Summit County Conservation Inventory
Volume I:
A Natural Heritage Assessment
1997 Final Report

Colorado Natural Heritage Program
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The Nature Conservancy

Natural Heritage Program COLORADO

Colorado State University

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Volume I:
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User's Guide

The Summit County Conservation Inventory conducted by the Colorado Natural Heritage Program consists of two essentially distinct projects that were highly integrated with respect to methodology, field work, and coordination with Summit County government. This report is organized in a two volume set to reflect the separate nature of the projects. Both projects utilize the same Natural Heritage methodology that is used throughout North America, and both searched for and assessed the plants, animals, and plant communities on Colorado Natural Heritage Program's List of rare and imperiled elements of biodiversity. Each volume prioritizes potential conservation sites based on the relative significance of the biodiversity they support and the urgency for protection of the site. All information explaining Natural Heritage methodology and ranks is repeated in each volume, so that each volume can stand alone and be used independently of the other.

Volume I presents *all* potential conservation sites identified in Summit County that support rare and imperiled plants and animals, and significant plant communities, including wetland and riparian areas. Volume II focuses exclusively on wetland and riparian areas. Volume II also presents "locally significant areas." These are sites that are among the most important wetlands in Summit County, but they are not unique from a national or state-wide perspective. Since they are not unique according to CNHP methodology, these sites do not receive a Biodiversity Rank. Additionally, Volume II presents an assessment of the wetland functions performed by each site surveyed. These functional assessments are intended to provide the user with a more complete picture of the value wetlands and riparian areas provide to Summit County residents.

Acknowledgments

Funding for the Summit County Conservation Inventory was provided by a grant from Great Outdoors Colorado and from Summit County. Funding for the Wetland and Riparian Area Survey was provided by a grant from the Colorado Department of Natural Resources with funds from the U.S. Environmental Protection Agency. In- kind support was provided by Summit County, the Colorado Natural Heritage Program (CNHP), the U. S. Forest Service, Colorado Division of Wildlife, and the Keystone Science School.

We would like to acknowledge and sincerely thank Summit County Government and the Summit County Conservation Inventory Guidance Committee which gave us invaluable support and advice. The following individuals and groups participated in this role: Todd Robertson with the Summit County Open Space and Trails Department; Dixie Kuhn with the Summit County Human Resources Department; Chris Hawkins and Steve Hill with the Summit County Planning Department; the Summit County Board of County Commissioners; the Summit County Geographic Information Systems (GIS) Department; Kathleen Phelps and Nancy Redner with the U. S. Forest Service Dillon Ranger District; Alex Chappell, Tom Hobbs, Tom Kroening and Monique Gilbert with the Colorado Division of Wildlife; Chuck Cesar with the Bureau of Land Management Kremmling Resource Area; the Towns of Breckenridge, Frisco, Dillon, Montezuma, Silverthorne, and Blue River; Chris Chopyak-Minor with the Keystone Science School; the Continental Divide Land Trust; the Sierra Club; Scott Hummer with the Open Space Advisory Council; Robert Ray with the Northwest Colorado Council of Governments; and Trout Unlimited; the U.S. Army Corps of Engineers.

We greatly appreciate the project volunteers and the Summit County landowners who participated in this natural heritage survey. The University of Colorado and the Colorado State University Herbaria provided important species distribution information. Pilot Phil Ecklund made a flight over the county possible and we would like to thank him for his continued support of CNHP.

The information management staff with CNHP was responsible for integrating the data resulting from the inventory into the Biological Conservation Database, coordinating with the System for Conservation Planning (SCoP) project, and creating a GIS coverage of the Summit County Proposed Conservation Site boundaries. This effort was performed by Liz Phillips, Brad Lambert, Phil Busteed, Barry Baker and Doug Shinnemann.

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Executive Summary

In 1996, The Colorado Natural Heritage Program (CNHP) was contracted by the Summit County Community Development Division to assess the natural heritage values of lands throughout Summit County. This work was made possible by a planning grant that Summit County was awarded by Great Outdoors Colorado. At the same time, the U.S. Environmental Protection Agency, through the Colorado Department of Natural Resources, provided CNHP with the support to conduct a Wetland and Riparian Area Survey of the private lands of Summit County. These two projects were closely coordinated and the results are presented together in this report.

Volume I includes a complete assessment of the natural heritage values documented in the County, including all wetland and riparian sites that merit this level of significance. Volume II presents the results of the Wetland and Riparian Area Survey. This second volume includes an assessment of all of the wetland and riparian areas represented in the County, including those wetland and riparian areas that were found to have natural heritage and local significance. Additionally, Volume II includes a function and value assessment of each of the wetland or riparian areas that were sampled. The information that is pertinent to both reports is repeated, so that each volume can stand alone and be used independently of the other volume.

The primary goal of the entire project was to identify the locations in Summit County that have natural heritage significance. These locations were identified by 1) examining existing biological data from the CNHP, 2) accumulating additional existing information on rare or imperiled plant species, animal species, and significant plant communities (collectively called **elements**), and 3) conducting exhaustive field surveys.

More than 80 rare or imperiled plant or animal species and significant plant communities (elements) have been documented in Summit County (see Table 5). Several of these natural heritage elements are globally significant. The other elements found in the county have state-wide significance. Overall, the concentration of elements indicates that conservation in Summit County will have state-wide as well as global consequences.

Locations in the County with natural heritage significance (those places where elements have been documented) are presented in this report as proposed **conservation sites**. **The proposed conservation site boundaries delineated in this report do not confer any regulatory protection on the site.** These boundaries were based on the ecological processes needed to support the elements at the site. Forty-three sites are described and prioritized, including twenty-one wetland and riparian sites. The sites are prioritized according to their **biodiversity significance rank**, or "B-rank," which ranges from B1 (outstanding biodiversity significance) to B5 (general or state-wide biodiversity significance). The highest ranking sites (e.g., B1-B3) are the highest priorities for conservation actions. The sum of all the sites in this report represents the area CNHP believes needs to be protected to ensure the County's natural heritage is not lost. Recommendations for protection and management of each site are presented.

The new information gathered during this inventory was placed in the Natural Heritage Program's database, the Biological and Conservation Data System (BCD). The BCD is used throughout the entire Natural Heritage network (which consists of over eighty offices in North America and internationally) to maintain species and community information and to assess each element's degree of imperilment. By incorporating new information into the BCD we can refine our conservation priorities. The new information becomes part of a permanent record of Colorado's natural heritage. It is important to keep in mind that the BCD is a very active database. In other words, records are continuously updated as we gather new data.

The Wetland and Riparian Survey followed the same methodology as the natural heritage assessment, but included an additional function and value assessment of each survey site. In addition to their biological significance, wetlands perform many functions that provide value to the residents of Summit County. Wetlands help control flooding, maintain water quality, provide wildlife habitat, offer recreational opportunities, and add to the aesthetic quality of the County. These functions were evaluated for all of the wetland and riparian survey sites. Information from this effort that may enhance a program for hydrogeomorphic (HGM) wetland function assessment in the southern Rocky Mountains is also presented.

The Natural Heritage Biological Inventory and the Wetland and Riparian Area Survey were conducted in several steps:

1. **Identify rare or imperiled species and significant plant communities with potential to occur in Summit County.** Using known range and life history information, over 120 natural heritage elements potentially occurring in Summit County were identified (see Table 3).

2. **Collect existing information.** CNHP databases were updated with information about both species' biology and locations within Summit County. Sources included museum collections, scientific literature, and local naturalists and biologists including expert sources at the Colorado Division of Wildlife.

3. **Identify targeted inventory areas.** Using available information, targeted inventory areas were identified based on several factors, including the presence of potential habitat for rare or imperiled species and evidence of little human disturbance.

4. **Conduct field surveys**. Targeted inventory areas were surveyed on-site (with landowner permission only). Data on the existence or lack of elements were recorded, and an estimate of overall biological quality of the location was made.

5. **Delineate and prioritize proposed conservation sites.** Preliminary conservation planning boundaries were identified based on the ecological processes that support the natural heritage elements at the site.

A guidance committee of about 25 people representing private and public organizations in Summit County provided input at all stages of the inventory.

Information was gathered to compliment and augment the System for Conservation Planning (SCoP) project and the Natural Diversity Information Source (NDIS) project. These complementary projects will provide world wide web access to interactive geographic information system (GIS) coverages containing biological and geopolitical information intended to aid planning efforts of county planners, conservation organizations, and other interested groups and individuals. CNHP has contributed to these projects by incorporating the results of the Summit County Conservation Inventory into a GIS coverage. This coverage was provided directly to Summit County, and will be available in a similar format through SCoP and NDIS. CNHP will also be developing a state-wide coverage for NDIS. All of these GIS data will also be maintained and updated in the Biological and Conservation Data System (BCD).

Recommendations

1. **Develop and implement a plan for protecting the conservation sites profiled in this report, with the most attention directed toward sites with biodiversity rank (B-rank) B1, B2, and B3.** The preliminary boundaries of the conservation sites in this report provide Summit County with a basic framework for implementing a comprehensive conservation program. The B1, B2, and B3 sites, because they have global significance, should receive the most attention. The sum of all the sites in this report represents the area CNHP believes needs to be protected to ensure the County's natural heritage is not lost over time.

2. **Consider open space acquisition and/or conservation easements for proposed conservation sites where appropriate and necessary to protect their ecological values.** Summit County and the Town of Breckenridge both have open space acquisition programs. The County currently holds several conservation easements on private land and the Summit County-based Continental Divide Land Trust also holds conservation easements. A possible source of funds to protect these sites as open space is Great Outdoors Colorado, which has a grant program that aims to protect natural areas of state-wide significance. Priority should be placed on B1, B2, and B3 conservation sites, although protection opportunities on B4 and B5 sites should be pursued where they exist.

3. **Incorporate the information included in this report in the review of proposed activities in or near conservation sites so that the activities do not adversely affect natural heritage elements.** All of the sites presented contain natural heritage elements of state or global significance. Development activities in or near a site may affect the element(s) presence. Wetland and riparian sites are particularly susceptible to impacts from off-site activities if the activities affect water quality or hydrologic regimes. In addition, cumulative impacts from many small changes can have effects as profound and far-reaching as one large impact. As proposed activities within Summit County are considered, they should be compared to the site maps presented herein. If a proposed project potentially would impact a site, planning personnel should contact people, organizations, or agencies with expertise to get detailed comments. The Colorado Natural Heritage Program, Colorado Natural Areas Program, and Colorado Division of Wildlife routinely conduct environmental reviews state-wide and should be considered as available resources.

4. **Using Volume II of this report, develop and implement a comprehensive county-wide program to protect wetlands**. Use the U.S. Fish and Wildlife Service definition of wetlands to guide this program, and include riparian areas in the wetland conservation program. Develop a system of buffers, while recognizing that some wetlands, such as those with natural heritage significance, require buffers larger than others.

5. **In the effort to protect natural diversity, promote cooperation among landowners and pertinent government agencies and non-profit conservation organizations.** The long-term protection of natural diversity in Summit County will be facilitated with the cooperation of many government agencies, non-government organizations, and private landowners. The

Summit County Planning Department has played a leadership role in attempting to incorporate diverse opinions in the planning process. Efforts to this end should continue, providing stronger ties among federal, state, local, and private interests involved in the protection or management of natural lands.

6. **Promote proper management of the natural heritage resources that exist within Summit County, recognizing that delineation of conservation sites does not in itself afford protection to the plants, animals, and plant communities.** Development of a conservation plan is a necessary component of the site designation. Because some of the most serious threats to Summit County's ecosystems are large-scale (altered hydrology, residential encroachment, non-native species invasion), considering each site in the context of its surroundings is critical. Building partnerships is essential to the long-term protection of a site. An important component of partnerships could be the research and development of techniques for maintaining or restoring sites to aid in the preservation of imperiled species or significant plant communities. CNHP would welcome the opportunity to partner with Summit County in the further development of strategic conservation plans for sites of natural heritage significance. In addition, several organizations and agencies are available for consultation in the development of conservation plans, including the Colorado Natural Areas Program, The Nature Conservancy, the Colorado Division of Wildlife, and various academic institutions.

7. **Increase public awareness of the benefits of protecting significant natural areas.** Natural lands are becoming increasingly scarce, especially those near densely populated areas. Rare and imperiled species will continue to decline if not given appropriate protection. This will result not only in the loss of our natural heritage, but may also lead to additional conflicts between developers and natural resource managers. Increasing the public's knowledge of the remaining significant areas will build support for the programmatic initiatives necessary to protect them. Finally, to build awareness of the commitment to protect sites of biodiversity significance, the County should publicize the significant conservation actions taken.

8. **Consider using incentives, including tax incentives, to promote conservation actions on private lands.** Conservation of important natural heritage resources can only take place with the cooperation of private landowners. Tax incentives could be used to help landowners defray the costs of protecting something of value to all of the residents of Summit County.

9. **Continue natural heritage resource inventories where necessary, including inventories for species that cannot be surveyed adequately in one field season and inventories on lands that CNHP could not access in 1997.** Not all targeted inventory areas can be field surveyed in one year and inventory for some species in one field season is often difficult. Despite the best efforts of one field season, it is likely that some elements occur at sites not identified in this report. Please see Figure 3.

10. **Prohibit the introduction and/or sale of non-native species that are known to negatively and profoundly affect natural areas, especially wetlands and riparian areas.** These non-

natives include but are not limited to Russian olive, wild chamomile, and non-native fish species. Natural area managers, public agencies, and private landowners should be encouraged to remove these species from their properties. The above mentioned individuals should work with the local landscape companies and nurseries to build local supplies of native plants and seeds for restoration projects, re-seeding efforts, and other such activities. To find out more about exotic plant species management contact the Colorado Department of Agriculture, Noxious Weed Management.

Overview of the Study Area

Summit County straddles the west flank of the Continental Divide and is approximately 396,036 acres. Private lands comprise about 81,725 acres (28%) of Summit County (Summit County Planning Department personal communication). Most private lands are along the major stream corridors in the valleys. The majority of remaining lands is managed by the U.S. Forest Service. Elevations range from 4280 m (14,265 feet) on Quandary Peak to 2274 m (7,580 feet) where the Blue River leaves Summit County. More than 85% of the county is above 9,000 feet (White Horse Assoc. 1996).

Summit County is located in the north central portion of Colorado and lies within the North-Central Highlands and Rocky Mountain section (Bailey et al. 1994). Summit County is bordered by the Gore Range on the northwest, the Williams Fork Mountains on the northeast, and the Tenmile on the west. Hoosier Pass and Loveland Pass lie on the continental divide which forms the county line to the south and east. The Blue River and its major tributaries (Swan River, Snake River, and Tenmile Creek) drain the majority of Summit County. Three major reservoirs (Blue Lakes, Dillon Lake, and Green Mountain) influence the Blue River and its associated wetlands.

The climate is generally characterized by long, cold, moist winters, and short, cool, dry summers. The Town of Dillon, where climate data are recorded, receives approximately 41.58 cm (16.37 in.) of precipitation each year. Average minimum and maximum temperatures are -7.9^0 C (17.7^0 F) and 11^0 C (51.8^0 F) respectively. The average total snow fall is 334.8 cm (131.8 in.) (Western Regional Climate Center 1997). The geology of Summit County is complex, as evidenced by the Geological Map of Colorado (Tweto 1979). The Williams Fork Mountains, Gore Range and the Tenmile Range consist of Precambrian granitic rock with several faults. (Tweto 1979). The lower Blue Valley at the base of the Williams Fork Mountains consists of Pierre Shale. There are outcrops of Dakota sandstone near the Dillon Dam. High elevation outcrops of Leadville limestone are found in the southern portion of the county. The Blue River Valley was glacially created as evidenced by the numerous boulder-strewn moraines (Chronic 1980).

Typical Southern Rocky Mountain flora is prevalent in Summit County. Elevations between approximately 2274 m (7,580 ft) to 2400 m (8,000 ft) are dominated by *Amelanchier alnifolia* (service berry), *Artemisia tridentata* ssp. *vaseyana* (mountain sagebrush) and *Symphoricarpos rotundifolius* (snowberry). At these elevations, wetlands occur in riparian areas on floodplains and in beaver ponds. These wetlands are dominated by *Salix* spp. (willows), *Populus angustifolia* (narrowleaf cottonwood), *Picea pungens* (Colorado blue spruce) and *Alnus incana* (thinleaf alder).

Above 2400 m (8,000 ft), *Populus tremuloides* (quaking aspen), *Pinus contorta* (lodgepole pine), *Pseudotsuga menziesii* (Douglas fir), and *Picea engelmannii* (Engelmann spruce) dominate. In the elevational zone between 3000 m to 4200 m (10,000 to 14,000 ft) *Picea engelmannii* (Engelmann spruce), *Abies lasiocarpa* (subalpine fir), *Salix brachycarpa* (short-fruit willow), and *Salix planifolia* (planeleaf willow) occur.

Historical mining and timbering operations have dramatically affected lands throughout the county. Currently, developments associated with the ski areas and other residential and commercial developments are widespread in the county. Additionally, gravel mining and agricultural activities are found in isolated pockets. Two large reservoirs, Dillon Reservoir and Green Mountain Reservoir, are also significant components of the human influences in the county. These various land uses introduce problems associated with habitat fragmentation, hydrological alterations, non-native species invasions, and alternation of natural fire regimes.

The Natural Heritage Network and Biodiversity

Colorado is well known for its rich diversity of geography, wildlife, plants, and plant communities. However, like many other states, it is experiencing a loss of much of its flora and fauna. This decline in biodiversity is a global trend resulting from human population growth, land development, and subsequent habitat loss. Globally, the loss in species diversity has become so rapid and severe that Wilson (1988) has compared the phenomenon to the great natural catastrophes at the end of the Paleozoic and Mesozoic eras.

The need to address this loss in biodiversity has been recognized for decades in the scientific community. However, many conservation efforts made in this country were not based upon preserving biodiversity; instead, they primarily focused on preserving game animals, striking scenery, and locally favorite open spaces. To address the absence of a methodical, scientifically-based approach to preserving biodiversity, Robert Jenkins, in association with The Nature Conservancy, developed the Natural Heritage Methodology in 1978.

Recognizing that rare and imperiled species are more likely to become extinct than common ones, the Natural Heritage Methodology ranks species according to their rarity or degree of imperilment. The ranking system is scientifically based upon the number of known locations of the species as well as its biology and known threats. By ranking the relative rareness or imperilment of a species, the quality of its populations, and the importance of associated conservation sites, the methodology can facilitate the prioritization of conservation efforts so the most rare and imperiled species may be preserved first. As the scientific community began to realize that plant communities are equally important as individual species, this methodology has also been applied to ranking and preserving rare plant communities as well as the best examples of common communities.

The Natural Heritage Methodology is used by Natural Heritage Programs throughout North, Central, and South America, forming an international database network. Natural Heritage Network data centers are located in each of the 50 U.S. states, five provinces of Canada, and 13 countries in South and Central America and the Caribbean. This network enables scientists to monitor the status of species from a state, national, and global perspective. It also enables conservationists and natural resource managers to make informed, objective decisions in prioritizing and focusing conservation efforts.

What is Biological Diversity?

Protecting biological diversity has become an important management issue for many natural resource professionals. Biological diversity at its most basic level includes the full range of species on Earth, from species such as bacteria, and protists, through multicellular kingdoms of plants, animals, and fungi. At finer levels of organization, biological diversity includes the genetic variation within species, both among geographically separated populations and among individuals within a single population. On a wider scale, diversity includes variations in the

biological communities in which species live, the ecosystems in which communities exist, and the interactions among these levels. All levels are necessary for the continued survival of species and plant communities, and all are important for the well-being of humans. It stands to reason that biological diversity should be of concern to all people.

The biological diversity of an area can be described at four levels:

1. **Genetic Diversity** -- the genetic variation within a population and among populations of a plant or animal species. The genetic makeup of a species is variable between populations within its geographic range. Loss of a population results in a loss of genetic diversity for that species and a reduction of total biological diversity for the region. This unique genetic information cannot be reclaimed.

2. **Species Diversity** -- the total number and abundance of plant and animal species and subspecies in an area.

3. **Community Diversity** -- the variety of plant communities within an area that represent the range of species relationships and inter-dependence. These communities may be diagnostic or even endemic to an area. It is within communities that all life dwells.

4. **Landscape Diversity** -- the type, condition, pattern, and connectedness of plant communities. A landscape consisting of a mosaic of plant communities may contain one multifaceted ecosystem, such as a wetland ecosystem. A landscape also may contain several distinct ecosystems, such as a riparian corridor meandering through shortgrass prairie. Fragmentation of landscapes, loss of connections and migratory corridors, and loss of natural communities all result in a loss of biological diversity for a region. Humans and the results of their activities are integral parts of most landscapes.

The conservation of biological diversity must include all levels of diversity: genetic, species, community, and landscape. Each level is dependent on the other levels and inextricably linked. In addition, and all too often omitted, humans are also linked to all levels of this hierarchy. We at the Colorado Natural Heritage Program believe that a healthy natural environment and human environment go hand in hand, and that recognition of the most imperiled elements is an important step in comprehensive conservation planning.

Colorado's Natural Heritage Program

To place this document in context, it is useful to understand the history and functions of the Colorado Natural Heritage Program (CNHP).

CNHP is the state's primary comprehensive biological diversity data center, gathering information and field observations to help develop state-wide conservation priorities. After operating in Colorado for 14 years, the Program was relocated from the State Division of Parks and Outdoor Recreation to the University of Colorado Museum in 1992, and more recently to the College of Natural Resources at Colorado State University.

The multi-disciplinary team of scientists and information managers gathers comprehensive information on rare, threatened, and endangered species and significant plant communities of Colorado. Life history, status, and locational data are incorporated into a continually updated data system. Sources include published and unpublished literature, museum and herbaria labels, and field surveys conducted by knowledgeable naturalists, experts, agency personnel, and our own staff of botanists, ecologists, and zoologists. Information management staff carefully plot the data on 1:24,000 scale U.S.G.S. maps and enter it into the Biological and Conservation Data System. The Element Occurrence database can be accessedfrom a variety of angles, including taxonomic group, global and state rarity rank, federal and state legal status, source, observation date, county, quadrangle map, watershed, management area, township, range, and section, precision, and conservation unit.

CNHP is part of an international network of conservation data centers that use the Biological and Conservation Data System (BCD) developed by The Nature Conservancy. CNHP has effective relationships with several state and federal agencies, including the Colorado Natural Areas Program, Colorado Department of Natural Resources and the Colorado Division of Wildlife, the U.S. Environmental Protection Agency, and the U.S. Forest Service. Numerous local governments and private entities also work closely with CNHP. Use of the data by many different individuals and organizations, including Great Outdoors Colorado, encourages a proactive approach to development and conservation thereby reducing the potential for conflict. Information collected by the Natural Heritage Programs around the globe provides a means to protect species before the need for legal endangerment status arises.

Concentrating on site-specific data for each element of natural diversity enables us to evaluate the significance of each location to the conservation of natural biological diversity in Colorado and in the nation. By using species imperilment ranks and quality ratings for each location, priorities can be established for the protection of the most sensitive or imperiled sites. A continually updated locational database and priority-setting system such as that maintained by CNHP provides an effective, proactive land-planning tool.

The Natural Heritage Ranking System

Information is gathered by CNHP on Colorado's plants, animals, and plant communities. Each of these species and plant communities is considered an **element of natural diversity**, or simply an **element**. Each element is assigned a rank that indicates its relative degree of imperilment on a five-point scale (e.g., 1 = extremely rare/imperiled, 5 = abundant/secure). The primary criterion for ranking elements is the number of occurrences, i.e., the number of known distinct localities or populations. This factor is weighted more heavily because an element found in one place is more imperiled than something found in twenty-one places. Also of importance are the size of the geographic range, the number of individuals, trends in both population and distribution, identifiable threats, and the number of already protected occurrences.

Element imperilment ranks are assigned both in terms of the element's degree of imperilment within Colorado (its State or S-rank) and the element's imperilment over its entire range (its Global or G-rank). Taken together, these two ranks give an instant picture of the degree of imperilment of an element. For example, the lynx, which is thought to be secure in northern North America but is known from less than 5 current locations in Colorado, is ranked G5S1. The Rocky Mountain Columbine which is known only from Colorado, from about 30 locations, is ranked a G3S3. Further, a tiger beetle that is only known from one location in the world at the Great Sand Dunes National Monument is ranked G1S1. CNHP actively collects, maps, and electronically processes specific occurrence information for elements considered extremely imperiled to vulnerable (S1 - S3). Those with a ranking of S3S4 are "watchlisted," meaning that specific occurrence data are collected and periodically analyzed to determine whether more active tracking is warranted. A complete description of each of the Natural Heritage ranks is provided in Table 1.

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

Table1. Definition of Colorado Natural Heritage Imperilment Ranks.

Global imperilment ranks are based on the range-wide status of a species. State imperilment ranks are based on the status of a species in an individual state. State and Global ranks are denoted, respectively, with an "S" or a "G"

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

Notes: Where two numbers appear in a state or global rank (e.g., S2S3), the actual rank of the element falls between the two numbers.

Legal Designations

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

Please note that the U.S. Fish and Wildlife Service has issued a Notice of Review in the February 28, 1996 Federal Register for plants and animal species that are "candidates" for listing as endangered or threatened under the Endangered Species Act. The revised candidate list replaces an old system that listed many more species under three categories: Category 1 (C1), Category 2 (C2), and Category 3 (including 3A, 3B, 3C). Beginning with the February 28, 1996 notice, the Service will recognize as candidates for listing most species that would have been included in the former Category 1. This includes those species for which the Service has sufficient information on their biological status and threats to propose them as endangered or threatened under the Endangered Species Act.

Candidate species listed in the February 28, 1996 Federal Register are indicated with a "C". While obsolete legal status codes (Category 2 and 3) are no longer used, CNHP will continue to maintain them in its Biological and Conservation Data system for reference.

Table 2. Federal and State Agency Special Designations.

Federal Status:

1. U.S. Fish and Wildlife Service (58 Federal Register 51147, 1993) and (61 Federal Register 7598, 1996)

LE Endangered; species or subspecies formally listed as endangered.

E(S/A) Endangered due to similarity of appearance with listed species.

LT Threatened; species or subspecies formally listed as threatened.

P Proposed Endangered or Threatened; species or suabspecies formally proposed for listing as endangered or threatened.

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

2. U.S. Forest Service (Forest Service Manual 2670.5) (noted by the Forest Service as "S")

FS Sensitive: those plant and animal species identified by the Regional Forester for which population viability is a concern as evidenced by:

a. Significant current or predicted downward trends in population numbers or density.

b. Significant current or predicted downward trends in habitat capability that would reduce a species' existing distribution.

3. Bureau of Land Management (BLM Manual 6840.06D) (noted by BLM as "S")

BLM Sensitive: those species found on public lands, designated by a State Director, that could easily become endangered or extinct in a state. The protection provided for sensitive species is the same as that provided for C (candidate) species.

State Status:

1. Colorado Division of Wildlife

E Endangered

T Threatened

SC Special Concern

Element Occurrence Ranking

Actual locations of elements, whether they be single organisms, populations, or plant communities, are referred to as element occurrences. The element occurrence is considered the most fundamental unit of conservation interest and is at the heart of the Natural Heritage Methodology. In order to prioritize element occurrences for a given species, an element occurrence rank (EO-Rank) is assigned according to their ecological quality whenever sufficient information is available. This ranking system is designed to indicate which occurrences are the healthiest and ecologically the most viable, thus focusing conservation efforts where they will be most successful. The EO-Rank is based on 4 factors:

> **Quality** -- the representativeness of the occurrence as compared to element occurrence (EO) specifications including maturity, size, and numbers. The element occurrence specifications are set by a consensus of experts regarding the element in question;
> **Condition** -- how much has the site and EO been damaged or altered from its optimal condition and character;
> **Viability --** the long-term prospects for continued existence of this occurrence;
> **Defensibility** -- the extent to which the occurrence can be protected from extrinsic human factors that might otherwise degrade or destroy it.

Each of these factors are rated on a scale of A through D, with A representing an excellent grade and D representing a poor grade. These grades are then averaged to determine an appropriate EO-Rank for the occurrence. If there is insufficient information available to rank an element occurrence, an EO-Rank is not assigned. Possible EO-Ranks and their appropriate definitions are as follows:

A	The occurrence is relatively large, pristine, defensible, and viable.
B	The occurrence is small but in good condition, or large but removed from its natural condition and/or not viable and defensible.
C	The occurrence is small, in poor condition, and possibly of questionable viability.
D	The occurrence does not merit conservation efforts because it is too degraded or not viable.
H	Historically known, but not verified for an extended period of time.

Proposed Conservation Sites

In order to successfully protect populations or occurrences, it is necessary to delineate conservation sites. These conservation sites focus on capturing the ecological processes that are necessary to support the continued existence of a particular element occurrence of natural heritage significance. Conservation sites may include a single occurrence of a rare element or a suite of rare element occurences or significant features.

The goal of the process is to identify a land area that can provide the habitat and ecological processes upon which a particular element occurrence or suite of element occurrences depends

for its continued existence. The best available knowledge of each species' life history is used in conjunction with information about topographic, geomorphic, and hydrologic features, vegetative cover, as well as current and potential land uses. **The proposed boundary does not automatically exclude all activity.** It is hypothesized that some activities will prove degrading to the element or the process on which they depend, while others will not. Consideration of specific activities or land use changes proposed within or adjacent to the preliminary conservation planning boundary should be carefully considered and evaluated for their consequences to the element on which the conservation unit is based.

Proposed Conservation Site Boundaries

Once the presence of rare or imperiled species or significant plant communities has been confirmed, the first step toward thier protection is the delineation of a **preliminary** conservation planning boundary. In general, the proposed conservation site boundary is our best estimate of the primary area supporting the long-term survival of targeted species and plant communities. In developing such boundaries, CNHP staff consider a number of factors that include, but are not limited to:

- the extent of current and potential habitat for the elements present, 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;
- land necessary for management or monitoring activities.

As the label "conservation planning" indicates, the boundaries presented here 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. Please note that these boundaries are based primarily on our understanding of the ecological systems. A thorough analysis of the human context and potential stresses was not conducted. 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.

Off-Site Considerations

Furthermore, it is often the case that all relevant ecological processes cannot be contained within a site of reasonable size. Taken to the extreme, the threat of ozone depletion could expand every site to include the whole globe. The boundaries illustrated in this report signify the immediate, and therefore most important, area in need of protection. Continued landscape level conservation efforts are needed. This will involve county-wide efforts as well as coordination and cooperation with private landowners, neighboring land planners, and state and federal agencies.

Ranking of Conservation Sites

One of the strongest ways that the CNHP uses element and element occurrence ranks is to assess the overall biodiversity significance of a site, which may include one or many element occurrences. If an element occurrence is unranked due to a lack of information the element occurrence rank is considered a C rank. Similarly, if an element is a GU or G? it is treated as a G4. Based on these ranks, each site is assigned a **biodiversity** (or B-) **rank**:

B1 Outstanding Significance: only site known for an element or an excellent occurrence of a G1 species.

B2 Very High Significance: one of the best examples of a community type, good occurrence of a G1 species, or excellent occurrence of a G2 or G3 species.

B3 High Significance: excellent example of any community type, good occurrence of a G3 species, or a large concentration of good occurrences of state rare species.

B4 Moderate or Regional Significance: good example of a community type, excellent or good occurrence of state-rare species.

B5 General or State-wide Biodiversity Significance: good or marginal occurrence of a community type, S1, or S2 species.

Protection Urgency Ranks

Protection urgency ranks (P-ranks) refer to the time frame in which conservation protection must occur. In most cases, this rank refers to the need for a major change of protective status (e.g., agency special area designations or ownership). The urgency for protection rating reflects the need to take legal, political, or other administrative measures to alleviate threats that are related to land ownership or designation. The following codes are used to indicate the rating which best describes the urgency to **protect** the area:

P1 Immediately threatened by severely destructive forces, within 1 year of rank date; protect now or never!
P2 Threat expected within 5 years.
P3 Definable threat but not in the next 5 years.
P4 No threat known for foreseeable future.
P5 Land protection complete or adequate reasons exists not to protect the site; do not act on this site.

A protection action involves increasing the current level of legal protection accorded one or more tracts of a potential conservation area. It may also include activities such as educational or public relations campaigns or collaborative planning efforts with public or private entities to minimize adverse impacts to element occurrences at a site. It does not include management actions, i.e., any action requiring stewardship intervention. Threats that may require a protection action are as follows:

1) Anthropogenic forces that threaten the existence of one or more element occurrences at a site; e.g., development that would destroy, degrade or seriously compromise the long-term viability of an element occurrence and timber, range, recreational, or hydrologic management that is incompatible with an element occurrence's existence;
2) The inability to undertake a management action in the absence of a protection action; e.g., obtaining a management agreement;
3) In extraordinary circumstances, a prospective change in ownership management that will make future protection actions more difficult.

Management Urgency Ranks

Management urgency ranks (M-ranks) indicate the time frame in which a change in management of the element or site must occur. Using best scientific estimates, this rank refers to the need for management in contrast to protection (e.g., increased fire frequency, decreased herbivory, weed control, etc.). The urgency for management rating focuses on land use management or land stewardship action required to maintain element occurrences at the potential conservation area.

A management action may include biological management (prescribed burning, removal of exotics, mowing, etc.) or people and site management (building barriers, rerouting trails, patrolling for collectors, hunters, or trespassers, etc.). Management action does not include legal,

political, or administrative measures taken to protect a potential conservation area. The following codes are used to indicate the action needed to be taken at the area:

M1 Management action required immediately or element occurrences could be lost or irretrievably degraded within one year.
M2 New management action will be needed within 5 years to prevent the loss of element occurrences.
M3 New management action will be needed within 5 years to maintain current quality of element occurrences.
M4 Although not currently threatened, management may be needed in the future to maintain the current quality of element occurrences.
M5 No serious management needs known or anticipated at the site.

Methods

The methods for assessing and prioritizing conservation needs over a large area are necessarily diverse. The Colorado Natural Heritage Program follows a general method which is continuously being developed specifically for this purpose. The Summit County Biological Inventory was conducted in several steps summarized below. Additionally, input from a local guidance committee of local public and private interests was sought at all stages.

Collect Available Information

CNHP databases were updated with information regarding the known locations of species and significant plant communities within Summit County. A variety of information sources were searched for this information. The Colorado State University museums and herbarium were searched, as were plant and animal collections at the University of Colorado, Western State, Rocky Mountain Herbarium, and local private collections. The Colorado Division of Wildlife provided extensive data on the fishes of Summit County as well as information regarding the status of the boreal toad. Both general and specific literature sources were incorporated into CNHP databases, in the form of either locational information or as biological data pertaining to a species in general. Such information covers basic species and community biology including range, habitat, phenology (reproductive timing), food sources, and substrates. This information was entered into CNHP databases.

Identify Rare Or Imperiled Species And Significant Plant Communities With Potential To Occur In Summit County

The information collected in the previous step was used to refine the potential element list and to refine our search areas. In general, species and plant communities that have been recorded from Summit County, or from adjacent counties, are included in this list. Species or plant communities which prefer habitats that are not included in this study area were removed from the list.

The following list of elements includes those elements currently monitored by CNHP that were thought to potentially to occur in Summit County, and were therefore targeted in CNHP field inventories. Over 225 rare species and significant plant communities were targeted in these surveys.

The amount of effort given to the inventory for each of these elements was prioritized according to the element's rank. Globally rare (G1 - G3) elements were given highest priority, state rare elements were secondary.

Table 3. Targeted Elements of Global or State-wide Concern

List of targeted elements, organized by taxonomic group, identified for the Summit County Conservation Inventory in 1997. The species in bold were documented in Summit County prior to the inventory.

Element Name	Element Common Name
AMPHIBIANS	
Bufo boreas boreas	**boreal toad**
Rana pipiens	leopard frog
BIRDS	
Botaurus lentiginosus	American bittern
Setophaga ruticilla	American redstart
Haliaeetus leucocephalus	bald eagle
Bucephala islandica	**Barrow's goldeneye**
Cypseloides niger	black swift
Aegolius funereus	**boreal owl**
Accipiter cooperii	Coopers hawk
Aquila chrysaetos	golden eagle
Cumetella carolinensis	gray catbird
Ardea herodias	great blue heron
Grus canadensis tabida	greater sandhill crane
Lanius ludovicianus	**loggerhead shrike**
Asio otus	long-eared owl
Accipiter gentilis	**northern goshawk**
Circus cyaneus	northern harrier
Conotopus borealis	olive-sided flycatcher
Pandion haliaetus	osprey
Falco mexicanus	prairie falcon
Vireo olivaceus	red-eyed vireo
Larus delawarensis	ring-billed gull
Accipiter striatus	sharp-shinned hawk
Porzana carolina	sora
Picoides tridactylus	three-toed woodpecker
Catharus fuscenscens	veery
Loxia leucoptera	white-winged crossbill
Grus americana	**whooping crane**
MAMMALS	
Canis lupus	gray wolf
Felis lynx canadensis	**lynx**
Gulo gulo	**wolverine**
Plecotus townsendi pallescens	pale lump-nosed bat
Sorex hoyi montanus	pygmy shrew subsp.
Sorex nanus	dwarf shrew
Ursus arctos	**grizzly bear**
FISH	

Catostomus platyrhynchus	mountain sucker
Onchorynchus clarki pleuriticus	**Colorado River cutthroat trout**
Prosopium williamsoni	mountain whitefish
REPTILES	
non suspected in Summit County	
INVERTEBRATES	
Acroloxus coloradensis	Rocky Mountain capshell
Aeshna eremita	lake darner
Boloria acrocnema	Uncompahgre fritillary
Callophrys afinis affinis	green-winged hairstreak
Erebia theano	theano alpine
Hyles gallii	galium spninx moth
Lycaena editha	Edith's copper
Oeneis alberta	Alberta arctic
Oeneis jutta	**arctic jutta**
Oeneis jutta reducta	Rocky Mountain arctic jutta
Oeneis plixenes	polixenes arctic
Oeneis taygeete	white-veined arctic
Phyciodes batesii	tammy crescent
Pyrgus ruralis	two-banded skipper
Satrium fuliginosum	sooty gossamer wing
Somatochlora hudsonica	hudsonian emerald
Somatochlora minor	oceliated emerald
PLANT COMMUNITIES	
Artemisia tridentata wyomingensis/Elymus lanceolatus	**western slope sagebrush shrublands**
Artemisia tridentata wyomingensis/Pseudoroegneria spicata	**xeric sagebrush shrublands**
Phippsia algida	**alpine wetlands**
Salix geyeriana-Salix monticola/Calamagrostis canadensis	**montane willow carrs**
PLANTS	
Aquilegia saximontana	**Rocky Mountain columbine**
Arabidopsis salsuginea	salt-lick mustard
Armeria maritima* ssp. *sibirica	**sea pink**
Asplenium trichomanes-ramosum	green spleenwort
Aster alpinus var. *vierhapperi*	alpine aster
Astragalus bodinii	Bodin milkvetch
Astragalus molybdenus	**Leadville milkvetch**
Botrychium campestre	prarie moonwort
Botrychium echo	reflected moonwort
Botrychium hersperium	western moonwort
Botrychium lanceolatum* var. *lanceolatum	**lance-leaved moonwort**
Botrychium lunaria	**moonwort**

Botrychium minganense	
Botrychium pallidum	pale moonwort
Botrychium simplex	least moonwort
Braya humilis	**alpine braya**
Carex capitata ssp. *arctogena*	round-headed sedge
Carex concinna	**low northern sedge**
Carex limosa	**mud sedge**
Chionophila jamesii	**Rocky Mountain snowlover**
Conimitella williamsii	**Williams Bishop's cap**
Crepis nana	**dwarf hawksbeard**
Cryptogramma stelleri	**slender rock-brake**
Cypripedium fasciculatum	**purple lady's-slipper**
Cypripedium pubescens	yellow lady's slipper
Cystopteris montana	**mountain bladder fern**
Draba borealis	**northern rockcress**
Draba crassa	**thick-leaf whitlow-grass**
Draba exunguiculata	**clawless draba**
Draba fladnizensis	**arctic draba**
Draba globosa	rockcress draba
Draba grayana	**Grays Peak whitlow-grass**
Draba incerta	Yellowstone whitlow-grass
Draba oligosperma	woods draba
Draba porsildii	**Porsild draba**
Draba rectifructa	**mountain whitlow-grass**
Draba streptobrachia	**Colorado Divide whitlow-grass**
Draba ventosa	tundra draba
Draba weberi	**Webers draba**
Dryopteris expansa	spreading wood fern
Erigeron humilis	low fleabane
Eriogonum coloradense	Colorado wild buckwheat
Eriophorum altaicum var. *neogaium*	altai cottongrass
Eriophorum gracile	slender cottongrass
Eutrema penlandii	**Penland alpine fen mustard**
Goodyera repens	**dwarf rattlesnake-plantain**
Ipomopsis globularis	**globe gilia**
Lewisia rediviva	bitteroot
Lilium philadelphicum	wood lily
Listera borealis	**northern twayblade**
Lomatium nuttallii	dog parsley
Lycopodium alpinum	
Lycopodium annotinum* var. *pungens	**stiff clubmoss**
Machaeranthera coloradoensis	Colorado tansy-aster
Mimulus gemmiparus	Weber monkey-flower
Oxytropis parryi	**Parry oxytrope**
Papaver lapponicum* ssp. *occidentale	**alpine poppy**
Parnassia kotzebuei	**Kotzebue grass-of-parnassus**
Penstemon cyathophorus	middle park penstemon
Penstemon harringtonii	**Harrington beardtongue**

Phippsia algida	**snow grass**
Platanthera sparsiflora var. *ensifolia*	canyon bog-orchid
Potentilla effusa var. *rupincola*	Rocky Mountain cinquefoil
Ptilagrostis mongholica* ssp. *porteri	**Porter feathergrass**
Ranunculus karelinii	**tundra buttercup**
Rubus arcticus ssp. *acaulis*	nagoon berry
Salix candida	hoary willow
Saussurea weberi	**Weber saussurea**
Saxifraga foliolosa	leafy saxifrage
Senecio pauciflorus	few-flowered ragwort
Solidago ptarmicoides	prairie goldenrod
Trillium ovatum	western wake-robin

Identify Targeted Inventory Areas

Survey sites were chosen based on their likelihood of harboring rare or imperiled species or significant plant communities. Known locations were targeted, and additional potential areas were chosen using available information sources, such as aerial photography. Precisely known element locations were always included so that they could be verified and updated. Many locations were not precisely known due to ambiguities in the original data, i.e., "headwaters of Cataract Creek." In such cases, survey sites for that element were chosen in likely areas in the general vicinity. Areas with potentially high natural values were chosen using aerial photographs, geology maps, vegetation surveys, personal recommendations from knowledgeable local residents, and numerous roadside surveys by our field scientists. Aerial photography is perhaps the most useful tool in this step of the process. High altitude infrared photographs at 1:40,000 scale (National Aerial Photography Program) were used for this project and are well suited for assessing vegetation types and, to some extent, natural conditions on the ground.

Using the biological information stored in the CNHP databases, these information sources were analyzed for sites having the highest potential for supporting specific elements. General habitat types can be discerned from aerial photographs. Those chosen for survey sites appeared to be in the most natural condition. In general, this means those sites that are the largest, least fragmented, and relatively free of visible disturbances such as roads, trails, fences, quarries, etc.

The above information was used to delineate over 50 survey areas that were believed to have relatively high probability of harboring natural heritage resources. These areas, illustrated on the map of Targeted Inventory Areas (Figure 2), vary in size from less than 10 to several thousand acres and include all major habitat types in the study area.

Roadside surveys were useful in further resolving the natural condition of these areas. The condition of grasslands is especially difficult to discern from aerial photographs, and a quick survey from the road can reveal such features as weed infestation or overgrazing. Similar information was attained by flying low over the study area in a small aircrafeet

Because of the overwhelming number of potential sites and limited resources, surveys for all elements were prioritized by the degree of imperilment. For example, all species with Natural Heritage ranks of G1-G3 were the primary target of our inventory efforts. Although species with lower Natural Heritage ranks were not the main focus of inventory efforts, many of these species occupy similar habitats as the targeted species, and were searched for and documented as they were encountered.

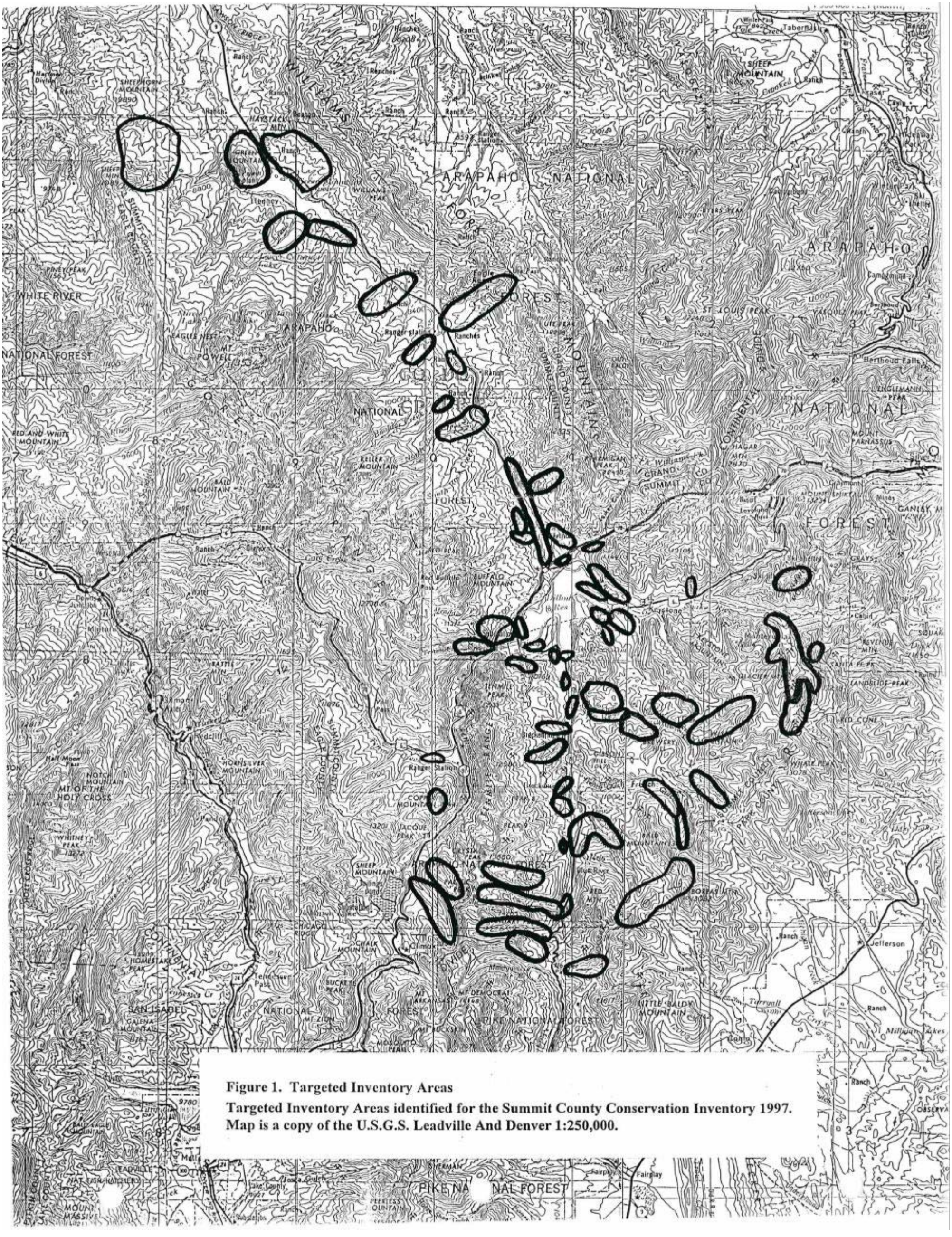


Figure 1. Targeted Inventory Areas

Targeted Inventory Areas identified for the Summit County Conservation Inventory 1997. Map is a copy of the U.S.G.S. Leadville And Denver 1:250,000.

Contact Landowners

Obtaining permission to conduct surveys on private property was essential to this project. Once survey sites were chosen, land ownership of these areas was determined using records at the Summit County assessor's office. Landowners were then either contacted by phone or mail or in person. If landowners could not be contacted, or if permission to access the property was denied, this was recorded and the site was not visited. **Under no circumstances were properties surveyed without landowner permission.**

Conduct Field Surveys

Survey sites where access could be obtained were visited at the appropriate time as dictated by the phenology of the individual elements. It is essential that surveys take place during a time when the targeted elements are detectable. For instance, breeding birds cannot be surveyed outside of the breeding season and plants are often not identifiable without flowers or fruit which are only present during certain times of the season.

The methods used in the surveys necessarily vary according to the elements that were being targeted. In most cases, the appropriate habitats were visually searched in a systematic fashion that would attempt to cover the area as thoroughly as possible in the given time. Some types of organisms require special technique in order to capture and document their presence. These are summarized below:

Amphibians: visual or with aquatic nets
Mammals: shrews only, pit fall traps
Birds: visual or by song/call, evidence of breeding sought
Insects: aerial net
Plant communities: visual, collect qualitative or quantitative composition data
Wetland plant communities: visual, collect qualitative or quantitative composition, soil, hydrological, function, and value data

When necessary and permitted, voucher specimens were collected and deposited in local university museums and herbaria.

When a rare species or significant plant community was discovered its precise location and known extent was recorded on 1:24,000 scale topographic maps. Other data recorded at each occurrence included numbers observed, breeding status, habitat description, disturbance features, observable threats, and potential protection and management needs. The overall significance of each occurrence, relative to others of the same element, was estimated by rating the quality (size, vigor, etc.) of the population or community, the condition or naturalness of the habitat, the long-term viability of the population or community, and the defensibility (ease or difficulty of protecting) of the occurrence. These factors are combined into an element occurrence rank,

useful in refining conservation priorities. See the section on Natural Heritage Methodology for more about element occurrence ranking.

Delineate Proposed Conservation Site Boundaries

Finally, since the objective for this inventory is to prioritize specific areas for conservation efforts, proposed conservation planning boundaries were delineated. Such a boundary is an estimation of the minimum area needed to assure persistence of the element. Primarily, in order to insure the preservation of an element, the ecological processes that support that occurrence must be preserved. The preliminary conservation planning boundary is meant to include features on the surrounding landscape that provide these functions. Data collected in the field are essential to delineating such a boundary, but other sources of information such as aerial photography are also used. These boundaries are considered preliminary and additional information about the site or the element may call for alterations to the boundaries.

Results

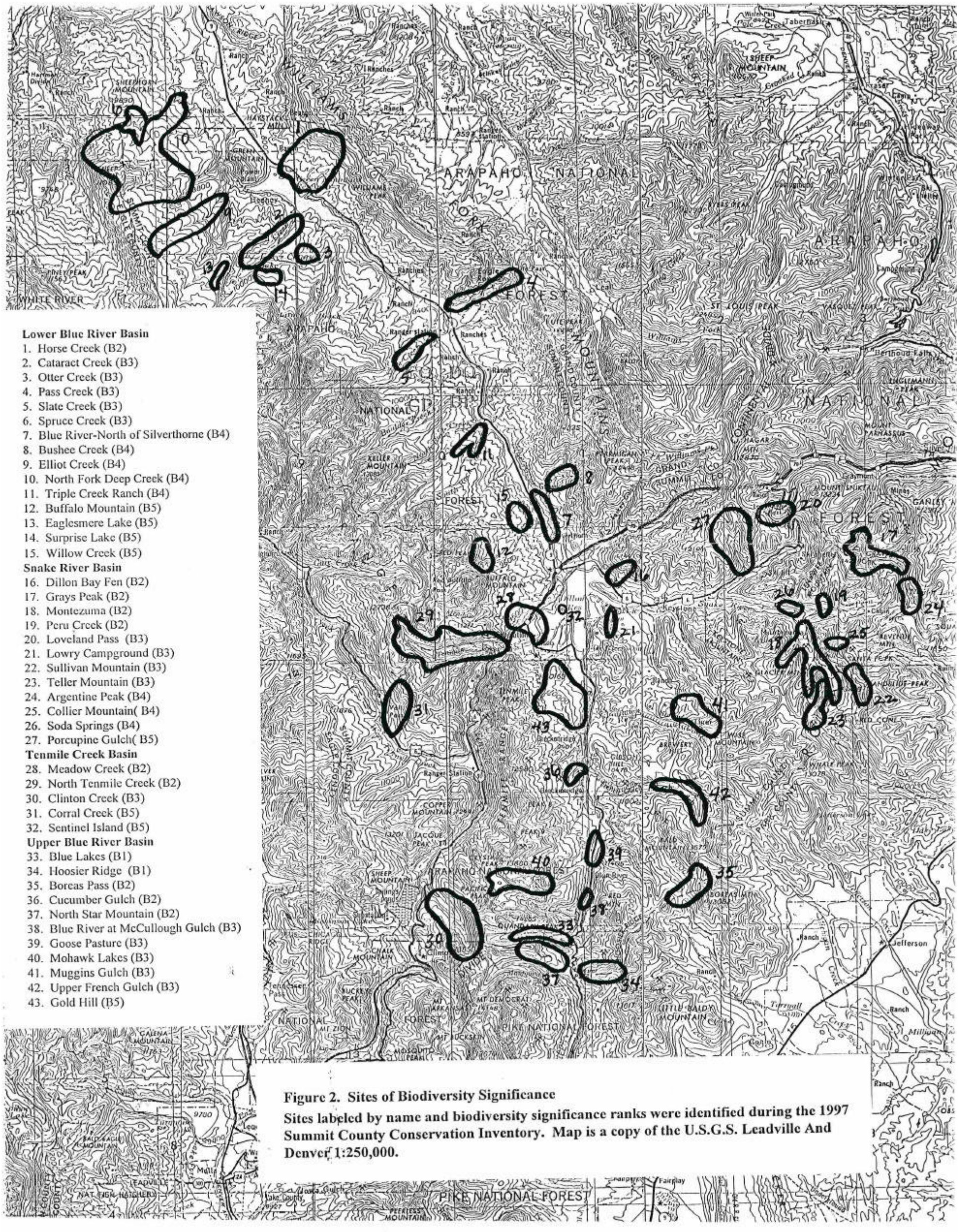
A total of 19 of the targeted plant species, 3 of the targeted animal species, and 30 significant plant communities were identified during the inventory. These occurrences as well as other specific information that was made available by the U.S. Forest Service and the Colorado Division of Wildlife provide the foundation for a total of 43 conservation sites that follow. All of the data collected are housed and maintained in the Biological and Conservation Data System (BCD). Moreover, a geographic information system (GIS) coverage has been created for the sites. This coverage has been provided to Summit County, and will be included in the System for Conservation Planning (SCoP) project.

Table 4. Sites Of Biodiversity Significance

The following sites, organized by river basin, were identified during the 1997 Summit County Conservation Inventory. The Biodiversity Significance, Protection Urgency, and Management Urgency Ranks (See pages 18-20 For Rank Definitions) are included.

Site Name	Biodiversity Rank	Protection Urgency Rank	Management Urgency Rank
Lower Blue River Basin			
Horse Creek	B2	P3	M2
Cataract Creek	B3	P3	M2
Otter Creek	B3	P4	M4
Pass Creek	B3	P2	M2
Slate Creek	B3	P4	M3
Spruce Creek	B3	P4	M4
Blue River-North of Silverthorne	B4	P1	M1
Bushee Creek	B4	P4	M4
Elliot Creek	B4	P4	M4
North Fork Deep Creek	B4	P4	M3
Triple Creek Ranch	B4	P4	M4
Buffalo Mountain	B5	P5	M1
Eaglesmere Lake	B5	P4	M4
Surprise Lake	B5	P4	M4
Willow Creek	B5	P1	M4
Snake River Basin			
Dillon Bay Fen	B2	P2	M2
Grays Peak	B2	P4	M1
Montezuma	B2	P2	M2
Peru Creek	B2	P2	M2
Loveland Pass	B3	P4	M4
Lowry Campground	B3	P2	M1
Sullivan Mountain	B3	P3	M4
Teller Mountain	B3	P3	M3
Argentine Peak	B4	P3	M3
Collier Mountain	B4	P3	M1
Soda Springs	B4	P3	M4
Porcupine Gulch	B5	P4	M4

Tenmile Creek Basin			
Meadow Creek	B2	P1	M1
North Tenmile Creek	B2	P3	M2
Clinton Creek	B3	P4	M2
Corral Creek	B5	P4	M4
Sentinel Island	B5	P4	M1
Upper Blue River Basin			
Blue Lakes	B1	P3	M3
Hoosier Ridge	B1	P4	M4
Boreas Pass	B2	P2	M3
Cucumber Gulch	B2	P1	M1
North Star Mountain	B2	P1	M1
Blue River at McCullough Gulch	B3	P3	M3
Goose Pasture	B3	P4	M3
Mohawk Lakes	B3	P3	M2
Muggins Gulch	B3	P1	M1
Upper French Gulch	B3	P3	M2
Gold Hill	B5	P1	M2



Lower Blue River Basin

1. Horse Creek (B2)
2. Cataract Creek (B3)
3. Otter Creek (B3)
4. Pass Creek (B3)
5. Slate Creek (B3)
6. Spruce Creek (B3)
7. Blue River-North of Silverthorne (B4)
8. Bushee Creek (B4)
9. Elliot Creek (B4)
10. North Fork Deep Creek (B4)
11. Triple Creek Ranch (B4)
12. Buffalo Mountain (B5)
13. Eaglesmere Lake (B5)
14. Surprise Lake (B5)
15. Willow Creek (B5)

Snake River Basin

16. Dillon Bay Fen (B2)
17. Grays Peak (B2)
18. Montezuma (B2)
19. Peru Creek (B2)
20. Loveland Pass (B3)
21. Lowry Campground (B3)
22. Sullivan Mountain (B3)
23. Teller Mountain (B3)
24. Argentine Peak (B4)
25. Collier Mountain(B4)
26. Soda Springs (B4)
27. Porcupine Gulch(B5)

Tenmile Creek Basin

28. Meadow Creek (B2)
29. North Tenmile Creek (B2)
30. Clinton Creek (B3)
31. Corral Creek (B5)
32. Sentinel Island (B5)

Upper Blue River Basin

33. Blue Lakes (B1)
34. Hoosier Ridge (B1)
35. Boreas Pass (B2)
36. Cucumber Gulch (B2)
37. North Star Mountain (B2)
38. Blue River at McCullough Gulch (B3)
39. Goose Pasture (B3)
40. Mohawk Lakes (B3)
41. Muggins Gulch (B3)
42. Upper French Gulch (B3)
43. Gold Hill (B5)

Figure 2. Sites of Biodiversity Significance

Sites labeled by name and biodiversity significance ranks were identified during the 1997 Summit County Conservation Inventory. Map is a copy of the U.S.G.S. Leadville And Denver 1:250,000.

Site Profile Explanation

Each preliminary site is described in a standard site report which reflects data fields in CNHP's Biological and Conservation Data System (BCD), used to track rare and imperiled elements. The sections of this report and the contents are outlined and explained below.

Biodiversity Rank (B-rank): The overall significance of the site in terms of rarity of the Natural Heritage resources and the quality (condition, abundance, etc.) of the occurrences. Please see page 18 for the definitions of the ranks.

Protection Urgency Rank (P-rank): An estimate of the time frame in which conservation protection must occur. This rank generally refers to the need for a major change of protective status (e.g., ownership or designation as a natural area). Please see page 19 for the definitions of the ranks.

Management Urgency Rank (M-rank): An estimate of the time frame in which conservation management must occur. Using best scientific estimates, this rank refers to the need for management in contrast to protection (legal, political, or administrative measures). See page 20 for the definitions of the ranks.

Location: General location and specific road/trail directions.
Legal Description: U.S.G.S. 7.5 minute Quadrangle name and Township Range Section(s).

General Description: A brief narrative picture of the topography, vegetation, and current use of the proposed conservation site. Common names are used along with the scientific names. The approximate hectares (acres) included within the proposed conservation site boundary for the site is reported.

Biodiversity Rank Justification: A synopsis of the rare species and significant plant communities that occur on the conservation site. A table within the site profile lists each element occurrence found in the site, global and state ranks of these elements, the occurrence ranks and federal and state agency special designations. The species or community that is the primary element of concern is bolded within the table. See Table 1 for explanations of ranks and Table 2 for legal designations.

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

Protection Rank Justification: A summary of major land ownership issues that may affect the site and the element(s) in the site.

Management Rank Justification: A summary of site management issues that may affect the long-term viability of the site.

LOWER BLUE RIVER DRAINAGE

Horse Creek

Biodiversity Rank: B2 (Very high significance)
The Horse Creek site supports good examples of the globally rare clustered sedge wetland and a state rare xeric sagebrush shrubland. The site also supports a fair example of a globally rare montane willow carr and a 1994 occurrence of the state rare boreal owl.

Protection Urgency Rank: P3
The majority of this site is privately owned. Threats to the site include increased fragmentation and altered hydrology due to agricultural activities. The potential of residential development is high due to the close proximity of Green Mountain Reservoir. This site would be an excellent candidate for a conservation easement.

Management Urgency Rank: M2
New management actions action will be needed within five years to prevent the loss of element occurrences. Actions could include fencing off the fen and riparian areas and grazing during late fall.

Location: 23 miles north of Silverthorne, next to Highway 9; one mile north of Cow Creek campground

U.S.G.S. 7.5 minute quadrangle: King Creek; Battle Mountain
Legal Description: T2S R79W Sections 7, 6, 8, 17, 18, 5
T2S R80W Sections 1, 12

General Description: The Horse Creek site is located at the base of the Williams Fork Mountains and on the northeastern side of Green Mountain Reservoir. Mumford Gulch, Horse Gulch, and Horse Creek flow through the site. The site supports a fen (peat-accumulating wetland that is supported by ground water discharge) dominated by clustered sedge (*Carex praegracilis),* beaked sedge (*Carex utriculata*), and water hemlock (*Cicuta douglasii*). The fen is located at the confluence of several springs that emerge from deposits of Pierre Shale. The montane willow carr (*Salix geyeriana-Salix monticola/Calamagrostis canadensis*) extends northwest up the intermittent streams. The uplands are dominated by xeric sagebrush shrublands (*Artemisia tridentata* ssp. *wyomingensis/ Pseudoroegneria spicata*). The site is approximately 3,000 acres ranging in elevation from 8,000 to 9,000 feet.

The entire site, except for the boggy areas, receives moderate to heavy grazing. A two-track road borders the site to the north. A hay meadow fragments the willow carr in the southern portion of the site.

Biodiversity Rank Justification: The Horse Creek site is unique in that it contains one of the few relatively intact fens observed on private lands in Summit County. The fen supports a good example of a globally rare clustered sedge (*Carex praegracilis*) wetland. There are only five occurrences of clustered sedge wetlands known in Colorado; three of these are located in Summit

County (CNHP 1997). There is a good example of a xeric sagebrush shrubland (*Artemisia tridentata* ssp. *wyomingensis/ Pseudoroegneria spicata*). There are 13 known Colorado occurrences of this community type and only two of these are found in Summit County. The site also supports a fair example of a globally rare montane riparian willow carr (*Salix geyeriana-Salix monticola/ Calamagrostis canadensis*). The boreal owl (*Aegolius funereus*), a U.S. Forest Service sensitive species, has been located within the Horse Creek site.

Natural Heritage element occurrences at the Horse Creek site.

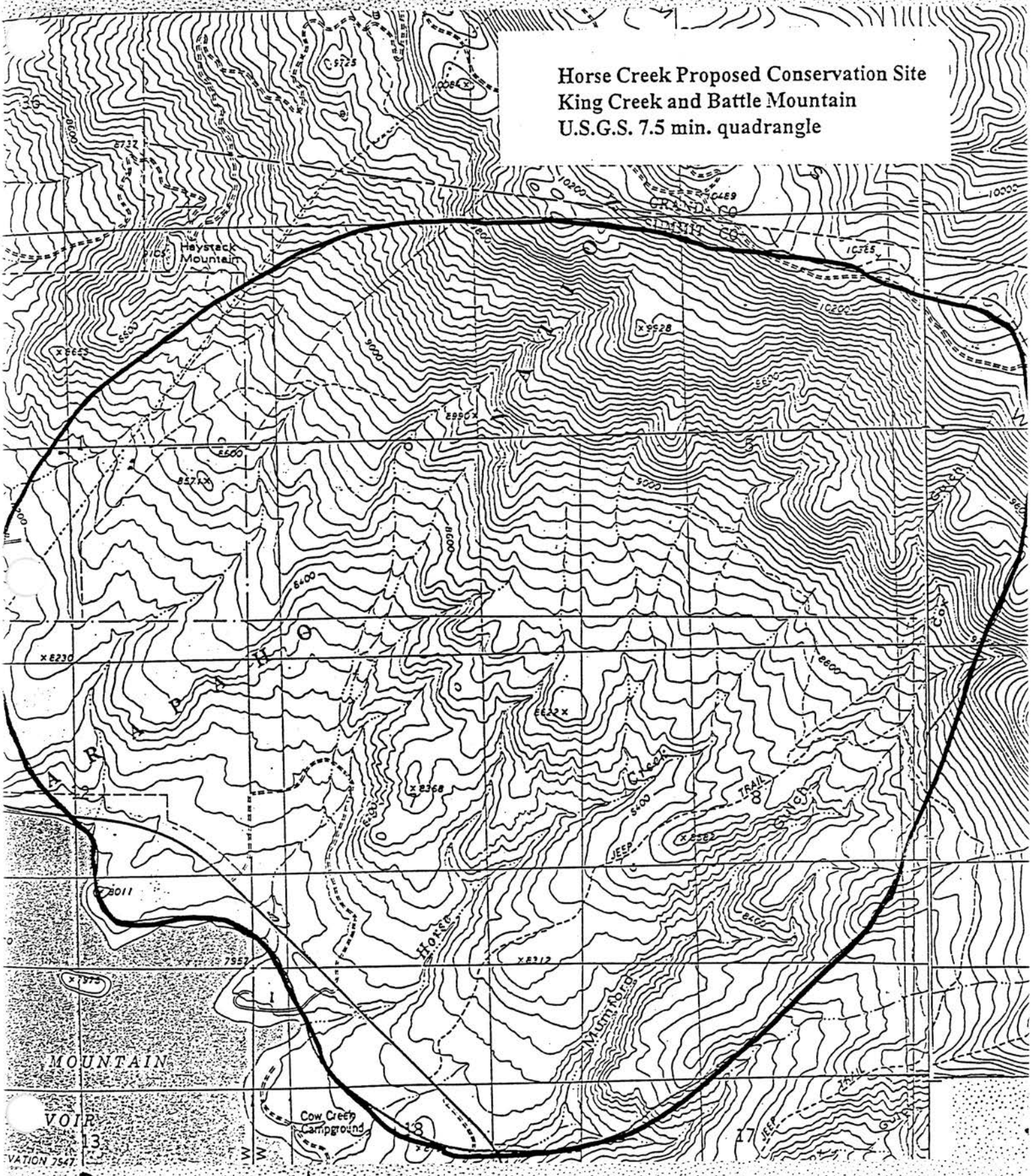
Element	Common Name	Global Rank	State Rank	Federal Status	State Status	Federal Sens.	EO* Rank
Aegolius funereus	boreal owl	G5	S2			FS	unranked
Artemisia tridentata ssp. *wyomingensis/ Pseudoroegneria spicata*	xeric sagebrush shrublands	G5	S3?				B
Carex praegracilis	**clustered sedge wetland**	**G2G3**	**S2**				**B**
Salix geyeriana-Salix monticola/ Calamagrostis canadensis	montane riparian willow carr	G3	S3				C

*EO=Element Occurrence

Boundary Justification: The boundaries drawn encompass the fen, the willow carr, and the intermittent streams to provide a buffer from direct impacts (e.g., water diversions, increased agriculture production) to the hydrology. The site boundaries extend west to the county line to include the sagebrush community and north to include spruce/fir habitat for the boreal owl. This site was drawn after a 1997 visit by a CNHP wetland ecologist. The boundary was further verified using a 1988 National Aerial Photography Program 1:40,000 infrared aerial photograph.

Protection Rank Justification: The majority of this site is entirely privately owned. There are several anthropogenic threats that include: fragmentation, altered hydrology, increased agricultural activities, and residential development. This site would be an excellent opportunity for a conservation easement.

Management Rank Justification: New management for the site must take place within 5 years or the element occurrences could be lost. Actions could include: fencing off the willow carr and fen and monitoring the water. The hydrology of this site is important to the ecological processes which support the riparian communities. The water quality, quantity, and timing should be maintained at current levels.



Horse Creek Proposed Conservation Site
King Creek and Battle Mountain
U.S.G.S. 7.5 min. quadrangle

Cataract Creek

Biodiversity Rank: B3 (High significance)
The Cataract Creek site supports a fair example of a globally rare clustered sedge wetland. Located on U.S. Forest Service lands within the site are occurrences of state rare low northern sedge, the Colorado River cutthroat trout, and a 1993 occurrence of the state endangered lynx.

Protection Urgency Rank: P3
The site is privately owned from Lower Cataract Lake downstream to Green Mountain Reservoir. Lower Cataract Lake is publicly owned. Threats to the site include: hydrological alterations, increased agricultural activities, or development.

Management Urgency Rank: M2
New management actions will be needed within five years to prevent the loss of element occurrences.

Location: 22 miles north of Silverthorne; southwest of Green Mountain Reservoir
U.S.G.S. 7.5 minute quadrangle: Mount Powell
Legal Description: T2S R79W Section 19;
T2S R80W Sections 25, 36, 35, 34, 36

General Description: The Cataract Creek site is located between the eastern side of the Gore Range and Green Mountain Reservoir. Cataract Creek is fed by several intermittent streams and numerous springs. The Cataract Creek site supports several riparian and wetland communities which include ponds with broad-leaf cattail marsh (*Typha latifolia*) and riparian areas that are dominated by thinleaf alder/Geyer willow (*Alnus incana/Salix geyeriana*). The site includes a U.S. Forest Service campground, hay fields, irrigation ditches, homes, and several access roads. The site is approximately 600 acres, ranging in elevation from 8,360 to 8,420 feet.

Biodiversity Rank Justification: The Cataract Creek site supports a fair example of the globally rare clustered sedge wetland (*Carex praegracilis*). There are only five occurrences of clustered sedge wetlands known in Colorado; three of these are located in Summit County (CNHP 1997). There are also occurrences of the state rare low northern sedge (*Carex concinna*) and the Colorado River cutthroat trout (*Oncorhynchus clarki pleuriticus*), a U.S. Forest Service sensitive and state special concern species. This occurrence was documented in 1992. It was observed that there was a mixed population of brook and native trout below a 75 feet waterfall, however, above the barrier there were only native trout. There is a 1993 occurrence of lynx (*Felis lynx canadensis*), a U.S. Forest Service sensitive and state endangered species, documented in the site.

Natural Heritage element occurrences at the Cataract Creek site.

Element	Common Name	Global Rank	State Rank	Federa Status	State Status	Federal Sens.	EO* Rank
Carex concinna	low northern sedge	G4G5	S1				unranked
Carex praegracilis	**clustered sedge wetland**	**G2G3**	**S2**				**C**
Felis lynx canadensis	lynx	G5	S1		E	FS	unranked
Oncorhynchus clarki pleuriticus	Colorado River cutthroat trout	G5T3	S3		SC	FS	unranked
Populus tremuloides/ Alnus incana	montane riparian forest	GU	S3				A

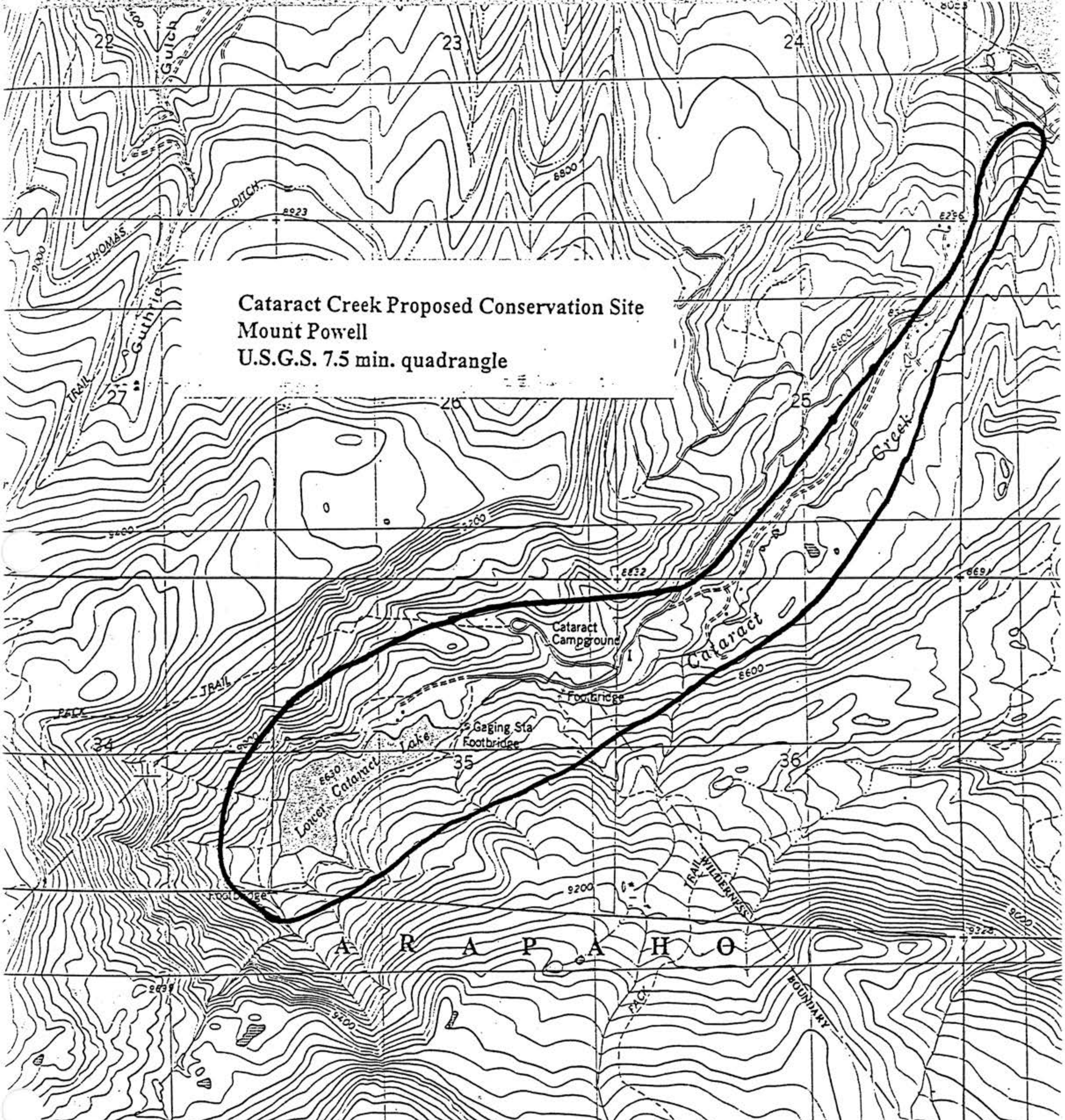
*EO=Element Occurrence

Boundary Justification: The boundary drawn encompass all the elements and provides a buffer of 1,000 feet to protect the hydrology and waterway from direct impacts such as, water diversion or development. This site was drawn after a 1997 visit by a CNHP wetland ecologist. The boundary was further verified using a 1988 National Aerial Photography Program 1:40,000 infrared aerial photograph.

Protection Rank Justification: The site is owned both privately and publicly. Currently, there are no definable threats within the next five years for this site. Potential threats include: increased agricultural activities, altered hydrology, or development. A conservation easement for the slope wetlands/clustered sedge meadow is recommended.

Management Rank Justification: New management actions will be needed within five years to prevent the loss of the element occurrences. These actions should include a plan to maintain or increase beaver activity below the waterfall. Overall, the hydrology of this site is important to the ecological processes which support the cutthroat and riparian communities. The water quality, quantity, and timing should be maintained at current levels.

Cataract Creek Proposed Conservation Site
Mount Powell
U.S.G.S. 7.5 min. quadrangle



Otter Creek

Biodiversity Rank: B3 (High significance)
The Otter Creek site supports an excellent example of a state rare montane riparian willow carr and a good example of a submerged palustrine wetland. This site is one of the best wetlands observed on private lands in the lower Blue River Basin.

Protection Urgency Rank: P4
The Otter Creek site is privately owned with adjacent U.S. Forest Service lands. There is a conservation easement already in place. Hydrological concerns need to be considered.

Management Urgency Rank: M4
The water rights for this site are owned by three parties. The hydrology of the site could ultimately be threatened. Adjacent hay fields present a management concern of exotic plant species and hydrological alterations.

Location: 21 miles north of Silverthorne; southwest Green Mountain Reservoir
U.S.G.S. 7.5 minute quadrangle: Mount Powell
Legal Description: T2S R79W Sections 29, 30, 31, 32

General Description: The Otter Creek site consists of a series of beaver ponds that are fed by Otter Creek and several intermittent streams. The ponds support beaver, muskrat, brook trout and aquatic vegetation e.g., water milfoil (*Myriophyllum sibiricum*) and bladderwort (*Utricularia macrorhiza*). The montane riparian willow carr (*Salix monticola-Salix geyeriana/* mesic forb) extends throughout the site. The site is approximately 500 acres and ranges in elevation from 8,300 to 8,400 feet.

There are two-track roads and hay fields adjacent to the site. The understory in the drier areas consist of hay grasses. Uplands support communities of quaking aspen-Engelmann spruce (*Populus tremuloides-Picea engelmannii*) to the south and sagebrush (*Artemisia tridentata vaseyana*) shrublands to the west.

Biodiversity Rank Justification: The Otter Creek site supports an excellent example of a montane riparian forest (*Salix monticola-Salix geyeriana/*mesic forb) and a good example of a submerged palustrine community (*Myriophyllum exalbescens*). This site is one of the best wetlands observed in the Lower Blue River Basin for private lands.

Natural Heritage element occurrences at the Otter Creek site.

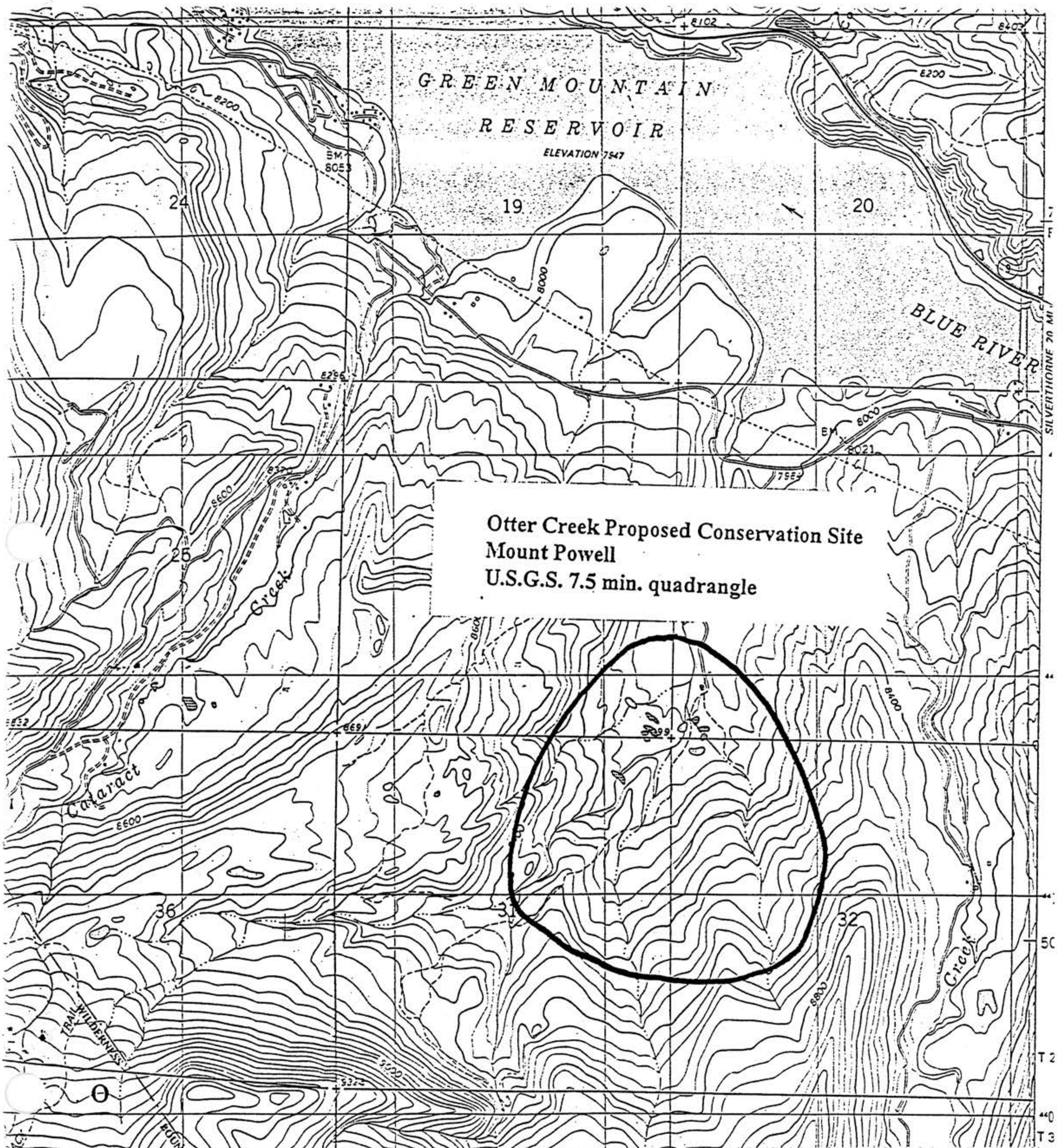
Element	Common Name	Global Rank	State Rank	Federal Status	State Status	Federal Sens.	EO* Rank
Myriophyllum sibiricum	submerged palustrine wetland	GU	SU				B
***Salix monticola-Salix geyeriana/* mesic forb**	**montane riparian forest**	**GU**	**S3**				**A**

*EO=Element Occurrence

Boundary Justification: The boundary drawn encompasses the riparian and wetland communities and the intermittent streams on U.S. Forest Service lands. A much larger area including the full watershed of Otter Creek needs to be considered when developing a plan for the long-term viability of this site. This site was drawn after a 1997 visit by a CNHP wetland ecologist. The boundary was further verified using a 1988 National Aerial Photography Program 1:40,000 infrared aerial photograph.

Protection Rank Justification: The water rights for this site are owned by three other parties. The only anticipated threat to the site would be hydrological alterations.

Management Rank Justification: Management actions could include monitoring of water quality and amount fluctuations due to agricultural practices. Control weeds and hay grasses needs to be addresses in a management plan.


Otter Creek Proposed Conservation Site
Mount Powell
U.S.G.S. 7.5 min. quadrangle
GREEN MOUNTAIN
RESERVOIR
ELEVATION 7947
BLUE RIVER
Creek
Cataract
Creek
24
19
20
25
36
31
32

Pass Creek

Biodiversity Rank: B3 (High significance)
The Pass Creek site supports a good example of globally rare montane riparian forest. Additionally, there is a good occurrence of the state rare lower montane forest. There is a historical record of the globally rare Williams bishop's cap located in the spruce-fir uplands.

Protection Urgency Rank: P2
The majority of the site is privately owned with adjacent public lands. Currently, the site is moderately to heavily grazed, especially in the adjacent uplands. The site contains weeds and hay grasses in the understory. There is also a human-made pond located within the site.

Management Urgency Rank: M2
Management actions need to be taken within five years to prevent the loss of the occurrences. Management actions could include: weed control, fencing of the riparian area, and a management plan to ensure beaver viability.

Location: 13 miles north of Silverthorne on Highway 9 to Pass Creek Ranch
U.S.G.S. 7.5 minute quadrangle: Squaw Creek, Ute Pass
Legal Description: T3S R78W Sections 3, 4, 8, 9

General Description: The Pass Creek site is located at the southern base of Flat Top and Eagle Roost mountains. Pasture Creek, Hole Creek, and Pass Creek drain the site. Ute Pass borders the site to the east and Highway 9 forms the west border. The site consists of visible outcrops of Pierre Shale, common within the Williams Fork Mountains. The headwaters of Pass Creek are contained within the site. Pass Creek flows through a riparian area that is moderately to heavily grazed. There are several intact and active beaver ponds within the willow carr (*Salix monticola-Salix geyeriana/*mesic forb). The site is approximately 1,300 acres and ranges in elevation from 8,146 to 9,568 feet.

There is a human-made pond located between a two-track road and Pass Creek. Ditches flow adjacent on both sides of Pass Creek. There is a pipeline and powerline that bisect the site.

Biodiversity Rank Justification: The Pass Creek site includes good examples of the globally rare riparian forest (*Populus angustifolia-Picea pungens/Alnus incana*) and the state rare lower montane forest (*Pseudotsuga menziesii/Acer glabrum*) communities. There is an imprecise location of the globally rare Williams bishop cap (*Conimitella williamsii*) that was not relocated during the 1997 survey. There are only two known occurrences in Colorado for the Williams bishop cap; both are from the Ute Pass area (CNHP 1997). Additionally, there is a historical record (1876) for wolverine (*Gulo gulo*) from the Ute Pass area. The site was searched for Southern Rocky Mountain boreal toad (*Bufo boreas boreas*) in 1997; but none were found.

Natural Heritage element occurrences at the Pass Creek site.

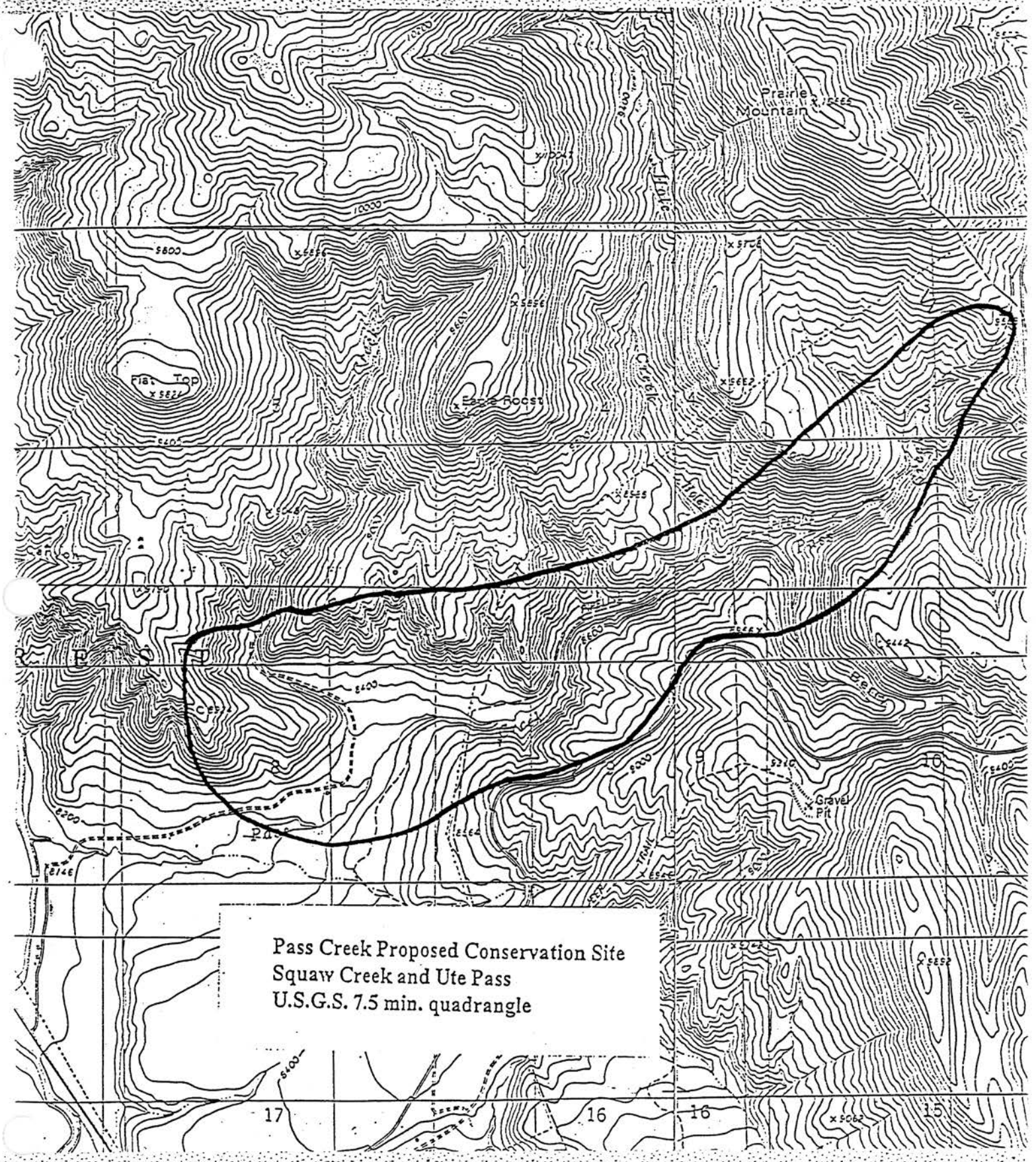
Element	Common Name	Global Rank	State Rank	Federal Status	State Status	Federal Sens.	EO* Rank
Conimitella williamsii	Williams bishop's cap	G3	SH				B-
Gulo gulo	wolverine	G4	S1		E	FS	Historical
Populus angustifolia-Picea pungens/ Alnus incana	**montane riparian forest**	**G3**	**S3**				**B**
Pseudotsuga menziesii/ Acer glabrum	lower montane forest	G4	S1				B

*EO=Element Occurrence

Boundary Justification: The boundary drawn encompasses the elements found within the site. The boundary includes the Pass Creek watershed west of Ute Pass and extends south to the Ute Pass Road and west to Highway 9. A much larger area should be considered in any long-term management plan to protect the hydrology. This site was drawn after a 1997 visit by a CNHP wetland ecologist. The boundary was further verified using a 1988 National Aerial Photography Program 1:40,000 infrared aerial photograph.

Protection Rank Justification: The majority of the site is privately owned. The northeastern portion is publicly owned. The site is currently in agricultural use and has sustained alterations which include weeds, hay grasses, and fragmentation of the willow carr.

Management Rank Justification: Management for the site needs to include limited grazing practices, especially within the riparian areas. Beaver are active along Pass Creek and need to be managed to ensure the longevity and viability of the willow carr. The hydrology needs to be closely monitored so not to adversely ly impact the riparian communities and the beaver population. The hydrology of this site is important to the ecological processes which support the riparian communities. The water quality, quantity, and timing should be maintained at current levels. Additional searches are required to relocate the Williams bishop's cap.



Pass Creek Proposed Conservation Site
Squaw Creek and Ute Pass
U.S.G.S. 7.5 min. quadrangle

Slate Creek

Biodiversity Rank: B3 (High significance)
The Slate Creek site supports an excellent example of a state rare montane floating/submerged wetland, a good example of a state rare montane riparian willow carr, and a fair example of a northern goshawk nesting occurrence, a state rare raptor.

Protection Urgency Rank: P4
The upper portion of this site has been purchased by the U.S. Forest Service and is now part of the Eagles Nest Wilderness. The lower portion is privately owned. A conservation easement would extend protection to compliment to the wilderness area.

Management Urgency Rank: M3
New management actions should be considered within five years to maintain current quality of the riparian and aquatic communities. These actions could include fencing off the riparian area and the kettle pond.

Location: 11 miles north of Silverthorne on Highway 9
U.S.G.S. 7.5 minute quadrangle: Squaw Creek
Legal Description: T3S R78W Sections 35, 26, 25, 24, 19

General Description: The Slate Creek site is located at the eastern base of the Gore Range. This site supports an extensive montane willow carr (*Salix monticola-Salix geyeriana/*mesic forb) with a series of beaver ponds. The sagebrush/grass uplands grade into aspen/lodgepole pine forests. There are two irrigation ditches that run adjacent to Slate Creek with several headgates located along the creek. The Gore Range trail bisects the site to the west and there is an access trail to the Gore Range trail beginning at the ranch house. There are no other roads or trails within the site. The site is approximately 1,700 acres and ranges in elevation from 8,800to9,300 feet.

A kettle pond is located above Slate Creek and supports a viable population of pond weed (*Potamogeton natans*) and beaked sedge (*Carex utriculata*). A Northern goshawk (*Accipter gentilis*) nest is located in the lodgepole pine forest north of Slate Creek.

Biodiversity Rank Justification: This site consists of an excellent example of a state rare montane floating/submerged wetland (*Potamogeton natans*) and a good example of a state rare montane riparian willow carr (*Salix monticola-Salix geyeriana/*mesic forb). There is a 1994 occurrence of the state rare Northern goshawk (*Accipiter gentilis*), a U.S. Forest Service sensitive species. The nest was not active in 1995. There were no observations of northern goshawk made during the 1997 field season. The willow carr and beaver ponds are good potential habitat for the Southern Rocky Mountain boreal toad (*Bufo boreas boreas*). The site was searched in 1997 for the boreal toad; but none were observed.

Natural Heritage element occurrences at the Slate Creek site.

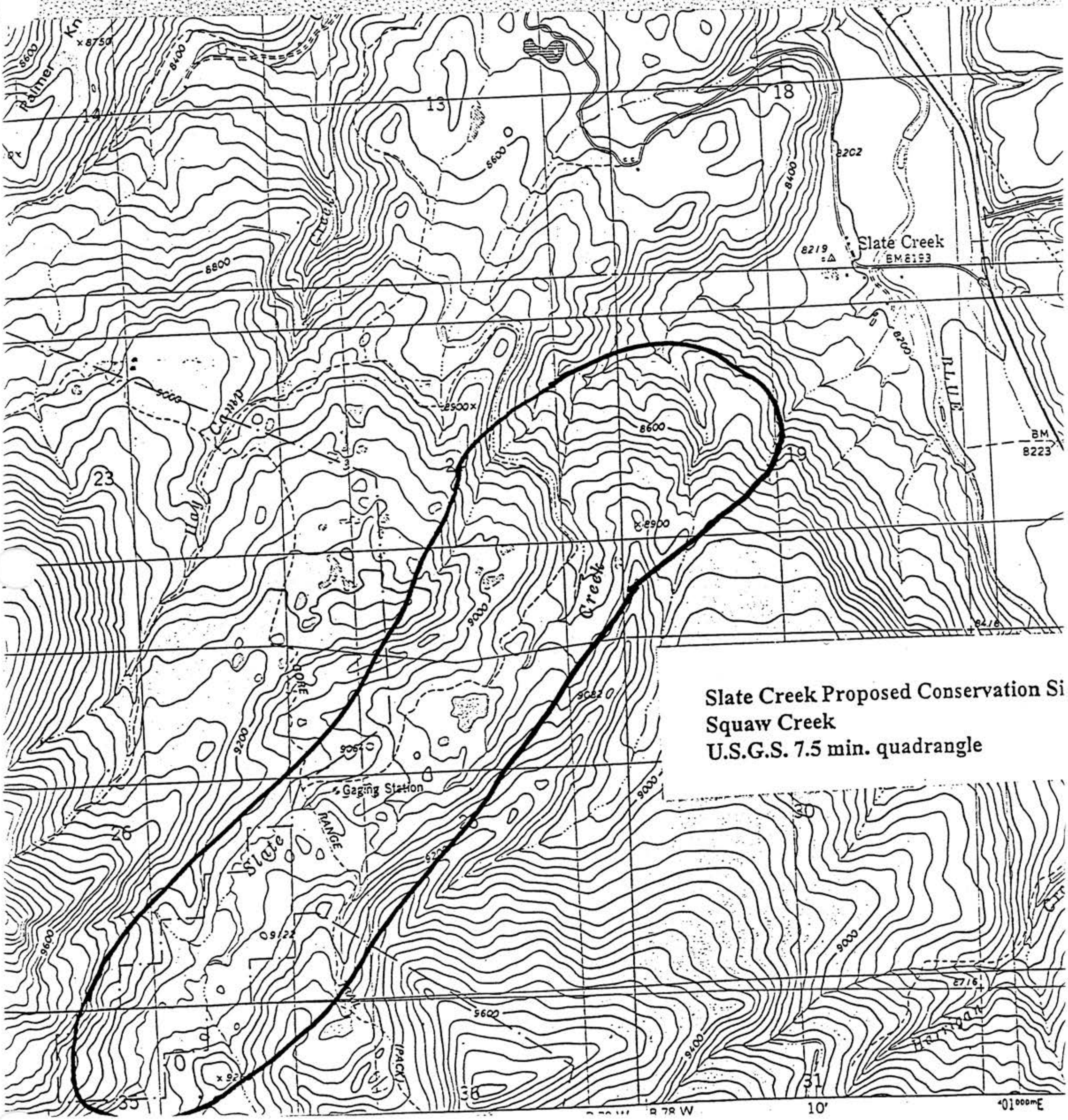
Element	Common Name	Global Rank	State Rank	Federal Status	State Status	Federal Sens.	EO* Rank
Accipter gentilis	Northern goshawk	G5	S3B, S4N			FS	unranked
Potamogeton natans	**montane floating/ submerged wetland**	**G5?**	**S1**				**A**
Salix monticola-Salix geyeriana /mesic forb	montane riparian willow carr	GU	S3				B

*EO=Element Occurrence

Boundary Justification: The boundary drawn includes the entire riparian area along Slate Creek where the creek enters the broad valley down to the ranch house. The boundary encompasses all the elements including the goshawk nest and the immediate view-shed up to 0.5 mile radius. A larger area may need to be considered to protect the hydrological setting required by the riparian communities. This site was drawn after a 1997 visit by a CNHP wetland ecologist. The boundary was further verified using a 1988 National Aerial Photography Program 1:40,000 infrared aerial photograph.

Protection Rank Justification: A portion of the site is within the Eagles Nest Wilderness. However the remaining portion remains threatened by incompatible grazing practices, residential development, and increased hydrological alterations from irrigation.

Management Rank Justification: Actions may need to be taken within the next five to protect the elements from the above mentioned threats. The hydrology of this site is important to the ecological processes which support the riparian communities. The water quality, quantity, and timing should be maintained at current levels.



Slate Creek Proposed Conservation Si
Squaw Creek
U.S.G.S. 7.5 min. quadrangle

Spruce Creek

Biodiversity Rank: B3 (High significance)
The Spruce Creek site contains an excellent example of a globally rare montane riparian willow community and a B+ strain of a Colorado River cutthroat trout. This site supports one of the best examples of a montane willow carr observed on private lands in this portion of the county.

Protection Urgency Rank: P4
The site is privately and publicly owned. Plans for private lands are unknown, however there were no observable threats. The site is located in a very scenic area of Summit County, therefore there is a threat of increased residential development that would lead to the alteration of hydrology.

Management Urgency Rank: M4
Management actions may need to be taken within the next five years to protect the riparian community from an increase in agricultural activities. Actions could include control of weeds and fencing off the riparian area.

Location: Two air miles northeast of Sheephorn Mountain in northwestern Summit County
U.S.G.S. 7.5 minute quadrangle: Sheephorn Mountain
Legal Description**:** T1S R81W Sections 1, 2, 11, 12

General Description: The Spruce Creek site is located in the northwestern portion of Summit County northeast of Sheephorn Mountain. Spruce Creek enters the willow carr from the south and meanders through the extensive willow carr (*Salix monticola-Calamagrostis canadensis*) and series of beaver ponds for approximately one mile where it enters a narrow canyon. The majority of the beaver ponds are located on private lands.

The private lands appear to be in very good condition with a viable willow population and little grazing, although there was no on site visit of the private lands. The area located on public land is not grazed heavily by domestic stock, but there is evidence of wildlife utilizing the willow carr e.g., beaver, moose, mule deer, and elk. There are irrigated hay meadows upslope of the riparian area, but they do not appear to be in production or heavily grazed. The uplands consist of Engelmann spruce-Douglas fir (*Picea engelmannii-Pseudotsuga menziesii*) montane forest with quaking aspen (*Populus tremuloides*). This site is approximately 800 acres and ranges in elevation from 8,720 to 8,920 feet.

Biodiversity Rank Justification: The Spruce Creek site supports an excellent occurrence of a globally rare montane willow carr (*Salix monticola-Calamagrostis canadensis*) community. There is a location of a B+ strain of the Colorado River cutthroat trout (*Oncorhynchus clarki pleuriticus*), a U.S. Forest Service sensitive and state special concern species. This site supports the best example of a montane willow carr observed on private lands in the northwestern portion of Summit County. The site was searched for Southern Rocky Mountain boreal toad (*Bufo boreas boreas*), but none were observed.

Natural Heritage element occurrences at the Spruce Creek site.

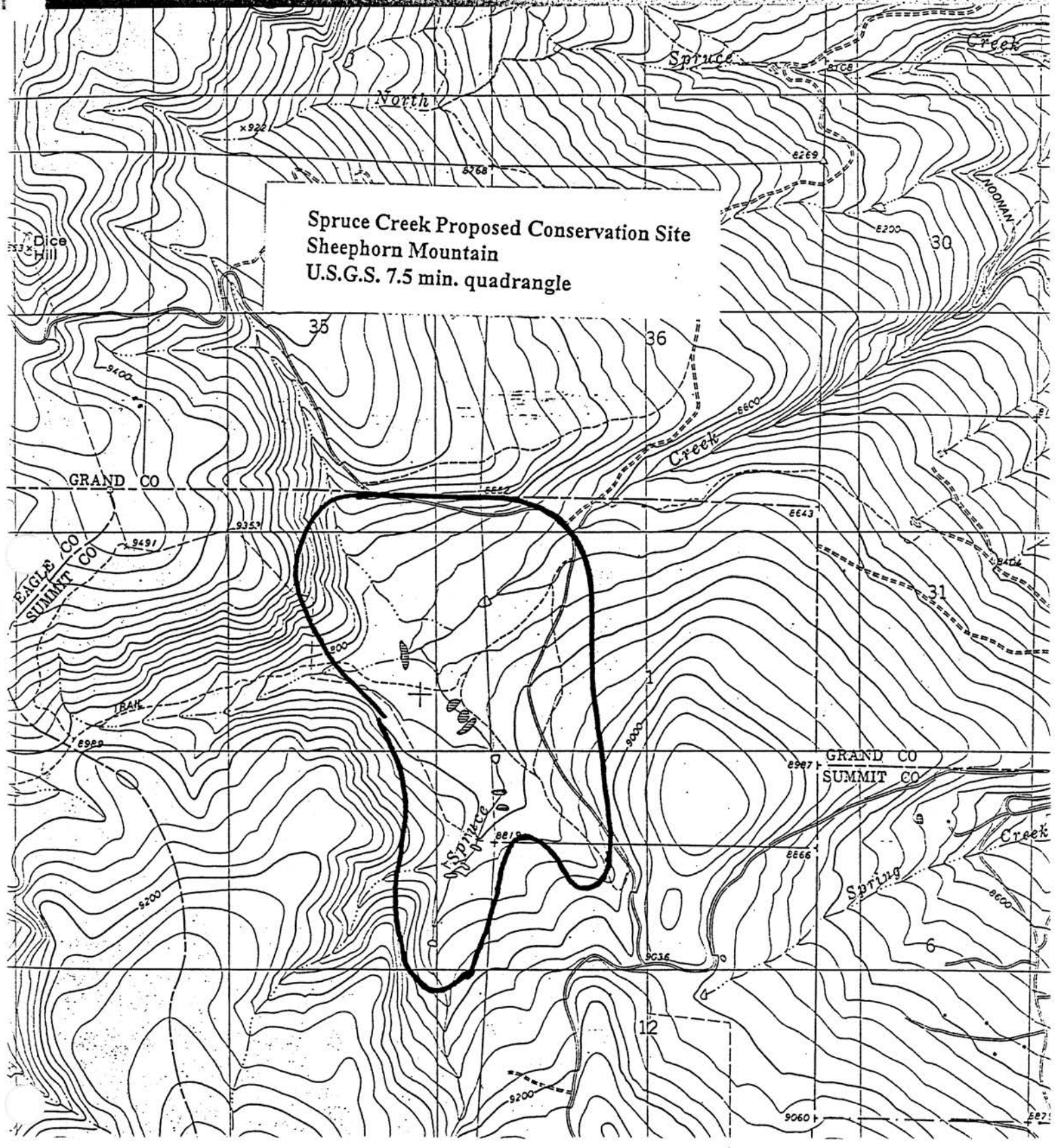
Element	Common Name	Global Rank	State Rank	Federal Status	State Status	Federal Sens.	EO* Rank
Oncorhynchus clarki pleuriticus	Colorado River cutthroat trout	G5T3	S3		SC	FS	unranked
Salix monticola-Calamagrostis canadensis	**montane willow carr**	**G3**	**S3**				**A**

*EO=Element Occurrence

Boundary Justifications: The boundary encompasses the low gradient wetlands that are adjacent to Spruce Creek and two intermittent streams to the north and west. A 1,000 ft buffer is drawn from each side of the river to protect from direct disturbances e.g., grazing. A much larger area, including the full watershed of Spruce Creek, needs to be considered when developing a long-term protection or management plan for the cutthroat trout and riparian community. This site was drawn after a 1997 visit by a CNHP wetland ecologist. The boundary was further verified using a 1988 National Aerial Photography Program 1:40,000 infrared aerial photograph.

Protection Rank Justification: The Spruce Creek site is both privately and publicly owned. Currently, there is a public access road to the south and one residence located within the site. There are hay fields adjacent to the riparian area. Future plans for use of the site are unknown. A private landowner did not allow access to a portion of the site. This portion of Summit County is very scenic and there is good likelihood that eventually this area will receive development pressure.

Management Rank Justification: Management actions will need to be undertaken within five years to prevent the degradation of the riparian area. Altered hydrology, increased grazing and agricultural practices would increase sedimentation within the wetland, thereby affecting the viability of the cutthroat trout, beaver and eventually the longevity of the willow carr.


Spruce Creek Proposed Conservation Site
Sheephorn Mountain
U.S.G.S. 7.5 min. quadrangle
North
Spruce
Creek
Dice Hill
NOONAN
GRAND CO
EAGLE CO
SUMMIT CO
IRAK
Spruce
GRAND CO
SUMMIT CO
Spring
Creek
35
36
30
31
6
12

Blue River-North of Silverthorne

Biodiversity Rank: B4 (Moderate significance)
The Blue River-North of Silverthorne site supports fair occurrences of globally rare montane riparian forests and a montane willow carr. The site also contains a series of ponds (human-made) that provide nesting habitat for the state rare osprey and several common waterfowl species.

Protection Urgency Rank: P1
This site is immediately threatened by development pressures from residential and commercial enterprises. The majority of the site is privately owned, but there are public fishing access points along the river. The hydrology, in particular, is most threatened by development, fragmentation, and sedimentation.

Management Urgency Rank: M1
New management of this site is required immediately or the riparian communities will be lost or irretrievably degraded.

Location: Approximately two miles north of Silverthorne exit off of I 70, east of Highway 9 along a 2 miles stretch of the Blue River

U.S.G.S. 7.5 minute quadrangle: Dillon
Legal Description: T4S R78W Sections 36, 26, 35
T5S R78W Section 1

General Description: The Blue River-North of Silverthorne site is located 1.5 miles north of the I-70/Silverthorne interchange. Several intermittent and perennial streams, including Hamilton and Bushee Creeks drain into the Blue River within the site. There are several intact, vigorous stands of two montane riparian communities (*Populus angustifolia/Picea pungens/ Alder incana* and *Picea pungens/Alder incana*). The Blue River Ranch Lakes are located adjacent to the Blue River at the north end of Silverthorne. The Blue River does receive some flooding, but the floodflow is controlled by Dillon Reservoir. The site is approximately 600 acres ranging in elevation from 8,534 to 8,700 feet.

The site consists of several ponds, created by a gravel mining operation. It supports a fair example of a montane riparian willow carr (*Salix geyeriana-Salix monticola/Calamagrostis canadensis*) and a fair example of a subalpine riparian shrubland (*Betula glandulosa*/mesic forb-mesic graminoid). There are nesting osprey (*Pandion haliaetus*) within the site. There is a housing subdivision to the east that utilizes the area for open space. The site contains several housing developments, a sewage treatment plant, gravel mines, and hay fields.

Biodiversity Rank Justification: The Blue River-North of Silverthorne site supports fair examples of two montane riparian communities (*Populus angustifolia-Picea pungens/Alder incana* and *Populus angustifolia/Alder incana*). The Blue River Ranch Lakes contain of fair

examples of a globally rare montane willow carr (*Salix geyeriana-Salix monticola/Calamagrostis canadensis*) and a state rare subalpine riparian shrubland (*Betula glandulosa*/mesic forb-mesic graminoid). The site also contains a series of ponds (human-made) that provide habitat for osprey (*Pandion haliaetus*), a U.S. Forest Service sensitive species, and several common waterfowl. Eight migrating white-faced ibises (*Plegadis chihi*) were observed on the lakes on the date of the survey (June 8, 1997).

Natural Heritage element occurrences at the Blue River-North of Silverthorne site.

Element	Common Name	Global Rank	State Rank	Federal Status	State Status	Federal Sens.	EO* Rank
Betula glandulosa/mesic forb-mesic graminoid	subalpine riparian shrubland	GU	S2S3				C
Pandion haliaetus	osprey	G5	S1B, SZN			FS	B
Populus angustifolia-Picea pungens/Alder incana	**montane riparian forest**	**G3**	**S3**				**C**
Populus angustifolia/ Alder incana	**montane riparian forest**	**G3**	**S3**				**C**
Salix geyeriana-Salix monticola/ Calamagrostis canadensis	**montane willow carr**	**G3**	**S3**				**C**

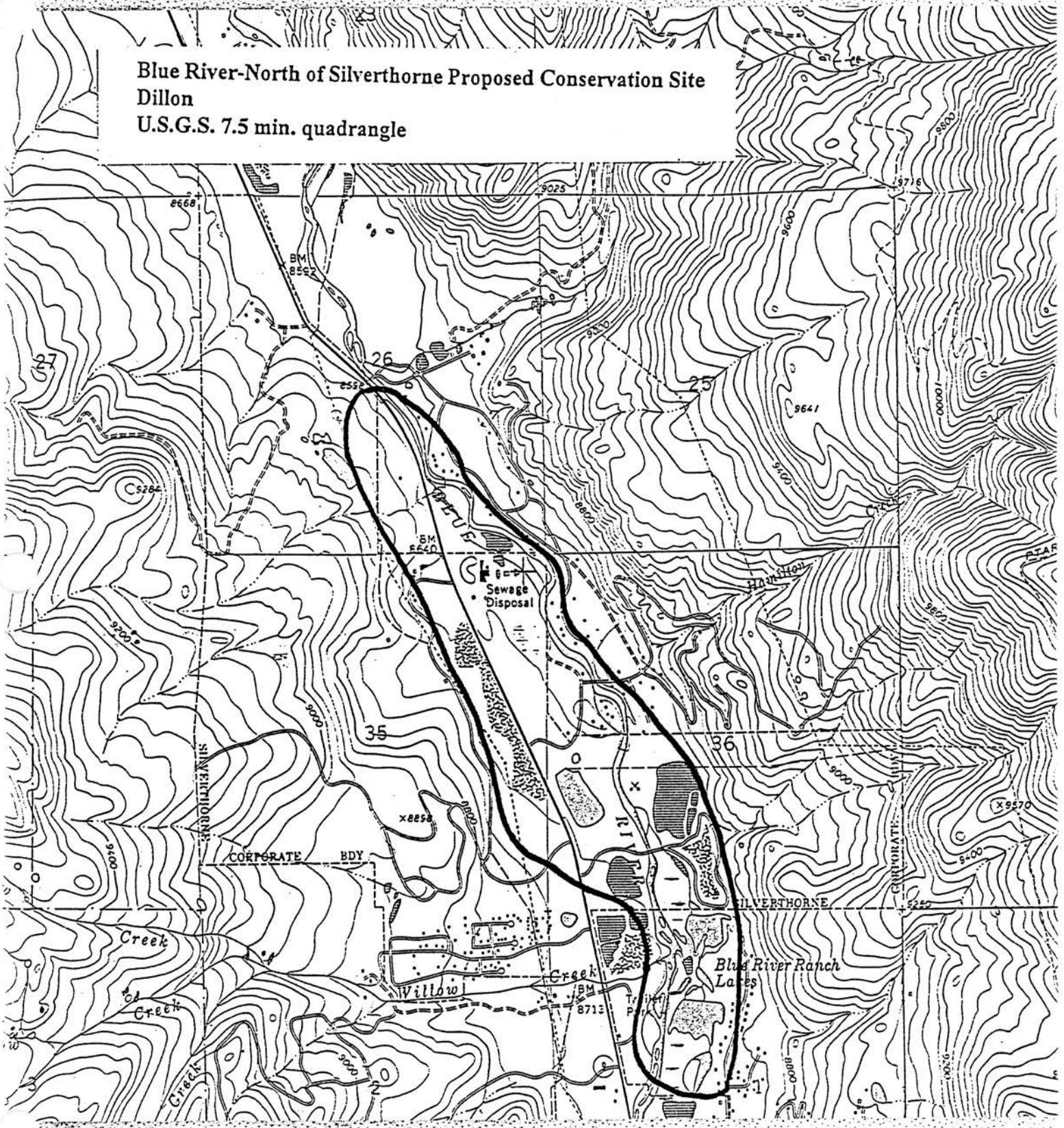
*EO=Element Occurrence

Boundary Justification: The boundary drawn encompasses the riparian communities which includes a portion within residential and commercial developments. Lower portions near the Town of Silverthorne are included within the site to provide a buffer. The boundary includes all four ponds, the area between the ponds and the Blue River, and a buffer of 1,000 feet to protect the site from direct impacts e.g., development, water diversions. This site was drawn after a 1997 visit by a CNHP wetland ecologist. The boundary was further verified using a 1988 National Aerial Photography Program 1:40,000 infrared aerial photograph.

Protection Rank Justification: The majority of this site is privately owned. There are several public fishing access points to the Blue River. The site is immediately threatened by development (e.g., golf courses, agricultural activities, subdivisions, and gravel mining).

Management Rank Justification: New management for this site is required immediately. Actions could include a plan that protects the riparian corridor from development or other types of exploitation. Control of exotic plants and hay grasses, as well as monitoring hydrologic fluctuations should be considered in a management plan.

Blue River-North of Silverthorne Proposed Conservation Site
Dillon
U.S.G.S. 7.5 min. quadrangle



Bushee Creek

Biodiversity Rank: B4 (Moderate significance)
The Bushee Creek site consists of good examples of state rare western slope sagebrush shrubland and montane riparian willow carr.

Protection Urgency Rank: P4
This site is privately owned and primarily used as a dude ranch. Currently the site is not being heavily impacted by agricultural practices or grazing, but historically the site was in agricultural production. There are no known threats for the foreseeable future.

Management Urgency Rank: M4
Presently the owners want to maintain the area in its current state. Management actions could include: control of noxious weeds and managment of wetland for beaver viability.

Location: 3 miles north of Silverthorne: 0.5 miles north of water treatment plant
U.S.G.S. 7.5 minute quadrangle: Dillon
Legal Description: T4S R78W Sections 23, 24, 25

General Description: The Bushee Creek site is located on the west side of the Williams Fork Mountains. Bushee Creek and two intermittent streams flow through the site. The site supports several slope wetlands with springs. The common montane wet meadow (*Carex aquatilis-Pedicularis groenlandica)* is prominent within the slope wetlands. The montane riparian forest (*Abies lasiocarpa-Picea engelmannii/ Mertensia ciliata*) is located at the mouth of the canyon where North Bushee Creek enters the valley. The uplands are dominated by a western slope sagebrush shrubland (*Artemisia tridentata vaseyana/Festuca thurberi*). The montane riparian willow carr (*Salix monticola/*mesic graminoid) dominates the riparian area in the lower portion of the site. There are a series of active beaver ponds along the two main streams. The site is approximately 640 acres ranging in elevation from8,640 to9,600 feet.

U.S. Forest Service lands surround the site on three sides. There are two 2-track roads that dissect the site. A cabin is located within the upper portion of the site. The open meadows consist of hay grasses, but no recent agricultural activities are evident.

Biodiversity Rank Justification: The Bushee Creek site consists of good examples of the state rare montane riparian willow carr (*Salix monticola/*mesic graminoid) and the state rare western slope sagebrush shrubland (*Artemisia tridentatata vaseyana/Festuca thurberi*). The site was searched in 1997 for the Southern Rocky Mountain boreal toad (*Bufo boreas boreas*) by a CDOW volunteer, but none were found.

Natural Heritage element occurrences at the Bushee Creek site.

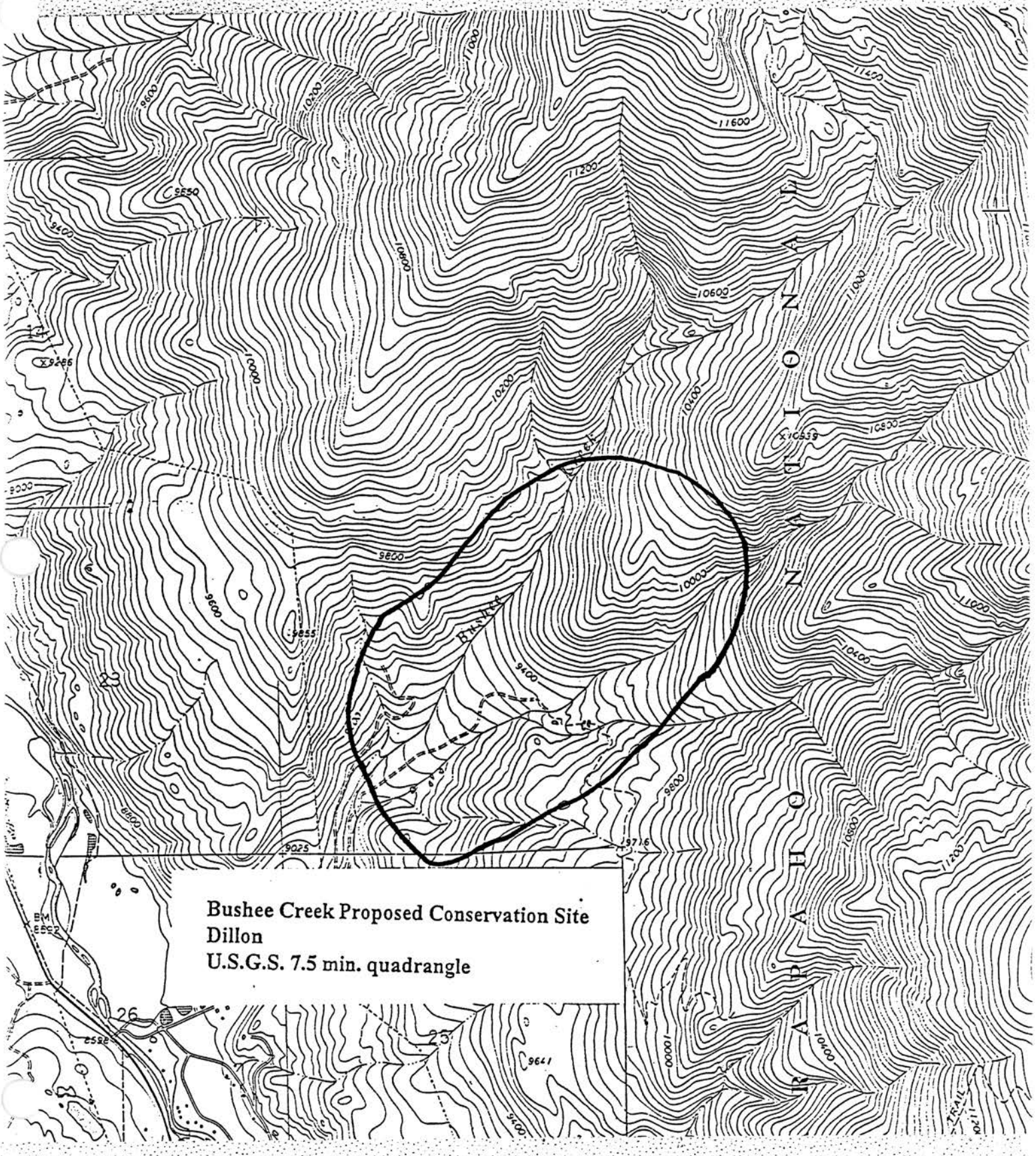
Element	Common Name	Global Rank	State Rank	Federal Status	State Status	Federal Sens.	EO* Rank
Artemisia tridentata vaseyana/Festuca thurberi	**western slope sagebrush shrublands**	**GU**	**S1S2**				**B**
*Salix geyeriana/Salix monticola/*mesic graminoid	montane riparian willow carr	GU	S3				B

*EO=Element Occurrence

Boundary Justification: The boundary includes the headwaters of Bushee Creek and the riparian areas adjacent to Bushee Creek and South Bushee Creek. The sagebrush uplands and lodgepole pine forests located above the creeks are included as a buffer to protect the riparian and wetlands from immediate impacts. This site was drawn after a 1997 visit by a CNHP wetland ecologist. The boundary was further verified using a 1988 National Aerial Photography Program 1:40,000 infrared aerial photograph.

Protection Rank Justification: The site is entirely privately owned and is surrounded by U.S. Forest Service lands. The area was historically used for domestic stock and haying operations. The specific plans for the property are not known, but there were no obvious threats observed.

Management Rank Justification: Currently, the riparian areas are in relatively pristine condition. There are active beaver within the willow carr. Although not currently threatened, management may be needed in the future to maintain the current quality of the occurrences, (e.g., maintaining the beaver population) if conditions change. Water diversions should be minimized. Control of hay grasses and weeds needs to be addressed.


Bushee Creek Proposed Conservation Site
Dillon
U.S.G.S. 7.5 min. quadrangle

Elliot Creek

Biodiversity Rank: B4 (Moderate significance)
This site contains an excellent occurrence of a state rare plant, *Carex limosa,* and a fair occurrence of a globally rare fish subspecies, the Colorado cutthroat trout.

Protection Urgency Rank: P4
This site is found mostly on National Forest land and there are no threats known for the foreseeable future.

Management Urgency Rank: M4
Although not currently threatened, management may be needed in the future to maintain current quality of the element occurrences.

Location: This site is situated west of Heeney and Green Mountain Reservoir, along the North Fork of Elliot Creek, above the confluence with Martin Creek. The site contains most of the mainstem of the North Fork of Elliot Creek, as well as the headwater area around Mahan Lake, on the eastern slope of Elliot Ridge.

U.S.G.S. 7.5 minute quadrangles: Mount Powell and Piney Peak
Legal Description: T2S R80W S 21, 22, 28, 32, 33
T3S R80W S 5, 6, 7, 8
T3S R81W S1, 12

General Description: The Elliot Creek site stretches from alpine tundra on Elliot Ridge in the Gore Range, through subalpine spruce-fir (*Picea engelmannii-Abies lasiocarpa*) forest, down into the upper montane (8500-11,600 feet). Three creeks-the North Fork, Elliot Creek, and an unnamed creek-flow eastward off of Elliot Ridge. These creeks converge into Elliot Creek. Hoagland Reservoir is located about midway along the mainstem of Elliot Creek.

The site lies in a mountain landscape that was highly modified by Pleistocene glacial activity, which ended ten to fifteen thousand years ago. The evidence of the glacial activity is apparent in both the alpine lakes and wetlands (formed by melting blocks of ice) and in the lower elevation ridges (formed when the glaciers deposited rock debris along their edges).

Spruce-fir forest dominates the subalpine portion of this site. Stands of lodgepole pine (*Pinus contorta*) occur commonly across this portion of the Gore Range. The upper subalpine and alpine areas support a particularly diverse mix of dry tundra plant communities and saturated wetlands and riparian areas. Elliot Creek originates in a wetland that supports a plant species that is rare in Colorado and at the very southern edge of its global distribution. This wetland consists of extensive sedge dominated peatlands and low willow carrs. Snowbanks that persist throughout most summers keep these wetlands saturated all year long. Where there are not persistent snowbanks above the wetlands, dry rocky ridges support alpine tundra. This site is about 3,200 acres in size.

Biodiversity Rank Justification: This site contains an excellent occurrence of a state rare mud sedge (*Carex limosa*). The site also contains a fair occurrence of a globally rare subspecies, the Colorado River cutthroat trout (*Oncorhynchus clarki pleuriticus*). The Colorado River cutthrout trout is a U.S. Forest Service Sensitive and a State Special Concern species. The introduction of non-native trout species, dating back to 1872 in Colorado, is considered a primary cause for the decline in numbers and genetic purity of Colorado River cutthroat trout. The populations of Colorado River cutthroat that are still genetically intact are now the priority for conservation. Elliot Creek contains brook trout, but the purity of the Colorado River cutthroat trout is still intact, which makes this site important for this globally rare subspecies.

Natural Heritage element occurrences at the Elliot Creek site.

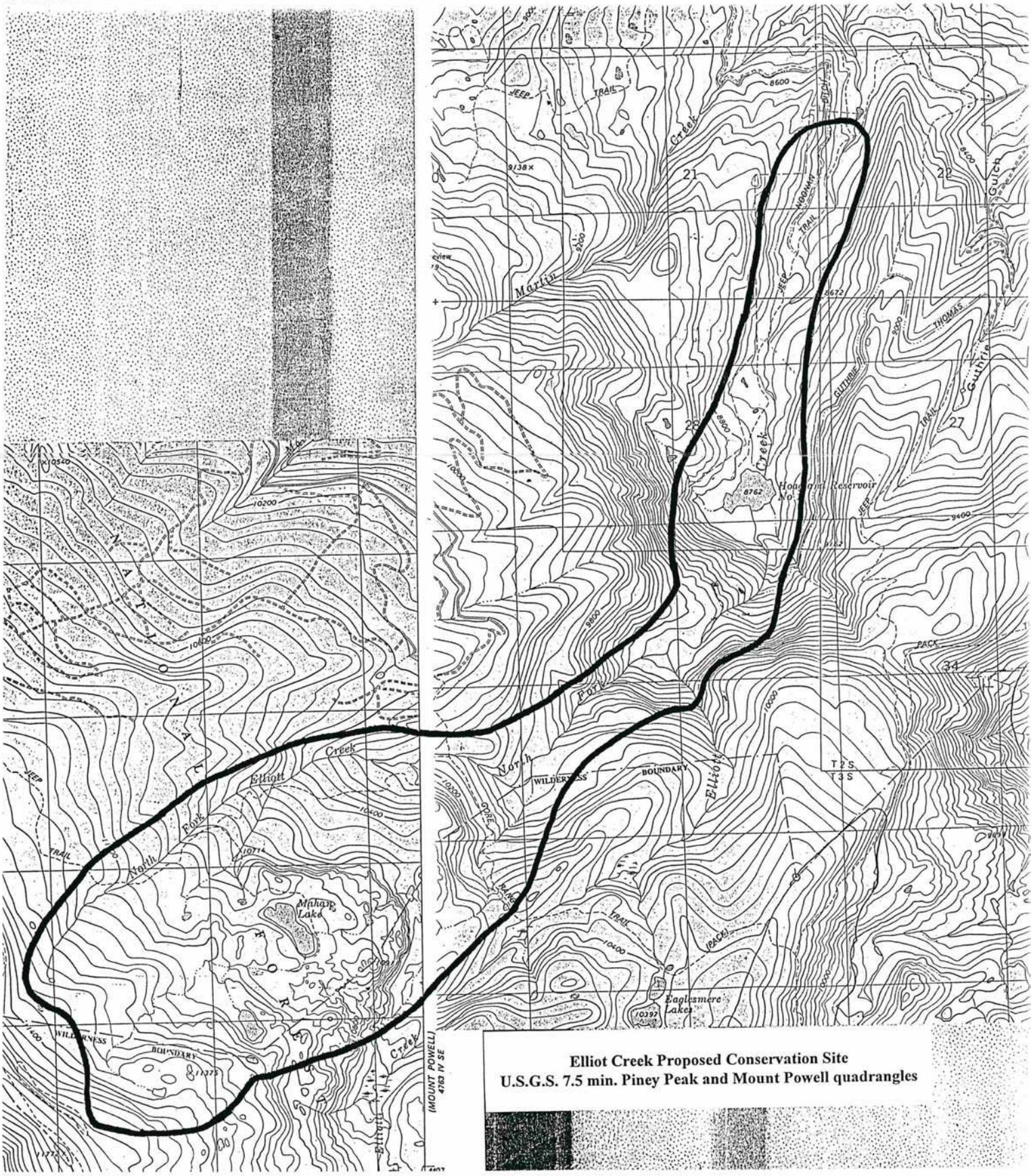
Element	Common Name	Global Rank	State Rank	Federal Status	State Status	Federal Sens.	EO* Rank
Oncorhynchus clarki pleuriticus	**Colorado River Cutthroat**	**G4T3**	**S3**		**SC**	**FS**	**C**
Carex limosa	Mud sedge	G5	S2				A

*EO=Element Occurrence

Boundary Justification: The proposed conservation site boundary includes the headwaters of the North Fork of Elliot Creek, the mainstem of this creek, and a 1000 feet buffer along the lower portion of the creek. This boundary should be sufficient to limit direct physical disturbance and hydrologic alteration of the headwater wetlands and the creek channel. The suggested boundary will also minimize indirect disturbances due to sedimentation from roads, grazing, logging, etc. Although the trout has been documented above and below Hoagland Reservoir, the most significant area for the trout is above 10,250 feet (above the reservoir). This site was drawn after a 1996 visit by a CNHP wetland ecologist.

Protection Rank Justification: This site contains private land and public land managed by the White River National Forest. The upper portion of the site is located in the Eagles Nest Wilderness Area, and therefore already has a high level of protection.

Management Rank Justification: Past timber sales (as recent as 1996) have occurred around Mahan Lake vicinity. However, there are no current plans for timber activity. Grazing on the public lands in this area is maintained at a low level. Brook trout in Elliot Creek pose a threat to the native trout, but there are natural barriers, especially at higher elevations, that minimize competition between the native trout and the Brook trout. This site appears to have good potential for conversion to a pure cutthroat stream. There were no exotic plant species noted in this area. The rare plant species should be monitored to detect changes in overall quality or condition of this occurrence. The U.S. Forest Service plans to close some roads in this area and to convert others to trails. This will reduce threats to the cutthroat from sedimentation and excessive solar radiation. Water quality, quantity, and timing must not be significantly altered in order to maintain both the headwater wetlands and the fish population. Hydrologic considerations must extend beyond the site boundaries, especially in the Elliot Creek watershed wherever the watershed is not contained in the proposed site. Increased grazing and/or increased recreational use of the headwaters could adversely impact both the rare sedge and the trout.



Elliot Creek Proposed Conservation Site
U.S.G.S. 7.5 min. Piney Peak and Mount Powell quadrangles

North Fork Deep Creek

Biodiversity Rank: B4 (Moderate significance)
This site includes the best known occurrence of a state rare orchid species.

Protection Urgency Rank: P4
This site is contained mostly on National Forest land and there are no threats known for the foreseeable future.

Management Urgency Rank: M3
Management of exotic plant species is needed within five years to maintain the quality of the site.

Location: This site is situated west of Green Mountain Reservoir and reaches up to the northern portion of Elliot Ridge in the Gore Range, in Summit and Eagle counties. Drive north on Highway 9 from Silverthorne into Grand County. 1.1 miles from the County Line turn left on Spring Creek Road. Drive 7.1 miles (crossing back into Summit County) to a junction of roads. This junction is in the northcentral part of the site.

U.S.G.S. 7.5 minute quadrangles: Sheephorn Mountain and Piney Peak
Legal Description: T2S R81W S 1, 2, 3, 10, 11, 12, 13, 14, 15, 23, 24, 25, 26
T2S R80W S 6, 7, 8, 17, 18, 19, 30
T1S R80W S 31
T1S R81W S 36

General Description: The North Fork of Deep Creek flows east off of the northern portion of Elliot Ridge in the Gore Range. Sheep Mountain (11,089 feet) is a prominent peak along Elliot Ridge, and this peak marks the approximate center of the western border of the site. Lodgepole pine *(Pinus contorta*), quaking aspen (*Populus tremuloides*), and Engelmann spruce-subalpine fir (*Picea engelmannii-Abies lasiocarpa*) communities are scattered across the slopes of Sheep Mountain and the Deep Creek drainage. There are U.S. Forest Service and other roads throughout the site, but many have been closed to motor vehicles. This site includes about 2000 acres, and ranges in elevation from about 8200 feet to the summit of Sheep Mountain at 11,089 feet.

Biodiversity Rank Justification: The Purple lady's-slipper (*Cypripedium fasciculatum*) is a state rare orchid species. This site includes the largest known occurrence of this orchid. There are over 5000 individuals estimated, scattered over 1000 or more acres of excellent condition lodgepole pine (*Pinus contorta*) and spruce-fir (*Picea engelmannii-Abies lasiocarpa*) forests. Also located in this habitat is the dwarf rattlesnake-plantain (*Goodyera repens*) which is also a state rare orchid. In contrast to the occurrence of the purple lady's-slipper, the dwarf rattlesnake-plantain population is very small and is located adjacent to a clear cut.

Natural Heritage element occurrences at the North Fork Deep Creek site.

Element	Common Name	Global	State	Federal	State	Federal	EO*

		Rank	Rank	Status	Status	Sens.	Rank
Cypripedium fasciculatum	**purple lady's-slipper**	**G4**	**S3**			**FS**	**A**
Goodyera repens	dwarf rattlesnake-plantain	G5	S2				D

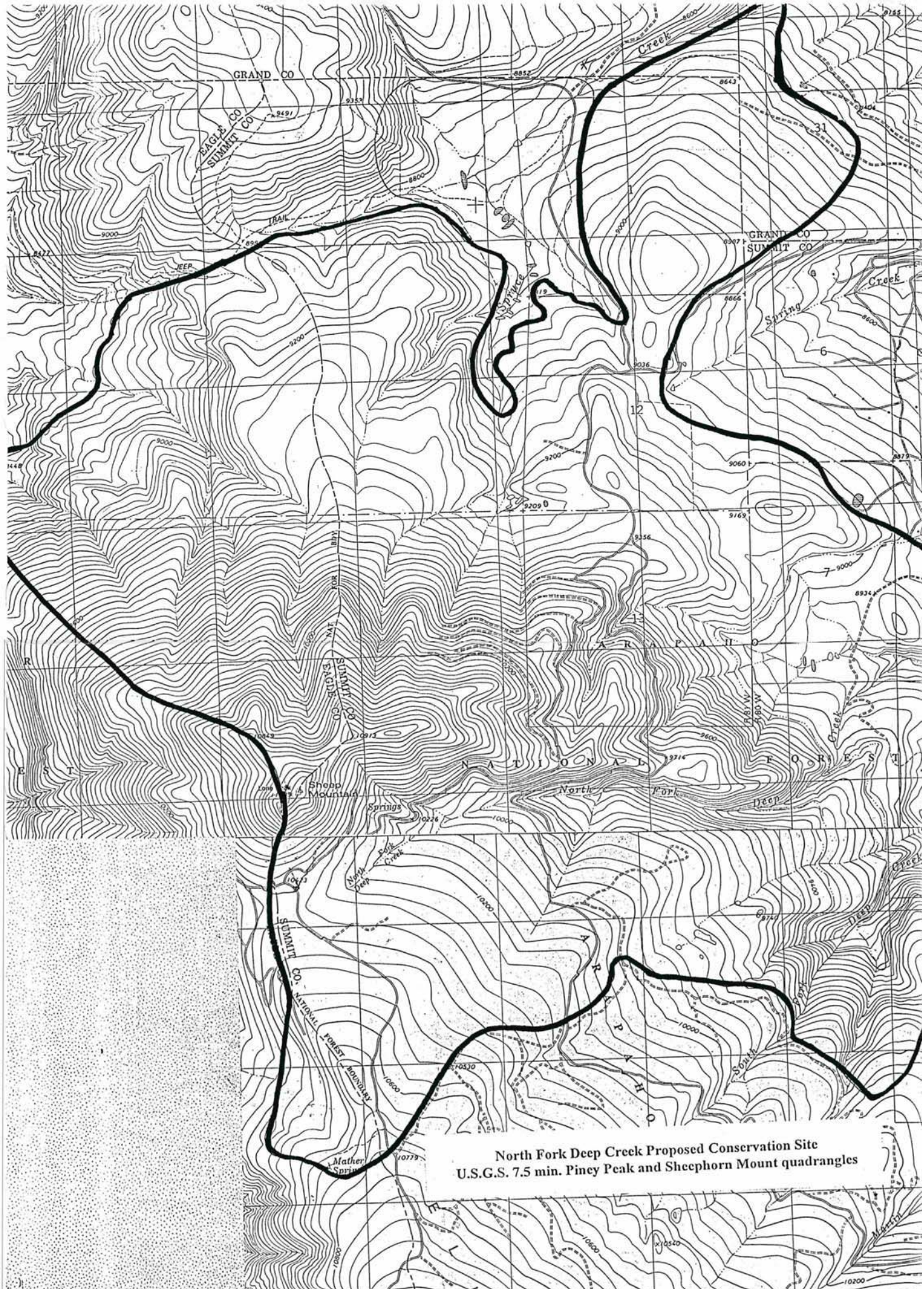
*EO=Element Occurrence

Boundary Justification: The boundary is drawn to include the full distribution of the rare orchid, as well as all additional adjacent suitable habitat. The boundary was drawn following a site visit by CNHP botanists in 1997. A 1988 National Aerial Photography Program 1:40,000 infrared aerial photograph was used to delineate the boundary and include the extent of the adjacent suitable habitat.

Protection Rank Justification: This site includes lands that are publicly owned and managed by the U.S. Forest Service and the Bureau of Land Management, as well as some private parcels. Special area designation should not be necessary for protection if management issues are adequately addressed.

Management Rank Justification: There is a timber sale proposed for a quarter of the inventoried population of the rare orchid. Although the timber is not sold yet, the logging was proposed to take place during the summer of 1997. The USFS has established 75 plots to determine the effects of timber activity on the population of orchids. Surveys are planned for 1-3, 3-5, 10, 15, and 25 year intervals after logging.

Cattle enter the area late and stay only a short time. This creates a light grazing practice. Recreational use in the area is light also. Timothy (*Phleum pratense)* and other hay grasses are abundant on the roadsides, particularly at the lower elevations in the site. Management plans should aim to curb the spread of these and other exotic plant species.



North Fork Deep Creek Proposed Conservation Site
U.S.G.S. 7.5 min. Piney Peak and Sheephorn Mount quadrangles

Triple Creek Ranch

Biodiversity Rank: B4 (Moderate significance)
The Triple Creek Ranch site supports an excellent example of a state rare montane willow carr. A 1972 occurrence of the globally rare mountain whitlow-grass is located within the sagebrush uplands.

Protection Urgency Rank: P4
The site is privately owned with adjacent public lands. The owners want to conserve the area and have not grazed domestic livestock since 1990.

Management Urgency Rank: M4
The only management action needed for this site is to reintroduce and maintain a viable population of beaver.

Location: seven miles north of Silverthorne; four air miles northeast of Keller Mountain
U.S.G.S. 7.5 minute quadrangle: Willow Creek
Legal Description: T4S R78W Sections 8, 9, 16, 17

General Description: The Triple Creek Ranch is located on the eastern base of the Gore Range. It is located at the confluence of three forks of Rock Creek. The site consists of two areas of beaver ponds. The upper ponds consist of three-four abandoned ponds. The wetland is fed by several springs. One pond contains water and supported aquatic vegetation e.g., water starwort (*Callitriche verna*), burreed (*Sparganium emersum*), beaked sedge (*Carex utriculata*), and manna grass (*Glyceria striata*). The lower ponds contains water and peaty soils. There is evidence of moose, elk, and deer. The upslope community supports an aspen/lodgepole forest (*Populus tremuloides, Pinus contorta*). The river corridor is dominated by a montane riparian willow carr (*Salix geyeriana/Carex utriculata*) with alder (*Alnus incana*), Colorado blue spruce (*Picea pungens*), and Rocky Mountain willow (*Salix monticola*). The site is approximately 640 acres ranging in elevation from 8,800to 9,280 feet.

Biodiversity Rank Justification: The Triple Creek Ranch site supports an excellent example of a state rare montane riparian willow carr (*Salix geyeriana/Carex utriculata*). There is also an imprecise location (1972) occurrence of mountain whitlow-grass (*Draba rectifructa)* on Rock Creek. This occurrence was not relocated during the 1997 field season. There are 14 known occurrences in Colorado for mountain whitlow-grass (CNHP 1997).

Natural Heritage element occurrences at the Triple Creek Ranch site.

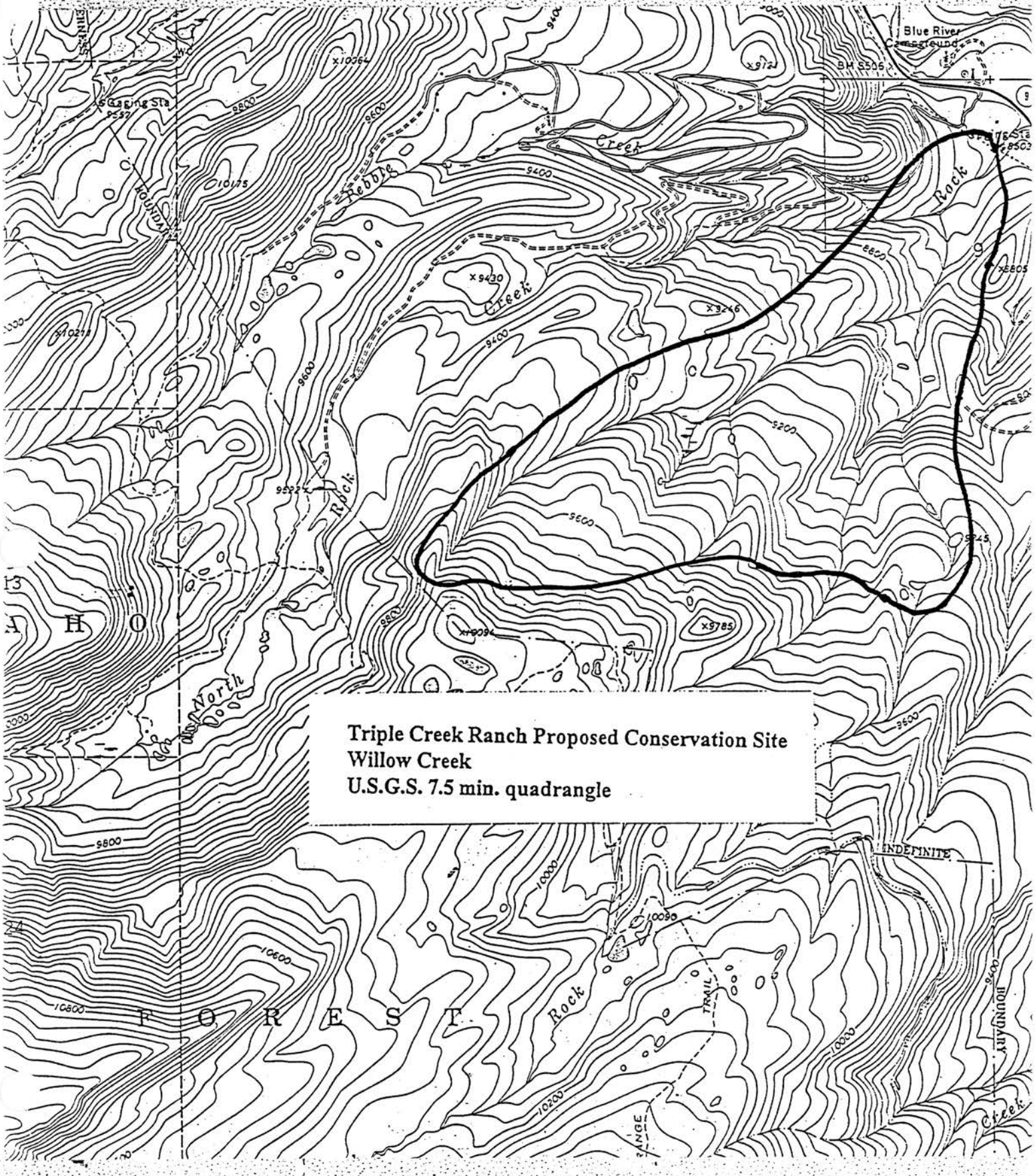
Element	Common Name	Global Rank	State Rank	Federal Status	State Status	Federal Sens.	EO* Rank
Draba rectifructa	mountain whitlow-grass	G3	S2				unranked
Salix geyeriana/ Carex utriculata	**montane riparian willow carr**	**G5**	**S3**				**A**

*EO=Element Occurrence

Boundary Justification: The boundary drawn encompasses the headwaters of Rock Creek and the riparian community and the rare plant. A 1,000 feet buffer is drawn to protect the hydrology from immediate impacts e.g., water diversions, development. This site was drawn after a 1997 visit by a CNHP wetland ecologist. The boundary was further verified using a 1988 National Aerial Photography Program 1:40,000 infrared aerial photograph.

Protection Rank Justification: The site is privately owned with adjacent public lands. The owners want to conserve the area and have not grazed domestic livestock since 1990. A conservation easement would permanently protect this site and its elements.

Management Rank Justification: Management actions could include reintroduction of beaver and manage for their viability. Control of weeds and hay grasses needs to be addressed.



Triple Creek Ranch Proposed Conservation Site
Willow Creek
U.S.G.S. 7.5 min. quadrangle

Buffalo Mountain

Biodiversity Rank: B5 (General or state-wide biodiversity interest)
This site includes a small occurrence of a state rare orchid.

Protection Urgency Rank: P5
This site is protected within the Eagles Nest Wilderness Area and there are no threats known for the foreseeable future.

Management Urgency Rank: M1
Management regarding recreation is essential within one year to prevent loss of the occurrence.

Location: This site is northwest of the town of Silverthorne, on the east slope of the Gore Range. Travel on the Gore Range Trail to the Wheeler Dillon Trail that parallels South Willow Creek. Follow this trail for about one mile into the site. The site includes an approximately one mile stretch of South Willow Creek, one mile stretch of Middle Willow Creek, and the forested area between these drainages.

U.S.G.S. 7.5 minute quadrangle: Willow Lakes
Legal Description: T5S R78W S4, 5, 8, 9

General Description: Subalpine valleys on the eastern slope of the Gore Range are dominated by young subalpine fir (*Abies lasiocarpa)* and medium-aged lodgepole pine (*Pinus contorta*). The understory is dominated by native forbs, but has a high percentage of bare ground with a thick layer of pine needles and dry granitic top soil. Steep north and south-facing slopes drop into the Willow Creek drainages from Buffalo Mountain and Red Peak. The purple lady's slipper orchids were found at the base of these slopes along the creek. Elevations range between 10,000-12,000 feet.

Biodiversity Rank Justification: This site includes a small occurrence of a state rare orchid species, purple lady's-slipper (*Cypripedium fasciculatum*). This occurrence has not been seen since 1991 despite attempts to relocate. The purple lady's slipper, like many orchids, may vary greatly in the numbers observed in subsequent years. Currently, CNHP is not considering this occurrence historical and is recommending that the location be visited in the future.

Natural Heritage element occurrences at the Buffalo Mountain site.

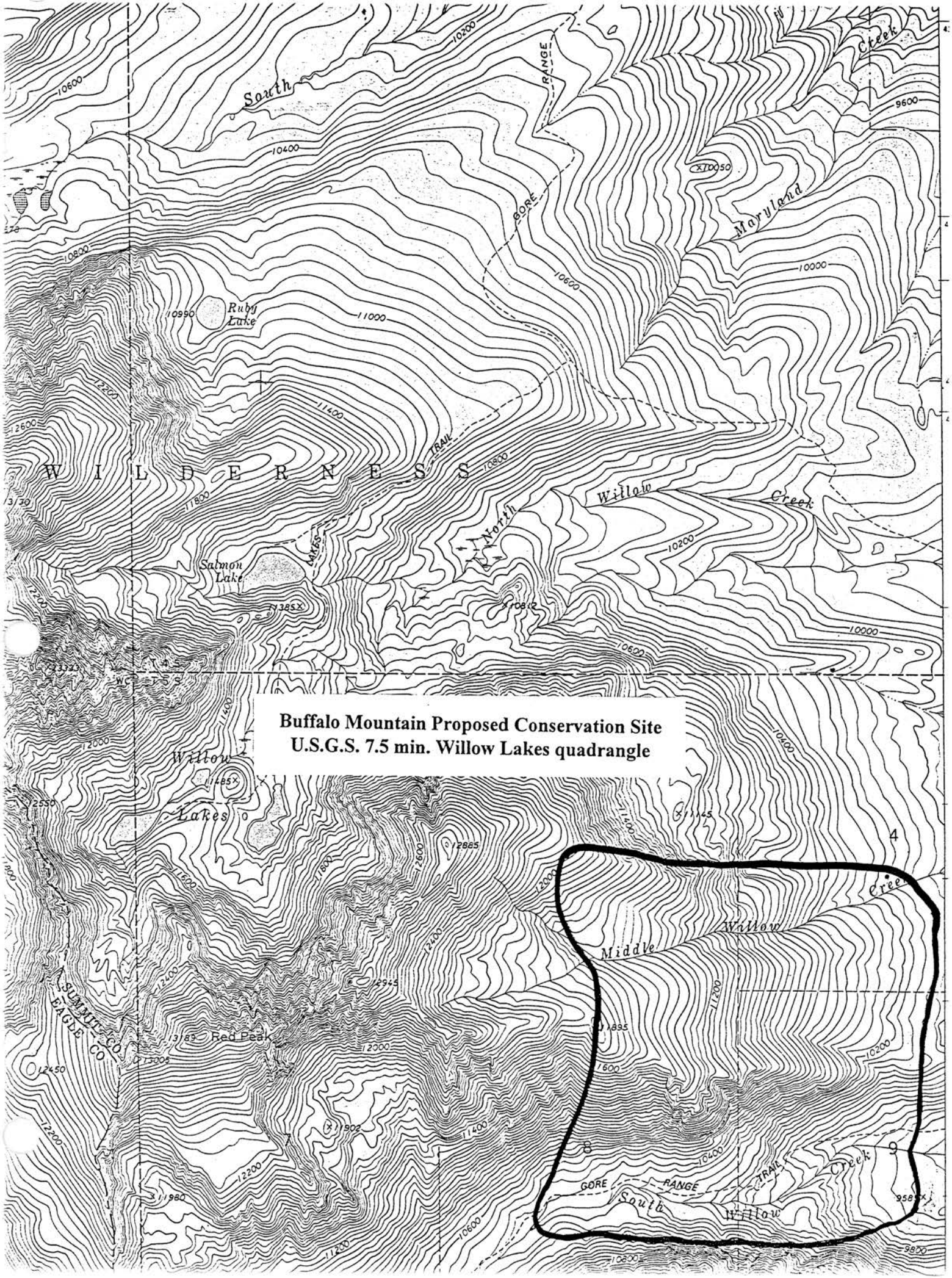
Element	Common Name	Global Rank	State Rank	Federal Status	State Status	Federal Sens.	EO* Rank
Cypripedium fasciculatum	**purple lady's-slipper**	**G4**	**S3**			**FS**	**C**

*EO=Element Occurrence

Boundary Justification: The boundary encompasses the occurrence and all adjacent suitable habitat as identified on the 1988 National Aerial Photography Program 1:40,000 infrared aerial photograph.

Protection Rank Justification: The site is publicly owned and managed by the White River National Forest and is within the Eagles Nest Wilderness Area.

Management Rank Justification: This site is managed by the White River National Forest, which is aware of this population. There is heavy recreation use (mostly day use) along the Wheeler Dillon Trail, which crosses through the southern portion of this site. Trail maintenance crews should be aware of population locations so that they may avoid impacting them during routine maintenance (i.e., removing downed trees). Most hikers stay on the trail but evidence of human disturbance (e.g., fire rings) was found in the area. Hikers and recreational users should be educated (through interpretive signs or other means) not to pick or otherwise disturb wildflowers along trails. Explaining the importance of the rare orchid habitat may help to keep visitors on the trail. According to Kathleen Phelps, wildlife biologist of the Dillon Ranger District, the purple lady's-slipper (*Cypripedium fasciculatum)* flourishes in recently burned areas. In her opinion, this site would benefit from a fire. This population has not been seen since 1991. The site has been revisited but the plants were not seen. This site should be revisited during June to attempt to relocate the plants.


Buffalo Mountain Proposed Conservation Site
U.S.G.S. 7.5 min. Willow Lakes quadrangle
WILDERNESS
South
GORE
RANGE
TRAIL
Maryland
Creek
Ruby Lake
Salmon Lake
North
Willow
Creek
Willow Lakes
Red Peak
SUMMIT CO
EAGLE CO
Middle
Willow
Creek
South
Willow
Creek
GORE
RANGE
TRAIL
4
8
9

Eaglesmere Lake

Biodiversity Rank: B5 (General or state-wide biodiversity interest)
This site contains a small occurrence of a state rare orchid species.

Protection Urgency Rank: P4
This site is located within the Eagles Nest Wilderness Area and no threats are known for the foreseeable future.

Management Urgency Rank: M4
Management is not needed now but may be necessary in the future.

Location: This site is located southwest of Green Mountain Reservoir, at the base of the Gore Range in Summit County, approximately 0.25 miles east of Eaglesmere Lakes. To access the site, take the Cataract Creek Road (County Road 1725) 2.5 miles to the Eaglesmere Lake trailhead. Follow this trail to the intersection with the Gore Range trail. Follow the Gore Range trail south into the site.

U.S.G.S. 7.5 minute quadrangle: Mount Powell
Legal Description: T3S R80W S 3, 4, 9, 10

General Description: The Eaglesmere Lake site includes east-facing slopes that support mixed coniferous forests in the Cataract Creek drainage. The forests are dominated by a combination of Engelmann spruce (*Picea engelmannii*) and subalpine fir (*Abies lasiocarpa*), with an understory dominated by blueberry (*Vaccinium* sp.) and heart-leaf arnica (*Arnica cordifolia*). The site includes about 600 acres and ranges in elevation from about 9800 to about 10,800 feet above sea level.

Biodiversity Rank Justification: The purple lady's slipper (*Cypripedium fasciculatum*) is a globally secure orchid species, however, it is rare in the state of Colorado. This orchid is known from four locations in Summit County. This site includes a small occurrence of this species.

Natural Heritage element occurrences at the Eaglesmere Lake site.

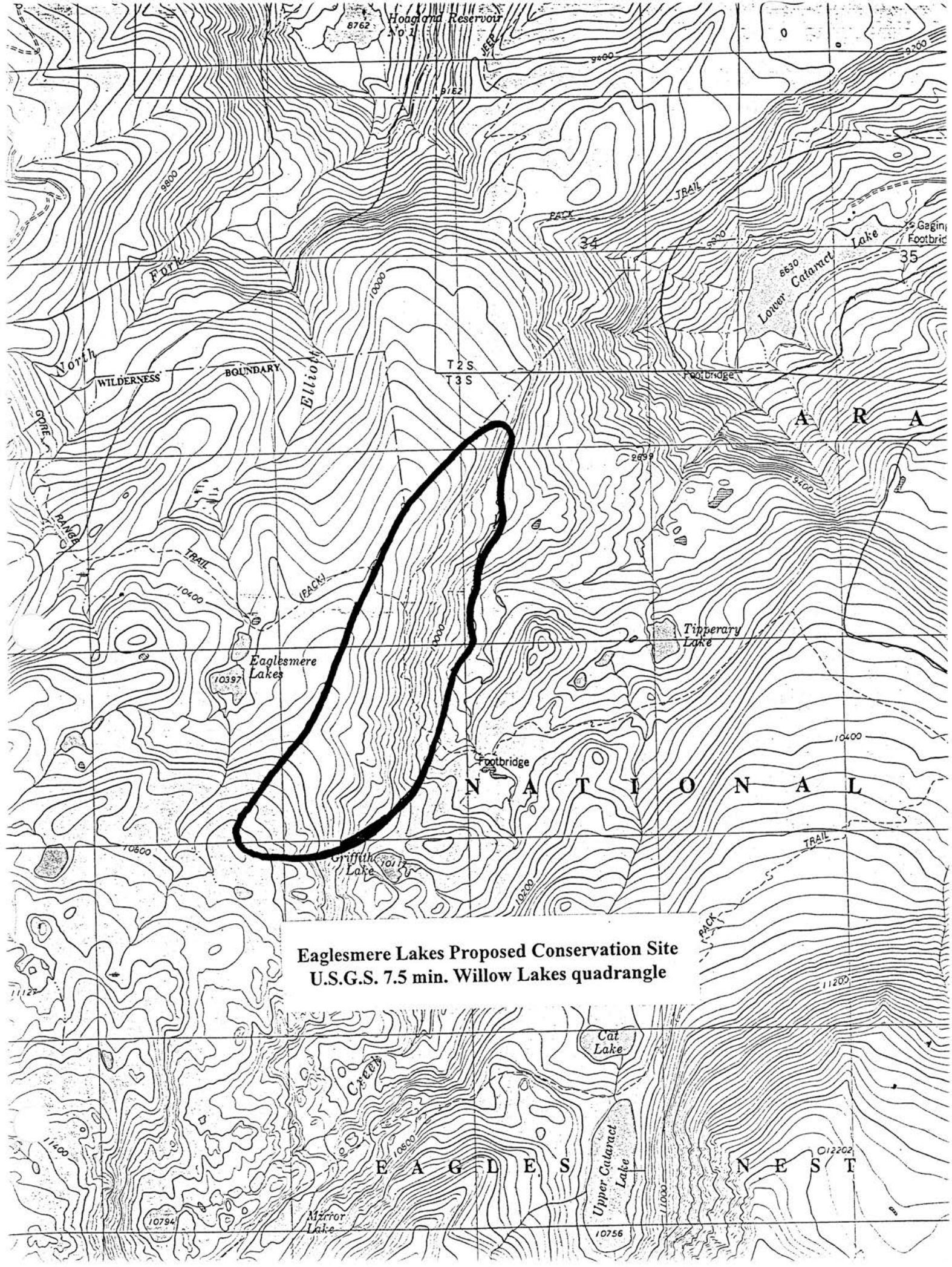
Element	Common Name	Global Rank	State Rank	Federal Status	State Status	Federal Sens.	EO* Rank
Cypripedium fasciculatum	**purple lady's-slipper**	**G4**	**S3**			**FS**	**C**

*EO=Element Occurrence

Boundary Justification: The boundary is drawn to protect the occurrence from direct impacts, and to provide additional suitable habitat where the orchids can become established over time. The boundary was drawn using a 1988 National Aerial Photography Program 1:40,000 infrared aerial photograph.

Protection Rank Justification: This site is located within the White River National Forest Eagles Nest Wilderness Area.

Management Rank Justification: The full extent of this occurrence of orchids should be delineated and management practices should be adopted that are compatible with the long-term survival of this species in this area.



Eaglesmere Lakes Proposed Conservation Site
U.S.G.S. 7.5 min. Willow Lakes quadrangle

Surprise Lake

Biodiversity Rank: B5 (General or state-wide biodiversity interest)
This site contains a small occurrence of a state rare orchid species.

Protection Urgency Rank: P4
This site is located within the Eagles Nest Wilderness Area and there are no threats known for the foreseeable future.

Management Urgency Rank: M4
Management is not needed now but may be needed in the future.

Location: Southwest of Green Mountain Reservoir, and southeast of Lower Cataract Lake in northwestern Summit County. To access the site, take Cataract Creek Road (County Road 1725) 2.5 miles to the Surprise Lake Trailhead, and hike a couple of miles south into the site.

U.S.G.S. 7.5 minute quadrangle: Mount Powell
Legal Description: T3S R80W S1,2

General Description: The Surprise Lake site includes north-facing slopes that support mixed coniferous forests in the Cataract Creek drainage. The forests are dominated by a combination of Engelmann spruce (*Picea engelmannii*), subalpine fir (*Abies lasiocarpa*), and lodgepole pine (*Pinus contorta*), with an understory dominated by blueberry (*Vaccinium*) and heart-leaf arnica (*Arnica cordifolia*). The site includes about 700 acres and ranges in elevation from about 9400 to about 10,200 feet above sea level.

Biodiversity Rank Justification: This site includes a small occurrence of a state rare plant species.

Natural Heritage element occurrences at the Surprise Lake site.

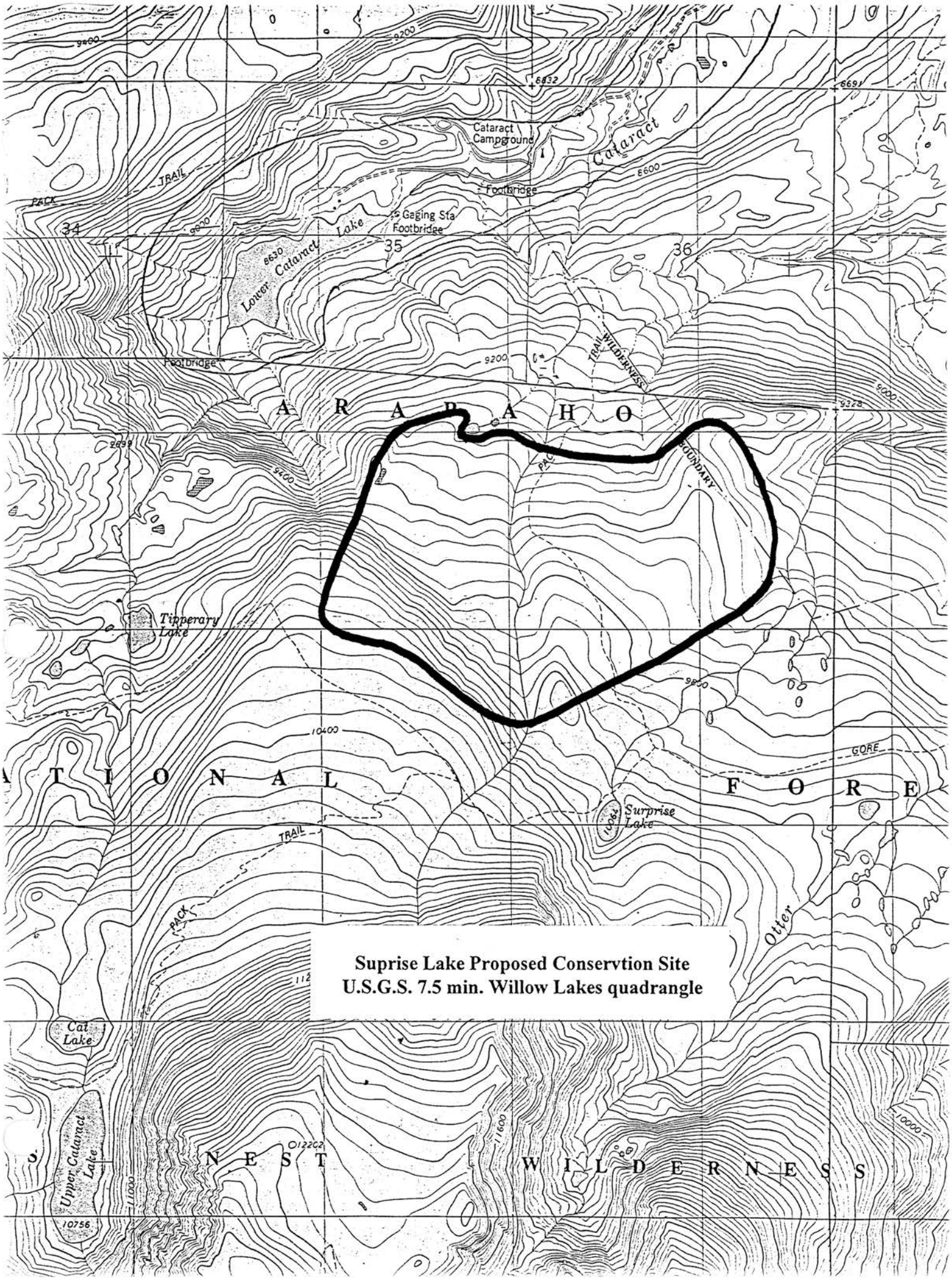
Element	Common Name	Global Rank	State Rank	Federal Status	State Status	Federal Sens.	EO* Rank
Cypripedium fasciculatum	**purple lady's-slipper**	**G4**	**S3**			**FS**	**unranked**

*EO=Element Occurrence

Boundary Justification: The boundary is drawn to protect the occurrence from direct impacts and to provide additional suitable habitat where the orchids can become established over time. The boundary was drawn using a 1988 National Aerial Photography Program 1:40,000 infrared aerial photograph. The photo was helpful in determining the extent of the potentially suitable habitat.

Protection Rank Justification: This site is located within the White River National Forest, Eagles Nest Wilderness Area.

Management Rank Justification: The full extent of this occurrence should be delineated, and management practices should be adopted that are compatible with the long-term survival of this species in this area.



Suprise Lake Proposed Conservtion Site
U.S.G.S. 7.5 min. Willow Lakes quadrangle

Willow Creek

Biodiversity Rank: B5 (General or state-wide biodiversity interest)
globally rare and a state rare plant community are located within this site.

Protection Urgency Rank: P1
This site is immediately threatened by development.

Management Urgency Rank: M4
Management is not needed presently, but may be needed in the future depending on the protection actions.

Location: About two air miles northwest of Silverthorne, just north of the confluence of North, Middle, and South Willow Creeks. Take Highway 9 north from Silverthorne. Turn left into the Eagles Nest subdivision (Golden Eagle Road). Continue straight back into the Willow Highlands subdivision.

U.S.G.S. 7.5 minute quadrangle: Dillon
Legal Description: T4S R78W S 27, 33, 34, 35

General Description: This site is composed of east-facing slopes in the Blue River drainage on the east slope of the Gore Range. Several intermittent drainages flow through the site. The vegetation in the site is characterized by a mosaic of lodgepole pine/ buffaloberry (*Pinus contorta/Shepardia canadensis)* forests, quaking aspen/ alder (*Populus tremuloides/Alnus incana)* woodlands, and riparian areas dominated by blue spruce, quaking aspen, alder, and bush honeysuckle (*Picea pungens-Populus tremuloides/Alnus incana-Lonicera involucrata).* The riparian areas are narrow and are presently in fair to good condition. There are logging roads through the site and subdivisions to the east. The site is about 650 acres in size and ranges in elevation from about 9000 to 9700 feet above sea level.

Biodiversity Rank Justification: This site includes two significant riparian communities, one that is globally vulnerable and another that is considered to be vulnerable in the state of Colorado. Both occurrences are fragmented by logging roads, adjacent to subdivisions, and considered to be in fair condition.

Natural Heritage element occurrences at the Willow Creek site.

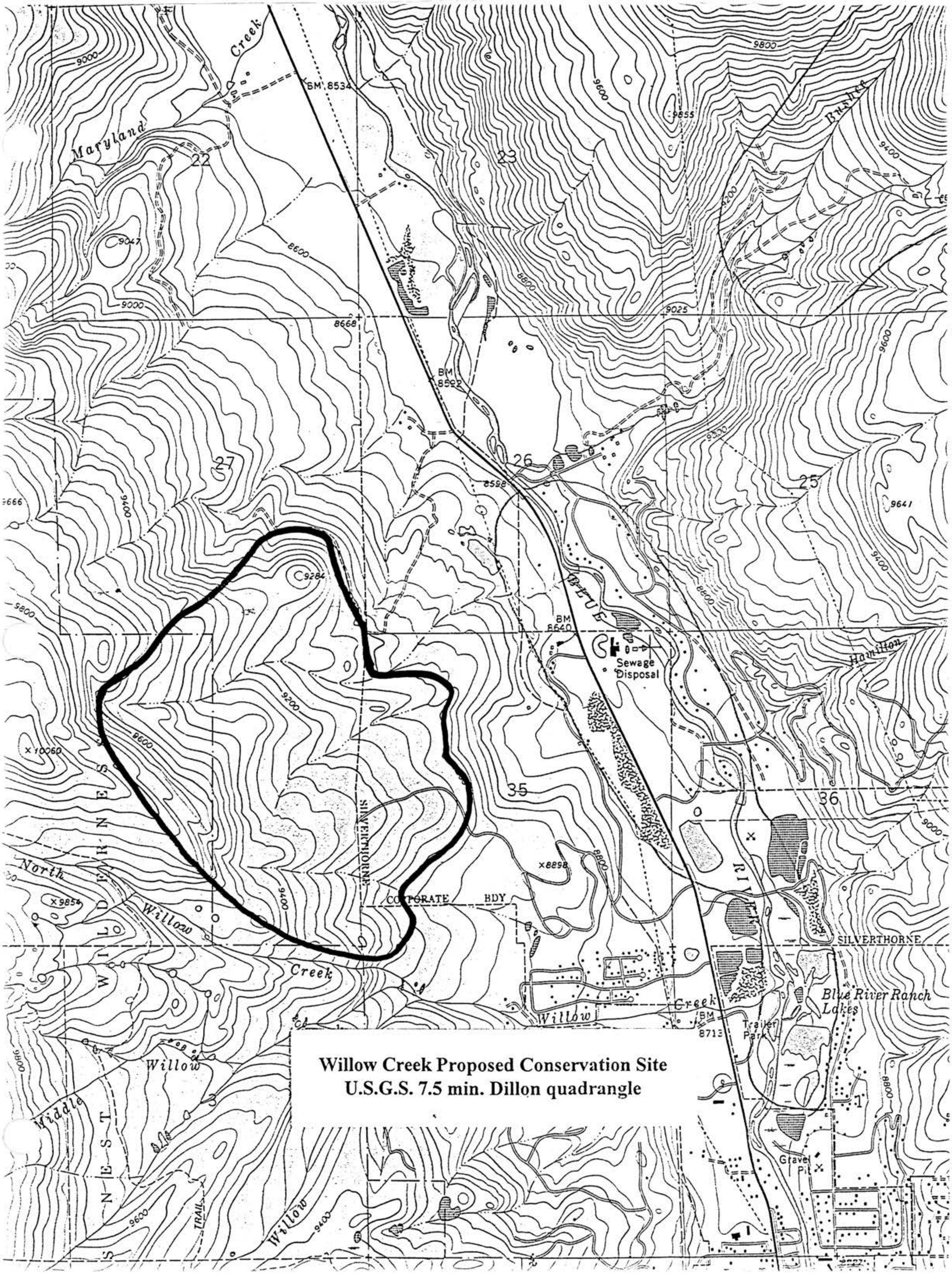
Element	Common Name	Global Rank	State Rank	Federal Status	State Status	Federal Sens.	EO* Rank
Picea pungens/Alnus incana	**montane riparian forests**	**G3**	**S3**				**C**
Populus tremuloides/Alnus incana	montane riparian forest	GU	S3				C

*EO=Element Occurrence

Boundary Justification: The site includes 1) the rare plant community occurrences, 2) a buffer to protect these occurrences from direct disturbances, and 3) representation from the dominant plant communities immediately adjacent to the occurrences. A larger area may need to be considered to protect the hydrological setting. This boundary was drawn after a 1997 visity by a CNHP ecologist. A National Aerial Photography Program 1:40,000 infrared aerial photograph was referenced while delineating the boundary.

Protection Rank Justification: This site is privately owned by the Eagles Nest subdivision and will be sold to a new owner within the next three months. This area is one the fastest growing subdivisions in the County. If development occurs the elements of concern will likely be destroyed. The Willow Creek Site should be considered for purchase for Open Space.

Management Rank Justification: Logging and habitat fragmentation due to roads and development are the main threats to this site. Recreation use, especially horses, should be considered as threats also. The Willow Creek site is upslope from a subdivision and adjacent to a wilderness area. This site could be valuable as a buffer between these distinct land uses. The hydrology of this site is important to the ecological processes which support these riparian communities. The water quality, quantity, and timing should be maintained at its current status.



Willow Creek Proposed Conservation Site
U.S.G.S. 7.5 min. Dillon quadrangle

Snake River Drainage

Dillon Bay Fen

Biodiversity Rank: B2 (Very high significance)
The Dillon Bay site consists of a good example of the globally rare clustered sedge meadow.

Protection Urgency Rank: P2
The Dillon Bay site is entirely privately owned with adjacent public lands. This site is located adjacent to Highway 6 and the Dillon Reservoir where there is the high probability of alteration due to residential development and/or road improvements. A conservation easement or open space designation should be considered to prevent development or negative impact to the fen.

Management Urgency Rank: M2
Management of site should be taken within 5 years to prevent the loss of the wetland.

Location: 2 miles east of Dillon on Highway 6
U.S.G.S. 7.5 minute quadrangle: Frisco; Dillon; Keystone; Loveland Pass
Legal Description**:** T5S R77W Sections 16, 9, 10, 15

General Description: The Dillon Bay site is located at the southeastern tip of Dillon Bay, north of Highway 6 on the southwest side of Tenderfoot Mountain. It is a fen (peat-accumulating wetland that is supported by ground water discharge) supported by groundwater discharging from the Pierre Shale. The fen is dominated by cluster sedge (*Carex praegracilis*), aquatic sedge (*Carex aquatilis*), beaked sedge (*Carex utriculata*), Geyer willow (*Salix geyeriana*), Rocky Mountain willow (*Salix monticola*), shortfruit willow (*Salix brachycarpa*), shrubby cinquefoil (*Pentaphylloides floribunda*) and Englemman spruce (*Picea engelmannii*). Upslope of the wetland, aspen (*Populus tremuloides*) and lodgepole pine (*Pinus contorta*) dominate. The drier areas are dominated by sagebrush (*Artemisia tridentata* ssp. *vaseyana*) and rabbitbrush (*Chrysothamnus parryi*).

The site is bordered to the south by Highway 6 and to the north by Tenderfoot Mountain. The Oro Grande bicycle trail bisects the site. The site is a total of 500 acres ranging in elevation from 9,070 to 9,600 feet.

Biodiversity Rank Justification: This site contains a globally imperiled clustered sedge (*Carex praegracilis*) wetland community. There are only 5 occurrences of clustered sedge wetlands known in Colorado, three of these are located in Summit County (CNHP 1997). It is a significant site due to the relative rarity of fens observed on private lands in Summit County.

Natural Heritage element occurrences at the Dillon Bay Fen site.

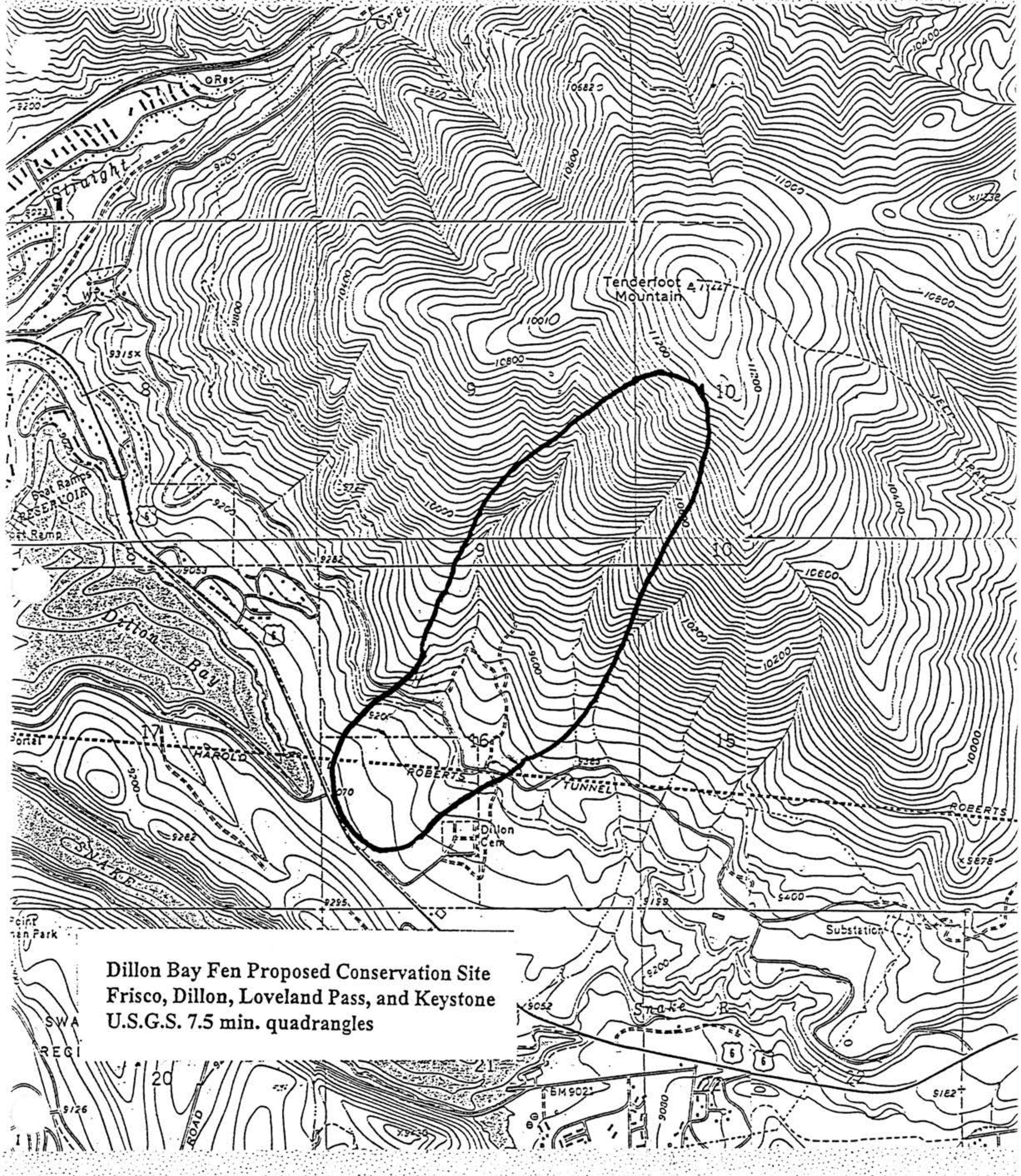
Element	Common Name	Global Rank	State Rank	Federal Status	State Status	Federal Sens.	EO* Rank
Carex praegracilis	**clustered sedge wetland**	**G2G3**	**S2**				**B**

*EO=Element Occurrence

Boundary Justification: The boundary drawn encompasses the fen, adjacent uplands, and montane forest. This boundary includes property owned both privately and publicly. A much larger area should be considered in any long-term management or protection plan to protect the hydrology of this site. This site was drawn after a 1997 visit by a CNHP wetland ecologist. The boundary was further verified using a 1988 National Aerial Photography Program 1:40,000 infrared aerial photograph.

Protection Rank Justification: The site is located in a quickly growing area of Summit County. Residential development is encroaching from the Town of Dillon which could attempt to fill and build on this site. The site is located very close to Highway 6 therefore, there is the threat of road widening activities.

Management Rank Justification: The private landowners need to be notified of the importance of this site both as a unique wetland and the location of the globally rare sedge wetland so that a management plan can be in place to protect this site. The hydrology of this site is important to the ecological processes which support these riparian communities. The water quality, quantity, and timing should be maintained at its current status.



Dillon Bay Fen Proposed Conservation Site
Frisco, Dillon, Loveland Pass, and Keystone
U.S.G.S. 7.5 min. quadrangles

Grays Peak

Biodiversity Rank: B2 (Very high significance)
his site includes 19 occurrences of 10 rare plant species.

Protection Urgency Rank: P4
This site is within National Forest land and there are no threats known for the foreseeable future.

Management Urgency Rank: M1
Management of recreation is essential within one year to prevent loss to the occurrences.

Location: This site includes Grays Peak, Torreys Peak, Kelso Mountain, and Mount Edwards which are located along the Continental Divide in Summit and Clear Creek counties. To access the site take Interstate 70 west from Georgetown to the Bakerville exit. Take Stevens Gulch Road south to the end of the road to Grays Peak trailhead. Follow the main trail approximately 3.5 miles to Grays Peak or Torreys Peak summits.

U.S.G.S. 7.5 minute quadrangle: Grays Peak
Legal Description: T4S R75W S 29, 31, 32
T5S R75W S 4, 5, 6, 7, 8, 9

General Description: The site contains a high elevation massif with four peaks that reach 13,000 to over 14,000 feet above sea level. Only one of the saddles between the peaks drops below 13,000 feet. The peaks are composed primarily of scree and talus slopes with outcrops of bedrock. The vegetation on the peaks consists primarily of small mossy areas around snow melt rivulets, and a few other microhabitats where other opportunistic species have taken advantage of a bit of soil development. The saddle areas support meadows and rocky areas with snowbed patches. Ten plant species of concern have been documented in this site, mostly in the rocky areas and on the mossy tundra. This site is about 2000 acres in size, and ranges in elevation from about 11,600 feet to the summit of Grays Peak at 14,270 feet above sea level.

Biodiversity Rank Justification: The Grays Peak site contains a plethora of globally and state rare plant species, second only to the Hoosier Ridge and North Star Mountain sites in local and state-wide significance. There are sixteen occurrences of ten plant species of concern found in this site. The species of primary concern is Grays Peak whitlow-grass (*Draba grayana*). This species is considered to be globally imperiled. It is endemic to Colorado and only known from 18 total occurrences. All of these occurrences have startlingly low total number of individuals documented. There are five occurrences of the Grays Peak whitlow-grass known in Summit County; this site supports three of these five occurrences. The occurrences are in good to fair condition.

Natural Heritage element occurrences at the Grays Peak site.

Element	Common Name	Global Rank	State Rank	Federal Status	State Status	Federal Sens.	EO* Rank
Draba grayana	**Grays Peak whitlow-grass**	**G2**	**S2**				**B**
Draba grayana	Grays Peak whitlow-grass	G2	S2				H
Draba grayana	Grays Peak whitlow-grass	G2	S2				C
Draba grayana	Grays Peak whitlow-grass	G2	S2				C
Draba porsildii	Porsild draba	G3	S3				H
Draba exunguiculata	clawless draba	G3	S2				C
Draba exunguiculata	clawless draba	G3	S2				C
Aquilegia saximontana	Rocky Mountain columbine	G3	S3				H
Aquilegia saximontana	Rocky Mountain columbine	G3	S3				B
Draba streptobrachia	Colorado Divide whitlow-grass	G3	S3				D
Draba streptobrachia	Colorado Divide whitlow-grass	G3	S3				C
Chionophila jamesii	Rocky Mountain snowlover	G3G4	S3S4				Unranked
Draba fladnizensis	arctic draba	G4	S2S3				A
Ranunculus karelinii	tundra buttercup	G4G5	S2				Unranked
Papaver lapponicum ssp. *occidentale*	alpine poppy	G4T5	S2				C
Crepis nana	dwarf hawksbeard	G5	S2				B

*EO=Element Occurrence

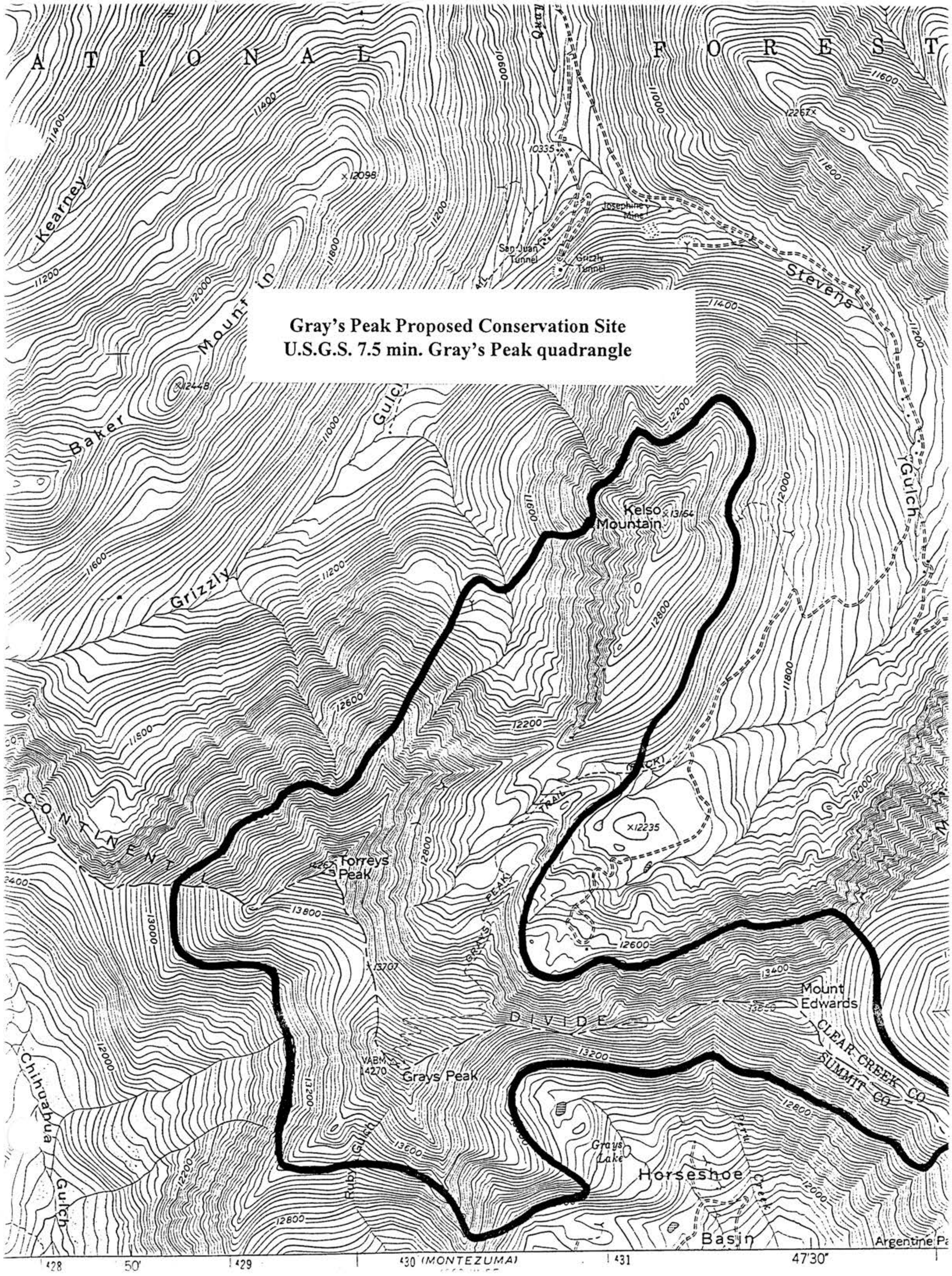
Boundary Justification: This boundary is drawn to 1) protect the occurrences from direct impacts such as trampling or other surface disturbances; 2) provide suitable habitat where additional individuals can become established over time; and 3) include representation from each of the local alpine plant communities which may support a pollinator for one or more of the rare plant species.

Protection Rank Justification: This site is publicly owned and managed by the U.S. Forest Service, with the exception of small inholdings which are privately owned. These inholdings should be acquired by the USFS to ensure that renewed mining activities do not threaten the rare plant occurrences.

Management Rank Justification: Continued disturbance of the talus slopes and mossy tundra may very well eliminate some of these rare species from this site. High levels of use by hikers and mountain goats are the main sources of these disturbances. Hikers cutting off trail switchbacks are creating numerous social trails up steep gravely slopes which are now rapidly eroding. Hikers probably avoid some of the scree slopes, but mountain goats use them for routes off the west-facing slopes. This serious damage needs immediate attention. The Continental Divide Trail is proposed to go through this site. This construction and subsequent trail

improvements would disturb and/or destroy some of these occurrences; of particular concern are the occurrences of *Draba* species on Mount Edwards.

To rectify these problems, the U.S. Forest Service (Clear Creek Ranger District) has made an effort to locate the best trail route to avoid destruction of the rare plants. Plans were made for 1994 to reconstruct portions of the trails and to place interpretive signs to inform visitors of the significant rare plant communities. Follow-up with the USFS is necessary to determine whether or not these plans were implemented. Well-planned, designated hiking routes, if adhered to, would alleviate most of the impacts to the plant species of concern.



Gray's Peak Proposed Conservation Site
U.S.G.S. 7.5 min. Gray's Peak quadrangle

Montezuma

Biodiversity Rank: B2 (Very high significance)
The Montezuma site supports a good occurrence of a breeding population of the globally imperiled southern Rocky Mountain boreal toad and excellent examples of several subalpine riparian willow carrs.

Protection Urgency Rank: P2
The Montezuma site is owned both privately and publicly. The southern Rocky Mountain boreal toad occurrence is located on private lands. The site is located in a scenic part of Summit County and therefore the threats from residential and commercial development are high. The southern Rocky Mountain boreal toad occurrence is located adjacent to the only access road to Montezuma. The threat of road enhancement or maintenance projects are very high.

Management Urgency Rank: M2
Management actions need to be taken within 5 years to prevent the further degradation of the southern Rocky Mountain boreal toad population and the loss of the willow carr to impacts from development, mining, or road improvements.

Location: The site is located 0.5 miles north of Montezuma and extends along Deer Creek, Saint John Creek, and Snake River for 3.0 miles south to treeline.

U.S.G.S. 7.5 minute quadrangle: Montezuma
Legal Description: T5S R76W Sections 26, 34, 35, 24
T6S R76W Sections 1, 2, 3, 10, 12

General Description: The Montezuma site consists of three glaciated valleys. Saint John Creek, Deer Creek, and the Snake River drain the site. The prominent peaks that border the site include: Bear, Glacier, Teller, Landslide, and Geneva Peaks. The site supports an extensive willow carr that is approximately 2,800 acres ranging in elevation from 10,000to 11,400 feet. There are excellent occurrences of subalpine riparian willow carrs (*Salix planifolia/Carex aquatilis* and *Salix planifolia/Caltha leptosepala*) located mainly on National Forest lands. There is a good occurrence of a subalpine riparian willow carr (*Salix planifolia/ Calamagrostis canadensis*) that is located near the Town of Montezuma and a breeding occurrence of the southern Rocky Mountain boreal toad. The site supports a series of beaver ponds that are fed by Deer Creek, Saint John Creek, Snake River, intermittent streams, and several springs. There are several areas where fens (peat-accumulating wetland that is supported by ground water discharge) have been created from groundwater discharge, such as the area 1 mile north of Webster Pass.

Portions of the wetlands were heavily mined evidenced by tailings and abandoned equipment throughout much of the site. The site is bisected by 4WD roads that allow access to the alpine areas. These roads are utilized by both private and commercial enterprises.

Biodiversity Rank Justification: The Montezuma site supports excellent examples of subalpine riparian willow carrs (*Salix planifolia/Carex aquatilis* and *Salix planifolia/Caltha leptosepala*) and a good example of a subalpine riparian willow carr (*Salix planifolia/ Calamagrostis canadensis-Carex aquatilis*). There is a 1995 occurrence of the state endangered southern Rocky Mountain boreal toad (*Bufo boreas boreas*). There was no evidence of breeding in 1996 or 1997 (Horstman 1996; 1997).

The southern Rocky Mountain population of boreal toads is likely distinct from other populations (A. Goebel unpbl. data). There are approximately 206 historical localities for the southern Rocky Mountain boreal toad in Colorado. Presently, only three to four healthy populations remain, comprised of less than 20 high priority breeding sites (Steve Corn, pers. comm.; Lauren Livo, pers. comm.) Populations have declined precipitously or disappeared over the past 20 years and continue to do so (Goettl 1997). The reasons for the decline are unknown and the factors important to the perseverance of this species are not well understood (Pague et al. 1997). The southern Rocky Mountain boreal toad is currently a candidate for federal listing, a state endangered and a U.S. Forest Service sensitive species.

Natural Heritage element occurrences at the Montezuma site.

Element	Common Name	Global Rank	State Rank	Federa Status	State Status	Federal Sens.	EO* Rank
Bufo boreas boreas	**southern Rocky Mountain boreal toad**	**G4T1Q**	**S1**	**C**	**E**	**FS**	**B**
Salix planifolia/ Calamagrostis canadensis	subalpine riparian willow carr	G2G4	S2S4				C
Salix planifolia/ Caltha leptosepala	subalpine riparian willow carr	G4	S4				A
Salix planifolia/ Carex aquatilis	subalpine riparian willow carr	G4	S4				A

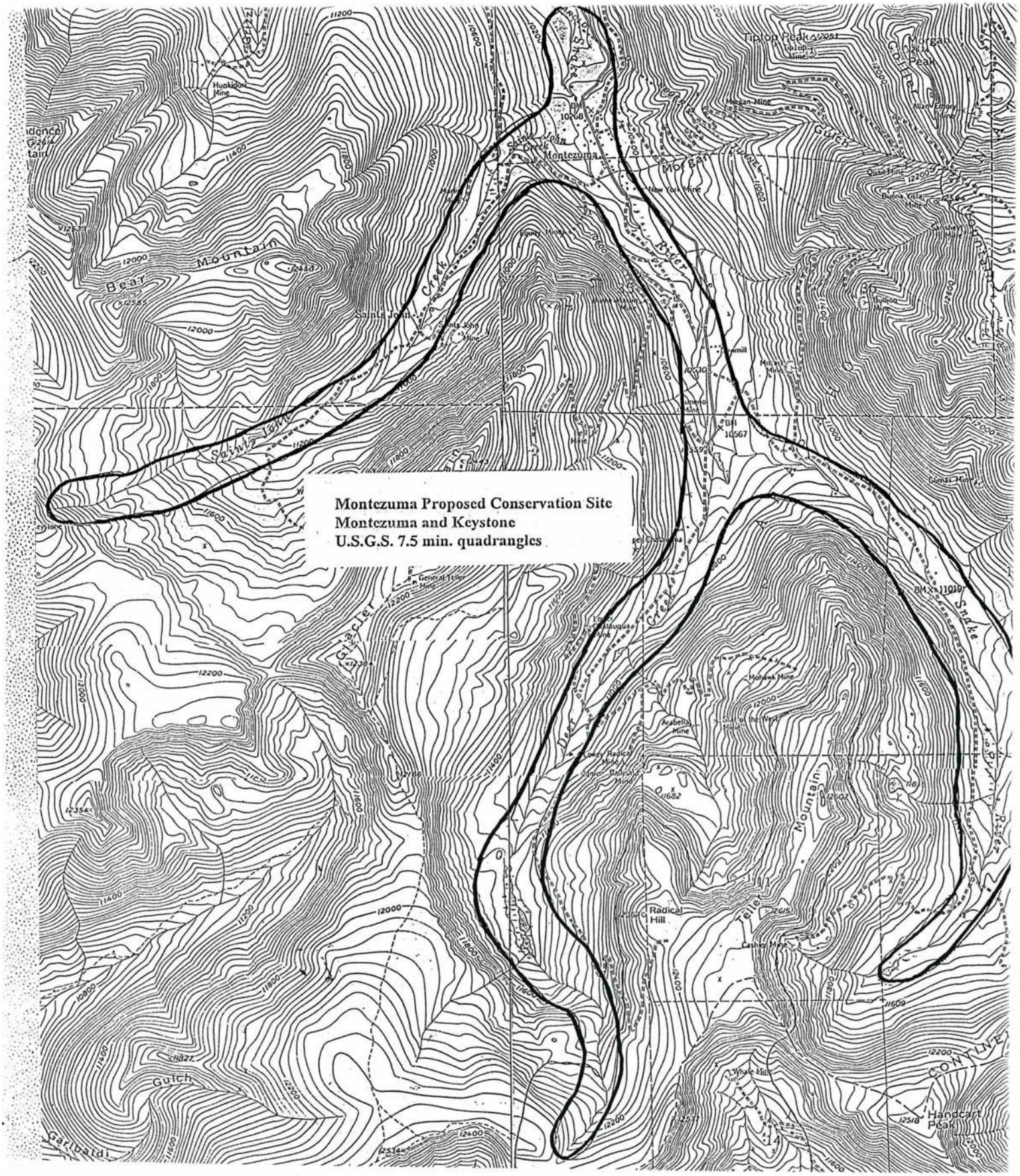
*EO=Element Occurrence

Boundary Justification: The boundary drawn encompasses the riparian areas adjacent to Deer Creek, Saint John Creek, and the Snake River. The boundary incorporates the Town of Montezuma due to the potential boreal toad habitat located within the town limits. This boundary also includes a buffer zone along the talus slopes to protect the willow carr and the southern Rocky Mountain boreal toad habitat from direct disturbances such as mining, ORV, and road improvements. This site was drawn after a 1997 visit by a CNHP wetland ecologist. The boundary was further verified using a 1988 National Aerial Photography Program 1:40,000 infrared aerial photograph.

Protection Rank Justification: This site is owned both privately and publicly. The southern Rocky Mountain boreal toad occurrence is located on private lands. There are several threats to the site stemming from residential development and off road vehicles travel through the site.

Management Rank Justification: Management actions are needed within 5 years to improve the southern Rocky Mountain boreal toad occurrence. Beaver need to be reintroduced to the site

to maintain ponds. Sediment trapping material needs to placed between the road and wetland to prevent sedimentation of wetland. The hydrology of this site is important to the ecological processes which support the boreal toad occurrence and its habitat. The water quality, quantity, and timing should be maintained at its current status.


Montezuma Proposed Conservation Site
Montezuma and Keystone
U.S.G.S. 7.5 min. quadrangles

Peru Creek

Biodiversity Rank: B2 (Very high significance)
The Peru Creek site supports one of the best breeding populations of southern Rocky Mountain boreal toad observed on private lands in Summit County.

The majority of the Peru Creek site is located on public lands. Easiest access is via privately owned property. This site is threatened within the next 5 years due to increased traffic on the Peru Creek road, potential expansion of adjacent ski area, proposed Peru Creek reservoir, and increased beaver activity. A conservation easement or open space designation would be appropriate to ensure the viability of this element occurrence.

Management Urgency Rank: M2
Management actions need to be taken within 5 years to prevent the degradation of the breeding population of boreal toads. Monitoring of the southern Rocky Mountain boreal toad population and its habitat is necessary to ensure viability of the occurrence.

Location: 2 air miles northeast of Montezuma along the Peru Creek road by the Maid of Orleans Mine site

U.S.G.S. 7.5 minute quadrangle: Montezuma
Legal Description: T5S R76W Section 24

General Description: The Peru Creek site is located on the south side of Lenawee Mountain. The site is fed by numerous springs that flow from the base of Lenawee Mountain. Peru Creek borders the wetland to the south. It supports a small montane riparian willow carr (*Salix planifolia/Carex aquatilis*) that supports a series of small beaver ponds located on the southside of the Peru Creek road. The abandoned Maid of Orleans mine and a private residence are located within the site. The site is approximately 300 acres ranging in elevation from 10,252 to 10,280 feet.

Biodiversity Rank Justification: The Peru Creek site supports the best example of a breeding population of the southern Rocky Mountain boreal toad (*Bufo boreas boreas*) observed on private lands in Summit County (Horstman 1996). Toads were first discovered on June 20, 1996 by Greg Horstman. Eight juveniles were observed on that date. On July 24, 1996, 150-200 tadpoles were observed in one of the beaver ponds. During 1996 the Peru Creek site was highly successful with definite recruitment (or survival of young) in high numbers (Horstman 1996). The 1997 survey documented approximately 150-200 tadpoles in the same beaver pond. There were two juveniles observed on the survey date.

The southern Rocky Mountain population of boreal toads is likely distinct from other populations (A. Goebel unpbl. data). There are approximately 206 historical localities for the boreal toad in Colorado. Presently, only three to four healthy populations remain, comprised of

less than 20 high priority breeding sites (Steve Corn, pers. comm.; Lauren Livo, pers. comm.) Populations have declined precipitously or disappeared over the past 20 years and continue to do so (Goettl 1997). The reasons for the decline are unknown and the factors important to the perseverance of this species are not well understood (Pague et al. 1997). The boreal toad is currently a candidate for federal listing, a state endangered and U.S. Forest Service sensitive species.

Natural Heritage element at the Peru Creek site.

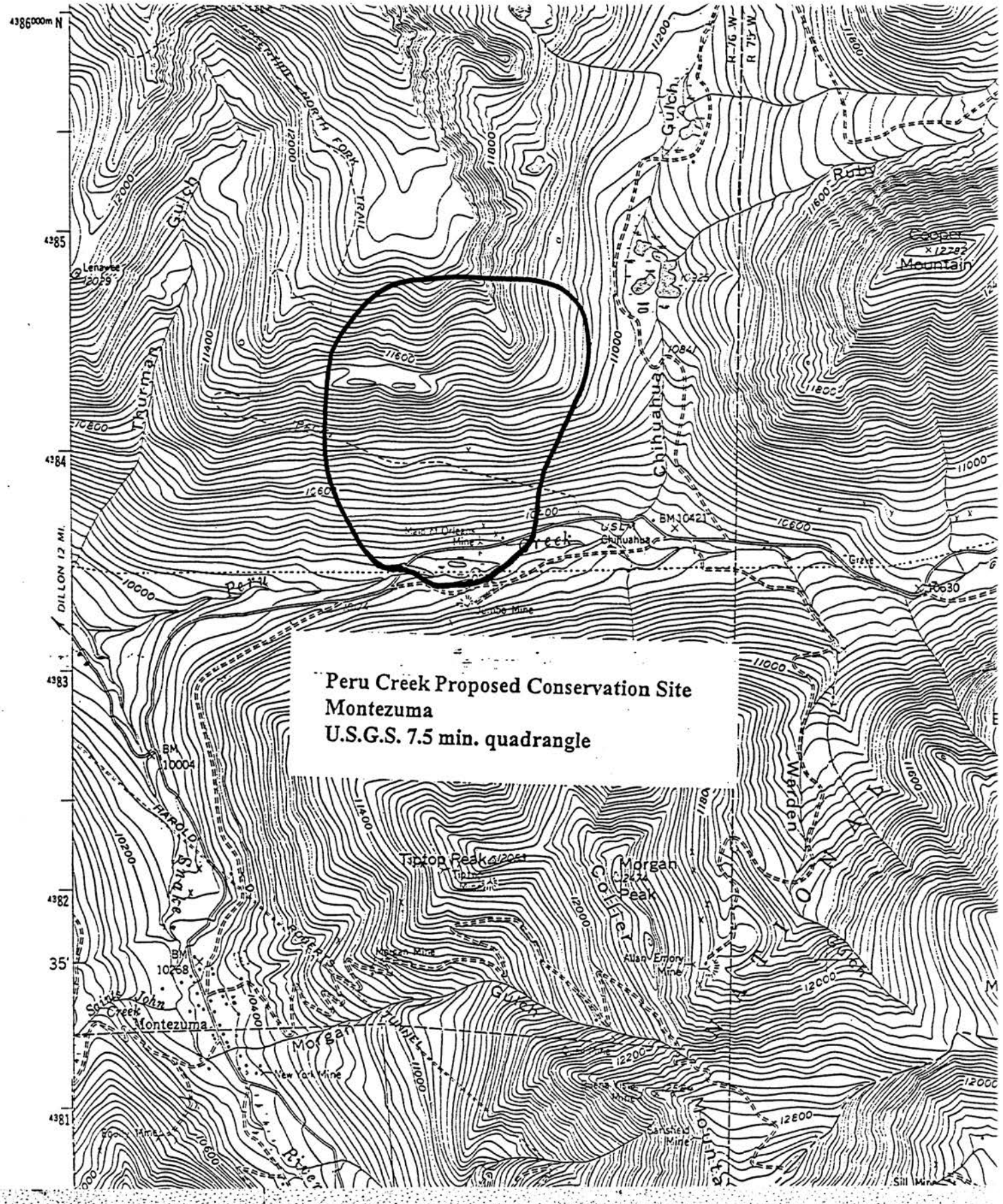
Element	Common Name	Global Rank	State Rank	Federal Status	State Status	Federal Sens.	EO* Rank
Bufo boreas boreas	**southern Rocky Mountain boreal toad**	**G5T2Q**	**S1**	**C**	**E**	**FS**	**A**

*EO=Element Occurrence

Boundary Justification: The boundary is drawn to encompass the elements, beaver ponds and upslope area along Lenawee Mountain to protect the occurrence and the hydrology which is the keystone to the viability of the boreal toad. Upslope of the ponds is included to provide an area of post-dispersal for the boreal toad. This site was drawn after a 1997 visit by a CNHP wetland ecologist. The boundary was further verified using a 1988 National Aerial Photography Program 1:40,000 infrared aerial photograph.

Protection Rank Justification: This site is located mainly on National Forest lands, but access is across private lands. The Summit County Small Reservoir Feasibility Study completed for Summit County government in September 1989 identified Peru Creek for a reservoir. No action has been taken of developing the wetlands to date. There are also potential plans for snow making operations at A-Basin that could affect the hydrology of Peru Creek. Increased traffic along the Peru Creek road could increase sedimentation of the beaver ponds.

Management Rank Justification: Management actions will need to occur within 5 years to prevent the loss of the boreal toad. Beaver need to be monitored so that the water level of the ponds are not increased to the degree that it is detrimental to the success of southern Rocky Mountain boreal toad reproduction. A Research Natural Area designation would ensure the long-term viability of this occurrence.


Peru Creek Proposed Conservation Site
Montezuma
U.S.G.S. 7.5 min. quadrangle

Loveland Pass

Biodiversity Rank: B3 (High significance)
There are five rare plant species, two globally rare and three state rare, and a historical record for a state rare butterfly within this site.

Protection Urgency Rank: P4
This site is within National Forest land and there are no threats known for the foreseeable future.

Management Urgency Rank: M4
Management is not needed now but may be needed in the future.

Location: Loveland Pass and an approximately three mile stretch of the Continental Divide between Summit and Clear Creek counties. To access the site, drive east from the town of Dillon on Highway 6, to the summit of Loveland Pass. From Loveland Pass hike three miles west on the Continental Divide. The site is on both sides of the divide and also includes a small area east of Loveland Pass.

U.S.G.S. 7.5 minute quadrangle: Loveland Pass
Legal Description: T4S R76W S33, 34, 35

General Description: This site includes alpine ridges and cirques containing dry rocky tundra and scree slopes of granitic rocks varying from pebbles to boulders. Native forbs and graminoids offer only sparse vegetative cover (about 25% cover). The site ranges from about 11,800 to 12,500 feet above sea level and is about 650 acres. Please see also Draft Porcupine RNA report (USFS 1997).

Biodiversity Rank Justification: This site includes six rare plant species, of which three are globally rare. The Rocky Mountain columbine is reported from three locations in Summit County, however, Loveland Pass is the only record with a specific location. All of the rare plant species occurrences in this site are considered to be in fair to good condition. Adding to the significance of this site is a state rare butterfly species, Polixenes arctic (*Oenies polixens*), which has only been historically reported in the general area.

Natural Heritage element occurrences at the Loveland Pass site.

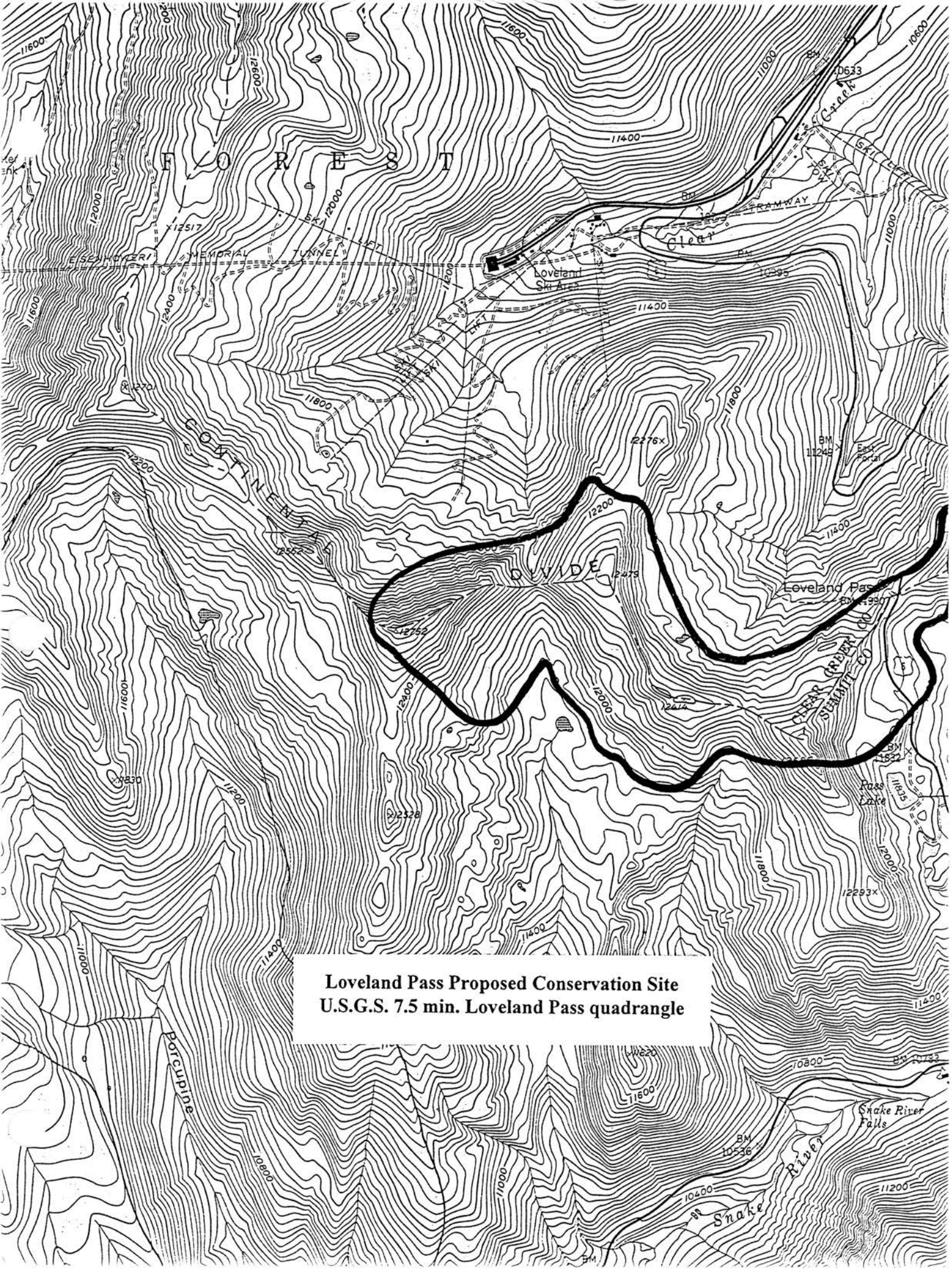
Element	Common Name	Global Rank	State Rank	Federal Status	State Status	Federal Sens.	EO* Rank
Draba exunguiculata	**clawless draba**	**G3**	**S2**				**C**
Aquilegia saximontana	Rocky Mountain columbine	G3	S3				B
Draba globosa	rockcress draba	G3G4	S1				unranked
Draba lonchocarpa var. *lonchocarpa*	lancepod whitlow-grass	G4T4	S3				C
Crepis nana	dwarf hawksbeard	G5	S2				unranked
Crepis nana	dwarf hawksbeard	G5	S2				C
Oeneis polixenes	Polixenes arctic	G5	S3				H

*EO=Element Occurrence

Boundary Justification: This boundary is drawn to 1) protect the occurrences from direct impacts such as trampling or other surface disturbances; 2) provide suitable habitat where additional individuals can become established over time; and 3) include representation from each of the local alpine plant communities which may support a pollinator for one or more of the rare plant species.

Protection Rank Justification: This site is publicly owned and managed by the U.S. Forest Service and may be included within the proposed RNA for Porcupine Gulch. The site does not appear to be threatened currently. This status could change if the Continental Divide Trail is routed through this specific area.

Management Rank Justification: The level of disturbance from hiking activity should be monitored, especially right around Loveland Pass. Skiing occurs through early summer if the snow persists. Impacts from mountain goats have also been documented within the site boundaries.



Loveland Pass Proposed Conservation Site
U.S.G.S. 7.5 min. Loveland Pass quadrangle

Lowry Campground

Biodiversity Rank: B3 (High significance)
This site includes a globally rare plant species, mountain whitlow-grass (*Draba rectifructa*).

Protection Urgency Rank: P2
The threat of recreational development is possible within five years.

Management Urgency Rank: M1
Management of exotic species, and road and powerline maintenance is essential within one year to prevent loss of the occurrence.

Location: This site lies between the Snake River Arm and the Blue River Arm of Dillon Reservoir. Drive east from Dillon on Highway 6. Turn right on Swan Mountain Road. Turn left on Cove Boulevard, then right on Coachman Drive. Turn right onto a dirt road immediately before the trailer park. Walk up this road and through a fence with a U.S. Forest Service sign. Walk west through a small patch of sagebrush to a rock outcrop under the powerline, and adjacent to a small dirt road.

U.S.G.S. 7.5 minute quadrangle: Frisco
Legal Description: T5S R77W S21, 28, 29

General Description: This site includes large flat slabs of Pierre Shale lying on an east-facing, 20 degree slope which continues for approximately 0.5 miles. The rock outcrop covers about 30% of the slope, and 70% is comprised mainly of native forbs such as *Thermopsis, Mahonia repens, Potentilla, Antennaria, Eriogonum, Heterotheca*, and *Epilobium*. There are scattered lodgepole pine *(Pinus contorta*) and quaking aspen saplings (*Populus tremuloides*), along with sagebrush (*Artemisia tridentata*) and snowberry (*Symphoricarpos*). This area appears to have been burned and then cut. It appears that the aspens are coming in as a result of these disturbances and may be replaced with lodgepole at some point in the future. The plant communities adjacent to the site are dominated by lodgepole pine (*Pinus contorta*), quaking aspen (*Populus tremuloides*) and/or big sagebrush (*Artemisia tridentata*). The site is about 200 acres in size, and ranges in elevation from about 9000 to 9400 feet above sea level.

Biodiversity Rank Justification: This site includes a good occurrence of a globally rare mustard species in a somewhat degraded habitat that is surrounded by extensive recreational and residential developments.

Natural Heritage element at the Lowry Campground site.

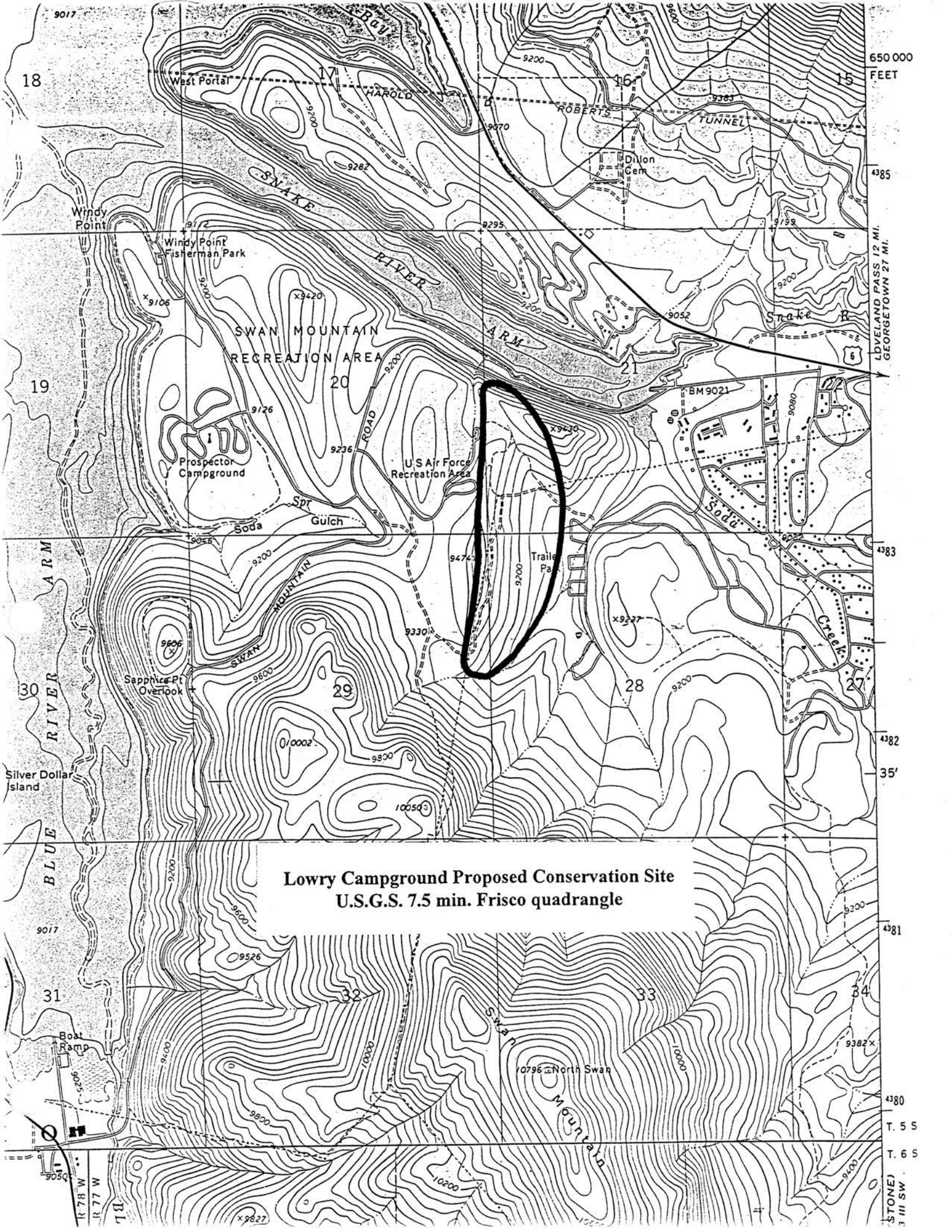
Element	Common Name	Global Rank	State Rank	Federal Status	State Status	Federal Sens.	EO* Rank
Draba rectifructa	**mountain whitlow-grass**	**G3**	**S2**				**B**

*EO=Element Occurrence

Boundary Justification: This site includes the Pierre shale rock outcrop (approximately 0.5 miles long) which supports the rare mustard species, as well as portions of the adjacent dominant plant communities. This boundary was drawn during a 1997 site visit by CNHP botanists. The boundary was further verified using a 1988 National Aerial Photography Program 1:40,000 infrared aerial photograph.

Protection Rank Justification: This site is publicly owned and managed by the U.S. Forest Service except for a small piece of private land on the northern end of the site. Expansion of the Lowry Campground or other developments by the USFS may destroy the site. The USFS is currently working on an environmental assessment for the County on the feasibility of a paved bike path through this area.

Management Rank Justification: Lowry Campground occurs at the top of this ridge formed by the Pierre Shale outcrop, just outside of the site boundary. Activities above may affect the rare plant occurrence by an increase in erosion. Trampling is a possible threat from recreationists. A powerline, telephone line and dirt road are directly adjacent to the rock outcrop and below the rare plant occurrence. A management plan for this species, in regard to the maintenance of this road and utility lines, should be implemented. A hay meadow occurs downslope of the occurrence and is the source of exotic grass species moving into this site. These weeds should be controlled and should be managed within the site boundaries.


Lowry Campground Proposed Conservation Site
U.S.G.S. 7.5 min. Frisco quadrangle
Ray
West Portal
HAROLD
ROBERTS
TUNNEL
Dillon
Gem
SNAKE
RIVER
Windy
Point
Windy Point
Fisherman Park
SWAN MOUNTAIN
RECREATION AREA
ARM
Snake R
LOVELAND PASS 12 MI.
GEORGETOWN 27 MI.
BM 9021
ROAD
Prospector
Campground
U.S Air Force
Recreation Area
Spr
Gulch
Soda
Trailer
Pa
Soda
Creek
SWAN
MOUNTAIN
Sapphire Pt
Overlook
BLUE RIVER
ARM
Silver Dollar
Island
Boat
Ramp
10796 North Swan
Mountain
650 000
FEET
T. 5 S
T. 6 S
R 78 W
R 77 W

Sullivan Mountain

Biodiversity Rank: B3 (High significance)
Four small occurrences of four globally rare plant species are within this site.

Protection Urgency Rank: P3
This site falls within National Forest land with the exception of small private mining claims. Renewed mining activity may threaten this site in the future.

Management Urgency Rank: M4
Management is not needed now but may be needed in the future.

Location: Southeast of the town of Montezuma on the Continental Divide between Santa Fe and Landslide Peak. Despite the very small size of the site, it includes portions of Summit, Park and Clear Creek counties; most of the site is in Summit County.

U.S.G.S. 7.5 minute quadrangle: Montezuma
Legal Description: T6S R75W S 6
T6S R76W S 1

General Description: The Sullivan Mountain site follows an alpine ridge along the Continental Divide for about three miles, and includes three prominent summits, Sullivan Mountain (13,134 feet), Geneva Peak (13,266 feet), and Landslide Peak (13,238 feet). The site is characterized by high alpine slopes covered with various sizes of boulders and scree slopes. The rocks are granitic and support a sparse vegetation cover. The dominant plant species include nailwort and alpine sandwort (*Paronychia pulvinata* and *Lidia obutsiloba)*. The rocky areas also support occurrences of two plant species that are known only from Colorado. The site is about 600 acres in size and ranges in elevation from about 12,400 to the summit of Geneva Peak at 13,266 feet above sea level.

Biodiversity Rank Justification: This site includes small occurrences of four globally rare plant species.

Natural Heritage element occurrences at the Sullivan Mountain site.

Element	Common Name	Global Rank	State Rank	Federal Status	State Status	Federal Sens.	EO* Rank
Draba grayana	**Grays Peak whitlow-grass**	**G2**	**S2**				**C**
Draba exunguiculata	clawless draba	G3	S2				C
Draba streptobrachia	Colorado Divide whitlow-grass	G3	S3				C
Draba crassa	thick-leaf whtlow-grass	G3	S3				D

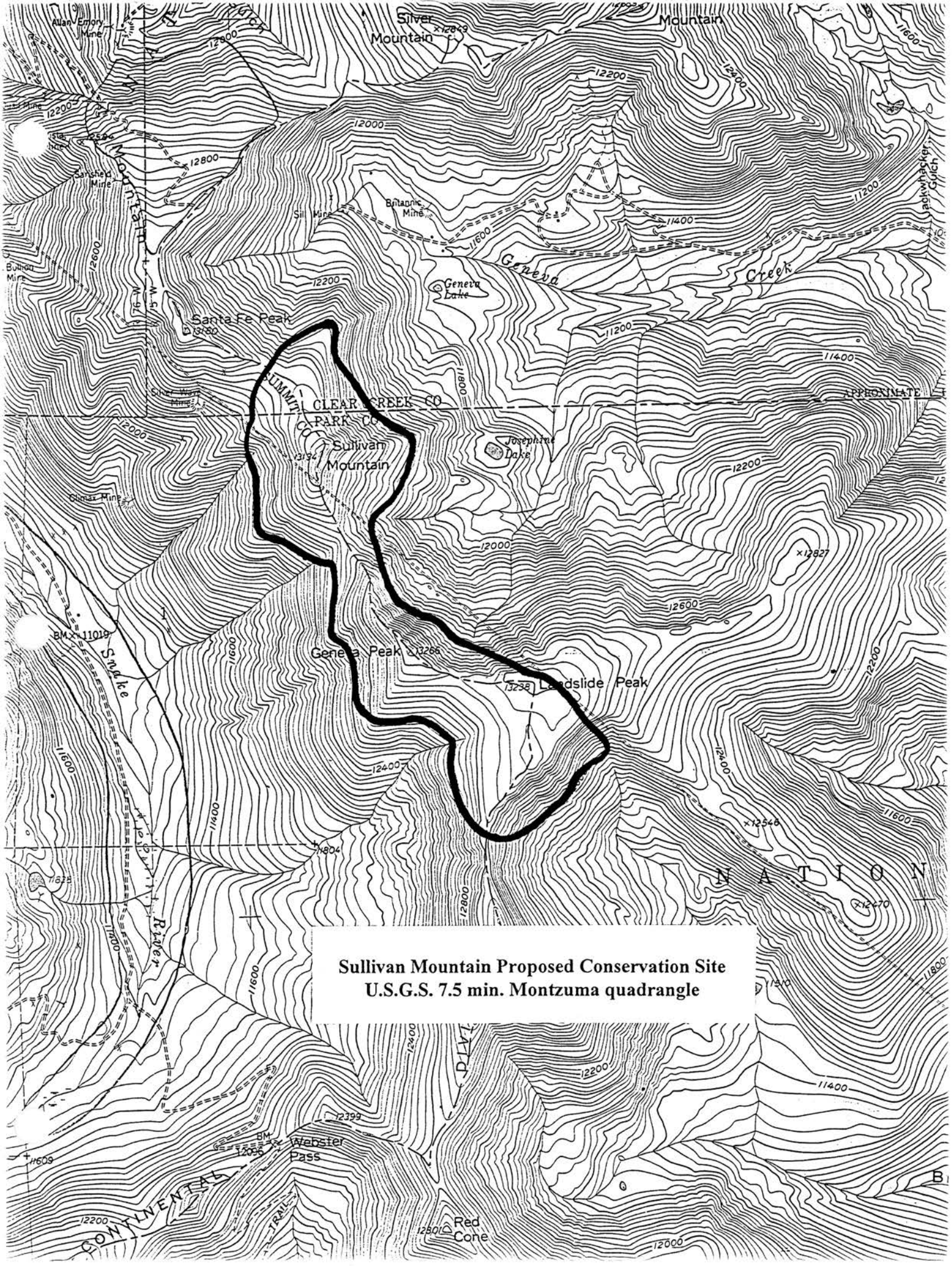
*EO=Element Occurrence

Boundary Justification: This boundary is drawn to 1) protect the occurrences from direct impacts such as trampling or other surface disturbances; 2) provide suitable habitat where

additional individuals can become established over time; and 3) include representation from each of the local alpine plant communities which may support a pollinator for one or more of the rare plant species. The boundary was delineated using 1988 National Aerial Photography Program 1:40,000 infrared aerial photographs.

Protection Rank Justification: This site is publicly owned and managed by the U.S. Forest Service with the exception of small inholdings which are privately owned. These inholdings should be acquired by the U.S. Forest Service to ensure that renewed mining activities do not threaten these occurrences. The Continental Divide Trail is proposed and may pass through this area. This construction and subsequent trail improvements could disturb and/or destroy part or all of these occurrences.

Management Rank Justification: The Continental Divide Trail is proposed and may pass through this area. This construction and subsequent trail improvements could disturb and/or destroy part or all of these occurrences. Nonetheless, a well-planned trail designed to minimize impacts to the rare plant species, may be an appropriate management tool in this site.



Sullivan Mountain Proposed Conservation Site
U.S.G.S. 7.5 min. Montzuma quadrangle

Teller Mountain

Biodiversity Rank: B3 (High significance)
This site includes eight occurrences of globally and state imperiled plant species.

Protection Urgency Rank: P3
This site falls within National Forest land with the exception of small private mining claims. Renewed mining activities may threaten this site in the future.

Management Urgency Rank: M3
Management actions are needed in regards to recreation uses within five years to maintain the quality of the site.

Location: Summit and Park counties. South of Montezuma. To reach Teller Mountain/Radical Hill, drive from Montezuma up the Deer Creek Road. Continue to the top of the flat ridgetop. There are roads which continue in all directions on top. To reach the Missouri Mine drive up the road following the North Fork of the South Platte River, Hall Valley.

U.S.G.S. 7.5 minute quadrangle: Montezuma
Legal Description: T6S R76W S 2, 10, 11,14, 15, 22, 23

General Description: Teller Mountain extends for approximately 2 miles as a long flat ridge following the Continental Divide. This flat ridgetop (12,400 feet) fingers out between four major drainages (Deer Creek, North Fork of the South Platte River, Snake River, and Middle Fork of the Swan River) and then drops 1000 feet to the valley floors. There are two summits on Teller Mountain: one reaches 12,615 feet, and the other just below at 12,602 feet. The ridge is predominantly covered by dry alpine meadow communities which support three state rare plant species. The cliffs and cirques below the ridge are also excellent rare plant habitat and are known to support three other rare plant species. This site includes approximately 1800 acres.

Biodiversity Rank Justification: The Teller Mountain site is botanically significant and includes occurrences of globally and state rare plant species. A fair example of a globally rare mustard, Grays Peak whitlow-grass (*Draba grayana*), is the species of primary concern. Also of global importance is Weber saussurea (*Saussurea weberi)* which is a globally rare species with 21 known locations, all in Summit and Park counties. This site contains two locations of the alpine poppy (*Papaver lapponicum* ssp. *occidentale)* in two distinct habitats. The alpine poppy is typically known from steep scree slopes, but occasionally is found in alpine meadows. This site contains one occurrence in each habitat type, making this site unique for this species. Found with the alpine poppy is the best occurrence known of sea pink *(Armeria maritima* ssp. *sibirica*) in Summit County. Along with the sea pink, another state rare species which is found on the steep scree slopes adjacent to the alpine meadow, is the northern rockcress (*Draba borealis*). Porter feathergrass (*Ptilagrostis mongholica* ssp. *porteri*), a globally rare plant subspecies, and the Rocky Mountain snowlover (*Chionophila jamesii*), a watchlisted species by CNHP, are also found within this site. Adding to the significance of this site, is a state rare butterfly species which has only been historically reported in the general area.

Natural Heritage element occurrences at the Teller Mountain site.

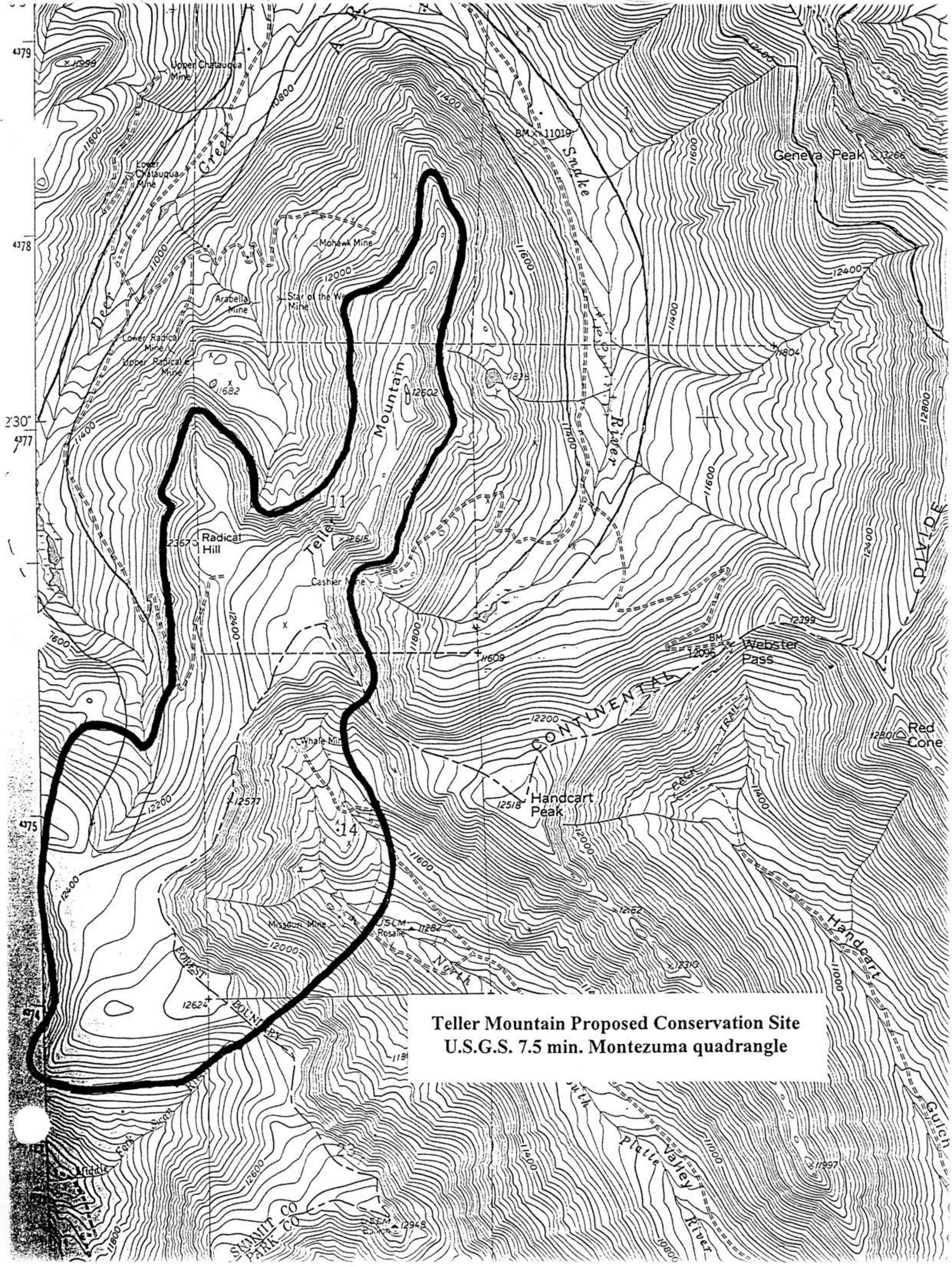
Element	Common Name	Global Rank	State Rank	Federal Status	State Status	Federal Sens.	EO* Rank
Draba grayana	**Grays Peak whitlow-grass**	**G2**	**S2**				**C**
Ptilagrostis mongholica ssp. *porteri*	Porter feathergrass	G3G5 T2	S2			FS	unranked
Saussurea weberi	Weber saussurea	G3Q	S2				C
Saussurea weberi	Weber saussurea	G3Q	S2				unranked
Draba borealis	northern rockcress	G4	S2				C
Chionophila jamesii	Rocky Mountain snowlover	G4?	S3S4				unranked
Papaver lapponicum ssp. *occidentale*	alpine poppy	G4T4	S2				A
Oeneis polixenes	Polixenes arctic	G5	S3				H
Armeria maritima ssp. *sibirica*	sea pink	G5T5	S1			FS	A

*EO=Element Occurrence

Boundary Justification: This boundary is drawn to 1) protect the occurrences from direct impacts such as trampling or other surface disturbances; 2) provide suitable habitat where additional individuals can become established over time; and 3) include representation from each of the local alpine plant communities which may support a pollinator for one or more of the rare plant species. The boundary was delineated using a 1988 National Aerial Photography Program 1:40,000 infrared aerial photograph following a 1997 site visit by CNHP botanists.

Protection Rank Justification: This site is publicly owned and managed by the U.S. Forest Service with the exception of small inholdings which are privately owned. These inholdings should be acquired by the USFS to ensure that renewed mining activities do not threaten these occurrences.

Management Rank Justification: Recreational uses, including mountain bikes, dirt bikes, and four wheel drive vehicles, are high in this area. Recreational vehicles should be limited to the already existing roads. The Continental Divide Trail is proposed to pass through this site. Four of the eight rare plant occurrences are adjacent to or bisected by existing roads. Off-trail/road activities and mountain goat grazing may destroy parts or all of one or more of these rare plant occurrences. Exotic plant species should be controlled before they spread to the top of the ridge.



Teller Mountain Proposed Conservation Site
U.S.G.S. 7.5 min. Montezuma quadrangle

Argentine Peak

Biodiversity Rank: B4 (Moderate significance)
Two alpine rare plant species are documented in this site. The alpine poppy (*Papaver lapponicum var. occidentale*) is a state rare species and the thick-leaf whitlow-grass (*Draba crassa*) is a globally rare Colorado endemic.

Protection Urgency Rank: P3
This site falls within National Forest land with the exception of small private mining claims. Renewed mining activities may threaten this site in the future.

Management Urgency Rank: M3
Management of recreational uses is needed within five years to maintain the quality of the site.

Location: This site occurs primarily along the west slope of the Continental Divide in Summit County, with a very small portion of the site extending to the east slope of the divide into Clear Creek County. The site includes the summit of Argentine Peak. Access the site at the Argentine Pass trailhead which is located in Horseshoe Basin on the west side of the divide, at the base of Grays Peak and Argentine Peak.

U.S.G.S. 7.5 minute quadrangle: Montezuma
Legal Description: T5S R75W S 15, 16, 22

General Description: Along the Continental Divide, Argentine Peak rises to 13,738 feet above sea level. Just below this peak, the Argentine Trail follows a steep, west-facing, granitic scree slope with sparse vegetation. Most of the slopes in the site are west-facing, as well as some south and east-facing slopes. The site includes about 600 total acres, and ranges from about 11,800 feet to the summit of Argentine Peak.

Biodiversity Rank Justification: The Argentine Peak site includes a small occurrence of a Colorado endemic plant species, the thick-leaf whitlow-grass (*Draba crassa*). The alpine poppy (*Papaver lapponicum* ssp. *occidentalis*) was also reported here; however, only two individual plants were observed and therefore, the viability of this species at this site is questionable.

Natural Heritage element occurrences at the Argentine Peak site.

Element	Common Name	Global Rank	State Rank	Federal Status	State Status	Federal Sens.	EO* Rank
Draba crassa	**thick-leaf whitlow-grass**	**G3**	**S3**				**C**
Papaver lapponicum ssp. *occidentale*	alpine poppy	G4T5	S2				D

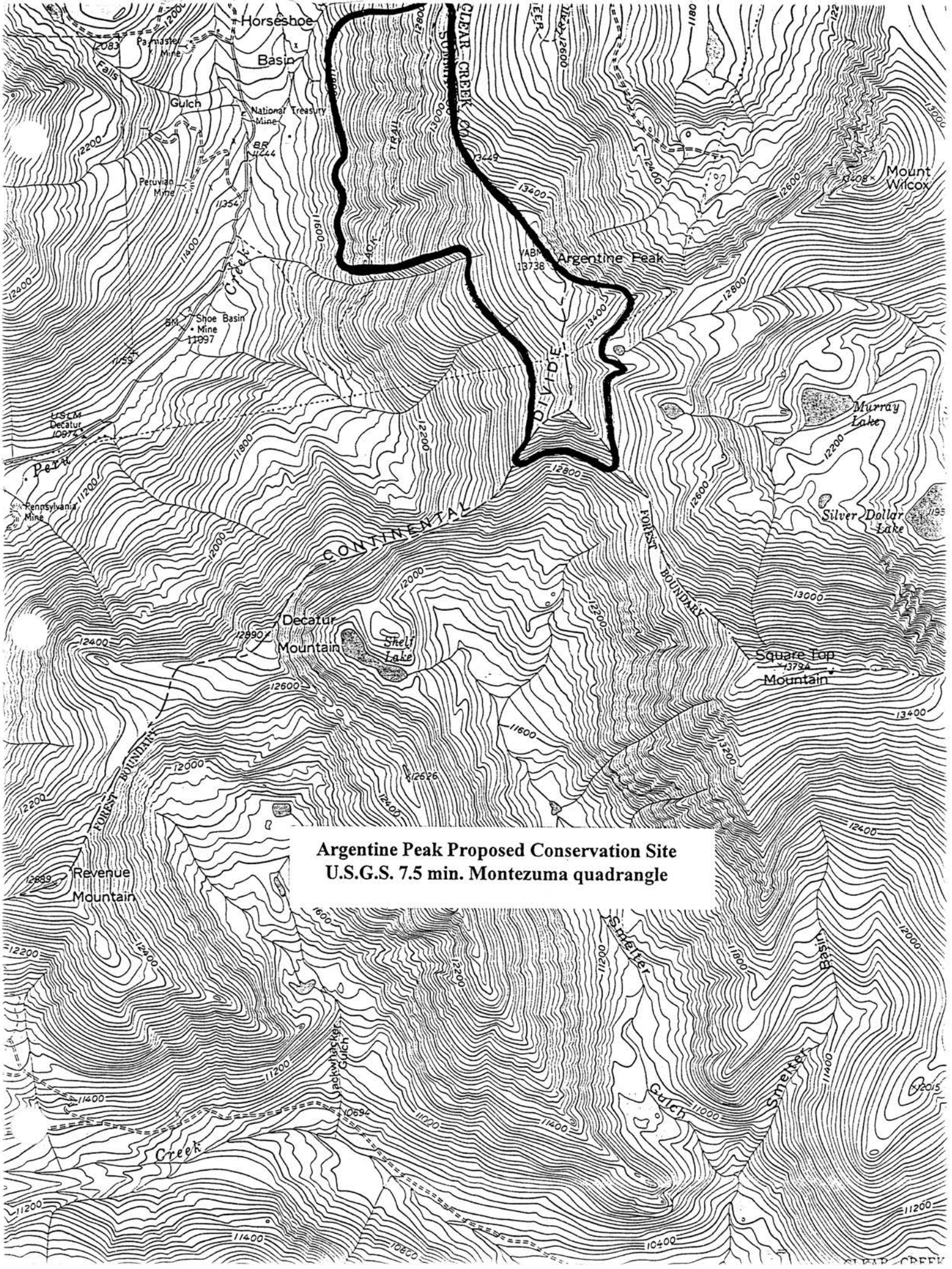
*EO=Element Occurrence

Boundary Justification: This boundary is drawn to 1) protect the occurrences from direct impacts such as trampling or other surface disturbances; 2) provide suitable habitat where

additional individuals can become established over time; and 3) include representation from each of the local alpine plant communities which may support a pollinator for one or more of the rare plant species. The boundary was delineated using a 1988 National Aerial Photography Program 1:40,000 infrared aerial photograph.

Protection Rank Justification: This site is publicly owned and managed by the U.S. Forest Service with the exception of small inholdings which are privately owned. These inholdings should be acquired by the U.S.F.S. to ensure that renewed mining activities do not threaten these occurrences.

Management Rank Justification: The Continental Divide Trail is proposed to pass through the site, and would include the existing historical Argentine Pass Road (Argentine Trail). This proposal would include trail improvements which may affect the rare plant occurrences. The area has also been trampled and grazed by introduced mountain goats. The full extent of the rare plant occurrences should be delineated, and a monitoring plan designed to detect changes in overall quality or condition of the occurrences should be established.



Argentine Peak Proposed Conservation Site
U.S.G.S. 7.5 min. Montezuma quadrangle

Collier Mountain

Biodiversity Rank: B4 (Moderate significance)
There are five small occurrences of five rare plant species, two of which are a global concern, within this site.

Protection Urgency Rank: P3
This site falls within National Forest land with the exception of small private mining claims. Renewed mining activities may threaten this site in the future.

Management Urgency Rank: M1
Management of recreational uses is essential within one year to prevent loss at this site.

Location: Collier Mountain east of Montezuma. From Montezuma, head east on the Morgan Gulch Road that passes south of Tiptop and Morgan Peaks. Park at the saddle between Morgan Peak and Santa Fe Peak. Walk southeast up the ridge to the north-facing slopes.

U.S.G.S. 7.5 minute quadrangle: Montezuma
Legal Description: T5S R75W S 30, 31
T5S R76W S 25, 36

General Description: This site includes a rocky alpine ridge along the Continental Divide between 12,000-13,000 feet above sea level with spectacular views of the entire Gore Range. These rock outcrops are surrounded by high quality communities dominated by tufted hairgrass/alpine avens (*Deschampsia cespitosa/Geum rossii*) and sibbaldia/alpine sandwort (*Sibbaldia procumbens/Lidia obutsiloba*). A few small rivulets from snowmelt run through the area and support a more mesic combination of plant species. There is extensive impact to the surrounding lands from historical mining and associated roads. The site is about 300 acres in size.

Biodiversity Rank Justification: This site contains small occurrences (few individuals) of two globally and three state rare plant species.

Natural Heritage element occurrences at the Collier Mountain site.

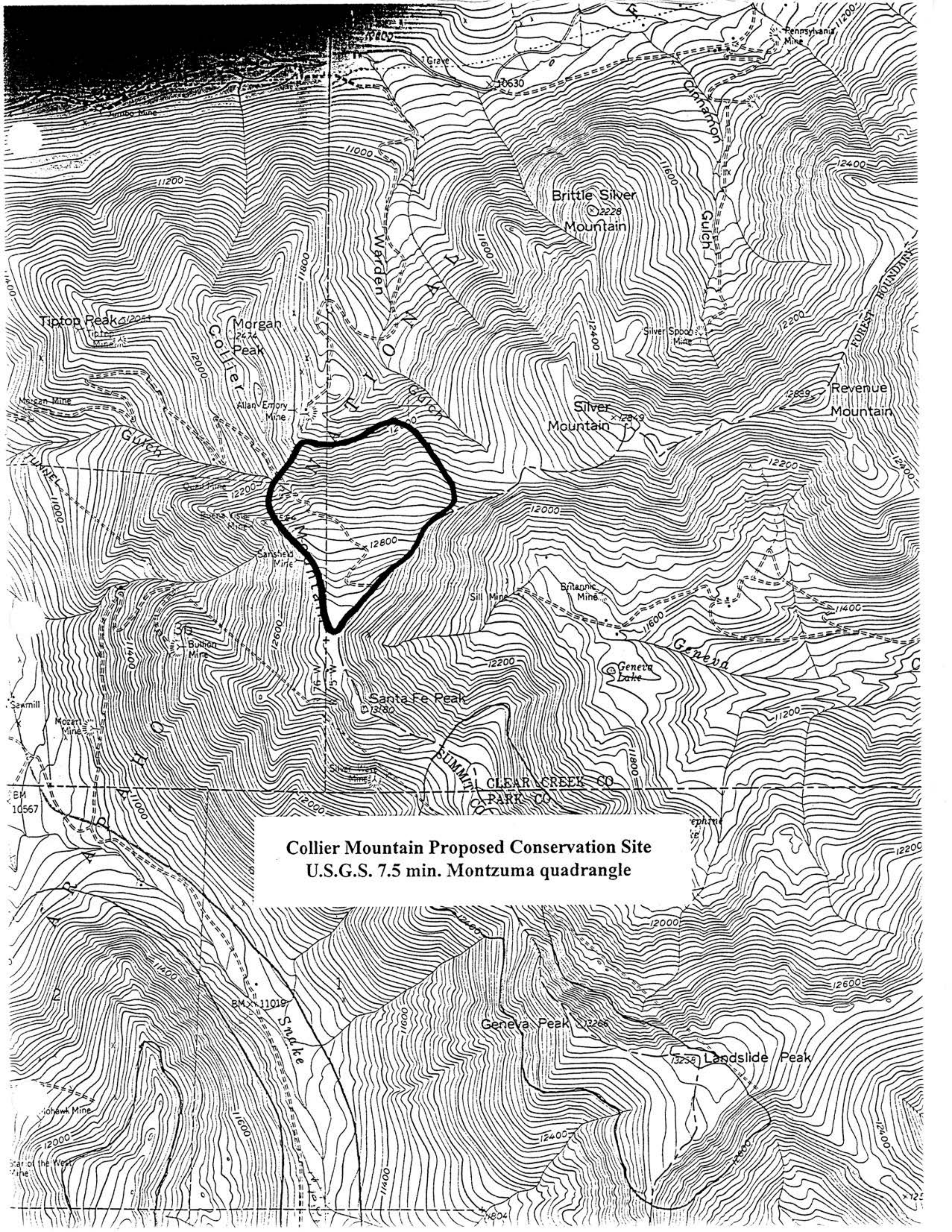
Element	Common Name	Global Rank	State Rank	Federal Status	State Status	Federal Sens.	EO* Rank
Draba exunguiculata	**clawless draba**	**G3**	**S2**				**C**
Draba crassa	thick-leaf whitlow-grass	G3	S3				D
Draba fladnizensis	arctic draba	G4	S2S3				C
Chionophila jamesii	Rocky Mountain snowlover	G4?	S3S4				unranked
Ranunculus karelinii	tundra buttercup	G4G5	S2				D

*EO=Element Occurrence

Boundary Justification: This boundary is drawn to 1) protect the occurrences from direct impacts such as trampling or other surface disturbances; 2) provide suitable habitat where additional individuals can become established over time; and 3) include representation from each of the local alpine plant communities which may support a pollinator for one or more of the rare plant species. The boundary was delineated using a 1988 National Aerial Photography Program 1:40,000 infrared aerial photograph following a 1997 site visit by a CNHP botanist.

Protection Rank Justification: This site is publicly owned and managed by the U.S. Forest Service with the exception of small inholdings which are privately owned. These inholdings should be acquired by the USFS to ensure that renewed mining activities do not threaten these occurrences.

Management Rank Justification: Recreation (mainly hunting) is the primary current land use and mining occurred in the area historically. The Continental Divide Trail is proposed for this area. The trail construction and improvements would likely detrimentally affect these rare plant occurrences. Nonetheless, a trail could be designed that would ultimately minimize impacts to the occurrences.



Collier Mountain Proposed Conservation Site
U.S.G.S. 7.5 min. Montzuma quadrangle

Soda Springs

Biodiversity Rank: B4 (Moderate significance)
The Soda Springs site supports a good example of a state rare montane willow carr. It is also excellent potential habitat for boreal toads.

Protection Urgency Rank: P3
The majority of the Soda Springs site is privately owned. The threats for development are high due to its location in a rapidly growing section of Summit County.

Management Urgency Rank: M4
Although not currently threatened, management may be needed in the future to maintain current quality of element occurrences. Management for beaver viability and potential southern Rocky Mountain boreal toad may need considered.

Location: 3.5 miles east of junction of Highway 6 and the Montezuma Road
U.S.G.S. 7.5 minute quadrangle: Keystone; Montezuma
Legal Description: T5S R76W Section 22, 23

General Description: The Soda Springs site is located at the base of Porcupine Peak. Thurman Gulch bisects the site and the Snake River forms the southern border. It supports an extensive willow carr (approximately 300 acres) at an elevation of 9760 feet. The wetland supports a series of beaver ponds that are fed by several springs that flow from the base of Porcupine Mountain. The water flow from the springs supports a small fen and a subalpine scrub (*Salix brachycarpa*/mesic forb) community. There is a powerline that bisects the site and a housing development (5-6 homes) to the west. The Montezuma Road borders the site to the south.

Biodiversity Rank Justification: The Soda Springs site supports a good example of a state rare montane riparian willow carr (*Salix drummondiana/Carex utriculata*). The site contains excellent southern Rocky Mountain boreal toad (*Bufo boreas boreas*) habitat and was searched in 1997 with negative results.

Natural Heritage element occurrences at the Soda Springs site.

Element	Common Name	Global Rank	State Rank	Federa Status	State Status	Federal Sens.	EO* Rank
Salix drummondiana/ Carex utriculata	**montane riparian willow carr**	**GU**	**S3**				**B**

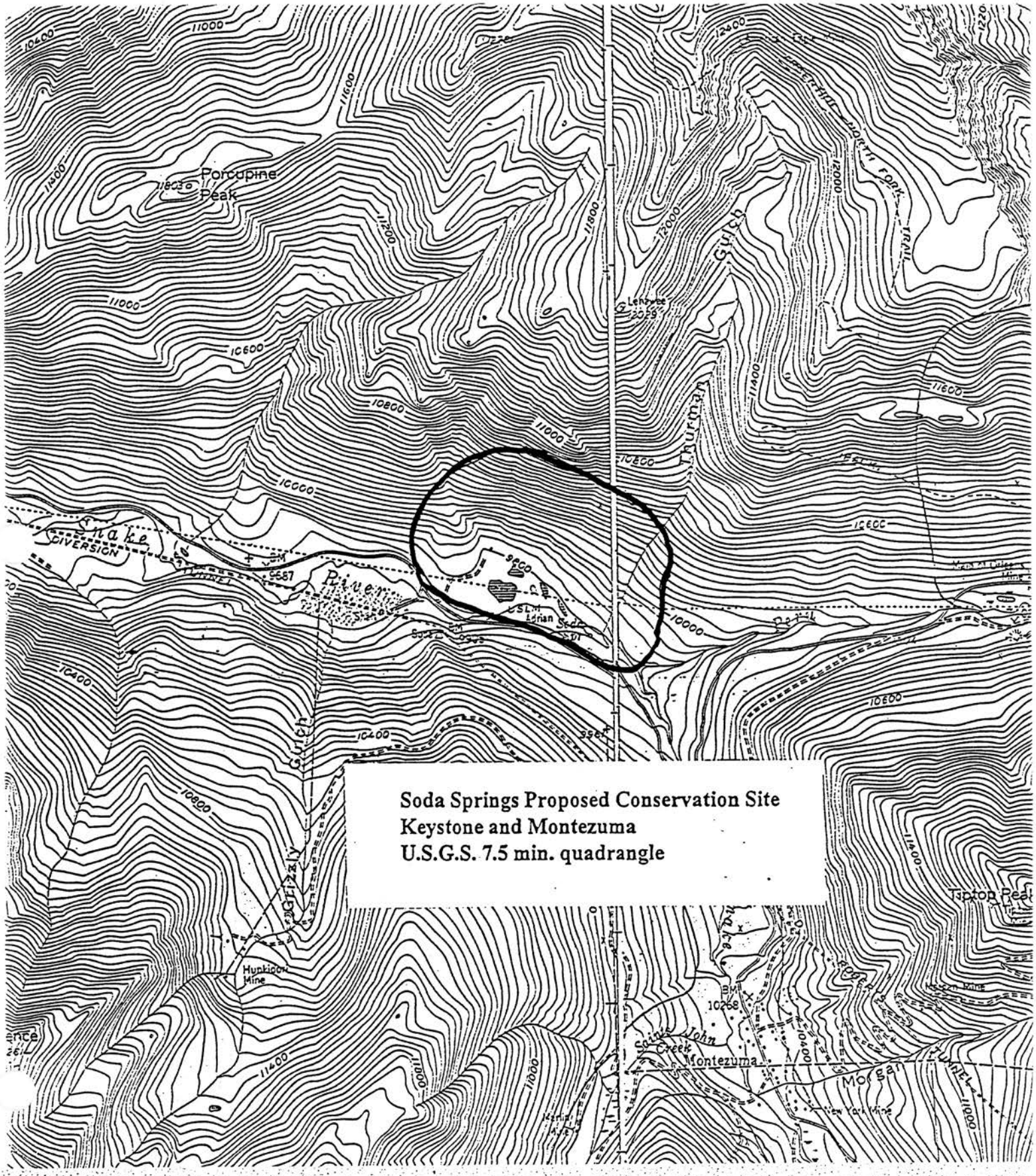
*EO=Element Occurrence

Boundary Justification: The boundary drawn encompasses the beaver ponds and extends south to the Snake River. The north boundary is drawn 0.5 mi. above the ponds to provide a buffer for the wetland to protect from disturbances e.g., mining and residential development. A much larger area should be considered in any long-term management or protection plan to protect the hydrology of the site. This site was drawn after a 1997 visit by a CNHP wetland

ecologist. The boundary was further verified using a 1988 National Aerial Photography Program 1:40,000 infrared aerial photograph.

Protection Rank Justification: The only definable threat for this site is the expansion of the residential area and this would likely take place within the next 5 years. A conservation easement should be considered due to the good potential habitat for the southern Rocky Mountain boreal toad.

Management Rank Justification: There do not appear to be any current management issues. The hydrology of this site is important to the protect the ecological processes which support the riparian communities. The water quality, quantity, and timing should be maintained at its current status.



Soda Springs Proposed Conservation Site
Keystone and Montezuma
U.S.G.S. 7.5 min. quadrangle

Porcupine Gulch

Biodiversity Rank: B5 (General biodiversity interest)
This site includes a good occurrence of a state rare willow carr.

Protection Urgency Rank: P4
This site is publicly owned and managed by the U.S.F.S. and there are no threats in the foreseeable future.

Management Urgency Rank: M4
Management is not needed now but may be needed in the future.

Location: Southwest of Loveland Pass on Highway 6.
U.S.G.S. 7.5 minute quadrangle: Loveland Pass
Legal Description: T5S R76W S 4, 5, 6, 7, 8, 9
T4S R76W S 31, 32

General Description: Porcupine Gulch is a south-facing drainage on the North Fork of the Snake River. The Gulch flows south over about three miles from about 12,000 feet above sea level to about 10,000 feet, through a mixed coniferous forest dominated by lodgepole pine (*Pinus contorta*), Engelmann spruce (*Picea engelmannii*), subalpine fir (*Abies lasiocarpa*), blueberry (*Vaccinium* sp.), and heart leaved arnica (*Arnica cordifolia*). The riparian area is dominated by willow species (*Salix* spp.) and sedge (*Carex* sp.) dominated mossy meadows. This site includes approximately 2000 acres.

Biodiversity Rank Justification: This site includes a good occurrence of a state rare willow carr. The range wide distribution of this community type is currently unknown.

Natural Heritage element occurrences at the Porcupine Gulch site.

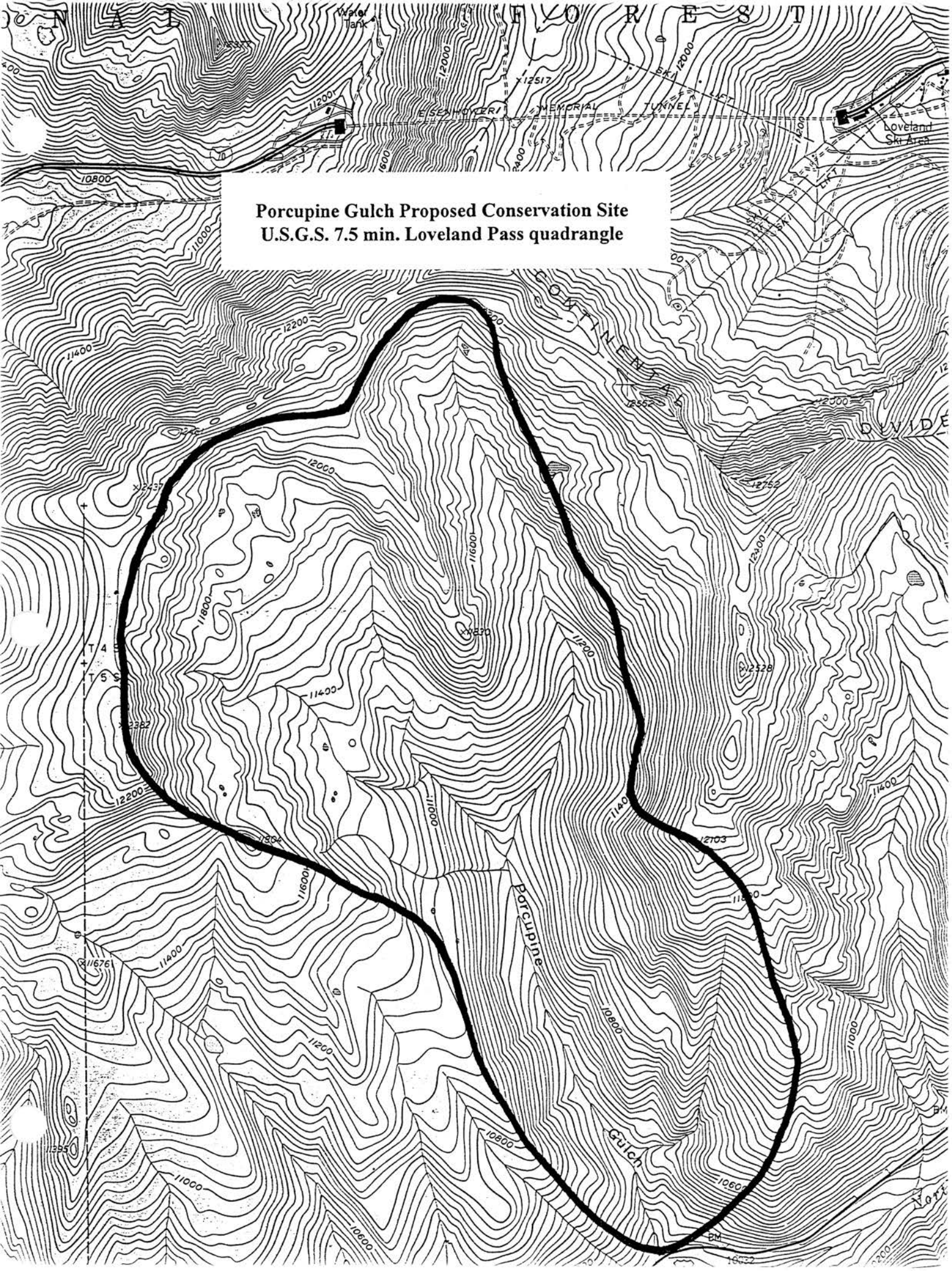
Element	Common Name	Global Rank	State Rank	Federal Status	State Status	Federal Sens.	EO* Rank
Salix monticola/mesic forb	**montane riparian willow carr**	**GU**	**S3**				**B**

*EO=Element Occurrence

Boundary Justification: The boundary is drawn to protect the riparian systems along Porcupine Gulch. The site includes the Gulch, all of its main tributaries, and the adjacent uplands to the nearest ridgeline. High elevation areas of the site should be visited to determine more specific boundary recommendations. The boundary was drawn using a 1988 National Aerial Photography Program 1:40,000 infrared aerial photograph. CNHP scientists visited the site in 1993.

Protection Rank Justification: This site is publicly owned and managed by the U.S. Forest Service and is within the proposed Porcupine Gulch RNA.

Management Rank Justification: Current management appears to be adequate. A trail parallels the creek, but does not appear to receive heavy visitor use. No exotic plant species were noted. The free-flowing nature of the stream should be maintained. Prevent timbering within the site.


Porcupine Gulch Proposed Conservation Site
U.S.G.S. 7.5 min. Loveland Pass quadrangle
Water Tank
EISENHOWER
MEMORIAL
TUNNEL
Loveland Ski Area
CONTINENTAL
DIVIDE
Porcupine
Gulch
T 4
T 5

Tenmile Creek Drainage

Meadow Creek

Biodiversity Rank: B2 (Very high significance)
The Meadow Creek site supports a mosaic of plant communities that includes a good example of a globally rare western slope sagebrush shrublands, an excellent occurrence of a globally common montane aspen forest, and a fair examples of a globally rare montane riparian willow carrs. There are several kettle ponds located throughout the site that support aquatic vegetation. There is a historical (1949) occurrence of a southern Rocky Mountain boreal toad and a 1994 occurrence of Colorado River cutthroat trout. The state rare Barrow's goldeneye nests within the site on Dillon Reservoir.

Protection Urgency Rank: P1
The majority of this site is privately owned with adjacent public lands. It is immediately threatened by severely destructive forces within 1 year that include: residential/commercial development, altered hydrology, and continued fragmentation of riparian communities.

Management Urgency Rank: M1
Management actions are required immediately or element occurrences could be lost or irretrievably degraded within one year.

Location: Northwest of the Town of Frisco
U.S.G.S. 7.5 minute quadrangle: Frisco
Legal Description: T5S R78W Sections 22, 23, 27, 26, 35

General Description: The Meadow Creek site is located between the Dillon Reservoir and the Gore Range. The site encompasses the northern portion of the Town of Frisco and portions of Giberson and Frisco Bays. The portion of the site northwest of Frisco and I-70, which is owned both privately and publicly, consists of a western slope sagebrush community (*Artemisia tridentata vaseyana/Festuca thurberi*). The willow carr (*Salix geyeriana/Calamagrostis canadensis*) that follows Meadow Creek is fragmented, but is an important functioning urban wetland. There are several kettle ponds scattered throughout the site that support aquatic vegetation e.g., pondweed (*Potamogeton gramineus*) and chorus frog (*Pseudacris triseriata*). The site is approximately 1,300 acres ranging in elevation from 9,017 to9,800 feet. The site is highly impacted by urban development, which includes commercial/residential development, road construction, and dam construction. Interstate 70 and Highway 9 bisect the site.

Biodiversity Rank Justification: The Meadow Creek site supports one of the best examples observed in Summit County of a globally common montane aspen forest (*Populus tremuloides*/tall forbs), a good example of a globally rare western slope sagebrush shrublands (*Artemisia tridentata vaseyana/Festuca thurberi*) and a fair example of a globally common montane riparian willow carr (*Salix drummondiana/Carex utriculata*). There are several kettle ponds, including one located in the Frisco Duck subdivision, located throughout the site that support aquatic vegetation e.g., pondweed (*Potamogeton gramineus*). The montane willow carr

(*Salix geyeriana/Carex aquatilis*) is located where Meadow Creek enters the reservoir on floodplain that was formerly a very extensive willow carr. The montane willow carr (*Salix drummondiana/Carex utriculata*) located between the sewage disposal ponds and Frisco Bay is a highly functioning wetland. There is a historical occurrence (1949) of the state endangered southern Rocky Mountain boreal toad (*Bufo boreas boreas*) and a 1994 occurrence of the state rare Colorado River cutthroat trout (*Oncorhynchus clarki pleuriticus*), a U.S. Forest Service sensitive and state special concern species. There is a 1990 occurrence of the Barrow's goldeneye (*Bucephala islandica*), a state special concern species, located between Giberson and Frisco Bays on Dillon Reservoir.

Natural Heritage element occurrences at the Meadow Creek site.

Element	Common Name	Global Rank	State Rank	Federa Status	State Status	Federal Sens.	EO* Rank
Artemisia cana/Festuca thurberi	**western slope sagebrush shrublands**	**G2G3**	**S2S3**				**B**
Bucephala islandica	Barrow's goldeneye	G5	S2B, SZN		SC		unranked
Bufo boreas boreas	southern Rocky Mountain boreal toad	G4T1Q	S1	C	E	FS	Historical
Oncorhynchus clarki pleuriticus	Colorado River cutthroat trout	G5T3	S3		SC	FS	unranked
Populus tremuloides/tall forbs	montane aspen forest	G5	S5				A
Salix drummondiana/ Carex utriculata	lower montane riparian willow carr	GU	S3				C
Salix geyeriana/Carex aquatilis	montane willow carr	G3	S3				C

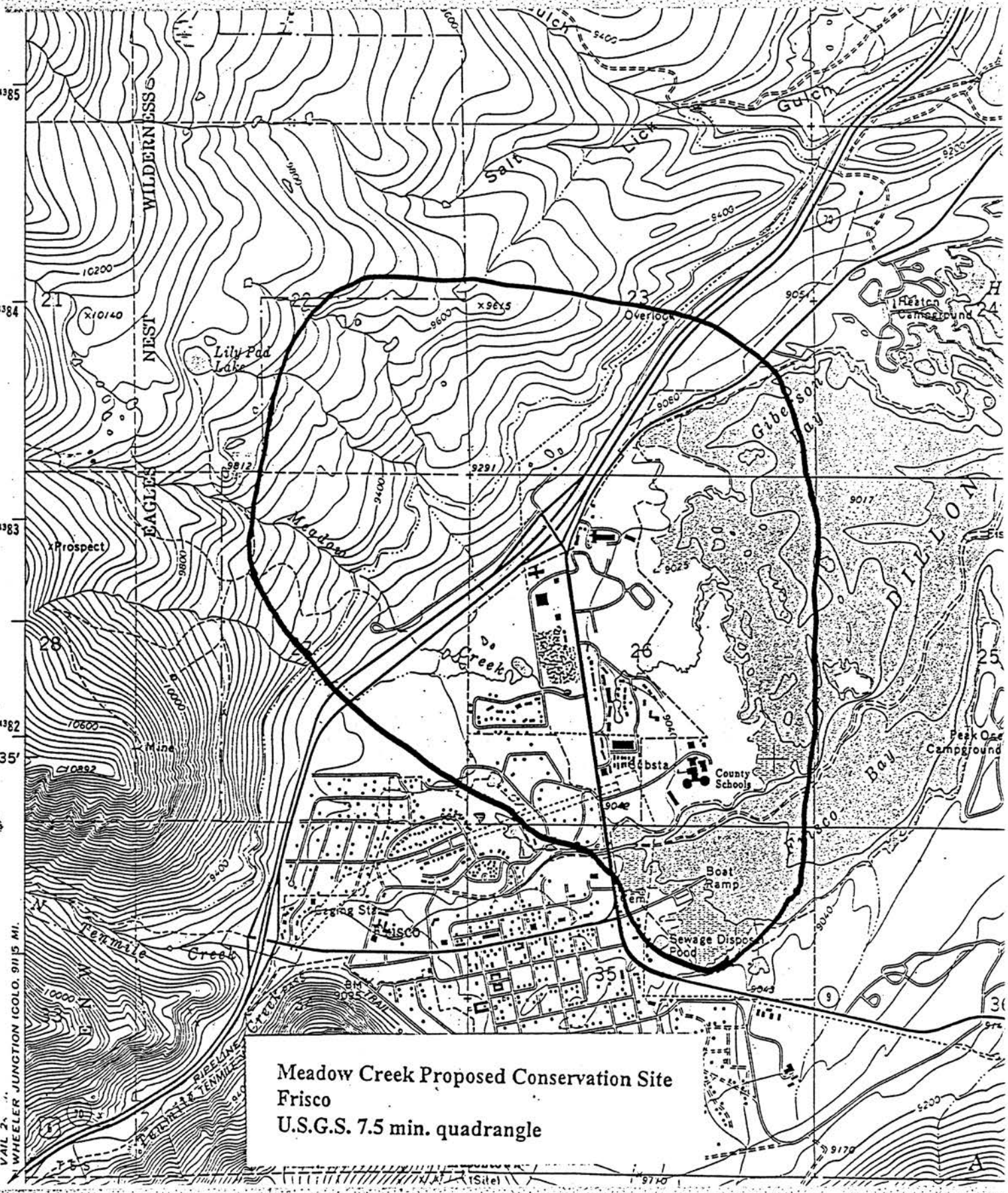
*EO=Element Occurrence

Boundary Justification: The boundary is drawn to encompass all the elements and to provide a buffer of 1,000 feet to protect the site from immediate impacts to the hydrology or waterway of the site. The Town of Frisco is incorporated within the site to illustrate the importance of this site to town management of its open space. A much larger area should be considered in any long-term management or protection plan to protect the hydrological regime. This site was drawn after a 1997 visit by a CNHP wetland ecologist. The boundary was further verified using a 1988 National Aerial Photography Program 1:40,000 infrared aerial photograph.

Protection Rank Justification: This site is immediately threatened by severely destructive forces within 1 year. The main threats are continued expansion of urban sprawl, fragmentation and alteration of hydrology, road construction and maintenance, and filling of wetlands. Consideration for open space designation would be appropriate for this site.

Management Rank Justification: Management action is required immediately or element occurrences could be lost or irretrievably degraded within one year. Actions could include beaver management and monitoring of water quality. The hydrology of this site is important to the ecological processes which support the riparian communities. The water quality, quantity,

and timing should be maintained at its current status. Control of exotic plant species along the trails is necessary to maintain the integrity of native grass composition.



Meadow Creek Proposed Conservation Site
Frisco
U.S.G.S. 7.5 min. quadrangle

North Tenmile Creek

Biodiversity Rank: B2 (Very high significance)
This site includes two occurrences of the boreal toad (*Bufo boreas boreas*) which is a globally rare subspecies. A state rare orchid is also within the boundaries.

Protection Urgency Rank: P3
Water manipulations on Tenmile Creek are expected within five years and would threaten the site.

Management Urgency Rank: M2
Management regarding the recreational uses within this site is essential within five years to maintain the quality of the site.

Location: Eagles Nest Wilderness in the White River National Forest. Take the Frisco Main Street exit (201) from Interstate 70. Park at the Tenmile Creek Trailhead which is on the north side of Interstate 70. Walk approximately 0.5 miles up the trail to the far eastern end of the site.

U.S.G.S. 7.5 minute quadrangles: Vail Pass and Frisco
Legal Description: T5S R78W S 28, 31, 32, 33, 34
T5S R79W S 23, 25, 26, 35, 36

General Description: North Tenmile Creek is one of the primary drainages that flows from the east slope of the Gore Range. The riparian areas are dominated by willows (*Salix* spp.), open wet meadows, and scattered beaver ponds. The north-facing slopes of the drainage support mature forests dominated by Engelmann spruce (*Picea engelmannii*) and subalpine fir (*Abies lasiocarpa*). The site ranges in elevation from about 9200 feet to about 12,000 feet above sea level, and is about 3600 acres in size.

Biodiversity Rank Justification: This site contains the only occurrence in Summit County of a state rare orchid, northern twayblade (*Listera borealis*), and two occurrences of a globally rare boreal toad subspecies (*Bufo boreas boreas*). The site also includes additional suitable habitat for both species in good to excellent condition.

Natural Heritage element occurrences at the Tenmile Creek site.

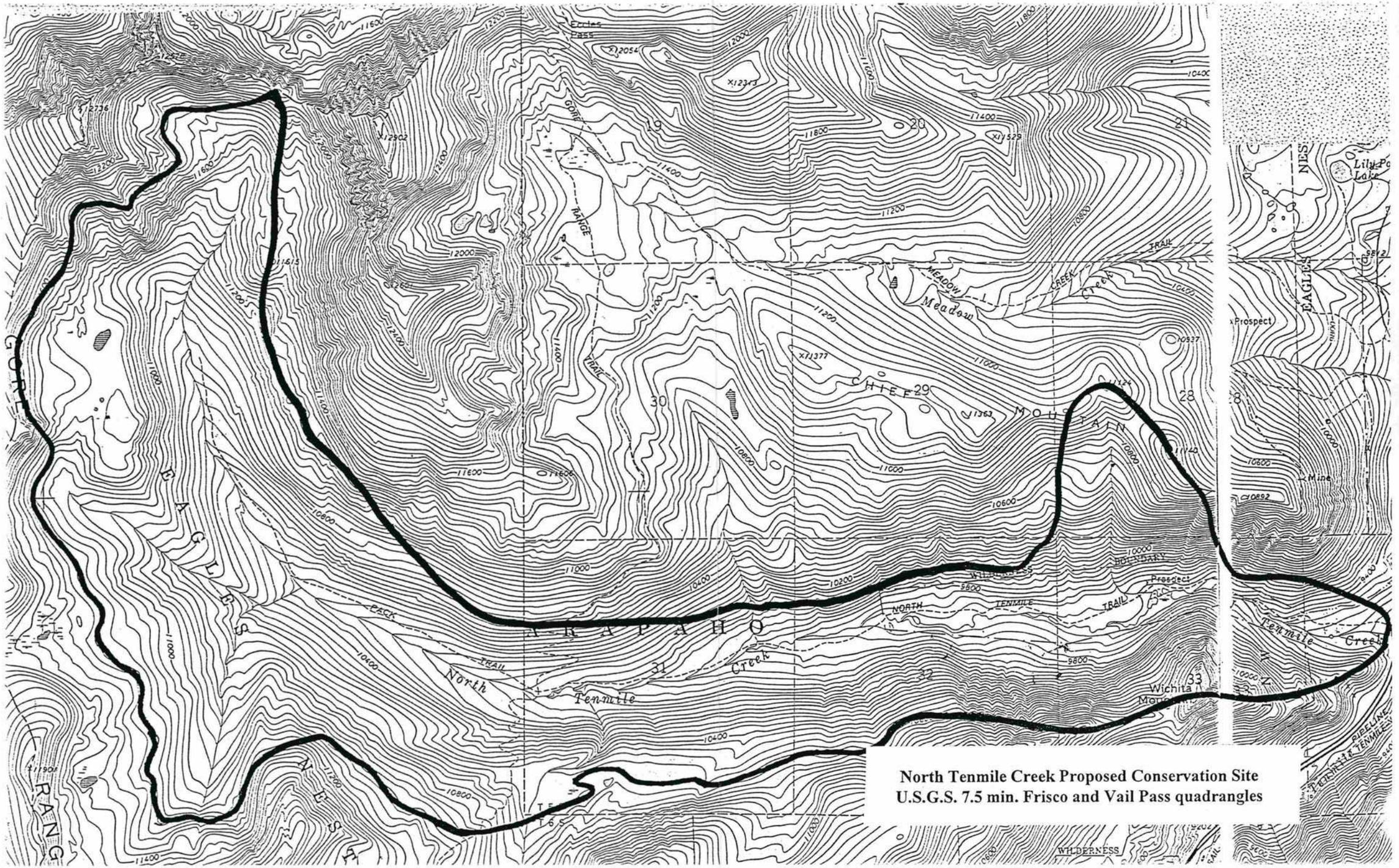
Element	Common Name	Global Rank	State Rank	Federal Status	State Status	Federal Sens.	EO* Rank
Bufo boreas boreas	boreal toad	G4 T1Q	S1		E	FS	D
Bufo boreas boreas	**boreal toad**	**G4 T1Q**	**S1**		**E**	**FS**	**B**
Listera borealis	northern twayblade	G4	S2				C

*EO=Element Occurrence

Boundary Justification: The boundary includes the contiguous aquatic and riparian areas which support habitat for the boreal toad (*Bufo boreas boreas*), as well as some adjacent north-facing spruce-fir (*Picea engelmannii-Abies lasiocarpa*) forests which provide habitat for the northern twayblade (*Listera borealis*). A narrow buffer is provided to prevent direct disturbance to these habitats and to include additional suitable habitat where the species of concern may become established over time. The boundary was drawn following a 1997 site visit by CNHP scientist. A 1988 National Aerial Photography Program 1:40,000 infrared aerial photograph was referenced to more precisely delineate the boundary.

Protection Rank Justification: This site is publicly owned and managed by the U.S. Forest Service. Special area designation should not be necessary for protection if management issues are adequately addressed.

Management Rank Justification: Recreational use is high and illegal camping is known to occur in the eastern portion of the site where there is a great deal of associated litter. Trails go across boggy sections of the drainage, which is the rare orchid habitat, and through the creek. This may destroy this rare plant habitat. There is no anticipated timber activity. The Denver Water Board has plans for trans-mountain water diversion which would dump more water in North Tenmile Creek from Piney River drainage via a tunnel. This change in the hydrological processes may affect the elements detrimentally. The hydrology of the site should be maintained including water quality, quantity, and timing to sustain site viability.



North Tenmile Creek Proposed Conservation Site
U.S.G.S. 7.5 min. Frisco and Vail Pass quadrangles

Clinton Creek

Biodiversity Rank: B3 (High significance)
The Clinton Creek site supports an excellent occurrence of the Colorado River cutthroat trout. It also supports excellent examples of globally common subalpine riparian willow carrs and a mesic alpine meadow. Mayflower Creek drainage supports occurrences of two state rare whitlow-grasses.

Protection Urgency Rank: P4
The Clinton Creek site is privately and publicly owned. Currently, the owners have no plans for the site. A conservation easement should be considered to protect the riparian, meadow, and rare plant habitat from future threats.

Management Urgency Rank: M2
Actions need to be taken within 5 years to control the introduced Snake River cutthroat trout. Additionally, beaver need to be reintroduced to ensure the viability of the willow communities.

Location: 8 miles south of Copper Mountain along Highway 91
U.S.G.S. 7.5 minute quadrangle: Copper Mountain
Legal Description: T7S R79W Sections 36, 25, 24
T7S R78W Sections 19, 30, 29, 32, 31
T8S R79W Section 1
T8S R78W Sections 6, 5

General Description: The Clinton Creek site contains two glacially carved valleys. Clinton and Mayflower creeks flow through the site. The Tenmile Range including Bartlett, Little Bartlett, and Fletcher Mountains border the site to the southeast. It consists of two subalpine riparian willow carrs (*Salix brachycarpa*/mesic forb and *Salix planifolia/Caltha leptosepala*) and an alpine mesic meadow (*Deschampsia cespitosa-Ligusticum tenuifolium*). There are a series of inactive beaver ponds along Clinton Creek before it enters Clinton Reservoir. Clinton and Mayflower creeks and their riparian communities are fed by numerous springs from both east and west slopes. Two rare plant species are known to occur in the large cirques above Mayflower Creek. The site is approximately 2,500 acres ranging in elevation from 11,200 to 12,400 feet.

There are several abandoned mines above the wetland and there is an abandoned fish weir where Clinton Creek enters the reservoir. The Clinton Reservoir was created in the 1960s with the construction of Highway 91. There are fishing access trails on both sides of the reservoir, but few venture into the thick willow carr.

Biodiversity Rank Justification: The Clinton Creek site supports an excellent occurrence of the Colorado River cutthroat trout (*Oncorhynchus clarki pleuriticus*), a U.S. Forest Service sensitive and state special concern species. This site also supports excellent examples of

subalpine riparian willow carr (*Salix brachycarpa*/mesic forb and *Salix planifolia/Caltha leptosepala*) and an alpine mesic meadow (*Deschampsia cespitosa-Ligusticum tenuifolium*). There are fair occurrences of two state rare whitlow-grasses (*Draba lonchocarpa* var. *lonchocarpa* and *Draba crassa*) located above Mayflower Creek.

Natural Heritage element occurrences at the Clinton Creek site.

Element	Common Name	Global Rank	State Rank	Federa Status	State Status	Federal Sens.	EO* Rank
Deschampsia cespitosa-Ligusticum tenuifolium	alpine wet meadow	G4	S4				A
Draba crassa	thick-leaf whitlow-grass	G3	S3				C
Draba lonchocarpa var. *lonchocarpa*	mustard	G4T4	S3				C
Oncorhynchus clarki pleuriticus	**Colorado River cutthroat trout**	**G5T3**	**S3**		**SC**	**FS**	**A**
Salix brachycarpa/ mesic forb	subalpine riparian willow carr	GUQ	S4				A
Salix planifolia/ Caltha leptosepala	subalpine riparian willow carr	G4	S4				A

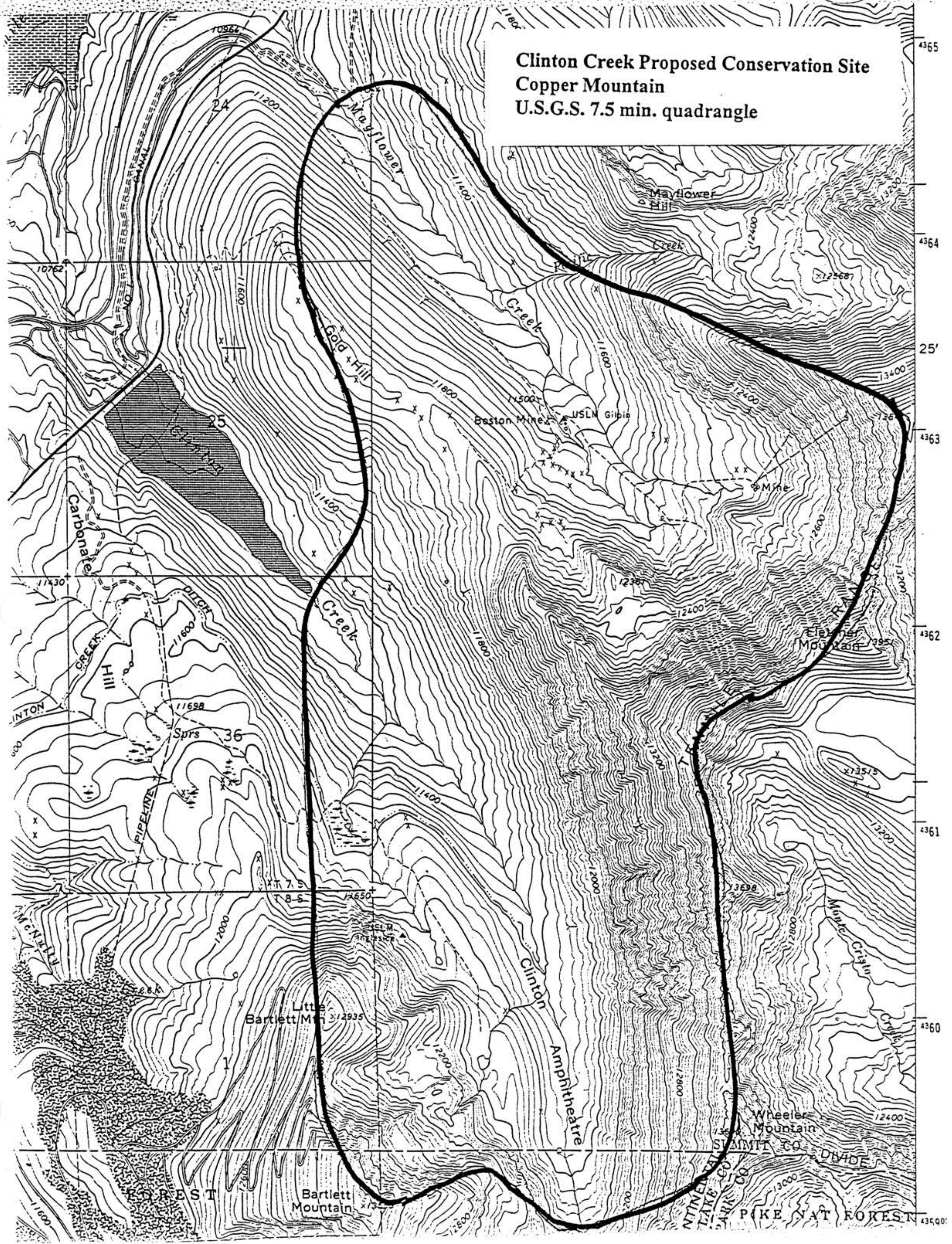
*EO=Element Occurrence

Boundary Justification: Boundaries drawn encompass the elements and the contiguous water way. A buffer of 1,000 feet is included to protect hydrology and water quality from direct impacts. The buffer will also protect occurrences from trampling or other surface disturbances for the rare plants and will provide suitable habitat where additional individuals can become established over time. This site was drawn after a 1997 visit by a CNHP wetland ecologist. The boundary was further verified using a 1988 National Aerial Photography Program 1:40,000 infrared aerial photograph.

Protection Rank Justification: The site is owned both privately and publicly. Currently, there are no known threats to the site from anthropogenic activities. However, the Snake River cutthroat trout has been introduced and could interbreed with the native trout in Clinton Creek.

Management Rank Justification: Recreation use (mountain biking, hiking, 4WD vehicles) is high in this site. There are multiple dirt roads which may be used for these activities and recreationists should be encouraged to stay on them. There are only a few exotic plants present e.g., dandelion (*Taraxacum officinale*). Management actions need to consider reintroducing beaver and managing for their longevity.

Clinton Creek Proposed Conservation Site
Copper Mountain
U.S.G.S. 7.5 min. quadrangle



Corral Creek

Biodiversity Rank: B5 (General or state-wide biodiversity interest)
A globally rare subspecies of trout occurs in this site.

Protection Urgency Rank: P4
This site falls within National Forest land and there are no threats known for the foreseeable future.

Management Urgency Rank: M4
Management is not needed now but may be needed in the future.

Location: Tenmile Creek drainage near Vail Pass. Corral Creek crosses Interstate 70 approximately 1 mile south of Vail Pass and flows into West Tenmile Creek. Hike up the trail paralleling Corral Creek from the interstate.

U.S.G.S. 7.5 minute quadrangle: Vail Pass
Legal Description: T6S R79W S10, 11, 14, 15, 22

General Description: From about 12,300 feet above sea level small tributaries drain from the west slope of the Gore Range into Corral Creek, which then meets West Tenmile Creek at approximately 10,400 feet. Engelmann spruce (*Picea engelmannii*) and subalpine fir (*Abies lasiocarpa*) dominate the slopes and willows (*Salix* spp.) dominate the riparian area. The site includes approximately 1200 acres.

Biodiversity Rank Justification: The Colorado River cutthrout trout (*Oncorhynchus clarki pleuriticus*) is a U.S. Forest Service Sensitive and a State Special Concern species. The introduction of non-native trout species, dating to 1872 in Colorado, is considered a primary cause for the decline in numbers and genetic purity of Colorado River cutthroat trout. The populations of Colorado River cutthroat that are still genetically intact are now a priority for conservation. Corral Creek is a small headwater stream which does contain brook trout, and the population of Colorado River cutthroat trout still seems to be genetically pure and therefore this is an important site for this species.

Natural Heritage element occurrences at the Corral Creek site.

Element	Common Name	Global Rank	State Rank	Federal Status	State Status	Federal Sens.	EO* Rank
Oncorhynchus clarki pleuriticus	Colorado River cutthroat	G4T3	S3		SC	FS	B

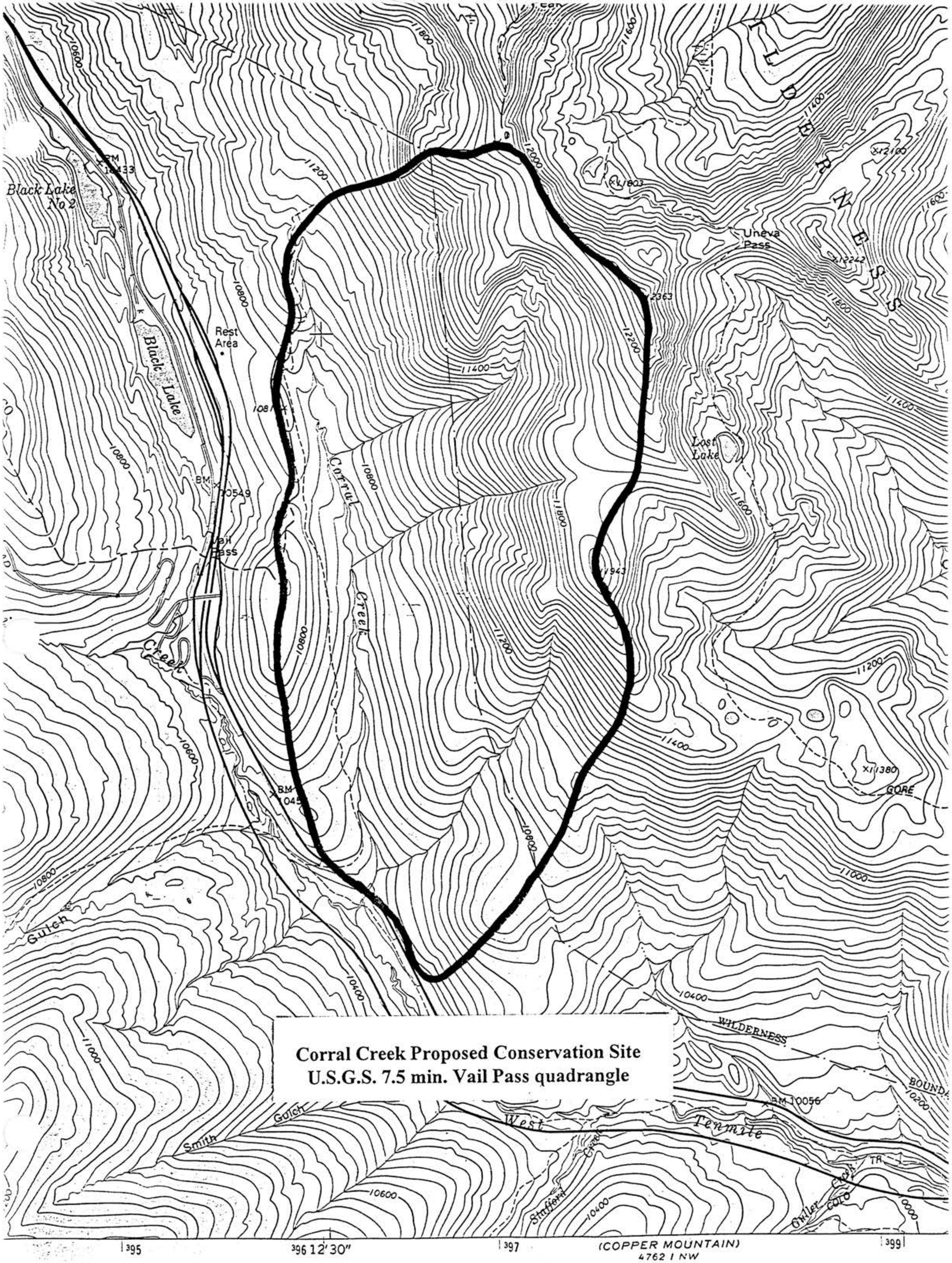
*EO=Element Occurrence

Boundary Justification: The planning boundary includes the Colorado River cutthroat trout (*Oncorhynchus clarki pleuriticus*) occurrence and its adjacent contiguous habitat on this short creek. Since this local watershed is so small, the watershed boundary is recommended as a

buffer to prevent disturbance of the aquatic habitat. The small portion of the Creek south of Interstate 70 is not included in the site.

Protection Rank Justification: This site is publicly owned and managed by the White River National Forest and is partially contained in the Eagles Nest Wilderness Area.

Management Rank Justification: The U.S. Forest Service and the Colorado Division of Wildlife are aware of this population of trout. The population should be managed to protect the high genetic purity of the Colorado River cutthroat trout (*Oncorhynchus clarki pleuriticus*). Hydrological processes originating outside of the planning boundary, including water quality, quantity, and timing, must be managed to maintain population and community viability. There is a natural barrier along the creek which is important to keep the exotic fish out of the upper stretch. There are no trout in this upper stretch and would be a good candidate for a re-introduction of the Colorado River cutthroat. There has been significant disturbance from highway construction which should be limited in the future.



Corral Creek Proposed Conservation Site
U.S.G.S. 7.5 min. Vail Pass quadrangle

Sentinel Island

Biodiversity Rank: B5 (General or state-wide biodiversity interest)
n osprey nest is included within this site. Breeding occurrences for this bird are rare in the state of Colorado.

Protection Urgency Rank: P4
This site occurs on public land and there are no known threats for the foreseeable future.

Management Urgency Rank: M1
To prevent loss of the element, access to this island should be limited within one year.

Location: Dillon Reservoir near Frisco. From Interstate 70 exit at the Highway 9 Breckenridge/Frisco exit. Drive south from the exit, take an immediate first left onto the reservoir dam road, and head northeast along the reservoir shoreline/bike path to the osprey viewing station with fixed spotting scopes. The site is on Sentinel Island within Dillon Reservoir.

U.S.G.S. 7.5 minute quadrangle: Frisco
Legal Description:. T5S R78W S24

General Description: Sentinel Island is approximately 0.5 miles long and 0.3 miles wide. The island is essentially flat, at an elevation of 9200 feet. Conifers dominate the island. The Osprey (*Pandion haliaetus*) nest is located on a human-made nesting platform atop a live tree.

Biodiversity Rank Justification: This site includes an active nest for Osprey (*Pandion haliaetus*), which is a state rare bird species. The Osprey is considered globally secure, but there are only 11 confirmed breeding occurrences in Colorado, with an additional 6 probable breeding occurrences in the state (Pague et. al 1997). Although continental numbers have increased significantly in the last 3 decades (Colorado Bird Observatory 1997), the total population size in Colorado is likely less than 150 birds (Pague et. al 1997).

Natural Heritage element occurrences at the Sentinel Island site.

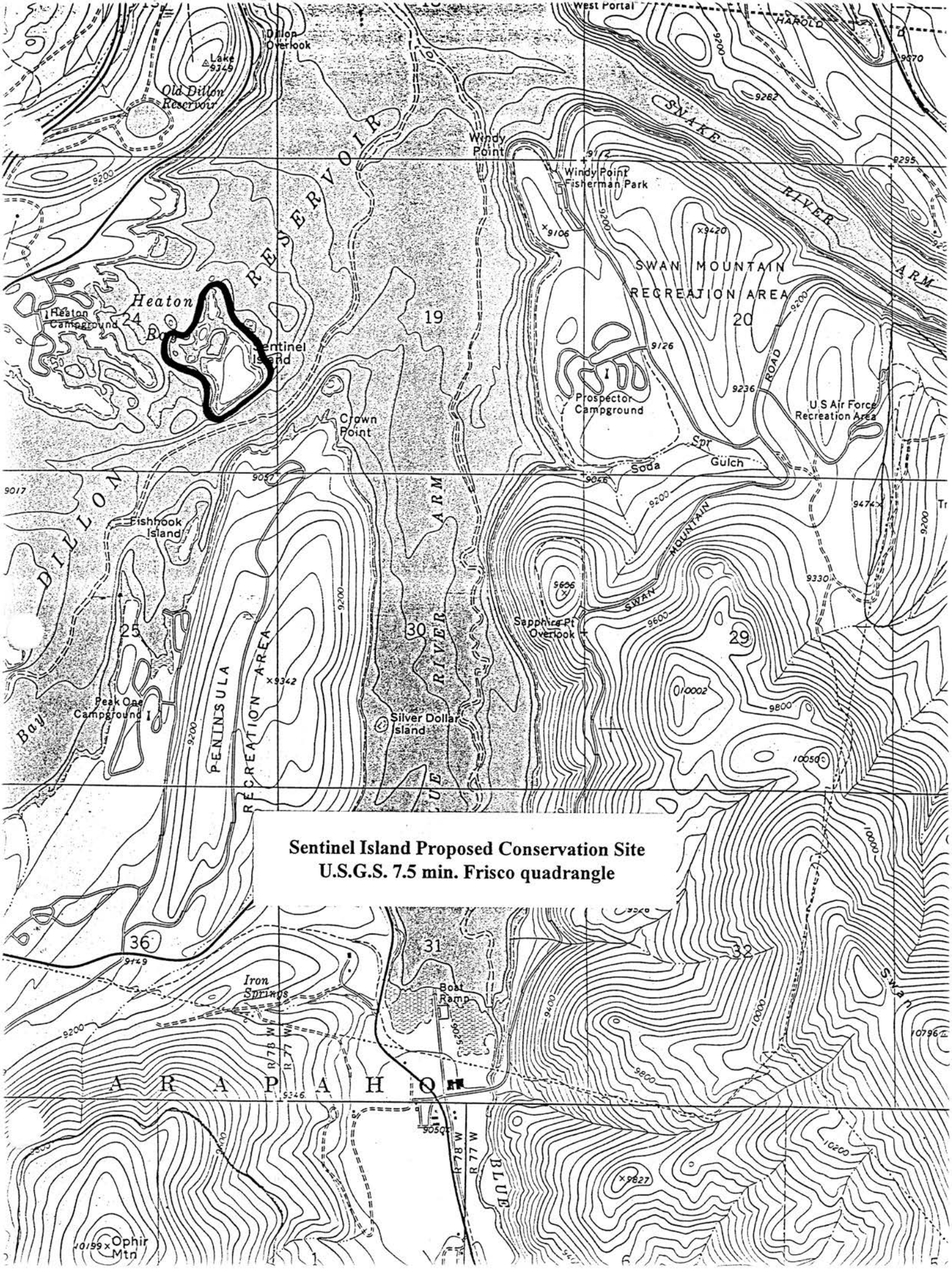
Element	Common Name	Global Rank	State Rank	Federal Status	State Status	Federal Sens.	EO* Rank
Pandion haliaetus	**Osprey**	**G5**	**S3B, SZ**			**FS**	**unranked**

*EO=Element Occurrence

Boundary Justification: This site includes the nest and the entire island. This boundary should protect the osprey (*Pandion haliaetus*) from direct disturbance. This boundary was drawn after a 1997 visit by a CNHP zoologist.

Protection Rank Justification: This site is on public land managed by the U.S. Forest Service.

Management Rank Justification: The U.S. Forest Service and the Colorado Division of Wildlife are aware of this nest and are managing the island with consideration for the Osprey (*Pandion haliaetus*). This island is only accessible by boat. However, boaters have accidentally disturbed nesting adults, and this may explain the repeated nest failures in the past. Disturbing the adults off the nest leaves the eggs exposed to the elements which may create nest failure. Restricting access to the nest location must be immediately considered to restore and maintain the long-term viability of this occurrence.



Sentinel Island Proposed Conservation Site
U.S.G.S. 7.5 min. Frisco quadrangle

UPPER BLUE RIVER DRAINAGE

Blue Lakes

Biodiversity Rank: B1 (Outstanding significance)
The Blue Lakes site supports ten CNHP elements of concern. Specifically, this site supports the only known occurrence of Weber whitlow-grass. Additionally, Weber saussurea and Porter feathergrass, both globally rare are located next to the Blue Lake Reservoir spillway. The following state rare plants also occur within the site: Kotzebue grass-of-parnassus, northern rockcress, thick-leaf whitlow-grass, arctic draba, moonwort, stiff clubmoss, and mountain bladder fern.

Protection Urgency Rank: P3
The majority of this site is privately owned with adjacent public lands. A conservation easement is recommended to ensure protection for elements. Increased mining, expansion of the reservoir, and recreational activities could threaten current and potential rare plant habitat.

Management Urgency Rank: M3
Although current management appears to be adequate, actions may be needed in the future to maintain the current quality of element occurrences. Actions could include restoration of social trails to prevent further erosion and destruction of rare plant habitat.

Location: 1 air mile south of Quandary Peak: 6.5 miles south of Breckenridge on Highway 9 to Blue Lakes Road, west on road to reservoir

U.S.G.S. 7.5 minute quadrangle: Breckenridge
Legal Description: T8S R78W Sections 4, 3, 2, 1, 34

General Description: The Blue Lakes site is a glacial valley located between Quandary Peak and North Star Mountain. The Tenmile range consists of Leadville limestone, providing the specific substrate for several rare plants species. The steep, talus slopes also support a subalpine willow scrub community (*Salix brachycarpa/*mesic forb). A subalpine riparian willow carr (*Salix planifolia/Carex aquatilis*) is located adjacent to Monte Cristo creek that flows through the site. The site is approximately 1,100 acres in size and ranges in elevation from 10,600 to 12,000 feet.

The Blue Lakes are reservoirs that have been created by the city of Colorado Springs. There are several mining claims scattered throughout the site. A road bisects the site allowing access for recreational and sight-seeing trips. There is a small residential development within the eastern portion of the site.

Biodiversity Rank Justification: The Blue Lakes site supports ten CNHP elements of concern. Specifically, this site supports the only known occurrence of the Colorado endemic, Weber whitlow grass (*Draba weberi*). There are a total of 18 known Colorado occurrences of the globally rare Weber saussurea (*Saussurea weberi*), seven of those occurrences are within Summit County. Porter feathergrass (*Ptilagrostis mongholica* ssp. *porteri)*, a globally rare plant

species, is known from 24 other locations all in Colorado. The Blue Lakes occurrence of this subspecies is the only known location for Summit County. The following state rare plants also occur within the site: Kotzebue grass-of-parnassus (*Parnassia kotzebuei*), northern rockcress (*Draba borealis*), thick-leaf whitlow-grass (*Draba crassa*), arctic draba (*Draba fladnizensis*), moonwort (*Botrychium lunaria*), stiff clubmoss (*Lycopodium annotinum* var. *pungens*), and mountain bladder fern (*Cystopteris montana*).

Natural Heritage element occurrences at the Blue Lakes site.

Element	Common Name	Global Rank	State Rank	Federa Status	State Status	Federal Sens.	EO* Rank
Botrychium lunaria	moonwort	G5	S1				B
Cystopteris montana	mountain bladder fern	G5	S1				B
Draba borealis	northern rockcress	G4	S2				unranked
Draba crassa	thick-leaf whitlow-grass	G3	S2				D
Draba fladnizensis	arctic draba	G4	S2S3				unranked
Draba weberi	**Weber whitlow-grass**	**G1**	**S1**				**unranked**
Lycopodium annotinum var. *pungens*	stiff clubmoss	G5TU	SU				unranked
Parnassia kotzebuei	Kotzebue grass-of-parnassus	G4	S1				unranked
Ptilagrostis mongholica ssp. *porteri*	Porter feathergrass	G3G5T2	S2				B
Saussurea weberi	Weber saussurea	G3Q	S2				unranked

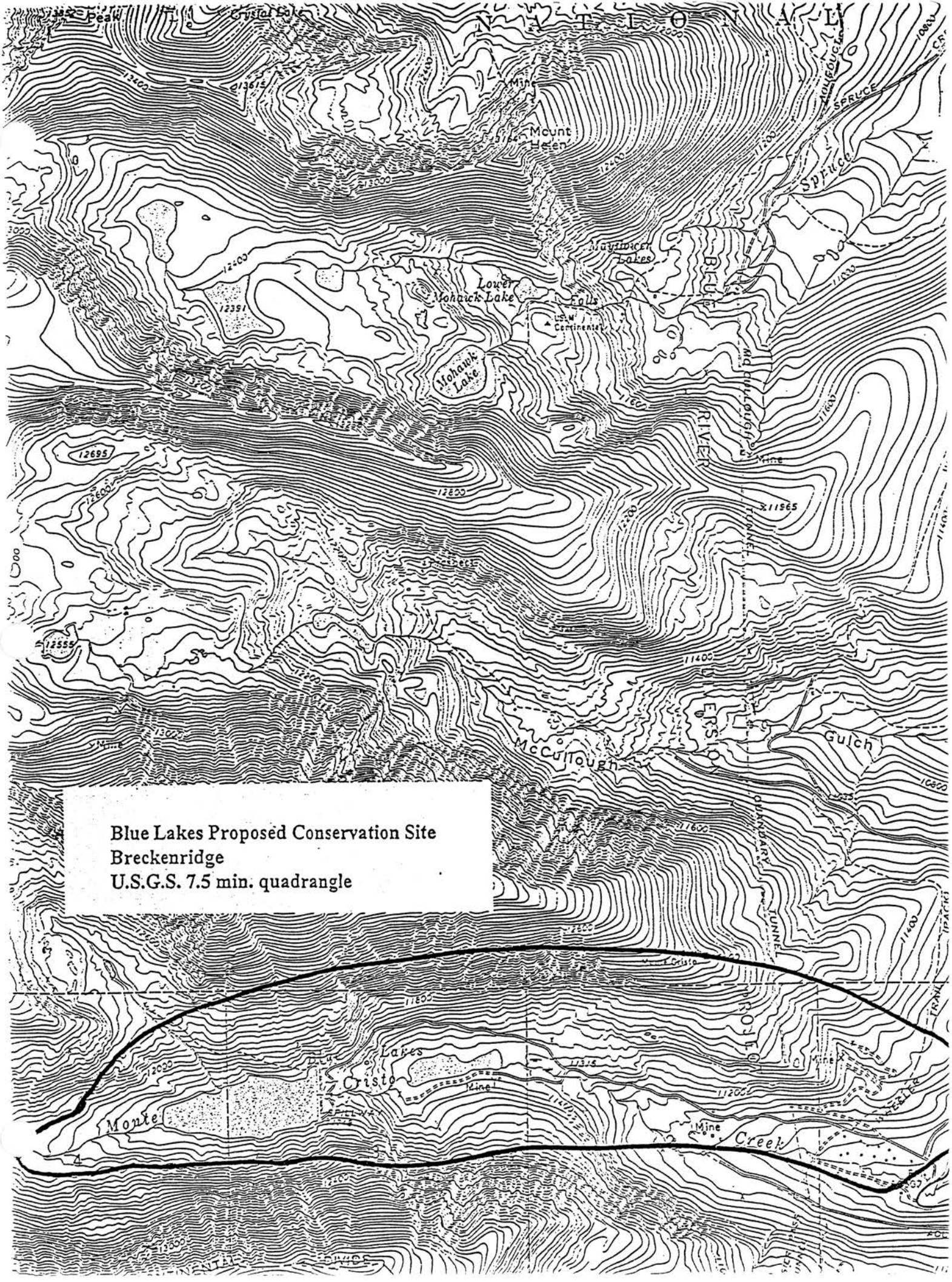
*EO=Element Occurrence

Boundary Justification: The boundary encompasses the elements and provides a 1,000 feet buffer zone along the talus slopes to limit direct disturbance e.g., trampling and indirect disturbances e.g., unnatural erosion. The site also includes the spillway, which is vital to the survival of the elements. The boundary is drawn to encompass the willow communities and the rare plants. A much larger area should be considered in any long-term management or protection plan to protect from negative impacts on the hydrology. Boundary provides suitable habitat where additional individuals can become established over time. This site was drawn after a 1997 visit by a CNHP wetland ecologist. The boundary was further verified using a 1988 National Aerial Photography Program 1:40,000 infrared aerial photograph.

Protection Rank Justification: The site is privately owned with adjacent publicly owned lands. The status of the mining claims should be considered. A conservation easement is recommended due the high concentration of rare plants and potential rare plant habitat.

Management Rank Justification: There is some recreational use of the area but it is concentrated on the road. Although this site does not appear to be threatened at this time, this rank could change if recreational or mining impacts increase in the future. Should mining become active, management plans should be developed prior to on-ground activities. Monitoring activities should occur every 5-10 years unless there is a significant change in on-site activity.

The hydrology of this site is important to the ecological processes which support the rare plants and the riparian communities. The water quality, quantity, and timing should be maintained at its current status.



Blue Lakes Proposed Conservation Site
Breckenridge
U.S.G.S. 7.5 min. quadrangle

Hoosier Ridge

Biodiversity Rank: B1 (Outstanding significance)
An excellent occurrence of a globally critically imperiled mustard species.

Protection Urgency Rank: P4
This site is a Registered Natural Area and there are no threats known for the foreseeable future.

Management Urgency Rank: M4
There are no current threats but management may be needed in the future.

Location: The Hoosier Ridge site is located in the White River and Pike National Forests on the Summit/Park county line along the Continental Divide. Eight air miles south of the town of Breckenridge. From the summit of Hoosier Pass on Highway 9, hike east of the Pass on a gated Forest Service Road.

U.S.G.S. 7.5 minute quadrangle: Alma
Legal Description: T8S R77W S 7, 8, 17, 18
T8S R78W S12, 13

General Description: Hoosier Ridge runs east-west along the Continental Divide in Summit and Park counties, just east of Hoosier Pass. The Hoosier Ridge site follows the Divide for about two miles, and includes an area that supports twelve rare plant occurrences. This is an extraordinarily high concentration of rare plant species. The top of the ridge is characterized by scree slopes, boulder fields, and permanent snow fields. Snow melt-off flows down the north and south-facing slopes in intermittent drainages from the top of the ridge. The slopes are typified by tufted hairgrass/golden avens (*Deschampsia cespitosa/Geum rossii*) and kobresia/golden avens (*Kobresia myosuroides/Geum rossii*) communities, with scattered patches of willows (*Salix glauca* and *Salix brachycarpa*) and krummholz Engelmann spruce (*Picea engelmannii*). Moist areas with mossy ground cover provide the necessary habitat for Penland alpine fen mustard (*Eutrema penlandii*), which is the element of primary importance in this site(Colorado Natural Areas Program personal communication).

Mining, which was prevalent in Summit County at the turn of the century, has not dramatically affected the Hoosier Ridge site, and overall this site is in excellent condition. This site is about 1300 acres in size and ranges from about 11,600 to 13,000 feet above sea level. Within the site, 1025 acres are now designated as a U.S. Forest Service Research Natural Area.

Biodiversity Rank Justification: Hoosier Ridge is one of the botanical "hotspots" in Colorado. The Hoosier Ridge site and the North Star Mountain site (less than one mile to the west on the opposite side of Hoosier Pass) make up this geographic area. There are no other areas in the state accruing the number and rarity of plants as are found here. High elevation outcrops of Leadville Limestone are said to be a predominant factor in setting the stage for such high densities of rare plant species. Many of the rarest plants in this site are thought to be restricted to this geologic substrate. One of these is the Penland alpine fen mustard (*Eutrema penlandii*).

This species is a Colorado endemic known only from 15 locations, all in Summit and Park counties, and is listed on the federal Endangered Species List as a Threatened species. Along with this globally rare species, a good occurrence of globe gilia (*Ipomopsis globularis)* was found, and Grays Peak whitlow-grass (*Draba grayana)* was documented here in 1959. Additionally, there are a number of species that are found here in populations that are disjunct from arctic distributions. The sea pink (*Armeria maritima* ssp. *sibirica)* is common in Alaska and the Northern Territories. This species is absent from northern continental U.S. and southern Canada but reappears in Colorado in a few alpine sites.

Natural Heritage element occurrences at the Hoosier Ridge site.

Element	Common Name	Global Rank	State Rank	Federal Status	State Status	Federal Sens.	EO* Rank
Eutrema penlandii	Penland alpine fen mustard	G1G2	S1S2	T			unranked
Eutrema penlandii	**Penland alpine fen mustard**	**G1G2**	**S1S2**	**T**			**A**
Draba grayana	Grays Peak whitlow-grass	G2	S2				H
Ipomopsis globularis	globe gilia	G2	S2			FS	B
Draba porsildii	Porsild draba	G3	S1				unranked
Astragalus molybdenus	leadville milkvetch	G3	S2			FS	A
Draba crassa	thick-leaf whitlow-grass	G3	S3				unranked
Draba streptobrachia	Colorado Divide whitlow-grass	G3	S3				A
Chionophila jamesii	Rocky Mountain snowlover	G3G4	S3S4				unranked
Saussurea weberi	Weber saussurea	G3Q	S2				unranked
Saussurea weberi	Weber saussurea	G3Q	S2				B
Draba borealis	northern rockcress	G4	S2				unranked
Draba fladnizensis	arctic draba	G4	S2S3				H
Papaver lapponicum ssp. *occidentale*	alpine poppy	G4T4	S2				unranked
Armeria maritima ssp. *sibirica*	sea pink	G5T5	S1			FS	unranked

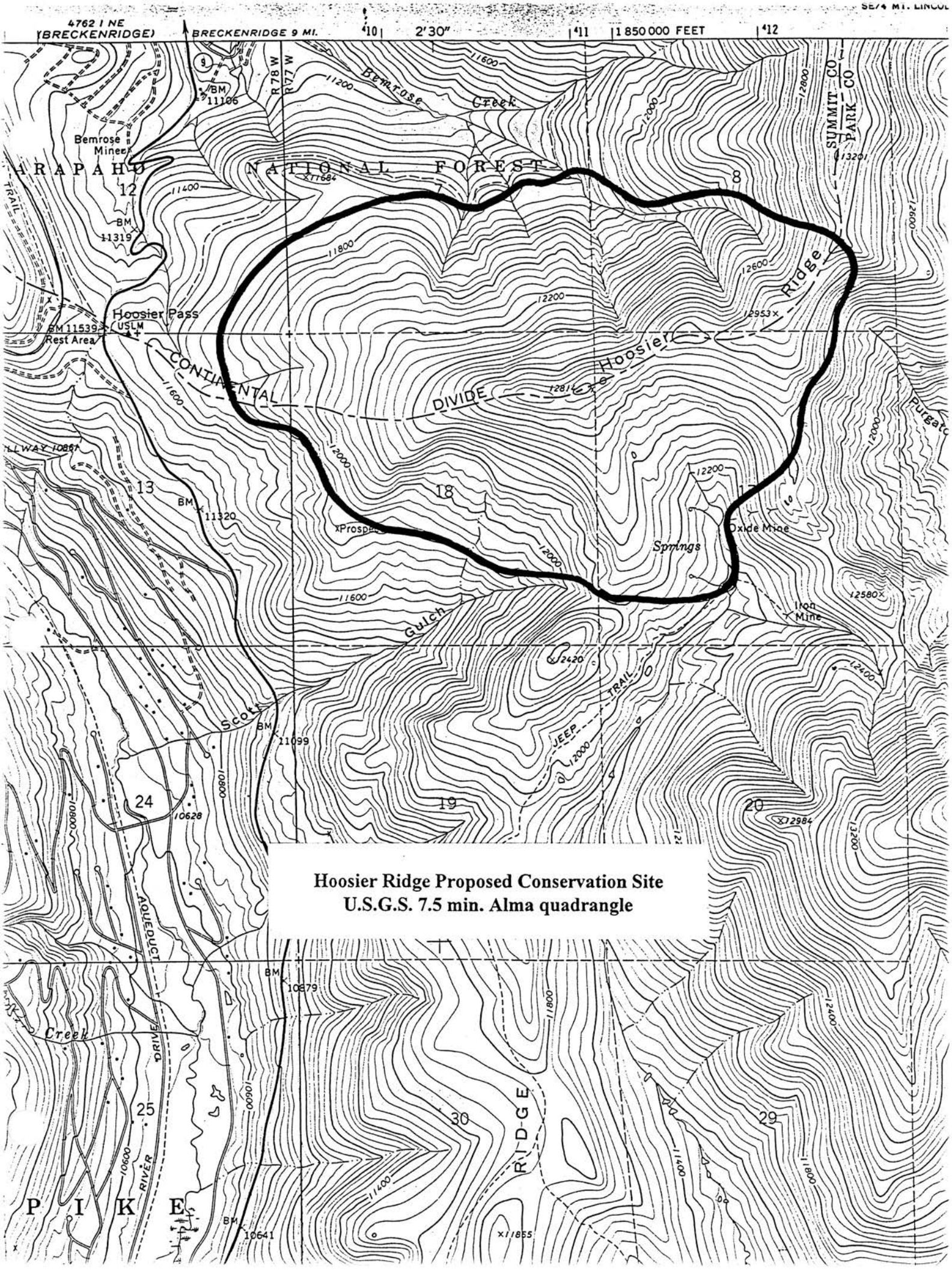
*EO=Element Occurrence

Boundary Justification: This boundary is drawn to: 1) protect the occurrences from direct impacts such as trampling or other surface disturbances; 2) provide suitable habitat where additional individuals can become established over time; and 3) include representation from each of the local alpine plant communities which may support a pollinator for one or more of the rare plant species. The boundary was drawn by a CNHP botanist during a site visit in 1997.

Protection Rank Justification: This site is publicly owned and managed by the White River and Pike National Forests. This site was registered as Hoosier Ridge Research Natural Area in 1980 and fought its way toward designation for over fifteen years. The Hoosier Ridge Research Natural Area was finally designated in 1997, and includes 1025 acres of the roughly 1300 total

acres that are included in the site. This site is one of the most important botanical areas in Colorado.

Management Rank Justification: This alpine ecosystem and the rare plants it supports does not tolerate disturbance from motor vehicles or high levels of other recreational uses. A power line crosses the site at about 12,400 feet elevation. Associated maintenance should be managed closely. Since the early 1980's the U.S. Forest Service and the Colorado Natural Areas Program have been working to alleviate the impacts within this site. The Continental Divide Scenic Trail was re-routed out of this area. The roads have been closed and grazing leases have been removed. Currently, this area receives little use and it is important that minimal use continues. The Bemrose Ski network crosses this site on the Summit County side. This is a popular cross-country ski trail, however, the effects of winter activities is of little concern to the rare plant species. No exotic plant species have been documented in the site. This site should be monitored at least every five years to detect changes in overall quality or condition of the rare plant occurrences and/or the associated plant communities. In general, Hoosier Ridge is an excellent area for botanical research because of the high number of rare plant species that are found here, including species that are endemic to Colorado and species that are disjunct from their primary distributions. All research activities should be designed to have little or no impact on the imperiled species. The Research Natural Area designation includes detailed information on management guidelines which should be followed as much as possible.



Hoosier Ridge Proposed Conservation Site
U.S.G.S. 7.5 min. Alma quadrangle

Boreas Pass

Biodiversity Rank: B2 (Very high significance)
There are five rare plant species found in this site. All except one are globally rare.

Protection Urgency Rank: P2
This site is publicly owned with the exception of small private mining inholdings. Renewed mining activities may threaten this site in the future.

Management Urgency Rank: M3
Management of recreational activities is needed within five years to maintain the quality of the site.

Location: At the south edge of the town of Breckenridge turn east onto Boreas Pass Road. Drive to the summit of the Pass.

U.S.G.S. 7.5 minute quadrangle: Boreas Pass
Legal Description: T7S R77W S23, 24, 25, 26, 27, 34

General Description: The Boreas Pass site follows the Continental Divide in a northeast to southwest direction in Summit and Park counties. Boreas Pass lies in the center of the site and is marked by a historical railroad building, the Section House. The Boreas Pass site supports a mosaic of willow dominated communities, mesic alpine meadows, and krummholz Engelmann spruce (*Picea engelmannii*). Along the ridgeline, including several summits, small outcrops of Leadville Limestone, fell-fields, and scree slopes are common. Several plant species of concern are known to occur in the meadows and the rocky areas within the site. The summits along the ridge rise to 12, 800 feet at the highest point, from the Pass at 11,480 feet. Boreas Pass is used by elk and mountain goats to access foraging areas on Boreas Mountain. This site is about 1400 acres in size.

Biodiversity Rank Justification: The Boreas Pass site includes four globally rare and one state rare plant species. Globe gilia (*Ipomopsis globularis*) and Weber saussurea (*Saussurea weberi*) are known only from Summit and Park counties in Colorado. This limited distribution includes the globe gilia's entire range in the world. Weber saussurea is also found in northern Wyoming and western Montana but is considered to be rare throughout its range. Leadville milkvetch (*Astragalus molybdenus*) and Rocky Mountain columbine (*Aquilegia saximontana*), are two other globally imperiled plants species that have been documented in this area. These two species are only known from Colorado. Additionally, the state rare wood draba (*Draba oligosperma*), known more commonly in the northern parts of the continent, was documented in this area.

Natural Heritage element occurrences at the Boreas Pass site.

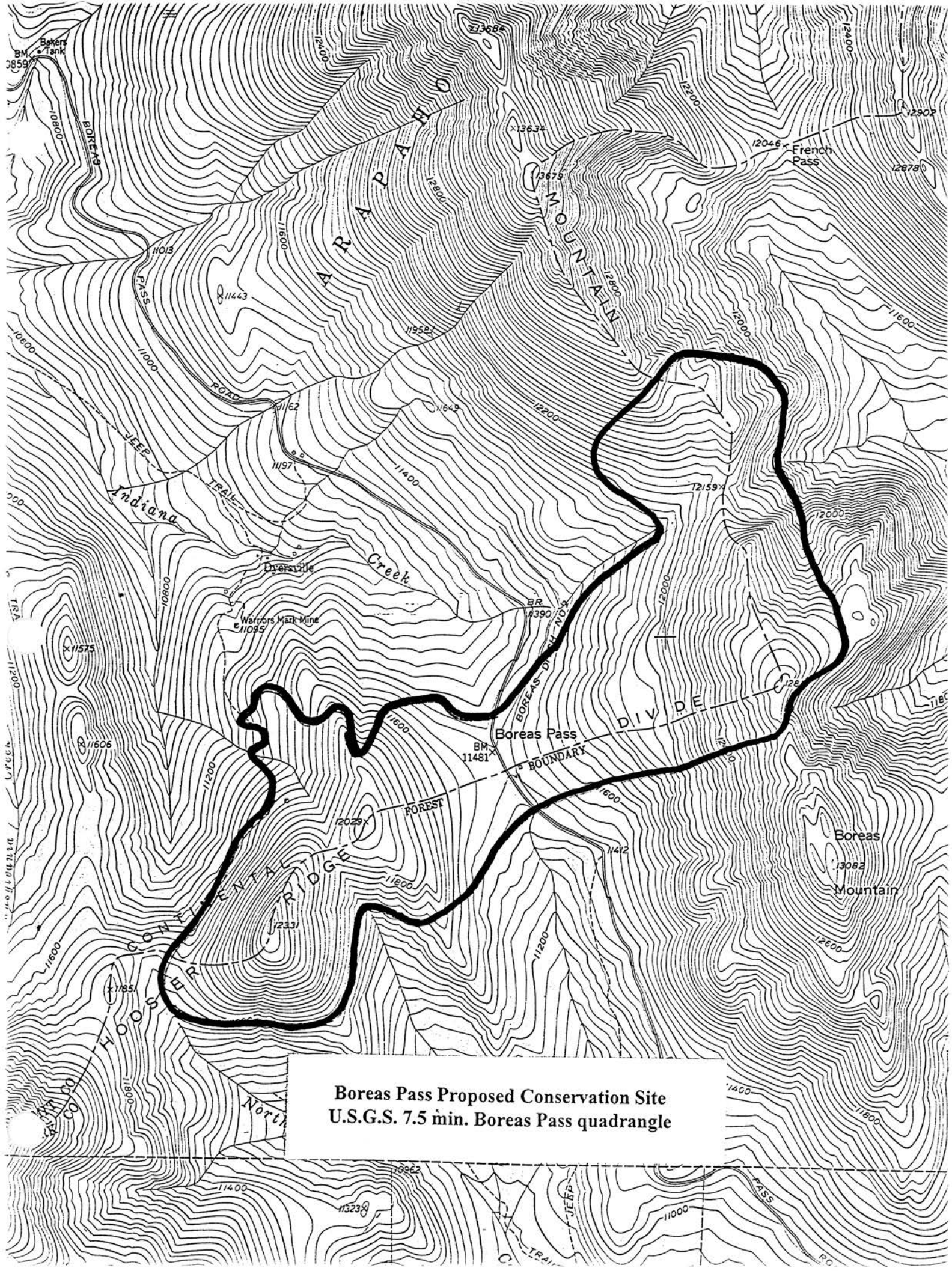
Element	Common Name	Global Rank	State Rank	Federal Status	State Status	Federal Sens.	EO* Rank
Ipomopsis globularis	**globe gilia**	**G2**	**S2**				**A**
Ipomopsis globularis	globe gilia	G2	S2				unranked
Aquilegia saximontana	Rocky Mountain columbine	G3	S3				unranked
Saussurea weberi	Weber saussurea	G3Q	S2				unranked
Draba oligosperma	woods draba	G5	S1				unranked

*EO=Element Occurrence

Boundary Justification: This boundary is drawn to: 1) protect the occurrences from direct impacts such as trampling, unnatural erosion or other surface disturbances; 2) provide suitable habitat where additional individuals can become established over time; 3) include representation from each of the local alpine plant communities which may support a pollinator for one or more of the rare plant species. The boundary was drawn following a 1997 CNHP site visit and using the 1988 National Aerial Photography Program 1:40,000 infrared aerial photograph.

Protection Rank Justification: This site is publicly owned and managed by the U.S. Forest Service with the exception of several small inholdings which are privately owned. These inholdings should be acquired by the USFS to ensure that renewed mining activities do not threaten these occurrences. This area is a proposed Research Natural Area; final designation should be pursued.

Management Rank Justification: This site receives high recreational use. Since the roads from the summit of Boreas Pass into the U.S. Forest Service land have been closed to motor vehicles, the primary uses are hiking and mountain biking. Trampling and erosion problems resulting from these recreational activities are threatening the rare plant occurrences. Re-routing or closing the trails may be needed on the south side of Boreas Pass, as the trail cuts through a population of globe gilia (*Ipomopsis globularis*). Surface disturbances from road maintenance on Boreas Pass Road or on the Boreas Ditch should be considered a threat to this site. All of the rare plant species and their associated habitats should be monitored to detect changes in overall quality or condition.



Boreas Pass Proposed Conservation Site
U.S.G.S. 7.5 min. Boreas Pass quadrangle

Cucumber Gulch

Biodiversity Rank: B2 (Very high significance)
The Cucumber Gulch site supports a breeding population of the globally imperiled southern Rocky Mountain boreal toad.

Protection Urgency Rank: P1
This site is immediately threatened by residential development, road maintenance, and activities associated with the Breckenridge Ski Area and the Keystone Nordic Ski Area. The site is privately owned and there are specific plans for development (e.g., homes, access roads, etc.) of the area. The breeding population of the southern Rocky Mountain boreal toad population is located within the trail system of the nordic center. Recreational uses, including skiing and mountain biking, pose threats to this site. The ski trails are mowed in the summer spreading exotic plant species, fragmenting the willow carr, affecting the hydrology, and creating erosion problems. A conservation easement or open space designation is recommended.

Management Urgency Rank: M1
Management actions must be taken immediately to prevent the further fragmentation of the willow communities and further degradation of the southern Rocky Mountain boreal toad. Actions could include: limiting access of mountain bikes and hikers during post-breeding, due to juvenile and adult dispersal, monitoring the effects of snowmaking on water quality, and management of beaver to provide optimal water levels and habitat for southern Rocky Mountain boreal toad viability.

Location: Cucumber Gulch is 0.5 miles west of the confluence of the Blue River and French Gulch. From Breckenridge, follow signs to Breckenridge Ski Area, Peak 8 on Ski Hill Road. About one and a half miles up the road, before reaching the ski area parking lot, turn right into the Nordic Center Parking lot. From the Nordic Center head north and west, about 1/4 mile walk along an old road to Cucumber Gulch.

U.S.G.S. 7.5 minute quadrangle: Breckenridge
Legal Description: T6S R78W Sections 25, 36

General Description: Cucumber Gulch is a north to northeast-facing drainage in the Blue River watershed. It is dominated by a montane willow carr (*Salix planifolia/Carex aquatilis*) and an alpine willow scrub (*Salix brachycarpa*-mesic forb) with bog birch (*Betula glanulosa*). There are numerous beaver ponds located throughout the willow carr. The open valley is about 0.3 miles wide at its widest point with Engelmann spruce (*Picea engelmannii*) and lodgepole pine (*Pinus contorta*) scattered throughout. Mudflats around the margins of the beaver ponds provide important habitat for the boreal toad. The upland areas in the site are dominated by Engelmann spruce (*Picea engelmannii*), subalpine fir (*Abies lasiocarpa*) and lodgepole pine (*Pinus contorta*). The site is approximately 500 acres with an elevation range from 9,500to 9,900 feet.

Biodiversity Rank Justification: The Cucumber Gulch site contains one of three breeding populations of the southern Rocky Mountain boreal toad (*Bufo boreas boreas*) located on private lands in Summit County. This population of breeding toads was first documented in 1995. There was no breeding observed during the summer of 1996 (Horstman 1996). During the 1997 survey only two adults and 150-200 tadpoles were observed on June 18. There was no evidence of recruitment or survival of young in 1997 (Horstman 1997).

The southern Rocky Mountain population of boreal toads is likely distinct from other populations (A. Goebel unpbl. data as cited in Pague et al. 1997). There are approximately 206 historical localities for the southern Rocky Mountain boreal toad in Colorado. Presently, only three to four healthy populations remain, comprised of less than 20 high priority breeding sites (S. Corn and L. Livo, pers. comm. as cited in Pague et al. 1997). Populations have declined precipitously or disappeared over the past 20 years and continue to do so (Goettl 1997). The reasons for the decline are unknown and the factors important to the perseverance of this species are not well understood (Pague et al. 1997). The southern Rocky Mountain boreal toad is currently a candidate for federal listing, a state endangered and U.S. Forest Service sensitive species.

Natural Heritage element occurrences at the Cucumber Gulch site.

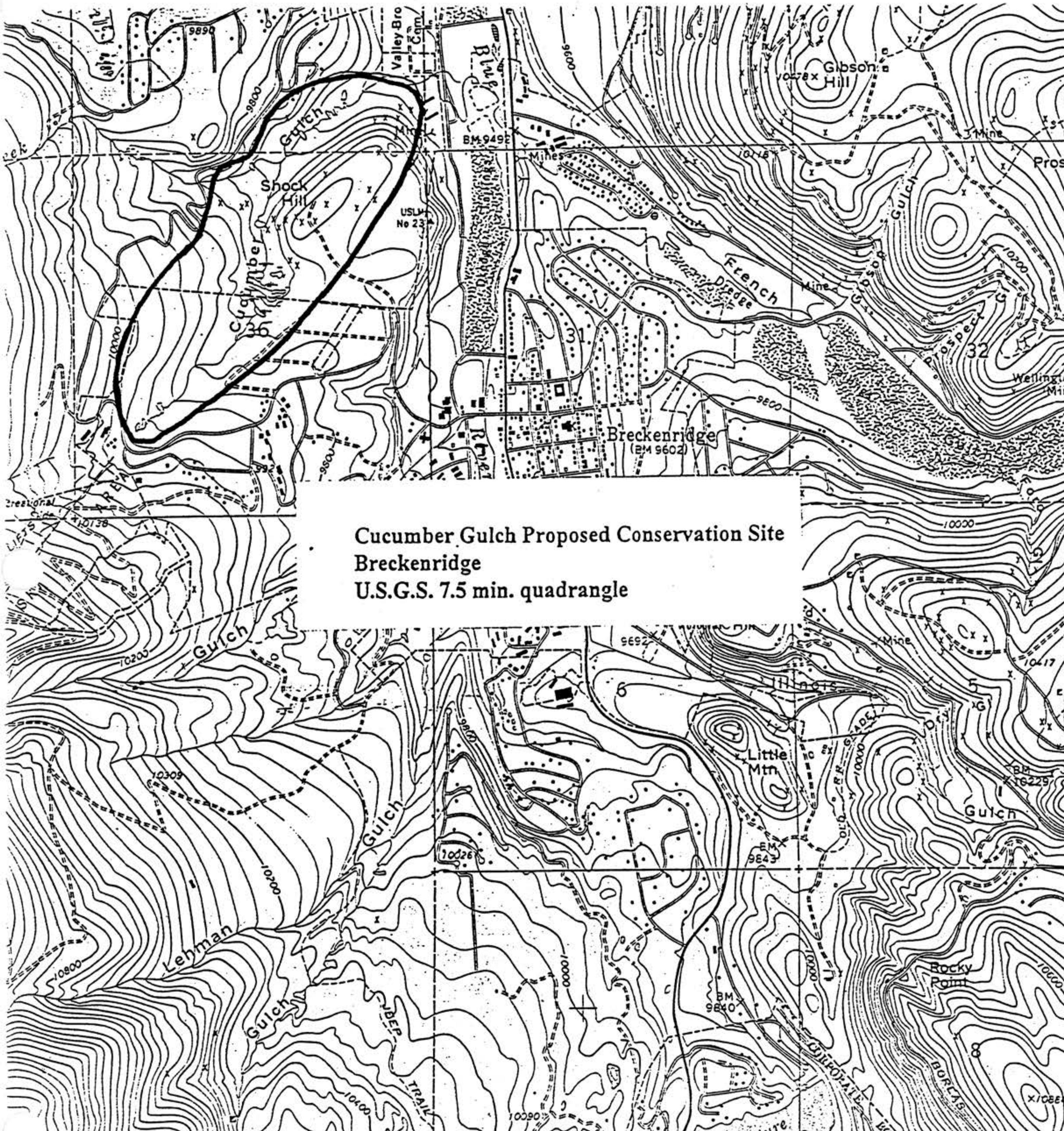
Element	Common Name	Global Rank	State Rank	Federal Status	State Status	Federal Sens.	EO* Rank
Bufo boreas boreas	**southern Rocky Mountain boreal toad**	**G4T1Q**	**S1**	**C**	**E**	**FS**	**B**

*EO=Element Occurrence

Boundary Justifications: The boundary includes the southern Rocky Mountain boreal toad occurrence and adjacent contiguous habitat. A buffer of 1,000 feet is provided to prevent direct disturbance such as, development, access roads, trampling, mowing, trails, to the southern Rocky Mountain boreal toad and riparian habitats. A much larger area, including the full watershed, and post-breeding dispersal area for the toad should be considered in any conservation plan. This site was drawn after a 1997 visit by CNHP scientists. The boundary was further verified using a 1988 National Aerial Photography Program 1:40,000 infrared aerial photograph.

Protection Rank Justification: The Cucumber Gulch is immediately threatened by a proposed residential development for site. A conservation easement or open space designation is recommended to protect the southern Rocky Mountain boreal toad and its habitat.

Management Rank Justification: Management actions must be taken immediately due to the high threat of residential development, road improvements, and continual recreational use. Hydrological processes originating outside of the planning boundary, including water quality, quantity, and timing, must be managed to maintain boreal toad population and community viability. These processes may be affected by the Breckenridge Ski Area Peak 8 snowmaking operations which are located at the top of the Cucumber Gulch site.



Cucumber Gulch Proposed Conservation Site
Breckenridge
U.S.G.S. 7.5 min. quadrangle

North Star Mountain

Biodiversity Rank: B2 (Very high significance)
There are 10 species of rare plants in this site, including four Colorado endemics.

Protection Urgency Rank: P1
This site is publicly and privately owned and is immediately threatened by mining.

Management Urgency Rank: M1
Management of recreational activities is essential within one year to prevent loss at the site.

Location: South of Breckenridge on the Summit/Park county line. Drive west of Highway 9 at the summit of Hoosier Pass toward Magnolia Mine and Crystal Lake.

U.S.G.S. 7.5 minute quadrangles: Alma and Breckenridge
Legal Description: T8S R78W S 2, 3, 10, 11, 12.

General Description: This site includes the southeastern portion of North Star Mountain, and follows the Continental Divide, including portions of both Summit and Park counties. The site is characterized by dry alpine meadows, rock outcrops, gravely slopes, an alpine lake (Crystal Lake), willow carrs and snowmelt streamlets. Microhabitats within these communities support nine rare plant species. The elevation within the site ranges from about 11,600 feet near Hoosier Pass and Crystal Lake to the summit of North Star Mountain at 13,600 feet. The site is about 1400 acres in size.

Biodiversity Rank Justification: The North Star Mountain site, along with the Hoosier Ridge site (less than one mile to the west on the opposite side of Hoosier Pass), is one of the botanical "hotspots" in Colorado. There are few other areas in the state accruing the number and rarity of plant species found here. High elevation outcrops of Leadville Limestone are said to be a predominant factor in setting the stage for such high densities of rare plant species. Some of the rarest plants in this site are thought to be restricted to this geologic substrate. One of these is the Penland alpine fen mustard (*Eutrema penlandii*). This species is a Colorado endemic known only from 15 locations, all in Summit and Park counties, and is listed on the federal Endangered Species List as a Threatened species. Along with this globally rare species, eight occurrences of six other globally and/or state rare plant species were found during the 1997 field season. This site includes the largest known occurrence of Kotzebue grass-of-parnassus in Colorado.

Natural Heritage element occurrences at the North Star Mountain site.

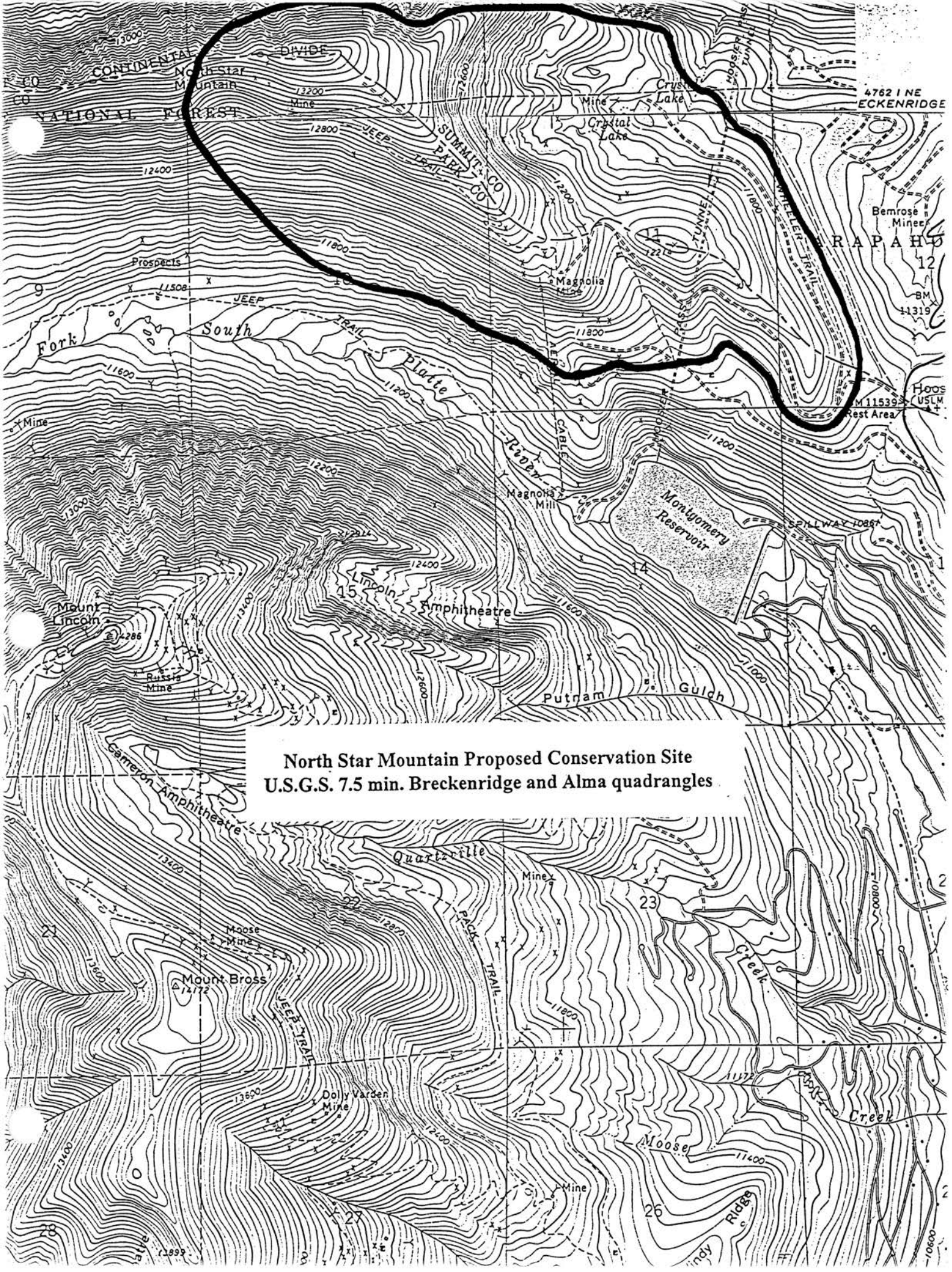
Element	Common Name	Global Rank	State Rank	Federal Status	State Status	Federal Sens.	EO* Rank
Eutrema penlandii	**Penland alpine fen mustard**	**G1G2**	**S1S2**	**T**			**C**
Ipomopsis globularis	globe gilia	G2	S2				B
Astragalus molybdenus	leadville milkvetch	G3	S2				unranked
Draba streptobrachia	Colorado Divide whitlow-grass	G3	S3				unranked
Draba crassa	thick-leaf whitlow-grass	G3	S3				C
Saussurea weberi	Weber saussurea	G3Q	S2				D
Saussurea weberi	Weber saussurea	G3Q	S2				A
Parnassia kotzebuei	Kotzebue grass-of-parnassus	G4	S2				A
Braya humilis	alpine braya	G4	S2				A
Draba fladnizensis	arctic draba	G4	S2S3				unranked
Papaver lapponicum ssp. *occidentale*	alpine poppy	G4T5	S2				unranked

*EO=Element Occurrence

Boundary Justification: This boundary is drawn to: 1) protect the occurrences from direct impacts such as trampling or other surface disturbances; 2) provide suitable habitat where additional individuals can become established over time; and 3) include representation from each of the local alpine plant communities which may support a pollinator for one or more of the rare plant species. The boundary was drawn following a 1997 CNHP site visit and using 1988 National Aerial Photography Program 1:40,000 infrared aerial photograph.

Protection Rank Justification: This site is publicly owned and managed by the U.S. Forest Service with the exception of small inholdings which are privately owned. These inholdings should be acquired by the USFS to ensure that renewed mining activities do not threaten this occurrence. Special area designation may be required to ensure adequate protection. Approximately four acres are owned by The Nature Conservancy, however, a specific management strategy is not in place.

Management Rank Justification: This area was extensively explored for minerals. There are extensive mine tailings, roads and historic disturbances from mining activities. There have also been water diversions, historical and present. Recreation is probably the biggest current management concern. Several of the imperiled alpine plant species are very small and easily overlooked. Therefore, these species are highly threatened by trampling. Foot and vehicle traffic creates direct disturbances. Unnatural erosion is created by these activities and often brings debris onto the rare plant occurrences. Recreationists should be educated to understand the importance of rare plant habitat and the direct threat of trampling. A few of the roads in the area have been blocked, and the two still open should also be closed. This site should be monitored at least every five years to detect changes in overall quality or condition of the rare plant occurrences and/or the associated plant communities.



North Star Mountain Proposed Conservation Site
U.S.G.S. 7.5 min. Breckenridge and Alma quadrangles

Blue River at McCullough Gulch

Biodiversity Rank: B3 (High significance)
The Blue River at McCullough Gulch site contains excellent examples of globally common alpine willow and montane riparian scrub communities. The state rare Preble's shrew was documented within the site. It is one of the best examples of a riverine wetland observed on private lands in Summit County.

Protection Urgency Rank: P2
This site is privately owned with adjacent public lands. Plans for private lands are unknown; however, the site is located in an area that is being developed rapidly with residences. Seven acres on the southeastern portion of the site are owned by Summit County. This portion is managed as open space and has a conservation easement to limit future development. A conservation easement or open space designation is recommended to protect the entire site.

Management Urgency Rank: M3
The site is bordered by Highway 9, which impacts the wetland with road maintenance and improvement projects. Beaver are enhancing the wetland and their continued success relies on proper management.

Location: 5 miles south of Breckenridge, west of Highway 9.
U.S.G.S. 7.5 minute quadrangle: Breckenridge
Legal Description: T7S R77W Sections 36, 30, 25

General Description: The Blue River at McCullough Gulch site is a riparian wetland located between the Tenmile Range and the western base of Red Mountain. The wetland supports a two mile long alpine willow scrub (*Salix brachycarpa/*mesic forb) that is fed by the Blue River as it meanders through the site, as well as several springs that flow from the base of the Tenmile Range. The site includes a pristine wetland that is adjacent to several subdivisions. There is no evidence of grazing from domestic animals, but the site is heavily used by wildlife, e.g., beaver, deer, elk. There are few weeds or hay grasses present. The site is approximately 300 acres and ranges in elevation from 10,200 to 10,263 feet.

Biodiversity Rank Justification: The Blue River at McCullough Gulch site is one of the best remaining wetlands in the upper Blue River Basin. This site supports excellent examples of an alpine willow scrub (*Salix brachycarpa/*mesic forb) and a montane riparian shrubland (*Pentaphylloides floribunda/Deschampsia cespitosa*). The site provides excellent potential habitat for the southern Rocky Mountain boreal toad. The site was searched for toads in 1997 with negative results. Between July 16 and August 27, 1997 seven Preble's shrews (*Sorex* c.f. *preblei*) were documented. The Preble's shrew is a state rare species recently documented for Colorado.

Natural Heritage element occurrences at the Blue River at McCullough Gulch site.

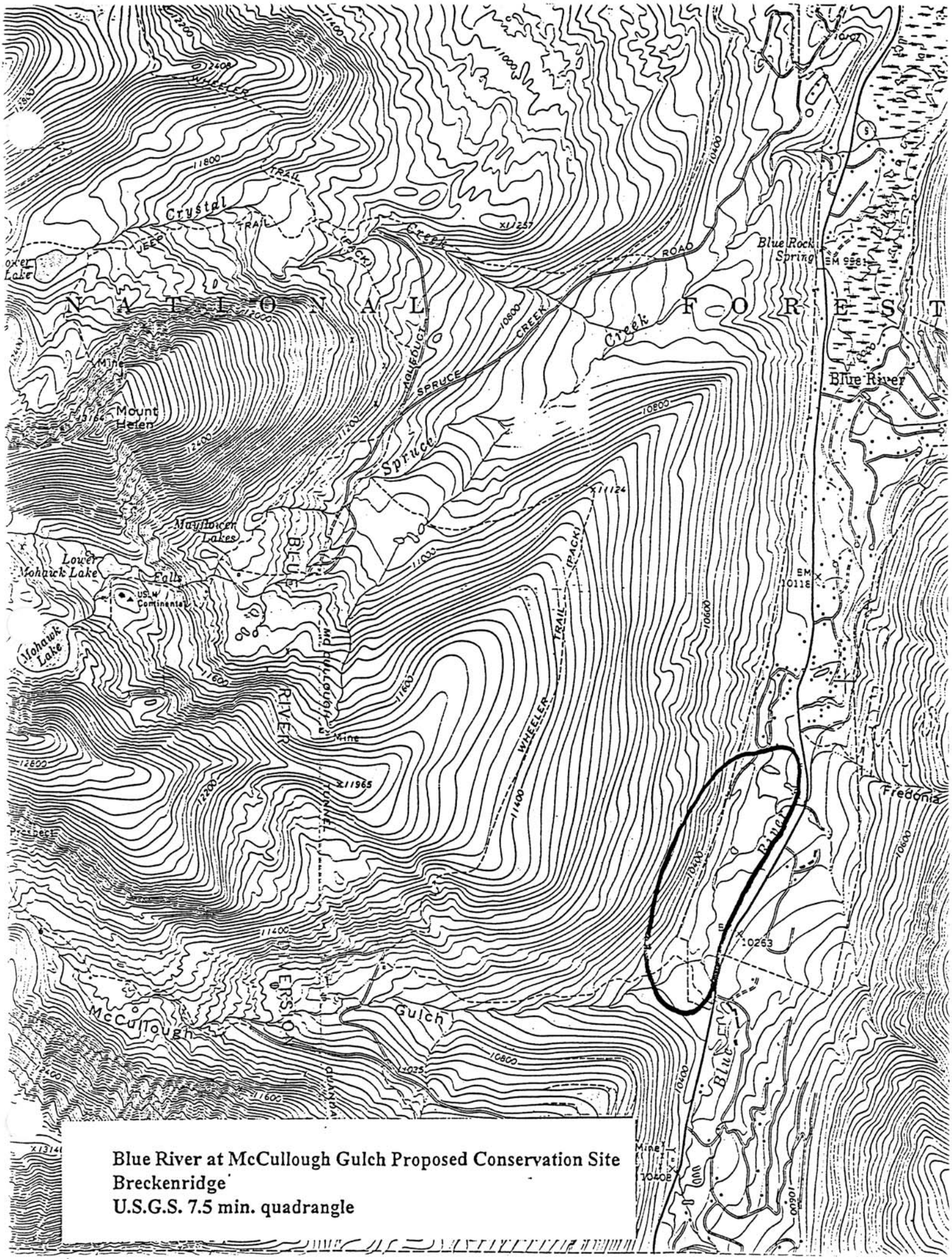
Element	Common Name	Global Rank	State Rank	Federal Status	State Status	Federal Sens.	EO* Rank
Pentaphylloides floribunda/ Deschampsia cespitosa	**montane riparian shrubland**	**G4**	**SU**				**A**
Sorex c.f. *preblei*	Preble's shrew	G5	S1				unranked
Salix brachycarpa/ mesic forb	alpine willow scrub	GUQ	S4				A

*EO=Element Occurrence

Boundary Justification: The boundary encompasses the willow carr and provides a 1,000 feet buffer to protect the site from immediate impacts (e.g., road improvements, development) to the elements and the hydrology. A much larger area, including the full watershed of the Blue River, needs to be considered when developing a plan for long-term viability of the plant communities and Preble's shrew. This site was drawn after a 1997 visit by a CNHP wetland ecologist. The boundary was further verified using a 1988 National Aerial Photography Program 1:40,000 infrared aerial photograph.

Protection Rank Justification: The site is privately owned by two parties (the southern portion of site was not visited). The boundary includes portions of the seven acre McCullough Gulch trailhead property acquired by Summit County as open space in 1995. This portion is managed as open space and has a conservation easement to limit future development. A conservation easement or open space designation is recommended to protect the entire site.The private landowners need to be aware of importance of this remaining wetland in a rapidly developing area of Summit County. The wetlands of the upper Blue River are being rapidly developed and this site is still in relative pristine condition.

Management Rank Justification: Presently, the site is being well managed. But there are future threats to the sites in particular residential development and road enhancement projects. Management for beaver viability should be a priority. This occurrence of the Preble's shrew should be periodically sampled (approximately every 5 years) to determine changes in viability and overall quality of the occurrence as well as the riparian habitat. Further searches for the southern Rocky Mountain boreal toad are recommended. Alterations in hydrology above this site could have profoundly negative impacts on the elements. The hydrology of this site is important to the ecological processes which support the southern Rocky Mountain boreal toad and the riparian communities. The water quality, quantity, and timing should be maintained at its current status.



Blue River at McCullough Gulch Proposed Conservation Site
Breckenridge
U.S.G.S. 7.5 min. quadrangle

Goose Pasture Wetland

Biodiversity Rank: B3 (High significance)
The Goose Pasture wetland supports excellent examples of a common montane riparian willow carr and a common alpine willow scrub. It is the most extensive willow carr observed on private lands in Summit County. Several kettle ponds (glaciated depressions) with submerged vegetation are located in the adjacent uplands. There is also a historical record for the southern Rocky Mountain boreal toad from 1961.

Protection Urgency Rank: P4
This wetland is privately owned by several owners and the Town of Blue River. The tarn (mountain lake) is owned by the Town of Breckenridge. It is considered open space, but no official designation has been made. The site is located in a rapidly growing area of Summit County. A conservation easement or open space designation is recommended to protect this wetland for the future.

Management Urgency Rank: M3
New management will be needed within 5 years to maintain current quality of element occurrences. Management actions could include: monitor water quality due to road maintenance and construction and control spread of exotic plant species. The Town of Breckenridge should limit access to the tarn and adjacent property in order to prevent degradation of the wetland. Future searches for the southern Rocky Mountain boreal toad are recommended.

Location: 2 miles south of Breckenridge
U.S.G.S. 7.5 minute quadrangle: Breckenridge
Legal Description: T7S R77W Sections 7, 18, 19

General Description: The Goose Pasture wetland is located directly south (upstream) of Goose Pasture Tarn. The site is located in a glaciated valley between the Tenmile Range to the west and Boreas Pass to the east. The Blue River meanders through the wetland creating several riverlets and ponds. There are numerous, active beaver ponds within the wetland, as well as natural depressions. There are several kettle ponds interspersed in the spruce/fir uplands that support submerged vegetation. The site is approximately 700 acres and ranges in elevation from 9,880 to 10,000 feet.

The main portion of the site is bordered to the west by Highway 9 and to the east by subdivisions. The kettle ponds (glacial ice depressions) are located west above Goose Pasture Tarn within the Spruce Creek subdivision. The Town of Blue River is located adjacent to the wetland. There is no grazing within the site. There is little pedestrian traffic or fishing within the wetland.

Biodiversity Rank Justification: The Goose Pasture wetland supports excellent examples of a montane riparian willow carr (*Salix drummondiana*/mesic forb) and an alpine willow scrub

(*Salix brachycarpa*/mesic forb). It is the most extensive willow carr observed on private lands in Summit County. A good example of a floating/submergent palustrine (freshwater marsh) wetland (*Nuphar luteum* ssp. *polysepalum*) is located upslope of the riverine wetland. A historical record (1961) for the state endangered southern Rocky Mountain boreal toad (*Bufo boreas boreas*) is located within the site. The site was searched for the boreal toad in 1997, but none were observed.

Natural Heritage element occurrences at the Goose Pasture Wetland site.

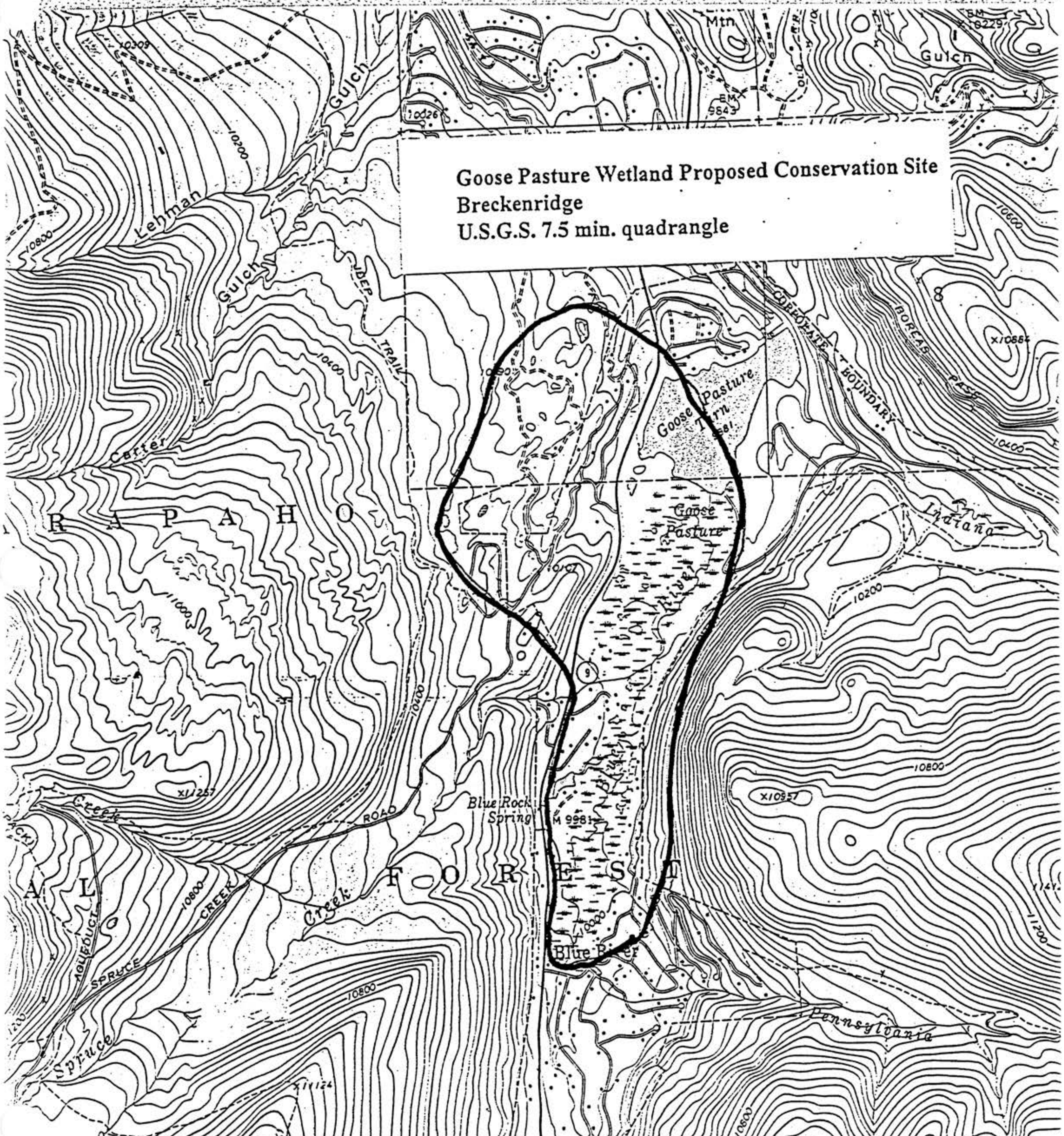
Element	Common Name	Global Rank	State Rank	Federal Status	State Status	Federal Sens.	EO* Rank
Bufo boreas boreas	southern Rocky Mountain boreal toad	G4T1Q	S1	C	E	FS	Historical
Nuphar luteum ssp. *polysepalum*	floating/submerged palustrine wetland	GU	SU				B
Salix brachycarpa/ mesic forb	alpine willow scrub	GUQ	S4				A
***Salix drummondiana*/ mesic forb**	**montane riparian willow carr**	**GU**	**S4**				**A**

*EO=Element Occurrence

Boundary Justification: The boundary is drawn to encompass the elements and provide a buffer of at least 1,000 feet The boundary includes the wetlands and the kettle ponds located to the west upslope of the wetland. A buffer zone is intended to protect the elements from immediate impacts such as development and road expansion operations. A much larger area should be considered in any long-term management or protection plan to protect the hydrology. This site was drawn after a 1997 visit by a CNHP wetland ecologist. The boundary was further verified using a 1988 National Aerial Photography Program 1:40,000 infrared aerial photograph.

Protection Rank Justification: This wetland is both privately and publically owned. It is considered open space, but no official designation has been made. The kettle ponds are located on private lands within the Spruce Creek subdivision. The site is located in a rapidly growing area of Summit County and it needs a conservation easement or county open space designation.

Management Rank Justification: New management will be needed within 5 years to maintain current quality of element occurrences. Management actions could include: monitor water quality due to road maintenance and construction and control spread of exotic plant species. The Town of Breckenridge should limit access to the tarn and adjacent property in order to prevent degradation of the wetland. Future searches for the southern Rocky Mountain boreal toad are recommended. Alterations in hydrology above this site would have profoundly negative impacts on the elements.


Goose Pasture Wetland Proposed Conservation Site
Breckenridge
U.S.G.S. 7.5 min. quadrangle
Lehman
Gulch
Carter
Mtn
R A P A H O
A L
F O R E S T
Goose Pasture Tarn
Goose Pasture
Blue Rock Spring
Blue River
CORPORATE BOUNDARY
BOREAS PASS
TRAIL
ROAD
Creek
SPRUCE CREEK
Spruce
Indiana
Pennsylvania
10800
10400
10200
10600
X10957
X11257
X11124
X10884

Mohawk Lakes

Biodiversity Rank: B3 (High significance)
An excellent example of a globally secure plant community and three rare plant species occur within this site.

Protection Urgency Rank: P3
This site is publicly owned with the exception of small private mining inholdings. Renewed mining activities may threaten this site in the future.

Management Urgency Rank: M2
Management of recreational activities is essential within five years to prevent loss at the site.

Location: West of the Blue River toward the headwaters of Spruce Creek. From Highway 9 south of Breckenridge, turn right (across from Goose Pasture Tarn) at Crown Street. Veer to your left twice and drive to the U.S. Forest Service 4WD parking lot. Take the road to Mohawk Lakes. At the end of the road park and hike on the trail to Mohawk Lakes.

U.S.G.S. 7.5 minute quadrangle: Breckenridge
Legal Description: T7S R78W S21,22, 23, 26, 27, 28

General Description: This site is a glacially carved basin consisting of a series of small ponds, lakes, waterfalls, and snow melt streamlets above treeline (11,600-12,400 feet). This scenic drainage system supports a combination of sedge (*Carex* spp.) dominated wetlands, subalpine fir/willow (*Abies lasiocarpa/Salix brachycarpa*), krummholz communities, and mesic alpine meadows interspersed with large boulders and rock outcrops. The surrounding landscape rises to steep talus slopes and the summits of Pacific Peak and Mount Helen.

Biodiversity Rank Justification: Grays Peak whitlow-grass (*Draba grayana*) is a globally rare plant species known only from Colorado, and is considered to be the primary species of concern in this site. This species is known from 13 locations in Colorado, and all of the locations have a very low total number of individuals documented. An excellent occurrence of Snow grass (*Phippsia algida*), a state rare plant species was documented at this site in 1996. This species is only known from 13 locations in Colorado. An excellent occurrence of a krummholz plant community also exists at this site.

Natural Heritage element occurrences at the Mohawk Lake site.

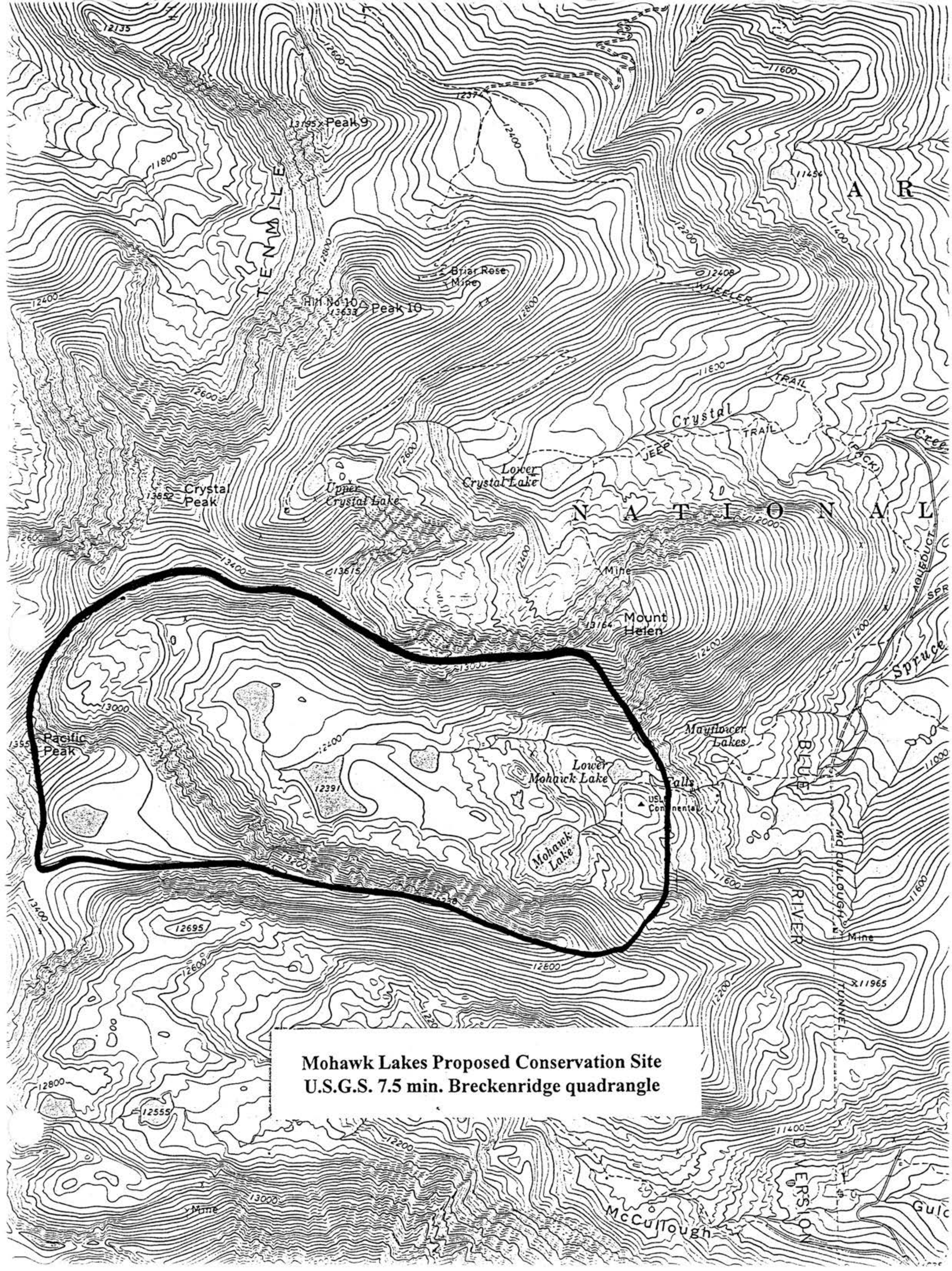
Element	Common Name	Global Rank	State Rank	Federal Status	State Status	Federal Sens.	EO* Rank
Draba grayana	**Grays Peak whitlow-grass**	**G2**	**S2**				**C**
Abies lasiocarpa/ Salix brachycarpa	krummholz	G3G4	S3S4				A
Chionophila jamesii	Rocky Mountain snowlover	G4?	S3 S4				unranked
Phippsia algida	snow grass	G5	S2				A

*EO=Element Occurrence

Boundary Justification: This boundary is drawn to 1) protect the occurrences from direct impacts such as trampling or other surface disturbances; 2) provide suitable habitat where additional individuals/communities can become established over time; and 3) include representation from each of the local alpine plant communities which may support a pollinator for one or more of the rare plant species. The boundary was drawn during a site visit by CNHP botanists in 1997.

Protection Rank Justification: This site is publicly owned and managed by the U.S. Forest Service with the exception of small inholdings which are privately owned. These inholdings should be acquired by the USFS to ensure that renewed mining activities do not threaten these occurrences. The City of Colorado Springs owns several of these inholdings and has worked with the USFS to create a management plan.

Management Rank Justification: The Mohawk Lakes Trail is a very popular hiking trail. In wet conditions hikers tend to leave the trail and promote increased erosion problems. The trail should be better established with careful consideration to an alignment that would be more suitable during wet periods. In addition, the trail should be established to avoid any direct impacts to the element occurrences. The element occurrences at this site should be monitored approximately once every five years to detect any changes in overall quality or condition. No exotic plant species were documented at this site. A plan for early detection and eradication of invasive exotics should be established.



Mohawk Lakes Proposed Conservation Site
U.S.G.S. 7.5 min. Breckenridge quadrangle

Muggins Gulch

Biodiversity Rank: B3 (Moderate significance)
The Muggins Gulch site supports a good occurrence of a globally rare lower montane woodland and an excellent occurrence of a state rare alpine willow carr. There is also a good occurrence of a state rare subalpine riparian shrubland.

Protection Urgency Rank: P1
The majority of the Muggins Gulch site is privately owned with adjacent public lands. This site is located in a rapidly developing area and the threats from residential development and road improvements are high. Additionally, the current owners are considering the creation of a fishing pond within the willow carr for their bed and breakfast clients. This site is an excellent candidate for either a conservation easement or open space designation.

Management Urgency Rank: M1
Management actions are required immediately or the riparian areas will be lost or degraded. Actions should also consider reintroducing beaver to maintain the viability of the occurrences. Additional research is needed to determine the hydrological impacts from the planned pond creation. This site would be a good place to promote the importance of wetlands through interpretive displays for the bed and breakfast patrons.

Location: 9 air miles southeast of Frisco, along the Swan River
U.S.G.S. 7.5 minute quadrangle: Keystone
Legal description: T6S R77W Sec 11, 12, 14, 13, 24

General Description: Muggins Gulch site is located north of the Swan River at the southwest base of Keystone Ski Area. The site extends from Muggins Gulch east to the North Fork of the Swan River. There is one residence within the site that currently operates as a bed and breakfast. The site has historically been logged and burned. The site supports a mosaic of natural communities ranging from wet meadows (*Deschampsia cespitosa*) to sagebrush shrubland (*Artemisia cana/Festuca thurberi*) to bristlecone pine (*Pinus aristata*) forests. The site is approximately 1,600 acres and ranges in elevation from 9,700 to 9,920 feet.

The wetlands around Muggins Gulch are supported by three streams and numerous springs. The riparian areas support dense willow carrs that contain abandoned beaver dams. Upslope of the riparian areas are numerous springs that support slope wetlands with peaty soils. In the wetter areas near the springs there are wet meadows and bog birch (*Betula glandulosa*) communities. Engelmann spruce (*Picea engelmannii*) and quaking aspen (*Populus tremuloides*) communities occur on adjacent slopes. The bristlecone pine (*Pinus aristata*) community exists on the south-southwest facing slopes east of Muggins Gulch.

Biodiversity Rank Justification: The Muggins Gulch site is a relatively undisturbed area that supports a mosaic of plant communities. The site supports an excellent example of a subalpine willow carr (*Salix wolfii/Carex aquatilis*). There is a good occurrence of a globally rare lower

montane woodland (*Pinus aristata/Festuca thurberi*) and a state rare riparian shrubland (*Betula glandulosa*/mesic forb-mesic graminoid). There is a good occurrence of a western slope sagebrush shrubland (*Artemisia cana/Festuca idahoensis*) also documented for this site. The site is also good potential habitat for the state endangered southern Rocky Mountain boreal toad (*Bufo boreas boreas*). The site was surveyed for the boreal toad in 1997, but none were found.

Natural Heritage element occurrences at the Muggins Gulch site.

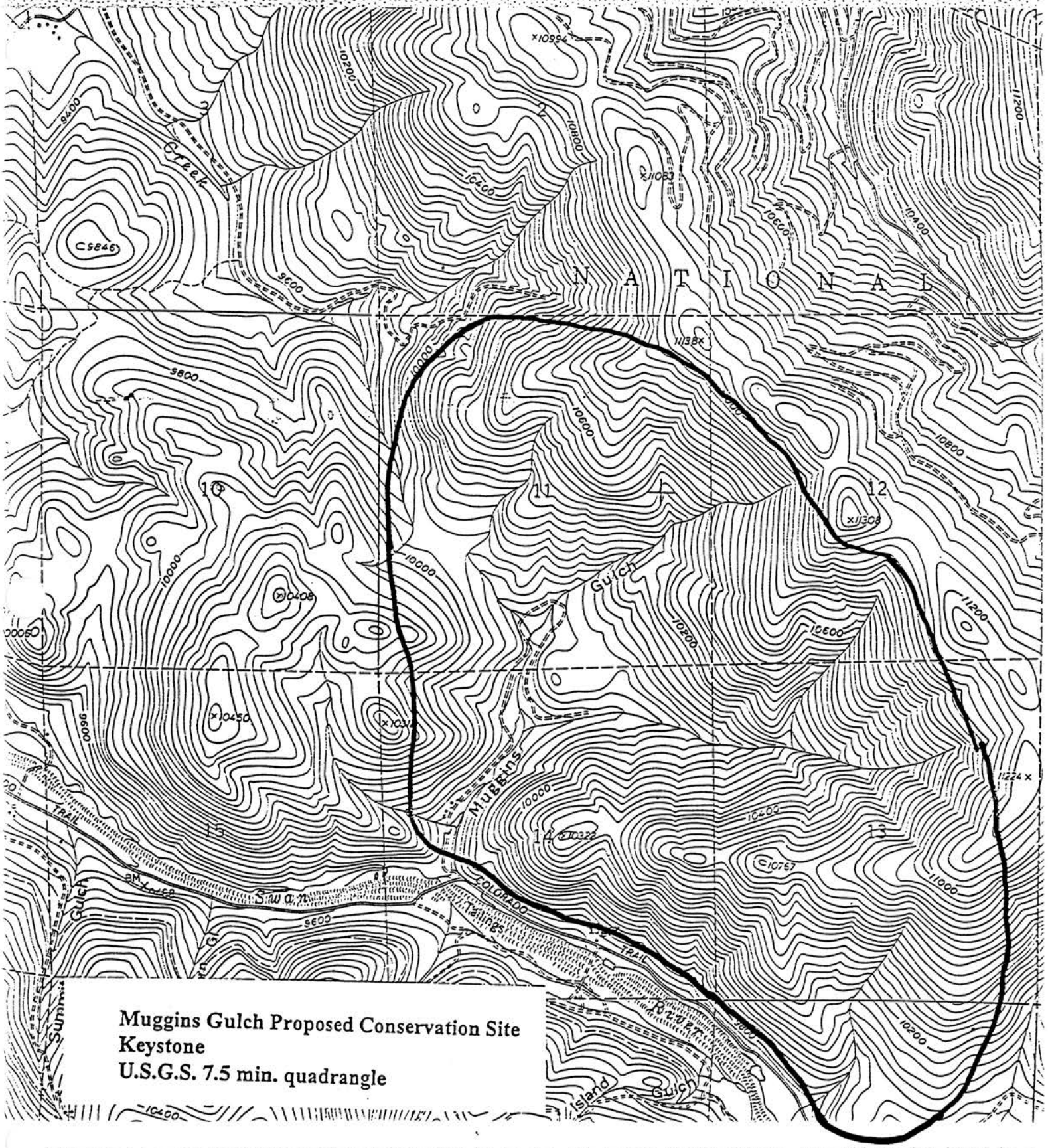
Element	Common Name	Global Rank	State Rank	Federal Status	State Status	Federal Sens.	EO* Rank
Artemisia cana/ Festuca idahoensis	western slope sagebrush shrublands	G4	SU				B
Betula glandulosa/ mesic forb and graminoid	subalpine riparian shrubland	GU	S2S3				B
Pinus aristata/ Festuca thurberi	**lower montane woodlands**	**G3**	**S2**				**B**
Salix wolfii/Carex aquatilis	subalpine willow carr	G4	S3				A

*EO=Element Occurrence

Boundary Justifications: The boundary drawn includes the drainages and adjacent upslope areas. There is a 1,000 ft buffer drawn to provide protection from immediate impacts, such as development. A much larger area should be considered in any long-term management or protection plan to protect the hydrology. This site was drawn after a 1997 visit by a CNHP wetland ecologist. The boundary was further verified using a 1988 National Aerial Photography Program 1:40,000 infrared aerial photograph.

Protection Rank Justification: The site is owned privately with adjacent public lands. The private owners are interested in keeping area as open space. The U.S. Forest Service plans are unknown. The area is surrounded by residential development. The Keystone Ski Area and the Keystone Ranch are located to the north of site. There is a residential development next to the Swan River along the western border of the site. There is the threat that Keystone Ski Area will expand and eventually be linked with Breckenridge Ski Area.

Management Rank Justification: Management actions must be taken immediately to prevent loss of the elements. The private landowners are considering construction of a 5 acre pond which would negatively impact the willow communities (e.g., introduction of non-native fish and plants) and alter the hydrology of the site, possibly diminishing boreal toad habitat. Beaver should be reintroduced to the site to improve the viability of the riparian areas. Monitoring of water quality should be considered, especially with the proposed pond creation. The hydrology of this site is important to the ecological processes which support the riparian communities. The water quality, quantity, and timing should be maintained at its current status. The Forest Service should monitor the bristlecone pine occurrence due to the observed dying branches, perhaps from pine bark beetle activity. This site would be a good place to promote the importance of wetlands through interpretive displays for the bed and breakfast patrons.


Muggins Gulch Proposed Conservation Site
Keystone
U.S.G.S. 7.5 min. quadrangle

Upper French Gulch

Biodiversity Rank: B3 (High significance)
The Upper French Gulch site supports an excellent example of a Colorado River cutthroat trout occurrence.

Protection Urgency Rank: P3
The Upper French Gulch site is owned both privately and publicly. It is threatened by residential development, road improvements, and mining activities.

Management Urgency Rank: M2
New management actions will be needed within 5 years to prevent the loss of the elements.

Location: Approximately 4 miles east of Breckenridge
U.S.G.S. 7.5 minute quadrangle: Boreas Pass
Legal Description: T6S R77 W Sections 34, 35
T7S R77 W Sections 2, 1

General Description: The Upper French Gulch site is a narrow, subalpine riparian willow carr located in a glacially carved valley between Bald Mountain and Mt. Guyot. French Gulch, Black Gulch, and Little French Gulch drain the site. There is an extensive montane riparian willow carr (*Salix planifolia/Carex aquatilis*) that supports several beaver ponds. The site is approximately 400 acres ranging in elevations from 10,220 to 10,800 feet. The lower portion of the drainage was destroyed by dredging operations and is not included in the site. There is a 4WD road that parallels French Gulch that is currently closed to motorized use by the public. Motorized access is allowed for homeowners in the Mountain Meadows subdivision.

Biodiversity Rank Justification: The Upper French Gulch site supports an A-purity rank for a 1993 occurrence of the Colorado River cutthroat trout (*Oncorhynchus clarki pleuriticus*). The Colorado River cutthroat trout is a U.S. Forest sensitive and a state special concern species. The introduction of non-native trout species, dating to 1872 in Colorado, is considered a primary cause for the decline in numbers and genetic purity of the Colorado River cutthroat trout. The population in Upper French Gulch in 1993 was determined to be genetically intact.

Natural Heritage element occurrences at the Upper French Gulch site.

Element	Common Name	Global Rank	State Rank	Federal Status	State Status	Federal Sens.	EO* Rank
Oncorhynchus clarki pleuriticus	**Colorado River cutthroat trout**	**G5T3**	**S3**		**SC**	**FS**	**A-purity rank**

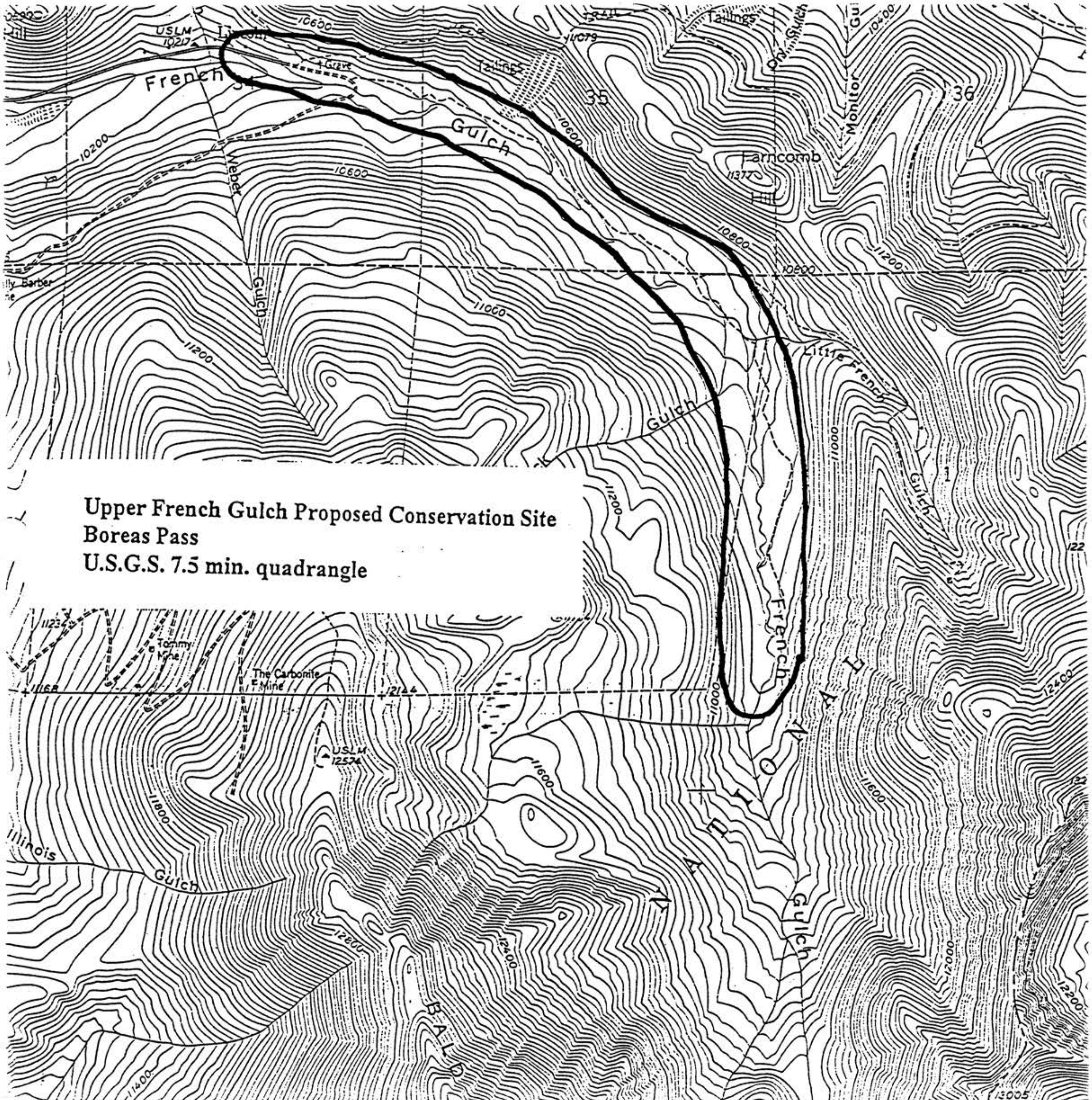
*EO=Element Occurrence

Boundary Justification: The boundary is drawn to encompass the riparian community and a 1,000 feet buffer from each side of the river to protect the trout from direct disturbances, e.g., development, water diversions. A much larger area should be considered in any long-term

management or protection plan to protect the hydrology. This site was drawn after a 1997 visit by a CNHP wetland ecologist. The boundary was further verified using a 1988 National Aerial Photography Program 1:40,000 infrared aerial photograph.

Protection Rank Justification: The site is owned both publicly and privately. There are a number of potential threats to the site which include: residential/commercial development, road improvement or creation, and increase in mining/dredging operations.

Management Rank Justification: New management actions will be required within the next 5 years. These actions could include: a management plan for cutthroat trout and beaver viability. The hydrology of this site is important to the ecological processes which support the trout and the riparian communities. The water quality, quantity, and timing should be maintained at its current status. Management should consider designating trails for winter and summer use to encourage users to stay on roads and trails to prevent erosion and trampling.



Upper French Gulch Proposed Conservation Site
Boreas Pass
U.S.G.S. 7.5 min. quadrangle

Gold Hill

Biodiversity Rank: B5 (General or state-wide biodiversity interest)
A good example of a state rare plant community, a state rare bird species, and a state rare orchid species fall within these site boundaries.

Protection Urgency Rank: P1
The private lands around the Barton Gulches is immediately threatened by residential development and hydrological modifications.

Management Urgency Rank: M2
Management of recreational activities and exotic plant species is needed within 5 years to prevent loss to the element occurrences.

Location: This site occurs in the lower elevation hills at the eastern base of the Ten Mile Range and above a subdivision called, Gold Hill. The Colorado Trail/Gold Hill trailhead is found on Colorado Highway 9 between the towns of Breckenridge and Frisco, approximately west of the confluence of the Blue and Swan rivers.

U.S.G.S. 7.5 minute quadrangle: Frisco
Legal Description: T6S R78W S1, 2, 10, 11, 12, 13, 14, 23, 24
T6S R77W S7, 18

General Description: Within the foothills of the Ten Mile Range, east of Ten Mile Peak, the Gold Hill site includes a mosaic of community types including shrublands, slope wetlands, riparian communities, quaking aspen *(Populus tremuloides*) stands, and lodgepole pine (*Pinus contorta*) forests. The upper slopes of Gold Hill, summiting at 10,315 feet, are dominated by lodgepole pine with scattered subalpine fir (*Abies lasiocarpa*). The understory is sparsely vegetated and dominated by heart leaved arnica (*Arnica cordifolia)*. The ground cover is thick with lodgepole pine needles and a cobbly granite soil. The shrublands are dominated by sagebrush (*Artemisia tridentata*). Riparian areas are dominated by willows (*Salix planifolia, S. brachycarpa*, and *S. geyeriana*). Northern Goshawks were observed on numerous occasions during 1997 in this site. It is likely that the goshawks rely on Barton Gulch, in the southern portion of the site, as a primary nesting and hunting area. Barton Gulch has several roads, hay meadows, human-made ponds, and irrigation ditches as well as two beaver created ponds/wetlands and willow carrs that are considered to be locally significant wetlands. The far eastern portion of the site has been impacted by gravel mining but nonetheless supports some locally significant beaver created wetlands, willow carrs, and slope wetlands. This site includes approximately 3500 acres.

Biodiversity Rank Justification: Purple lady's-slipper (*Cypripedium fasciculatum*), a state rare orchid, is known from five locations in Summit County. This occurrence of this plant species is extremely small and is threatened by potential residential development and or timbering activities. This site also supports a significant montane riparian forest that is in good condition and is dominated by aspen (*Populus tremuloides*), alder (*Alnus incana*), and native forbs and

grasses. Goshawks (*Accipiter gentilis*) have been observed in the area and should be considered an important addition to this site.

Natural Heritage element occurrences at the Gold Hill site.

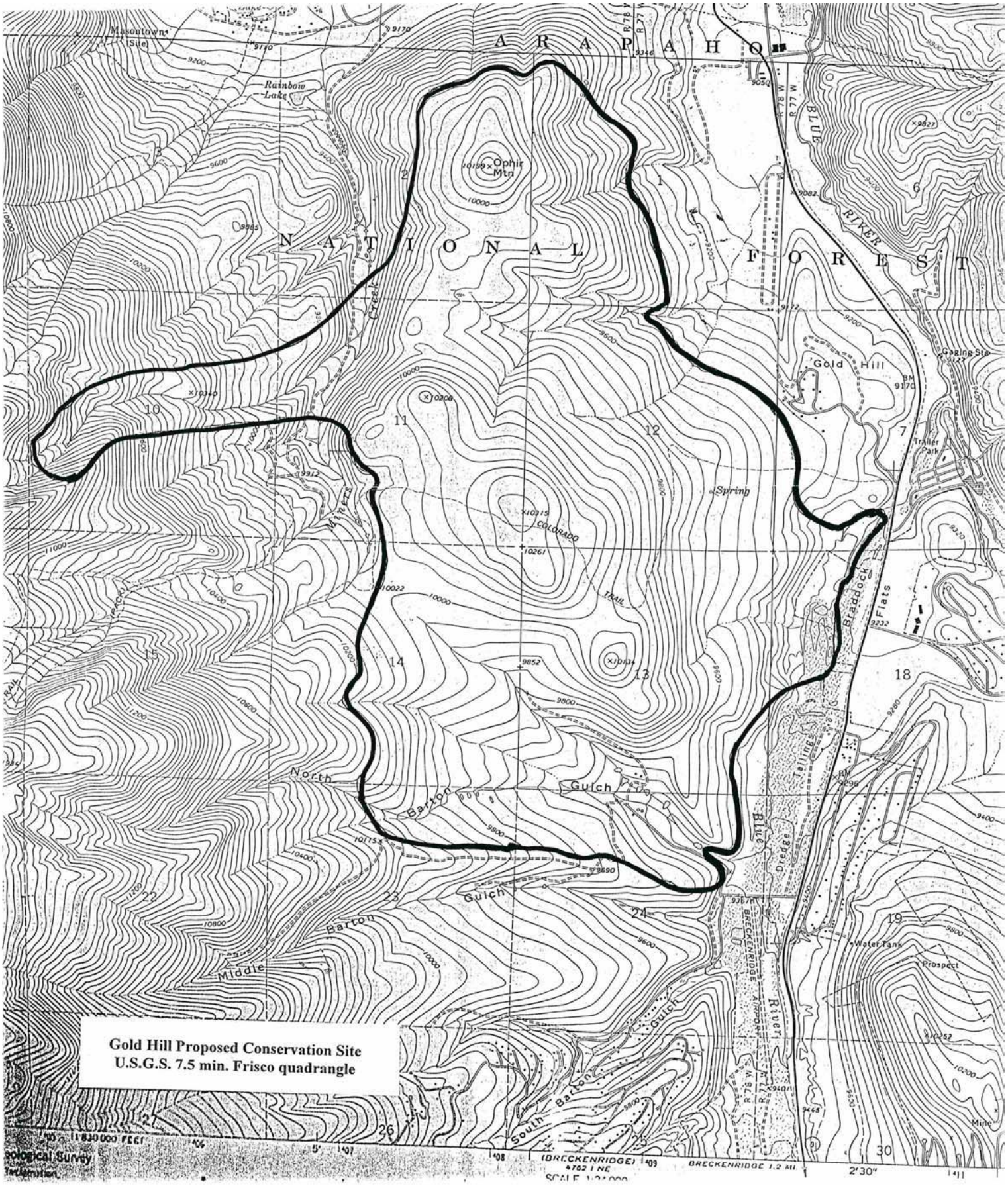
Element	Common Name	Global Rank	State Rank	Federal Status	State Status	Federal Sens.	EO* Rank
Cypripedium fasciculatum	purple lady's-slipper	G4	S3			FS	D
Populus tremuloides/Alnus incana	**montane riparian forests**	**GU**	**S3**				**B**

*EO=Element Occurrence

Boundary Justification: The boundary is drawn to protect the occurrences from direct impacts, and to provide additional suitable habitat where the elements of concern can become established over time. The site includes representation from all of the major community types in the local area, primarily the lodgepole pine (*Pinus contorta*) forests and the riparian communities that are known to support elements of concern. The boundary also includes a portion of North Barton Gulch which is likely to provide nesting and foraging habitat for the Northern goshawk (*Accipiter gentilis*). Additionally, the boundary incorporates two locally significant wetlands (please see Volume 2, Whatley Gulch and Braddock Flats). The boundary was drawn following a 1997 site visit by a CNHP wetland ecologist, and using 1988 National Aerial Photography Program 1:40,000 infrared aerial photographs.

Protection Rank Justification: The majority of this site is publicly owned and managed by the U.S. Forest Service. Private land is adjacent to the public lands on the eastern edge including an open space tract purchased by the County in October 1997. There are also private claims on Ophir Mountain and in Barton Gulch drainage. The private lands around the Barton Gulches is immediately threatened by residential development and hydrological modifications.

Management Rank Justification: The private land is in poor condition and the private landowners management practices may affect the quality of the entire site. The private landowners and the U.S. Forest Service should work together to create a management plan. There is a proposed timber sale in the area. Unlike most species, this orchid tends to move into timber cuts and recently burned areas. This action may improve the likelihood of survival of this species at this site. This area receives a high level of recreational use, including hiking and camping. The spread of exotic plant species in this area is a concern and should be monitored. The full extent of the orchid occurrence should be delineated, and a monitoring and management plan should be developed for the orchid habitat. The site should be protected from impacts of various land uses such as timbering and recreational activities, as well as alteration of the hydrological setting.



Gold Hill Proposed Conservation Site
U.S.G.S. 7.5 min. Frisco quadrangle

Glossary

calcareous- referring to limestone or calcium-rich soils

carr- a wetland willow thicket

circumboreal- distributed around the high latitudes of the northern hemisphere

circumpolar- distributed around the north or south poles

endemic- restricted to a particular geographic region or soil type

exotic- not native

fellfield- type of tundra that is thiry-five to fifty percent bare rock, with cushion plants, mosses, and lichens between

forb- herbaceous

graminoid- grasslike

mesic- moist

montane- referring to the biogeographical zone of relatively moist cool slopes below timberline dominated by large evergreen trees.

palustrine- pond or marsh

phenology- the seasonal occurrences of plants and animals

recruitment- the influx of new members into a population by reproduction or immigration.

riparian- streamside, riverside

xeric- dry

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Appendix A

Table 5. Elements Of Global Or State-Wide Concern

The following elements, organized by taxonomic group, have been documented in Summit County as of 1997. Please See Table 1 and 2 For Rank And Status Definitions.

Element Name	Element Common Name	Global Rank	State Rank	Fed Status	State Status	Fed Sens
AMPHIBIANS						
Bufo boreas boreas	boreal toad	G4T1Q	S1	C	E	FS
BIRDS						
Bucephala islandica	Barrow's goldeneye	G5	S2B, SZN		SC	
Accipiter gentilis	northern goshawk	G5	S3B, SZN			FS
Aegolius funereus	boreal owl	G5	S2			FS
Pandion haliaetus	osprey	G5	S3B, SZN			FS
Lanius ludovicianus	loggerhead shrike	G5	S3S4B, SZN			FS
Grus americana	whooping crane	G1	SAN	LE	E	
MAMMALS						
Felis lynx canadensis	lynx	G5	S1	C	E	FS
Gulo gulo	wolverine	G4	S1		E	FS
Sorex c.f. preblei	Preble's shrew	G5	S1?			
Ursus arctos	grizzly bear	G4	SX	SX	LT	E
FISH						
Onchorynchus clarki pleuriticus	Colorado River cutthroat trout	G4T3	S3		SC	FS
REPTILES						
none documented in Summit County						
INVERTEBRATES						
Oeneis jutta reducta	Rocky Mountain jutta arctic	G5TU	S1			

PLANT COMMUNITIES			
Abies lasiocarpa-Picea engelmanii/ Mertensia ciliata	montane riparian forests	G5	S5
Artemisia cana/ Festuca idahoensis	western slope sagebrush shrublands	G5	S2?
Artemisia cana/ Festuca thurberi	western slope sagebrush shrublands	G2G3	S2S3
Artemisia tridentata ssp. *vaseyana/ Festuca thruberi*	western slope sagebrush shrublands	GU	S1S2
Artemisia tridentata wyomingensis/ Pseudoroegneria spicata	xeric sagebrush shrublands	G5	S3?
Betula glandulosa/ mesic forb-mesic graminoid	subalpine riparain shrubland	GU	S2S3
Carex praegracilis	clustered sedge wetland	G2G3	S2
Deschampsia cespitosa-Ligusticum tenuifolium	mesic alpine meadows	GU	SU
Myriophyllum exalbescens	floating/submerged palustrine wetlands	GU	SU
Nuphar luteum ssp. *polysepalum*	floating/submergent palustrine wetlands	GU	SU
Pentaphylloides floribunda/ Dschampsia cespitosa	montane riparian shrubland	G4	S3
Picea pungens/ Alnus incana	montane riparian forests	G3	S3
Pinus aristata/ Festuca thruberi	lower montane woodlands	G3	S2
Populus angustifolia-Picea pungens/ Alnus incana	montane riparian forest	G3	S3
Populus angustifolia/ Alnus incana	montane riparian forest	G3	S3
Populus tremuloides/ Alnus incana	montane riparian forest	GU	S3
Populus tremuloides/ tall	montane aspen forest	G5	S5

forbs				
Potamogeton natans	montane floating/submergent wetland	G5?	S1	
Pseudotsuga mensiezii/ Acer glabrum	lower montane forests	G4	S1	
Salix brachycarpa/ mesic forb	alpine willow scrub	GUQ	S4	
Salix drummondiana/ Carex utriculata	montane willow carr	GU	S3	
Salix drummondiana/ mesic forb	Drummonds willow / mesic forb	GU	S4	
Salix geyeriana-Salix monticola/ Calamagrostis canadensis	montane willow carr	G3	S3	
Salix geyeriana-Salix monticola/ mesic	montane riparian willow carr	GU	S3	
Salix geyeriana/ Carex aquatilis	montane willow carr	G3	S3	
Salix geyeriana/ Carex utriculata	Geyer's willow/beaked sedge	G5	S3	
Salix geyeriana-Salix monticola/ mesic forb	Rocky Mountain willow-Geyer's willow/ mesic forb	GU	SU	
Salix monticola/ Calamagrostis canadensis	montane willow carr	G3	S3	
Salix monticola/ mesic forb	montane riparian willow carr	GU	S3	
Salix planifolia/ Calamagrostis canadensis	subalpine riparian willow carr	G4	S4	
Salix planifolia/ Caltha leptosepala	subalpine riparian willow carr	G4	S4	
Salix planifolia/ Carex aquatilis	subalpine riparian willow carr	G4	S3	
Salix wolfii/ Carex aquatilis	subalpine riparian willow carr	G4	S3	
PLANTS				
Aquilegia saximontana	columbine	G3	S3	
Armeria maritima ssp. *sibirica*	sea pink	G5T5	S1	FS
Astragalus molybdenus	Leadville milkvetch	G3	S2	FS

Botrychium lanceolatum var. *lanceolatum*	lance-leaved moonwort	G5T4	S2		
Botrychium lunaria	moonwort	G5	S2		
Braya humilis	alpine braya	G4	S2		
Carex concinna	low northern sedge	G4G5	S1		
Carex limosa	mud sedge	G5	S2		
Chionophila jamesii	Rocky Mountain snowlover	G4?	S3S4		
Conimitella williamsii	Williams Bishop's cap	G3	SH		
Crepis nana	dwarf hawksbeard	G5	S2		
Cryptogramma stelleri	slender rock-brake	G5	S2		
Cypripedium fasciculatum	purple lady's-slipper	G4	S3		FS
Cystopteris montana	mountain bladder fern	G5	S1		
Draba borealis	northern rockcress	G4	S2		
Draba crassa	thick-leaf whitlow-grass	G3	S3		
Draba exunguiculata	clawless draba	G3	S2		
Draba fladnizensis	arctic draba	G4	S2S3		
Draba grayana	Grays Peak whitlow-grass	G2	S2		
Draba lonchocarpa var. *lonchocarpa*	lancepod whitlow-grass	G4T4	S3		
Draba porsildii	Porsild draba	G3	S1		
Draba rectifructa	mountain whitlow-grass	G3	S2		
Draba spectabilis var. *oxyloba*	showy whitlow-grass	G3T3Q	S3		
Draba streptobrachia	Colorado Divide whitlow-grass	G3	S3		
Draba weberi	Webers draba	G1	S1		
Eutrema penlandii	Penland allpine fen mustard	G1G2	S1S2	LT	BLM
Goodyera repens	dwarf rattlesnake-plantain	G5	S2		
Ipomopsis globularis	globe gilia	G2	S2		FS
Listera borealis	northern twayblade	G4	S2		
Lycopodium annotinum var. *pungens*	stiff clubmoss	G5TU	SU		
Oxytropis parryi	Parry oxytrope	G5	S1		
Papaver lapponicum ssp. *occidentale*	alpine poppy	G4T4	S2		
Parnassia kotzebuei	Kotzebue grass-of-parnassus	G4	S2		

Penstemon cyathophorus	middle park penstemon	G3G4	S3		
Penstemon harringtonii	Harrington beardtongue	G3	S3		FS
Phippsia algida	snow grass	G5	S2		
Ptilagrostis mongholica ssp. *porteri*	Porter feathergrass	G3G5T2	S2		FS
Ranunculus karelinii	tundra buttercup	G4G5	S2		
Saussurea weberi	Weber saussurea	G3Q	S2		

Summary Natural History Information on the Elements of Global or State-Wide Concern Documented in Summit County As Of 1997 By Taxonomic Group

The following information was compiled from Pague 1997, CNHP 1997, and Osborn et al. 1998, and Spackman et al. 1997 unless otherwise noted. Please see Table 5 for ranks.

Rare Or Imperiled Plants Of Summit County By Scientific Name

Rocky Mountain columbine (*Aquilegia saximontana*) is a globally rare plant species endemic to central and north-central Colorado. This alpine species may be somewhat protected by its inaccessible habitat.

The globally common **sea pink (*Ameria maritima* ssp. *sibirica*)** is an arctic disjunct. It is only found in Park and Summit counties in Colorado and is considered critically imperiled in the state. Mining is a threat to this species in Colorado.

The **Leadville milkvetch (*Astragalus molybdenus*)** is a globally rare species known from Colorado and Montana. This alpine species is threatened by mining and recreation.

The **lance-leaved moonwort (*Botrychium lanceolatum* var. *lanceolatum*)** is globally common. This species, like all moonworts, is extremely small and easily overlooked. The lance-leaved moonwort is scattered throughout Colorado in diverse habitats but with small numbers of individuals at each location. The threats to this species are not well known.

The **moonwort (*Botrychium lunaria*)** is a globally secure species that is rare in Colorado. It can be locally common, but is very inconspicuous. A total of 34 Colorado occurrences are documented. Three are located within Summit County. This moonwort generally occurs on calcareous soils in the sunlight of open fields, wood edges, and occasionally forests in the southern parts of its range (Harrington 1954).

Alpine braya (*Braya humilis*) is known from 18 locations in Colorado. One of these locations is within Summit County.

The **low northern sedge (*Carex concinna*)** is a globally common but state rare plant. There are only three known Colorado locations, one is in Summit County. This species is found in cool, moist forests with mosses, on rich peaty soil, often calcareous.

The **mud sedge (*Carex limosa*)** is a circumpolar globally common species. In Colorado, it is found in the northcentral portion of the state. The mud sedge, like most wetland species, is in danger of habitat destruction and loss.

The **Rocky Mountain snowlover (*Chionophila jamesii*)**, is a regional endemic to Wyoming and Colorado.

This regional endemic, **Williams bishop's cap (*Conimitella williamsii*)**, is known from Idaho, Montana, Wyoming and Colorado. It is known from one occurrence in Colorado (Summit County) which has not been seen since the 1970's.

The **dwarf hawksbeard (*Crepis nana*)** is a circumboreal species which is known from central Colorado. Recreation is the primary threat to this alpine species.

The **slender rock-brake *(Cryptogramma stelleri*)** is globally common and scattered throughout central Colorado in moist coniferous habitats. Specific threats to this species are unkown.

Purple lady's slipper (*Cypripedium fasciculatum*) is a globally secure orchid species found throughout the western United States. It is known from nearly 60 locations scattered throughout central Colorado and four in Summit County. The largest known occurrence for this species has been documented in Summit County, Colorado. This orchid is found in spruce-fir and lodgepole forests. Even though this habitat is one of the most common in Colorado, this species is considered rare in our state because most occurrences are very small.

The **mountain bladder fern (*Cystopteris montana*)** is a globally common fern that is found along streamsides (Weber 1961), near moist sites in woods, heathlands, and meadows, often on limestone (Welsh 1974). A total of 11 Colorado locations are known, two are located Summit County.

There are several species within the mustard family which are found in less than 30 locations in the world and are restricted to the alpine peaks in Colorado. These species include: **Grays Peak whitlow-grass (*Draba grayana*), thick-leaf whitlow-grass (*Draba crassa*), Colorado Divide whitlow-grass (*Draba streptobrachia*) and clawless draba (*Draba exunguiculata*)**. Trampling, mining and unnatural erosion due to recreation disturbances are the current threats to these species.

The **northern rockcress (*Draba borealis*)** is apparently secure globally. However, there are only 4 known occurrences in Colorado and only one record in Summit County. It occurs on creek banks, cliffs, gravely terraces, steep slopes, meadows, and roadsides from Alaska to Colorado.

The **arctic draba (*Draba fladnizensis*)** is a circumpolar species that is apparently globally secure, but is rare in Colorado. There are a total of 23 occurrences in Colorado with five records in Summit County. It occurs in wet meadows, on bare soil in dry tundra, and in rocky areas both wet and dry (Rollins 1993).

The **lancepod whitlow-grass (*Draba lonchocarpa* var. *lonchocarpa*)** is a globally secure subspecies but limited in Colorado. Like many of the alpine species, recreation, is a primary threat.

Disjunct from its Canadian populations the **Porsild draba (*Draba porsildii*)** is a globally vulnerable and state rare alpine species. This species is known from twelve locations in central Colorado. Like many of the alpine species, recreation, is a primary threat.

The **mountain whitlow-grass (*Draba rectifructa*)** is a mustard species which occurs in a variety of habitats in a large elevational range. Ironically, this species is only known from 17 locations in Colorado. In addition to Colorado, the global range includes Utah, New Mexico, and Arizona. This species is considered to be rare throughout its range.

The **showy whitlow-grass (*Draba spectabilis* var. *oxyloba*)** is known from 23 locations in central and southwestern Colorado. This species is documented over a wide elevation range and a variety of different habitat types.

Weber whitlow-grass (*Draba weberi*) is an extremely restricted endemic, known only from a population of about 100 individuals at the type locality, north of North Star Peak in the Blue Lake site in Summit County. This plant is critically imperiled globally because of its extreme rarity.

Penland alpine fen mustard (*Eutrema penlandii*) is the only plant species in Summit County that is on the Endangered Species list (USFWS 1996). This species is endemic to Park and Summit counties, Colorado. There are 16 known locations of this species in the world, two of which are in Summit County. This species occurs in wet areas above 12,000 feet elevation. This habitat is threatened by recreation, grazing, mining and alterations in the hydrology.

The **rattlesnake plantian (*Goodyera repens*)** is a state rare circumboreal orchid species known from 28 locations throughout Colorado. There is one occurrence in Summit County.

Globe gilia (*Ipomopsis globularis*) is known only from Summit and Park counties in Colorado. There are 13 locations, of which three are in Summit County. This Colorado endemic is an alpine species threatened by mining and recreation.

The **northern twayblade (*Listera borealis*)** is a small orchid of spruce-fir forests. This circumboreal species is globally secure but is known from only 22 locations in Colorado. There is only one record of this species in Summit County.

The **stiff clubmoss (*Lycopodium annotinum* var. *pungens*)** is a globally common species. The state rank is unknown due to the lack of information for this species. It is found in deep wet humus, swampy moist coniferous forests and exposed grass or rocky sites. There are four known occurrences in Colorado. The Blue Lakes site is the only documented occurrence in Summit County.

Parry oxytrope (*Oxytropis parryi*) is a state rare species in the pea family. Scattered throughout the high peaks of the western United States, this species is globally secure. This species is known from five locations in five counties in Colorado. This species is threatened by the typical threats to alpine regions, i.e., mining, and recreation.

Harrington's and middle park beardontongue (*Penstemon harringtonii* and *Penstemon cyathophorus*) both occur just over the county line of Summit County in Grand County. These species have been reported in Summit County but only with general/vague location information, and not since the 1980's. These globally rare beardtongues are local endemics, their distributions overlap in Middle Park. The distribution of Harrington's beardtongue centers around the town of Eagle, and middle park beardtongue occurrs in northern Colorado and southern Wyoming. Both species are highly threatened by recreational, residential, and agricultural developments.

The **alpine poppy (*Papaver lapponicum* ssp. *occidentale*)** is known from 38 locations in central Colorado. These locations include small numbers of individuals which makes this species more of a concern. The global range includes Alaska to Greenland and south to New Mexico. This species typically occurs on alpine scree slopes which afford some natural protection due to their instability.

Kotzebue grass-of-parnassus (*Parnassia kotzebuei*) is a state rare plant species. There are a total of 12 occurrences known from Colorado, three of the 12 are located in Summit County. This plant is found on wet ledges and rills in subalpine and alpine regions (Weber 1996).

Porter feathergrass (*Ptilagrostis mongholica* ssp. *porteri*) is considered to be a globally imperiled plant because of its restricted range, known only from 4 counties in Colorado. It grows only in peat bog hummocks at elevations from 9,700 ft to 12,000 feet There are a total of 24 occurrences in Colorado, only one is in Summit County.

Occurring in Montana and Colorado, disjunct from Alaska, the **tundra buttercup (*Ranunculus karelinii*)**, occurs in 15 locations in Colorado. This alpine species is found in three sites in Summit County two of which are threatened by mining.

Weber saussurea (*Saussurea weberi*) is a very rare species in the sunflower family that grows only in exposed alpine sites with poorly developed soils derived from Leadville Limestone and Manitou Dolomite. It occurs in Wyoming, Montana, and two counties (Park and Summit) in Colorado. There are a total of 18 known occurrences in Colorado, seven of which are located in Summit County.

Rare or Imperiled Amphibians of Summit County

One amphibian of concern is found in Summit County. There are a total of nine occurrences for the **boreal toad *(Bufo boreas boreas)*** in the county. Five of the occurrences are historical records. The remaining four occurrences are or have been active breeding sites within the past five years. Three of the four breeding sites are located on private lands. There are only 20 known breeding occurrences for Colorado (G. Hammerson personal communication as cited in Pague et al. 1997).

The Southern Rocky Mountain population of boreal toads is likely distinct from other populations (A. Goebel, unpbl. data). Although relationships among all populations of this toad are not resolved, recent genetic evaluations suggest that the southern Rocky Mountain population occurs from southern Idaho to New Mexico (Goettl 1997; Steve Corn pers. comm.; A. Goebel unpbl. data) with about ninety percent of the full range found in Colorado. In Colorado, the species occurs throughout the mountains above 8,000 feet The boreal toad breeds in marshes, ponds, and lakes and inhabits the drier surrounding habitats at other times (Hammerson 1982). There are approximately 206 historical localities for the boreal toad in Colorado. Presently, only three to four healthy populations remain, comprised of less than 20 high priority breeding sites (Steve Corn, pers. comm.; Lauren Livo, pers. comm.). Based on the small numbers of egg masses, it is estimated there are currently fewer than 1,000 breeding adults. Although there is an abundance of "protected" habitat, populations have declined precipitously or disappeared over the past 20 years, and continue to do so (Goettl 1997). The reasons for the decline are unknown and the factors important to the perseverance of this species are not well understood. The boreal toad is currently a candidate for federal listing, a state endangered, and U.S. Forest Service sensitive species.

The best current method of protecting amphibians is to protect breeding habitat, especially high quality wetlands within their range, and adjacent non-breeding habitat.

Rare or Imperiled Fish of Summit County

The **Colorado River cutthroat trout (*Oncorhynchus clarki pleuriticus*)** is a globally vulnerable subspecies. It is a U.S. Forest Service sensitive species and listed as a state special concern species by the Colorado Division of Wildlife. There are a total of 14 occurrences for this fish in Summit County. The largest threats stem from the introduction of non-native trout and alteration of habitat.

This subspecies is the only trout native to the upper Colorado River basin. Its native range extends southward to the Escalante River on the west and San Juan drainage on the east sides of the basin, including the Green, Yampa, Gunnison, Dolores, San Juan rivers, and their tributaries (CDOW 1986; CDOW 1987; Proebstel 1994; Young et al. 1996). Its current distribution includes remnant populations in Colorado, Wyoming, and Utah. The historical habitat included most clearwater streams and rivers of western Colorado (Behnke 1992). The trout remains only in smaller order streams and a few high elevation lakes of the mountainous country. The Colorado River cutthroat trout is heavily managed and studied. Presently there are 42 populations in Colorado judged to be genetically pure "A category" (Proebstel 1994). However, the primary reasons for conservation concern at the global and state levels are long-term trend prognoses and threats. Populations continue to decline in many streams (Young et al. 1996); hybridization between this subspecies and non-native trout species poses the greatest threat to the elimination of pure populations. Competition with non-native trout species and exotic fish diseases also pose threats.

The wetlands in the floodplain of the Blue River and its tributaries play an important role in sustaining the populations of these fish. Wetlands provide organic input as food, shelter from heat and predators, temperature regulation, and breeding habitat. The presence of these fish is one reason that wetlands along the length of this major river and its tributaries should not be destroyed.

Rare or Imperiled Birds of Summit County by Common Name

The Colorado occurrences of the **Barrow's Goldeneye** ***(Bucephala islandica)*** are at the southern margin of the species' range, and may be disjunct. This species is globally stable, but considered imperiled in Colorado due to the small numbers of actual breeding localities, uncertain population status, and small number of protected occurrences within Colorado (Pague et al. 1997).

The **boreal owl** ***(Aegolius borealis)*** is a rare to locally uncommon resident of the high mountains of Colorado. U.S. Forest Service surveys have documented 13 occurrences in Colorado and about 20 breeding pairs. This species is globally secure, but is considered state vulnerable and is a U.S. Forest Service sensitive species.

The **loggerheaded shrike** ***(Lanius ludovicianus)*** is common on the plains in Colorado, but is declining in its global range. The decline is not understood but probably can partially be explained by the decline in habitat quality and availability.

The **Northern goshawk** ***(Accipiter gentilis)*** is secure globally, but there are only 62 nest sites reported from Colorado's national forests. This species apparently responds negatively to some forms of forest fragmentation (Reynolds 1983), but there are few data on population trends. The Northern goshawk is considered vulnerable and is a U.S. Forest Service species of special concern.

The **osprey** ***(Pandion haliaetus)*** is considered globally secure, but there are only 11 confirmed breeding occurrences in Colorado, with an additional six probable breeding occurrences. Although continental numbers have increased significantly in the last three decades (Colorado Bird Observatory 1997), the total population size in Colorado is likely less than 150 birds.

The **whooping crane** ***(Grus americana)*** is critically imperiled globally. There are only two populations in the world with very few numbers of individuals. Colorado is within the migration route of one of these populations (Idaho to New Mexico). There are nine migration stopover locations that have been used by these birds in our state. One of these, from 1989, is in Summit County at Dillon Reservoir. The whooping crane is threatened by the drainage of wetland areas and the change in vegetation in these habitats.

Note that for most migratory birds, CNHP documents only breeding locations; migratory birds are otherwise too unpredictable in their locations. However, the Natural Heritage Program does

track predictable locations of migratory birds such as winter roosts of bald eagles and staging areas for greater sandhill cranes.

Rare And Imperiled Mammals Of Summit County By Scientific Name

The **lynx** ***(Felis lynx canadensis)*** is critically imperiled in the state of Colorado. This species is considered globally secure, however, the overall range of the species has declined, as it has in Colorado. The current status of the lynx in Colorado is not known. Studies indicate that existing records may represent sporadic populations based more upon wandering and dispersing individuals rather than viable, long-term populations. Lynx need large home range areas and are being threatened by habitat fragmentation, increased backcountry access by humans, and habitat conversion.

Wolverine ***(Gulo gulo),*** like the lynx, is an elusive mammal in need of a large area to roam. There is no evidence to prove that an extant population exists in Colorado today. The species is globally common.

Long-tailed shrews are difficult enough to discern at the species level, and identification is generally only accurately accomplished with cranial (skeletal) analysis. The specimens collected during this research in 1997 have been sent to an expert in New Mexico to be verified, however, the early stages of identification have determined **Preble's shrew (*Sorex* c.f. *preblei*)**. The Preble's shrew is primarily described as a species of the upper Great Basin and Columbian Plateau, where habitats are generally described as semi-arid shrublands, inlcuding sagebrush, grasslands, alpine tundra, and sagebrush openings in subalpine forest (Hoffman and Fisher 1978; Fitzgerald et al. 1994). In Colorado, there are only four locations documented. In general, there is little known about most shrew species. It is expected that most of them are more common than the current information reflects.

The **grizzly bear (*Ursus arcticus*)** is historically known from Colorado. This species was last seen in the late 1970's.

Rare and Imperiled Invertebrates of Summit County

Known from only four locations in Colorado is the **Rocky Mountain arctic jutta** ***(Oenies jutta reducta)*** butterfly**.** This species is globally secure and is typically found in montane to subalpine bogs. However, the rare Rocky Mountain subspecies occurs in dry open lodgepole pine forests.

Plant Communities of Summit County by Scientific Name

The Colorado Natural Heritage Program collects information on rare and imperiled plant communities, as well as high quality examples of common native communities. Together these constitute our "coarse filter" approach to conservation. The coarse filter concept states that if aggregates (e.g., plant communities) are managed, the components of these aggregates (e.g.,

plants, animals, microbes, ecological processes, etc.) will be managed as well. Thus plant communities are used to identify and formulate conservation strategies for all the components of native ecological systems, including both the rare and common as well as the known and unknown. The term "plant community" reflects the fact that plant species composition is the primary factor distinguishing one element from another.

Summary information for the following six plant communities is not available at this time: montane riparian forest (*Abies lasiocarpa-Picea engelmanii/Mertensia ciliata*), western slope sagebrush shrublands (*Artemisia cana/Festuca idahoensis* and *Artemisia cana/Festuca thruberi*), western slope sagebrush shrublands (*Artemisia tridentata* ssp. *vaseyana/Festuca thruberi*, *Artemisia tridentata* ssp. *wyomingensis/Pseudoroegneria spicata*), lower montane woodlands (*Pinus aristata/Festuca thurberi*), and lower montane forest (*Pseudotsuga mensiezii/Acer glabrum*).

Bog birch/mesic forb-mesic graminoid (*Betula glandulosa*/mesic forb-mesic graminoid) is a broad-leaved deciduous palustrine scrub-shrub community. This plant association and similar types occur in Montana, Idaho, and Colorado. In Colorado, it is found in the northwest and north central part of the state. There are two occurrences for this plant community in Summit County. Overgrazing by livestock causes reduced vigor of shrubs, and eventually the shrub cover may be completely eliminated.

Clustered Sedge (*Carex praegracilis)* plant association forms an open meadow in swales and along stream channels of the short-grass prairie. Plant associations dominated or co-dominated by this species occur in Montana, Idaho, Utah, Wyoming, and New Mexico. This association is found along small creeks of the Pawnee National Grassland and is likely to occur throughout the eastern plains. In southwestern Montana, *Carex praegracilis* (clustered sedge) forms large meadows. This sedge is considered to have medium to high forage value for horses and cattle, especially early in the grazing season. In Colorado, *Carex praegracilis* never forms extensive meadows and may be limited to more mesic habitats found within riparian areas. Soils of this association are susceptible to compaction if grazed in early spring and summer when saturated.

Summary information on the **mesic alpine meadow (*Deschampsia cespitosa-Ligusticum tenuifolium*)** was unavailable, however, it has the same characteristics as the following tufted hairgrass (*Deschampsia cespitosa*) community:

This dense graminoid meadow occurs in broad, nearly flat, valley bottoms in openings of willow carrs and coniferous forests in subalpine regions across Colorado. It is characterized by a dense sward of *Deschampsia cespitosa* (tufted hairgrass) and minor cover of other graminoids and forbs. This plant association and similar types are documented from throughout the West in Oregon, Washington, Nevada, western Montana, eastern and central Idaho, western Wyoming (Youngblood et al. 1985, Girard et al. 1995), Utah, and Colorado. This plant association has been documented from the White River Basin, the Colorado River Basin, and the Routt and San Juan National Forests. *Deschampsia cespitosa* (tufted hairgrass) is highly palatable to livestock and is therefore, subject to heavy grazing pressure. The typically wet soils of this plant association are easily compacted by vehicles and livestock use.

American milfoil (*Myriophyllum exalbescens*) plant association is a lacustrine or depressional wetland with a permanent hydroperiod and rare flooding. The *Myriophyllum exalbescens* plant association was found in the literature reported only from Colorado at lower to mid elevations. The lack of reporting in the literature probably results from inadequate study of aquatic communities; this type should be expected to have a wider distribution (Sanderson and Kettler 1996). *M. exalbescens* is a circumboreal species distributed in North America south to West Virginia, Arkansas, Texas, New Mexico, Arizona, and California. Weber and Wittman (1992) state that this plant species is common in lakes and ponds at lower and middle altitudes of Colorado. This plant association was found in one location in Boulder, CO. Additionally, it was found to dominate a few beaver ponds that were filling with sediment in the Telluride region, CO. Sanderson and Kettler (1996) found two stands that were dominated by *Myriophyllum exalbescens*. There was only one location for this plant association documented on private lands in Summit County. It is suspected that this plant association is under documented and is widely distributed.

Rocky Mountain pond lily (*Nuphar luteum* ssp. *polysepalum*) plant association is a depressional wetland with a permanent hydroperiod and no flooding. The presence of *Nuphar lutea* ssp. *polysepala*, often in abundance, makes this type a conspicuous plant association. In Summit County, it is found in relatively shallow water of kettle ponds in the subalpine. The prominent yellow flowers, broad floating leaves, and general lack of associated species make this plant association unmistakable. This type has been reported from Colorado, Wyoming, and Idaho. It can be expected to have a much wider distribution. Weber and Wittman (1996) state that in Colorado this plant species occurs in subalpine ponds, most common on Grand Mesa.

Shrubby cinquefoil/tufted hairgrass *(Pentaphylloides floribunda/Deschampsia cespitosa)* is a deciduous palustrine scrub-shrub community. This plant association has been found in Utah, southeastern Idaho, western Wyoming, and Montana. This plant association occurs in Park County and the Routt National Forest, Colorado. In Colorado, the *Pentaphylloides floribunda/Deschampsia cespitosa* (shrubby cinquefoil/tufted hairgrass) plant association is considered to be grazing-induced. *Pentaphylloides floribunda* is not very palatable to livestock and large mammals. However, *Deschampsia cespitosa* is highly palatable and is heavily grazed. With livestock grazing, *Pentaphylloides floribunda* and less palatable *Juncus balticus* (Baltic rush) increase in cover while the highly palatable *Deschampsia cespitosa* (tufted hairgrass) decreases in cover.

The **Colorado blue spruce/thinleaf alder (*Picea pungens/Alnus incana* spp. *tenuifolia)*** plant association is a common montane riparian type in Colorado. It occurs in deep, shaded canyons and narrow valleys along relatively straight stream reaches. It generally forms small pockets, but can be continuous for several river miles. This plant association and similar types occur in western Wyoming, Colorado, and northern New Mexico. This plant association occurs in the Routt National Forest, the Yampa, White, Colorado, Gunnison, and SanMiguel/Dolores River Basins, and the San Juan and Rio Grande National Forests. Dense stands of *Alnus incana* (thinleaf alder) hinder livestock access into this plant association. *Alnus incana* is not particularly palatable to livestock, but can be trampled as animals search for more palatable species.

Narrowleaf cottonwood/thinleaf alder (*Populus angustifolia/Alnus incana*) is a globally rare broad-leaved deciduous palustrine forest. Similar plant associations occur in western Wyoming, central and southern Colorado, and New Mexico. This plant association is documented once within Summit County and is also known from the Yampa, Arkansas and Gunnison River Basins, and the San Juan National Forest. Grazing and alterations to the hydrologic regime are the main threats to this plant community.

Narrowleaf cottonwood-Colorado blue spruce/thinleaf alder (*Populus angustifolia-Picea pungens/Alnus incana*) is a globally rare broad-leaved deciduous palustrine forest. It occurs in a riverine wetland with a seasonal hydroperiod and occasional flooding. This plant association is probably found in eastern Idaho, western Wyoming, and southern Utah. This plant association was found twice in Summit County. It is also found in five major river basins and two National Forests on the west slope of Colorado. It is likely to occur along the Colorado Front Range. Grazing and alterations to the hydrologic regime are the main threats to this plant community.

Quaking aspen/thin-leaf alder (*Populus tremuloides/Alnus incana* ssp. *tenuifolia*) is a broad-leaved deciduous palustrine forest. It occurs in a riverine wetland with a seasonal hydroperiod and occasional flooding. This plant association has not been documented outside of Colorado but it is thought to be common globally. Within Colorado, it is found in the Routt National Forest, and the Colorado and Gunnison River Basins. It was documented twice in Summit County. Grazing may threaten the condition of this community.

Quaking aspen/tall forb (*Populus tremuloides*/tall forb) is a broad-leaved deciduous palustrine forest. It occurs as a slope wetland that receives an intermittent hydroperiod with rare flooding. This is a globally and state common plant community known from the western United States . An excellent example of this community was documented once in Summit County. The primary source of unnatural disturbance for this plant association is livestock grazing, which can have severe impacts. Clearcutting can also have dramatic effects to the water table, soil stabilization, and regeneration of plant species.

Pondweed (*Potamogeton natans*) plant association is found in Eurasia and North America; Alaska to Newfoundland, south to southern California; central Arizona, northern New Mexico, and most of the midwest and northeastern U.S.; widely scattered throughout the Intermountain region. Weber and Wittman (1996) state that Colorado *Potamogeton* spp. are not well-enough collected to justify precise comments on habitat or altitude. This plant association was found once on private lands in Summit County. There are 3 other occurrences documented in Colorado; 2 in Jackson County and 1 in Routt County. It is found in shallow lakes or kettle ponds.

Barrenground willow/mesic forb (*Salix brachycarpa*/mesic forb) is a broad-leaved deciduous palustrine scrub-shrub community. The global distribution is not fully known, however, similar types occur in western Wyoming and Utah. This is a common subalpine community in Colorado. Three excellent occurrences of this plant association were documented in Summit County. Management information for this plant association is not well known.

Drummond willow-beaked sedge (*Salix drummondiana/Carex utriculata*) is a broad-leaved deciduous palustrine scrub-shrub community. Similar plant associations have been reported from Utah, southeastern Idaho, and Montana. The full global distribution is not known. This plant association has only been documented from the South Platte River Basin along the Colorado Front Range. Two occurrences are documented in Summit County. Beaver activity enhances this community structure and should be maintained. The Drummond willow and the beaked sedge are both palatable to livestock. Overgrazing can detrimentally affect the quality of the community and may eventually eliminate the willow from the site, thus destroying the plant community.

Drummond willow/mesic forb (*Salix drummondiana*/mesic forb) is a broad-leaved deciduous palustrine scrub-shrub community. This is a secure community in the state of Colorado, occurring throughout the west slope and in montane regions along the Front Range. This plant association and similar types occur in Nevada, eastern Idaho, western Wyoming and Utah. Beaver activity in the vicinity of this plant association is important for maintaining the health of the riparian ecosystem. Season-long grazing can reduce native forb cover and increase the abundance of non-native grasses.

Geyer willow-mountain willow/bluejoint reedgrass (*Salix geyeriana-Salix monticola/Calamagrostis canadensis*) is broad-leaved deciduous palustrine scrub-shrub community. This is a globally rare plant association which is only documented from Colorado. This association was documented twice in Summit County. It is also known from the western slope and the Colorado Front Range. Beaver activity in the vicinity of this plant association is important for maintaining the health of the riparian ecosystem. Like other wetland willow communities, the wet and often saturated soils of this plant association are vulnerable to compaction by livestock and heavy equipment. Overgrazing by livestock can dry the site, increase non-native grass cover, and reduce the vigor of willow root structure.

Geyer's willow-mountain willow/mesic forb *(Salix geyeriana-Salix monticola*/mesic forb) plant association and similar types occur in eastern Utah, Idaho, Wyoming, and Colorado. This association occurs in the Routt National Forest and the San Miguel and Arkansas River Basins. The management responses of this plant association are likely to be similar to other tall-willow shrublands dominated by *Salix geyeriana* (Geyer willow) or *Salix monticola* (mountain willow). The wet and often saturated soils of this plant association are vulnerable to compaction by livestock and heavy equipment. Overgrazing by livestock can dry the site, increase non-native grass cover, and reduce the vigor of willow root structure. Beaver activity in the vicinity of this plant association is important for maintaining the health of the riparian ecosystem. Beaver dams abate channel downcutting, bank erosion, and downstream movement of sediment. Beaver dams raise the water across the floodplain and provide year-round saturated soils. Plant establishment and sediment build-up behind beaver dams raises the channel bed and creates a wetland environment.

Geyer willow/aquatic sedge *(Salix geyeriana/Carex aquatilis)* plant association and similar types occur in Montana, Idaho, Utah, Wyoming and Colorado. This association occurs in the

Routt National Forest and in the Gunnison and Arkansas River Basins. *Salix geyeriana* (Geyer willow) appears to be less tolerant of browsing pressure than other tall montane willow species. *Salix geyeriana* (Geyer willow) will form the classic "mushroom" shape with over browsing by deer and cattle. *Carex* (sedge) species are often heavily utilized by livestock in narrow riparian areas in mid- to high-elevation rangelands. Overgrazing by livestock can dry sites, increase non-native grass cover, and result in decreased vigor of willow root structure and eventually eliminate them from the site. The wet and often saturated soils of this plant association are also vulnerable to compaction by livestock and heavy equipment. Beaver activity in the vicinity of this plant association is important for maintaining the health of the riparian ecosystem. Beaver dams abate channel downcutting, bank erosion, and downstream movement of sediment. Beaver dams raise the water across the floodplain and provide year-round saturated soils. Plant establishment and sediment build-up behind beaver dams raises the channel bed and creates a wetland environment.

Geyer's willow/beaked sedge (*Salix geyeriana/Carex utriculata*) is a broad-leaved deciduous palustrine scrub-shrub community. This is a globally common plant association which is found in Montana, Utah, Idaho and Colorado. This plant association was documented once in Summit County. It also occurs in north-central Colorado, in the Yampa and South Platte River Basins. Beaver activity in the vicinity of this plant association is important for maintaining the health of the riparian ecosystem. Like other wetland willow communities, the wet and often saturated soils of this plant association are vulnerable to compaction by livestock and heavy equipment. Overgrazing by livestock can dry the site, increase non-native grass cover, and reduce the vigor of willow root structure.

Geyer's willow-Mountain willow/mesic forb (*Salix geyeriana-Salix monticola*/mesic forb) is broad-leaved deciduous palustrine scrub-shrub community. This plant association and similar types occur in eastern Utah, Idaho, Wyoming, and Colorado. The full distribution is not known. There are two occurrences in Summit County. It also occurs in the San Miguel and Arkansas River Basins and in northcentral Colorado. Beaver activity in the vicinity of this plant association is important for maintaining the health of the riparian ecosystem. Like other wetland willow communities, the wet and often saturated soils of this plant association are vulnerable to compaction by livestock and heavy equipment. Overgrazing by livestock can dry the site, increase non-native grass cover, and reduce the vigor of willow root structure.

Mountain willow/bluejoint reedgrass (*Salix monticola/Calamagrostis canadensis*) is broad-leaved deciduous palustrine scrub-shrub community. This is a globally rare plant community known only from Colorado, however, similar associations occur in Wyoming. There is one occurrence in Summit County. Beaver activity in the vicinity of this plant association is important for maintaining the health of the riparian ecosystem. Livestock grazing may detrimentally effect the structure of the community.

Rocky Mountain willow/mesic forbs *(Salix monticola/*mesic forb) plant association has not been reported outside of Colorado, however, similar associations occur in Utah, Idaho, and Wyoming. *Salix monticola* (mountain willow) is more abundant in Colorado and becomes less frequent to the north and west in the Rocky Mountains. Outside of Colorado, *Salix monticola* mixes with other *Salix* species where it is less dominant. In central and eastern Utah, *Salix*

monticola dominated stands are infrequent and due to structural and ecological similarities are included in *Salix boothii* (Booth willow) associations. *Salix monticola* also has a limited distribution in Idaho and largely associates with other *Salix* (willow) species. This plant association is a major type in the upper montane areas of the San Miguel/Dolores (Kittel and Lederer 1993), Colorado, White, Gunnison and South Platte River Basins as well as the western half of the San Juan National Forest. Overgrazing by livestock in this plant association can dry sites, increase non-native cover, and reduce the vigor of willow root structure. Beaver activity in the vicinity of this plant association is important for maintaining the health of the riparian ecosystem. Beaver dams abate channel down cutting, bank erosion, and downstream movement of sediment. Beaver dams raise the water table across the floodplain and provide year-round saturated soils. Plant establishment and sediment build-up behind beaver dams raises the channel bed and creates a wetland environment.

Planeleaf willow *(Salix planifolia)* is an abundant subalpine willow, forming large shrublands (carrs) with a wide variety of undergrowth species. The **planeleaf willow/bluejoint reedgrass (*Salix planifolia/Calamagrostis canadensis)*** type is less common and is frequently heavily grazed to the point of shifting the dominant undergrowth grasses. In Colorado, this type is frequently encountered and occurs as small stands. It may have been more abundant historically. This plant association occurs in the Big Horn National Forest in north-central Wyoming and in northeastern Utah. This association occurs in southeast Colorado, the San Juan National Forest, the White River Basin, and along the Front. *Salix planifolia* (planeleaf willow) is highly palatable to wildlife and livestock. The forage value of *Calamagrostis canadensis* (bluejoint reedgrass) is moderate to high with young foliage the most palatable to livestock. With high grazing pressure, the height and density of *Salix planifolia* will be decreased and the production of *Calamagrostis canadensis* will decrease. Low-stature *Salix planifolia* willow carrs appear to be sensitive to trampling and soil compaction by livestock due to saturated conditions throughout the growing season. However, livestock will typically avoid these sites until August or September, due to the wet soils. If season-long grazing does occur, the plants and soils will be damaged. Heavy grazing opens the canopy and lowers the water table. This allows *Salix brachycarpa* (barrenground willow), *Salix wolfii* (wolf's willow) or *Pentaphylloides floribunda* (shrubby cinquefoil) and drier herbaceous species to become established. Beaver activity in the vicinity of this plant association is important for maintaining a high water table and a wetland environment This allows for the establishment of hydrophytic plants including willows and sedges as well as providing excellent habitat for waterfowl and fish.

Planeleaf willow/marsh marigold (*Salix planifolia/Caltha leptosepala*) is a broad-leaved deciduous palustrine scrub-shrub community. This plant association is globally and state common and occurs in northwestern and north-central Wyoming. This plant association is a common subalpine community in Summit County. An excellent example is located near Montezuma. Beaver activity in the vicinity of this plant association is important for maintaining the health of the riparian ecosystem. Livestock grazing may detrimentally effect the structure of the community.

Planeleaf willow/aquatic sedge (*Salix planifolia/Carex aquatilis*) is a broad-leaved deciduous palustrine scrub-shrub community. This is a globally and state common plant association known

from Montana, Wyoming, Idaho, Idaho, Utah, and Colorado. This plant association occurs throughout the Rocky Mountains of Colorado, including Summit County. Beaver activity in the vicinity of this plant association is important for maintaining the health of the riparian ecosystem. Livestock grazing may detrimentally effect the structure of the community.

Wolf willow/aquatic sedge (*Salix wolfii/Carex aquatilis*) is a broad-leaved deciduous palustrine scrub-shrub community. This plant association is found in Utah, southeastern Idaho, Montana, Wyoming, and Colorado. There is one occurrence of this type in Summit County. It is also found scattered throughout the west slope and in the Arkansas River Basin on the east slope of Colorado. Beaver activity in the vicinity of this plant association is important for maintaining the health of the riparian ecosystem. Livestock grazing may detrimentally effect the structure of the community.

Appendix B

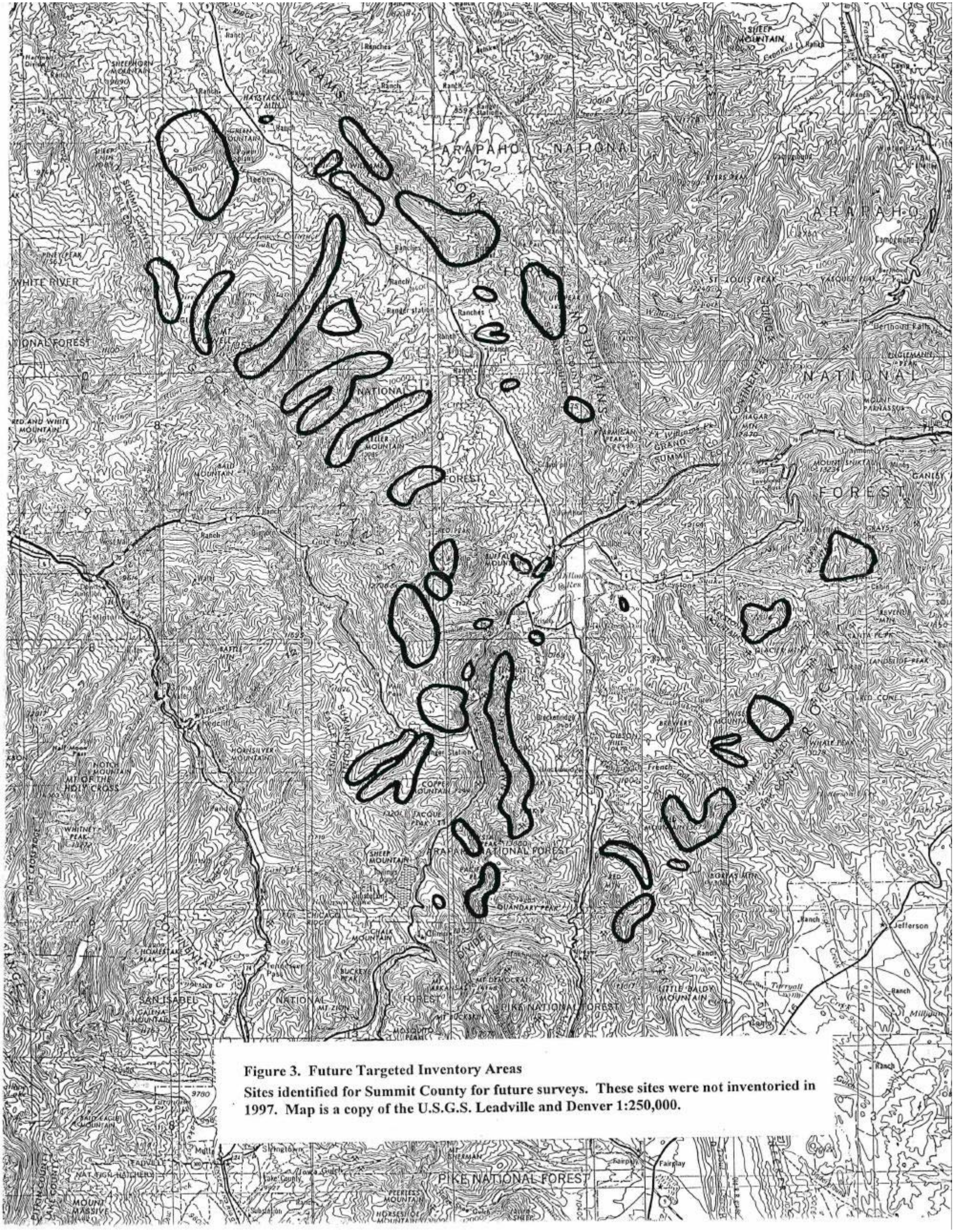

Figure 3. Future Targeted Inventory Areas

Sites identified for Summit County for future surveys. These sites were not inventoried in 1997. Map is a copy of the U.S.G.S. Leadville and Denver 1:250,000.

Appendix C

Slides Of The Study Area

Slides were provided to Summit County Open Space and Trails Department only. The slides included were taken during the 1997 field season by Susan Spackman, CNHP.

Slide Number	**Site Name**	**Element of biodiversity**
roll 4, frame 4	Cucumber Gulch	*Bufo boreas* habitat
roll 4, frame 29	Pass Creek	*Conimitella williamsii* habitat
roll 4, frame 32	Pass Creek	communities
roll 5, frame 5	Deep Creek	*Cypripedium fasciculatum*
roll 5, frame 6	Deep Creek	*Cypripedium fasciculatum* habitat
roll 5, frame 8	Deep Creek	*Cypripedium fasciculatum* habitat
roll 8, frame 14	Lowry Campground	*Draba rectifructa*
roll 8, frame 17	Lowry Campground	*Draba rectifructa* habitat
roll 8, frame 20	North Star Mountain	*Ipomopsis globularis*
roll 8, frame 23	North Star Mountain	*Braya humilis*
roll 10, frame 2	North Star Mountain	*Parnassia kotzebue* habitat
roll 10, frame 12	North Star Mountain	*Parnassia kotzebue*
roll 10, frame 14	North Star Mountain	rare plant habitat
roll 10, frame 25	North Star Mountain	*Ipomopsis globularis* habitat
roll 11, frame 18	North Star Mountain	*Saussurea weberi*
roll 11, frame 22	North Star Mountain	rare plant habitat
roll 10, frame 23	Hoosier Ridge	rare plant habitat
roll 13, frame 18	Clinton Creek	community
roll 10, frame 31	Teller Mountain	*Armeria maritima* ssp *sibirica*
roll 10, frame 35	Teller Mountain	*Armeria maritima* ssp *sibirica* habitat
roll 10, frame 28	Clinton Creek	*Draba crassa* habitat
roll 13, frame 29	Gray's and Torrey's	rare plant habitat

The slides for the following sites can be found in Volume II of this report: Blue Lakes, Blue River at McCullough Gulch, Goose Pasture, Muggins Gulch, Upper French Gulch, Horse Creek, Cataract Creek, Otter Creek, Slate Creek, Blue River-North of Silverthorne, Bushee Creek, Triple Creek Ranch, Dillon Bay Fen, Montezuma, Peru Creek, Soda Springs, Meadow Creek.