NATURAL HERITAGE INVENTORY OF THE CLEAR CREEK RANGER DISTRICT, ARAPAHO-ROOSEVELT NATIONAL FOREST

PHASE II

FINAL REPORT

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EXECUTIVE SUMMARY

In 1992, the Colorado Natural Heritage Program (CNHP) joined efforts through a Challenge Cost-Share Agreement with the Clear Creek Ranger District of the Arapaho-Roosevelt National Forests to conduct a Natural Heritage Inventory of the proposed corridor of the Continental Divide Trail. In 1993 the partnership was continued but with the more general goal of continuing the inventory for the entire district. The goal of the inventory was to systematically identify the localities of rare, threatened, or endangered species and the locations of significant natural communities.

The Natural Heritage Inventory was conducted in six steps:

1. Review aerial photographs, topographic maps, soil maps, and geological maps.

2. Gather additional existing information.

3. Map the "potential natural areas" from information gathered in steps 1 and 2.

4. Perform initial ground surveys.

5. Complete an inventory of as many PNAs as possible in the 1993 field season.

6. Compile the results and prepare a final report.

At the completion of the 1993 field season, the CNHP had records of two rare vertebrate species, one rare invertebrate species, seventeen rare plant species, and sixteen natural communities/plant associations of statewide significance (Table 1). Many of these elements of natural diversity are sensitive to unnatural disturbance or may be sought out by collectors. For this reason, the exact locations have not been presented in this report. Requests for additional information on these resources should be addressed to: Colorado Natural Heritage Program, c/o University of Colorado Museum, Hunter 115, Campus Box 315, Boulder, CO 80309-0315.

Fifty-nine Potential Natural Area's (PNAs) were identified during phases I (Pague and Reid 1993) and II of the inventory (**Table 3 and Figure 2**). Of these, twenty were found to support natural heritage resources (rare, threatened, or endangered species and significant natural communities/plant associations). Using information from other sources and the results of this inventory, we have mapped out 20 significant biodiversity areas which range in size from 32 to 6,600 acres (**Figure 3**). For these areas, the staff

of the CNHP developed preliminary conservation planning boundaries. In developing these boundaries, Natural Heritage staff and contracted scientists considered a number of factors including habitat for rare species, protection of water quality, and buffers from potentially detrimental land uses.

The delineation of preliminary conservation planning boundaries in this report does not confer any regulatory protection on recommended areas. These boundaries are intended to be used to support wise planning and decision-making for the conservation of these significant areas. The CNHP encourages the Arapaho-Roosevelt National Forest to take appropriate actions to protect these sites. We believe such actions to be consistent with the Forest Service Manual and the Ecosystem Management initiative from the Chief, USFS. CNHP offers its assistance in working with the Arapaho-Roosevelt National Forest to ensure protection of these areas.

This report is considered an addendum to Pague and Reid (1993). The report includes five recommendations for the Clear Creek District and the Forest:

1. Where appropriate, large areas of biodiversity significance should not be fragmented unavoidably. This recommendation extends to currently unfragmented areas.

2. Expand public and staff awareness of the need for protecting significant biodiversity areas.

3. Facilitate the designation of appropriate areas as Special Management Areas, Special Interest Areas, or Research Natural Areas.

4. Properly manage all areas known to be inhabited by sensitive, rare, threatened, or endangered species, or the locations of significant natural communities to assure that these elements of natural diversity persist within the context of a natural ecosystem.

5. Continue inventory/survey efforts in the study area, particularly for rare, threatened, and endangered animal species.

INTRODUCTION--PHASE II

In July 1992, the Colorado Natural Heritage Program (CNHP) was contracted by the Clear Creek District of the Arapaho-Roosevelt National Forest to conduct an inventory of: (1) the proposed Continental Divide Trail corridor; (2) the Mt. Evans corridor; (3) the Mt. Goliath Research Natural Area; and (4) the proposed Bakersville to Loveland Pass bike path corridor. The goal of the inventory was to systematically identify the localities containing natural heritage resources. In 1993, the partnership continued, but the inventory was expanded to include the entire Clear Creek District.

Natural heritage resources are defined as the rare, threatened, endangered, or sensitive species and significant natural communities/plant associations that are monitored for their biodiversity significance by the CNHP. In short, we were to identify those sites supporting unique or exemplary natural communities, rare plants and rare animals, and other significant natural features.

The second year of inventory has been completed, and the results of it are presented herein. The reader should refer to Pague and Reid (1993) for an overview of the study area, specific methods, a description of the Colorado Natural Heritage Program (CNHP), and the results found on PNAs visited in year one but not revisited in year 2. As in the report resulting from the 1992 efforts, the areas of biodiversity significance identified during the 1993 field season are described and future actions, including protection options, are introduced. Where we revisited the Conservation Sites or PNAs, we have updated the appropriate Conservation Site Profiles.

RESULTS

The Natural Heritage Inventory of the Clear Creek District of the Arapaho and Roosevelt National Forests has been completed. In the spring of 1993 we examined aerial photographs of the study area to choose sites known or believed to be significant for the protection of the Forest's natural diversity (PNAs). During the 1993 field season (June-October), we completed field work on priority PNAs and species (steps 4 and 5 of the inventory). Based on the results of the inventory, preliminary conservation planning boundaries were developed for natural heritage resources, and these sites were prioritized in terms of their contribution to maintaining the State's and Forest's natural biological diversity.

Information Collection Phase

Twenty-six PNAs were identified for the Clear Creek Ranger District for Phase I (Pague and Reid 1993) of the inventory. After examination of aerial photos and the addition of existing information we identified 33 additional PNAs for the entire District. The total PNAs identified for the study area is 59.

The Colorado Natural Heritage Program currently has records of two vertebrates, one invertebrates, seventeen plants, and sixteen significant natural communities from the study area in its databases (**Table 1**). Figure 2 illustrates the known distribution of natural heritage resources in the study area after the 1993 field season.

Table 1. Rare species and significant natural communities of the study area: Clear Creek District of the Arapaho National Forest

ELEMENT	COMMON NAME	GLOBAL RANK	STATE RANK	FEDERAL STATUS	STATE STATUS	FOREST SENSITIVE
Aquilegia saximontana	Rocky Mountain columbine	G2G3	S2S3	3C	-	-
Botrichia echo	Reflected moonwort	G2	S?	-	-	-
Botrichia hesperium	Western moonwort	G3?	S?	-	-	-
Botrichia minganense	Mingan moonwort	G4	S?	-	-	-
Bufo boreas	Boreal toad	G5T4	S2	C2	LE	FS
Carex aquatilis fen	a carices fen	G5	S3S4	-	-	-
Carex aquatilis/ Pedicularis groenlandica wetland	a sedge-dominated wetland	G4	S?	-	-	-
Carex capitata ssp. arctogena	a sedge	G5	SU	-	-	-
Carex leptalea	Bristle-stalk sedge	G4	S1	-	-	-
Carex limosa	mud sedge	G5	S?	-	-	-
Carex rostrata wetlands	montane wetlands	G3G4	S3	-	-	-
Carex rupestris/ Geum rossii	alpine wetlands	G4	S4	-	-	-
Carex scopulorum alpine wetlands	alpine wetlands	G3G4	S3S4	-	-	-
Crepis nana	Dwarf hawksbeard	G4	S2	-	-	-
Danthonia intermedia grassland	montane grassland	GU	S3S4	-	-	-
Danthonia parryi grassland	montane grassland	G3	S2	-	-	-
Deschampsia cespitosa-Calamagrostis canadensis	alpine wet meadow	G5	S4	-	-	-
Deschampsia cespitosa/ Geum rossii	alpine wet meadow	G5	S5	-	-	-
Draba exunguiculata	Clawless draba	G3	S2	-	-	-
Draba fladnizensis	Arctic draba	G4	S2S3	-	-	-
Draba grayana	Gray's Peak whitlow-grass	G2	S?	-	-	-
Draba porsildii	Porsild draba	G3	S1	-	-	-
Erigeron humilis	Low fleabane	G4	S1	-	-	-
Eriophorum gracile	Slender cotton grass	G5	S2	-	-	-

Natural Heritage Inventory of the Clear Creek District

ELEMENT	COMMON NAME	GLOBAL RANK	STATE RANK	FEDERAL STATUS	STATE STATUS	FOREST SENSITIVE
Felis lynx canadensis	Lynx	G5	S1	C2	E	-
Kobresia myosuroides/ Geum rossii	alpine turf	G5	S5	-	-	-
Muhlenbergia montana/ Danthonia parryi	montane grassland	G2	S2	-	-	-
Paludella squarrosa	a moss	G?	S1	-	-	-
Paronychia pulvinata/ Silene acaulis	alpine community	G5	S5	-	-	-
Phippsia algida	Snow grass	G4	S1	-	-	-
Picea engelmanni-Abies lasiocarpa	Engelmann spruce/subalpine fir	G5	S?	-	-	-
Pinus aristata/ Trifolium dasyphyllum	Bristlecone pine/ Whiproot clover plant association	G2	S2	-	-	-
Ranunculus gelidus	Tundra buttercup	G4	S1	_	-	-
Salix brachycarpa shrubland	a willow carr	G5	S4?	-	-	-
Salix planifolia-Salix brachycarpa/ Caltha leptosepala	a willow carr	G4	S4?	-	-	-
Saxifraga foliolosa	Leafy saxifrage	G4	S1	-	-	-

Table 2. Definition of Natural Heritage state rarity ranks. Global rarity ranks are similar, but refer to a species' rarity throughout it range. State and Global ranks are denoted, respectively, with an "S" or a "G" followed by a character. Note that GA and GN are not used and GX means extinct. These ranks should not be interpreted as legal designations.

S1	Extremely rare: usually 5 or fewer occurrences in the state; or may be a few remaining individuals; often especially vulnerable to extirpation.
S2	Very rare; usually between 5 and 20 occurrences; or with many individuals in fewer occurrences; often susceptible to becoming endangered.
S3	Rare to uncommon; usually between 20 and 100 occurrences; may have fewer occurrences, but with a large number of individuals in some populations; may be susceptible to large-scale disturbances.
S4	Common; usually > 100 occurrences, but may be fewer with many large populations; may be restricted to only a portion of the state; usually not susceptible to immediate threats.
S5	Very common; demonstrably secure under present conditions.
SA	Accidental in the state.
SH	Historically known from the state, but not verified for an extended period, usually > 15 years; this rank is used primarily when inventory has been attempted recently.
S#B	Same rank as the numbered S-series, but refers to the breeding season rarity of migrants.
S#N	Same rank as the numbered S-series, but refers to the non-breeding season rarity of migrants; where no consistent location can be discerned for migrants or non-breeding populations, a rank of SZN is used.
SU	Status uncertain, often because of low search effort or cryptic nature of the element.
SX	Apparently extirpated from the state.

Field Survey Phase

Field surveys conducted as part of the 1993 Clear Creek Ranger District survey revealed substantial new information on the natural history of the study area. Among the highlights are:

- A rare remnant montane grassland was found on Fairburn Mountain. This is somewhat surprising since it is found in the mining district. These Danthonia-dominated grasslands have become very rare in the Southern Rocky Mountains.

- The Summit Lake area remains one of the most significant areas in Colorado. There are no areas like it known in the continental United States. All of the rare plants and natural communities persist at the site. However, signs of overuse and potential threats abound and the integrity of the area is considered highly threatened. The preliminary conservation planning boundaries need to be extended to the area of tundra wetlands below the Summit Lake area.

- The high elevation wetland located in a saddle between Mt. Evans and Mt. Epaulet was carefully surveyed and found to contain additional rare plant species. Dr. William Weber (University of Colorado, Herbarium) pointed out that the area has had only preliminary search, but a very rare plant in Colorado is known from a museum specimen. Two additional rare plant species were found during the 1993 surveys. Further work is warranted.

- The boreal toad (Bufo borealis) was located at many additional sites through inventories conducted by the Clear Creek Ranger District Staff. This species is placed in Category 2 of the U. S. Fish and Wildlife Service. These additional locations suggest that the Clear Creek District is the stronghold of this species in Colorado. It is particularly significant that the largest numbers were found in the Upper Clear Creek watershed.

- Additional populations of rare plants were located at Guanella Pass, adding to the significance of the site. In addition, sample plots were studied to better understand the complex vegetation. This is the only known location in Colorado for one of the two rare plants and the site contains an exemplary high elevation willow carr.

- A remnant patch of old growth Engelmann spruce stand was found adjacent to the Loveland Ski Area. The importance of these remnants should be further investigated.

Identification and protection of rare and wide-ranging species.

We did not conduct additional inventory activity for rare and wide-ranging species such as the lynx and wolverine. No assessment was made of migratory bird use of the study area. Data on these wide-ranging elements of natural diversity are important, but surveys specifically designed for these elements are necessary to adequately interpret the results. We encourage the Clear Creek Ranger District to consider specific inventories for these elements.

PROTECTION OF SIGNIFICANT BIODIVERSITY AREAS

Of the 59 total PNAs identified during Phase I and II of the study, 19 have been dropped from consideration and 11 have not been visited. One site, Herman Gulch, has been changed from a "dropped site" (based on vegetation condition) to a conservation site (based on Boreal toad data). Seven PNAs will need further investigation to accurately discern the biodiversity significance. The remaining 20 PNAs were found to support rare, threatened, or endangered

species or significant natural communities. These sites are retained as conservation sites and are recommended to the Forest Service as areas in need of special protection or management. The CNHP in no way implies that areas that were studied but not considered conservation sites are not of importance for conservation purposes. The ranking system used ranks sites for protection relative to the rarity or degree of imperilment of known significant features. Therefore, the sites identified herein comprise the highest priority sites, based on known information, for the conservation of the study area's natural diversity.

As in Pague and Reid (1993), we have delineated conservation planning boundaries for each conservation site. In developing these boundaries, Natural Heritage staff and network scientists considered a number of factors. These include, but are not limited to:

- the extent of current and potential habitat for natural heritage resources, considering the ecological processes necessary to maintain or improve existing conditions;
- species movement and migration corridors;
- maintenance of surface water quality within the site and the surrounding watershed;
- maintenance of the hydrologic integrity of the groundwater, e.g. by protecting recharge zones;
- land intended to buffer the site against future changes in the use of surrounding lands;
- exclusion or control of invasive exotic species; and
- land necessary for management or monitoring activities.

The final 20 conservation sites found to support natural heritage resources range in size from 32 to 6,600 acres **(Table 3)**.

We repeat the description of "preliminary conservation planning boundaries" herein. First and foremost, the boundaries presented here and in Pague and Reid (1993) are for planning purposes. They delineate ecologically sensitive areas where land-use practices should be carefully planned and managed to ensure that they are compatible with protection goals for natural heritage resources and sensitive species. All land within the conservation planning boundary should be considered an integral part of a complex economic, social, and ecological landscape that requires wise land-use planning at all levels. Fortunately, all of the study area is largely managed by the Forest Service, an agency

mandated to administer its lands under a policy known as Ecosystem Management. Such policies combined with special land designations (e.g. Special Management Areas, Special Interest Areas, and Research Natural Areas) provide the Forest Service with ample tools to assure the long term viability of each candidate natural area (see below). Maps showing these preliminary boundaries are included as a part of each conservation site profile.

Figure 2 shows the locations of the 20 conservation sites identified during this survey as well as those from the previous year's work. While many of the natural areas are known to support one rare species, other support several. The conservation sites also range greatly in their significance, indicated by the Biodiversity Rank (see explanation in Pague and Reid (1992).

RECOMMENDATIONS

1. **Develop an implementation plan for designations of areas the Forest Service determines fulfill criteria for protection.**

   This inventory has documented the existence of 20 sites determined to be significant for the protection of Colorado's and the Forest's natural diversity. Seven of these sites resulted from the 1993 inventory efforts. We recommend that the District consider including this report's recommendations in the Forest Plan's most recent revision. For those sites recommended for RNA status, review should be conducted by the RNA ecologist. [Such reviews are ongoing as for the Guanella Pass proposed RNA].

2. **Include the Colorado Natural Heritage Program in the review of projects in or near areas identified as significant.**

The areas identified in this study are known to support unique or exemplary natural communities and rare species. As proposed Forest activities are considered, they should be compared to the maps presented in each conservation site profile. The CNHP staff considers this contract the establishment of a continuing partnership and offer their expertise in reviewing project proposals that may affect the significant areas or species. Since the early stages of the planning process typically offer the greatest flexibility, it is important to contact the CNHP and other reviewers at the earliest possible time.

3. **Expand public awareness of the need for protecting areas determined to be significant to the Forest's natural diversity.**

Given the proximity of the Forest to the densely populated metropolitan areas, natural lands are becoming ever more scarce. Rare species may continue to decline if not given appropriate protective measures. Increasing the public's knowledge of the remaining significant areas will build support for the programmatic initiatives necessary to protect them. Such activities could be done through interpretive facilities, conferences or meetings to stimulate public involvement, information pamphlets, and others. Finally, the Forest Service should promote any protection designations to the public and scientific community to build awareness of the commitment to New Perspectives and Ecosystems Management policies.

4. **Increase cooperation among pertinent organizations.**

The long-term protection of the Forest's natural diversity will be facilitated with the cooperation of many organizations. The Forest Service has played a leadership role in attempting to incorporate diverse opinions in the planning process. Efforts to this end should continue, providing the Forest with stronger ties among federal, state, and local and private interests involved in the protection or management of natural lands. The example of the Mt. Evans Corridor Study Group provides a useful example.

5. **Properly manage significant elements of natural diversity within the Clear Creek District study area.**

The first step in accomplishing this recommendation would be the appropriate designation of deserving sites. In doing so,

the development of management plans would be a necessary component of the designations. The CNHP and TNC are willing to assist the Forest in developing management plans. We would also encourage the development of partnerships that could research and develop techniques for maintaining or restoring conservation sites to aid in the preservation or rare, threatened, or endangered species or significant natural communities.

LITERATURE CITED

Armstrong, D. A. 1972. Distribution of mammals in Colorado. Monograph of the Mus. of Natural Hist., The University of Kansas. No. 3. 415 pp.

Cooper, D. 1991. The habitats of three boreal fen mosses new to the Southern Rocky Mountains of Colorado. The Bryologist 94(1):49-50.

Pague, C. A., and M. S. Reid. 1993. Natural Heritage inventory of the proposed Continental Divide Trail Corridor, Clear Creek District, Arapaho-Roosevelt National Forests. Natural Heritage Technical Report #92-1. Colorado Natural Heritage Program, University of Colorado Museum. Boulder, CO. Feb. 18, 1993. V + 81 pp.

Reid, M., and P. Bourgeron. in prep. A Preliminary classification of the natural vegetation of Colorado. The Nature Conservancy, Western Heritage Task Force, Boulder, Colorado. 66 pp.

Weber, W. A. 1976. Rocky Mountain Flora. Colorado Assoc. Univ. Press, Boulder. 479 pp.

Weber, W. A. 1991. The botany and significance of the Summit Lake area. Aquilegia.

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Table 3. Potential Natural Areas of the Proposed Continental Divide Trail Corridor in the Clear Creek Ranger District, Arapaho-Roosevelt National Forest

PNA #	PNA NAME	QUADRANGLE	STATUS
1	Dry Gulch Cirque	Loveland Pass	A
2	Herman Lake	Loveland Pass	O
3	Upper Bobtail Creek	Loveland Pass	O
4	Loveland Ridge	Loveland Pass	O
5	Mt. Sniktau	Grays Peak	O
6	**Upper Clear Creek**	Loveland Pass & Grays Peak	C
7	**Stanley Mountain**	Berthoud Pass	C
8	Vasquez Pass	Berthoud Pass	A
9	**West Vasquez Pass**	Berthoud Pass	C
10	Bobtail Creek	Byers Peak	A
11	Loch Lomond	Empire	A
12	**James Peak**	Empire	C
13	**Witter Peak**	Empire	C
14	**Herman Gulch**	Grays Peak	C
15	**Grays Peak**	Grays Peak	C
16	**Kelso Mountain**	Grays Peak	C
17	Upper Steven's Gulch	Grays Peak	O
18	**Guanella Pass**	Mt. Evans	C
19	Argentine Peak	Montezuma	A
20	**McClellan Mountain**	Grays Peak	C
22	Square Top Mountain	Montezuma	A
23	Watrous Gulch	Grays Peak	O

24	Summit Lake Park	Mt. Evans & Harris	C
25	**Mt. Goliath RNA**	Mt. Evans	C
26	**Evans-Epaulet Saddle**	Mt. Evans	C
27	**Mount Trelease South**	Loveland Pass	C
28	**Upper Mill Creek Basin**	Empire	C
29	**Fairburn Mountain**	Central City	C
30	**Tumbling Creek**	Harris Park	C
31	Ice Lake-Ohman Lake	Empire	O
32	Slater Basin	Empire	O
33	Roosevelt Lakes	Harris Park	O
34	Lincoln Lake	Harris Park	O
35	Beartrack Lakes	Harris Park	O
36	Sixteen Springs Gulch	Central City	O
37	Mill Creek	Empire	O
38	West Chicago Creek	Georgetown	A
39	Murray Lake	Montezuma	O
40	West Fork Clear Creek	Berthoud Pass	O
41	Jones Pass East	Byers Peak	O
42	Kingston Peak	Empire	A
43	Kearney Gulch	Grays Peak	O
44	Grizzly Creek	Grays Peak	O
45	**Mud Lake**	Meridian Hill	C
46	**Guanella Pass Campground West**	Mt. Evans	C
47	**Chicago Lakes**	Mt. Evans	C

48	Leavenworth Creek	Grays Peak	O
49	Ruby Creek	Grays Peak	U
50	Hassell Lake	Grays Peak	U
51	Silver Plum Mountain	Grays Peak	U
52	Upper Lost Creek	Harris Park	U
53	Bard Creek Mine	Georgetown	U
54	Sunburst Pond	Georgetown	U
55	Fall River	Empire	U
56	Pickle Gulch	Central City	U
57	Mexican Gulch	Central City	U
58	Vasquez Lake	Byers Peak	U
59	Blue Lake	Berthoud Pass	U

PNAs in **boldface** have been included as a Conservation Site. Detailed information on each site is found in **Appendix B.**

O = Omitted from the study as Conservation Sites. This designation does not imply the lack of conservation value; rather, such sites are prioritized lower than sites known to have rare, sensitive, threatened, or endangered species or exemplary natural communities.

A = Although no natural heritage resources are known to occur at these sites, additional work is warranted prior to exclusion as a conservation site. One of the most common reasons for this designation is the presence of high quality examples of common natural community types. Until further comparative work is done on these communities, the possibility of their exemplary nature will not be known. Another reason for an "A" designation is the presence of suitable habitat for a cryptic animal or plant species.

C = Conservation sites that are known to have one or more occurrences of a natural heritage resource. These are

Potential Natural Areas that have proven to have conservation significance. Detailed information on each of these sites are included in **Appendix B** along with preliminary conservation planning boundaries.

X = PNA found to no longer be in a natural state. No such sites were found in this study.

U = Identified as a PNA based upon potential significance, but not yet visited.

CONSERVATION SITES

Significant Biodiversity Areas Identified During the Inventory

The 59 PNAs identified during the two year of a Natural Heritage Inventory (**Table 1**) were largely surveyed and subsequently categorized as: (1) Omitted from further consideration; (2) Considered in need of additional survey prior to the need for conservation attention; and (3) Designated as a Conservation Site. A conservation site is any site which contains one or more occurrences, believed to be viable, of a rare species or significant natural community. Therefore, conservation sites have known values for conserving the natural biological diversity of the Arapaho-Roosevelt National Forest.

The conservation sites are described in standard site reports and appear in alphabetical order by conservation site name. Sites that remain unchanged from the results presented in Pague and Reid (1993) are not included in this report, but should be referenced in the 1993 report. The format for the conservation site profiles follows closely that of Pague and Reid (1993). The sections of these reports and their contents are outlined and explained below, including a few small changes from the format of the previous year's report.

The conservation site name appears at the top of the site profile. This name is assigned by the CNHP and provides a useful reference for the conservation site.

SIZE: The approximate acreage included within the conservation planning boundary for the conservation site.

BIODIVERSITY RANK: The overall (global) significance of the conservation site in terms of rarity of the natural heritage resources and the quality (health, abundance, etc.) of their occurrences. As discussed on page 5 of Pague and Reid (1993), these ranks range from B1 (Outstanding Significance) to B5 (General Biodiversity Significance).

PROTECTION URGENCY: The level of urgency believed applicable to a conservation site. The urgency derives generally from the existing threats to the site. Such threats are generally those that would grossly change the natural community or significantly (in a short time frame) change the ecological processes that support rare, threatened, endangered, or sensitive species. Again, ranks range from 1 to 5 with 1 indicating that significant changes are likely to occur within a year; therefore, rapid conservation action should

be applied.

MANAGEMENT URGENCY: Management urgency ranks are comparable to protection urgency ranks, except they imply not gross, rapid ecological change, but generally a degradation of the ecosystem due to alteration of the ecological processes. Good examples of these ranks are those deriving from fire suppression, hydrological disturbance, beaver removal, etc. Factors responsible for these urgency ranks are generally remedied by changes in management rather than by other protective measures.

LOCATION: The county and USFS 7.5′ quadrangles that include the conservation site. The Natural Heritage code for the quadrangle is noted in parentheses (e.g. 3910576 is the Empire quad).

GENERAL DESCRIPTION: A brief narrative picture of the topography, vegetation, and current use of the conservation site. Scientific names are included in the text in parentheses following the common name.

NATURAL HERITAGE RESOURCE SIGNIFICANCE: A synopsis of the rare species and significant natural communities that occur on the conservation site. Many rare species and some natural communities are sensitive to disturbance or may be sought out by collectors; therefore, the exact locations of each element are not shown on the maps. Requests for additional information should be addressed to the CNHP. A table of elements known to occur on the conservation site is provided.

CURRENT STATUS: A summary of the ownership (in this case largely USFS owned), degree of protection currently afforded the conservation site, and threats to the site or natural heritage resources as determined to date.

BOUNDARY JUSTIFICATION: The conservation planning boundary delineated in this report includes all known occurrences of natural heritage resources and the adjacent lands required for their protection. A discussion of the major factors that were considered is on pages iii-vi.

PROTECTION AND MANAGEMENT CONSIDERATIONS: A summary of the major issues and factors that are known or likely to affect the protection and management of the conservation site.

Table 4. Conservation sites identified during the Clear Creek Ranger District Natural Heritage Inventory.

Conservation Site	Biodiversity Rank	PNA #	USGS Quadrangle
Chicago Lakes	B3	47	Mt. Evans
Evans-Epaulet Saddle	B4	26	Mt. Evans
Fairburn Mountain	B4	29	Central City
Grays Peak	B3	15	Grays Peak
Guanella Pass	B2	18	Mt. Evans
Guanella Pass Campground	B3	46	Mt. Evans
Herman Gulch	B3	14	Grays Peak
James Peak	B3	12	Empire
Kelso Mountain	B3	16	Grays Peak
McClellan Mountain	B5	20	Grays Peak
Mount Trelease South	B4	27	Empire
Mt. Flora	B4	N/A	Empire
Mt. Goliath RNA	B3	25	Mt. Evans
Mud Lakes	B2	45	Meridian Hill
One-O-Three Cross Five	B3	N/A	Idaho Springs
Stanley Mountain	B3	7	Berthoud Pass
Summit Lake	B3	24	Mt. Evans
Tumbling Creek	B3	30	Harris Park
Upper Clear Creek	B5	6	Loveland Pass & Grays Peak
Upper Mill Creek	B3	28	Empire
West Vasquez Pass	B4	9	Berthoud Pass
Witter Peak	B3	13	Empire

CHICAGO LAKES

SIZE: ca. 600 acres

BIODIVERSITY RANK: B3
PROTECTION URGENCY: P4
MANAGEMENT URGENCY: M3

LOCATION: Clear Creek County
Mt. Evans Quadrangle (3910556)
T5S R74W S 13, 14, 23

GENERAL DESCRIPTION: The Chicago Lakes basin is one of the most spectacular bowl-lake complexes in the Front Range of Colorado. The inlet of Upper Chicago Lake has a rare plant, Phippsia algida, in the gravelly inlet. The lake is deep and has fish with a well-used trail leading to it. There appear to be no impacts seen off the trail. The main (lower) Chicago lake is surrounded by typical willow carrs and fens. The southeast-facing slope above the lower lake has sparse, burned Pinus aristida forest (bristlecone pine). The north face of Chicago Creek has three small ponds, the uppermost of which is dry. There is a fen with Carex microglochin in the basin northeast of the lowest pond. A jeep trail approaches within 2.5 miles of the lakes.

NATURAL HERITAGE RESOURCE SIGNIFICANCE: Such high elevation lakes are poorly studied in Colorado. The Chicago lakes have been stocked with exotic trout species, but otherwise retain their natural structure. A single rare plant species, Phippsia algida was found within the site on the gravelly bar of the inlet to the upper Chicago Lakes. Whereas the willow carrs and fens are important for wildlife and other values, we could not justify ranking them as exemplary.

Element	Common Name	Occurrence Rank	Global Rank	State Rank	Federal Status	Forest Sensitive
Phippsia algida	Snow grass	B	G5	S2	-	-

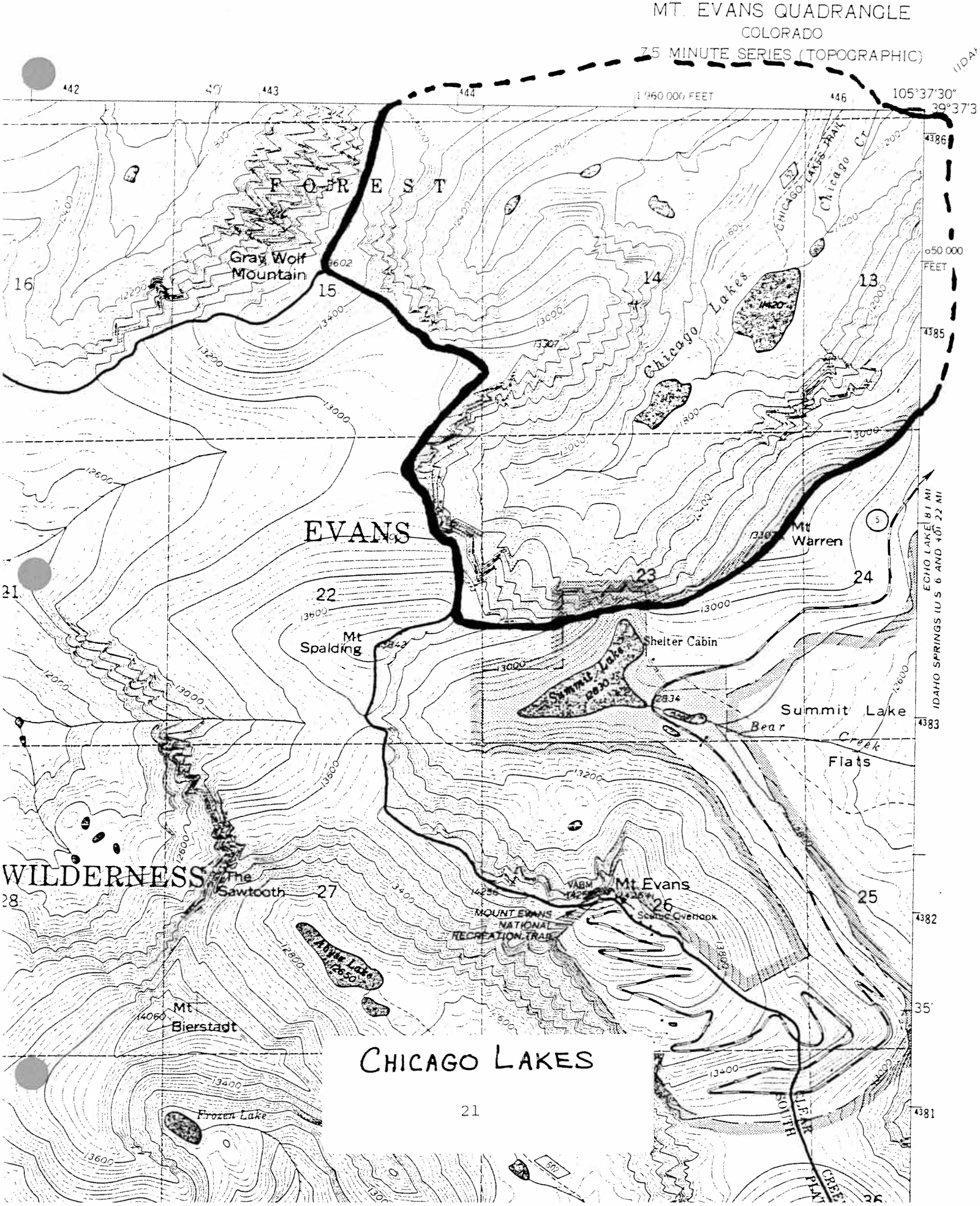
CURRENT STATUS: The conservation site occurs within the Mt. Evans Wilderness Area, but has no special designation.

BOUNDARY JUSTIFICATION: The conservation planning boundary incorporates the entire upper watershed of the Chicago Lakes basin. Since much of the area is bare rock and talus, we believe that a watershed boundary is adequate to protect the ecosystem processes that support the lakes.

PROTECTION AND MANAGEMENT CONSIDERATIONS: The Chicago Lakes basin is a spectacular glacial feature. The lakes have been managed for a backcountry fishing recreation. Although there is a well-worn

trail into and around the lakes, the vegetation seems to be little impacted. We urge the Forest Service, the Colorado Division of Wildlife and other parties to investigate the longterm management needs of the conservation site.

We have ranked the protection urgency as P4 indicating that there is little threat. The conservation site occurs within a designated wilderness. The management urgency is considered to be M3, indicating that a threat can be identified, but it is not believed to be significant for at least five years. Much of the management urgency comes from the need to reevaluate the impacts of fishing and exotic fish on the high elevation ecosystems. We suspect that hiking will intensify and threaten selected areas around the lakes. These threats are best mitigated through proactive trail planning. It would be advisable to consider closing the upper lake to fishing and closing the trail should off-trail sign continue to grow.



CHICAGO LAKES

EISENHOWER RIDGE

SIZE: ca. 75 acres

BIODIVERSITY RANK: B5
PROTECTION URGENCY: P4
MANAGEMENT URGENCY: M3

LOCATION: Clear Creek and Summit counties
Loveland Pass Quadrangle (3910568)
T4S R76W S 20

GENERAL DESCRIPTION: The Eisenhower Ridge site is located on an alpine saddle above the Eisenhower Tunnel. The small population of Draba exunguiculata is scattered in the tundra vegetation. The elevation is approximately 12,700'.

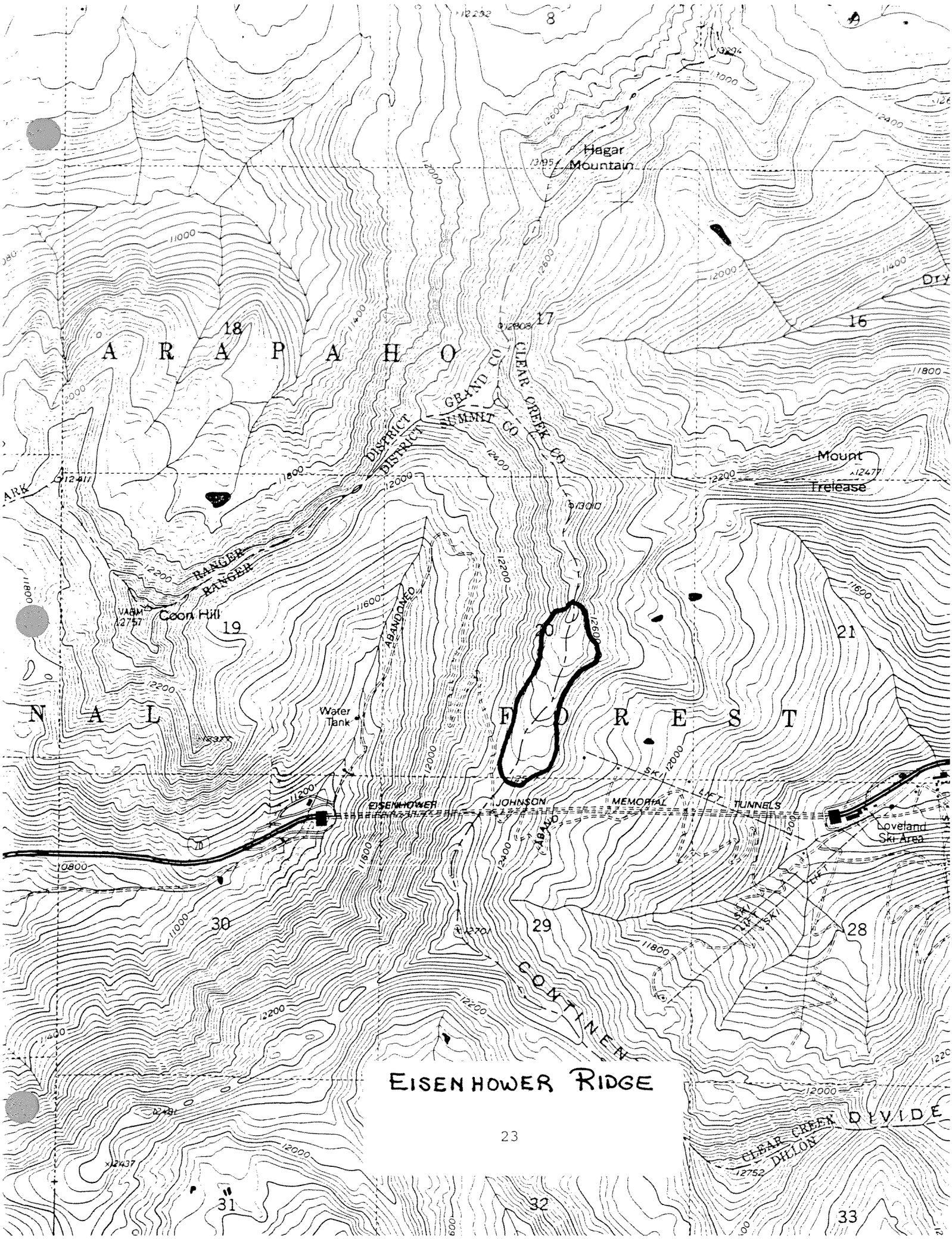
NATURAL HERITAGE RESOURCE SIGNIFICANCE: This species of Clawless draba is considered globally rare, known from fewer than 100 occurrences worldwide. The small numbers of this species on the ridge comprise a modest conservation site.

Element	Common Name	Occurrence Rank	Global Rank	State Rank	Federal Status	Forest Sensitive
Draba exunguiculata	Clawless draba	C	G3	S2	-	-

CURRENT STATUS: The conservation site is not designated for special protection. While there is considerable skiing activity in the area, there is little summer recreational use. The ridge is one of the proposed corridors for a trail.

BOUNDARY JUSTIFICATION: The preliminary conservation planning boundary incorporates all of a small saddle on the ridge above the Eisenhower Tunnel. A buffer believed to be significant is also provided.

PROTECTION AND MANAGEMENT CONSIDERATIONS: The scattered individuals of Draba exunguiculata found at this site are immediately on the ridge. This is also the most likely location for any hiking activity. A well marked trail and signs urging hikers to remain on the trail would assist in the management of this population. No special designation is recommended for this site, but future monitoring of the population is warranted. Many species are known to vary widely in numbers from year to year. Should this population be found to be very large, a reconsideration of whether or not a special designation should be recommended would be necessary.



EISENHOWER RIDGE

EVANS-EPAULET SADDLE

SIZE: ca. 95 acres

BIODIVERSITY RANK: B3
PROTECTION URGENCY: P2
MANAGEMENT URGENCY: M2

LOCATION: Clear Creek County
Mt. Evans Quadrangle (3910556)
T5S R74W S 35,36

GENERAL DESCRIPTION: The Evans-Epaulet Saddle site is located in the saddle between the two mountains appearing in the name. The Mt. Evans road bounds the north edge of the conservation site, the downward or upward slopes bounding the other aspects. The area is flat to very gently sloping with wet to saturated soils. The elevation is 13,000' and therefore the vegetation is composed of alpine species. Evidence of frost heaving is common. Apparently, snow remains on this site until well into June. There is little evidence of human disturbance except at the western edge where foot travel (apparently to Epaulet Mountain) has formed a poor trail.

NATURAL HERITAGE RESOURCE SIGNIFICANCE: Such high elevation wetlands are often of interest, but more so on calcareous soils. The state-rare saxifrage (Saxifraga foliolosa) occurs at the site. The occurrence became known through a specimen in the Iowa State University Herbarium (William Weber, pers. comm.). This species is only known in Colorado from the nearby shore of Summit Lake, 1.5 air miles to the north. As recommended in Pague and Reid (1993), the area was resurveyed in the summer of 1993. During that survey, Saxifrage foliolosa was not found. This cryptic species could have been missed and should be sought again. Nonetheless, three additional rare species were located in the wetlands of the Evans-Epaulet Saddle Conservation Site.

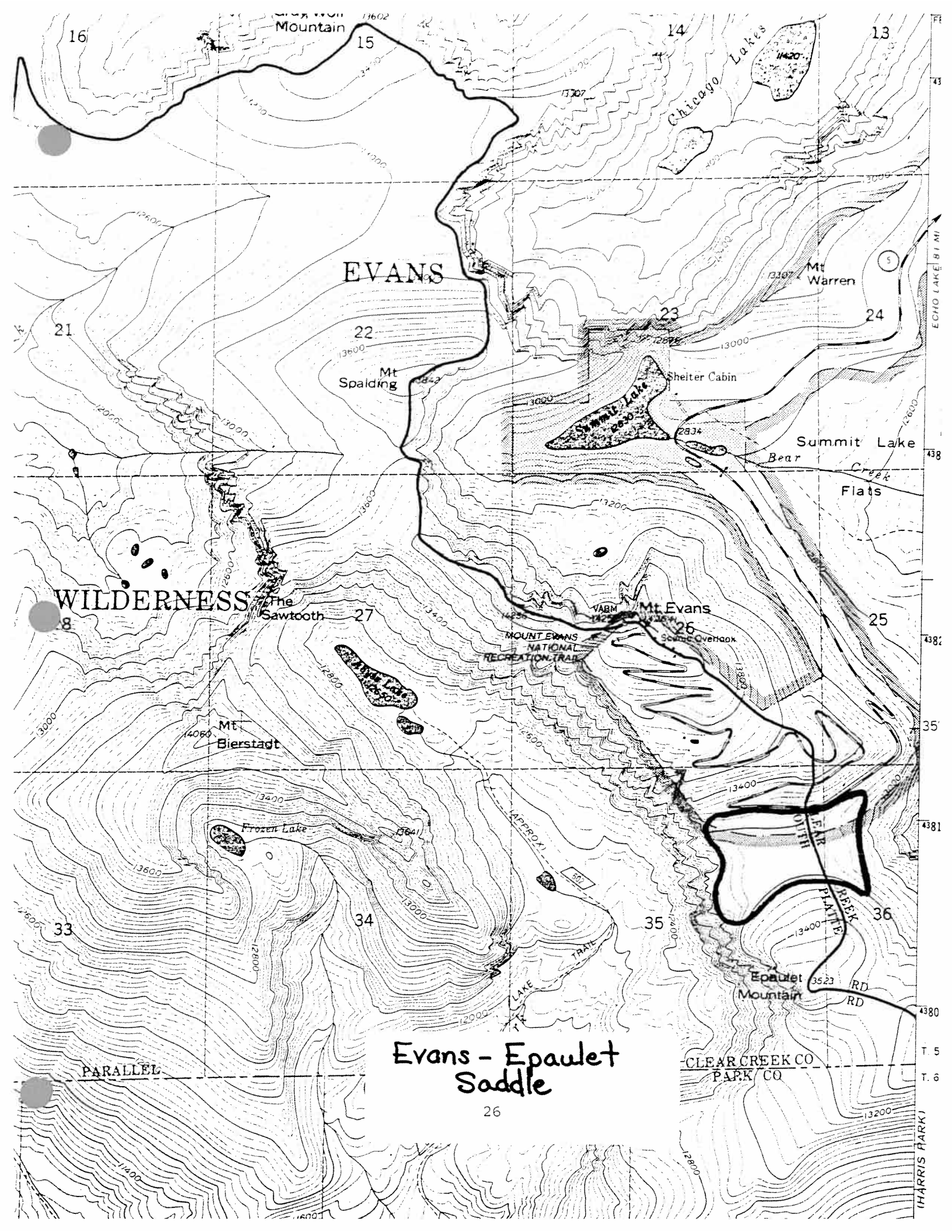
Element	Common Name	Occurrence Rank	Global Rank	State Rank	Federal Status	Forest Sensitive
Saxifraga foliolosa	Leafy saxifrage	B	G4	S1	-	-
Draba fladnizensis	Arctic draba	B	G4	S2S3	-	-
Draba exunguiculata	Clawless draba	C	G3	S2	-	-

CURRENT STATUS: The conservation site is not designated for special protection; however, ca. the southern two thirds of the site is within the boundary of the Mt. Evans Wilderness. The Department of Transportation right-of-way is within the northern part of the site.

BOUNDARY JUSTIFICATION: The conservation planning boundary incorporates the entire saddle between Mt. Evans and Epaulet Mountain. The rare plant location is included within the recommended area. As the slope quickly steepens in all directions, little buffer is included with the exception of the northern border. On the north the Mt. Evans road passes. Because of the potential impacts of foot traffic, part of the road's right-of-way and a crude parking area are included in the planning boundary.

PROTECTION AND MANAGEMENT CONSIDERATIONS: The high quality condition of the site suggested that few humans intrude on the area. However, a parking pullout near the northwest corner of the site allows some foot access to the area. Most of the hiking apparently moves along the western edge of the site and onto Epaulet Mountain. Foot traffic should be guided from the wetlands of this saddle. We recommend that the site be designated as a Special Interest Area to adequately protect the known natural heritage resources. In addition, there is a potential interpretive value for such high elevation wetlands.

The Protection Urgency rank of this site is P2, indicating a possible threat within 5 years. Hiking use may already be increasing. In addition, the Mt. Evans Corridor and Scenic Byway could potentially develop a parking area adjacent to the wetland. Road maintenance is not generally considered a threat; however, consideration should be given to protecting the site from road runoff during the application of chemicals (e.g. tar). Road construction should not intrude further into the conservation site and should prevent siltation and runoff into the wetlands. The Management Urgency is assigned a value of M2 indicating a likely threat within 5 years. Evidence of hiking through the area was light, but present. With intensified use of the Mt. Evans area, we foresee that this use will increase. It will become critical to steer hikers around the sensitive wetland environment. This would be essential if a parking pullout were to be developed nearby.



Evans - Epaulet Saddle

FAIRBURN MOUNTAIN

SIZE: ca. 125 acres

BIODIVERSITY RANK: B4
PROTECTION URGENCY: P2
MANAGEMENT URGENCY: M3

LOCATION: Gilpin County
Central City Quadrangle (3910575)
T2S R73W S24

GENERAL DESCRIPTION: The south face of Fairburn Mountain has a small, remote montane meadow. The meadow appears not to have been grazed by livestock; however, elk skat and tracks were evident. The surrounding forest on Fairburn Mountain has been heavily logged in the past. This is not surprising given that the mountain is in the midst of the mining district. The forest is mostly young lodgepole pines. The meadow is composed of mostly native grasses, including Danthonia parryi, D. intermedia, Festuca thurberi, small amounts of Muhlenbergia montana, and quite a bit of the shrub, Potentilla fruticosa.

NATURAL HERITAGE RESOURCE SIGNIFICANCE: Although the meadow is small, it is a remnant of a natural community that was much more common. Two of the three plant associations represented in the meadows are considered globally rare, but occur in C- or D-ranked occurrences (see table below). Such grasslands, even remnants, are increasingly uncommon today.

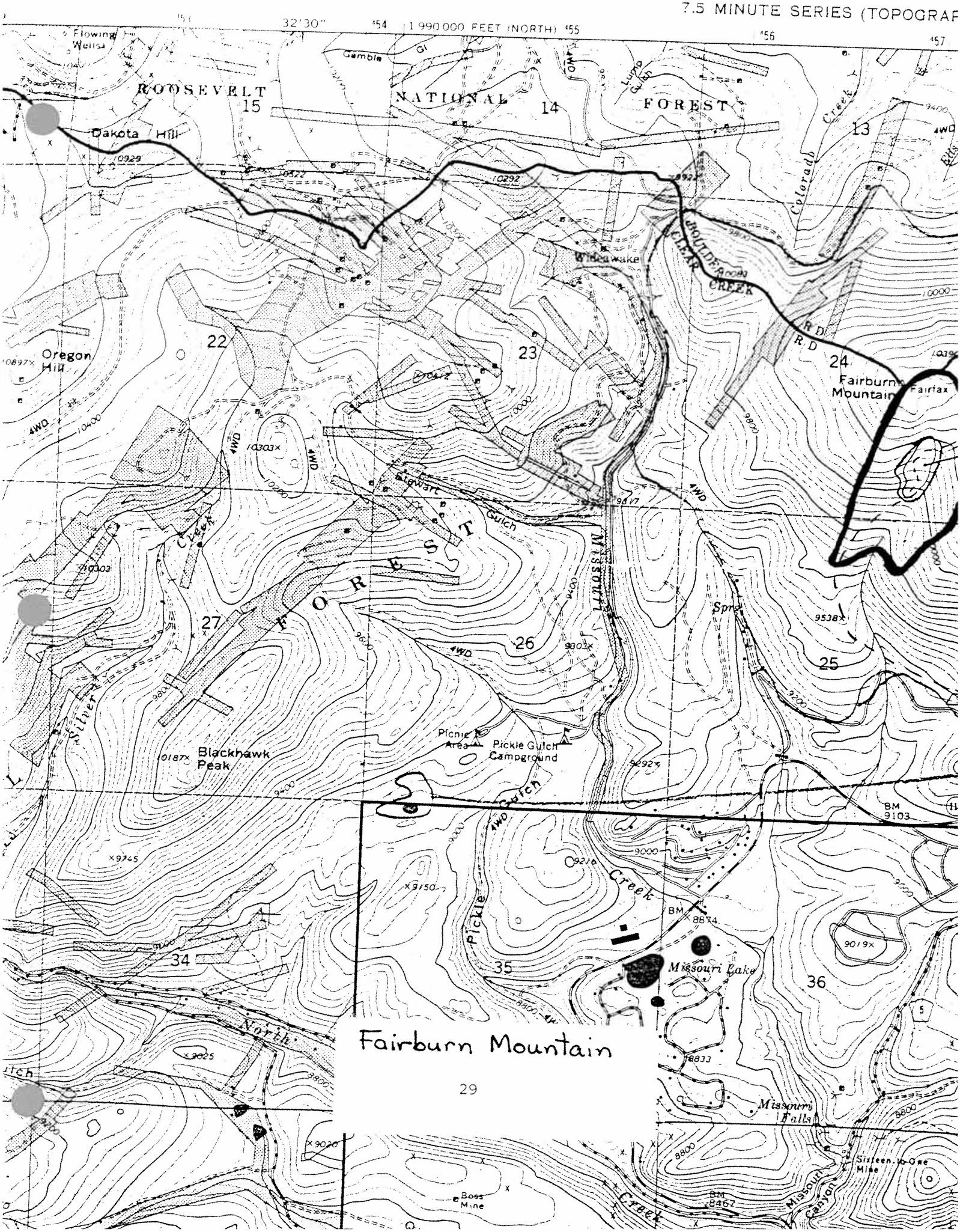
Element	Common Name	Occurrence Rank	Global Rank	State Rank	Federal Status	Forest Sensitive
Muhlenbergia montana/ Danthonia parryi	montane grassland	D	G2	S2	-	-
Danthonia parryi grassland	montane grassland	C	G3	S2	-	-
Danthonia intermedia grassland	montane grassland	C	GU	S3S4	-	-

CURRENT STATUS: The conservation site is not designated for special protection and therefore receives no special management. There are current plans for hiking trail development throughout the area.

BOUNDARY JUSTIFICATION: The conservation planning boundary incorporates the entire grassland and a buffer. Much of the design incorporates the upslope areas which drain into the grassland.

PROTECTION AND MANAGEMENT CONSIDERATIONS: This grassland community has apparently recovered from the extensive logging of the area

during the heyday of the mining era. Currently, the condition is fair, but will certainly maintain or improve with effective management/protection. We have assigned a Protection Urgency Rank of 2 and a Management Urgency Rank of 3. These are indicated by the possibility of trail development through the area. Trails that penetrate the montane grasslands have the potential to introduce exotic species, especially grasses. Should the trail be developed, monitoring and management to prevent invasion would be appropriate.



Fairburn Mountain

GRAYS PEAK

SIZE: ca. 600 acres

BIODIVERSITY RANK: B3
PROTECTION URGENCY: P2
MANAGEMENT URGENCY: M2

LOCATION: Clear Creek and Summit counties
Grays Peak Quadrangle (3910567)
T4S R75W S5

GENERAL DESCRIPTION: The site is a high elevation massif with two peaks exceeding 14,000 feet. Both of the peaks are composed of scree, talus, blocky talus with outcrops of bedrock. The harsh conditions result in little vegetation on the peaks. Where vegetation exists it is primarily small mossy tundra areas. Opportunistic species inhabit areas where soil has accumulated. The saddle between the peaks has small areas of turf, meadow vegetation, and rocky areas with snowbed patches. The area is spectacular and rugged.

NATURAL HERITAGE RESOURCE SIGNIFICANCE: The very high elevation and talus substrates are inhabited by three rare plant species. This is a large concentration for alpine habitats on acidic rock. The area is extremely rugged and deserving of additional searches where other occurrences or individuals of rare species may be located.

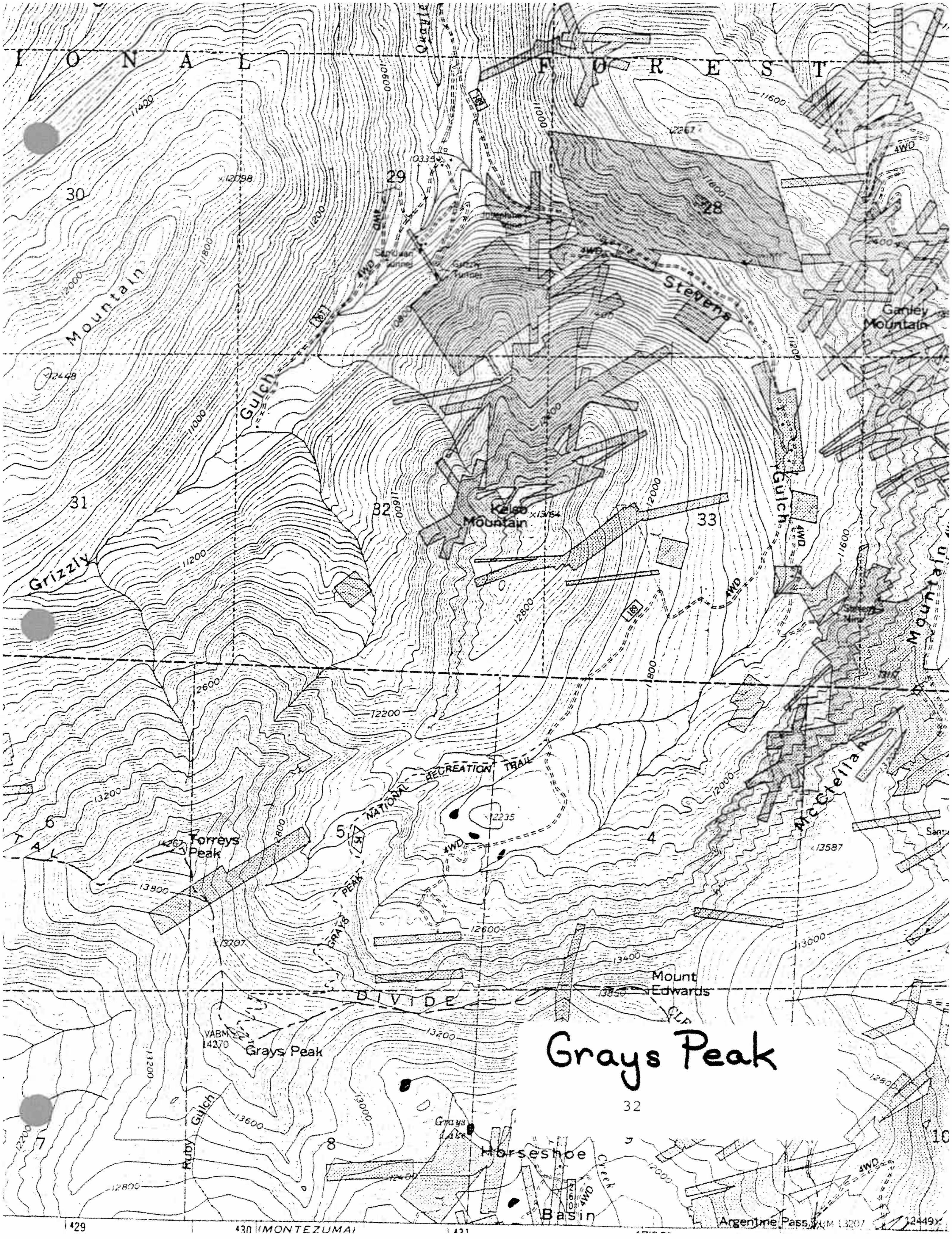
Element	Common Name	Occurrence Rank	Global Rank	State Rank	Federal Status	Forest Sensitive
Ranunculus gelidus	Tundra buttercup	-	G4	S2	_	-
Draba grayana	Gray's Peak whitlow-grass	B	G2	S2	_	-
Crepis nana	Dwarf hawksbeard	B	G5	S2	-	-
Draba fladnizensis	Arctic draba	B	G4	S2S3	-	-
Draba exunguiculata	Clawless draba	B	G3	S2	-	-

CURRENT STATUS: The entire area is within the National Forest boundary. The area is given no special designation.

BOUNDARY JUSTIFICATION: The boundary includes all of the known element occurrences and some buffer. The extensive talus and scree habitat between known occurrences is incorporated and likely contains additional individuals of rare species.

PROTECTION AND MANAGEMENT CONSIDERATIONS: Several of the populations of rare species are currently threatened from the intensive trail use. Grays and Torreys peaks are among the most popular of Colorado's fourteeners and sustain heavy hiker use. The substrate on the mountains present difficulties in marking the trails. Multiple routes through the scree directly threaten rare species and may very well eliminate some of these species without protective actions. Routing of the Continental Divide Trail through the area would probably increase the trail use and subsequently the threats to the rare species.

The large numbers of rare species on the two peaks indicates the significance of the area. Such a site should be considered a candidate for designation as a Special Interest Area for its botanical significance. Protection of the SIA should include informational and directional signs. It may be necessary to construct a well-marked trail in the future and in such a case, care should be taken to reroute the trail away from known occurrences of rare plants where possible. Since the only observed threat to the plants is from wandering hikers, trail design is of utmost importance to the welfare of these populations. A monitoring program should be established as soon as possible. In 1993, Nan Lederer of CNHP accompanied Clear Creek Ranger District personnel to lay out a trail design that would minimize or remove threats to known individuals of Papaver kluanense. We encourage the Forest to monitor the effects of trail improvements.


I O N A L F O R E S T
Mountain
Grizzly
Gulch
Stevens
Kelso Mountain
Ganley Mountain
McClellan
Mountain
NATIONAL RECREATION TRAIL
GRAYS PEAK
Torreys Peak
DIVIDE
Mount Edwards
VABM 14270
Grays Peak
Grays Lake
Horseshoe
Basin
Ruby Gulch
Argentine Pass
(MONTEZUMA)
4WD
12098
12448
13164
12235
14267
13707
13850
13587
12449
29
28
30
31
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8

Grays Peak

GUANELLA PASS

SIZE: ca. 6,600 acres

BIODIVERSITY RANK: B2
PROTECTION URGENCY: P3
MANAGEMENT URGENCY: M3

LOCATION: Clear Creek County
Mt. Evans Quadrangle (3910556)
T5S R74W S15-22, 27-34

GENERAL DESCRIPTION: Guanella Pass proper passes between two large and significant wetland areas. Benches and swales begin just off the roadway. The conservation site is divided into two unequal areas by the road. To the west of the pass is the headwaters of Duck Creek. To the east of the road is gently sloping bench between the headwaters of South Clear Creek and Scott Gomer Creek. Water is generally near or on the surface and causes several distinct vegetation types in a complex mosaic. First and most dominant are dense shrub communities, largely composed of willows (Salix brachycarpa and S. planifolia with an occasional dense understory of graminoids and herbs. Second, several ponds occur, varying in size from tiny to approximately 12 acres. Third, around several ponds and occasionally independent of them are small marshes. These areas are composed largely of carices, particularly Carex aquatilis. Snowmelt is probably the primary water source. Finally, wet meadows are common in several areas including benches above Scott Gomer Creek. These areas are generally drier than marshes, but may retain some water. This site contains some of the most extensive treeline shrub communities in the Front Range.

NATURAL HERITAGE RESOURCE SIGNIFICANCE: Guanella Pass is inhabited by state-rare plant species, each more common in northerly regions. The moss, Paludella squarrosa, is known in Colorado only from this site (Cooper, 1991). Eriophorum gracile is known from not more than 6 site in Colorado. Prior to the 1993 surveys, this species was known from a two small areas near the road. This species was found to be widespread, found on approximately 80 acres. Carex limosa was reported from Guanella Pass for the first time. Several hundred to a thousand individual plants were observed.

The most significant biodiversity feature of the Guanella Pass site is the extensive willow carrs and associated habitats. The CNHP considers these exemplary examples of this community. The dominant plant association is the Salix planifolia-Salix brachycarpa/Caltha leptosepala. Other important communities include the Carex rostrata wetlands, Carex aquatilis/Pedicularis groenlandica wetlands, Carex aquatilis wetlands, and Salix brachycarpa shrublands. While these communities are not considered rare, again the examples at the Guanella Pass site are of very high quality.

In addition to rare species, the area is known for its large wintering population of white-tailed ptarmigan. It is noteworthy that during one of our visits to this site, the migrating warblers were extremely abundant. The significance of high elevation willow thickets to migrating birds is not understood, but may be important.

Element	Common Name	Occurrence Rank	Global Rank	State Rank	Federal Status	Forest Sensitive
Eriophorum gracile	Slender cotton grass	A	G5	S2	-	-
Carex limosa	Mud sedge	A	G5	S?	-	-
Paludella squarrosa	a moss	B	G?	S1	-	-
Salix planifolia-Salix brachycarpa/Caltha leptosepala	a willow carr	A	G4	S4?	-	-
Carex aquatilis/Pedicularis groenlandica wetlands	a sedge-dominated wetland	A	G4	S?	-	-
Salix brachycarpa shrubland	a willow carr	A	G5	S4?	-	-

CURRENT STATUS: No protective status is given to the conservation site. The national forest boundary between the Pike and Arapaho national forests passes through the site. Much of the area on the east side of the road is contained within the Mt. Evans Wilderness Area; however, that portion on the west of the road does not. The area is heavily visited by casual and serious hikers. There is evidence of human traffic deep within the willow thickets, particularly near several of the larger ponds. Cross-country skiing is popular during the winter.

BOUNDARY JUSTIFICATION: The conservation planning boundaries for Guanella Pass include all element occurrences for rare plants and additional areas that may contain these species. The boundary also incorporates the extensive willow community. A minimum buffer is considered within the boundary since all of the upstream watershed for the east side of the road is within a wilderness area. The landscape in which the conservation site occurs varies from wilderness area (the vast majority) to public road access at Guanella Pass. Of course the ecological boundaries of this site extend to the watershed limits. Since wilderness designation provides the strongest protection for an area needing limited active management, the conservation planning boundary should be considered the minimum are required for protection of the rare and significant features. A designation, as on RNA, should consider boundaries extending to watershed limits.

PROTECTION AND MANAGEMENT CONSIDERATIONS: The Guanella Pass area is intensively used due to its easy accessibility. Any Forest activities that would increase the use of the area should be planned carefully to protect the significant elements of natural diversity. Should the Continental Divide Trail extend through the pass, higher use of the sensitive habitats is expected. Threats also exist from road maintenance activities. Road realignment or widening could seriously alter the hydrology of the area and subsequently threaten the rare plants of the site.

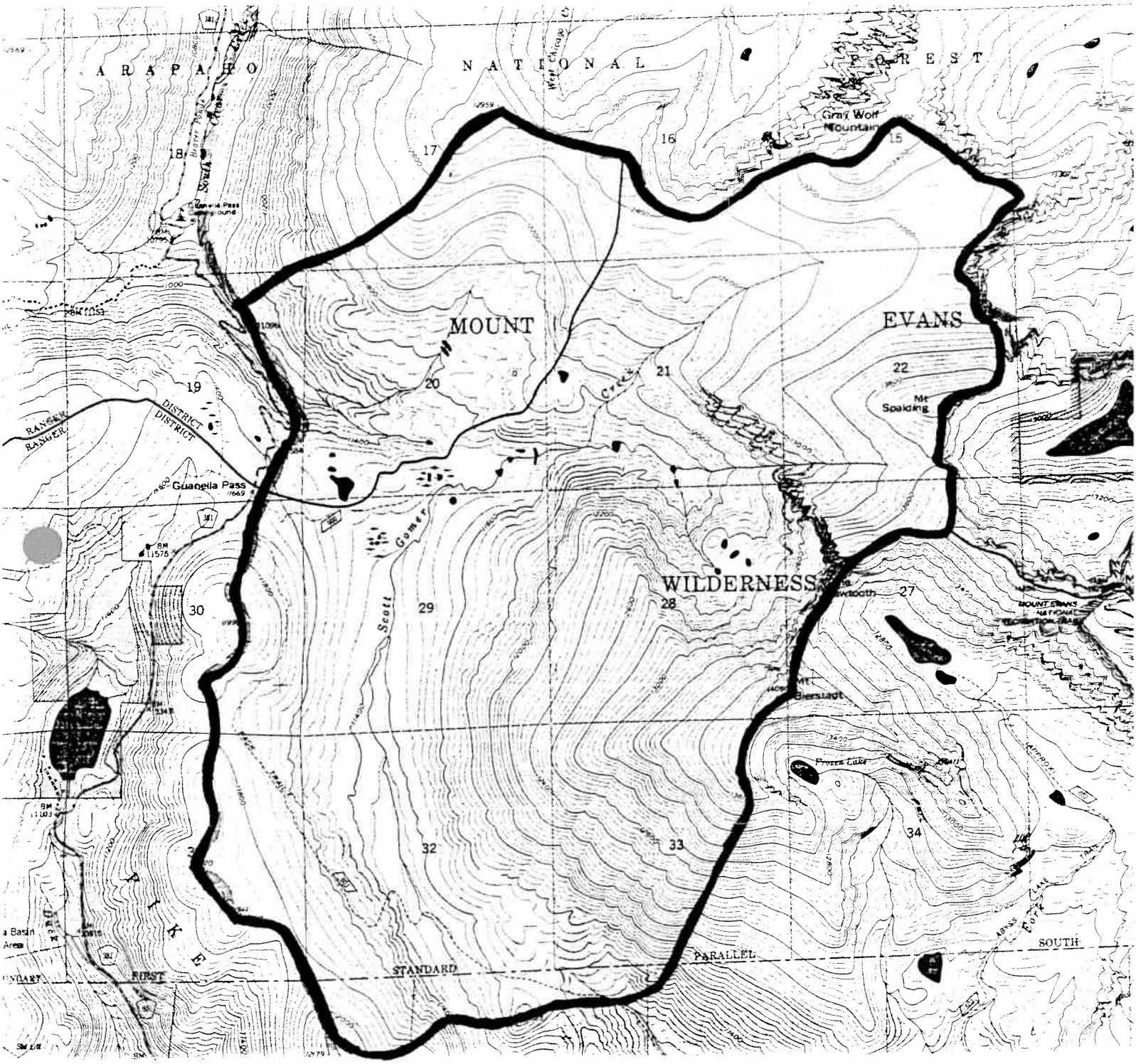
Due to the significance of Guanella Pass to the Forest's and state's biodiversity, we recommend that the portion of the site to the east of the road be considered as a candidate Research Natural Area. The area is an exemplary ecosystem that contains rare species. In addition, the high quality part of the Guanella Pass conservation site to the west of the road should be considered as a candidate for designation as a Special Interest Area (botanical and ecological).

We have assigned a Protection Urgency of P3 to the Guanella Pass area, indicating that serious threats may be realized, but perhaps after five years. This is largely due to the existing heavy hiking that passes through the area. This undirected walking has trampled many trails through the willow carrs. This seems to be especially true of through hikers on the way to Mt. Bierstadt.

The Management Urgency is believed to equate to M3, indicating that loss of quality of the element occurrences are likely to occur, but perhaps after five years. Much of the threat is due to hikers into and through the area. Marked and monitored trails could facilitate the protection of the significant natural communities.

Protection of the Guanella Pass site should include a redesigning of any trails through the area. Should the Continental Divide Trail pass through Guanella Pass, camping should not be allowed within the conservation planning boundaries unless safe sites can be determined. Mountain goats are known to use the area. Since this species is not native to the area, careful observation should be made to assess any potential negative impacts. Trampling within the wetlands of the site should be curtailed. Monitoring programs should be implemented for the rare plants. The Forest Service should work with DOT to minimize threats to the area from road maintenance activities. Although conservation planning boundaries have not been extended to watershed limits, acknowledgement of the significance of watersheds to this site should be recognized in the Forest Planning Processes. Such consideration is an integral part of the Ecosystem Management guidelines issued from the Chief of the U. S. Forest Service, 1992.

The activities of the proposed Continental Divide Trail corridor present additional threats to the Guanella Pass area, but we consider such threats of moderate to low significance. The rare plant species, Carex limosa and Paludella squarrosa are considered more seriously threatened due to their proximity to the Pass proper, i.e. their accessibility is greater and they are represented by small populations.



Guanella Pass

GUANELLA PASS CAMPGROUND WEST

SIZE: ca. 600 acres

BIODIVERSITY RANK: B3
PROTECTION URGENCY: P4
MANAGEMENT URGENCY: M3

LOCATION: Clear Creek County
Idaho Springs Quadrangle (3910565)
T5S R75W S13

GENERAL DESCRIPTION: The headwaters of this stream consist of a medium-sized, beautiful, undisturbed subalpine willow carr. There is a large beaver population with considerable activity. Old drained ponds and the gravelly creek support large populations of Chrysosplenium tetrandrum and Koenigia islandica. Seeps along the creek have great amounts of Mimulus guttatus. The willow carr is typical in species composition; dense shrubs 1-2 m tall. Upslope is second growth spruce/fir forest. Near treeline on the southwest-facing slope, just north of the willow carr, is a bristlecone pine stand.

NATURAL HERITAGE RESOURCE SIGNIFICANCE: There are few areas in this part of the state which have such high activity levels of beaver. The upper portions of the drainage have few signs of humans. The vegetation of the area is without exotics. The marsh vegetation is relatively small in area, but of exemplary quality.

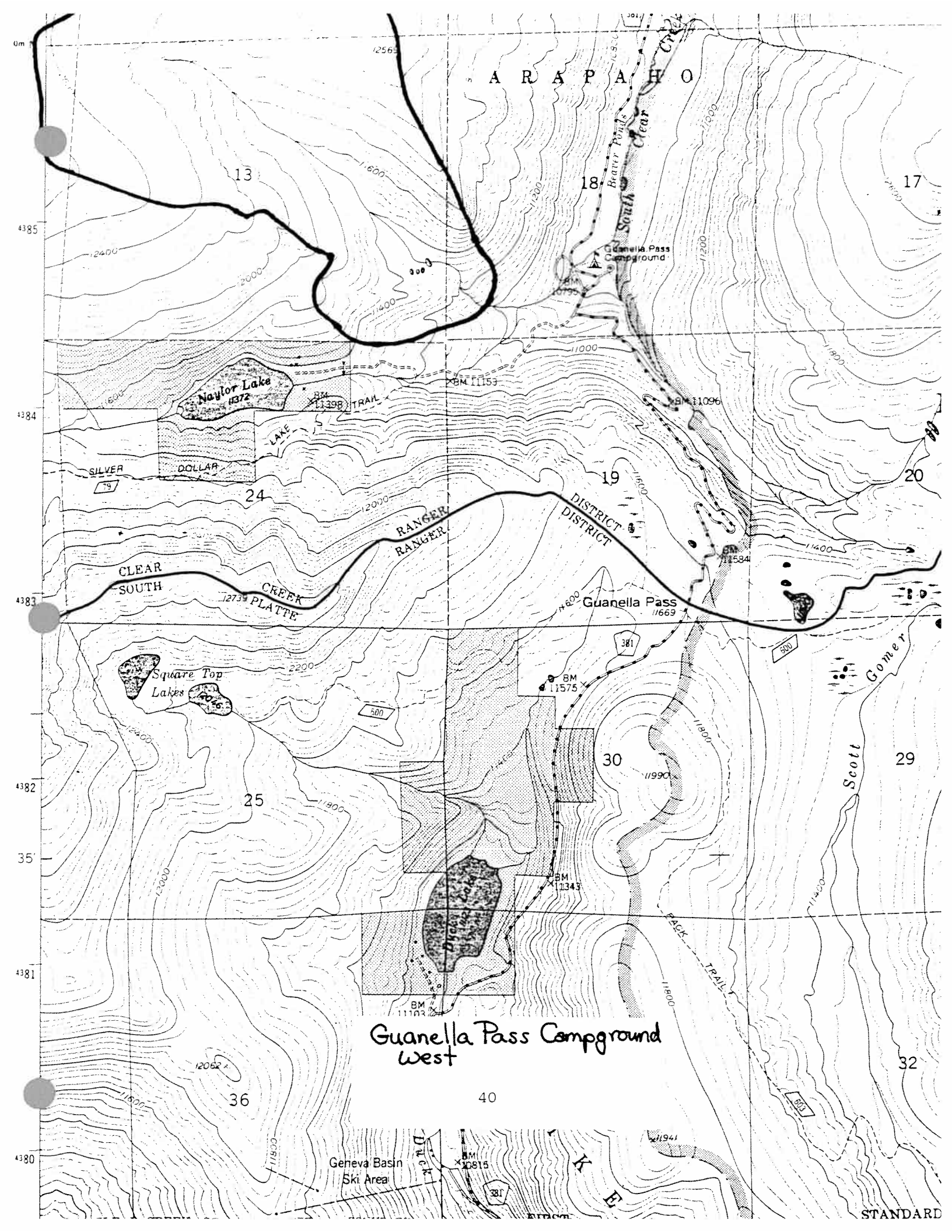
Element	Common Name	Occurrence Rank	Global Rank	State Rank	Federal Status	State Status	Forest Sensitive
Carex aquatilis/	a carices wetland	A	G4	S?	-	-	-
high elevation beaver pond complex		B	G5	S4	-	-	-

CURRENT STATUS: The preliminary conservation planning boundary includes properties under U. S. Forest Service ownership. At this time none of the area receives special protection.

BOUNDARY JUSTIFICATION: The preliminary conservation planning boundary includes most of the watershed and therefore the ecological processes that support the natural communities.

PROTECTION AND MANAGEMENT CONSIDERATIONS: Due to the nearly undisturbed nature of this site, it is recommended that the area be designated a Special Interest Area. Beaver probably dominated most of the streams of the Rocky Mountains. This sub-watershed is a remnant or restored example of what Colorado's natural heritage really was.

No rare, threatened, endangered, or sensitive species are known to occur at the site. The protection urgency is P4 since there are few direct threats in the foreseeable future. The Management Urgency is estimated to be approximately M3 due to the proximity to the Guanella Pass Campground. Significant, undirected hiking traffic could significantly impact the wetlands associated with the beaver. The plant associations should be identified in the drainage and appropriately ranked.



Guanella Pass Campground West

HERMAN GULCH

SIZE: ca. 400 acres

BIODIVERSITY RANK: B3
PROTECTION URGENCY: P1
MANAGEMENT URGENCY: M2

LOCATION: Clear Creek County
Grays Peak (3910567); Loveland Pass (391058)
T4S R76W S10, 11, 14

GENERAL DESCRIPTION: Herman Gulch is a subalpine drainage with varying amounts of disturbance. The slopes are heavily forested, mostly with second growth spruce and fir. The stream draining the area has abundant willow carrs.

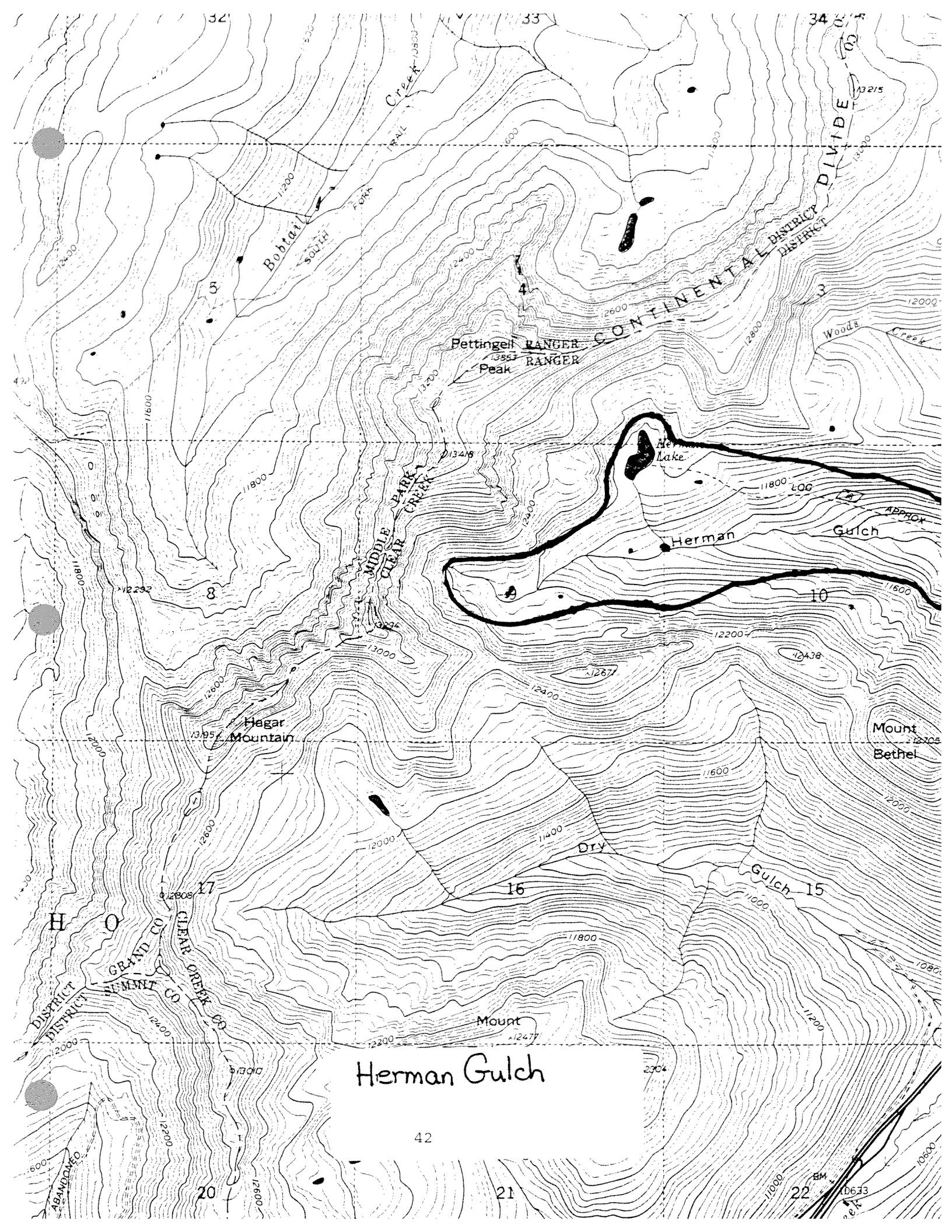
NATURAL HERITAGE RESOURCE SIGNIFICANCE: Clear Creek Ranger District personnel discovered Bufo boreas (Boreal toad) at this site. This is apparently a part of a nearly continuous remnant population in the headwaters of the Clear Creek drainage. This species has declined in numbers dramatically in the past 20 years. The population(s) in the Clear Creek drainage may be the best remaining.

Element	Common Name	Occurrence Rank	Global Rank	State Rank	Federal Status	State Status	Forest Sensitive
Bufo boreas	Boreal toad	C	G4	S1	C2	E	FS

CURRENT STATUS: Herman Gulch is currently unprotected; although it is owned by the U. S. Forest Service.

BOUNDARY JUSTIFICATION: The preliminary conservation planning boundary includes the known occurrence of the Boreal toad and an estimated buffer. Most importantly, potential breeding areas and adjacent nonbreeding habitat are incorporated into a contiguous preserve.

PROTECTION AND MANAGEMENT CONSIDERATIONS: Bufo boreas is proposed for listing as an endangered species by the U. S. Fish and Wildlife Service. All known populations should receive priority attention. We recommend that surveys continue in the Clear Creek Ranger District, but also that protection and management actions commence immediately. Although the source of population declines is debatable, it is likely that atmospheric conditions are involved. It is possible that the lowest elevation populations are the most likely to persist or survive.


Herman Gulch

JAMES PEAK

SIZE: ca. 200 acres **BIODIVERSITY RANK:** B3

LOCATION: Clear Creek, Gilpin, and Grand counties
Empire Quadrangle (3910576)

GENERAL DESCRIPTION: The James Peak site is a rocky mountain peak that reaches an elevation of 13,294'. The peak drops off dramatically into steep cirque walls/cliffs on the west and east sides. The south face is rocky and a large boulder field. Signs of frost-heave and patterned ground are abundant. The patterned ground is a mosaic of boulder and rock fields with graminoid-dominated turfs. There is water flowing under the rocks in several areas, surfacing for short runs. The drier convex slopes have Silene agraulis fellfield vegetation with cushion plants. The saddle and lower slopes are dominated by Kobresia meadows.

NATURAL HERITAGE RESOURCE SIGNIFICANCE: Two species of globally rare mustards are known from James Peak, one of which is known from fewer than 10 sites worldwide.

Element	Common Name	Occurrence Rank	Global Rank	State Rank	Federal Status	State Status
Draba porsildii	Porsild draba	B	G3	S1	-	3
Draba grayana	Gray's Peak whitlow-grass	B	G2	S?	-	4

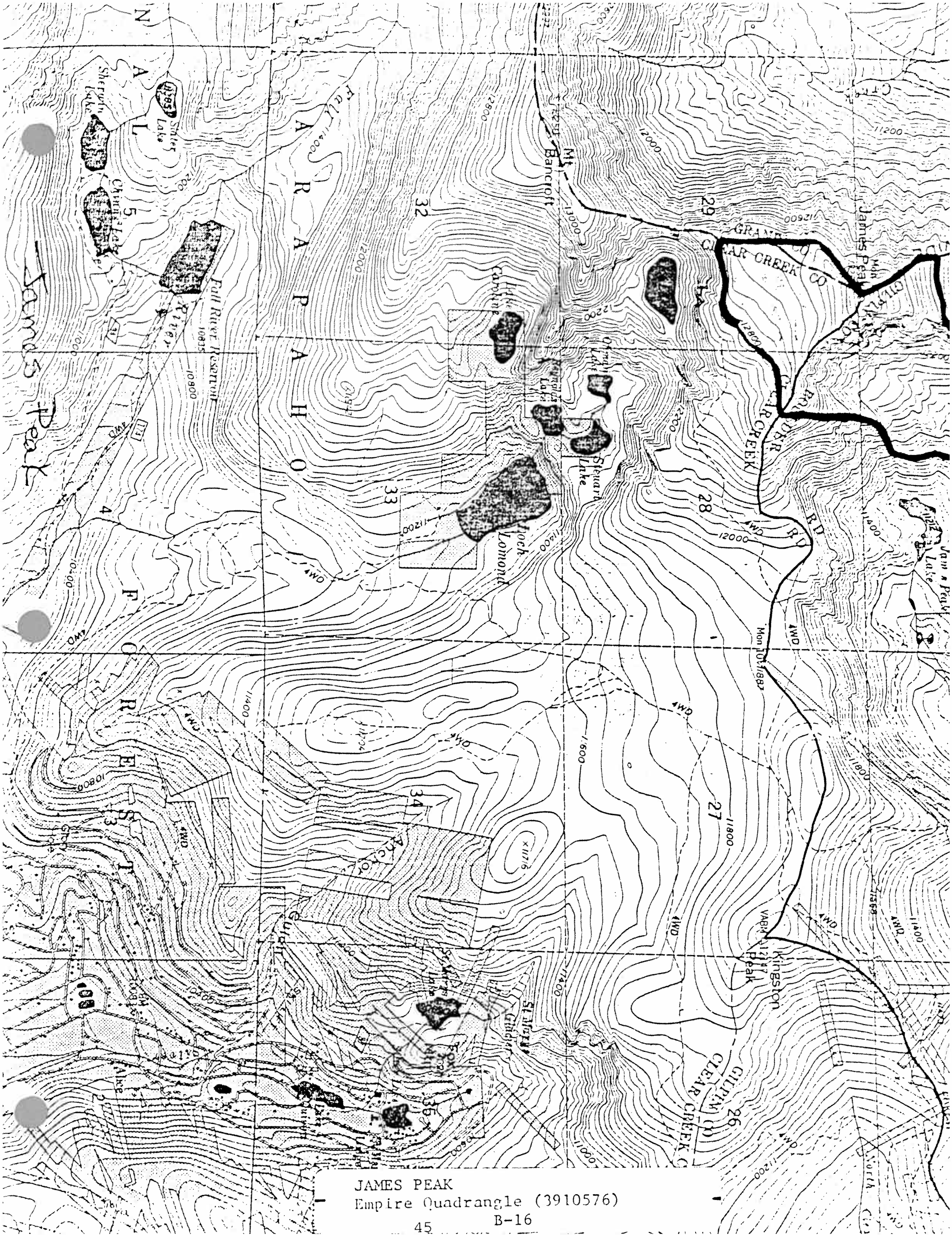
CURRENT STATUS: The James Peak site was historically mined heavily. A dirt road passing into the area is closed, but continues to have people drive around and into the area. The area is used by a large number of recreationists and nature observers. No special status designation for this area exists. Threats exist if the mining becomes economically feasible, from increased hiking (especially if scattering into the rockier areas.

BOUNDARY JUSTIFICATION: The preliminary conservation planning boundary includes the known occurrences of the two globally rare Draba species, adjacent similar habitat, and a buffer. These small species may be found over a wider area than we know them from now, but intensive surveys will be necessary to determine the full extent of the occurrences.

PROTECTION AND MANAGEMENT CONSIDERATIONS: Searches did not reveal either of the Draba species. We recommend that the planning

boundaries be used to evaluate potential impacts to these species in the planning processes of the Forest. No special designations are recommended at this time; however, efforts should be made to locate these globally rare species and determine if special designation is appropriate for sites. Threats to the two Draba species known to occur at the site are considered low in the case of D. grayana and moderate for D. porsildii.

Observations indicated that the blocking of the four-wheel drive road is not effective, resulting in the continued disturbance of the alpine habitat of James Peak.



JAMES PEAK
Empire Quadrangle (3910576)
B-16

MOUNT TRELEASE

SIZE: ca. 400 acres

BIODIVERSITY RANK: B4
PROTECTION URGENCY: P2
MANAGEMENT URGENCY: M3

LOCATION: Clear Creek County
Loveland Pass Quadrangle (3910568)
T4S R76W S20

GENERAL DESCRIPTION: The south face of Mount Trelease supports a natural patch of old growth forest. The plant association is largely Picea engelmanni-Abies lasiocarpa. The area has been slightly disturbed, but retains the characteristics of an old growth stand. The boundaries of the area appear to be natural, representing a relatively unknown component of the subalpine ecosystems on the east slope of the Front Range. The forest stand is perched above the Loveland Ski Area and is within a possible ski expansion proposal.

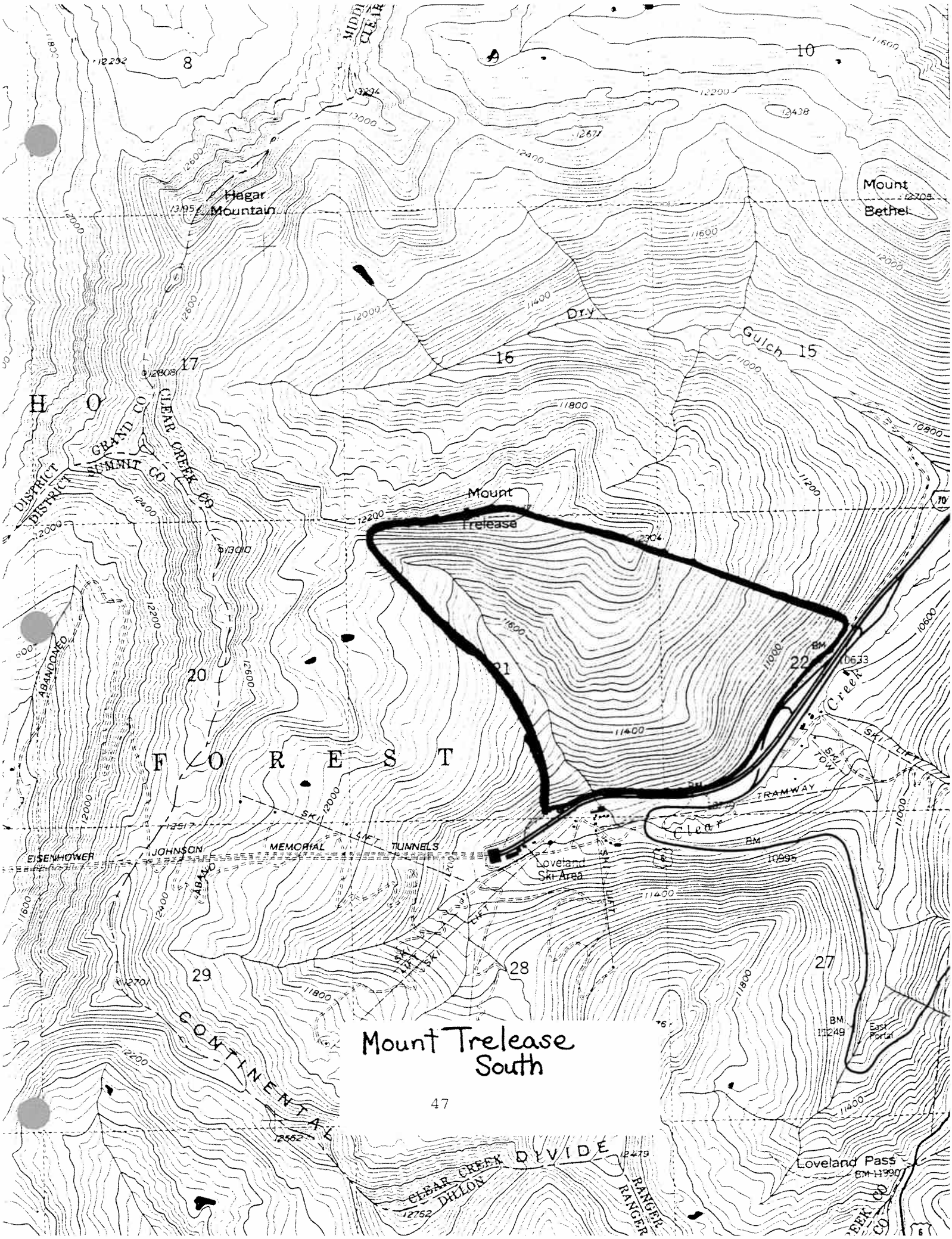
NATURAL HERITAGE RESOURCE SIGNIFICANCE: Old growth stands with natural boundaries are extremely difficult to locate within the Front Range of Colorado. Although the vegetation type is not rare, the old growth characteristics are. In this stand the lowest slopes have some signs of past logging. The ecological role of such natural patches of old growth are unknown.

Element	Common Name	Occurrence Rank	Global Rank	State Rank	Federal Status	Forest Sensitive
Picea engelmanni-Abies lasiocarpa old growth	Engelmann spruce old growth	B	G5	S?	-	-

CURRENT STATUS: The conservation site is not designated for special protection and therefore receives no special management. It occurs within the permit area of the Loveland Ski Area. Expansion plans for the ski area are known.

BOUNDARY JUSTIFICATION: The conservation planning boundary incorporates the entire old growth stand and a significant buffer. While it is not believed to be threatened by winter ski activities (non-invasive), it is possible that heavy summer use could pose some threats, particularly should trail development be considered.

PROTECTION AND MANAGEMENT CONSIDERATIONS: This ski area is one of the most accessible in the Southern Rocky Mountains. Since there are active ski area expansion proposals, the protection urgency is ranked P2. Management urgency is less urgent, but nonetheless is expected in the future. We have assigned a value of M3. This remnant old growth patch should be considered for special management status.



Mount Trelease South

MUD LAKES

SIZE: ca. 500 acres

BIODIVERSITY RANK: B2
PROTECTION URGENCY: P4
MANAGEMENT URGENCY: M4

LOCATION: Clear Creek County
Idaho Springs Quadrangle (3910565)
T6S R73W S1

GENERAL DESCRIPTION: Mud Lakes occurs on a large flat saddle, approximately .75 miles in length. Water seeps into lakes slowly, apparently, mostly from the gradually sloping south side. The water moves slowly through fens, gradually flowing into intermittent creeks draining the saddle to the northwest and southeast. Much of the area is dominated by Carex aquatilis/Pedicularis groenlandica with extensive stands of Eriophorum gracile. The lakes are shallow (approximately one foot deep) with peaty bottoms and no fish. There are at least three levels of "stepped" fens across the valley. A small willow carr is present.

NATURAL HERITAGE RESOURCE SIGNIFICANCE: Two rare plant species are known from the site: Eriophorum gracile and Carex limosa. Each of these occurrences is of the highest quality. In addition, three plant associations occur that are in exemplary status: Carex aquatilis - Pedicularis groenlandica fen, Salix planifolia - Salix brachycarpa willow carr, Deschampsia cespitosa-Calamagrostis canadensis.

Element	Common Name	Occurrence Rank	Global Rank	State Rank	Federal Status	Forest Sensitive
Eriophorum gracile	Slender cotton grass	A	G5	S2	-	-
Carex limosa	Mud sedge	A	G5	S?	-	-
Carex aquatilis - Pedicularis groenlandica fen	sedge wetland	A	G5	S4	-	-
Salix planifolia - Salix brachycarpa willow carr	a willow carr	B	G5	S4	-	-
Deschampsia cespitosa-Calamagrostis canadensis	a wet meadow	A	G5	S4	-	-

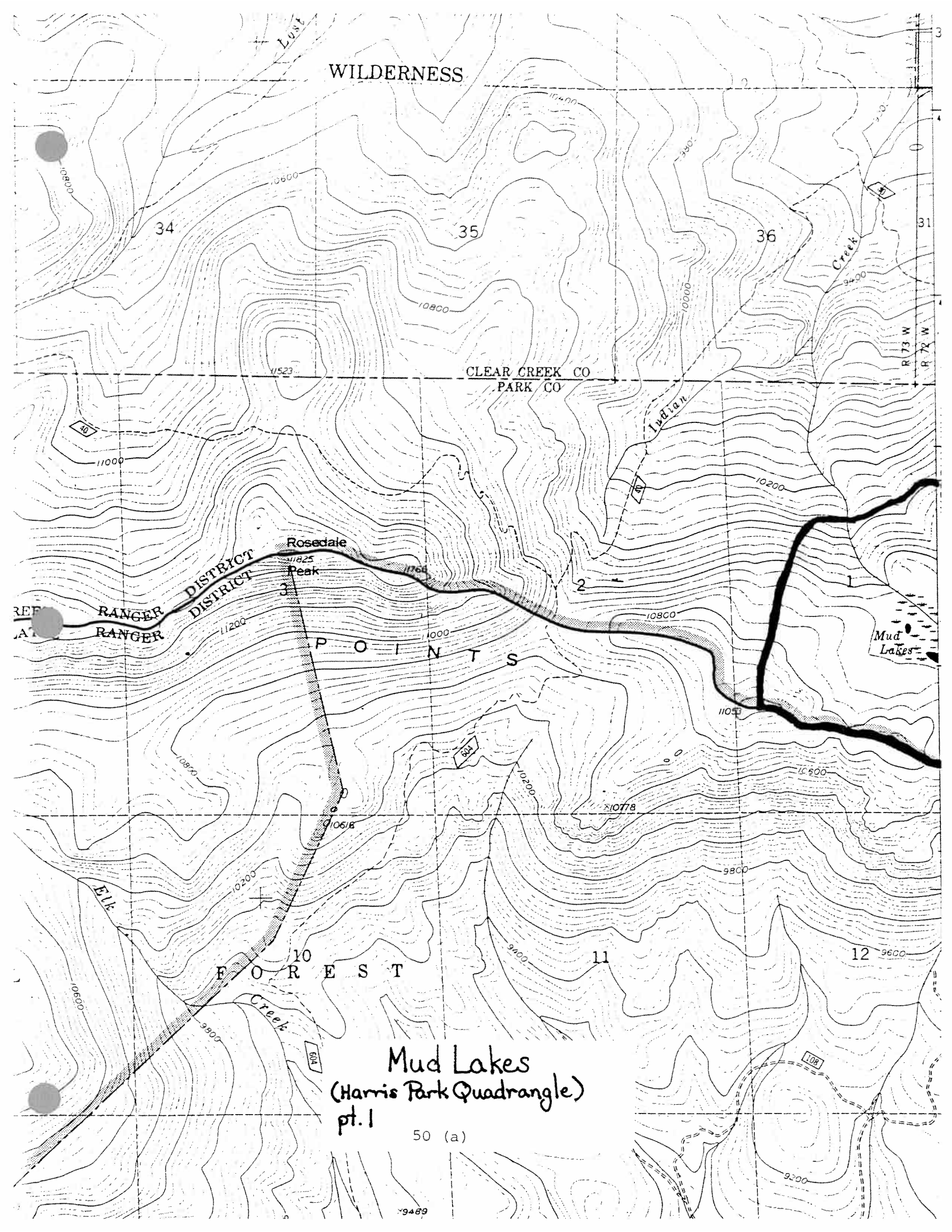
CURRENT STATUS: The entire conservation site occurs within the Mt. Evans Wilderness area. No other special designation is given. The conservation site is under U. S. Forest Service ownership.
BOUNDARY JUSTIFICATION: The preliminary conservation planning

boundary includes all of the rare species and significant communities known to occur at the site. It also includes a buffer sufficient to protect the majority of the adjacent slopes. The existence of this site within a wilderness area provides extra ecosystem protection.

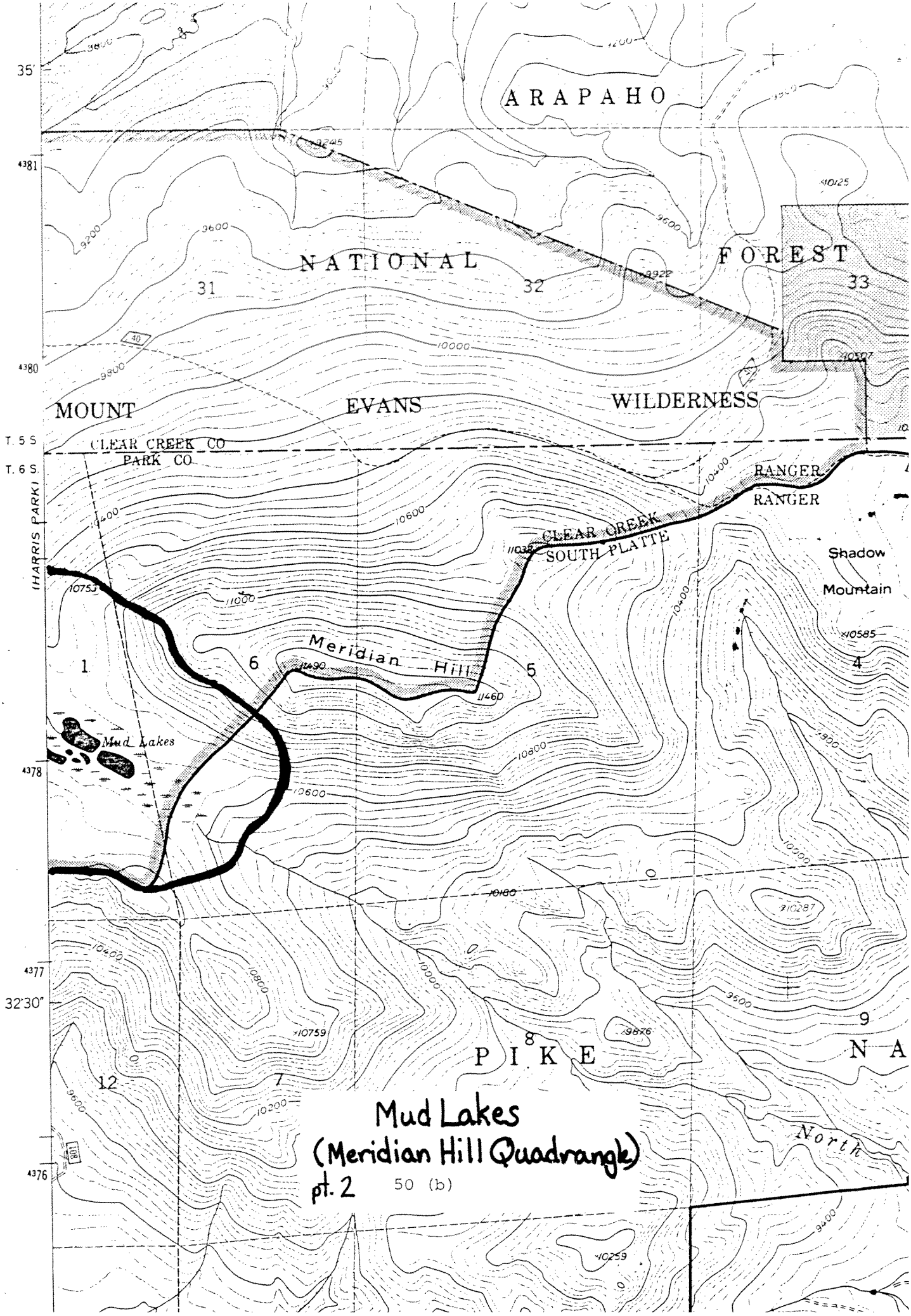
PROTECTION AND MANAGEMENT CONSIDERATIONS: Although this area occurs within a wilderness area, the site has no special area designation. There are no fish in the lakes, nor are there any developed hiking trails within the area. The area is of high quality.

We believe that there are no imminent threats or management needs as exemplified in assigned Protection Urgency and Management Urgency ranks of P4 and M4 respectively.

We strongly urge that an earlier season survey take place and include extensive animal work. Of great urgency is to survey the area for boreal toads (Bufo boreas). The pristine nature of the lakes and marshes lends them to analysis of the odonates (dragonflies and damselflies).



Mud Lakes
(Harris Park Quadrangle)
pt. 1



Mud Lakes
(Meridian Hill Quadrangle)
pt. 2 50 (b)

SUMMIT LAKE

SIZE: ca. 1,800 acres **BIODIVERSITY RANK:** B3

LOCATION: Clear Creek County
Mt. Evans Quadrangle (3910556)
Harris Park Quadrangle (3910555)

GENERAL DESCRIPTION: The Summit Lake conservation site is dominated by a large, alpine lake and extending east onto the wet tundra of Summit Lake Flats. The lake is within an east-northeast-facing cirque at 12,830'. Well-developed alpine wetlands characterize the inlet and outlet area of the Lake as well as on the Summit Lake Flats. These habitats are characterized by several extremely rare plants in Colorado. Frost-push hummocks with thick moss beds and anastomosing rivulets with gravel bars are locations for several of the rare plants. Alpine wild flower displays are extensive resulting in a diverse and abundant insect community. The Mt. Evans road bisects the area. The Flats are a relatively level alpine tundra with Acomastylis rossii moist tundra, Kobresia myosuroides dry tundra, patches of wet Carex scopulorum and Caltha leptosepala tundra, and snowbeds with Juncus drummondii. A parking area above Summit Lake permits direct access from hikers, sightseers, hunters, and fishermen. Bear Creek, originating at Summit Lake, traverses the Flats. The parking area is also used by the Department of Transportation for stockpiles and a local operations center.

NATURAL HERITAGE RESOURCE SIGNIFICANCE: Three state-rare plant species are known from the vicinity of Summit Lake. The tundra vegetation of the Summit Lake Flats is a significant example of this natural community. This combination of rare plants and significant natural communities is not known from any other place in Colorado. The natural communities/plant associations are complex and not adequately described.

Element	Common Name	Occurrence Rank	Global Rank	State Rank	Federal Status	State Status	Forest Sensitive
Phippsia algida	Snow grass	A	G4	S1	-	-	-
Saxifraga foliolosa	Leafy saxifrage	A	G4	S1	-	-	-
Carex scopulorum wetlands	alpine wetlands	A	G3G4	S3S4	-	-	-
Oenis polixenes	Polixenes arctic	?	G5	S3	-	-	-

CURRENT STATUS: The Summit Lake area is in complex ownership and management. The lake and immediate surrounding area is owned and managed by Denver Mountain Parks. The surrounding area is under ownership of the Forest Service, much of which is within the Mt. Evans Wilderness Area. The Mt. Evans road is a state-maintained highway with an associated right-of-way. Also of significance, the Summit Lake area was dedicated as a National Natural Landmark by the National Park Service. The Summit Lake area is a main focal point of efforts to create interpretive facilities for the Mt. Evans Scenic Byway.

The area is intensively used by the public. Most of the users drive the road to Summit Lake and the peak of Mt. Evans. The Summit Lake parking area is intensively used. Signs of severe habitat degradation are common in the Lake area and are extending into the more remote portions of the conservation site.

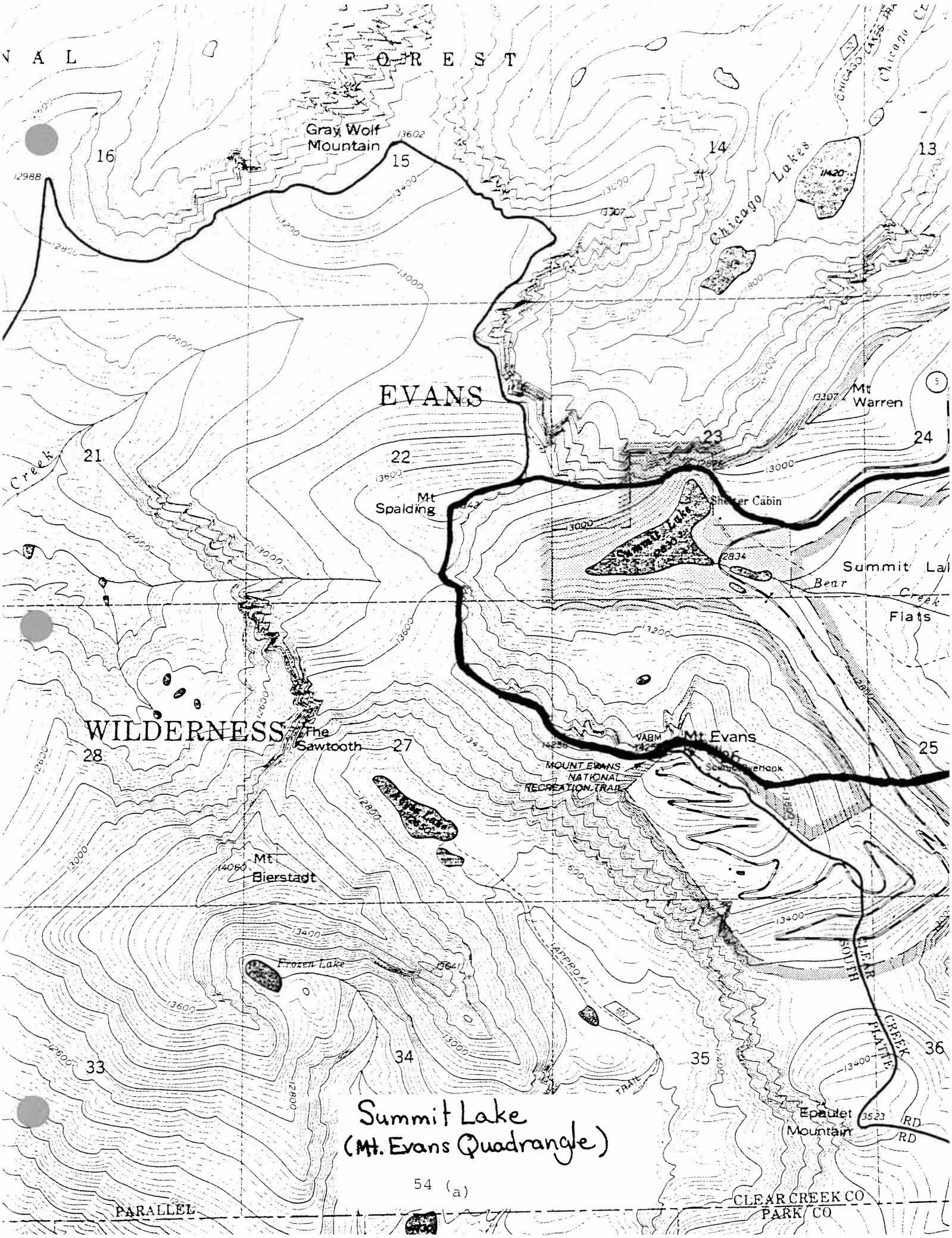
BOUNDARY JUSTIFICATION: The preliminary conservation planning boundaries include all of the known occurrences of rare plant species and significant natural communities. A buffer is provided to acknowledge ecological processes and to provide guidance for management activities.

PROTECTION AND MANAGEMENT CONSIDERATIONS: The Summit Lake area is unique in Colorado for its natural features, including its geomorphology as well as its proximity to the metro-Denver area. All rare species known to occur at this conservation site are extant. However, the environs of the Lake are heavily stressed from overuse. Foot traffic around the parking area and lake have caused extensive trampling. Recreational and education foot traffic completely ring the lake, threatening the highly significant inlet to Summit Lake. Threats exist from highway maintenance activities and include stockpiling raw materials, alterations of natural hydrology, and potential chemical runoff from salting and paving.

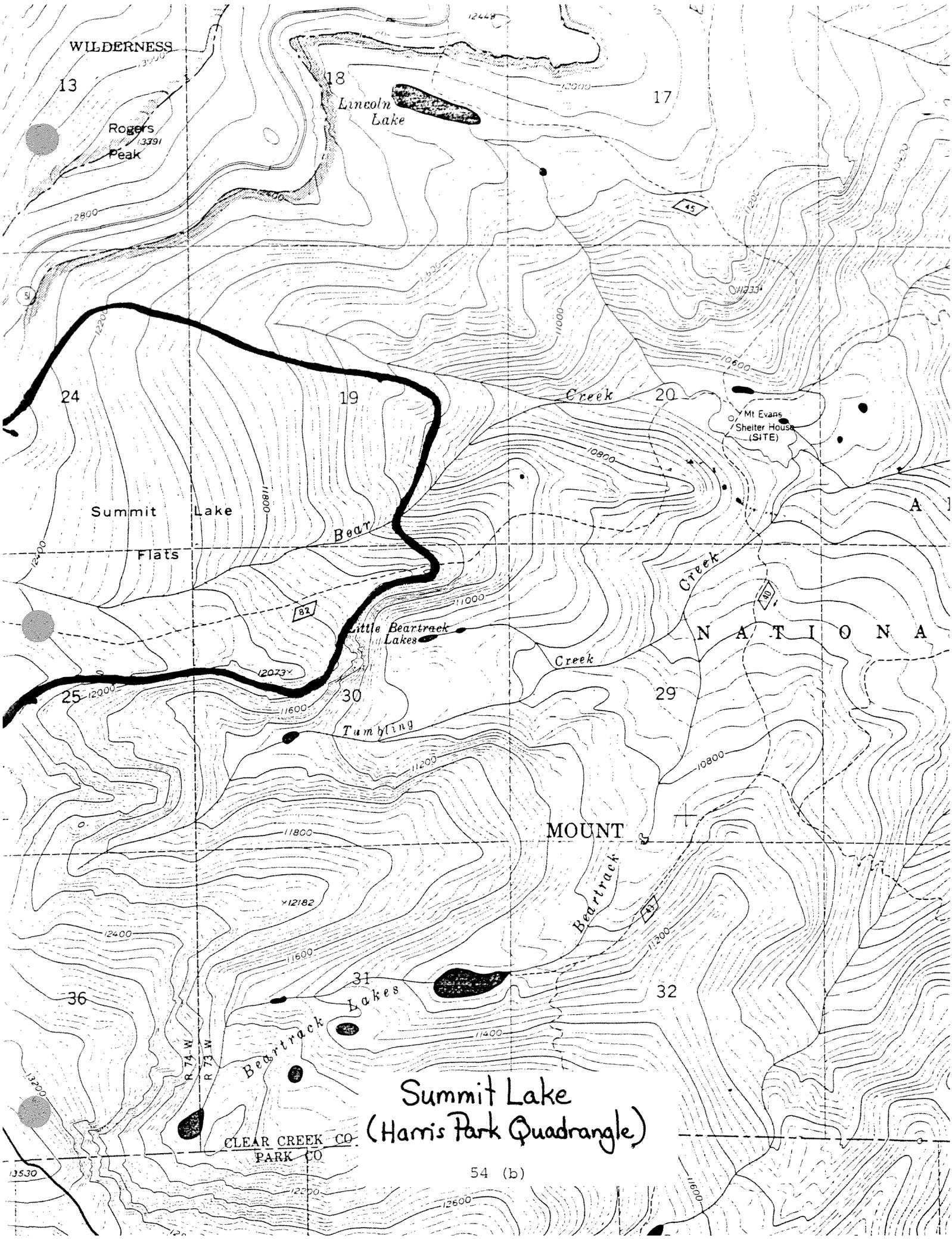
We recommend the following stewardship actions: (1) develop a well-maintained parking area which allows for good traffic flow while restricting the numbers of vehicles. Development should be directed uphill, away from the Lake's edge; (2) trails should be well-marked and supervised. Cross-country walking should be discouraged, but prevented in the vicinity of especially sensitive areas (e.g. the lake inlet area and much of Summit Lake Flats); (3) Highway maintenance activities should avoid the conservation site to the maximum extent possible; (4) Stocking of fish in Summit Lake and the subsequent recreational use should be evaluated via a risk analysis.

The ecological significance of the area should be protected. We recommend that the Forest Service consider this site as a

candidate for Special Interest Area or Special Management Area designation. Such a designation would be complex given the ownership patterns but would reflect the landscape approach to management as called for under the guidelines for Ecosystem Management.



Summit Lake
(Mt. Evans Quadrangle)



Summit Lake (Harris Park Quadrangle)

TUMBLING CREEK

SIZE: ca. 1,000 acres

BIODIVERSITY RANK: B3
PROTECTION URGENCY: P5
MANAGEMENT URGENCY: M4

LOCATION: Clear Creek County
Harris Park (3910555)
T5S, R73W, S30

GENERAL DESCRIPTION: The site includes the upper reach of Tumbling Creek. There are no trails along the creek and it is a dynamic ecosystem, largely due to beaver activity. The small pond at 11,350 ft. is now drained due to breached beaver dams; its wet gravelly/muddy bottom has an abundance of Koenigia islandica, Juncus castaneus Ranunculus hybervoreus ssp. intertextus. A fen upstream from the former pond has Eriophorum angustifolium, and "strangmoor" with raised ridges. A mile downstream from the former pond, the maps indicated a meadow or willow carr; however, this is now a large active beaver pond complex. Little Beartrack Lakes, nearby, are bordered with Carex rostrata, C. aquatilis, and Calamagrostis canadensis.

NATURAL HERITAGE RESOURCE SIGNIFICANCE: No rare, threatened or endangered species are known from the site; however, the stream corridor, without a trail or other human impacts, represents an excellent example of a subalpine stream ecosystem that is dominated by beaver activity. These elements are considered exemplary occurrences.

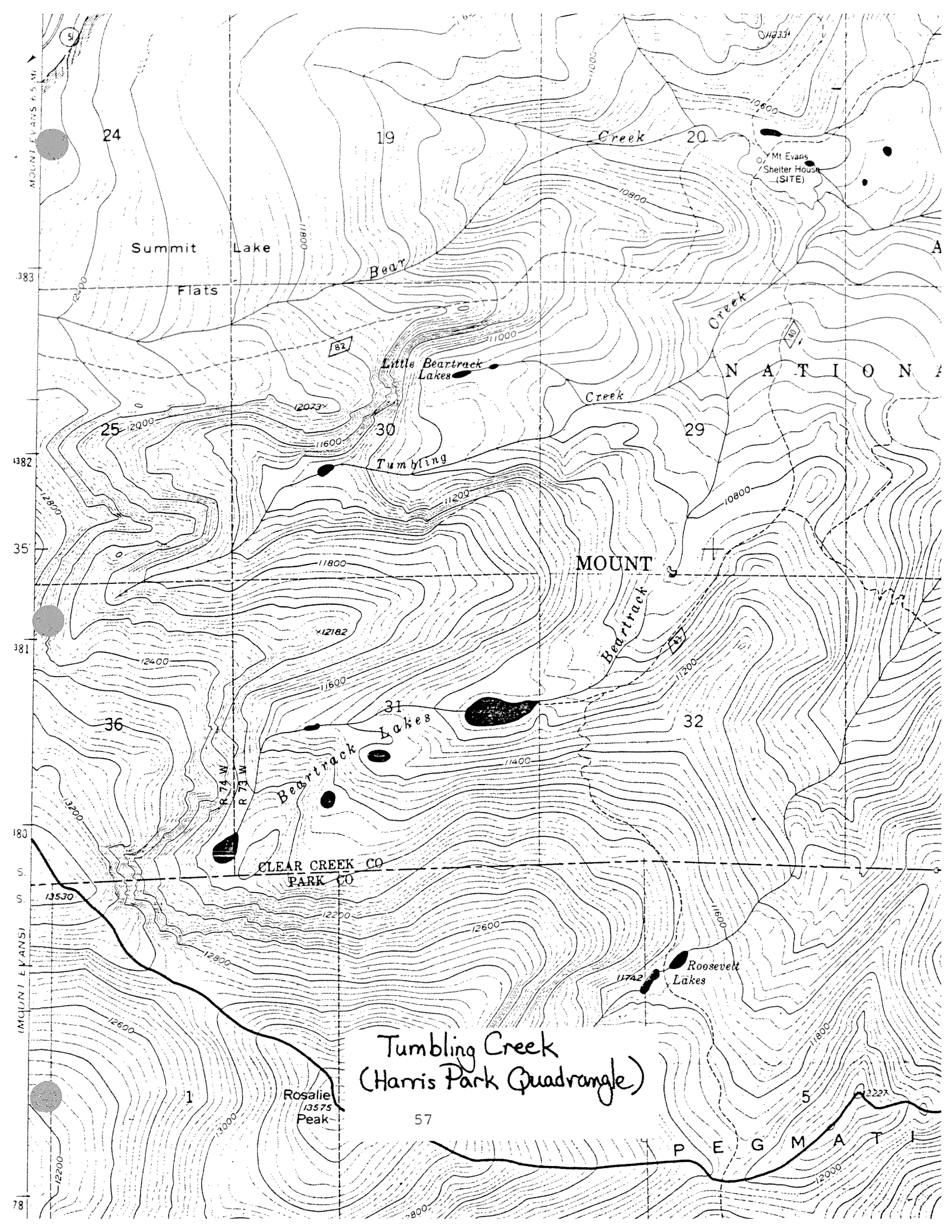
Element	Common Name	Occurrence Rank	Global Rank	State Rank	Federal Status	Forest Sensitive
Subalpine beaver pond complex		A	G5	S4	-	-
Carex aquatilis fen	a carices fen	A	G5	S3S4	-	-

CURRENT STATUS: The Tumbling Creek site occurs within the Mt. Evans Wilderness Area. The drainage is trailless and isolated with a spectacular landscape. Other than wilderness designation, there is no special site identification.

BOUNDARY JUSTIFICATION: The preliminary conservation planning boundary includes the known occurrences of natural heritage resources. In addition, much of the watershed, providing a broad

buffer, is included. The downstream delimitation should be reevaluated since it is currently based on the place of entry into the stream corridor. Additionally, the upstream boundaries abut the Summit Lake Conservation Site, but may need to be realigned to match ecosystem functions.

PROTECTION AND MANAGEMENT CONSIDERATIONS: The area occurs within a wilderness and in a remote corner of the same. This isolation has provided a great deal of protection. We encourage the Forest Service to monitor the use of the Tumbling Creek drainage. Hikers from the Summit Lake Flats currently continue north and east away from the headwaters of the drainage. No evidence of fish stocking was found in the Little Beartrack Lakes. Such a pristine condition presents excellent opportunities for monitoring lacustrine conditions for comparison with other lakes which have been altered. We have assigned a Protection Urgency of 5 since the area occurs within a wilderness area. However, we assigned a Management Urgency of 4 to indicate the potential for use to increase in the future. Heavy human use of the Tumbling Creek site could impact the present condition of the vegetation.


Summit Lake
Flats
Bear Creek
Mt Evans Shelter House (SITE)
Little Beartrack Lakes
Tumbling Creek
MOUNT
Beartrack Lakes
Beartrack
CLEAR CREEK CO
PARK CO
Roosevelt Lakes
Rosalie 13575 Peak
Tumbling Creek
(Harris Park Quadrangle)
PEGMATI
24
19
20
25
30
29
36
31
32
1
5
R 74 W
R 73 W

UPPER CLEAR CREEK

SIZE: ca. 1,800 acres **BIODIVERSITY**
RANK: B4

LOCATION: Clear Creek County
Loveland Pass Quadrangle (3910568)
Grays Peak Quadrangle (3910567)

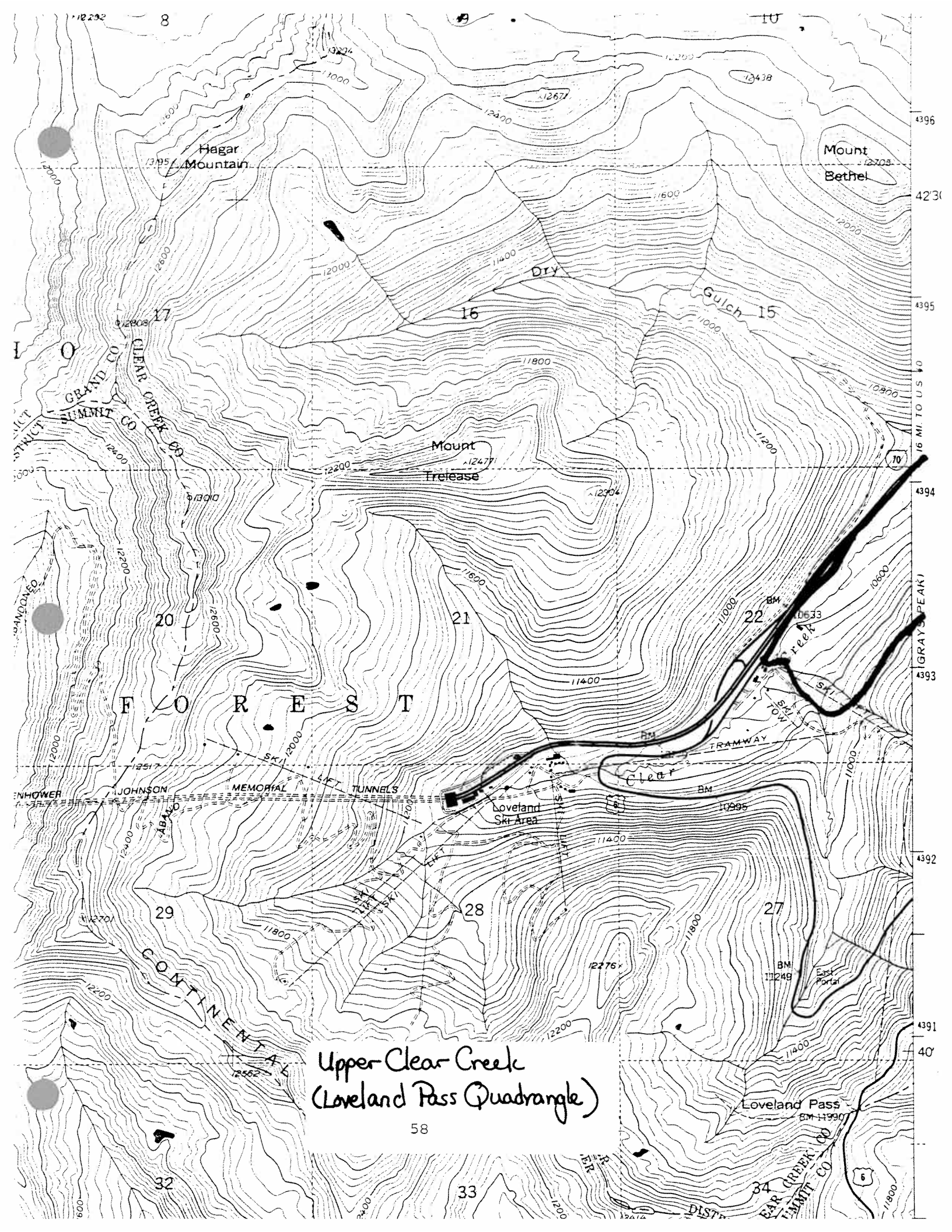
GENERAL DESCRIPTION: The Upper Clear Creek site is a stream valley, bounded on the north by Interstate 70. The south is the steep slope of Mt. Sniktau. Much of the stream valley is along the base of the densely forested slope. The forest is mid-aged and sized post-fire stands. Patches of older stands occur in the more mesic areas. The entire base of the slope is mesic to wet with a mossy understory. Many streams, rivulets, seeps and springs enter the stream valley from the mesic north-facing slope. Several small areas are very wet and therefore dominated by willows and deep moss and carices. Birch is scattered throughout the wetter areas. At the mouth of Herman Gulch significant plant associations and a single rare plant species occur.

NATURAL HERITAGE RESOURCE SIGNIFICANCE: The wetlands occurring on at this site are significant seeps. The wetlands occurring at the site remain abundant, but many of the previously known occurrences are highly degraded. The occurrence of Carex leptalea is extremely rare of Colorado and is in a highly protectable site.

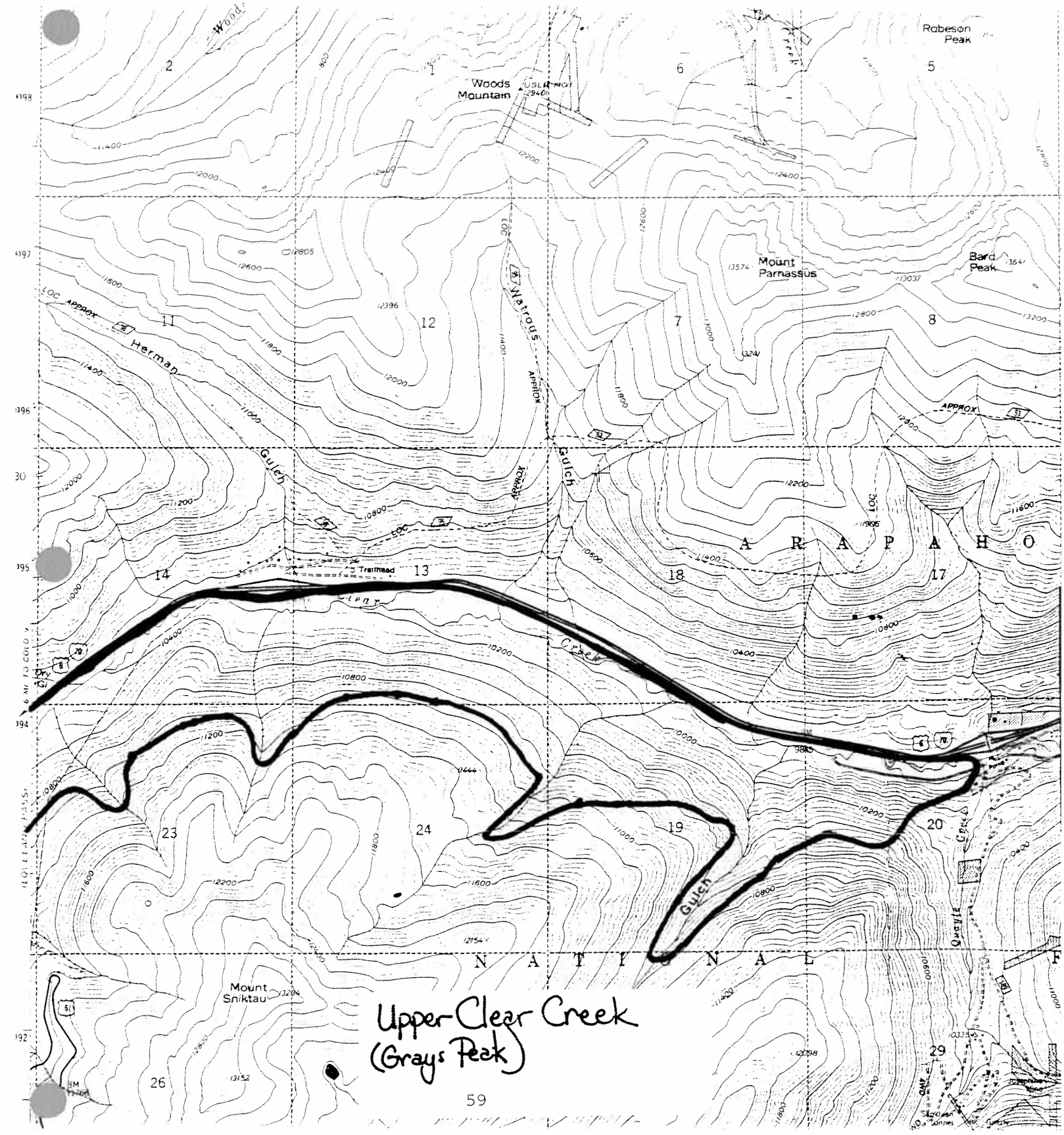
Element	Common Name	Occurrence Rank	Global Rank	State Rank	Federal Status	State Status	Forest Sensitive
Carex rostrata wetlands		B	G3G4	S3	-	-	-
Carex leptalea	Bristle-stalk sedge	AB	G4	S1	-	-	-
Bufo boreas	Boreal toad	B	G4	S1	C2	LE	-

CURRENT STATUS: The Upper Clear Creek site is not given special status. The corridor is potentially threatened by development of a bike path from Bakersville to Loveland Pass. High recreational use already occurs and is being developed further.

BOUNDARY JUSTIFICATION: The preliminary conservation planning boundaries include all known occurrences of natural heritage resources. Buffers are also included, primarily to protect ecological processes that maintain the wetland environment. Boundaries are greatly modified from those presented in Pague and Reid (1993). Upper Clear Creek is one of the few remaining populations of Boreal toads in the Southern Rocky Mountains.



Upper Clear Creek
(Loveland Pass Quadrangle)


Woods Mountain
Robeson Peak
Mount Parnassus
Bard Peak
Herman Gulch
Watrous Gulch
Trailhead
Clear Creek
Mount Sniktau
Upper Clear Creek
(Gray's Peak)
ARAPAHO
NATIONAL

UPPER MILL CREEK BASIN

SIZE: ca. 1,100 acres

BIODIVERSITY RANK: B3
PROTECTION URGENCY: P3
MANAGEMENT URGENCY: M4

LOCATION: Clear Creek County
Empire (3910576)
T3S R75W S1, 12

GENERAL DESCRIPTION: Bill Moore Lake is a beautiful subalpine lake surrounded by willow carr, sedge fens, subalpine meadows, open Picea engelmanni forest. A moist slope above the lake has the rare sedge Carex capitata ssp. arctogera (currently being considered for tracking by the CNHP). The valley has typical moist and dry tundra vegetation. The Lake is shallow and with no fish. A 4WD road approaches closely. There are a few signs of past disturbances including old mine structures and equipment. Apparently, impacts were minimal and recovery has been excellent. The upper drainages of Byron and Ethel lakes were not surveyed in the 1993 field season.

NATURAL HERITAGE RESOURCE SIGNIFICANCE: Such high elevation lakes are poorly studied in Colorado. Most lakes in the vicinity have been stocked with exotic fish species, altering the lacustrine ecosystems. The fens and willow carrs are of high quality, especially in association with the treeline lake.

Element	Common Name	Occurrence Rank	Global Rank	State Rank	Federal Status	Forest Sensitive
Carex capitata ssp. arctogena	a sedge	A	G5	SU	-	-
Salix planifolia/Caltha leptosepala	a willow carr	A	G5	S4?	-	-

CURRENT STATUS: The site receives no protection through special designations.

BOUNDARY JUSTIFICATION: The conservation planning boundary incorporates the entire upper watershed between Witter Peak, Mt. Flora, and Breckenridge Peak. Such a boundary will provide for the ecological processes that support the ecosystems of the upper lakes.

PROTECTION AND MANAGEMENT CONSIDERATIONS: The Bill Moore Lake and upper watershed should be protected from undue disturbance. The

area would be sensitive to increased use by 4WD vehicles, especially if they were to approach the shores of the Lake. We have estimated the Protection Urgency to rank a 3. This level indicates that access is fairly simple and some expectation of damaging use would be expected after at least five years. The Management Urgency is assigned a value of 4, indicating that although there are few current management issues, the lake is a possible source for stocking and the area would be a beautiful picnic area. While the latter use is not necessarily bad, it would warrant management if the area became popular.

PROTECTION AND MANAGEMENT CONSIDERATIONS: The site is threatened by increasing recreational use and trail development. It is essential that the trail avoid the significant vegetation of this site. The wetland depends on an intact hydrology, believed to extend from the floodplain of the creek, uphill onto the slopes of Mt. Sniktau. We recommend this site for consideration for special designation as a Special Interest Area. Should the bike/hiking trail be developed across the creek from the site, an excellent opportunity would be created for interpretation of montane wetland ecology while protecting this significant site.

It is of critical concern that the populations of the Boreal toad be protected. While exact breeding locations are poorly known for this species, the large number of individuals reported in the past five years indicates that this is an area of statewide significance. The Forest Service should be a key player in the development of a recovery plan for the species. They should also continue inventory and monitoring efforts.

The combined threats of the bike/hiking trail and the proposed Continental Divide Trail corridor are believed to be moderate to all elements of natural diversity. Should the trail be developed through the existing significant features or within the conservation planning boundaries, these threats would be elevated to high. It is clear that trail design and user guidance will be essential to the long term protection of these sensitive features. The potential impacts of a bike path along the Upper Clear Creek are more undefined, but for the Boreal toad, probably more ominous. At this time, we recommend that should the trail be constructed, it should be placed as far from mesic habitats as possible. Breeding sites should be identified and stringent efforts made to prevent their disturbance. Monitoring the trail regularly to identify patterns of toad use will assist in the development of effective management plans.

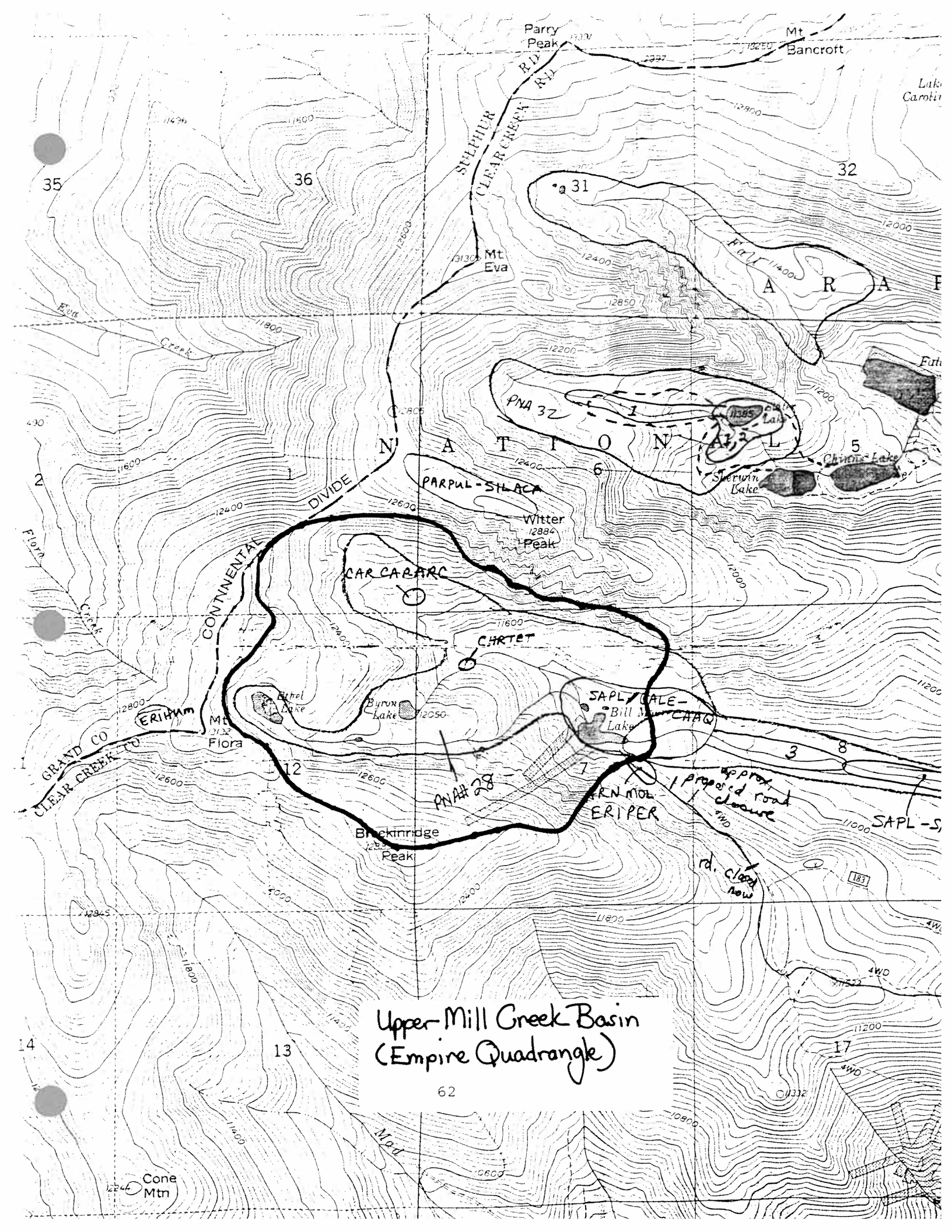
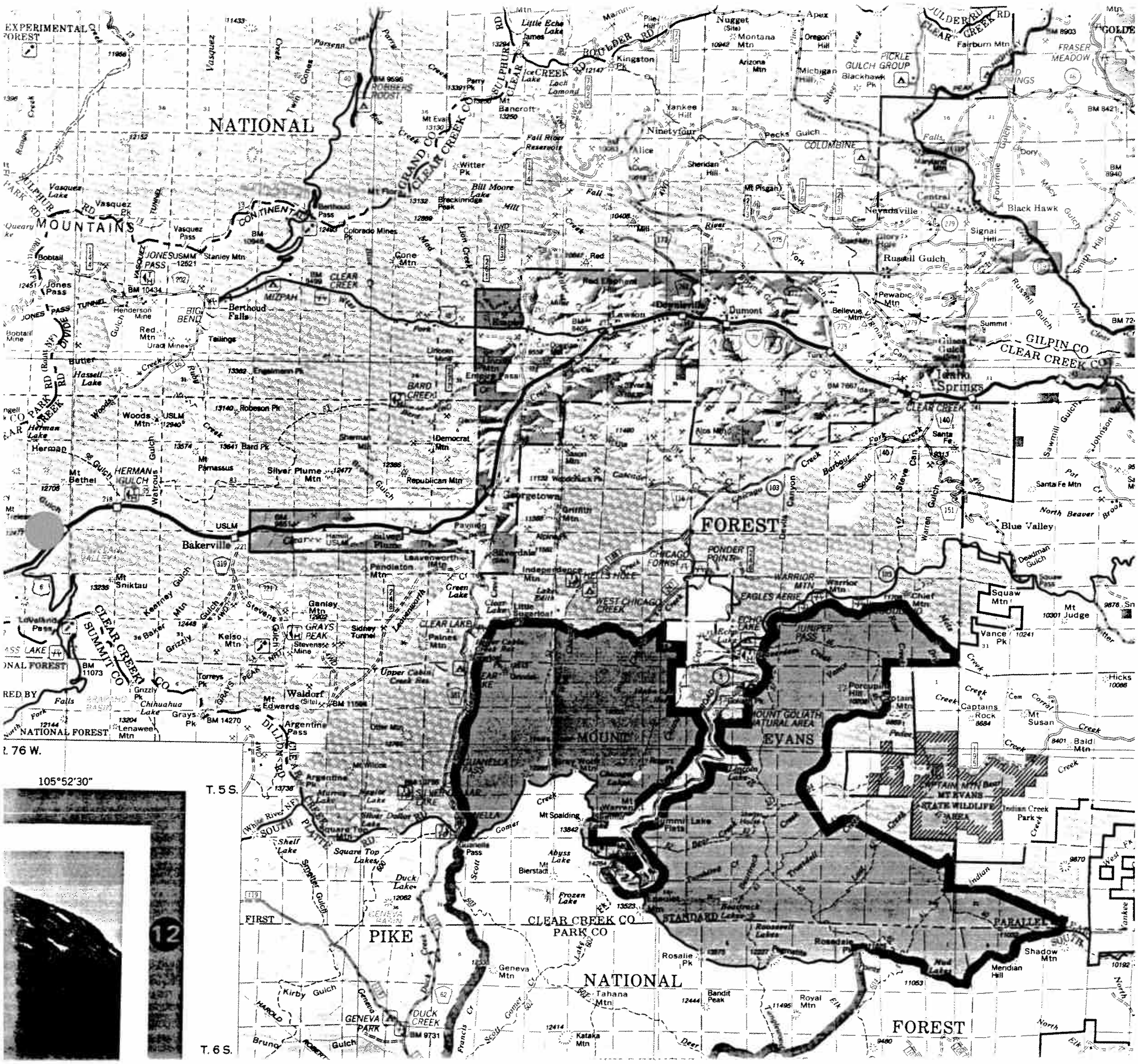

Upper Mill Creek Basin
(Empire Quadrangle)
62

Figure 1.



EXPERIMENTAL FOREST
NATIONAL
MOUNTAINS
FOREST
PIKE
NATIONAL
FOREST
MOUNT EVANS
GILPIN CO
CLEAR CREEK CO
CLEAR CREEK CO
PARK CO
Georgetown
Idaho Springs
Bakerville
Dumont
Lawson
Black Hawk
Nevadaville
Russell Gulch
Berthoud Falls
Berthoud Pass
Silver Plume
Blue Valley
Guanella Pass
Geneva Park
MOUNT GOLIATH NATURAL AREA
MT EVANS STATE WILDLIFE AREA
105°52'30"
R. 76 W.
T. 5 S.
T. 6 S.

Figure 2.

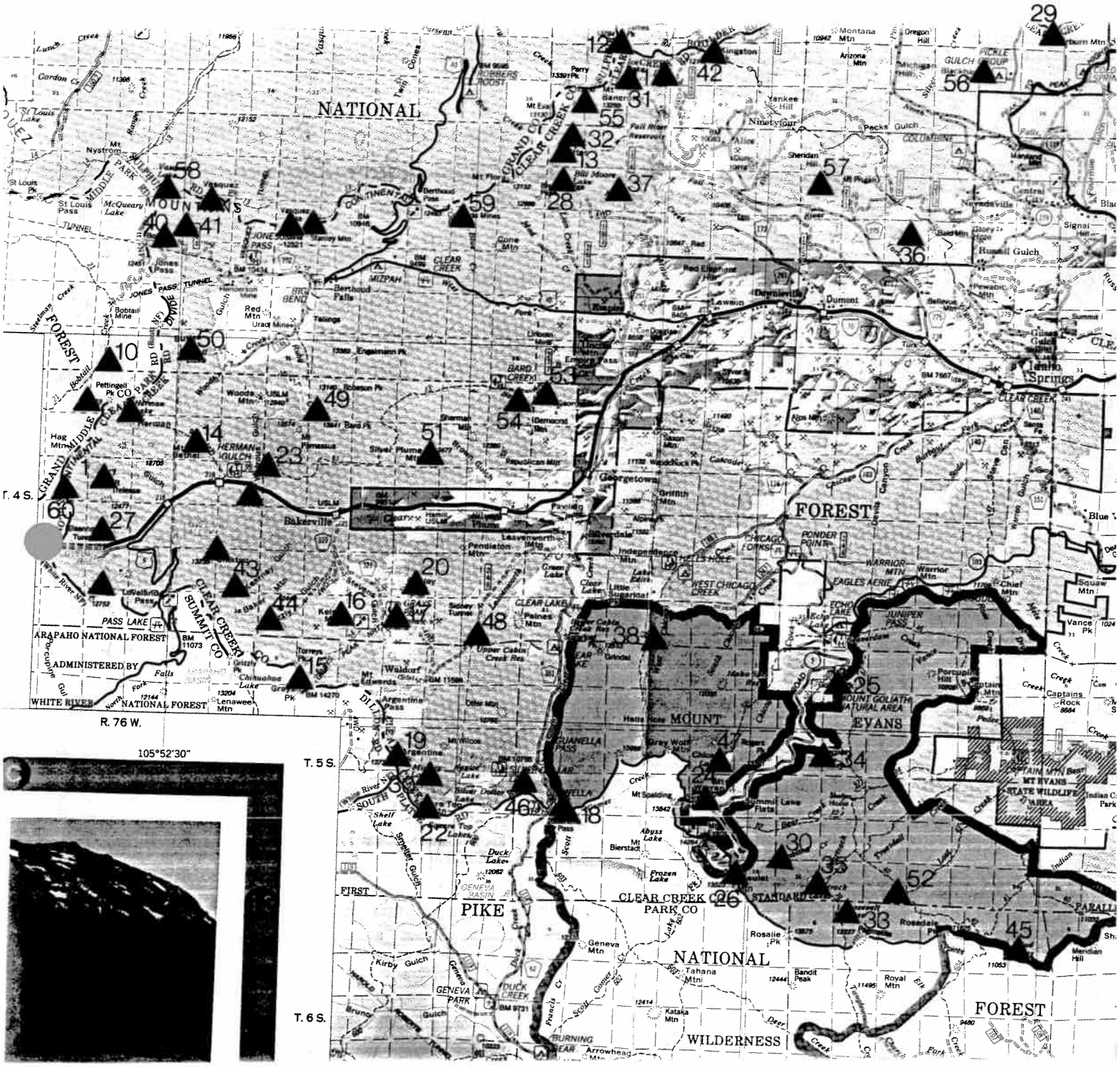
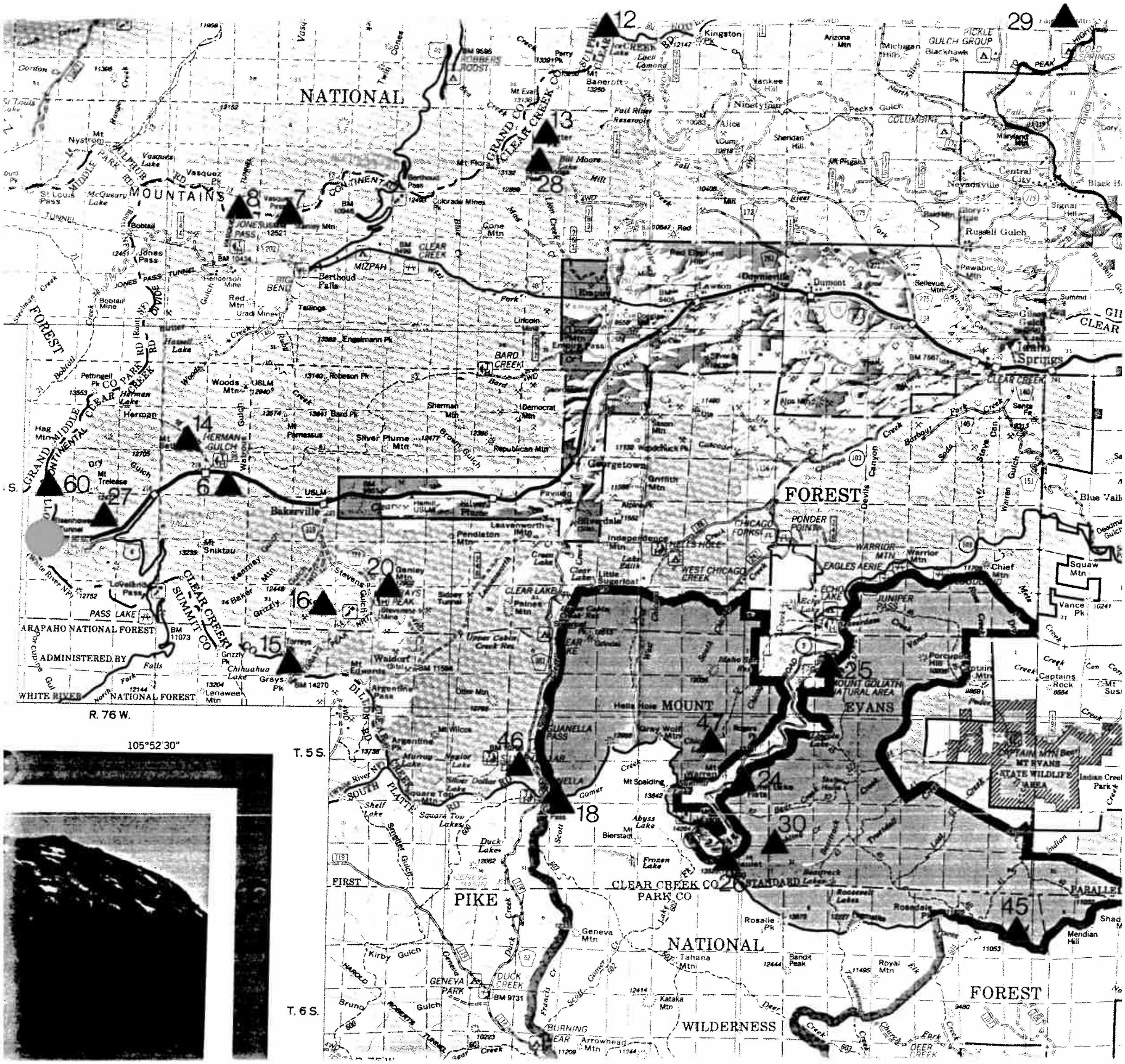

NATIONAL
FOREST
Georgetown
Bakerville
Idaho Springs
CLEAR CREEK
PARK CO
SUMMIT CO
PIKE
NATIONAL
FOREST
WILDERNESS
ARAPAHO NATIONAL FOREST
ADMINISTERED BY
WHITE RIVER
NATIONAL FOREST
MOUNT EVANS
WILDERNESS
T. 4 S.
T. 5 S.
T. 6 S.
R. 76 W.
105°52'30"

Figure 3.



NATIONAL
FOREST
NATIONAL
FOREST
PIKE
WILDERNESS
MOUNTAINS
MOUNT
EVANS
CONTINENTAL
DIVIDE
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Berthoud Pass
Berthoud Falls
Empire
Lawson
Dumont
Idaho Springs
Georgetown
Silver Plume
Bakerville
Central City
Nevadaville
Russell Gulch
Kingston Pk
Yankee Hill
Alice
Mt Flora
Jones Pass
Vasquez Pass
Loveland Pass
Grays Pk
Mt Spalding
Mt Bierstadt
Rosalie Pk
Geneva Park
Squaw Mtn
Chief Mtn
Captains Rock
Mt Evans State Wildlife Area
Mount Goliath Natural Area
CLEAR CREEK CO
PARK CO
ARAPAHO NATIONAL FOREST
ADMINISTERED BY
WHITE RIVER NATIONAL FOREST
R. 76 W.
105°52'30"
T. 5 S.
T. 6 S.

APPENDIX A

Natural Heritage Rank Explanation Sheet

Definitions of Rarity Ranks and Abbreviations Used on Species and Natural Communities of Special Concern Lists

Colorado Natural Heritage Program

Natural Heritage Ranks

The following ranks are used by the Colorado Natural Heritage Program to set protection priorities for natural heritage resources. Natural Heritage Resources, or "NHR's," are rare, threatened or endangered plant and animal species, rare and exemplary natural communities, and significant geologic features. The primary criterion for ranking NHR's is the number of populations or occurrences, i.e. the number of known distinct localities. Also of great importance is the number of individuals in existence at each locality or, if a highly mobile organism (e.g., large mammals, many birds, and butterflies), the total number of individuals. Other considerations may include the quality of the occurrences, the number of protected occurrences, and threats. However, the emphasis remains on the number of populations or occurrences such that ranks will be an index of known biological rarity.

S1 Extremely rare; usually 5 or fewer populations or occurrences in the state; or may be a few remaining individuals; often especially vulnerable to extirpation.

S2 Very rare; usually between 5 and 20 populations or occurrences; or with many individuals in fewer occurrences; often susceptible to becoming extirpated.

S3 Rare to uncommon; usually between 20 and 100 populations or occurrences; may have fewer occurrences, but with a large number of individuals in some populations; may be susceptible to large-scale disturbances.

S4 Common; usually >100 populations or occurrences, but may be fewer with many large populations; may be restricted to only a portion of the state; usually not susceptible to immediate threats.

S5 Very common; demonstrably secure under present conditions.

SA Accidental in the state.

S#B Breeding status of an organism within the state.

SH Historically known from the state, but not verified for an extended period, usually > 15 years; this rank is used primarily when inventory has been attempted recently.

S#N Non-breeding status within the state. Usually applied to winter resident species.

SU Status uncertain, often because of low search effort or cryptic nature of the element.

SX Apparently extirpated from the state.

SZ Long distance migrant whose occurrences are too irregular, transitory and/or dispersed to be reliably identified, mapped and protected.

S? Believed to be rare but awaiting formal rarity ranking.

Global ranks are similar, but refer to a species' rarity throughout its total range. Global ranks are denoted with a "G" followed by a character. Note that GA and GN are not used and GX means apparently extinct. A "Q" in a rank indicates that a taxonomic question concerning that species exists. Ranks for subspecies are denoted with a "T". The global and state ranks combined (e.g. G2/S1) give an instant grasp of a species' known rarity.

These ranks should not be interpreted as legal designations.

Federal Legal Status

The Colorado Natural Heritage Program uses the standard abbreviations for Federal endangerment developed by the U.S. Fish and Wildlife Service, Division of Endangered Species and Habitat Conservation.

LE - Listed Endangered
LT - Listed Threatened
PE - Proposed Endangered
PT - Proposed Threatened
C1 - Candidate for formal listing
C2 - Under review for formal listing

C2*- Under review for listing; possibly extinct
3A - Former candidate - presumed extinct
3B - Former candidate - not a valid species under current taxonomic understanding
3C - Former candidate - common or well protected
- No federal status

State Legal Status

The Colorado Natural Heritage Program uses similar abbreviations for State endangerment.

E - Listed Endangered
T - Listed Threatened
SC - Special Concern

U - Unknown
- no state status

For information on the laws pertaining to threatened or endangered species, contact:

U.S. Fish and Wildlife Service for all FEDERALLY listed species
Department of Natural Resources - Division of Wildlife for all STATE wildlife (vertebrates)

Federal Sensitive - "FS" indicates inclusion on U.S. Forest Service Region II Sensitive Species list of 3/93; "BLM" indicates inclusion on BLM Sensitive Plant List

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