoloma
Mitella pentandra
Oreochrysum parryi
Parnassia fimbriata
Pedicularis groenlandica
Phleum commutatum
Picea engelmannii
Pinus contorta
Populus tremuloides
Potentilla fruticosa
Potentilla pulcherrima
Pyrola minor
Rumex sp.
Salix brachycarpa
Salix monticola
Salix planifolia
Senecio eremophilus
Shepherdia canadensis
Spiranthes romanzoffiana
Trifolium repens
Zigadenus elegans

Grizzly Lake Trail, mine sites

Achillea lanulosa
Agoseris aurantiaca
Androsace septentrionalis
Anemone multifida var. *multifida*
Anemone narcissiflora var. *zephra*
Anemone patens var. *multifida*
Arnica mollis
Aster foliaceus
Bistorta bistortoides
Botrychium minganense
Carex microptera
Carex rupestris
Castilleja miniata
Castilleja rhexifolia
Chamerion subdentatum
Cilaria austromontana
Cirsium hesperium
Deschampsia cespitosa
Epilobium hornemannii
Eremogone fendleri
Erigeron melanocephalus
Erigeron peregrinus
Erigeron pinnatisectus
Festuca saximontana
Geum rossii
Heuchera parvifolia
Juncus drummondii
Juniperus communis
Ligularia amplexans
Luzula spicata
Mertensia ciliata
Mertensia lanceolata
Oreochrysum parryi
Oxyria digyna
Penstemon whippleanus
Phleum commutatum
Pneumonanthe parryi
Poa alpina
Poa reflexa
Polemonium pulcherrimum
Polemonium viscosum
Potentilla diversifolia
Potentilla pulcherrima
Pulsatilla patens

Salix brachycarpa
Salix planifolia
Sedum lanceolatum
Senecio amplexans var. *holmii*
Senecio crassulus
Sibbaldia procumbens
Stellaria umbellata
Trisetum spicatum
Valeriana edulis
Veronica nutans
Zigadenus elegans

Warren Lakes

Angelica grayi
Arnica mollis
Caltha leptosepala
Carex aquatilis
Carex ebenea
Carex norvegica
Carex nova
Carex scopulorum
Castilleja rhexifolia
Clementsia rhodantha
Delphinium barbeyi
Deschampsia cespitosa
Eleocharis sp.
Erigeron peregrinus
Eriophorum altaicum ssp. neogaenum
Eriophorum chamissonis
Hieracium gracile
Juncus balticus
Ligusticum tenuifolium var. filicinum
Luzula spicata
Micranthes odontoloma
Packera pseud aurea
Pedicularis groenlandica
Salix planifolia
Senecio triangularis
Spiranthes romanzoffiana
Swertia perennis
Veronica nutans

The following codes are used for surveyed areas on the spreadsheet.

Survey site	Code
McCullough Creek	MC
Magnolia mine	MM
Heart Lake (Flat Tops) 6.27.06	HL
Bison Lake (Flat Tops)	BL
Coffee Pot Spring (Flat Tops)6.27.06	CPS
Flat Tops General Area Extra, Date: 6.27.06 Heart Lk Qd.	FTGA
Spruce Fir (Flat Tops) 6.29.06 Heart Lk Qd.	SF
Wagonwheel Rd (Flat Tops), 6.28.06 Heart Lk Qd.	WW
Snowmelt Ponds Wagonwheel Rd (Flat Tops)S, 6.28.06 Heart Lk Qd.	SM
Buck Creek wetland (Flat Tops)	BCW
Buck Creek (Flat Tops)	BC
Road 621 (Flat Tops)	621
Indian Camp 1 (Flat Tops) 6.28	IC1
Indian Camp 2 (Flat Tops, feth) 6.28.06 Heart Lk Quad	IC2
The Meadow (Budges Resort, Flat Tops)	TM
Near Heart Lake	NHL
Independence Pass 7.4	IP
Peggy_Taylor Pass 7.5.06	TP
Loveland Pass East, 7.17.06	LPE
Loveland Pass West, 7.18.06	LPW
Hoosier Ridge, 7.19.06	HR
Boreas Pass, 7.20.06	BP
Upper Lost Man Trail, Date: 7.22.06	ULM
Santa Fe Peak-Silver Mt 7.27.06	SF
Silver Mt./Revenue Saddle btwn. (old mines) 7.28	SMR
Silver Mt. (aspect facing Sante Fe Pk) 7.28.06	SM
Warren Lakes General 8.6.06	WLG
Warren Lakes.E.altiacum site1	WLEA
Warren Lakes. Eriophorum cham site 1&2	WLEC
Missouri Mine, Georgia D. 8.7.06 Montezuma area	MMG
Iron Quarry Road 8.8 above Ashcroft	IQ
Hagerman Pass 8.9.06	HP
Town of Independence 8.10 Mine Sites	TI
Grizzly Creek Trail 8.11.06 mine sites	GC
Blue Lakes (Ptilogrostis site)	BL
Blue Lakes Rocky ledges and talus	BLR
Crystal Lake Fen 8.16	CLF
Crystal Lake.Hoosier Pass Area, 8.16.06	CLH
Quandry Peak 8.17.06	QP
Above Upper Blue Lk Talus Slope 8.18	UBLT
Above Upper Blue Lake Valley 8.18.06	UBLV
Horsethief	HT

Appendix II. The White River National Forest maintains and frequently updates its list of sensitive species. The current list is taken from USDA Forest Service, 2007. Sensitive Species List. Available online at <http://www.fs.fed.us/r2/projects/scp/sensitivespecies/index.shtml>, accessed on 12-21-07

Current sensitive species list

The following species are on the current R2 sensitive list (USDA 2007), and are known or expected from the White River National Forest. These species were the top priority for 2006 surveys. Each species is followed by its Natural Heritage rank (see Appendix II). Species in bold type were documented in 2006.

<i>Armeria maritima ssp. sibirica</i>	G5T5 S1
<i>Astragalus leptaleus</i>	G4 S2
<i>Astragalus wetherillii</i>	G3 S3
<i>Braya glabella</i>	G5 TNR S1
<i>Carex diandra</i>	G5 S1
<i>Cirsium perplexans</i>	G2G3 S2S3
<i>Draba exunguiculata</i>	G2 S2
<i>Draba grayana</i>	G2 S2
<i>Eriophorum altaicum var. neogaeum</i>	G4?T3T4S3
<i>Eriophorum chamissonis</i>	G5 S1
<i>Eriophorum gracile</i>	G5 S2
<i>Eutrema penlandii</i>	G1G2 S1S2 (Federally listed, Threatened)
<i>Ipomopsis globularis</i>	G2 S2
<i>Machaeranthera coloradoensis</i>	G2 S2
<i>Parnassia kotzebuei</i>	G5 S2
<i>Penstemon harringtonii</i>	G3 S3
<i>Phacelia scopulina var. submutica</i>	G4T2 S2
<i>Ptilagrostis porteri</i>	G2 S2
<i>Ranunculus karelinii</i>	G4G5 S2
<i>Rubus arcticus ssp. acaulis</i>	G5T5 S1
<i>Thalictrum heliophilum</i>	G3 S3

Species tracked by CNHP, documented from WRNF, not on any FS list:

<i>Asplenium trichomanes</i>	G4 S1S2
<i>Astragalus argophilus ssp. martini</i>	G4T4 S1
<i>Botrychium hesperium</i>	G3G4 S2
<i>Botrychium simplex</i>	G5 S1
<i>Carex concinna</i>	G4G5 S1
<i>Carex limosa</i>	G5 S2
<i>Conimitella williamsii</i>	G3? SH
<i>Cryptantha stricta</i>	G3 S3
<i>Cryptogramma stelleri</i>	G5 S2
<i>Cypripedium fasciculatum</i>	G4 S3
<i>Delphinium alpestre</i>	G2 S2

<i>Draba rectifruca</i>	G3? S2
<i>Draba ventosa</i>	G3 S1
<i>Festuca dasyclada</i>	G3 S3
<i>Lesquerella parviflora</i>	G2 S2
<i>Pellaea breweri</i>	G5 S2
<i>Penstemon mensarum</i>	G3 S3
<i>Phippsia algida</i>	G5 S2
<i>Saxifraga cespitosa</i>	G5T5 S1

Species	documented 2006	CNHP tracked/rank	FS Sensitive list 2002	FS species of viability concern 2002 plan	FS species which need more information 2002 plan	FS species recommended for sensitive list 2006	FS species recommended for other emphasis 2006	FS species recommended for list needing more information, 2006	Species to be monitored every 5 years per 2002 plan
Aquilegia saximontana		G3 S3			x		x		
Armeria maritima	x	G5T5 S1	x	x		x			x
Astragalus molybdenus		G3 S2		x			x		x
Astragalus wetherillii		G3 S3	x		x	x			
Besseya alpina	**	no					x		
Botrychium echo	x	G3 S3			x				
Botrychium lanceolatum	**?	no			x				
Botrychium minganense	x	G4 S1							
Botrychium pallidum		G3 S2							
Botrychium pinnatum		G4? S1							
Braya glabella		G5 TNR S1	x	x	x	x			
Braya humilis	x	G5 S2					x		
Carex diandra	x	G5 S1	x		x				
Cirsium perplexans	x	G2 S2				x			
Crataegus saligna	** (pvt land)	G2 S2						x	
Cyrtopodium parviflorum (none in wrnf)		G5 S2	x						

Species	documented 2006	CNHP tracked/rank	FS Sensitive list 2002	FS species of viability concern 2002 plan	FS species which need more information 2002 plan	FS species recommended for sensitive list 2006	FS species recommended for other emphasis 2006	FS species recommended for list needing more information, 2006	Species to be monitored every 5 years per 2002 plan
Cystopteris montana	x	G5 S1			x				
Draba borealis	x	G4 S2			x			x	
Draba crassa	x	G3 S3			x		x		
Draba exunguiculata	x	G2 S2	x		x	x			
Draba fladnizensis	x	G4 S2S3			x		x		
Draba globosa	x	G3 S1						x	x
Draba grayana	x	G2 S2	x		x	x			
Draba lonchocarpa		no			x				
Draba oligosperma	x	G5 S2			x		x		
Draba porsildii	x	G3G4 S1			x		x	x	
Draba streptobrachia	x	G3 S3			x		x		
Draba weberi	x	G1 S1						x	
Erigeron lanatus		G3G4 S1							
Erigeron pinnatisectus	**	no					x		
Eriogonum coloradoense		G2 S2			x			x	
Eriophorum altaicum	x	G4?T3T4 S3	x	x					x
Eriophorum chamissonis		G5 S1	x						

Species	documented 2006	CNHP tracked/rank	FS Sensitive list 2002	FS species of viability concern 2002 plan	FS species which need more information 2002 plan	FS species recommended for sensitive list 2006	FS species recommended for other emphasis 2006	FS species recommended for list needing more information, 2006	Species to be monitored every 5 years per 2002 plan
<i>Eutrema penlandii</i>	x	G1G2 S1S2	LT	x					
<i>Iliamna grandiflora</i>		G3?Q S1			x			x	
<i>Ipomopsis globularis</i>	x	G2 S2	x		x	x			
<i>Ipomopsis tenuituba</i>	**	no						x	
<i>Ligusticum tenuifolium</i>		no					x		
<i>Limnorchis ensifolia</i>		G4G5T4? S3			x				
<i>Listera borealis</i>		G4 S2			x				
<i>Listera convallarioides</i>		G5 S2			x				
<i>Lomatogonium rotatum</i>	**	no						x	
<i>Machaeranthera coloradoensis</i>	x	G2 S2	x	x		x			x
<i>Mentzelia multicaulis</i>		G3 S3					x		
<i>Menyanthes trifoliata</i>		no					x		
<i>Monardella odoratissima</i>		G4G5 S2					x		
<i>Papaver radicum ssp. kluanense</i>	**	no					x		

Species	documented 2006	CNHP tracked/rank	FS Sensitive list 2002	FS species of viability concern 2002 plan	FS species which need more information 2002 plan	FS species recommended for sensitive list 2006	FS species recommended for other emphasis 2006	FS species recommended for list needing more information, 2006	Species to be monitored every 5 years per 2002 plan
<i>Parnassia kotzebui</i>	x	G5 S2	x	x		x			x
<i>Penstemon harringtonii</i>		G3 S3	x	x		x			x
<i>Phacelia scopulina</i>		G4T2 S2	x	x					x
<i>Physaria alpina</i>	x	G2? S2?						x	
<i>Ptilogrostis porteri</i>	x	G2 S2	x	x					x
<i>Ranunculus karelinii</i>		G4G5 S2	x	x (gelidus)		x			x
<i>Rubus arcticus</i>		G5T5 S1	x			x			
<i>Saussurea weberi</i>	x	G2G3 S2			x		x		
<i>Sullivantia hapemanii</i> var. <i>purpusii</i>		G3T3 S3			x		x		
<i>Thalictrum heliophilum</i>		G3 S3	x	x		x			x

Appendix III

The Natural Heritage Ranking System

Key to the functioning of Natural Heritage Programs is the concept of setting priorities for gathering information and conducting inventories. The number of possible facts and observations that can be gathered about the natural world is essentially limitless. The financial and human resources available to gather such information are not. Because biological inventories tend to be under-funded, there is a premium on devising systems that are both effective in providing information that meets users' needs and efficient in gathering that information. The cornerstone of Natural Heritage inventories is the use of a ranking system to achieve these twin objectives of effectiveness and efficiency.

Ranking species and ecological communities according to their imperilment status provides guidance for where Natural Heritage Programs should focus their information-gathering activities. For species deemed secure, only general information needs to be maintained by Natural Heritage Programs. Fortunately, the more common and secure species constitute the majority of most groups of organisms. On the other hand, for those species that are by their nature rare, more detailed information is needed. Because of these species' rarity, gathering comprehensive and detailed population data can be less daunting than gathering similarly comprehensive information on more abundant species.

To determine the status of species within Colorado, CNHP gathers information on plants, animals, and plant communities. Each of these elements of natural diversity is assigned a rank that indicates its relative degree of imperilment on a five-point scale (for example, 1 = extremely rare/imperiled, 5 = abundant/secure). The primary criterion for ranking elements is the number of occurrences (in other words, the number of known distinct localities or populations). This factor is weighted more heavily than other factors because an element found in one place is more imperiled than something found in twenty-one places. Also of importance are the size of the geographic range, the number of individuals, the trends in both population and distribution, identifiable threats, and the number of protected occurrences.

Element imperilment ranks are assigned both in terms of the element's degree of imperilment within Colorado (its State-rank or S-rank) and the element's imperilment over its entire range (its Global-rank or G-rank). Taken together, these two ranks indicate the degree of imperilment of an element. For example, the lynx, which is thought to be secure in northern North America but is known from less than five current locations in Colorado, is ranked G5 S1 (globally-secure, but critically imperiled in this state). The Rocky Mountain Columbine, which is known only in Colorado from about 30 locations, is ranked a G3 S3 (vulnerable both in the state and globally, since it only occurs in Colorado and then in small numbers). Further, a tiger beetle that is only known from one location in the world at the Great Sand Dunes National Monument is ranked G1 S1 (critically imperiled both in the state and globally, because it exists in a single location). CNHP actively collects, maps, and electronically processes specific occurrence

information for animal and plant species considered extremely imperiled to vulnerable in the state (S1 - S3). Several factors, such as rarity, evolutionary distinctiveness, and endemism (specificity of habitat requirements), contribute to the conservation priority of each species. Certain species are “watchlisted,” meaning that specific occurrence data are collected and periodically analyzed to determine whether more active tracking is warranted. A complete description of each of the Natural Heritage ranks is provided in Table 1.

This single rank system works readily for all species except those that are migratory. Those animals that migrate may spend only a portion of their life cycles within the state. In these cases, it is necessary to distinguish between breeding, non-breeding, and resident species. As noted in Table 1, ranks followed by a “B,” for example S1B, indicate that the rank applies only to the status of breeding occurrences. Similarly, ranks followed by an “N,” for example S4N, refer to non-breeding status, typically during migration and winter. Elements without this notation are believed to be year-round residents within the state.

Table 1. Definition of Natural Heritage Imperilment Ranks

G/S1	Critically imperiled globally/state because of rarity (5 or fewer occurrences in the world/state; or 1,000 or fewer individuals), or because some factor of its biology makes it especially vulnerable to extinction.
G/S2	Imperiled globally/state because of rarity (6 to 20 occurrences, or 1,000 to 3,000 individuals), or because other factors demonstrably make it very vulnerable to extinction throughout its range.
G/S3	Vulnerable through its range or found locally in a restricted range (21 to 100 occurrences, or 3,000 to 10,000 individuals).
G/S4	Apparently secure globally/state, though it may be quite rare in parts of its range, especially at the periphery. Usually more than 100 occurrences and 10,000 individuals.
G/S5	Demonstrably secure globally/state, though it may be quite rare in parts of its range, especially at the periphery.
G/SX	Presumed extinct globally, or extirpated within the state.
G#?	Indicates uncertainty about an assigned global rank.
G/SU	Unable to assign rank due to lack of available information.
GQ	Indicates uncertainty about taxonomic status.
G/SH	Historically known, but usually not verified for an extended period of time.
G#T#	Trinomial rank (T) is used for subspecies or varieties. These taxa are ranked on the same criteria as G1-G5.
S#B	Refers to the breeding season imperilment of elements that are not residents.
S#N	Refers to the non-breeding season imperilment of elements that are not permanent residents. Where no consistent location can be discerned for migrants or non-breeding populations, a rank of SZN is used.
SZ	Migrant whose occurrences are too irregular, transitory, and/or dispersed to be reliably identified, mapped, and protected.
SA	Accidental in the state.
SR	Reported to occur in the state but unverified.
S?	Unranked. Some evidence that species may be imperiled, but awaiting formal rarity ranking.

Note: Where two numbers appear in a state or global rank (for example, S2S3), the actual rank of the element is uncertain, but falls within the stated range.

Legal Designations for Rare Species

Natural Heritage imperilment ranks should not be interpreted as legal designations. Although most species protected under state or federal endangered species laws are extremely rare, not all rare species receive legal protection. Legal status is designated by either the U.S. Fish and Wildlife Service under the Endangered Species Act or by the Colorado Division of Wildlife under Colorado Statutes 33-2-105 Article 2. In addition, the U.S. Forest Service recognizes some species as “Sensitive,” as does the Bureau of Land Management. Table 2 defines the special status assigned by these agencies and provides a key to abbreviations used by CNHP.

Table 2. Federal and State Agency Special Designations for Rare Species

Federal Status:	
1. U.S. Fish and Wildlife Service (58 Federal Register 51147, 1993) and (61 Federal Register 7598, 1996)	
LE	Listed Endangered: defined as a species, subspecies, or variety in danger of extinction throughout all or a significant portion of its range.
LT	Listed Threatened: defined as a species, subspecies, or variety likely to become endangered in the foreseeable future throughout all or a significant portion of its range.
P	Proposed: taxa formally proposed for listing as Endangered or Threatened (a proposal has been published in the Federal Register, but not a final rule).
C	Candidate: taxa for which substantial biological information exists on file to support proposals to list them as endangered or threatened, but no proposal has been published yet in the Federal Register.
PDL	Proposed for delisting.
XN	Nonessential experimental population.
2. U.S. Forest Service (Forest Service Manual 2670.5) (noted by the Forest Service as S’)	
FS	Sensitive: those plant and animal species identified by the Regional Forester for which population viability is a concern as evidenced by: Significant current or predicted downward trends in population numbers or density. Significant current or predicted downward trends in habitat capability that would reduce a species' existing distribution.
3. Bureau of Land Management (BLM Manual 6840.06D) (noted by BLM as “S”)	
BLM	Sensitive: those species found on public lands designated by a State Director that could easily become endangered or extinct in a state. The protection provided for sensitive species is the same as that provided for C (candidate) species.
4. State Status:	
The Colorado Division of Wildlife has developed categories of imperilment for non-game species (refer to the Colorado Division of Wildlife’s Chapter 10 – Nongame Wildlife of the Wildlife Commission's regulations). The categories being used and the associated CNHP codes are provided below.	
E	Endangered: those species or subspecies of native wildlife whose prospects for survival or recruitment within this state are in jeopardy, as determined by the Commission.
T	Threatened: those species or subspecies of native wildlife which, as determined by

the Commission, are not in immediate jeopardy of extinction but are vulnerable because they exist in such small numbers, are so extremely restricted in their range, or are experiencing such low recruitment or survival that they may become extinct.

SC

Special Concern: those species or subspecies of native wildlife that have been removed from the state threatened or endangered list within the last five years; are proposed for federal listing (or are a federal listing “candidate species”) and are not already state listed; have experienced, based on the best available data, a downward trend in numbers or distribution lasting at least five years that may lead to an endangered or threatened status; or are otherwise determined to be vulnerable in Colorado.

Appendix IV. Potential Conservation Areas.

Four new Potential Conservation Areas (PCAs) containing rare plants were identified on the White River National Forest in 2007. Another two were revised.

Potential Conservation Areas represent our best estimate of the primary area needed to support the plants, animals or communities on which the PCA is based. Each Potential Conservation Area is described in a standard site profile reflecting data fields in CNHP's Biotics Data System. They are arranged below in the approximate order of their need for conservation attention, i.e. by Biodiversity Rank, and then alphabetically within each rank.

Each PCA profile below contains the following information:

Biodiversity Rank (B-rank): The overall significance of the site in terms of rarity of the Natural Heritage resources and the quality (condition, abundance, etc.) of the occurrences. For rank definitions, please see the Natural Heritage Ranking System section of this report.

Protection Urgency Rank (P-rank): An estimate of the urgency of conservation protection. This rank generally refers to the need for a major change of protective status (i.e., ownership or designation as a natural area). For rank definitions, please see the Natural Heritage Ranking System section of this report (Appendix III)

Management Urgency Rank (M-rank): An estimate of the time frame in which conservation management must occur. Using best scientific estimates, this rank refers to the need for management such as weed control, trail closures, etc. For rank definitions, please see the Natural Heritage Ranking System section of this report (Appendix I).

Location: County, general location, usually in approximate air miles from the nearest town, and USGS 7.5 minute topographic map name.

Legal Description: Township, range and section(s).

Elevation Range: Lowest and highest elevations within the site boundaries, as drawn on U.S.G.S. topographic maps.

Size: Number of acres within the site boundary, as determined from GIS mapping (ArcView).

General Description: A brief narrative of the topography, vegetation, and current use of the potential conservation area.

Biodiversity Rank Justification: A synopsis of the significant elements occurring in the site. A table within the site profile lists the element occurrences found within the site, their rarity ranks, the occurrence ranks and federal and state agency special designations.

The species or communities that are the primary element of concern are printed in bold type within the table. When several entries are in bold type, any one of the occurrences would be sufficient to justify the site rank. See Table 1, Chapter I, for explanations of ranks, and Table 2, Chapter I, for legal designations.

Table of elements found in the PCA: Includes scientific name, common name, global and state ranks, federal or state status and element occurrence rank.

Boundary Justification: Justification for the location of the potential conservation site planning boundary delineated in this report, including all known occurrences of natural heritage resources and, in some cases, adjacent lands required for their protection.

Protection rank comments: Any additional pertinent information regarding the need for protection of the site.

Management rank comments: Any additional pertinent information regarding the need for management actions at the site.

Continental Divide-Santa Fe Peak to Revenue Mountain PCA

Biodiversity Rank: B2: Very high biodiversity significance. This PCA supports an excellent (A-ranked) occurrence of a globally imperiled (G2) plant.

Protection Urgency Rank: P2: Protection actions may be needed within 5 years. It is estimated that stresses may reduce the viability of the elements in the PCA within this approximate timeframe. Although the majority of the PCA is within the White River National Forest, there are several mining claims in the site with no known protection.

Management Urgency Rank: M4: Current management seems to favor the persistence of the plants in the PCA, but management actions may be needed in the future to maintain the current quality of the plants occurrences.

Location: To access the PCA drive from Montezuma east on the Morgan Gulch Road that passes south of Tiptop and Morgan Peaks. Park at the saddle between Morgan Peak and Santa Fe Peak. Walk southeast up the ridge to the north-facing slopes and to Continental Divide at Santa Fe Peak. Continue along divide to Revenue Peak.

U.S.G.S. 7.5 minute quadrangle: Montezuma
Legal Description: T5S, R75W, Sections 29-31
T5S, R76W, Sections 25 and 36

Elevation: 12,800 to 13,180 ft.

Size: Approximately 381 acres

General Description: The Continental Divide PCA includes a rocky alpine ridge along the Continental Divide between 12,000-13,000 feet above sea level with spectacular views of the entire Gore Range. These rock outcrops are surrounded by high quality communities dominated by tufted hairgrass/alpine avens (*Deschampsia cespitosa/Geum rossii*) and sibbaldia/ alpine sandwort (*Sibbaldia procumbens/Lidia obutsiloba*). A few small rivulets from snowmelt run through the area and support a more mesic combination of plant species. There is extensive impact to the surrounding lands from historical mining and associated roads.

Biodiversity Rank Justification and Comments: The Continental Divide PCA supports a total of ten occurrences of rare plants, including an excellent (A-ranked) occurrence of Gray's draba (*Draba grayana*), and a good (B-ranked) occurrences of clawless draba (*Draba exunguiculata*), both globally imperiled (G2). Although a positive identification of the species which is listed as *D. grayana* is still pending, the PCA rank is justified based on the clawless draba.

Natural Heritage element occurrences at the Continental Divide PCA.

Elements in bold are those upon which the PCA's B-rank is based.

Scientific Name	Common Name	Global Rank	State Rank	Federal and State Status	EO* Rank
<i>Draba grayana?</i>	Gray's draba	G2	S2		A
<i>Draba exunguiculata</i>	clawless draba	G2	S2		B
<i>Draba exunguiculata</i>	clawless draba	G2	S2		C
<i>Draba crassa</i>	thickleaf draba	G3	S3		B
<i>Draba crassa</i>	thickleaf draba	G3	S3		B
<i>Draba globosa</i>	beavertip draba	G3	S1		C
<i>Draba fladnizensis</i>	Austrian draba	G4	S2S3		B
<i>Draba borealis</i>	boreal draba	G4	S2		C
<i>Draba crassa</i>	thickleaf draba	G3	S3		D
<i>Ranunculus karelinii</i>	ice cold buttercup	G4G5	S2		D

*EO=Element Occurrence. Multiple listings represent separate locations.

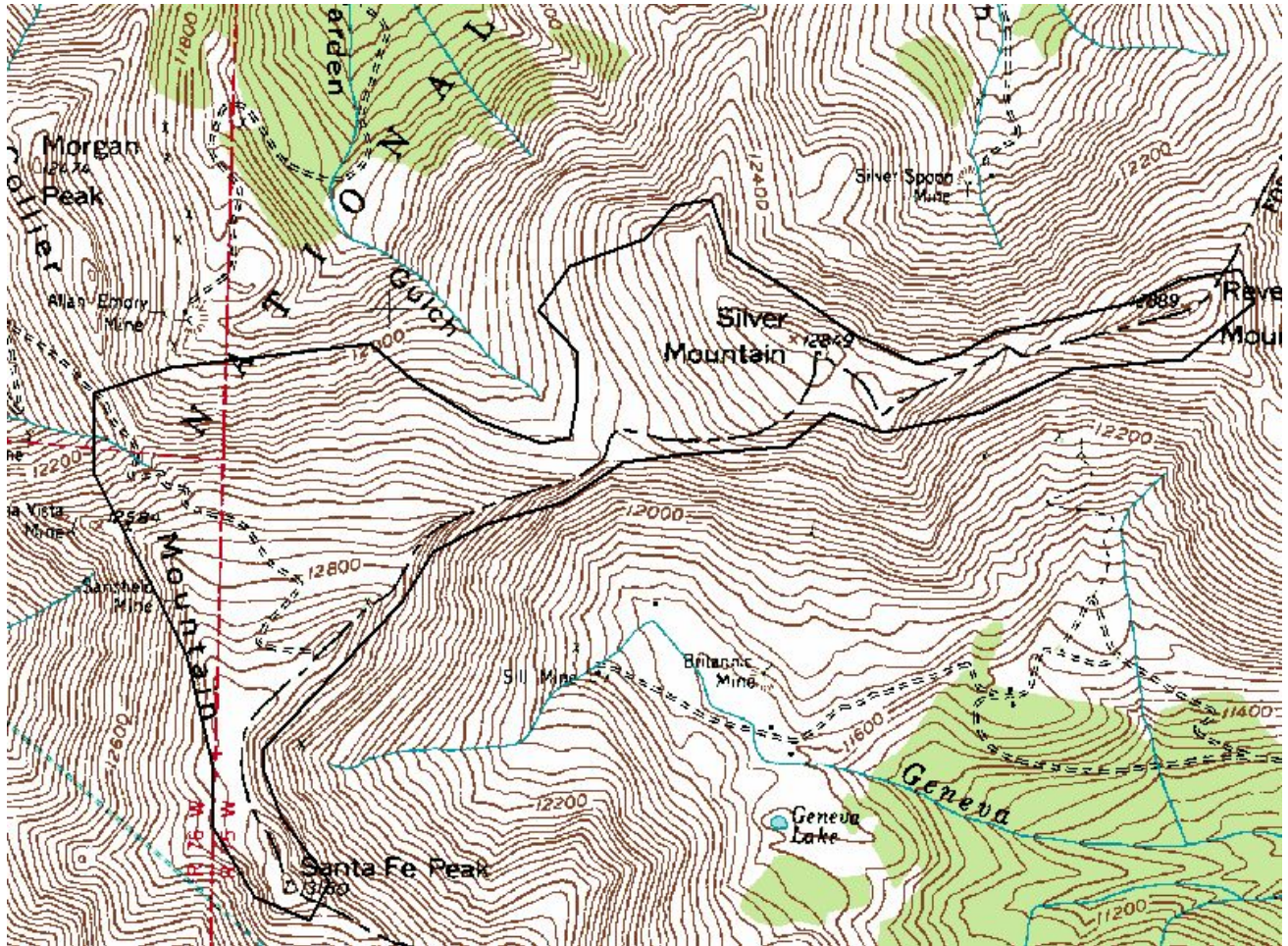
Boundary Justification: The boundary is drawn to encompass new plant element occurrences and surrounding similar habitat as well as the pre-existing adjacent Collier Mt. PCA

Protection Comments: The PCA is primarily within the White River National Forest, but includes several mining claims. Ownership of these sites is unknown. Acquisition of the private lands by the Forest Service could help to protect this site.

Management Rank Comments: The PCA is accessed from a four-wheel drive road which appears to be little used. Careful planning of any future trail development to avoid the rare plants would help to sustain these occurrences. Periodic monitoring is recommended. These high mountain populations may be threatened by global warming, and although there is little that local management can do, information about their response to climate change is of scientific concern.

Continental Divide PCA

B2: Very High Biodiversity Significance



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PCA Boundary

Montezuma
 7.5 Minute Series

Digital Raster Graphics
 Produced by the U.S. Geological Survey

Map created 11 March 2007
 UTM Zone 13 NAD 83

Location in Study Area



Town of Independence PCA

Biodiversity Rank: B4: Moderate biodiversity significance. The site rank is based on an extant (E) occurrence of *Botrychium echo*, a globally vulnerable (G3) plant

Protection Urgency Rank: P4: No protection actions are needed in the foreseeable future. The site is within the White River NF and has no special designation..

Management Urgency Rank: M3: New management actions may be needed within five years to maintain the current quality of the site.

Location: To access the PCA, drive from Aspen south on Hwy 82 to the town of Independence. Park at a pullout on the left by the first old buildings of Town. Walk up the hill to the north to reach the mine site with *Botrychium* spp. To reach the southern part, walk along old mining road on the south side of Hwy 82 toward Green Mountain; cross the Roaring Fork River. The road ends near this fen/marshy area. It is about a 30 minute walk.

U.S.G.S. 7.5 minute quadrangles: New York Peak and Independence Pass
Legal Description: T11S, R82W, Section 7
T11S, R83W, Sections 1, 2, 11, 12

Elevation: 10,800 to 11,830 ft.

Size: Approximately 376 acres

General Description: The Town of Independence PCA extends along a mine site north of highway and wetlands south of highway. The north section of site is a large area located on steep hillside of the Independence diggings, north of the old stamp mill (on L hillside as you head up the Pass). There are multiple species of *Botrychium* across the hillside from the top waypoint in tailings to the lower elevations in an old logged area. Southern part of site is a marshy opening in spruce/fir forest.

Biodiversity Rank Justification and Comments:

Site rank is based on an extant (E) occurrence of *Botrychium echo*, a globally vulnerable (G3) plant.

Natural Heritage element occurrences at the Town of Independence PCA.

Elements in bold are those upon which the PCA's B-rank is based.

Scientific Name	Common Name	Global Rank	State Rank	Federal and State Status	EO* Rank
<i>Botrychium echo</i>	reflected grapefern	G3	S3		E
<i>Botrychium minganense</i>	Mingan moonwort	G4	S1		E
<i>Botrychium pinnatum</i>	northern moonwort	G4?	S1		E
<i>Botrychium hesperium</i>	western moonwort	G3G4	S2		E
<i>Eriophorum altaicum</i> var. <i>neogaena</i>	whitebristle cottongrass	G4?T3T4	S3		E

*EO=Element Occurrence. Multiple listings represent separate locations.

Boundary Justification:

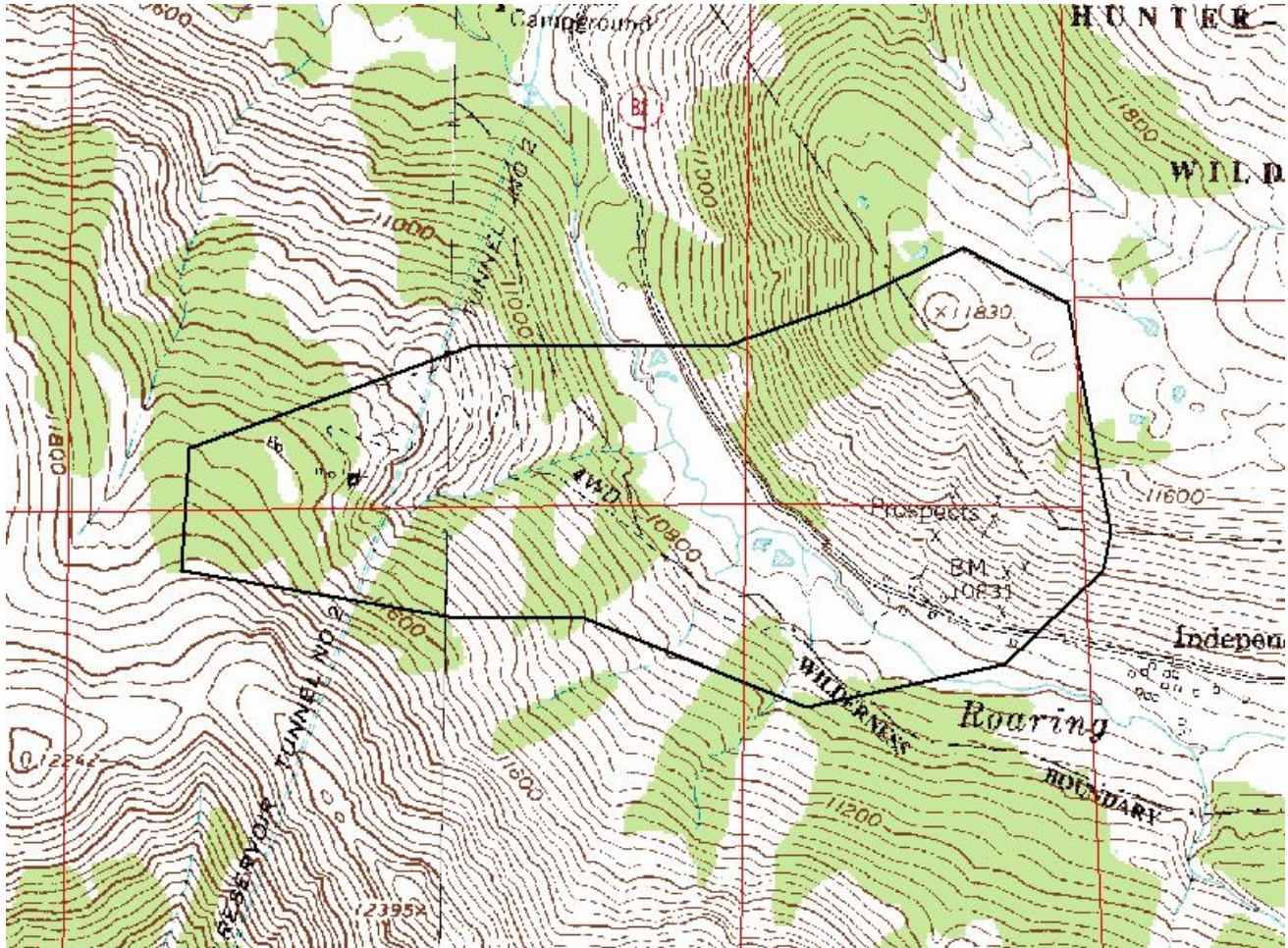
The boundary is drawn to include mine sites and surrounding areas on both sides of Hwy 82, with *Botrychium* and *Eriophorum* occurrences.

Protection Comments:

The site lies within the White River NF and has no special designation.

Management Rank Comments: The wetland areas with *Eriophorum altaicum* show much disturbance by people driving 4-wheelers. Closing the road from Hwy 82 would help to preserve this population. The USFS is planning to fill in a few open mine shafts near Hwy 82, which have *Botrychiums* growing in the old tailings that they plan to use as fill. However, there is such a large number of *Botrychiums* growing on the hillside above those areas, there is a plentiful source for spores. This area is across the street from the old Town of Independence, which receives thousands of visitors each day during summer months. It does not appear that many people are hiking in this area, possibly due to the steepness.

Town of Independence PCA B5: General Biodiversity Significance



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PCA Boundary

Independence Pass, New
York Peak
7.5 Minute Series

Digital Raster Graphics
Produced by the U.S. Geological Survey

Map created 11 March 2007
UTM Zone 13 NAD 83

Location in Study Area



Hunter Creek Wetland PCA

Biodiversity Rank: B4: The site rank is based on an excellent (A-ranked) occurrence of a state rare (S1) plant. The site also includes high quality wetlands and old growth spruce-fir forest.

Protection Urgency Rank: P4: No protection actions are needed in the foreseeable future.

Management Urgency Rank: M4: Current management seems to favor the persistence of the elements in the PCA, but management actions may be needed in the future to maintain the quality of the element occurrences.

Location: To access the PCA drive from Aspen on Mill Street to Red Mountain Road and follow signs into what says private (but you are actually staying on public road) to the gate for the Hunter Creek Trail. You must go inside the gate to park. It is also possible to park at the lower entrance to the trail, but there is just a long uphill. It may be easier to find as you can follow signs from the Red Mountain Road to this access. Hike up valley until beaver ponds appear ahead and on the right. Take the bridge that goes over Hunter Ck. There is an old trail to the site area, but it may be hard to locate. The site is on the south side of these first beaver ponds where the spruce-fir intersects with the willows. These ponds are easy to spot on the quad.

U.S.G.S. 7.5 minute quadrangle: Aspen
Legal Description: T10S, R84W, Sections 3 and 4

Elevation: 8773 to 8880 ft.

Size: Approximately 221 acres

General Description: The Hunter Creek PCA occupies the spruce-fir forest interface with willow carr/beaver ponds. There is deep, rich soil in an old growth forest with lots of decaying logs and detritus. Plants are growing in forest as well as among the willows that are intermixed with the spruces and firs. Associated species include *Streptopus amplexifolius*, *Heracleum spondylium* subsp. *montanum*, *Pyrola asarifolia*, *Geum macrophyllum*, *Galium septentrionalis*, *Thalictrum fendleri*, *Equisetum arvense*, *Micranthes odontoloma*, *Salix drummondii*, *Alnus incana* susp. *tenuifolia*, *Lonicera involucrata*, *Urtica gracilis*.

Biodiversity Rank Justification and Comments: The Hunter Creek Wetland PCA supports an excellent (A-ranked) occurrence of mountain bladderfern (*Cystopteris montana*), a plant that is very rare in Colorado.

Natural Heritage element occurrences at the Hunter Creek Wetland PCA.

Elements in bold are those upon which the PCA's B-rank is based.

Scientific Name	Common Name	Global Rank	State Rank	Federal and State Status	EO* Rank
<i>Cymopteris montana</i>	Mountain bladder fern	G5	S1		A

*EO=Element Occurrence. Multiple listings represent separate locations.

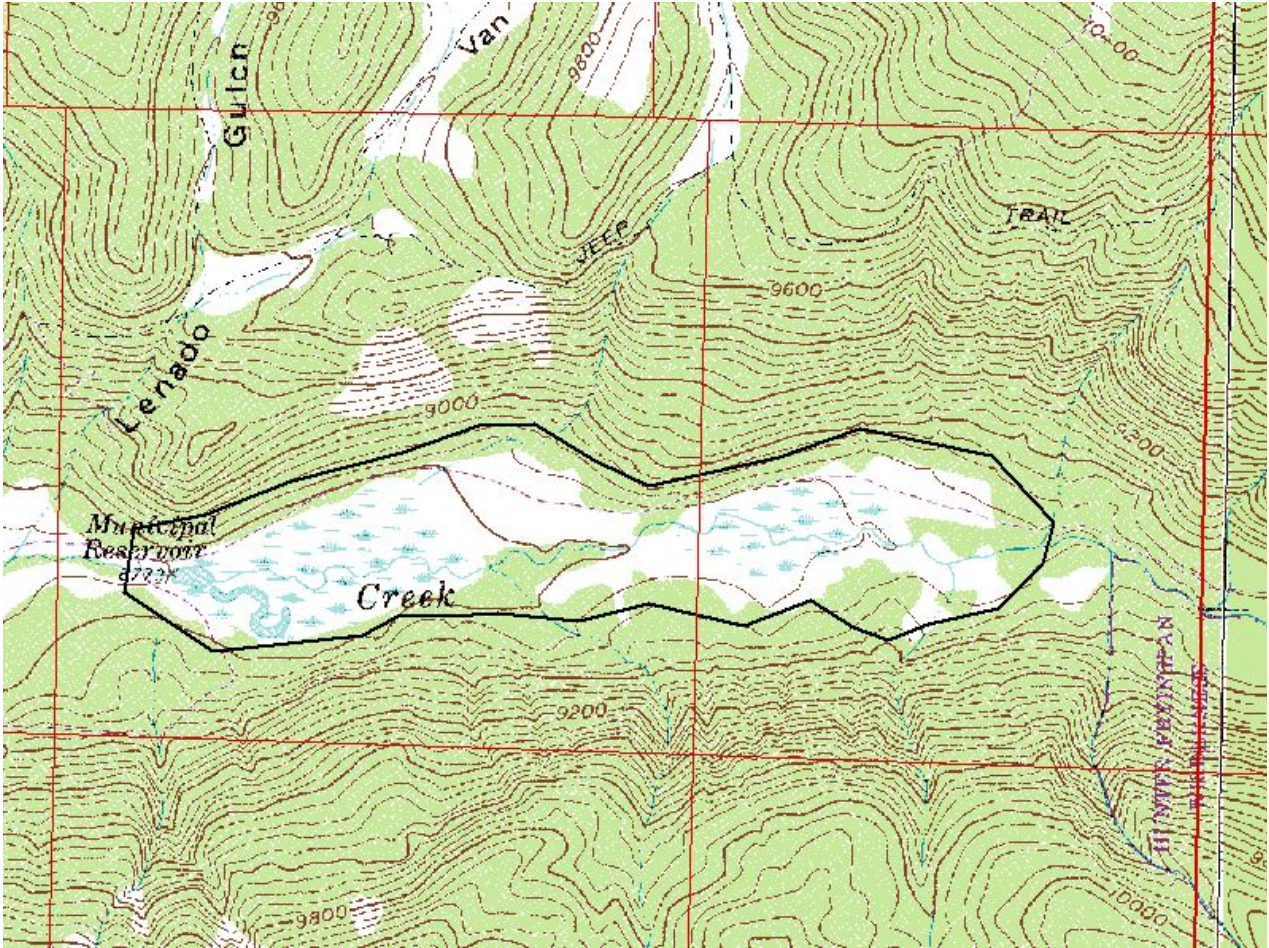
Boundary Justification: The boundary is drawn to include the occurrence of *Cystopteris montana* and the adjacent habitat at the edge of the spruce-fir forest.

Protection Comments: The site is within the White River NF and has no special designation. It is fairly difficult to access and gets little human use.

Management Rank Comments: Recent observations indicate that the occurrence may have grown in the last few years.

Hunter Creek Wetland PCA

B5: General Biodiversity Significance



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PCA Boundary

Aspen
 7.5 Minute Series

Digital Raster Graphics
 Produced by the U.S. Geological Survey

Map created 11 March 2007
 UTM Zone 13 NAD 83

Location in Study Area



Warren Lakes PCA

Biodiversity Rank: B5: General biodiversity significance. The site rank is based on a good (B) occurrence of a globally vulnerable subspecies (T3T4) that is included on the USFS Region 2 sensitive species list.

Protection Urgency Rank: P4: No protection actions are needed in the foreseeable future.

Management Urgency Rank: M3: New management actions may be needed within five years to maintain the current quality of the site.

Location: To access the PCA, drive from Aspen to Smuggler Road (4-wheel drive road) to the Warren Lakes area and park at the gate at the private property boundary. There is no trail into the area, but by bushwhacking around the hill to the south, one can intercept an old road at the south end of Warren Lake, at the wilderness boundary, which is signed. This road is closed, but only partially re-vegetated, and leads to a large meadow/wetland, where it becomes a single track, and then disappears. A pack trail which is shown on the USGS topo, but not on the forest map, runs from the north end of Warren Lake northeast to No Name and Hunter Creeks, and southeast through the area to Midway Pass. The trail is still in existence, but not maintained, and appears to be little used.

U.S.G.S. 7.5 minute quadrangles: Aspen, Thimble Rock

Legal Description: T10S, R83W, Sections 19, 20, 29, 30

T10S, R84W, Sections 14, 15, 22-26, 36

Elevation: 10,600 to 11,800 ft.

Size: Approximately 3,540 acres

General Description: The Warren Lakes PCA contains marshy openings in spruce-fir and lodgepole forest; it is a very wet area with some shallow open water. Associated species include *Micranthes oregana*, *Caltha leptosepala*, *Deschampsia caespitosa*, *Carex norvegica*, *Swertia perennis*, *Sedum rodanthum*, *Pedicularis groenlandica*, and *Packera pseudaurea*.

Biodiversity Rank Justification and Comments: The Warren Lakes PCA supports a good (B-ranked) occurrence of a globally vulnerable subspecies (T3T4) that is included on the USFS Region 2 sensitive species list.

Natural Heritage element occurrences at the Warren Lakes PCA.

Elements in bold are those upon which the PCA's B-rank is based.

Scientific Name	Common Name	Global Rank	State Rank	Federal and State Status	EO* Rank
<i>Eriophorum chamissonis</i>	Chamisso's cottongrass	G5	S1		
<i>E. altaicum</i> var. <i>neogaenum</i>	whitebristle cottongrass	G4?T3T4	S3		
<i>E. altaicum</i> var. <i>neogaenum</i>	whitebristle cottongrass	G4?T3T4	S3		

*EO=Element Occurrence. Multiple listings represent separate locations.

Boundary Justification: The boundary is drawn to include three occurrences of *Eriophorum* species and adjacent wetlands that are potential habitat.

Protection Comments: The site is within the White River NF and has no special designation. It is fairly difficult to access and gets little human use.

Management Rank Comments: The area has been impacted by peat mining in the past. There is now a gate to prevent access. It is unknown whether any restoration action is planned.

