COLORADO FOURTEENERS INITIATIVE

2007 RARE PLANT SURVEY REPORT

Mount Lincoln, Mount Democrat, and Mount Bross in the southern Mosquito Range

***Crepis nana* (dwarf hawksbeard) between Mt. Lincoln and Mt. Bross.**

Brian A. Elliott
Elliott Environmental Consulting
elliottconsultingusa.com

10-17-2007

Colorado Fourteeners Initiative
Rare Plant Survey Report
Rare plant surveys of
Mount Lincoln, Mount Democrat, and Mount Bross
in the southern Mosquito Range.
2007

Prepared for the
Colorado Fourteeners Initiative
and
US Forest Service
Leadville Ranger District
by
Brian A. Elliott
Elliott Environmental Consulting
elliottconsultingusa.com
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Introduction

Colorado's alpine zone supports a unique flora, including many rare species. Some rare species are circumboreal, being common in the arctic regions and reaching their southernmost distribution in the alpine of Colorado. Others are disjunct, known from small populations separated by hundreds of miles from main populations to the north. Finally, Colorado is also home to several endemic alpine species known only from the Colorado alpine.

Recreation in Colorado's alpine has recently grown exponentially with a corresponding increase in Colorado's population. Some of the most concentrated impacts in the alpine zone are on user-created trails accessing 14,000 foot peaks. These trails cause impacts to alpine vegetation, including rare alpine plants. By designating routes up the Fourteeners, impacts to alpine ecosystems can be avoided or minimized. Perhaps the most effective mitigation of impacts is re-routing trails to avoid populations of rare alpine plants.

The purpose of this rare plant survey was two-fold. First, to identify plant species of conservation concern within or adjacent to existing and proposed trail corridors. Second, to re-route existing or proposed trails and avoid these populations when an alternative route is feasible.

Survey Methods

A pedestrian survey of existing and proposed trail corridors was performed in support of proposed trail construction on Mount Lincoln, Mount Democrat, and Mount Bross in the southern Mosquito Range. The survey area followed proposed routes previously established by U.S. Forest Service personnel, and varied in width from 20 to 100 feet. Target species were identified from a variety of sources, including the U.S. Fish and Wildlife Service (FWS 2006), U.S. Forest Service (2007), and Colorado Natural Heritage Program (2007a and 2007b).

Survey methodology followed Forest Service guidelines (Forest Service 2005b). A meandering transect within the narrow trail corridor was designed to capture all species of concern within the corridor. Plants within the corridor were identified to species and compared to lists of target species. This technique leads to a relatively complete survey of the trail corridor. Survey intensity is high due to the rarity of many of the target species and the length of time for recovery from impacts in the alpine zone.

When populations of target species were identified the trail was re-routed immediately to avoid them. Changing the alignment during surveys prevented multiple visits to these inaccessible sites. The sole drawback was the necessity for both the trail planner and botanist to be present during botanical surveys. This technique has been used successfully on several 14,000 foot peaks.

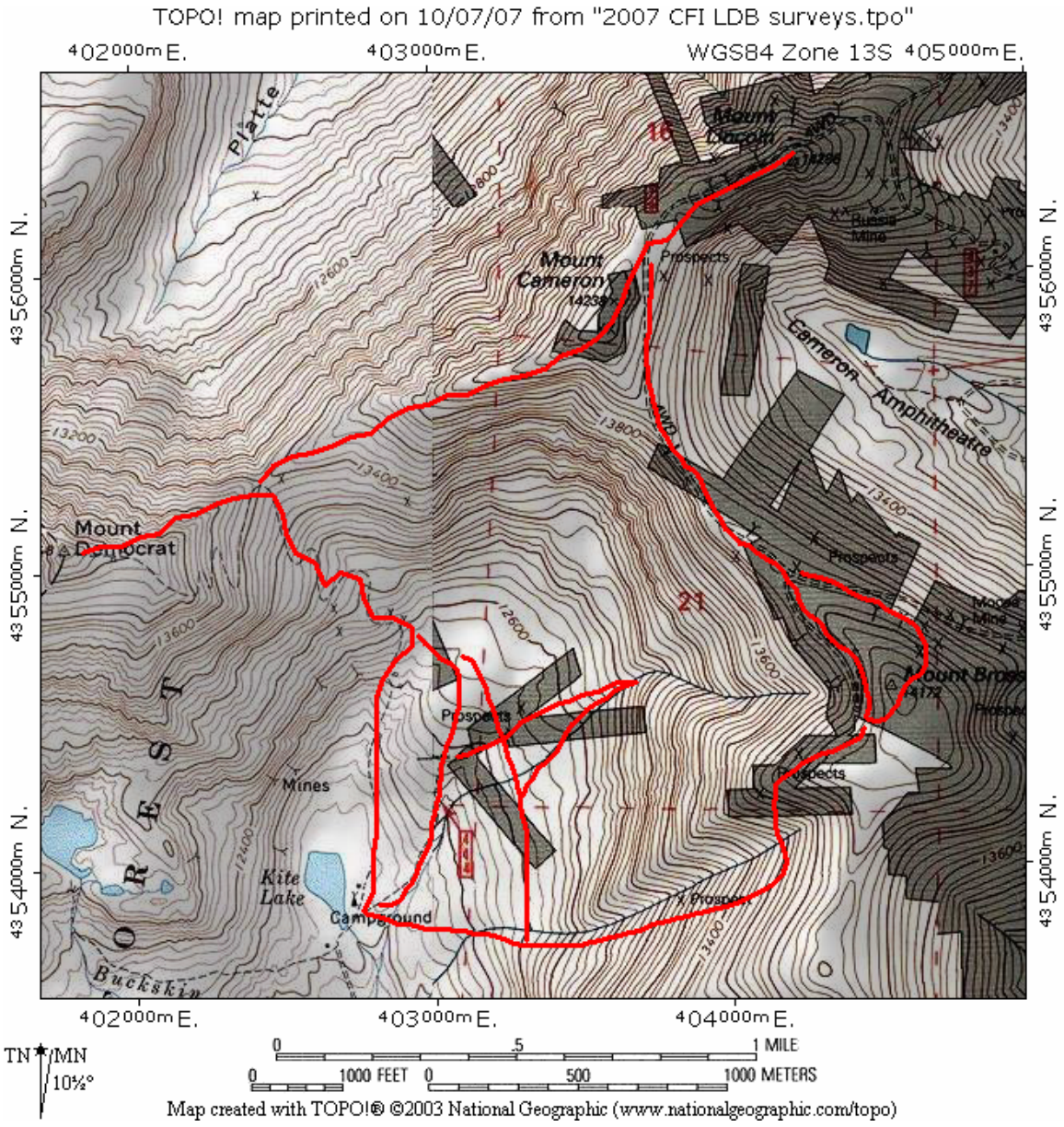
Results

The Mosquito Range is well known for its rare flora, and several rare plant species were located during surveys of Mount Lincoln, Mount Democrat, and Mount Bross, including *Aquilegia saximontana* (Rocky Mountain columbine), *Chionophila jamesii* (snowlover), *Crepis nana* (dwarf hawksbeard), *Draba crassa* (thick-leaf whitlow grass, *Eutrema penlandii* (Penland alpine fen mustard), *Penstemon harbourii* (Harbour beardtongue), *Papaver kluanense* (alpine poppy), and *Ranunculus gelidus* (ice-cold buttercup). No invasive plant species or noxious weeds were documented.

Mount Lincoln, Mount Democrat, and Mount Bross

Botanical surveys in the Kite Lake Basin and on Mt. Lincoln, Mt. Democrat, and Mt. Bross were performed on July 9, and on July 15-18 by Brian Elliott with assistance from Loretta McElhinney (Forest Service), Anya Byers, and Meghan Luke (Colorado Fourteeners Initiative). Numerous rare plant species were discovered. Those occurrences are discussed below. Surveyed routes are displayed in red on the map below.

Mt. Lincoln, Mt. Democrat, and Mt. Bross survey routes.



Survey transects are in red.

Aquilegia saximontana - Rocky Mountain columbine

Rocky Mountain columbine is a perennial herb of the buttercup family inhabiting subalpine forests and meadows, alpine turf, and rocky alpine areas. It has been documented at elevations ranging from 9,000-13,290 feet. It is a Colorado endemic known from the central mountains of the state from Larimer to El Paso counties. It is ranked G3S3 by the CNHP, indicating that is vulnerable throughout its range.

Photo 1: Aquilegia saximontana

Aquilegia saximontana on the lower slopes of Mt. Bross.

CNHP Form 1: Aquilegia saximontana

COLORADO NATURAL HERITAGE PROGRAM
PLANT ELEMENT OCCURRENCE FIELD FORM
COLORADO STATE UNIVERSITY-COLLEGE OF NATURAL RESOURCES
Mailing Address: CNHP, 8002 Campus Delivery, Fort Collins, CO 80523-8002
Physical Address: 254 General Services Bldg., Fort Collins, CO 80523
Attn: Jill Handwerk (970) 491-5857

General
Survey Date: 16 July 2007
Observer(s) Name & Affiliation: Brian Elliott, private contractor.
Observer(s) Address & Phone Number: elliottconsultingusa@yahoo.com

Taxonomy
Element Common Name(s): Rocky Mountain columbine
Element Scientific Name: *Aquilegia saximontana*
(For a list of elements tracked by CNHP, refer to http://www.cnhp.colostate.edu/list.html)

Data Sensitivity
Data Sensitive Element Occurrence: ☐ Y ☒ N
If yes, list reason (i.e., landowner requests confidentiality): _____

Locational Information
REMOVED FOR WEB VERSION

Locational Accuracy
1. Is your depiction of the individuals or population on the topographic map within 6.25m (20.5ft) of the actual location on the ground?
☒ **Yes** ☐ **No**
2. If the area occupied is long, narrow and less than 12.5 meters wide, please pace off or use measuring tape to obtain: Length: _____ (m) Width: _____ (m)
3. Make/Model of GPS receiver: ☒ Garmin ☐ Trimble ☐ Magellan ☐ Pharos Ipaq Other: _____
4. GPS receiver horizontal position accuracy (see GPS manual for manufacturer's technical specifications):

Autonomous (uncorrected)	20	☐ meters	☒ feet
DGPS (differentially corrected)	_____	☐ meters	☐ feet

Ownership
Owner Type: ☐ Private ☒ USFS ☐ BLM ☐ State ☐ Military ☐ Indian ☐ BuRec ☐ Other: _____
If Private, Owner Name: _____
National Forest or BLM District Name: Pike National Forest, South Park Ranger District
Owner Comments (special requests, permissions, circumstances): _____
Additional Comments: _____

Directions
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Element Occurrence Details
SIZE/POPULATION BIOLOGY (area of occupancy, population abundance, density, fluctuation):

Estimated Number of Individuals (or exact count, if feasible; if plants are spreading vegetatively, indicate number of aerial stems): I counted about 75 plants. I think that this population is fairly small as I did not see additional plants as I traversed the area several times.
Estimated Population Size: _____
Number of Subpopulations (if applicable): _____
Size of Area Covered by Population: ☐ **none (point)** or Three ☐ **sq. feet** ☒**acres**
Comments: _____

CONDITION (productivity, vigor/health, evidence of reproduction, health of population, degree of anthropogenic disturbance, naturalness of hydrology, and other ecological processes):
Phenology: Vegetative: 25% Flower: 75% Fruit: 0%
Reproductive Success: (evidence of seed dispersal and establishment): _____
Age Classes Present: All age classes were represented.
Symbiotic or Parasitic Relationships (e.g. pollinators): _____
Evidence of Disease, Predation or Injury: None.
Comments: Plants appeared vigorous.

LANDSCAPE CONTEXT (biological structure, species composition, degree of fragmentation and connectivity , condition, and extent of surrounding landscape; abiotic physical/chemical factors):
Comments: Surrounding landscape is steep talus slopes with patchy vegetation.

General Habitat Description

General Habitat Comments: _____
Associated Plant Community (list dominant species currently present, include age structure if known): Alpine species associated with rock, talus and unstable soils.
Additional Associated Plant Species: Polemonium viscosissimum, Draba crassa, Ligularia amplectens, Ligularia soldanella, Sedum rhodanthum, Oxyria digyna, Oreoxis alpina, Erysimum capitatum, Penstemon harbourii, Ranunculus gelidus.

Topographic Position:
☐ Interfluve (crest) ☐ High Slope ☐ High Level ☐ Midslope ☐ Backslope ☐ Step in Slope
☒ Lowslope ☐ Toeslope ☐ Low Level ☐ Channel Wall ☐ Channel Bed ☐ Basin Floor
☐ Not Assessed/Unkown ☐ Other _____

Aspect:
☐ Flat ☐ Variable ☐ N (338-22 degrees) ☐ NE (23-67 degrees)
☐ E (68-112 degrees) ☐ SE (112-157 degrees) ☐ S (158-202 degrees) ☐ S (158-202 degrees)
☐ SW (203-247 degrees) ☒W (248-292 degrees) ☐ NW (293-337 degrees)

% Slope:
☐ Flat 0% (0 degrees) ☐ Gentle 1-6% (1-5 degrees)
☒ Moderate 6-33% (5-30 degrees) ☒ Steep 33-50% (30- 45 degrees)
☐ Very steep 50-67% (45-60 degrees) ☐ Cliff 67-100% (60-90 degrees)
☐ Overhanging/sheltered (>90 degrees)

Slope Shape: ☐ Concave ☒ Convex ☐ Straight ☐ Other _____
Light Exposure: ☒ Open ☐ Shaded ☐ Partial shade ☐ Other _____
Moisture: ☒ Dry ☐ Moist ☐ Saturated ☐ Inundated ☐ Seasonal seepage ☐ Other _____
Parent Material: Granite Soil Texture: _____
Geomorphic Land Form (e.g., glaciated mountain slopes and ridges, alpine glacial valley, rolling uplands, breaklands, alluvial-colluvial-lacsutrine, rockslides, etc.): _____

Management Comments
Evidence of Threats and Disturbance (e.g. effects on population viability due to mining, recreation, grazing, exotic species; past/present/future recommendations): Trail to Mt. Bross passes though the site.
Predominant Land Uses: Recreation, mining.
Exotic Species: None

Protection Comments (Are there any protection plans or strategies in place?)
No

Documentation

Photographs Taken: ☒ Y ☐ N
If yes, indicate: Photographer: Brian Elliott
Photo Number(s): _____
Repository: _____

Specimens Taken: ☐ Y ☒ N
If yes, indicate: Collector: _____
Collection Number(s): _____
Repository: _____

General Comments

I have been spending some time at alpine over the last few years and rarely see Aquilegia saximontana. In discussions with Loretta McElhinney (US Forest Service coordinator for the Colorado 14rs Initiative), she agrees with me that Aquilegia saximontana is infrequent, and she has spent a great deal of time in the alpine doing trail design work. I do not know how many sites there are in Colorado, but I believe that this species should be re-evaluated and given higher priority.

Map 1: Aquilegia saximontana

AQSA = *Aquilegia saximontana*

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Approximately 75 plants on three acres at 12,600 feet elevation. Site is located at REMOVED FOR WEB VERSION However, plants were avoided in the trail reroute.

Chionophila jamesii - snowlover

Snowlover is a perennial herb of the figwort family (Scrophulariaceae) found on moist gravelly slopes above 11,000 feet. The species ranges from southern Wyoming through Colorado to northern New Mexico. CNHP ranks it G4?S3S4, indicating that it is apparently secure globally (although some uncertainty applies to that rank) and vulnerable in Colorado. Snowlover, while not common, is not as infrequent as many other rare alpine plants in Colorado (CNHP 1997).

Photo 2: Chionophila jamesii

Chionophila jamesii amongst *Salix petrophila.*

CNHP Form 2: Chionophila jamesii

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Physical Address: 254 General Services Bldg., Fort Collins, CO 80523
Attn: Jill Handwerk (970) 491-5857

General

Survey Date: July 16, 2007
Observer(s) Name & Affiliation: Brian Elliott, private contractor.
Observer(s) Address & Phone Number: elliottconsultingusa@yahoo.com

Taxonomy

Element Common Name(s): snowlover
Element Scientific Name: Chionophila jamesii
(For a list of elements tracked by CNHP, refer to http://www.cnhp.colostate.edu/list.html)

Data Sensitivity

Data Sensitive Element Occurrence: ☐ Y ☒ N
If yes, list reason (i.e., landowner requests confidentiality): _____

Locational Information

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Locational Accuracy

1. Is your depiction of the individuals or population on the topographic map within 6.25m (20.5ft) of the actual location on the ground?
☒ **Yes** ☐ **No**
2. If the area occupied is long, narrow and less than 12.5 meters wide, please pace off or use measuring tape to obtain: Length: _____ (m) Width: _____ (m)
3. Make/Model of GPS receiver: ☒ Garmin ☐ Trimble ☐ Magellan ☐ Pharos Ipaq Other: _____
4. GPS receiver horizontal position accuracy (see GPS manual for manufacturer's technical specifications):

Autonomous (uncorrected)	20	☐ meters	☒ feet
DGPS (differentially corrected)	_____	☐ meters	☐ feet

Ownership

Owner Type: ☐ Private ☒ USFS ☐ BLM ☐ State ☐ Military ☐ Indian ☐ BuRec ☐ Other: _____
If Private, Owner Name: _____
National Forest or BLM District Name: Pike National Forest, South Park Ranger District
Owner Comments (special requests, permissions, circumstances): _____
Additional Comments: Land ownership patterns in the area are complex as a result of mining claims. Although the sites appear on both Forest Service and private lands when plotted on topographic maps, recent mapping efforts associated with trail reroutes intended to move the trail off of private lands have shown the underlying base map to be in error.

Directions

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Element Occurrence Details

SIZE/POPULATION BIOLOGY (area of occupancy, population abundance, density, fluctuation):
Estimated Number of Individuals (or exact count, if feasible; if plants are spreading vegetatively, indicate number of aerial stems): I saw only 2 plants, but I was rushed and did not search widely for the species. There are likely more at the site.
Estimated Population Size: _____
Number of Subpopulations (if applicable): _____
Size of Area Covered by Population: ☐ **none (point)** or 200 ☒ **sq. feet** ☐ **acres**
Comments:

CONDITION (productivity, vigor/health, evidence of reproduction, health of population, degree of anthropogenic disturbance, naturalness of hydrology, and other ecological processes):
Phenology: Vegetative: 0% Flower: 100% Fruit: 0%
Reproductive Success: (evidence of seed dispersal and establishment): _____
Age Classes Present: No seedlings were seen. All plants were mature.
Symbiotic or Parasitic Relationships (e.g. pollinators): _____
Evidence of Disease, Predation or Injury: None.
Comments: Plants appeared vigorous and were producing flowers.

LANDSCAPE CONTEXT (biological structure, species composition, degree of fragmentation and connectivity , condition, and extent **of surrounding landscape**; abiotic physical/chemical factors):
Comments: Surrounding landscape is a mosaic of steep talus and alpine tundra/turf.

General Habitat Description

General Habitat Comments: _____
Associated Plant Community (list dominant species currently present, include age structure if known): Alpine species associated with alpine turf.
Additional Associated Plant Species: Smelowskia calycina, Lloydia serotina, Trifolium parryi, Noccaea montana and many others.

Topographic Position:
☐ Interfluve (crest) ☐ High Slope ☐ High Level ☐ Midslope ☐ Backslope ☒ Step in Slope
☒ Lowslope ☒ Toeslope ☐ Low Level ☐ Channel Wall ☐ Channel Bed ☐ Basin Floor
☐ Not Assessed/Unkown ☐ Other _____

Aspect:
☐ Flat ☐ Variable ☐ N (338-22 degrees) ☐ NE (23-67 degrees)
☒ E (68-112 degrees) ☐ SE (112-157 degrees) ☒ S (158-202 degrees)
☐ SW (203-247 degrees) ☐ W (248-292 degrees) ☐ NW (293-337 degrees)

% Slope:
☐ Flat 0% (0 degrees) ☒ Gentle 1-6% (1-5 degrees)
☒ Moderate 6-33% (5-30 degrees) ☐ Steep 33-50% (30- 45 degrees)
☐ Very steep 50-67% (45-60 degrees) ☐ Cliff 67-100% (60-90 degrees)
☐ Overhanging/sheltered (>90 degrees)

Slope Shape: ☐ Concave ☒ Convex ☐ Straight ☐ Other _____
Light Exposure: ☒ Open ☐ Shaded ☐ Partial shade ☐ Other _____
Moisture: ☐ Dry ☒ Moist ☐ Saturated ☐ Inundated ☐ Seasonal seepage ☐ Other _____
Parent Material: Granite Soil Texture: _____
Geomorphic Land Form (e.g., glaciated mountain slopes and ridges, alpine glacial valley, rolling uplands, breaklands, alluvial-colluvial-lacsutrine, rockslides, etc.): _____

Management Comments

Evidence of Threats and Disturbance (e.g. effects on population viability due to mining, recreation, grazing, exotic species; past/present/future recommendations): Predominant Land Uses: Recreation, mining.
Exotic Species: None

Protection Comments (Are there any protection plans or strategies in place?)
No

Documentation

Photographs Taken: ☒ Y ☐ N
If yes, indicate: Photographer: Brian Elliott
Photo Number(s): _____
Repository: _____

Specimens Taken: ☐ Y ☒ N
If yes, indicate: Collector: _____
Collection Number(s): _____
Repository: _____

General Comments

_____

Map 2: Chionophila jamesii

CHJA = *Chionophila jamesii*

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Chionophila jamesii in the Kite Lake basin.

Crepis nana - dwarf hawksbeard

Dwarf hawksbeard is perennial herb of the sunflower family (Asteraceae). It has also been referred to under the synonym *Askellia nana*. It is known from alpine scree and talus slopes as well as poorly vegetated areas above timberline from 10,000-14,000 feet. Flowers and fruit are produced from June through September. It is known from Asia and eastern Alaska east to Newfoundland and south to California, Utah and Colorado (Spackman *et al* 1997). In Colorado it has been documented from Boulder, Chaffee, Clear Creek, Custer, Gunnison, Lake, Park, Pitkin, and Summit counties. It is ranked G5S2 by CNHP indicating that is secure globally but imperiled within Colorado due to the limited number of occurrences. It is threatened primarily by mining and recreation.

Photo 3: Crepis nana

Crepis nana on the ridge between Mt. Lincoln and Mt. Bross.

CNHP Form 3: Crepis nana

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Physical Address: 254 General Services Bldg., Fort Collins, CO 80523
Attn: Jill Handwerk (970) 491-5857

General

Survey Date: 17 July 2007
Observer(s) Name & Affiliation: Brian Elliott, private contractor.
Observer(s) Address & Phone Number: elliottconsultingusa@yahoo.com

Taxonomy

Element Common Name(s): dwarf hawksbeard
Element Scientific Name: *Crepis nana*
(For a list of elements tracked by CNHP, refer to http://www.cnhp.colostate.edu/list.html)

Data Sensitivity

Data Sensitive Element Occurrence: ☐ Y ☒ N
If yes, list reason (i.e., landowner requests confidentiality): _____

Locational Information

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Locational Accuracy

1. Is your depiction of the individuals or population on the topographic map within 6.25m (20.5ft) of the actual location on the ground?
☒ **Yes** ☐ **No**
2. If the area occupied is long, narrow and less than 12.5 meters wide, please pace off or use measuring tape to obtain: Length: _____ (m) Width: _____ (m)
3. Make/Model of GPS receiver: ☒ Garmin ☐ Trimble ☐ Magellan ☐ Pharos Ipaq Other: _____
4. GPS receiver horizontal position accuracy (see GPS manual for manufacturer's technical specifications):

Autonomous (uncorrected)	20	☐ meters	☒ feet
DGPS (differentially corrected)	_____	☐ meters	☐ feet

Ownership

Owner Type: ☒ Private ☒ USFS ☐ BLM ☐ State ☐ Military ☐ Indian ☐ BuRec ☐ Other: _____
If Private, Owner Name: _____
National Forest or BLM District Name: Pike National Forest, South Park Ranger District
Owner Comments (special requests, permissions, circumstances): _____
Additional Comments: Land ownership patterns in the area are complex as a result of mining claims. Although the sites appear on both Forest Service and private lands when plotted on topographic maps, recent mapping efforts associated with trail reroutes intended to move the trail off of private lands have shown the underlying base map to be in error.

Directions

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Element Occurrence Details

SIZE/POPULATION BIOLOGY (area of occupancy, population abundance, density, fluctuation):
Estimated Number of Individuals (or exact count, if feasible; if plants are spreading vegetatively, indicate number of aerial stems): Hundreds
Estimated Population Size: _____
Number of Subpopulations (if applicable): _____
Size of Area Covered by Population: ☐ **none (point)** or 20 ☐ **sq. feet** ☒**acres**
Comments: Population and acre estimates are difficult as the plants are scattered in a large area. Estimates given above are minimums. Abundant unsurveyed habitat exists.

CONDITION (productivity, vigor/health, evidence of reproduction, health of population, degree of anthropogenic disturbance, naturalness of hydrology, and other ecological processes):
Phenology: Vegetative: 25% Flower: 60% Fruit: 15%
Reproductive Success: (evidence of seed dispersal and establishment): _____
Age Classes Present: All age classes were represented.
Symbiotic or Parasitic Relationships (e.g. pollinators): _____
Evidence of Disease, Predation or Injury: None.
Comments: Plants appeared vigorous.

LANDSCAPE CONTEXT (biological structure, species composition, degree of fragmentation and connectivity , condition, and extent **of surrounding landscape**; abiotic physical/chemical factors):
Comments: Surrounding landscape is composed of rocky areas with much bare soil.

General Habitat Description

General Habitat Comments: Plants did not occur on alpine tundra/turf. Plants were only seen in areas where vegetative cover was low, usually less than 10%.
Associated Plant Community (list dominant species currently present, include age structure if known): Alpine species associated with rock and talus, particularly cushion plants.
Additional Associated Plant Species: Papaver kluanense, Smelowskia calycina, Claytonia megarhiza, Nocaccea montana, Polemonium viscosissimum, Saxifraga cernua, Saxifraga flagillaris, Oxytropis podocarpa.

Topographic Position:
☒ Interfluve (crest) ☐ High Slope ☐ High Level ☐ Midslope ☐ Backslope ☐ Step in Slope
☐ Lowslope ☐ Toeslope ☐ Low Level ☐ Channel Wall ☐ Channel Bed ☐ Basin Floor
☐ Not Assessed/Unkown ☐ Other _____

Aspect:
☒ Flat ☐ Variable ☐ N (338-22 degrees) ☐ NE (23-67 degrees)
☐ E (68-112 degrees) ☐ SE (112-157 degrees) ☒ S (158-202 degrees) ☐ S (158-202 degrees)
☐ SW (203-247 degrees) ☐ W (248-292 degrees) ☐ NW (293-337 degrees)

% Slope:
☒ Flat 0% (0 degrees) ☒ Gentle 1-6% (1-5 degrees)
☒ Moderate 6-33% (5-30 degrees) ☐ Steep 33-50% (30- 45 degrees)
☐ Very steep 50-67% (45-60 degrees) ☐ Cliff 67-100% (60-90 degrees)
☐ Overhanging/sheltered (>90 degrees)

Slope Shape: ☐ Concave ☐ Convex ☒ Straight ☐ Other _____
Light Exposure: ☒ Open ☐ Shaded ☐ Partial shade ☐ Other _____
Moisture: ☒ Dry ☐ Moist ☐ Saturated ☐ Inundated ☐ Seasonal seepage ☐ Other _____
Parent Material: Granite Soil Texture: _____
Geomorphic Land Form (e.g., glaciated mountain slopes and ridges, alpine glacial valley, rolling uplands, breaklands, alluvial-colluvial-lacsutrine, rockslides, etc.): _____

Management Comments

Evidence of Threats and Disturbance (e.g. effects on population viability due to mining, recreation, grazing, exotic species; past/present/future recommendations):
Predominant Land Uses: Recreation, mining.

Exotic Species: None

Protection Comments (Are there any protection plans or strategies in place?)
No

Documentation

Photographs Taken: ☒ Y ☐ N
If yes, indicate: Photographer: Brian Elliott
Photo Number(s): _____
Repository: _____

Specimens Taken: ☐ Y ☒ N
If yes, indicate: Collector: _____
Collection Number(s): _____
Repository: _____

General Comments

Map 3: Crepis nana

CRNA = *Crepis nana*

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Draba crassa - thickleaf whitlow grass

Thickleaf whitlow grass is a perennial herb of the mustard family (Brassicaceae) that grows in rocky alpine areas. Herbarium records from Colorado University (Boulder) show an elevation range of 10,600 to 14,000 feet. It flowers and sets fruit from June through September. The species ranges from southern Montana to Colorado and the Uintah Mountains of Utah (Rollins 1993). The species has a wide distribution in Colorado and has been documented from Chaffee, Clear Creek, Conejos, Eagle, El Paso, Grand, Gunnison, Hinsdale, Jackson, La Plata, Lake, Ouray, Park, Pitkin, Saguache, San Juan, and Summit counties. It is ranked G3S3 by the CNHP, indicating that is vulnerable throughout its range. It is threatened primarily by recreation and mining.

Photo 4: Draba crassa

Draba crassa below Mt. Democrat.

CNHP Form 4: Draba crassa

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Mailing Address: CNHP, 8002 Campus Delivery, Fort Collins, CO 80523-8002
Physical Address: 254 General Services Bldg., Fort Collins, CO 80523
Attn: Jill Handwerk (970) 491-5857

General

Survey Date: July 16-18, 2007
Observer(s) Name & Affiliation: Brian Elliott, private contractor.
Observer(s) Address & Phone Number: elliottconsultingusa@yahoo.com

Taxonomy

Element Common Name(s): thickleaf whitlow grass
Element Scientific Name: Draba crassa
(For a list of elements tracked by CNHP, refer to http://www.cnhp.colostate.edu/list.html)

Data Sensitivity

Data Sensitive Element Occurrence: ☐ Y ☒ N
If yes, list reason (i.e., landowner requests confidentiality): _____

Locational Information: SEE ATTACHED MAPS FOR UTM INFORMATION

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Locational Accuracy

1. Is your depiction of the individuals or population on the topographic map within 6.25m (20.5ft) of the actual location on the ground?
☒ **Yes** ☐ **No**
2. If the area occupied is long, narrow and less than 12.5 meters wide, please pace off or use measuring tape to obtain: Length: _____ (m) Width: _____ (m)
3. Make/Model of GPS receiver: ☒ Garmin ☐ Trimble ☐ Magellan ☐ Pharos Ipaq Other: _____
4. GPS receiver horizontal position accuracy (see GPS manual for manufacturer's technical specifications):
Autonomous (uncorrected) 20 ☐ meters ☒ feet
DGPS (differentially corrected) _____ ☐ meters ☐ feet

Ownership

Owner Type: ☒ Private ☒ USFS ☐ BLM ☐ State
☐ Military ☐ Indian ☐ BuRec ☐ Other: _____
If Private, Owner Name: _____
National Forest or BLM District Name: Pike National Forest, South Park Ranger District
Owner Comments (special requests, permissions, circumstances): _____
Additional Comments: Land ownership patterns in the area are complex as a result of mining claims. Although the sites appear on both Forest Service and private lands when plotted on topographic maps, recent mapping efforts associated with trail reroutes intended to move the trail off of private lands have shown the underlying base map to be in error.

Directions

REMOVED FOR WEB VERSION

Element Occurrence Details

SIZE/POPULATION BIOLOGY (area of occupancy, population abundance, density, fluctuation):
Estimated Number of Individuals (or exact count, if feasible; if plants are spreading vegetatively, indicate number of aerial stems): I counted between 1 and 500 individuals at nine different sites. Note that for all sites except DRCR8 the count was only for plants within the existing or proposed trail corridor. Additional individuals almost certaily could be found outside the corridors at all sites.
Estimated Population Size: Minimum of 600 plants, probably more.
Number of Subpopulations (if applicable): Nine
Size of Area Covered by Population: ☐ **none (point)** or _____ ☐ **sq. feet** ☐ **acres**
Comments: Most sites were a few hundred square feet. DRCR9 was approximately 0.25 acres, and DRCR8 was 2-5 acres.

CONDITION (productivity, vigor/health, evidence of reproduction, health of population, degree of anthropogenic disturbance, naturalness of hydrology, and other ecological processes):
Phenology: Vegetative: 0% Flower: 25% Fruit: 75%
Reproductive Success: (evidence of seed dispersal and establishment): _____
Age Classes Present: All plants I saw were mature, no seedlings were observed.
Symbiotic or Parasitic Relationships (e.g. pollinators): _____
Evidence of Disease, Predation or Injury: None.
Comments: Plants appeared vigorous.

LANDSCAPE CONTEXT (biological structure, species composition, degree of fragmentation and connectivity , condition, and extent **of surrounding landscape**; abiotic physical/chemical factors):
Comments: Surrounding landscape is a mosaic of steep talus slopes, bare or lightly vegetated soil, and alpine tundra.

General Habitat Description

General Habitat Comments: _____
Associated Plant Community (list dominant species currently present, include age structure if known): Alpine species associated with rock, talus and unstable soils.
Additional Associated Plant Species: Polemonium viscosissimum, Draba crassa, Ligularia amplectens, Ligularia soldanella, Sedum rhodanthum, Oxyria digyna, Oreoxis alpina, Erysimum capitatum, Penstemon harbourii, and Ranunculus gelidus.

Topographic Position:
☒ Interfluve (crest) ☒ High Slope ☐ High Level ☒ Midslope ☐ Backslope ☐ Step in Slope
☐ Lowslope ☐ Toeslope ☐ Low Level ☐ Channel Wall ☐ Channel Bed ☐ Basin Floor
☐ Not Assessed/Unkown ☐ Other _____

Aspect:
☐ Flat ☐ Variable ☐ N (338-22 degrees) ☐ NE (23-67 degrees)
☒ E (68-112 degrees) ☐ SE (112-157 degrees) ☐ S (158-202 degrees) ☐ S (158-202 degrees)
☒ SW (203-247 degrees) ☒ W (248-292 degrees) ☒ NW (293-337 degrees)

% Slope:
☐ Flat 0% (0 degrees) ☐ Gentle 1-6% (1-5 degrees)
☒ Moderate 6-33% (5-30 degrees) ☒ Steep 33-50% (30- 45 degrees)
☐ Very steep 50-67% (45-60 degrees) ☐ Cliff 67-100% (60-90 degrees)
☐ Overhanging/sheltered (>90 degrees)

Slope Shape: ☐ Concave ☒ Convex ☒ Straight ☐ Other _____
Light Exposure: ☒ Open ☐ Shaded ☐ Partial shade ☐ Other _____
Moisture: ☒ Dry ☐ Moist ☐ Saturated ☐ Inundated ☐ Seasonal seepage ☐ Other _____
Parent Material: Granite Soil Texture: _____
Geomorphic Land Form (e.g., glaciated mountain slopes and ridges, alpine glacial valley, rolling uplands, breaklands, alluvial-colluvial-lacsutrine, rockslides, etc.): _____

Management Comments

Evidence of Threats and Disturbance (e.g. effects on population viability due to mining, recreation, grazing, exotic species; past/present/future recommendations): Trail to Mt. Lincoln, Mt. Democrat, and Mt. Bross passes though the sites.
Predominant Land Uses: Recreation, mining.
Exotic Species: None

Protection Comments (Are there any protection plans or strategies in place?)

No

Documentation

Photographs Taken: ☒ Y ☐ N
If yes, indicate: Photographer: Brian Elliott
Photo Number(s): _____
Repository: _____

Specimens Taken: ☐ Y ☒ N
If yes, indicate: Collector: _____
Collection Number(s): _____
Repository: _____

General Comments

I have been spending some time at alpine over the last few years and often see Draba crassa. In discussions with Loretta McElhinney (US Forest Service coordinator for the Colorado 14rs Initiative), she agrees with me that Draba crassa is more common than currently believed, and she has also spent a great deal of time in the alpine doing trail design work. I do not know how many sites there are in Colorado, but I believe that this species should be re-evaluated and perhaps downgraded. I made a particular effort to document what I saw here, and I have seen similar distribution patterns on other high mountains in Colorado.

Map 4: Draba crassa

DRCR = *Draba crassa*

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Eutrema penlandii - Penland alpine fen mustard

This is a perennial herb of the mustard family (Brassicaceae) that grows in wetlands and riparian areas of the alpine zone. The plant is also known under the synonym *Eutrema edwardsii* ssp. *penlandii.* It is typically found in alpine fens on the lee side of mountain crests where deep wind-deposited snow accumulates (Roy et al. 1993). However, plants have also been found growing alongside alpine rivulets. The species is endemic to Colorado and only found in the Mosquito Range from Hoosier Pass to Weston Pass in Park and Summit counties at elevations of 12,000-12,800 ft (Spackman et. al 1997). It is ranked G1G2S1S2 by the CNHP, indicating that it is considered critically imperiled or imperiled both globally and in Colorado. It is federally listed as a threatened species (FWS 2006).

Photo 5: Eutrema penlandii

CNHP Form 5: Eutrema penlandii

COLORADO NATURAL HERITAGE PROGRAM
PLANT ELEMENT OCCURRENCE FIELD FORM

COLORADO STATE UNIVERSITY-COLLEGE OF NATURAL RESOURCES
Mailing Address: CNHP, 8002 Campus Delivery, Fort Collins, CO 80523-8002
Physical Address: 254 General Services Bldg., Fort Collins, CO 80523
Attn: Jill Handwerk (970) 491-5857

General

Survey Date: July 15-18, 2007
Observer(s) Name & Affiliation: Brian Elliott, private contractor.
Observer(s) Address & Phone Number: elliottconsultingusa@yahoo.com

Taxonomy

Element Common Name(s): Penland alpine fen mustard
Element Scientific Name: Eutrema penlandii
(For a list of elements tracked by CNHP, refer to http://www.cnhp.colostate.edu/list.html)

Data Sensitivity

Data Sensitive Element Occurrence: ☒ Y ☐ N
If yes, list reason (i.e., landowner requests confidentiality): Species is Federally listed as Threatened.

Locational Information See attached map for additional locality information.

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Locational Accuracy

1. Is your depiction of the individuals or population on the topographic map within 6.25m (20.5ft) of the actual location on the ground?
☒ **Yes** ☐ **No**
2. If the area occupied is long, narrow and less than 12.5 meters wide, please pace off or use measuring tape to obtain: Length: _____ (m) Width: _____ (m)
3. Make/Model of GPS receiver: ☒ Garmin ☐ Trimble ☐ Magellan ☐ Pharos Ipaq Other: _____
4. GPS receiver horizontal position accuracy (see GPS manual for manufacturer's technical specifications):
Autonomous (uncorrected) 20 ☐ meters ☒ feet
DGPS (differentially corrected) _____ ☐ meters ☐ feet

Ownership

Owner Type: ☒ Private ☒ USFS ☐ BLM ☐ State
☐ Military ☐ Indian ☐ BuRec ☐ Other: _____
If Private, Owner Name: _____
National Forest or BLM District Name: Pike National Forest, South Park Ranger District
Owner Comments (special requests, permissions, circumstances): _____
Additional Comments: Land ownership patterns in the area are complex as a result of mining claims. Although the sites appear on both Forest Service and private lands when plotted on topographic maps, recent mapping efforts associated with trail reroutes intended to move the trail off of private lands have shown the underlying base map to be in error.

Directions

REMOVED FOR WEB VERSION

Element Occurrence Details

SIZE/POPULATION BIOLOGY (area of occupancy, population abundance, density, fluctuation):

Estimated Number of Individuals (or exact count, if feasible; if plants are spreading vegetatively, indicate number of aerial stems): A total of approximately 200 plants were observed at 8 different sites.
Estimated Population Size: _____
Number of Subpopulations (if applicable): Eight
Size of Area Covered by Population: ☐ **none (point)** or 0.85 ☐ **sq. feet** ☒**acres**
Comments: Acreage estimates are difficult as the plants are located at eight distinct sites. Furthermore, the sites are primarily linear, following alpine streamlets. Nine hundred linear feet of occupied habitat was observed. Assuming a forty foot width: (900x40=36,000 square feet). Two sites were points with a 15 foot radius (3.1415x15squaredx2sites=1,400 square feet). 37,400 square feet is approximately 0.85 acres of occupied habitat.

CONDITION (productivity, vigor/health, evidence of reproduction, health of population, degree of anthropogenic disturbance, naturalness of hydrology, and other ecological processes):
Phenology: Vegetative: 0% Flower: 25% Fruit: 75%
Reproductive Success: (evidence of seed dispersal and establishment): Eutrema penlandii is an annual. Without historic population data it is difficult to determine trend for seed dispersal and establishment.
Age Classes Present: Plants were all mature and producing flowers/fruit.
Symbiotic or Parasitic Relationships (e.g. pollinators): _____
Evidence of Disease, Predation or Injury: None.
Comments: Plants appeared vigorous.

LANDSCAPE CONTEXT (biological structure, species composition, degree of fragmentation and connectivity , condition, and extent **of surrounding landscape**; abiotic physical/chemical factors):
Comments: Surrounding landscape is alpine tundra/turf.

General Habitat Description

General Habitat Comments: Plants grew alongside alpine streams, rivulets, and boggy seeps. All sites were downslope from snowbanks but were not immediately adjacent to them. On streamsides plants grew amongst riparian vegetation and were often difficult to locate as they were dwarfed by the taller riparian vegetation. Alongside smaller rivulets and in boggy seeps plants grew where little other vegetation was present and were more easily located.
Associated Plant Community (list dominant species currently present, include age structure if known): Riparian alpine vegetation, primarily Cardamine cordifolia, Sedum rhodanthum, and Caltha leptosepala.
Additional Associated Plant Species: Salix planifolia, Salix reticulata, Salix petrophila, Trifolium parryi, Primula parryi, Polygonum bistorta, Noccaea montanum, and Cerastium sp.

Topographic Position:
☐ Interfluve (crest) ☐ High Slope ☐ High Level ☐ Midslope ☐ Backslope ☐ Step in Slope
☐ Lowslope ☐ Toeslope ☒ Low Level ☐ Channel Wall ☐ Channel Bed ☐ Basin Floor
☐ Not Assessed/Unkown ☐ Other _____

Aspect:
☐ Flat ☐ Variable ☐ N (338-22 degrees) ☐ NE (23-67 degrees)
☐ E (68-112 degrees) ☐ SE (112-157 degrees) ☐ S (158-202 degrees) ☐ S (158-202 degrees)
☒ SW (203-247 degrees) ☐ W (248-292 degrees) ☐ NW (293-337 degrees)

% Slope:
☒ Flat 0% (0 degrees) ☒ Gentle 1-6% (1-5 degrees)
☐ Moderate 6-33% (5-30 degrees) ☐ Steep 33-50% (30- 45 degrees)
☐ Very steep 50-67% (45-60 degrees) ☐ Cliff 67-100% (60-90 degrees)
☐ Overhanging/sheltered (>90 degrees)

Slope Shape: ☐ Concave ☒ Convex ☐ Straight ☐ Other _____
Light Exposure: ☒ Open ☐ Shaded ☐ Partial shade ☐ Other _____
Moisture: ☐ Dry ☐ Moist ☒ Saturated ☒ Inundated ☐ Seasonal seepage ☐ Other _____
Parent Material: Granite Soil Texture: _____
Geomorphic Land Form (e.g., glaciated mountain slopes and ridges, alpine glacial valley, rolling uplands, breaklands, alluvial-colluvial-lacsutrine, rockslides, etc.): _____

Management Comments

Evidence of Threats and Disturbance (e.g. effects on population viability due to mining, recreation, grazing, exotic species; past/present/future recommendations): REMOVED FOR WEB VERSION

Predominant Land Uses: Recreation, mining.
Exotic Species: None

Protection Comments (Are there any protection plans or strategies in place?)

Unknown. The Pike-San Isabel National Forest produced a Eutrema penlandii management plan in (try not to laugh!) 1981. However, the copy I have seen was not signed by the Forest Supervisor and I do not believe that the plan or any other has ever been implemented.

Documentation

Photographs Taken: ☒ Y ☐ N
If yes, indicate: Photographer: Brian Elliott
Photo Number(s): _____
Repository: _____

Specimens Taken: ☐ Y ☒ N
If yes, indicate: Collector: _____
Collection Number(s): _____
Repository: _____

General Comments

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Map 5: Eutrema penlandii

Numbers 1-8 indicate subpopulations. Letters “L” and “H” stand for low and high respectively and are used to indicate the upper and lower extent of populations in riparian areas. All other sites are point data. Site 1L was the only previously known site.

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Locality data is as follows:

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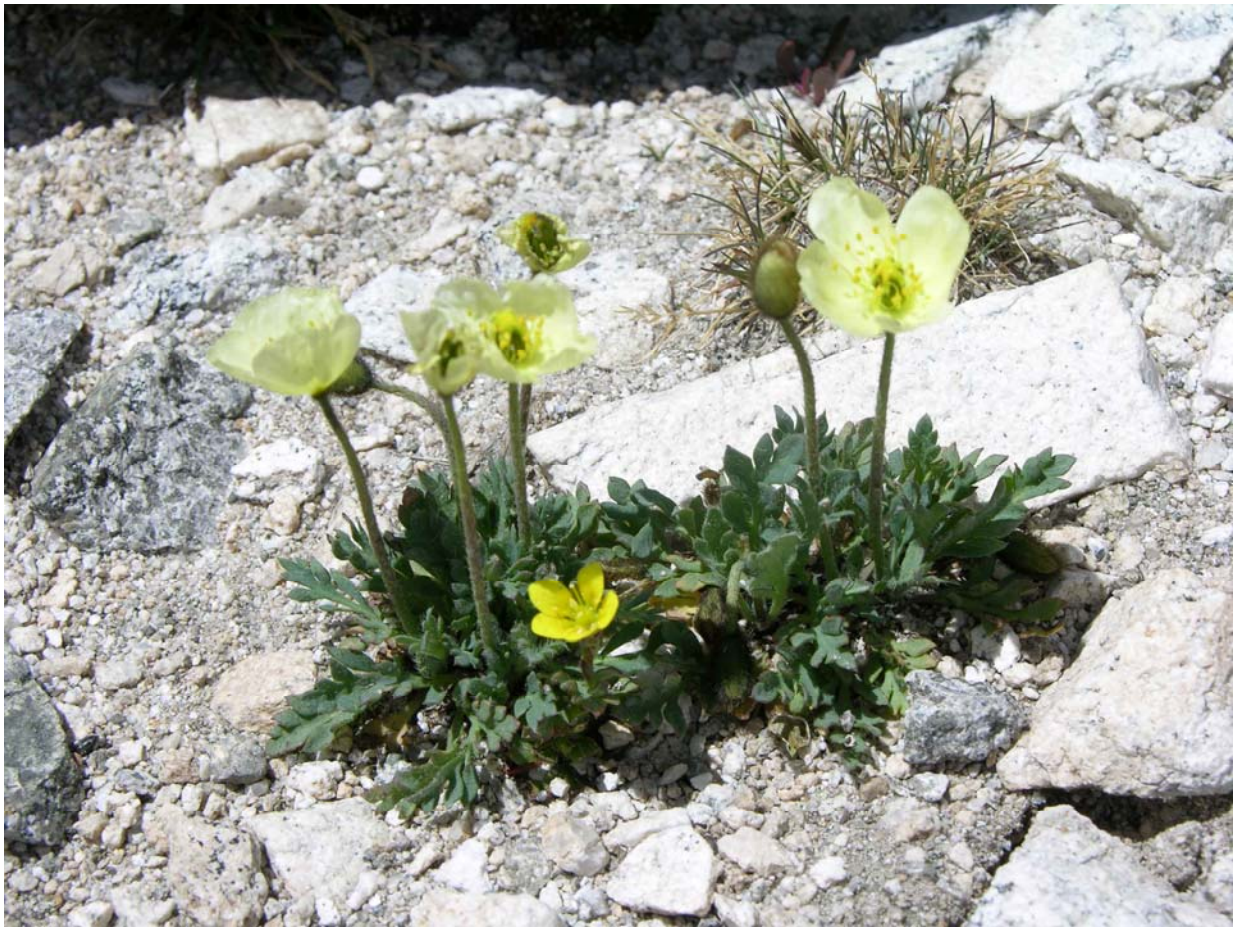
Plants were found along alpine rivulets as well as in seeps amongst mosses and in organic soils. While plants were downslope of snowbanks, they were not immediately adjacent to them. Site number 1 differed from the standard habitat description for the species, being alongside an alpine rivulet that was clearly not fen habitat.

Papaver kluanense - alpine poppy

Alpine poppy is a perennial herb of the poppy family (Papaveraceae) known from dry alpine tundra, gravelly slopes, talus, scree, and fell-fields (Spackman *et al* 1997). A synonym, *Papaver lapponicum* ssp. *occidentale*, has also been applied to the species. This poppy has been documented at elevations ranging from 11,500-14,000 feet. It ranges from Alaska east to Greenland and south to New Mexico where it reaches its southernmost North American distribution. The Colorado county distribution includes Boulder, Chaffee, Clear Creek, El Paso, Gilpin, Grand, Gunnison, Lake, Park, and Summit counties. Alpine poppy is ranked G5S3S4, indicating that it is secure globally but vulnerable and at the edge of its range in Colorado. Although individuals may be threatened by recreation and mining activities, it has been observed growing on old mine tailings near Mt. Bross and also Mt. Shavano.

Photo 6: Papaver kluanense



Papaver kluanense between Mt. Bross and Mt. Lincoln.

CNHP Form 6: Papaver kluanense

COLORADO NATURAL HERITAGE PROGRAM
PLANT ELEMENT OCCURRENCE FIELD FORM

COLORADO STATE UNIVERSITY-COLLEGE OF NATURAL RESOURCES
Mailing Address: CNHP, 8002 Campus Delivery, Fort Collins, CO 80523-8002
Physical Address: 254 General Services Bldg., Fort Collins, CO 80523
Attn: Jill Handwerk (970) 491-5857

General

Survey Date: July 15-18, 2007
Observer(s) Name & Affiliation: Brian Elliott, private contractor.
Observer(s) Address & Phone Number: elliottconsultingusa@yahoo.com

Taxonomy

Element Common Name(s): alpine poppy
Element Scientific Name: Papaver kluanense
(For a list of elements tracked by CNHP, refer to http://www.cnhp.colostate.edu/list.html)

Data Sensitivity

Data Sensitive Element Occurrence: ☐ Y ☒ N
If yes, list reason (i.e., landowner requests confidentiality): _____

Locational Information

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Locational Accuracy

1. Is your depiction of the individuals or population on the topographic map within 6.25m (20.5ft) of the actual location on the ground?
☒ **Yes** ☐ **No**
2. If the area occupied is long, narrow and less than 12.5 meters wide, please pace off or use measuring tape to obtain: Length: _____ (m) Width: _____ (m)
3. Make/Model of GPS receiver: ☒ Garmin ☐ Trimble ☐ Magellan ☐ Pharos Ipaq Other: _____
4. GPS receiver horizontal position accuracy (see GPS manual for manufacturer's technical specifications):

Autonomous (uncorrected)	20	☐ meters	☒ feet
DGPS (differentially corrected)	_____	☐ meters	☐ feet

Ownership

Owner Type: ☒ Private ☒ USFS ☐ BLM ☐ State
☐ Military ☐ Indian ☐ BuRec ☐ Other: _____
If Private, Owner Name: _____
National Forest or BLM District Name: Pike National Forest, South Park Ranger District
Owner Comments (special requests, permissions, circumstances): _____
Additional Comments: Land is primarily private, but plants also occupy Pike National Forest.

Directions

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Element Occurrence Details

SIZE/POPULATION BIOLOGY (area of occupancy, population abundance, density, fluctuation):
Estimated Number of Individuals (or exact count, if feasible; if plants are spreading vegetatively, indicate number of aerial stems): Hundreds
Estimated Population Size: _____
Number of Subpopulations (if applicable): _____

Size of Area Covered by Population: ☐ **none (point)** or 20 ☐ **sq. feet** ☒**acres**
Comments: Population and acre estimates are difficult as the plants are scattered in a large area. Estimates given above are minimums. Abundant unsurveyed habitat exists.

CONDITION (productivity, vigor/health, evidence of reproduction, health of population, degree of anthropogenic disturbance, naturalness of hydrology, and other ecological processes):
Phenology: Vegetative: 0% Flower: 90% Fruit: 10%
Reproductive Success: (evidence of seed dispersal and establishment): _____
Age Classes Present: All age classes were represented.
Symbiotic or Parasitic Relationships (e.g. pollinators): _____
Evidence of Disease, Predation or Injury: None.
Comments: Plants appeared vigorous.

LANDSCAPE CONTEXT (biological structure, species composition, degree of fragmentation and connectivity , condition, and extent **of surrounding landscape**; abiotic physical/chemical factors):
Comments: Surrounding landscape is composed of rocky areas with much bare soil.

General Habitat Description

General Habitat Comments: Plants did not occur on alpine tundra/turf. Plants were only seen in areas where vegetative cover was low, usually less than 10-20%.
Associated Plant Community (list dominant species currently present, include age structure if known): Alpine species associated with rock and talus, particularly cushion plants.
Additional Associated Plant Species: Papaver kluanense, Smelowskia calycina, Claytonia megarhiza, Noccaea montana, Polemonium viscosissimum, Saxifraga cernua, Saxifraga flagellaris, Oxytropis podocarpa.

Topographic Position:
☐ Interfluve (crest) ☒ High Slope ☐ High Level ☐ Midslope ☐ Backslope ☐ Step in Slope
☐ Lowslope ☐ Toeslope ☐ Low Level ☐ Channel Wall ☐ Channel Bed ☐ Basin Floor
☐ Not Assessed/Unkown ☐ Other _____

Aspect:
☒ Flat ☐ Variable ☐ N (338-22 degrees) ☐ NE (23-67 degrees)
☐ E (68-112 degrees) ☐ SE (112-157 degrees) ☒ S (158-202 degrees) ☐ S (158-202 degrees)
☐ SW (203-247 degrees) ☐ W (248-292 degrees) ☐ NW (293-337 degrees)

% Slope:
☒ Flat 0% (0 degrees) ☒ Gentle 1-6% (1-5 degrees)
☒ Moderate 6-33% (5-30 degrees) ☐ Steep 33-50% (30- 45 degrees)
☐ Very steep 50-67% (45-60 degrees) ☐ Cliff 67-100% (60-90 degrees)
☐ Overhanging/sheltered (>90 degrees)

Slope Shape: ☐ Concave ☐ Convex ☒ Straight ☐ Other _____
Light Exposure: ☒ Open ☐ Shaded ☐ Partial shade ☐ Other _____
Moisture: ☒ Dry ☐ Moist ☐ Saturated ☐ Inundated ☐ Seasonal seepage ☐ Other _____
Parent Material: Granite Soil Texture: _____
Geomorphic Land Form (e.g., glaciated mountain slopes and ridges, alpine glacial valley, rolling uplands, breaklands, alluvial-colluvial-lacsutrine, rockslides, etc.): _____

Management Comments

Evidence of Threats and Disturbance (e.g. effects on population viability due to mining, recreation, grazing, exotic species; past/present/future recommendations):
Predominant Land Uses: Recreation, mining.
Exotic Species: None

Protection Comments (Are there any protection plans or strategies in place?)
No

Documentation
Photographs Taken: ☒ Y ☐ N
If yes, indicate: Photographer: Brian Elliott
Photo Number(s): _____
Repository: _____

Specimens Taken: ☐ Y ☒ N
If yes, indicate: Collector: _____
Collection Number(s): _____
Repository: _____

General Comments
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Map 6: Papaver kluanense

PAKL = *Papaver kluanense*

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Penstemon harbourii - Harbour beardtongue

Harbour beardtongue is a perennial herb of the figwort family (Scrophulariaceae) found on talus and scree of alpine slopes at elevations ranging from 11,800-12,850 feet. It is a Colorado endemic, but is widely distributed in the state and ranges from the Medicine Bow Range in the north to the La Plata and San Juan mountain ranges in the south. CNHP ranks the species as G3S3S4. This rank indicates the species is vulnerable both globally and in Colorado.

Photo 7: Penstemon harbourii

Penstemon harbourii on mine tailings.

CNHP Form 7: Penstemon harbourii

COLORADO NATURAL HERITAGE PROGRAM
PLANT ELEMENT OCCURRENCE FIELD FORM

COLORADO STATE UNIVERSITY-COLLEGE OF NATURAL RESOURCES
Mailing Address: CNHP, 8002 Campus Delivery, Fort Collins, CO 80523-8002
Physical Address: 254 General Services Bldg., Fort Collins, CO 80523
Attn: Jill Handwerk (970) 491-5857

General

Survey Date: 17 July 2007
Observer(s) Name & Affiliation: Brian Elliott, private contractor.
Observer(s) Address & Phone Number: elliottconsultingusa@yahoo.com

Taxonomy

Element Common Name(s): Harbour beardtongue
Element Scientific Name: *Penstemon harbourii*
(For a list of elements tracked by CNHP, refer to http://www.cnhp.colostate.edu/list.html)

Data Sensitivity

Data Sensitive Element Occurrence: ☐ Y ☒ N
If yes, list reason (i.e., landowner requests confidentiality): _____

Locational Information

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Locational Accuracy

1. Is your depiction of the individuals or population on the topographic map within 6.25m (20.5ft) of the actual location on the ground?
☒ **Yes** ☐ **No**
2. If the area occupied is long, narrow and less than 12.5 meters wide, please pace off or use measuring tape to obtain: Length: _____ (m) Width: _____ (m)
3. Make/Model of GPS receiver: ☒ Garmin ☐ Trimble ☐ Magellan ☐ Pharos Ipaq Other: _____
4. GPS receiver horizontal position accuracy (see GPS manual for manufacturer's technical specifications):

Autonomous (uncorrected)	20	☐ meters	☒ feet
DGPS (differentially corrected)	_____	☐ meters	☐ feet

Ownership

Owner Type: ☐ Private ☒ USFS ☐ BLM ☐ State
☐ Military ☐ Indian ☐ BuRec ☐ Other: _____
If Private, Owner Name: _____
National Forest or BLM District Name: Pike National Forest, South Park Ranger District
Owner Comments (special requests, permissions, circumstances): _____
Additional Comments: _____

Directions

Driving and hiking directions and prominent topographical features (please provide a photocopy of map with REMOVED FOR WEB VERSION

Element Occurrence Details

SIZE/POPULATION BIOLOGY (area of occupancy, population abundance, density, fluctuation):
Estimated Number of Individuals (or exact count, if feasible; if plants are spreading vegetatively, indicate number of aerial stems): I counted about 30 plants at the eastern site and 50 at the western site.

Estimated Population Size: _____
Number of Subpopulations (if applicable): _____
Size of Area Covered by Population: ☐ **none (point)** or 500 ☒ **sq. feet** ☐ **acres**
Comments: _____

CONDITION (productivity, vigor/health, evidence of reproduction, health of population, degree of anthropogenic disturbance, naturalness of hydrology, and other ecological processes):
Phenology: Vegetative: 25% Flower: 75% Fruit: %
Reproductive Success: (evidence of seed dispersal and establishment): _____
Age Classes Present: All age classes were represented.
Symbiotic or Parasitic Relationships (e.g. pollinators): _____
Evidence of Disease, Predation or Injury: None.
Comments: Plants appeared vigorous.

LANDSCAPE CONTEXT (biological structure, species composition, degree of fragmentation and connectivity , condition, and extent **of surrounding landscape**; abiotic physical/chemical factors):
Comments: Surrounding landscape is steep talus slopes with patchy vegetation.

General Habitat Description

General Habitat Comments: _____
Associated Plant Community (list dominant species currently present, include age structure if known): Alpine species associated with rock, talus and unstable soils.
Additional Associated Plant Species: Eastern site: Polemonium viscosissimum, Draba crassa, Ligularia amplectens, Ligularia soldanella, Sedum rhodanthum, Oxyria digyna, Oreoxis alpina, Erysimum capitatum, Aquilegia saximontana, Ranunculus gelidus. Western site: Chaenactis alpina, Trisetum spicatum, Cirsium scopularum, and Erysimum capitatum.

Topographic Position:
☐ Interfluve (crest) ☐ High Slope ☐ High Level ☐ Midslope ☐ Backslope ☐ Step in Slope
☒ Lowslope ☐ Toeslope ☐ Low Level ☐ Channel Wall ☐ Channel Bed ☐ Basin Floor
☐ Not Assessed/Unkown ☐ Other _____

Aspect:
☐ Flat ☐ Variable ☐ N (338-22 degrees) ☐ NE (23-67 degrees)
☐ E (68-112 degrees) ☐ SE (112-157 degrees) ☐ S (158-202 degrees) ☐ S (158-202 degrees)
☐ SW (203-247 degrees) ☐ W (248-292 degrees) ☒ NW (293-337 degrees)

% Slope:
☐ Flat 0% (0 degrees) ☐ Gentle 1-6% (1-5 degrees)
☒ Moderate 6-33% (5-30 degrees) ☒ Steep 33-50% (30- 45 degrees)
☐ Very steep 50-67% (45-60 degrees) ☐ Cliff 67-100% (60-90 degrees)
☐ Overhanging/sheltered (>90 degrees)

Slope Shape: ☐ Concave ☒ Convex ☐ Straight ☐ Other _____
Light Exposure: ☒ Open ☐ Shaded ☐ Partial shade ☐ Other _____
Moisture: ☒ Dry ☐ Moist ☐ Saturated ☐ Inundated ☐ Seasonal seepage ☐ Other _____
Parent Material: Granite Soil Texture: _____
Geomorphic Land Form (e.g., glaciated mountain slopes and ridges, alpine glacial valley, rolling uplands, breaklands, alluvial-colluvial-lacsutrine, rockslides, etc.): _____

Management Comments

Evidence of Threats and Disturbance (e.g. effects on population viability due to mining, recreation, grazing, exotic species; past/present/future recommendations): Trail to Mt. Bross passes though eastern site.
Predominant Land Uses: Recreation, mining.
Exotic Species: None

Protection Comments (Are there any protection plans or strategies in place?)

No

Documentation
Photographs Taken: ☒ Y ☐ N
If yes, indicate: Photographer: Brian Elliott
Photo Number(s): _____
Repository: _____

Specimens Taken: ☐ Y ☒ N
If yes, indicate: Collector: _____
Collection Number(s): _____
Repository: _____

General Comments
_____

Map 7: Penstemon harbourii

PEHA = *Penstemon harbourii.*

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Ranunculus gelidus - ice cold buttercup

Ice cold buttercup is a perennial herb of the buttercup family (Ranunculaceae) that has also been known under the synonym *Ranunculus karelinii* and an alternative common name tundra buttercup. The species inhabits alpine slopes and summits, and is often found amongst rocks and scree at elevations ranging from 12,000-14,100 ft. It flowers during July and fruit is produced during August. Tundra buttercup ranges from Alaska and Canada south to Idaho, Montana, Wyoming, Utah, and Colorado. The Colorado county distribution includes Chaffee, Clear Creek, Gunnison, Lake, Park, and Summit counties. The species is globally ranked G4G5 by NatureServe (2003), indicating that the species is apparently secure globally but sometimes rare at the edges of its distribution. In Colorado, the species is ranked S2 (imperiled) by the Colorado Natural Heritage Program due to the few known occurrences.

Photo 8: Ranunculus gelidus

Ranunculus gelidus below Mt. Lincoln.

CNHP Form 8a: Ranunculus gelidus

COLORADO NATURAL HERITAGE PROGRAM
PLANT ELEMENT OCCURRENCE FIELD FORM

COLORADO STATE UNIVERSITY-COLLEGE OF NATURAL RESOURCES
Mailing Address: CNHP, 8002 Campus Delivery, Fort Collins, CO 80523-8002
Physical Address: 254 General Services Bldg., Fort Collins, CO 80523
Attn: Jill Handwerk (970) 491-5857

General

Survey Date: 16 July 2007
Observer(s) Name & Affiliation: Brian Elliott, private contractor.
Observer(s) Address & Phone Number: elliottconsultingusa@yahoo.com

Taxonomy

Element Common Name(s): ice cold buttercup
Element Scientific Name: Ranunculus gelidus
(For a list of elements tracked by CNHP, refer to http://www.cnhp.colostate.edu/list.html)

Data Sensitivity

Data Sensitive Element Occurrence: ☐ Y ☒ N
If yes, list reason (i.e., landowner requests confidentiality): _____

Locational Information

REMOVED FOR WEB VERSION

Locational Accuracy

1. Is your depiction of the individuals or population on the topographic map within 6.25m (20.5ft) of the actual location on the ground?
☒ **Yes** ☐ **No**

2. If the area occupied is long, narrow and less than 12.5 meters wide, please pace off or use measuring tape to obtain: Length: _____ (m) Width: _____ (m)
3. Make/Model of GPS receiver: ☒ Garmin ☐ Trimble ☐ Magellan ☐ Pharos Ipaq Other: _____
4. GPS receiver horizontal position accuracy (see GPS manual for manufacturer's technical specifications):

Autonomous (uncorrected)	20	☐ meters	☒ feet
DGPS (differentially corrected)	_____	☐ meters	☐ feet

Ownership

Owner Type: ☐ Private ☒ USFS ☐ BLM ☐ State ☐ Military ☐ Indian ☐ BuRec ☐ Other: _____
If Private, Owner Name: _____
National Forest or BLM District Name: Pike National Forest, South Park Ranger District
Owner Comments (special requests, permissions, circumstances): _____
Additional Comments: _____

Directions

REMOVED FOR WEB VERSION

Element Occurrence Details

SIZE/POPULATION BIOLOGY (area of occupancy, population abundance, density, fluctuation):
Estimated Number of Individuals (or exact count, if feasible; if plants are spreading vegetatively, indicate number of aerial stems): I counted 40 plants but did not cover the entire population. It is likely that additional plants could be found with additional survey effort.

Estimated Population Size: _____
Number of Subpopulations (if applicable): _____
Size of Area Covered by Population: ☐ **none (point)** or Two ☐ **sq. feet** ☒**acres**
Comments: _____

CONDITION (productivity, vigor/health, evidence of reproduction, health of population, degree of anthropogenic disturbance, naturalness of hydrology, and other ecological processes):
Phenology: Vegetative: 0% Flower: 10% Fruit: 90%
Reproductive Success: (evidence of seed dispersal and establishment): _____
Age Classes Present: All age classes were represented.
Symbiotic or Parasitic Relationships (e.g. pollinators): _____
Evidence of Disease, Predation or Injury: None.
Comments: Plants appeared vigorous and were producing fruit.

LANDSCAPE CONTEXT (biological structure, species composition, degree of fragmentation and connectivity , condition, and extent **of surrounding landscape**; abiotic physical/chemical factors):
Comments: Surrounding landscape is steep talus slopes with patchy vegetation.

General Habitat Description

General Habitat Comments: _____
Associated Plant Community (list dominant species currently present, include age structure if known): Alpine species associated with rock, talus and unstable soils.
Additional Associated Plant Species: Polemonium viscosissimum, Draba crassa, Ligularia amplectens, Ligularia soldanella, Sedum rhodanthum, Oxyria digyna, Oreoxis alpina, Erysimum capitatum, and Aquilegia saximontana.

Topographic Position:
☐ Interfluve (crest) ☐ High Slope ☐ High Level ☐ Midslope ☐ Backslope ☐ Step in Slope
☒ Lowslope ☐ Toeslope ☐ Low Level ☐ Channel Wall ☐ Channel Bed ☐ Basin Floor
☐ Not Assessed/Unkown ☐ Other _____

Aspect:
☐ Flat ☐ Variable ☐ N (338-22 degrees) ☐ NE (23-67 degrees)
☐ E (68-112 degrees) ☐ SE (112-157 degrees) ☐ S (158-202 degrees) ☐ S (158-202 degrees)
☐ SW (203-247 degrees) ☐ W (248-292 degrees) ☒ NW (293-337 degrees)

% Slope:
☐ Flat 0% (0 degrees) ☐ Gentle 1-6% (1-5 degrees)
☒ Moderate 6-33% (5-30 degrees) ☒ Steep 33-50% (30- 45 degrees)
☐ Very steep 50-67% (45-60 degrees) ☐ Cliff 67-100% (60-90 degrees)
☐ Overhanging/sheltered (>90 degrees)

Slope Shape: ☐ Concave ☒ Convex ☐ Straight ☐ Other _____
Light Exposure: ☒ Open ☐ Shaded ☐ Partial shade ☐ Other _____
Moisture: ☒ Dry ☐ Moist ☐ Saturated ☐ Inundated ☐ Seasonal seepage ☐ Other _____
Parent Material: Granite Soil Texture: _____
Geomorphic Land Form (e.g., glaciated mountain slopes and ridges, alpine glacial valley, rolling uplands, breaklands, alluvial-colluvial-lacsutrine, rockslides, etc.): _____

Management Comments

Evidence of Threats and Disturbance (e.g. effects on population viability due to mining, recreation, grazing, exotic species; past/present/future recommendations): Trail to Mt. Bross passes though the site.
Predominant Land Uses: Recreation, mining.
Exotic Species: None

Protection Comments (Are there any protection plans or strategies in place?)
No

Documentation

Photographs Taken: ☒ Y ☐ N

If yes, indicate: Photographer: Brian Elliott
Photo Number(s): _____
Repository: _____

Specimens Taken: ☐ Y ☒ N
If yes, indicate: Collector: _____
Collection Number(s): _____
Repository: _____

General Comments

Other Ranunculus gelidus sites I have seen are at higher elevation, usually over 13,000 feet.

Map 8a: Ranunculus gelidus

RAGE = *Ranunculus gelidus*

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CNHP Form 8b: Ranunculus gelidus

COLORADO NATURAL HERITAGE PROGRAM
PLANT ELEMENT OCCURRENCE FIELD FORM

COLORADO STATE UNIVERSITY-COLLEGE OF NATURAL RESOURCES
Mailing Address: CNHP, 8002 Campus Delivery, Fort Collins, CO 80523-8002
Physical Address: 254 General Services Bldg., Fort Collins, CO 80523
Attn: Jill Handwerk (970) 491-5857

General

Survey Date: July 9, 2007
Observer(s) Name & Affiliation: Brian Elliott, private contractor.
Observer(s) Address & Phone Number: elliottconsultingusa@yahoo.com

Taxonomy

Element Common Name(s): ice-cold buttercup
Element Scientific Name: Ranunculus gelidus
(For a list of elements tracked by CNHP, refer to http://www.cnhp.colostate.edu/list.html)

Data Sensitivity

Data Sensitive Element Occurrence: ☐ Y ☒ N
If yes, list reason (i.e., landowner requests confidentiality): _____

Locational Information

REMOVED FOR WEB VERSION

Locational Accuracy

1. Is your depiction of the individuals or population on the topographic map within 6.25m (20.5ft) of the actual location on the ground?
☒ **Yes** ☐ **No**
2. If the area occupied is long, narrow and less than 12.5 meters wide, please pace off or use measuring tape to obtain: Length: _____ (m) Width: _____ (m)
3. Make/Model of GPS receiver: ☒ Garmin ☐ Trimble ☐ Magellan ☐ Pharos Ipaq Other: _____
4. GPS receiver horizontal position accuracy (see GPS manual for manufacturer's technical specifications):
Autonomous (uncorrected) 20 ☐ meters ☒ feet
DGPS (differentially corrected) _____ ☐ meters ☐ feet

Ownership

Owner Type: ☒ Private ☒ USFS ☐ BLM ☐ State
☐ Military ☐ Indian ☐ BuRec ☐ Other: _____
If Private, Owner Name: _____
National Forest or BLM District Name: Pike National Forest, South Park Ranger District
Owner Comments (special requests, permissions, circumstances): _____
Additional Comments: Land ownership patterns in the area are complex as a result of mining claims. Although the sites appear on both Forest Service and private lands when plotted on topographic maps, recent mapping efforts associated with trail reroutes intended to move the trail off of private lands have shown the underlying base map to be in error.

Directions

REMOVED FOR WEB VERSION

Element Occurrence Details

SIZE/POPULATION BIOLOGY (area of occupancy, population abundance, density, fluctuation):

Estimated Number of Individuals (or exact count, if feasible; if plants are spreading vegetatively, indicate number of aerial stems): I counted 40 plants but it is likely that additional plants could be found west of the gap. It was steep, loose, and out of the trail corridor so I did not try to survey that area.
Estimated Population Size: _____
Number of Subpopulations (if applicable): _____
Size of Area Covered by Population: ☐ **none (point)** or Two ☐ **sq. feet** ☒**acres**
Comments: _____

CONDITION (productivity, vigor/health, evidence of reproduction, health of population, degree of anthropogenic disturbance, naturalness of hydrology, and other ecological processes):
Phenology: Vegetative: 0% Flower: 10% Fruit: 90%
Reproductive Success: (evidence of seed dispersal and establishment): _____
Age Classes Present: All age classes were represented.
Symbiotic or Parasitic Relationships (e.g. pollinators): _____
Evidence of Disease, Predation or Injury: None.
Comments: Plants appeared vigorous and were producing fruit.

LANDSCAPE CONTEXT (biological structure, species composition, degree of fragmentation and connectivity , condition, and extent **of surrounding landscape**; abiotic physical/chemical factors):
Comments: Surrounding landscape is steep talus slopes with patchy vegetation.

General Habitat Description

General Habitat Comments: _____
Associated Plant Community (list dominant species currently present, include age structure if known): Alpine species associated with rock, talus and unstable soils.
Additional Associated Plant Species: Claytonia megarhiza, Polemonium viscosissimum, Ligularia soldanella, Nocaccea montana, Saxifraga cernua.

Topographic Position:
☐ Interfluve (crest) ☒ High Slope ☐ High Level ☐ Midslope ☐ Backslope ☒ Step in Slope
☐ Lowslope ☐ Toeslope ☐ Low Level ☐ Channel Wall ☐ Channel Bed ☐ Basin Floor
☐ Not Assessed/Unkown ☐ Other _____

Aspect:
☐ Flat ☐ Variable ☒ N (338-22 degrees) ☐ NE (23-67 degrees)
☐ E (68-112 degrees) ☐ SE (112-157 degrees) ☐ S (158-202 degrees) ☐ S (158-202 degrees)
☐ SW (203-247 degrees) ☐ W (248-292 degrees) ☒ NW (293-337 degrees)

% Slope:
☐ Flat 0% (0 degrees) ☐ Gentle 1-6% (1-5 degrees)
☒ Moderate 6-33% (5-30 degrees) ☒ Steep 33-50% (30- 45 degrees)
☐ Very steep 50-67% (45-60 degrees) ☐ Cliff 67-100% (60-90 degrees)
☐ Overhanging/sheltered (>90 degrees)

Slope Shape: ☐ Concave ☒ Convex ☐ Straight ☐ Other _____
Light Exposure: ☒ Open ☐ Shaded ☐ Partial shade ☐ Other _____
Moisture: ☒ Dry ☐ Moist ☐ Saturated ☐ Inundated ☐ Seasonal seepage ☐ Other _____
Parent Material: Granite Soil Texture: Sandy
Geomorphic Land Form (e.g., glaciated mountain slopes and ridges, alpine glacial valley, rolling uplands, breaklands, alluvial-colluvial-lacsutrine, rockslides, etc.): _____

Management Comments

Evidence of Threats and Disturbance (e.g. effects on population viability due to mining, recreation, grazing, exotic species; past/present/future recommendations):
Predominant Land Uses: Recreation, mining.
Exotic Species: None

Protection Comments (Are there any protection plans or strategies in place?)

No

Documentation

Photographs Taken: ☒ Y ☐ N
If yes, indicate: Photographer: Brian Elliott
Photo Number(s): _____
Repository: _____

Specimens Taken: ☐ Y ☒ N
If yes, indicate: Collector: _____
Collection Number(s): _____
Repository: _____

General Comments

_____

Map 8b: Ranunculus gelidus

RAGE = *Ranunculus gelidus*

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CNHP Form 8c: Ranunculus gelidus

COLORADO NATURAL HERITAGE PROGRAM
PLANT ELEMENT OCCURRENCE FIELD FORM

COLORADO STATE UNIVERSITY-COLLEGE OF NATURAL RESOURCES
Mailing Address: CNHP, 8002 Campus Delivery, Fort Collins, CO 80523-8002
Physical Address: 254 General Services Bldg., Fort Collins, CO 80523
Attn: Jill Handwerk (970) 491-5857

General

Survey Date: July 9, 2007
Observer(s) Name & Affiliation: Brian Elliott, private contractor.
Observer(s) Address & Phone Number: elliottconsultingusa@yahoo.com

Taxonomy

Element Common Name(s): ice cold buttercup
Element Scientific Name: Ranunculus gelidus
(For a list of elements tracked by CNHP, refer to http://www.cnhp.colostate.edu/list.html)

Data Sensitivity

Data Sensitive Element Occurrence: ☐ Y ☒ N
If yes, list reason (i.e., landowner requests confidentiality): _____

Locational Information

REMOVED FOR WEB VERSION

Locational Accuracy

1. Is your depiction of the individuals or population on the topographic map within 6.25m (20.5ft) of the actual location on the ground?
☒ **Yes** ☐ **No**
2. If the area occupied is long, narrow and less than 12.5 meters wide, please pace off or use measuring tape to obtain: Length: _____ (m) Width: _____ (m)
3. Make/Model of GPS receiver: ☒ Garmin ☐ Trimble ☐ Magellan ☐ Pharos Ipaq Other: _____
4. GPS receiver horizontal position accuracy (see GPS manual for manufacturer's technical specifications):
Autonomous (uncorrected) 20 ☐ meters ☒ feet
DGPS (differentially corrected) _____ ☐ meters ☐ feet

Ownership

Owner Type: ☒ Private ☒ USFS ☐ BLM ☐ State
☐ Military ☐ Indian ☐ BuRec ☐ Other: _____
If Private, Owner Name: _____
National Forest or BLM District Name: Pike National Forest, South Park Ranger District
Owner Comments (special requests, permissions, circumstances): _____
Additional Comments: Land ownership patterns in the area are complex as a result of mining claims. Although the sites appear on both Forest Service and private lands when plotted on topographic maps, recent mapping efforts associated with trail reroutes intended to move the trail off of private lands have shown the underlying base map to be in error.

Directions

REMOVED FOR WEB VERSION

Element Occurrence Details

SIZE/POPULATION BIOLOGY (area of occupancy, population abundance, density, fluctuation):

Estimated Number of Individuals (or exact count, if feasible; if plants are spreading vegetatively, indicate number of aerial stems): I counted 60 plants but did not cover the entire population. It is likely that additional plants could be found further downslope.
Estimated Population Size: _____
Number of Subpopulations (if applicable): _____
Size of Area Covered by Population: ☐ **none (point)** or Five ☐ **sq. feet** ☒**acres**
Comments: _____

CONDITION (productivity, vigor/health, evidence of reproduction, health of population, degree of anthropogenic disturbance, naturalness of hydrology, and other ecological processes):
Phenology: Vegetative: 0% Flower: 50% Fruit: 50%
Reproductive Success: (evidence of seed dispersal and establishment): _____
Age Classes Present: All age classes were represented.
Symbiotic or Parasitic Relationships (e.g. pollinators): _____
Evidence of Disease, Predation or Injury: None.
Comments: Plants appeared vigorous and were producing fruit.

LANDSCAPE CONTEXT (biological structure, species composition, degree of fragmentation and connectivity , condition, and extent **of surrounding landscape**; abiotic physical/chemical factors):
Comments: Surrounding landscape is steep talus slopes with patchy vegetation.

General Habitat Description

General Habitat Comments: _____
Associated Plant Community (list dominant species currently present, include age structure if known): Alpine species associated with rock, talus and unstable soils.
Additional Associated Plant Species: Polemonium viscosissimum, Draba crassa. Little other vegetation at the site.

Topographic Position:
☐ Interfluve (crest) ☒ High Slope ☐ High Level ☐ Midslope ☐ Backslope ☐ Step in Slope
☐ Lowslope ☐ Toeslope ☐ Low Level ☐ Channel Wall ☐ Channel Bed ☐ Basin Floor
☐ Not Assessed/Unkown ☐ Other _____

Aspect:
☐ Flat ☐ Variable ☐ N (338-22 degrees) ☐ NE (23-67 degrees)
☐ E (68-112 degrees) ☐ SE (112-157 degrees) ☐ S (158-202 degrees) ☐ S (158-202 degrees)
☐ SW (203-247 degrees) ☐ W (248-292 degrees) ☒ NW (293-337 degrees)

% Slope:
☐ Flat 0% (0 degrees) ☐ Gentle 1-6% (1-5 degrees)
☒ Moderate 6-33% (5-30 degrees) ☒ Steep 33-50% (30- 45 degrees)
☐ Very steep 50-67% (45-60 degrees) ☐ Cliff 67-100% (60-90 degrees)
☐ Overhanging/sheltered (>90 degrees)

Slope Shape: ☐ Concave ☒ Convex ☐ Straight ☐ Other _____
Light Exposure: ☒ Open ☐ Shaded ☐ Partial shade ☐ Other _____
Moisture: ☒ Dry ☐ Moist ☐ Saturated ☐ Inundated ☐ Seasonal seepage ☐ Other _____
Parent Material: Granite Soil Texture: Sandy
Geomorphic Land Form (e.g., glaciated mountain slopes and ridges, alpine glacial valley, rolling uplands, breaklands, alluvial-colluvial-lacsutrine, rockslides, etc.): _____

Management Comments

Evidence of Threats and Disturbance (e.g. effects on population viability due to mining, recreation, grazing, exotic species; past/present/future recommendations): Trail from Montgomery Reservoir area to Mt. Lincoln passes though the site.
Predominant Land Uses: Recreation, mining.
Exotic Species: None

Protection Comments (Are there any protection plans or strategies in place?)

No

Documentation

Photographs Taken: ☒ Y ☐ N
If yes, indicate: Photographer: Brian Elliott
Photo Number(s): _____
Repository: _____

Specimens Taken: ☐ Y ☒ N
If yes, indicate: Collector: _____
Collection Number(s): _____
Repository: _____

General Comments

This is a known site. Crepis nana is also supposed to be here but I was unable to locate it. It may have been further downslope.

Map 8c: Ranunculus gelidus

RAGE = *Ranunculus gelidus*

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Saussurea weberi - Weber saussurea

Weber saussurea is a perennial herb of the sunflower family (Asteraceae) growing in gravelly tundra or scree slopes at elevations ranging from 10,500-14,300 feet (Spackman *et al* 2007). The species blooms in late summer, producing flowers in late July or August. It ranges from Montana to Wyoming and Colorado, but its Colorado distribution is limited to the Mosquito Range in Park and Summit counties.

Photo 9a: Saussurea weberi

Saussurea weberi in the Kite Lake Basin.

Photo 9b: Saussurea weberi

The plumose pappus of *Saussurea weberi.*

CNHP Form 9

COLORADO NATURAL HERITAGE PROGRAM
PLANT ELEMENT OCCURRENCE FIELD FORM

COLORADO STATE UNIVERSITY-COLLEGE OF NATURAL RESOURCES
Mailing Address: CNHP, 8002 Campus Delivery, Fort Collins, CO 80523-8002
Physical Address: 254 General Services Bldg., Fort Collins, CO 80523
Attn: Jill Handwerk (970) 491-5857

General

Survey Date: July 15-17, 2007 and October 10, 2007
Observer(s) Name & Affiliation: Brian Elliott, private contractor.
Observer(s) Address & Phone Number: elliottconsultingusa@yahoo.com

Taxonomy

Element Common Name(s): Weber saussurea
Element Scientific Name: Saussurea weberi
(For a list of elements tracked by CNHP, refer to http://www.cnhp.colostate.edu/list.html)

Data Sensitivity

Data Sensitive Element Occurrence: ☐ Y ☒ N
If yes, list reason (i.e., landowner requests confidentiality): _____

Locational Information

REMOVED FOR WEB VERSION

Locational Accuracy

1. Is your depiction of the individuals or population on the topographic map within 6.25m (20.5ft) of the actual location on the ground?
☒ **Yes** ☐ **No**
2. If the area occupied is long, narrow and less than 12.5 meters wide, please pace off or use measuring tape to obtain: Length: _____ (m) Width: _____ (m)
3. Make/Model of GPS receiver: ☒ Garmin ☐ Trimble ☐ Magellan ☐ Pharos Ipaq Other: _____
4. GPS receiver horizontal position accuracy (see GPS manual for manufacturer's technical specifications):

Autonomous (uncorrected)	20	☐ meters	☒ feet
DGPS (differentially corrected)	_____	☐ meters	☐ feet

Ownership

Owner Type: ☒ Private ☒ USFS ☐ BLM ☐ State
☐ Military ☐ Indian ☐ BuRec ☐ Other: _____
If Private, Owner Name: _____
National Forest or BLM District Name: Pike National Forest, South Park Ranger District
Owner Comments (special requests, permissions, circumstances): _____
Additional Comments: Although both sites appear to be on public land when plotted on a USGS topo map, land ownership patterns in the area are complex as a result of mining claims. Although the sites appear on both Forest Service and private lands when plotted on topographic maps, recent mapping efforts associated with trail reroutes intended to move the trail off of private lands have shown the underlying base map to be in error.

Directions

REMOVED FOR WEB VERSION

Element Occurrence Details

SIZE/POPULATION BIOLOGY (area of occupancy, population abundance, density, fluctuation):
Estimated Number of Individuals (or exact count, if feasible; if plants are spreading vegetatively, indicate number of aerial stems):

Estimated Population Size: Total population estimate for the entire polygon is about 2,000-perhaps 4,000 plants. We counted 478 near the trail reroute. We then traversed the population site estimating numbers of plants.
Number of Subpopulations (if applicable): _____
Size of Area Covered by Population: ☐ **none (point)** or 40-80 ☐ **sq. feet** ☒**acres**
Comments:

CONDITION (productivity, vigor/health, evidence of reproduction, health of population, degree of anthropogenic disturbance, naturalness of hydrology, and other ecological processes):
Phenology: Vegetative: 100% were in bud in July Flower: % Fruit: 100% in fruit in October
Reproductive Success: (evidence of seed dispersal and establishment): _____
Age Classes Present: All plants were mature, but it would be difficult to identify seedlings amongst alpine turf.
Symbiotic or Parasitic Relationships (e.g. pollinators): _____
Evidence of Disease, Predation or Injury: None.
Comments: Plants appeared vigorous.

LANDSCAPE CONTEXT (biological structure, species composition, degree of fragmentation and connectivity , condition, and extent **of surrounding landscape**; abiotic physical/chemical factors):
Comments: Surrounding landscape is alpine turf.

General Habitat Description

General Habitat Comments: On alpine turf. Plants were on an extensive field of solifluction lobes.
Associated Plant Community (list dominant species currently present, include age structure if known): Alpine turf species.
Additional Associated Plant Species: Polemonium viscosissimum, Trifolium parryi, Polygonum bistorta, Carex sp., Geum rossii, Salix planifolia and many others.

Topographic Position:
☐ Interfluve (crest) ☐ High Slope ☐ High Level ☐ Midslope ☐ Backslope ☐ Step in Slope
☒ Lowslope ☒ Toeslope ☐ Low Level ☐ Channel Wall ☐ Channel Bed ☐ Basin Floor
☐ Not Assessed/Unkown ☐ Other _____

Aspect:
☐ Flat ☐ Variable ☐ N (338-22 degrees) ☐ NE (23-67 degrees)
☐ E (68-112 degrees) ☐ SE (112-157 degrees) ☐ S (158-202 degrees) ☐ S (158-202 degrees)
☒ SW (203-247 degrees) ☒ W (248-292 degrees) ☐ NW (293-337 degrees)

% Slope:
☐ Flat 0% (0 degrees) ☒ Gentle 1-6% (1-5 degrees)
☒ Moderate 6-33% (5-30 degrees) ☐ Steep 33-50% (30- 45 degrees)
☐ Very steep 50-67% (45-60 degrees) ☐ Cliff 67-100% (60-90 degrees)
☐ Overhanging/sheltered (>90 degrees)

Slope Shape: ☐ Concave ☒ Convex ☐ Straight ☐ Other _____
Light Exposure: ☒ Open ☐ Shaded ☐ Partial shade ☐ Other _____
Moisture: ☒ Dry ☐ Moist ☐ Saturated ☐ Inundated ☐ Seasonal seepage ☐ Other _____
Parent Material: Granite Soil Texture: _____
Geomorphic Land Form (e.g., glaciated mountain slopes and ridges, alpine glacial valley, rolling uplands, breaklands, alluvial-colluvial-lacsutrine, rockslides, etc.): _____

Management Comments

Evidence of Threats and Disturbance (e.g. effects on population viability due to mining, recreation, grazing, exotic species; past/present/future recommendations): Trail to Mt. Bross passes though SAWE2. SAWE1 is off of any traveled route.
Predominant Land Uses: Recreation, mining.
Exotic Species: None

Protection Comments (Are there any protection plans or strategies in place?)

No

Documentation

Photographs Taken: ☒ Y ☐ N
If yes, indicate: Photographer: Brian Elliott
Photo Number(s): _____
Repository: _____

Specimens Taken: ☐ Y ☒ N
If yes, indicate: Collector: _____
Collection Number(s): _____
Repository: _____

General Comments

I never saw the plants bloom although I visited them several times in July. I saw no special habitat characteristics; plants were solifluction lobes covered by alpine turf. I was surprised to find that it was easier to survey for the plants in October than in July! In July it was difficult to pick the plants out of the alpine vegetation. In October, however, the vegetation was tan or brown but the snow-white pappus of *Saussurea weberi* was quite noticeable. Since it flowers late the fruit also disperses late, after almost any other composite. Plus, *Saussurea* has a plumose pappus and that is not common amongst the alpine plants. I saw *Cirsium scopulorum* (capillary pappus) and *Hymenoxys rydbergii* (scale-like pappus) in fruit in October, but nothing else with a plumose pappus. The majority of the population was found in the October survey. Of course, once it snows the survey window is over. Population estimate at this site was done by 4 people- everyone guessed 2,000-4,000 based on the count we made and the numbers we saw just walking across the basin. It is truly odd that this large site, with so much recreational activity, should remain undiscovered until now.

Map 9: Saussurea weberi

SAWE = *Saussurea weberi*

REMOVED FOR WEB VERSION

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Appendix 1: Codes and Ranks

Codes and ranks describing Federal or State legal status, as well as the G-code and S-code used to describe abundance used by Natural Heritage Programs and NatureServe are described below.

1. Federal Status: U.S. Fish and Wildlife Service

E: Endangered: taxa formally listed as endangered.

T: Threatened: taxa formally listed as threatened.

C: Candidate: taxa for which the Service has on file sufficient information on biological vulnerability and threat(s) to support proposals to list them as endangered or threatened species.

C1: Formerly used to indicate Notice of Review, Category 1: taxa for which substantial biological information exists on file to support proposing to list as endangered or threatened.

C2: Formerly used to indicate Notice of Review, Category 2: taxa for which current information indicates that proposing to list as endangered or threatened is possible, but appropriate or substantial biological information is not on file to support an immediate rulemaking.

C2*: Formerly used to indicate taxa believed to be possibly extirpated in the wild.

3A: Formerly used to indicate taxa for which the USFWS has persuasive evidence of extinction.

3B: Formerly used to indicate names that based on current taxonomic knowledge do not represent taxa meeting the Endangered Species Act's definition of a species.

3C: Formerly used to indicate Notice of Review, Category 3C: taxa that have proven to be more abundant or widespread than was previously believed, and/or those that are not subject to any identifiable threat.

2. Federal Status: U.S.D.A Forest Service

S: Sensitive. Those plant and animal species identified by the Regional Forester for which population viability is a concern as evidenced by a significant current or predicted downward trend in population numbers or density, or significant current or predicted downward trends in habitat capability that would reduce a species' existing distribution.

3. The Nature Conservancy and State Natural Heritage Program Ranking System
GLOBAL RANK (G): based on range-wide status of a species.

G1: Critically imperiled globally because of extreme rarity (5 or fewer occurrences, or very few remaining individuals), or because of some factor of its biology making it especially vulnerable to extinction. (Critically endangered throughout its range).

G2: Imperiled globally because of rarity (6 to 20 occurrences) or because of other factors demonstrably making it very vulnerable to extinction throughout its range. (Endangered throughout its range).

G3: Vulnerable throughout its range or found locally in a restricted range (21 to 100 occurrences). (Threatened throughout its range)
G4: Apparently secure globally, though it might be quite rare in parts of its range, especially at the periphery.
G5: Demonstrably secure globally, though it may be quite rare in parts of its range, especially at the periphery.
GX: Presumed extinct.
GQ: Indicates uncertainty about taxonomic status.
GU: Unable to assign rank due to lack of available information.
G?: Indicates uncertainty about an assigned global rank.
T: Trinomial rank used for subspecies or varieties. These taxa are ranked on the same criteria as G1-G5.

STATE RANK (S): based on the status of a species in an individual state. S ranks may differ between Colorado and neighboring states based on the relative abundance of a species in each state.

S1: Critically imperiled in state because of extreme rarity (5 or fewer occurrences, or very few remaining individuals, or because of some factor of its biology making it especially vulnerable to extirpation from the state. (Critically endangered in state)
S2: Imperiled in state because of rarity (6 to 20 occurrences) or because of other factors demonstrably making it very vulnerable to extirpation from the state. (Endangered or threatened in state).
S3: Vulnerable in state (21 to 100 occurrences).
S4: Apparently secure in the state, although it may be rare at the edge of its range.
S5: Demonstrably secure in the state, although it may be rare in parts of its, especially at the periphery.
S?: Indicates uncertainty about an assigned state rank.
SH: Of historical occurrence, not documented in the state since 1920.