Park County Inventory of Critical Biological Resources

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prepared for
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Knowledge to Go Places

Park County Inventory of Critical Biological Resources 2000-2001

FINAL REPORT

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" If ever there was a land of subtle, magnetic charms, South Park is that place."
—Virginia McConnell Simmons, *Bayou Salado*

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Executive Summary

Park County covers a very large and scenic area in central Colorado. The county supports the highest quality bristlecone pine (*Pinus aristata*) forests ever documented in the world, the largest montane shortgrass grassland ever documented, unusual and critically imperiled wetlands, an estimated 15-20% of the total nesting population for the globally imperiled mountain plover, and numerous globally significant plant species.

In 2000-2001, the Colorado Natural Heritage Program (CNHP) received funds from the City and County of Denver acting by and through its Board of Water Commissioners (Denver Water), the City of Aurora, Colorado Division of Wildlife, U.S. Environmental Protection Agency, Center of Colorado Water Conservancy District, Park County Land and Water Trust Fund, and the U.S. Forest Service to conduct an inventory of the critical biological resources found in Park County. This work, which spanned a one year period, included a prioritized field inventory as well as a concerted effort to update the highest priority information about the natural heritage values of Park County into one report. Although this report includes a complete assessment of the highest priority natural heritage values that have been documented in the County to date, it should be emphasized that additional field inventories are likely to identify additional significant locations. We have included with our results a map that shows areas that we recommend for future inventory efforts (see Targeted Inventory Area map).

The primary goal of this project was to identify the locations in Park County with natural heritage significance (places where rare or imperiled plants, animals, or plant communities have been documented). These locations were identified by 1) examining existing biological data, 2) accumulating additional information from other sources on rare or imperiled plant species, animal species, and significant plant communities (collectively called **elements**), and 3) conducting field surveys during the summer of 2000.

Over 115 rare or imperiled plant species, animal species, and significant plant communities (elements) have been documented in Park County. About 50 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 Park County will have local and state-wide as well as global benefits. Research efforts for this project were prioritized based on the level of significance of the elements, as well as the estimated potential threats to those elements. Private lands and wetlands in the County are subject to increasing development pressures, so the species and communities contained in such areas were the primary focus of our research, wherever access could be obtained from the landowners.

Locations in the County with natural heritage significance are presented in this report as **Potential Conservation Areas (PCA)**. **The potential conservation area boundaries designated in this report do not confer any regulatory protection on the area.** These boundaries are based on the ecological processes needed to support the elements within that area. Thirty-five PCAs are described and prioritized. The PCAs are prioritized according to their **biodiversity significance rank**, or "B-rank," which range in this report from B1 (outstanding biodiversity significance) to

B3 (high biodiversity significance). The highest ranking PCAs are the highest priorities for conservation action. Park County PCAs ranking B4 (moderate biodiversity significance) and B5 (general biodiversity interest) are not presented in this report. Additional information on these areas can be obtained from the Colorado Natural Heritage Program. The PCAs presented herein are the highest priority areas requiring conservation attention in Park County. Information about the protection and management of each PCA is also presented.

The 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 information gathered for this project 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, continually being updated as we gather new data.

The Inventory of Critical Biological Resources was conducted in several steps:

1. **Identify rare or imperiled species and significant plant communities with potential to occur in Park County.** Using known range and life history information, over 100 natural heritage elements potentially occuring in Park County were identified. Of these, 31 were the primary targets of our research; information on the other elements was gathered as time allowed.

2. **Collect existing information.** CNHP databases were updated with information about both species' biology and locations within Park County. Sources included museum collections, scientific literature, and local naturalists and biologists such as expert sources with the Colorado Division of Wildlife, the Bureau of Land Management, and the U.S. Forest Service.

3. **Identify targeted inventory areas.** Using the information collected in step 2 and aerial photography, 93 targeted inventory areas (TIAs) 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**. A total of 39 targeted inventory Areas (TIAs) were surveyed in order of priority based on the significance of the rare elements, and the estimated threats to the specific area. Surveys were conducted for all of the priority targets mentioned in step 1. Information was gathered on other elements of concern as time allowed. A total of 83 new occurrences were identified, and updated information was gained on another 60 occurrences. TIAs were surveyed **with landowner permission only**. Data on the presence of elements were recorded, and an estimate of overall biological quality of the location was made.

5. **Delineate and prioritize potential conservation areas.** Preliminary conservation planning boundaries were identified based on the ecological processes that support the Natural

Heritage elements at the site. A total of 35 PCAs were identified. The South Park PCA is by far the largest PCA identified in Park County. This PCA includes the known habitat for mountain plover in South Park, and addresses management needs for this species. Numerous additional PCAs are included within the South Park PCA that are designed primarily to encompass the significant wetland communities of South Park. The wetland PCAs are delineated separately because they do not cover as much area and they have different management and protection needs than the South Park PCA.

Recommendations for Protecting Park County's Critical Biological Resources

1. **Develop and implement a plan for protecting the Potential Conservation Areas (PCAs) profiled in this report, with the most attention directed toward PCAs with biodiversity rank (B-rank) B1 and B2.** The PCAs in this report provide Park County with a basic framework for implementing a comprehensive conservation program. All of the PCAs presented have a global level of significance. The sum of all the PCAs in this report represents the area CNHP believes needs to be protected to ensure the County's globally significant elements are not lost. Where appropriate, this information should be integrated into other Park County planning documents and records, including the Park County Strategic Master Plan.

2. **Consider open space acquisition and/or conservation easements for potential conservation areas where appropriate and necessary to protect their ecological values.** Priority should be placed on B1 and B2 PCAs, although protection opportunities on B3 PCAs should be pursued where they exist. Work with local land protection organizations such as CDOW Wetlands Initiative Program, Colorado Open Lands and The Nature Conservancy to develop a conservation strategy.

3. **Incorporate the information included in this report in the review of proposed activities in or near PCAs so that the activities do not adversely affect natural heritage elements.** All of the PCAs presented contain natural heritage elements of global significance. Development activities in or near a PCA may affect the element(s) present. Wetland and riparian PCAs 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 Park County are considered, they should be compared to the PCA maps presented herein. If a proposed project would potentially impact a PCA, planning personnel should contact persons, 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 available resources.

4. **Promote cooperation among landowners and pertinent government agencies and non-profit conservation organizations.** The long-term protection of natural diversity in Park County will be facilitated with the cooperation of many government agencies, non-government organizations, and private landowners. Park County, the Colorado Division of Wildlife (CDOW) South Park Wetlands Focus Area Committee, and the South Park Heritage Resource Area Board have 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.

5. **Promote proper management of the natural heritage resources that exist within Park County, recognizing that designation of Potential Conservation Areas does not by itself confer protection on the plants, animals, and plant communities.** Development of a conservation plan is a necessary component of protecting a PCA. Because some of the most serious threats to Park County's ecosystems are large-scale (altered hydrology, residential encroachment, non-native species invasion), considering each PCA in the context of its surroundings is critical. Building partnerships is essential to the long-term protection of a PCA. 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 organizations in Park County in the further development of strategic conservation plans for the PCAs. 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.

6. **Increase public awareness of the benefits of protecting significant natural areas.** Natural lands are becoming ever more 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. To build awareness of the commitment to protect sites of biodiversity significance, conservation actions should be publicized. Slides are available from CNHP to assist with this effort. Furthermore, the conservation of unique natural areas engenders development of new, sustainable economies in Park County. By selectively interpreting and "promoting" unique natural areas, resource-based tourism opportunities will be established through Park County's Heritage Tourism Project. Thus, not only will natural lands be conserved, they will be used to distinguish Park County as one of the State's most unique and authentic destinations. In turn, a portion of tourism revenues may be earmarked for future conservation projects in Park County. This approach has been successfully employed in other areas of Colorado, including the Monte Vista National Wildlife Refuge (Crane Festival).

7. **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 residents of Colorado.

8. **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 during 2000.** Despite the best efforts during one field season, it is certain that some elements occur in locations not identified in this report.

9. **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 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. Moreover, stocking or transplantation of non-native fish should be discouraged wherever populations of native cutthroat trout or other native fish species are currently established. The above mentioned individuals or organizations 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

Park County encompasses a very large (about 1,400 square miles) and scenic area in central Colorado. A prominent physiographic feature in Park County is South Park, a grass-dominated basin, fifty miles long and thirty-five miles wide (900 square miles). South Park is one of four intermountain basins in Colorado, and is surrounded on all sides by mountains. It is bordered to the west by the Buffalo Peaks and the Mosquito Range, to the north by the southern end of the Park Range, to the east by the Kenosha Mountains, Tarryall Mountains, and Puma Hills, and to the south by Black and Thirtynine Mile mountains. Within the county are the headwaters for two major rivers, the South Platte and the Arkansas Rivers. Elevations range from five peaks over 14,000 feet to 8500 feet on the floor of South Park. Park County is located within the Southern Rocky Mountain ecoregion (Bailey *et al.* 1994).

The climate in Park County is generally characterized by long, cold, and moist winters, and short, cool, dry summers. Climatic data from the Town of Fairplay indicate that this area receives approximately 13 inches of precipitation each year. Average minimum and maximum temperatures are, respectively, 9 and 69 degrees Fahrenheit. The average total snowfall in Fairplay is 84 inches (South Park Ranger District of the US Forest Service).

Park County supports several unique and interesting vegetation types. The vegetation on the floor of South Park is dominated by a globally rare grassland composed primarily of Arizona fescue (*Festuca arizonica*) and slimstem muhly (*Muhlenbergia filiculmis*). This grassland plant community is the largest example of its type ever documented (1.3 million acres). The vegetation here is generally short and sparse as a result of the dry, windy climate, historic and current grazing, fires, and, to a much lesser extent, prairie dog activity. These conditions provide habitat for an estimated 15-20% of the known breeding population of the globally imperiled mountain plover. Currently, this area includes a mosaic of agricultural and residential-developed areas, and large areas grazed by cattle and domestic bison.

The wetlands of South Park are comparable to few others found in the world. The geologic and hydrologic setting found in South Park combines to create wetlands known as “extreme rich fens,” so named because of their high concentrations of minerals. These fens provide habitat for a suite of rare plant species and plant communities. Porter feathergrass (*Ptilagrostis porteri*) is known only from Colorado, and only in wetlands in the vicinity of South Park. Other rare plants found here are regional endemics, species that are rarely found south of the arctic, and are believed to have been stranded as disjunct populations in South Park at the end of the last Ice Age. In addition to rare plant habitat, the unique fens in South Park are important for providing sediment trapping and element cycling. Unfortunately, approximately 20 % of the fen communities in Park County have been drained or mined for peat (Sanderson and March 1996). Other wetland types located in Park County include playa lakes, springs, wet meadows, and riparian wetlands. A highly unusual wetland of alkaline wet meadows and springs is found in the southwestern part of Park County, in the vicinity of Antero Reservoir.

At higher elevations the vegetation is dominated by willows (*Salix* spp.), spruce-fir *(Picea engelmannii-Abies lasiocarpa)*, ponderosa pine (*Pinus ponderosa*), lodgepole pine (*Pinus contorta* ssp. *latifolia*), bristlecone pine (*Pinus aristata*), quaking aspen *(Populus tremuloides)* and alpine communities. Park County supports the most extensive and high quality occurrences of bristlecone pine (*Pinus aristida*) ever documented. Historical mining and timbering operations have dramatically affected lands throughout the higher elevations of the county.

The Mosquito Range, which forms the western border of Park County, is one of the botanical "hotspots" in Colorado. Few other areas in the state support such a high number of rare plant species. A total of 41 rare plants have been documented in the alpine regions of this relatively small mountain range. High elevation outcrops of Leadville Limestone are thought to be a predominant factor in setting the stage for such high densities of rare plant species. The predominant habitats in the higher elevations of the Mosquito Range are characterized by alpine meadows, rock outcrops, scree slopes, boulder fields, alpine lakes, willow carrs, permanent snow fields, and krummholz Engelmann spruce (*Picea engelmannii*). Several 14,000 foot peaks occur in the Range, and it is a very popular area for recreational use. This area is also known for its past gold and lead mining activities.

Historically, large concentrations of wildlife, including bison, elk, pronghorn antelope, ducks, geese, and beaver, attracted Ute Indians and hunters, trappers, and fishermen to Park County. Bison were reported as abundant in South Park prior to 1862 (Carey 1911), but the last four bison were poached in 1897 (Meaney and Van Vuren 1993).

There is a high percentage of private lands in Park County, particularly in South Park and on the immediately adjacent slopes. The largest town in Park county is Fairplay, with about 600 residents, and the County includes eight other small towns, Alma, Bailey, Como, Grant, Hartsel, Jefferson, Guffy, and Lake George. The 2000 Census indicates there are now 14,500 people living in Park County. Particularly at the higher elevations, there are public lands managed by various government agencies, such as the U.S. Forest Service, Bureau of Land Management, and the State of Colorado.

Currently, residential, agricultural and commercial developments are widespread in the county. Over time these land use patterns contribute to habitat fragmentation, hydrological alterations, non-native species invasions, and alteration of natural fire regimes. Most of the streams in South Park are used to support some level of irrigation. There are three large reservoirs that provide water for growing Front Range cities.

Currently, non-native plants occupy a small area of Park County. When compared with other Colorado counties, Park has very few problem weed areas. Areas around new homes, roadsides, and campgrounds seem to be the primary problem areas, as well as some infestations of Canada thistle (*Breea arvensis*) in wetlands. To date, the following Colorado State Noxious Weeds have been documented in Park County: Canada thistle, dalmatian toadflax (*Linaria dalmatica*), yellow toadflax (*Linaria vulgaris*), leafy spurge (*Euphorbia esula*), musk thistle (*Carduus nutans*), whitetop (*Cardaria* sp.), diffuse knapweed (*Centaurea diffusa*) (pers. comm. Tom Grette 2001).

We also noted wild chamomile (*Matricaria perforata*) in low cover along highway 9 between Fairplay and Hoosier Pass, and yellow sweet clover (*Melilotis officinale*) along highway 285 in South Park.

Numerous organizations and individuals have taken an interest in the biodiversity of Park County and are working to ensure long-term conservation of this important area. Such entities include, but are not necessarily limited to: the South Park Wetland Focus Area Committee, Upper South Platte Watershed Protection Association, Colorado Open Lands, Center of Colorado Water Conservancy District, Park County Land and Water Trust, South Park Heritage Resource Area Board, The Nature Conservancy, Southern Rockies Ecosystem Project, Center for Native Ecosystems, Rocky Mountain Bird Observatory, Bureau of Land Management, US Forest Service, Natural Resource Conservation Service, US Fish & Wildlife Service, US Environmental Protection Agency, Colorado Division of Wildlife, Colorado State Parks, Great Outdoors Colorado, Colorado Heritage Area Partnership, Pikes Peak Area Council of Governments, Park County Planning Department, Park County Tourism & Community Development Office, Park County Environmental Health Department, and numerous Park County residents.

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 between 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 restricted to an area. It is within communities that all life dwells.

4. **Landscape Diversity** -- the type, condition, pattern, and connectedness of natural communities. A landscape consisting of a mosaic of natural 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. To assist in biodiversity conservation efforts, CNHP scientists strive to answer questions like the following: What species and ecological communities exist in the area of interest? Which are at greatest risk of extinction or are otherwise significant from a conservation perspective? What are their biological and ecological characteristics, and where precisely are these priority elements found? What is their condition at these locations, and what processes or activities are sustaining or threatening them? Where are the most important sites to protect? Who owns or manages those places deemed most important to protect, and what is threatening those places? What actions are needed for the protection of those sites and the significant elements of biodiversity they contain? And how can we measure our progress toward conservation goals?

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 at CNHP gathers comprehensive information on the 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. This locational information is incorporated into a GIS system (ArcView and ArcInfo). The Element Occurrence database can be accessed from 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 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 PCAs. 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.

Using these rankings, CNHP can keep track of the entire suite of species within its jurisdiction—the rare and the common—but target intensive information-gathering and inventory efforts toward those highly-ranked species that require concerted conservation attention. To complement this species-level information, CNHP and other heritage programs simultaneously have worked to develop tools that define and identify the particular ecological communities occuring within their states and, in turn, assessing the extent and status of each.

Table 1. 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" followed by a character. **These ranks should not be interpreted as legal designations.**

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

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

LT Threatened; taxa formally listed as threatened.

P Proposed E or T; taxa formally proposed for listing as endangered or threatened.

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

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 3 factors:

> **Size** – a quantitative measure of the area and/or abundance of an occurrence such as area of occupancy, population abundance, population density, or population fluctuation.
> **Condition** – an integrated measure of the quality of biotic and abiotic factors, structures, and processes within the occurrence, and the degree to which they affect the continued existence of the occurrence. Components may include reproduction and health, development/maturity for communities, ecological processes, species composition and structure, and abiotic, physical or chemical factors.
> **Viability –** an integrated measure of the quality of biotic and abiotic factors, and processes surrounding the occurrence, and the degree to which they affect the continued existence of the occurrence. Components may include landscape structure and extent, genetic connectivity, and condition of the surrounding landscape.

Each of these factors is 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 of E is 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.
X	Extirpated.
E	The occurrence does not contain enough information to rank using the above ranks.
F	The occurrence was not relocated; failed to find.

Potential conservation areas

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

Potential Conservation Area Planning Boundaries

Once the presence of rare or imperiled species or significant plant communities has been confirmed, the first step towards their protection is the delineation of a **preliminary** conservation planning boundary. In general, the potential conservation area 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 considered 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 PCA and the surrounding watershed;
- maintenance of the hydrologic integrity of the groundwater;
- land intended to buffer the PCA 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 PCA of reasonable size. Taken to the extreme, the threat of ozone depletion could expand every PCA 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 Potential Conservation Areas

One of the strongest ways that CNHP uses element and element occurrence ranks is to assess the overall biodiversity significance of a PCA, which may include one or many element occurrences. Based on these ranks, each PCA is assigned a **biodiversity** (or B-) **rank**:

B1 Outstanding Significance: only location 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.

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.

Protection Urgency Ranks

Protection urgency ranks (P-ranks) refer to the time frame in which conservation protection should 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 estimates the urgency to **protect** the area:

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

A protection action involves increasing the current level of legal protection accorded one or more tracts within 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. 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 PCA; 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 or 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 PCA should occur. 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 may be required immediately or element occurrences could be lost or irretrievably degraded within one year.

M2 New management action may be needed within 5 years to prevent the loss of element occurrences.

M3 New management action may 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 PCA.

Inventory 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 Natural Heritage Inventory was conducted in several steps summarized below. Additionally, input from a committee of individuals representing local public and private interests was sought at all stages.

Collect Information

CNHP databases were updated with information regarding the known locations of species and significant plant communities within Park 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 University, Rocky Mountain Herbarium, and local private collections. The Colorado Division of Wildlife provided extensive data on the fishes of the Arkansas and South Platte Watersheds. Both general and specific literature sources were incorporated into CNHP databases, either in the form of locational information or as biological data pertaining to a species in general. Other information was gathered to help locate additional occurrences of natural heritage resources. 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 Targeted Elements of Global and State-wide Concern

The information collected in the previous step was used to refine a potential element list and to refine our search areas. In general, species and plant communities that have been recorded from Park County, or from adjacent areas, 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 occur in Park County, and were therefore targeted in CNHP field inventories. Over 100 rare species and significant plant communities were targeted in these surveys. Given a limited amount of time and funding for this research, a specific subset of 31 species and communities were the priority of our research efforts. These elements were considered to be a priority because of their high level of biological significance (G1-G3) and/or because they are known to occur in areas that are subject to various development pressures such as hydrological alterations and residential development. These priority targets are presented in Table 3 in bold type.

The amount of effort given to the inventory for each of these elements is prioritized according to the element's rank. Globally-rare (G1 - G3) elements are given highest priority; state-rare elements are second.

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

List of targeted elements, organized by taxonomic group, identified for Park County Inventory of Critical Biological Resource in 2000. Species and communities that received top priority during our inventory efforts are presented in bold type. Please see Table 1 for rank explanations.

Elements	Common name	Global rank	State rank	Federal status	State status	Federal sensitive
Animals-vertebrates						
***Bufo boreas* pop 1**	**Boreal toad (southern rocky mountain population)**	**G4T1Q**	**S1**	**C**	**E**	**FS**
Buteo regalis	Ferruginous hawk	G4	S3B,S4N		SC	FS/BLM
Charadrius alexandrinus nivosus	Western snowy plover	G4T3	S1B,SZN	(PS:LT)	SC	BLM
Charadrius montanus	**Mountain plover**	**G2**	**S2B,SZN**	**PT**	**SC**	**FS/BLM**
Falco peregrinus anatum	American peregrine falcon	G4T3	S2B,SZN			
Grus americana	Whooping crane	G1	SAN	(LE,XN)	E	
Haliaeetus leucocephalus	Bald eagle	G4	S1B,S3N	(PS:LT,PDL)	T	
Pelecanus erythrorhynchos	American white pelican	G3	S1B,SZN		SC	BLM
Oncorhynchus clarki stomias	**Greenback cutthroat trout**	**G4T2T3**	**S2**	**LT**	**T**	
Gulo gulo	Wolverine	G4	S1		E	FS
Lynx canadensis	Lynx	G5	S1	(PS:LT)	E	FS
Mustela nigripes	Black-footed ferret	G1	SH	(LE,XN)	E	
Sorex nanus	Dwarf shrew	G4	S2			FS
Animals-invertebrates						
Cicindela nebraskana	A tiger beetle	G4	S1?			
Hesperia leonardus montana	**Pawnee montane skipper**	**G4T1**	**S1**	**LT**		
Oeneis alberta	Alberta arctic	G4	S3			
Oeneis polixenes	Polixenes arctic	G5	S3			
Polites rhesus	Rhesus skipper	G4	S2S3			
Pyrgus xanthus	Xanthus skipper	G3G4	S3			
Physa skinneri	Glass physa	G5	S2			
Plant communities						
Carex simulata	wet meadow	G4	S3			
Cercocarpus montanus/Stipa comata	mixed foothill shrublands	G2	S2			
Danthonia parryi	montane grasslands	G3	S3			
Eleocharis quinqueflora-Triglochin spp.	alkaline spring wetland	GU	S2			
Festuca arizonica-Muhlenbergia filiculmis	**montane grasslands**	**G2**	**S2**			
Kobresia myosuroides-Thalictrum alpinum	**extreme rich fen**	**G1?**	**S1**			

Kobresia simpliciuscula-Scirpus pumilus	**extreme rich fen**	**G2?**	**S1**			
Pentaphylloides floribunda/Deschampsia cespitosa	montane riparian shrubland	G4	S3S4			
Phippsia algida	alpine wetlands	GU	SU			
Picea engelmanniiTtrifolium dasyphyllum	timberline forests	G2	S2			
Picea pungens/Betula occidentalis	montane riparian woodlands	G2	S2			
Pinus aristata/Festuca arizonica	**montane woodlands**	**G4**	**S3**			
Pinus aristata/Festuca thurberi	lower montane woodlands	G3	S2			
Pinus aristata/Juniperus communis	montane woodlands	GU	SU			
Pinus aristata/Ribes montigenum	**upper montane woodlands**	**G2G4**	**S1**			
Pinus aristata/Trifolium dasyphyllum	**upper montane woodlands**	**G3**	**S3**			
Populus tremuloides/Betula occidentalis		G2G3	S2			
Populus tremuloides/Lonicera involucrata	montane riparian forests	G3	S3			
Puccinellia airoides	**salt meadows**	**G4**	**S1**			
Salicornia rubra	**salt meadows**	**G2**	**S1?**			
Salix brachycarpa/Carex aquatilis	subalpine riparian/wetland carr	G2G3	S2S3			
Salix drummondiana/mesic forb	drummonds willow/mesic forb	G4	S4			
Salix eriocephala var. *ligulifolia*	montane willow carr	G2G3	S2S3			
Salix monticola/Calamagrostis canadensis	montane willow carr	G3	S3			
Salix monticola/Carex aquatilis	montane riparian willow carr	G3	S3			
Salix monticola/Carex utriculata	montane riparian willow carr	G3	S3			
*Salix monticola/*mesic forb	montane riparian willow carr	G3	S3			
*Salix monticola/*mesic graminoid	montane riparian willow carr	G3	S3			
Salix planifolia/Caltha leptosepala	subalpine riparian willow carr	G4	S4			
Salix planifolia/Carex aquatilis	subalpine riparian willow carr	G5	S4			
Plants						
Aquilegia saximontana	Rocky mountain columbine	G3	S3			
Armeria scabra ssp sibirica	Sea pink	G5T5	S1			FS
Askellia nana	Dwarf hawksbeard	G5	S2			
Astragalus bodinii	Bodin milkvetch	G4	S2			
Astragalus molybdenus	Leadville milkvetch	G3	S2			FS
Botrychium echo	Reflected moonwort	G2	S2			FS
Botrychium lunaria	Common moonwort	G5	S2S3			
Botrychium pallidum	Pale moonwort	G2G3	S2			FS

Braya glabella var glabella	Arctic braya	G5T?	S1			FS
Braya humilis	Alpine braya	G5	S2			
Carex leptalea	Bristle-stalk sedge	G5	S1			
Carex livida	**Livid sedge**	**G5**	**S1**			**FS/BLM**
Carex oreocharis	**Grassyslope sedge**	**G3**	**S1**			
Carex scirpoidea	**Canadian single-spike sedge**	**G5**	**S2**			**BLM**
Carex tenuiflora	**Slender-flower sedge**	**G5**	**S1**			
Carex viridula	**Green sedge**	**G5**	**S1**			**BLM**
Castilleja puberula	Downy indian-paintbrush	G2G3	S?			
Cylactis arctica* ssp. *acaulis	**Nagoon berry**	**G5T5**	**S1**			**FS**
Cypripedium calceolus ssp. *parviflorum*	Yellow lady's-slipper	G5	S2			
Delphinium ramosum var. *alpestre*	Colorado larkspur	G?T2	S2			
Draba borealis	Northern rockcress	G4	S2			
Draba crassa	Thick-leaf whitlow-grass	G3	S3			
Draba exunguiculata	Clawless draba	G2	S2			
Draba fladnizensis	Arctic draba	G4	S2S3			
Draba grayana	Gray's peak whitlow-grass	G2	S2			
Draba incerta	Yellowstone whitlow-grass	G5	S1			
Draba oligosperma	Woods draba	G5	S2			
Draba porsildii	Porsild draba	G3G4	S1			
Draba streptobrachia	Colorado divide whitlow-grass	G3	S3			
Eriogonum coloradense	Colorado wild buckwheat	G2	S2			BLM
Eriophorum altaicum* var. *neogaeum	**Altai cottongrass**	**G4?T3?**	**S3**			**FS**
Eriophorum gracile	**Slender cottongrass**	**G5**	**S2**			**BLM**
Eutrema edwardsii ssp. *penlandii*	Penland alpine fen mustard	G1G2	S1S2	LT		
Ipomopsis globularis	Globe gilia	G2	S2			FS
Machaeranthera coloradoensis	**Colorado tansy-aster**	**G2**	**S2**			**FS**
Nuttallia densa	Arkansas canyon stickleaf	G2	S2			BLM
Oxytropis parryi	Parry oxytrope	G5	S1			
Packera pauciflora	**Few-flowered ragwort**	**G4G5**	**S1S2**			**BLM**
Parnassia kotzebuei	Kotzebue grass-of-parnassus	G4	S2			
Phippsia algida	Snow grass	G5	S2			
Phlox kelseyi ssp. *salina*	Marsh phlox	G4T3?Q	S1			
Physaria alpina	Avery peak twinpod	G2?	S2?			
Picradenia helenioides	Intermountain bitterweed	G3G4Q	S1			
Potentilla rupincola	Rocky mountain cinquefoil	G5?T2	S2			FS
Primula egaliksensis	**Greenland primrose**	**G4**	**S2**			**FS/BLM**
Ptilagrostis porteri	**Porter feathergrass**	**G3G5T2**	**S2**			**FS/BLM**
Ranunculus gelidus ssp. *grayi*	Tundra buttercup	G4G5	S2			
Salix candida	**Hoary or silver willow**	**G5**	**S2**			**BLM**
Salix lanata ssp. *calcicola*	Lime-loving willow	G4T4	S1			FS

Salix myrtillifolia	**Low blueberry willow**	**G5**	**S1**			**FS/BLM**
Salix serissima	Autumn willow	G4	S1			FS/BLM
Saussurea weberi	Weber saussurea	G2G3	S2			BLM
Sisyrinchium pallidum	**Pale blue-eyed grass**	**G2G3**	**S2**			**BLM**
Telesonix jamesii	James' telesonix	G2G3	S2?			
Thellungiella salsuginea	**Salt-lick mustard**	**G4G5**	**S1**			
Townsendia rothrockii	Rothrock townsend-daisy	G2?	S2?			
Trichophorum pumilum	**Little bulrush**	**G5**	**S2**			**FS/BLM**
Unamia alba	**Prairie goldenrod**	**G5**	**S2S3**			
Utricularia ochroleuca	**Northern bladderwort**	**G4?**	**S1?**			

Identify Targeted Inventory Areas

Survey sites were chosen based on their likelihood of harboring rare or imperiled species or significant plant communities. Previously documented locations were targeted, and additional potential areas were chosen using available information sources. 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., "South Park" or "Lost 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 85) were used for this project and are well suited for assessing vegetation types and, to some extent, natural conditions on the ground.

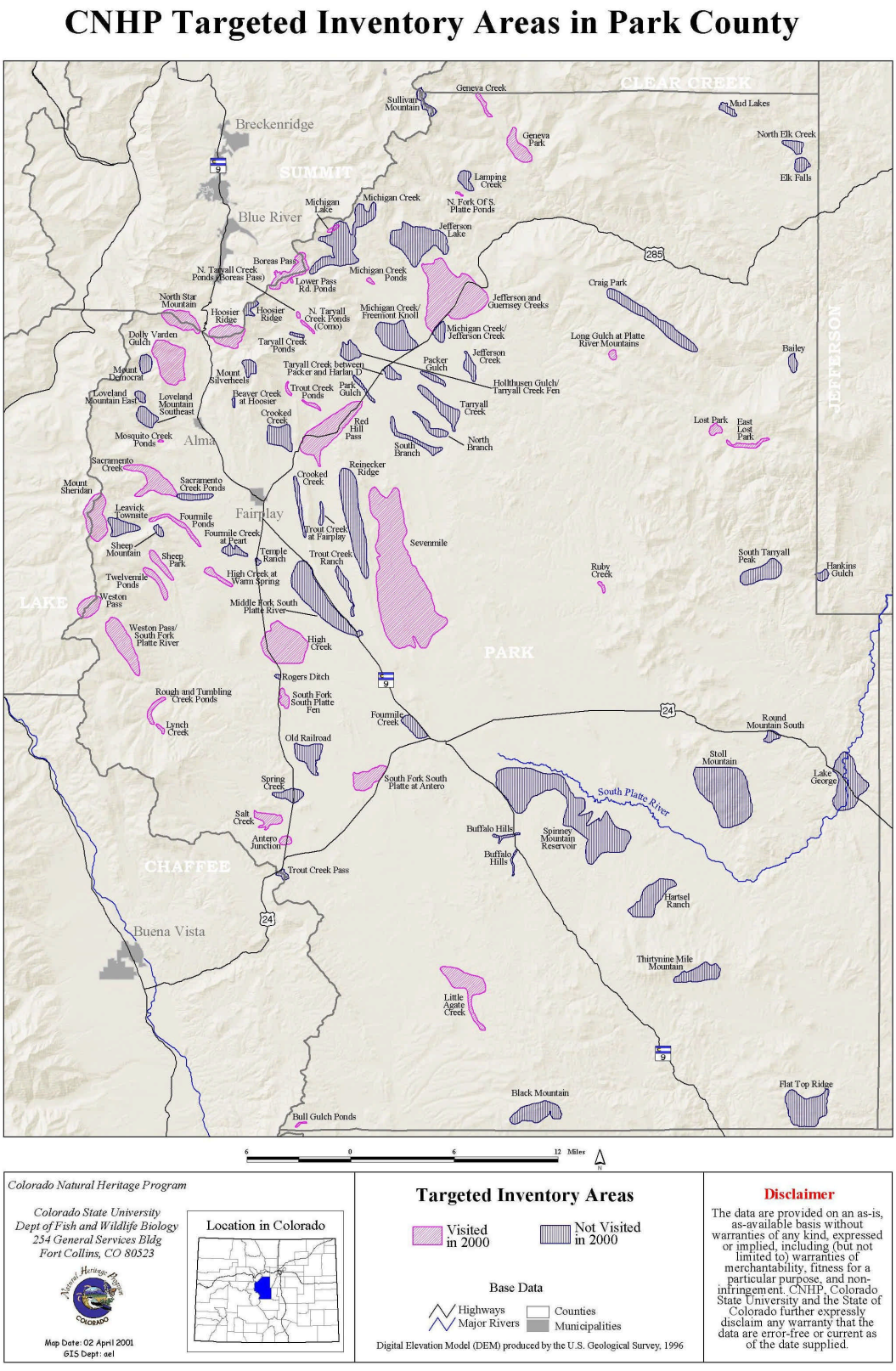
Using the biological information stored in the CNHP databases, these information sources were analyzed for areas having the highest potential for supporting specific elements. General habitat types can be discerned from aerial photographs. Those chosen for survey sites appeared to be in the most natural 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 93 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 1), vary in size from less than ten 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 shrublands is especially difficult to discern from aerial photographs, and a quick survey from the road can reveal such features as weed infestation or overgrazing.

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. Map of Targeted Inventory Areas in Park County.



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 local assessor's offices. 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 year.

The methods used in the surveys 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
Reptiles: visual
Mammals: shrews, pitfall traps; bats, mist nets
Birds: visual or by song/call, evidence of breeding sought
Insects: aerial net
Plants: visual
Plant communities: visual, collect qualitative or quantitative composition 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 Potential Conservation Areas

Finally, since the objective for this inventory is to prioritize specific areas for conservation efforts, Potential Conservation Area (PCA) boundaries were delineated. Such a boundary is an estimation of the minimum area needed to ensure persistence of the element. In order to ensure 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 PCA or the element may call for alterations to the boundaries.

Results

A total of 59 plant species, 20 animal species, and 30 significant plant communities have been identified in Park County (see table 3). Recently observed and accurately documented occurrences of the G1 through G3 elements provide the foundation for a total of 35 Potential Conservation Areas that follow (see figure 2 and table 5 for a summary of these PCAs). All of the data collected are housed and maintained in the Biological and Conservation Data System (BCD). *Draba crassa*, an alpine plant in the mustard family, previously thought to be rare in Colorado, was found to be common during the 2000 field season. This species has been taken off the Colorado Natural Heritage Program's list of rare and imperiled plants (CNHP 2001).

CNHP biologists visited 35 of the 85 targeted inventory areas. Surveys were conducted for all of the species listed in boldface in table 3. A total of 83 new occurrences were identified, and updated information was gained on another 60 occurrences. Despite our best efforts, we did not locate any occurrences of boreal toads, greenback cutthroat trout, or Pawnee montane skippers.

Although CNHP biologists did not locate any boreal toads during 2000, there have been sightings in Park County (Table 4). CNHP maintains information in the BCD and creates PCAs only for breeding sites of the boreal toad. These non-breeding observations are important for targeting inventory as well as evaluation of the distribution of this toad, but are not included in the following PCAs.

Table 4. Observations of boreal toads (*Bufo boreas* pop 1) in Park County

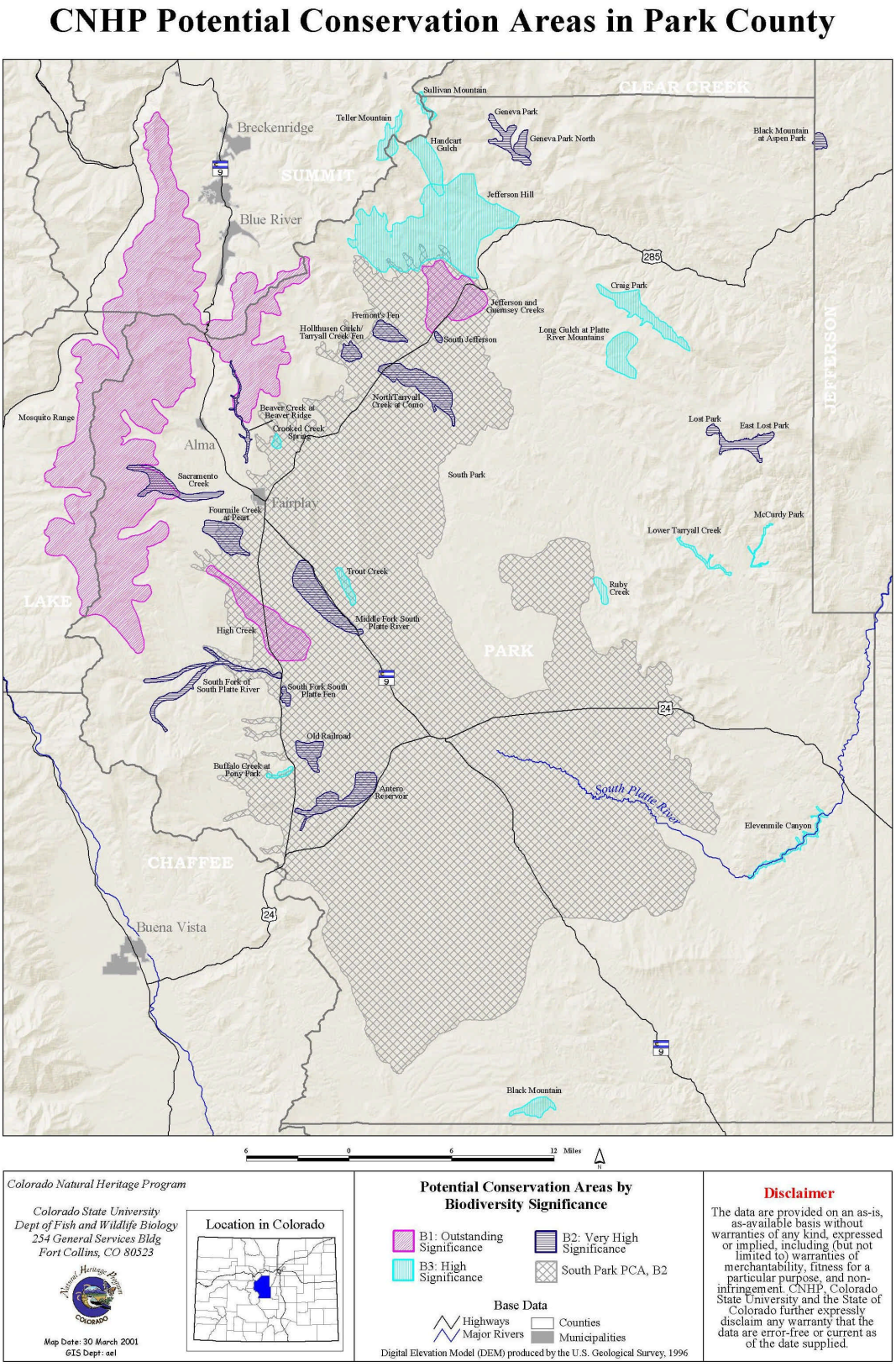
date of observation	number of boreal toads	location
July 10, 1996	1 juvenile, 1 adult	Geneva Creek, Kirby Gulch
July 1995		North Tarryall Creek
August 3, 1961	3 specimens	Warm Springs, Sheep Ridge
August 15, 1959	15 specimens	4, 5, and 8 miles north of Jefferson
unknown	1 specimen	Near Alma
unknown	12 specimens	Sacramento Creek

Table 5. Park County Potential Conservation Areas

The following PCAs were identified during the 2000 Park County Inventory of Critical Biological Resources. The Biodiversity Significance, Protection Urgency, and Management Urgency Ranks are included (see pages 10-17 for rank definitions). PCAs are listed in approximate order for conservation attention.

PCA Name	Biodiversity Rank	Protection Urgency Rank	Management Urgency Rank
Jefferson and Guernsey Creeks	B1	P1	M3
High Creek	B1	P2	M2
Mosquito Range	B1	P2	M3
Old Railroad	B2	P1	M1
Antero Reservoir	B2	P1	M2
South Fork of South Platte River	B2	P1	M2
Fremont's Fen	B2	P2	M3
Sacramento Creek	B2	P2	M3
North Tarryall Creek at Como	B2	P2	M3
Black Mountain at Aspen Park	B2	P3	M2
Lost Park	B2	P3	M2
Beaver Creek at Beaver Ridge	B2	P3	M3
Fourmile Creek at Peart	B2	P3	M3
Geneva Park North	B2	P3	M3
Hollthusen Gulch/Tarryall Creek Fen	B2	P3	M3
Middle Fork South Platte River	B2	P3	M3
South Fork South Platte Fen	B2	P3	M3
East Lost Park	B2	P4	M2
Geneva Park	B2	P4	M2
South Park	B2	P4	M4
Trout Creek	B3	P2	M2
Crooked Creek Spring	B3	P2	M2
South Jefferson	B3	P2	M4
Handcart Gulch	B3	P3	M2
Buffalo Creek at Pony Park	B3	P3	M3
Jefferson Hill	B3	P3	M3
Lower Tarryall Creek	B3	P3	M3
Ruby Creek	B3	P3	M3
Teller Mountain	B3	P3	M3
Sullivan Mountain	B3	P3	M4
Black Mountain	B3	P3	M4
McCurdy Park	B3	P3	M4
Craig Park	B3	P4	M3
Long Gulch at Platte River Mountains	B3	P4	M3
Elevenmile Canyon	B3	P4	M4

Figure 2. Park County Potential Conservation Areas



PCA Profile Explanation

Each potential conservation area is described in a standard PCA report that 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 PCA in terms of rarity of the Natural Heritage resources and the quality (condition, abundance, etc.) of the occurrences. Please see pages 10-17 for the definitions of the ranks.

Protection Urgency Rank (P-rank): An estimate of the timeframe in which conservation protection should 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 pages 10- 17 for the definitions of the ranks.

Management Urgency Rank (M-rank): An estimate of the timeframe in which conservation management should occur. Using best scientific estimates, this rank refers to the need for management in contrast to protection (legal, political, or administrative measures). See pages 10-17 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, and Section(s).

General Description: A brief narrative describing the topography, vegetation, current use, and size of the potential conservation area. Common names are used along with the scientific names.

Biodiversity Rank Justification: A synopsis of the rare species and significant plant communities that occur in the PCA. A table within the PCA profile lists the element occurrences found within the PCA, their ranks, the occurrence ranks, federal and state agency designations, and the last observation date. The species or community that is the primary element of concern is in boldface within the table. See Table 1 for explanations of ranks and Table 2 for legal designations.

Boundary Justification: Justification for the location of the preliminary conservation planning 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 Comments: A summary of major land ownership issues that may affect the PCA and the element(s) in the PCA.

Management Comments: A summary of PCA management issues that may affect the long-term viability of the PCA.

Park County Potential Conservation Areas

JEFFERSON AND GUERNSEY CREEKS POTENTIAL CONSERVATION AREA

Biodiversity Rank: B1
Protection Urgency Rank: P1
Management Urgency Rank: M3

Location: Park County. This PCA is located at the north end of South Park, north of the town of Jefferson, north and south of Highway 285. Jefferson and Guernsey Creeks run through the site.

USGS 30 x 60 Minute Quadrangle: Bailey
Legal Description: T7S, R75W, sections 19, 20, 27, 28, 29, 30, 31, 32, 33, 34; and T8S, R75W, sections 3, 4, 5, 6, 7, 8, and 9.

General Description: The most important part of the Jefferson and Guernsey Creeks PCA is two distinct areas of extreme rich fen (peatland) vegetation that merge into one toward Highway 285. Downstream from these peatland areas (to the southeast), an expansive area of wet meadow extends across 285 toward the Steiner Ranch. The western portion of the site is a combination of wet meadow and mesic and upland grasslands. One prominent knoll is included in the PCA behind the Wahl Ranch, northeast of Jefferson.

One fen is found in a large water discharge zone midway between Deadman Gulch and Guernsey Creek. This area is a hummock/swale complex. The hummocks are dominated by the *Kobresia simpliciuscula-Scirpus pumilus* community, and the swales are filled with water sedge (*Carex aquatilis)* and fewflower spikerush (*Eleocharis quinqueflora)*. The state rare silver willow (*Salix candida)* occurs infrequently on the hummocks. The state rare little bulrush (*Trichophorum pumilum)* is also very common on hummocks.

Another fen occurs in Deadman Gulch at the point where tall willows give way to lower stature vegetation. This fen is driven by groundwater discharge, but also exhibits influence of surface water draining from the gulch. Vegetation of this peatland grades from what can be called "rich" fen into "extreme rich" fen. This area supports tall (>2 m) shrubs (especially park willow-*Salix monticola*), which give way to an open shrubland of low shrubs such as diamondleaf willow (*Salix planifolia),* shortfruit willow *(Salix brachycarpa),* and bog birch (*Betula glandulosa*) on top of deep sedge peat (mostly water sedge-*Carex aquatilis*), then finally to the very low hummock/swale complex typical of the extreme nutrient rich wetland environments in South Park. It is at the lower end of this succession that the globally imperiled Porter feathergrass (*Ptilagrostis porteri)* occurs, dominating many of the hummocks. The same suite of extreme rich

fen species that occurs in the other fen (*Trichophorum pumilum, Primula egaliksensis*, etc.) is also found here.

Along the edges of both fen areas occur large stands of shrubby cinquefoil (*Pentaphylloides floribunda)*, and the *Salix brachycarpa/Kobresia myosuroides* plant association. At first glance this community appears much like one of the common *Pentaphylloides* stands, but a closer look reveals its alliance to the extreme rich fens with the presence of *Kobresia myosuroides,* the few-flowered ragwort *(Packera pauciflorus)*, and Canadian single-spike sedge (*Carex scirpoidea)*. The west and east sides of Route 285 are dominated by wet meadows that abound with the globally imperiled pale blue-eyed grass (*Sisyrinchium pallidum*, one 50 x 50 m patch west of the highway contains over 2500 individuals). This area also contains many patches of the state rare Greenland primrose (*Primula egaliksensis)*, which is scattered infrequently across the entire site.

The entire Jefferson and Guernsey Creek PCA is currently used for agriculture; part of the area is grazed moderately, and much of the site is used for hay production. Water has been diverted out of the permanent creeks through ditches to irrigate hay meadows, resulting in an increase in the amount of wetland on the site. The created wetlands do not, however, sustain extreme rich fen species and communities, although pale blue-eyed grass (*Sisyrinchium pallidum)* may occur in some created wet meadows. The fens, which are predominantly groundwater induced, do not appear to have suffered from the manipulation of water on the site. Aerial photos show an area in the middle of T7S R75W S32 that looks like it has been mined, but this area was not visited on the ground. Regardless of the status of the affected area, it is not adjacent to the other fens, and it does not diminish the overall quality of the site.

The three highest ranking elements at this PCA (*Ptilagrostis porteri*, the *Kobresia myosuroides-Thalictrum alpinum* community, and the *Kobresia simpliciuscula-Scirpus pumilus* community) are moderate-sized and in very good condition. These elements appear little affected by the agricultural activities on the site. This is the most northern occurrence of the *Kobresia simpliciuscula-Scirpus pumilus* community in South Park, and one of the top three or four examples of it. This community typifies extreme rich fens. The *Kobresia simpliciuscula-Scirpus pumilus* also occurs in the Swamp Lake Botanical Area of Shoshone National Forest, Wyoming (Fertig and Jones 1992). It may also occur in select small areas in Montana and Ontario, but it is not yet clear if fen communities in these areas are the same as South Park's (Cooper, pers. comm. to J. Sanderson). In any case, the geochemistry that creates habitat for this community is in general quite limited, and these systems are expected to be globally rare.

Current knowledge of Porter feathergrass (*Ptilagrostis porteri)* indicates that this is the third largest occurrence of this species, and the largest that does not occur adjacent to a large mined area. The distribution of this taxon is restricted to a small area in and around South Park.

This PCA is also significant for its extremely large population of the state rare little bulrush (*Trichophorum pumilum)*, which extends from the upper edges of the fens well down the two creeks for over a mile. This globally secure plant was recently rediscover in Colorado after not being seen in for over 100 years (Weber 1996). In Colorado it is found only in rich and extreme

rich fens in and near South Park. Greenland primrose (*Primula egaliksensis)* occurs frequently across a large area at this site, probably many hundreds or thousands of individuals. It is found in both fens and on the east and west sides of Highway 285.

The *Pentaphylloides floribunda-Salix brachycarpa/Kobresia myosuroides* community and the populations of Canadian single-spike sedge (*Carex scirpoidea)* and few-flowered ragwort (*Packera pauciflorus)* overlap somewhat on this site. All are found on the less wet edges of the extreme rich fens, where soils may have high levels of organic matter but are not peat. The abundance of *Pentaphylloides floribunda* in this community suggests it is heavily influenced by grazing. This community is quite similar to the more common *Pentaphylloides floribunda* communities that also occur in South Park and elsewhere in Colorado, and it probably merits less attention than the *Kobresia* communities in the park. It is, however, clearly associated with nutrient rich groundwater discharge areas.

The current status of Bodin milkvetch (*Astragalus bodinii)* and glass physa (*Physa skinneri)* is unknown.

This PCA includes approximately 5818 acres, with an elevation range of about 9420-10,200 feet.

Biodiversity Rank Justification: This PCA supports a good (B-ranked) occurrence of the *Kobresia myosuroides-Thalictrum alpinum* plant community which is globally critically imperiled (G1?). A total of 13 elements are known to occur on the site. Two of the plant species (*Ptilagrostis porteri* and *Sisyrinchium pallidum*) are regional endemics. One of the plant communities (*Kobresia simpliciuscula-Scirpus pumilus*) is the most typical hummock community of South Park's extreme rich fens. This community is positively known only from small areas in Colorado and Wyoming, although it may also occur to a limited extent in Montana and Ontario. This occurrence is one of the largest known from the area, and it is in excellent shape. All these factors contribute to the status of a B1 site.

Element occurrences at the Jefferson and Guernsey Creeks PCA.

Element	Common name	Global rank	State rank	Federal status	State status	Federal sensitive	EO* rank	Last observed
animals								
Physa skinneri	Glass physa	G5	S2				H	1976-06-24
Plant communities								
Kobresia myosuroides-Thalictrum alpinum	**extreme rich fens**	**G1?**	**S1**				**B**	**2000-07-15**
Kobresia simpliciuscula-Scirpus pumilus	**extreme rich fen**	**G2?**	**S1**				**A**	**2000-07-15**

Pentaphylloides floribunda/Deschampsia cespitosa	montane riparian shrubland	G4	S3S4				B	1995-07-23
plants								
Astragalus bodinii	Bodin milkvetch	G4	S2				E	1980-07-20
Astragalus bodinii	Bodin milkvetch	G4	S2				H	1951-08-07
Carex scirpoidea	Canadian single-spike sedge	G5	S2			BLM	B	1995-07-23
Packera pauciflora	Few-flowered ragwort	G4G5	S1S2			BLM	B	1995-07-23
Primula egaliksensis	Greenland primrose	G4	S2			FS/BLM	A	1995-07-23
Primula egaliksensis	Greenland primrose	G4	S2			FS/BLM	B	1989-07-07
Primula egaliksensis	Greenland primrose	G4	S2			FS/BLM	H	1963-06-24
Primula egaliksensis	Greenland primrose	G4	S2			FS/BLM	H	1954-07-11
Ptilagrostis porteri	**Porter feathergrass**	**G2**	**S2**			**FS/BLM**	**A**	**2000-07-15**
Ptilagrostis porteri	Porter feathergrass	G2	S2			FS/BLM	E	1990-07-06
Salix candida	Hoary or silver willow	G5	S2			BLM	A	2000-07-15
Salix myrtillifolia	Low blueberry willow	G5	S1			FS/BLM	B	2000-07-15
Salix serissima	Autumn willow	G4	S1			FS/BLM	B	2000-07-15
Sisyrinchium pallidum	Pale blue-eyed grass	G2G3	S2			BLM	B	1990-07-15
Sisyrinchium pallidum	Pale blue-eyed grass	G2G3	S2			BLM	C	1990-07-15
Trichophorum pumilum	Little bulrush	G5	S2			FS/BLM	A	1995-07-23

*EO=Element occurrence

Boundary Justification: The boundary drawn encompasses all of the elements associated with an interconnected wetland system that all drains into Guernsey Creek, including both fens and all connected wet meadows to a point downstream beyond which there are no reported elements. It also includes nearly contiguous wetlands in the Jefferson Creek drainage. The boundary is drawn to incorporate an area where natural processes (such as groundwater recharge, species reproduction) function in a manner that maintains viable populations of the elements associated with the fen. However, all hydrological processes necessary to the elements are not fully contained in the boundary. Upstream activities that alter hydrology or sediment loads could detrimentally affect the elements. With future inventory the boundary may need to be modified to include wetlands on the southeast and southwest sides of the site.

Protection Comments: Most of this PCA is privately owned, with some USFS lands included along the far northern boundary. Most of the entire area is used for either cattle grazing or hay production. The single greatest long-term threat is the potential removal of water from the site by Front Range municipalities, as has happened to several other large wetlands in South Park. The PCA falls within the maximum drawdown area of the South Park Conjunctive Use Project as modeled by Jehn Water Consultants, Inc. and Leanord Rice Consulting Water Engineers, Inc. (1998). Any decrease in water could adversely affect the elements; therefore, the South Park Conjunctive Use Project could detrimentally effect the elements at this PCA. Ditching of the wetlands or diversion of water from the wetlands may also adversely affect the extreme rich fen elements, although surface water diversions to date (for irrigation) appear not to have had a deleterious effect. Groundwater pumping above or near these wetlands would likely negatively affect the fens, but at present is not a concern. Runoff and effluent from residential development around the area poses no short-term threat, but may need to be considered in the future. The current moratorium on peat mining in Park County will offer some protection. Peat mining would probably destroy the Porter feathergrass (*Ptilagrostis porteri)* population, as well as several of the other extreme rich fen elements.

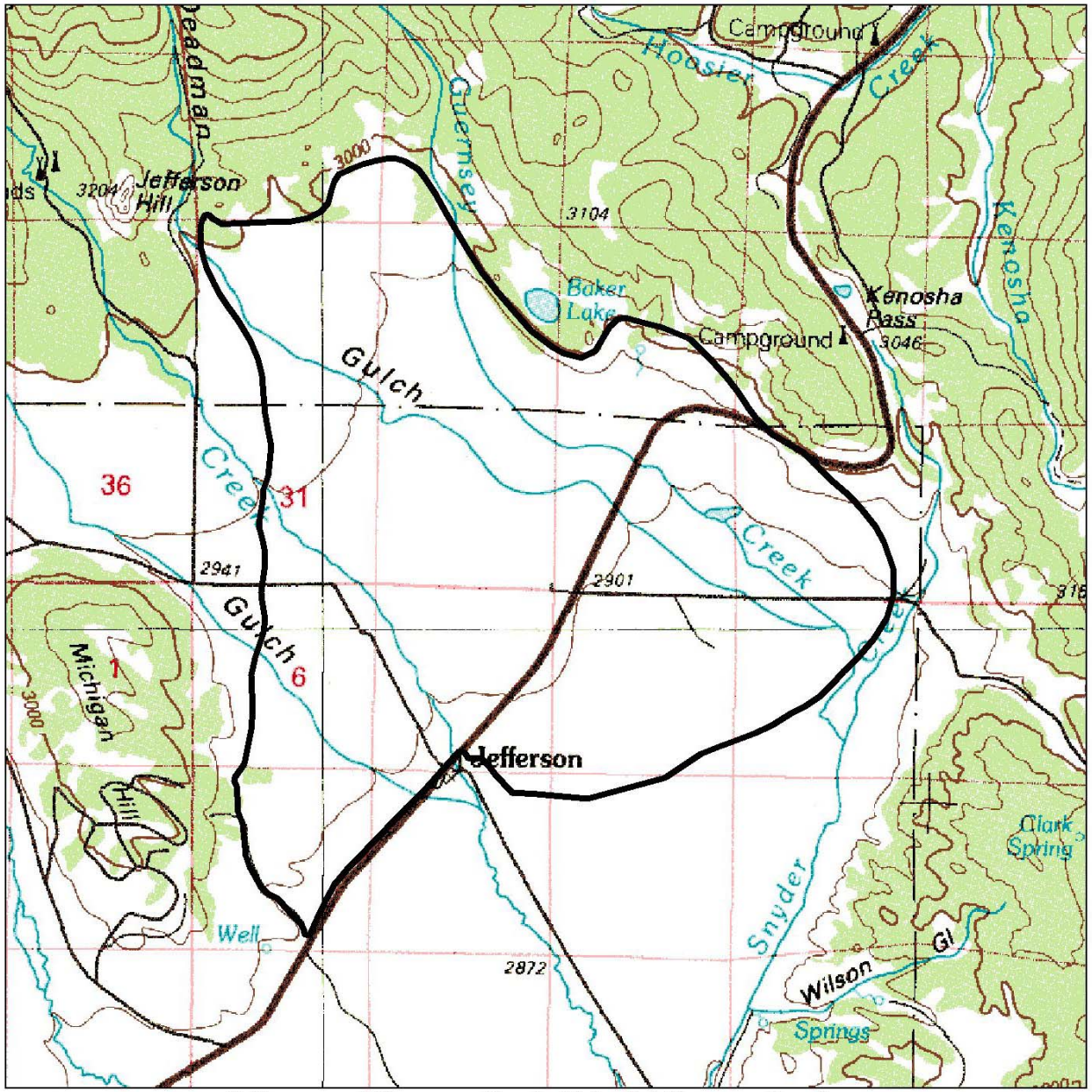
Much of this PCA (2,250 acres) is now protected as the result of a 1999 purchase of the Wahl/Coleman Ranch by Colorado Open Lands (COL). Subsequent placement of a conservation easement on the property ensures that water rights cannot be severed from the ranch, nor can the property be subdivided in the future. This proactive conservation effort by Park County, COL, and the Colorado Division of Wildlife affects much of Guernsey and Deadman Creeks. While adjacent ranches remain formally unprotected, discussions with landowners along lower Jefferson Creek indicate there are no ownership or land use changes pending in the near future (pers. comm. Gary Nichols 2001).

Management Comments: The most important extreme rich fen elements appear to be doing fine under the current management regime, mainly because both people and cattle tend to stay out of the "boggy" areas where these elements occur. Some water has been diverted from the upper part of the site and some ditches run through the site for irrigating hay fields. Despite these diversions, the site's hydrology appears sufficiently intact to maintain the elements (especially since this fen system is strongly groundwater driven.)

Dandelions (*Taraxacum officinale*) were noted as occuring in this area during a site visit in 1989.

A monitoring program designed to detect changes in the overall quality and condition of the elements of concern would benefit the management of this important area.

Porter feathergrass (*Ptilagrostis porteri*)



Jefferson and Guernsey Creeks Potential Conservation Area

The Colorado Natural Heritage Program

Colorado State University
254 General Services Bldg
Fort Collins, CO 80523

Map Date: 12 March 2001
GIS Dept: dcb

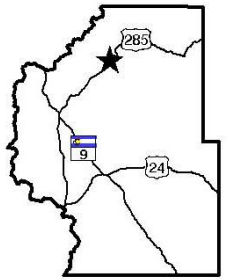
PCA Boundary

30 x 60 Minute Quadrangle:

Bailey, 39105-A1

Digital Raster Graphics (DRGs) produced by the U.S. Geological Survey, 1996

Location in Park County



Disclaimer

The data are provided on an as-is, as-available basis without warranties of any kind, expressed or implied, including (but not limited to) warranties of merchantability, fitness for a particular purpose, and noninfringement. CNHP, Colorado State University and the State of Colorado further expressly disclaim any warranty that the data are error-free or current as of the date supplied.

0.6 0 0.6 Miles

Projection UTM, Zone 13, NAD27

HIGH CREEK
POTENTIAL CONSERVATION AREA

Biodiversity Rank: B1
Protection Urgency Rank: P2
Management Urgency Rank: M2

Location: Park County. High Creek Fen is located about 9 miles south of Fairplay, and south of Highway 285. This PCA continues west of Highway 285 to include High Creek at Warm Springs.

USGS 30 x 60 Minute Quadrangles: Leadville, Bailey.
Legal Description: T10S, R77W, sections 19, 28, 29, 30, 32, 33, 34; T10S, R78W, sections 24, 25; and T11S, R77W, sections 2, 3, 4, 5, 9, 10, 11, 12, 13, 14, 15.

General Description: High Creek Fen is east of the Mosquito Range foothills in a depression at the base of several large glacial outwash fans that are fed by ground water flowing from the Mosquito Range through alluvial gravels. This fen is the most ecologically diverse, floristically rich fen known in the Southern Rocky Mountains. It contains more rare plant species than any other wetland location in Colorado, and includes 14 plant species that are rare in Colorado. It is one of the largest and most intact wetlands left in South Park; other wetlands in the area have been destroyed or greatly altered by water diversions or peat mining. High Creek Fen is owned and managed by The Nature Conservancy of Colorado.

In its entirety, this PCA includes High Creek Fen, and also includes lands that stretch for several miles upstream along High Creek. It includes Warm Springs at the upstream end of the PCA. Much of the width of the riparian zone in the upper reaches of the PCA is peatland, and along almost the entire length springs (groundwater discharge zones) replenish the surface and stream. Groundwater discharge is especially common along the west edge of the riparian area along the base of the hills. In the upper (upstream) portions of the PCA the occurrences of Canadian single-spike sedge (*Carex scirpoidea)* and few-flowered ragwort (*Packera pauciflorus)* are quite large, but adjacent to a mined area and grazed. The best-developed extreme rich fen elements (both communities and plants) occur (farther downstream) at the base of a hill on the west side of High Creek, sandwiched between the hill and the creek, but also occur in patches in other areas in the Warm Springs area. This occurrence is in very nice shape, having been protected from most grazing impacts by the hill on the west and by the creek and boggy ground to the east.

This PCA includes approximate 5670 acres with an elevation range of about 9000-10,200 feet.

Biodiversity Rank Justification: This PCA is rich with state and global imperiled plants and plant communities. The site supports an excellent (A-ranked) occurrence of a globally critically imperiled plant community (G1?), *Kobresia myosuroides-Thalictrum alpinum*, an excellent (A-

ranked) occurrence of a globally imperiled plant community (G2/S1), *Kobresia simpliciuscula-Scirpus pumilus*, and several other globally and state rare elements. It is the most extensive and highest quality example of extreme rich fens in all of South Park. It also contains nine rare aquatic and semi-aquatic macroinvertebrates not yet found at any other extreme rich fen. All but the upper, mined portion of the site is in good condition. In the upper portions of the PCA the element occurrences are generally smaller than in the High Creek Fen preserve managed by The Nature Conservancy.

Element occurrences documented at the High Creek PCA.

Elements	Common Name	Global Rank	State Rank	Federal Status	State Status	Federal Sensitive	EO * Rank	Last Observed
Plant communities								
Eleocharis quinqueflora-Triglochin spp.	alkaline spring wetland	GU	S2				A	1998-07-15
Kobresia myosuroides-Thalictrum alpinum	**extreme rich fens**	**G1?**	**S1**				**A**	**1998-07-15**
Kobresia myosuroides-Thalictrum alpinum	extreme rich fens	G1?	S1				C	1999-09-01
Kobresia simpliciuscula-Scirpus pumilus	extreme rich fen	G2?	S1				A	1998-07-15
Kobresia simpliciuscula-Scirpus pumilus	extreme rich fen	G2?	S1				C	1995-08-24
Plants								
Carex livida	Livid sedge	G5	S1			FS/BLM		1989-07-28
Carex scirpoidea	Canadian single-spike sedge	G5	S2			BLM	A	1992-07-04
Carex scirpoidea	Canadian single-spike sedge	G5	S2			BLM	B	1995-08-24
Carex scirpoidea	Canadian single-spike sedge	G5	S2			BLM	C	1999-09-01
Carex viridula	Green sedge	G5	S1			BLM		1992-07-04
Eriophorum gracile	Slender cottongrass	G5	S2			BLM	C	1995-08-24
Lilium philadelphicum	Wood lily	G5	S3S4					1991-07-04
Packera pauciflora	Few-flowered ragwort	G4G5	S1S2			BLM	A	2000-08-03
Packera pauciflora	Few-flowered ragwort	G4G5	S1S2			BLM	B	1995-08-24
Packera pauciflora	Few-flowered ragwort	G4G5	S1S2			BLM	C	1999-09-01
Primula egaliksensis	Greenland primrose	G4	S2			FS/BLM	A	1992-07-28

Primula egaliksensis	Greenland primrose	G4	S2			FS/BLM	C	1995-08-24
Ptilagrostis porteri	Porter feathergrass	G2	S2			FS/BLM	C	1996-08-12
Ptilagrostis porteri	Porter feathergrass	G2	S2			FS/BLM	C	2000-08-10
Salix candida	Hoary or silver willow	G5	S2			BLM	A	2000-08-03
Salix candida	Hoary or silver willow	G5	S2			BLM	A	1995-08-24
Salix candida	Hoary or silver willow	G5	S2			BLM	C	1999-09-01
Salix myrtillifolia	Low blueberry willow	G5	S1			FS/BLM		1992-07-28
Salix serissima	Autumn willow	G4	S1			FS/BLM		1991-99-99
Sisyrinchium pallidum	Pale blue-eyed grass	G2G3	S2			BLM	A	2000-08-03
Sisyrinchium pallidum	Pale blue-eyed grass	G2G3	S2			BLM	C	1999-09-01
Trichophorum pumilum	Little bulrush	G5	S2			FS/BLM	A	1992-07-04
Trichophorum pumilum	Little bulrush	G5	S2			FS/BLM	C	1995-08-24
Trichophorum pumilum	Little bulrush	G5	S2			FS/BLM	C	1999-09-01
Unamia alba	Prairie goldenrod	G5	S2S3					2000-08-03
Utricularia ochroleuca	Northern bladderwort	G4?	S1?					1991-99-99

*Element occurrence

Boundary Justification: This PCA was designed to encompass all elements known to occur in High Creek Fen system, and an area on the upstream end of the site that had peat removed. Boundaries also include adjacent natural wetlands, but do not include much of the irrigated areas to the east of the site. The boundary is drawn to incorporate an area where natural processes (such as groundwater recharge, species reproduction) function in a manner that maintains viable populations of the elements associated with the fen. However, all hydrological processes necessary to the elements are not fully contained in the boundary. Upstream activities that alter hydrology or sediment loads could detrimentally affect the elements.

Protection Comments: Much of the PCA falls within the High Creek Fen Preserve, designed and maintained by The Nature Conservancy. This preserve is open to the public. The High Creek PCA, presented herein, extends beyond the preserve and could be considered for future incorporation into the preserve. The full PCA includes private, BLM and state lands. Some factors, especially site hydrology, extend well beyond the borders of the PCA. There is one tract of land in the southeast portion of the PCA that is projected for home construction. A 1,000 acre parcel within the TNC preserve is also a Colorado State Registered Natural Area. There are no

known plans to divert water from the site, but if water diversion were to occur in the future, it may adversely affect the elements. Removal of peat from the site, as has occurred at the upper end, would destroy the habitat for the elements. The current moratorium on peat mining in Park County will protect the fen from additional mining at this time.

The Nature Conservancy, Colorado Open Lands, and Park County are viewing the entire area around High Creek as significant to the conservation of several extreme rich fens, riparian areas, and mountain plover habitat (pers. comm. Gary Nichols 2001).

Management Comments: Some peat mining has occurred on several acres of the upper and lower portions of the PCA. Several ditches divert water from the upper end of the PCA and across the site. Diversion of water may adversely affect the elements on the site. Grazing occurs on drier portions of the PCA. If the areas immediately adjacent to the wetlands must be grazed, it would probably be better to graze them from late summer through late winter and not in spring and summer during peak productivity of the elements of concern.

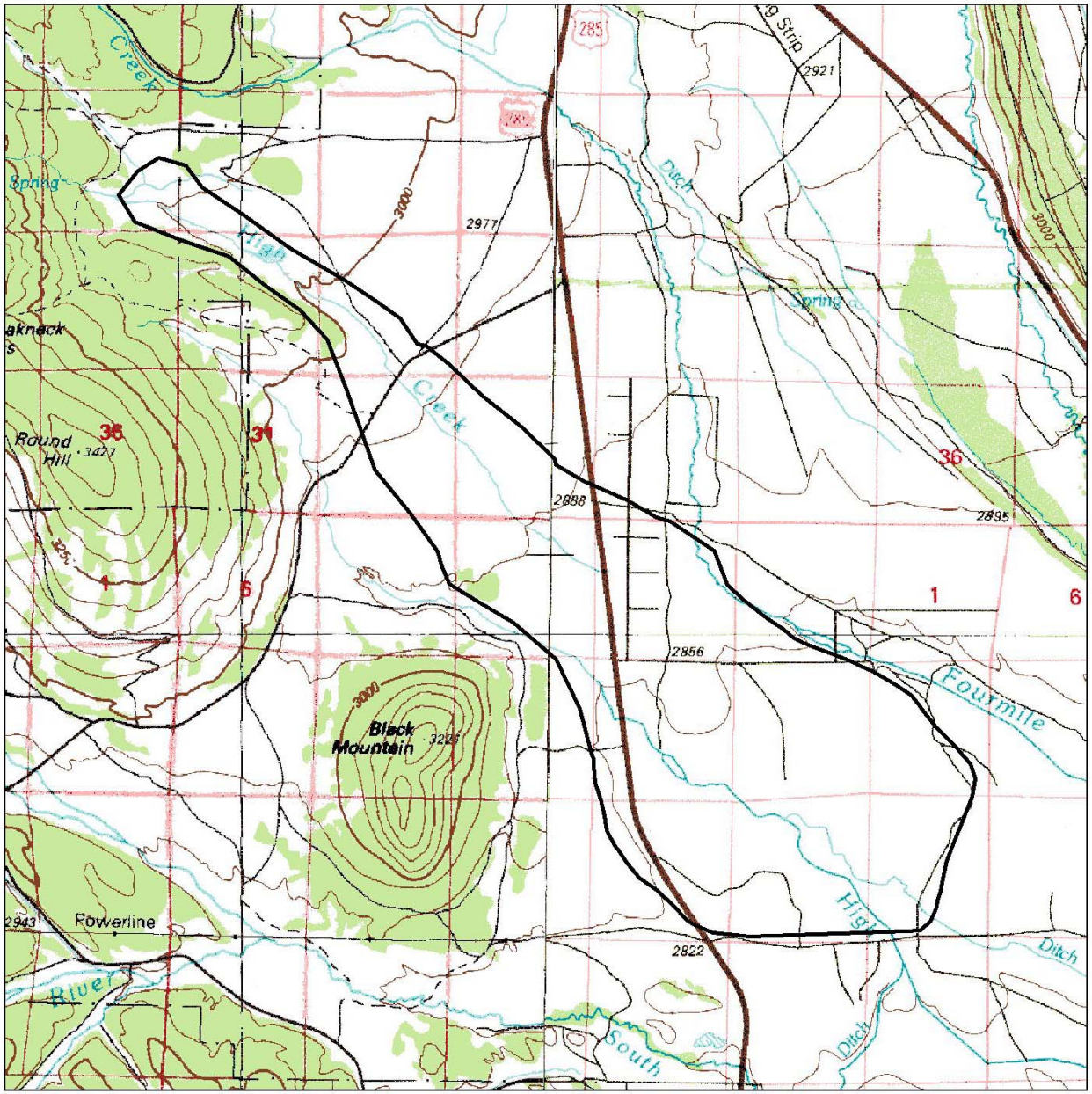
The High Creek Fen preserve managers may need to repair and maintain fences if cattle are to be kept off of the preserve. A small patch of Canada thistle (*Breea arvensis*) has been documented at High Creek Fen (pers. comm. Terri Schulz 2001.)

Mountain plovers have been documented within this PCA. However, conservation efforts for this species would be better directed to other locations within South Park because the land use practices that benefit mountain plovers run contrary to practices that are beneficial to the wetland habitats. Mountain plovers will not use wetlands, rather they prefer dry barren uplands that are maintained by some disturbance process like grazing by cattle or bison, or burning. These disturbance processes can be detrimental to fen habitats. Please see South Park PCA for additional information about mountain plover.

High Creek Fen is an important area for disjunct invertebrates (Durfee and Polonsky 1996). Management and inventory needs for the invertebrates needs to be addressed.

A monitoring program designed to detect overall changes in the quality or condition of the elements of concern would benefit the management of this important area.

Prairie goldenrod (*Unamia alba)*



High Creek Potential Conservation Area

The Colorado Natural Heritage Program

Colorado State University
254 General Services Bldg
Fort Collins, CO 80523

Map Date: 12 March 2001
GIS Dept: dcb

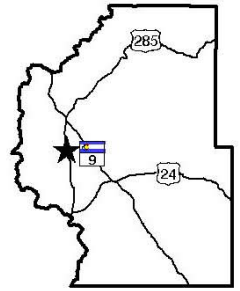
PCA Boundary

30 x 60 Minute Quadrangles:

Leadville, 39106-A1
Bailey, 39105-A1

Digital Raster Graphics (DRGs) produced by the U.S. Geological Survey, 1996

Location in Park County



Disclaimer

The data are provided on an as-is, as-available basis without warranties of any kind, expressed or implied, including (but not limited to) warranties of merchantability, fitness for a particular purpose, and noninfringement. CNHP, Colorado State University and the State of Colorado further expressly disclaim any warranty that the data are error-free or current as of the date supplied.

0.8 0 0.8 Miles

Projection UTM, Zone 13, NAD27

N

MOSQUITO RANGE
POTENTIAL CONSERVATION AREA

Biodiversity Rank: B1
Protection Urgency Rank: P2
Management Urgency Rank: M3

Location: Park, Lake and Summit counties.

USGS 1 x 2 Degree Quadrangles: Denver, Leadville.

General Description: This PCA incorporates nearly the entire alpine area of the Mosquito Range. The predominant habitats are characterized by alpine meadows, rock outcrops, scree slopes, boulder fields, alpine lakes, willow carrs, snowmelt streamlets, and permanent snow fields. Snow melt flows down the north and south-facing slopes in intermittent drainages from the top of the ridges. 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 one of the elements of primary importance in this PCA.

This PCA support an extraordinarily high concentration of rare plant species. A total of 180 occurrences of 56 significant plants, animals, and plant communities have been documented within the PCA boundary. A total of 18 smaller PCAs have been identified within the Mosquito Range PCA, though a thorough inventory and analysis of this important area has never been conducted. Several 14,000 foot peaks occur in the PCA, and this area is known for its past gold mining. The elevation within the PCA ranges from about 10,500 to 14,200 feet. The PCA is about 96,628 acres in size.

Plants of concern documented in the Mosquito Range PCA. Species in bold are endemic to the Mosquito Range. Species ranked G1-3 are globally imperiled. Species ranked G5 or G4 and S1 or S2 are found in the Mosquito Range in populations that are disjunct from the primary part of the species range. Additional information about the animals and plant communities, and specific element occurrences, is available from the Colorado Natural Heritage Program at www.cnhp@colostate.edu.

Element	Common Name	Global Rank	State Rank	Federal Status
Draba weberi	**Weber's draba**	**G1**	**S1**	
Eutrema penlandii	**Penland alpine fen mustard**	**G1G2**	**S1S2**	
Botrychium pallidum	Pale moonwort	G2	S2	FS

Ipomopsis globularis	**Globe gilia**	**G2**	**S2**	
Draba exunguiculata	Clawless draba	G2	S2	
Botrychium echo	Reflected moonwort	G2	S2	FS
Draba grayana	Gray's Peak whitlow-grass	G2	S2	
Physaria alpina	Avery Peak twinpod	G2	S2	
Machaeranthera coloradoensis	Colorado tansy-aster	G2?	S2	FS
Astragalus molybdenus	Molybdenum milk-vetch	G3	S2	FS
Draba streptobrachia	Colorado divide whitlow-grass	G3	S3	
Aquilegia saximontana	Rocky Mountain columbine	G3	S3	
Draba porsildii	Porsild's whitlow-grass	G3G4	S1	
Ptilagrostis porteri	Porter feathergrass	G2	S2	FS
Saussurea weberi	Weber's saw-wort	G3Q	S2	BLM
Scirpus rollandii	Rolland bulrush	G3Q	S2	FS
Braya humilis	Low braya	G4	S2	
Parnassia kotzebuei	Kotzebue's grass-of-parnassus	G4	S2	
Draba borealis	Boreal whitlow-grass	G4	S2	
Draba fladnizensis	White arctic whitlow-grass	G4	S2S3	
Ranunculus karelinii	Ice cold buttercup	G4G5	S2	
Salix lanata ssp calcicola	Lanate willow	G4T4	S1	FS
*Draba lonchocarpa v*ar. *lonchocarpa*	Lance-pod whitlowgrass	G4T4	S2	
Eriophorum altaicum var. *neogaeum*	Altai cotton-grass	G4T?	S3	FS
Draba incerta	Yellowstone whitlow-grass	G5	S1	
Oxytropis parryi	Parry's crazy-weed	G5	S1	
Crepis nana	Dwarf alpine hawksbeard	G5	S2	
Draba oligosperma	Few-seeded whitlow-grass	G5	S2	
Phippsia algida	Ice grass	G5	S2	
Botrychium lunaria	Moonwort grape-fern	G5	S2S3	
Papaver radicatum ssp. *kluanense*	Alpine poppy	G5T3?	S3	
Armeria maritima ssp. *sibirica*	Sea pink	G5T5	S1	FS

Biodiversity Rank Justification: The Mosquito Range is one of the botanical "hotspots" in Colorado. There are few other areas in the state supporting 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. This PCA includes every known location for this species in the world. Globe gilia (*Ipomopsis globularis*) is another very narrowly restricted species found in this PCA and nowhere else in the world. Along with these globally rare species, 40 other globally and/or state imperiled plants and nine significant plant communities are documented here. The Colorado River Cutthroat Trout is known from the west slope of the Mosquito range (within the PCA but outside of Park County). The Polixenes arctic butterfly is also known from this area. The Lynx and Wolverine are known here from historical documentation.

Boundary Justification: The boundary includes all known elements and potential conservation areas in the Mosquito Range alpine zone. This boundary is thought to incorporate a large enough area to support all of the ecological processes of the Mosquito Range. This area will provide suitable habitat where additional individuals can become established over time.

Protection Comments: This PCA is publicly owned and managed by the U.S. Forest Service with the exception of numerous small inholdings which are privately owned. During the last 10 years increasing numbers of mining claims (small inholdings) have been sold to individuals for home site development in the Mosquito Range. Many new homes and access roads are now being constructed at or near timberline, in areas that were historically used for mining and recreation. This trend represents a significant shift in land use and human access to areas that were previously undeveloped or inaccessible (pers. comm. Gary Nichols 2001).

A total of 1025 acres are designated as a USFS Research Natural Area; however, several mining companies have appealed this because of their intent to conduct future mining operations in the area. Approximately four acres are owned by The Nature Conservancy, however, a specific management strategy is not in place. A total of 925 acres are registered as a State Natural Area. Additional special area designations may be required to ensure adequate protection for this important area. The Colorado Rare Plant Technical Committee considers the Mosquito Range among the top ten areas in Colorado needing protection focus.

Management Comments: This area was extensively explored for minerals, particularly at the turn of the last century. There are extensive mine tailings, roads and historic disturbances from mining activities. The renewal of mining may threaten this site. 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 could 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. A monitoring program designed to detect changes in the overall quality or condition of the element occurrences in this PCA would benefit the management of this important area.

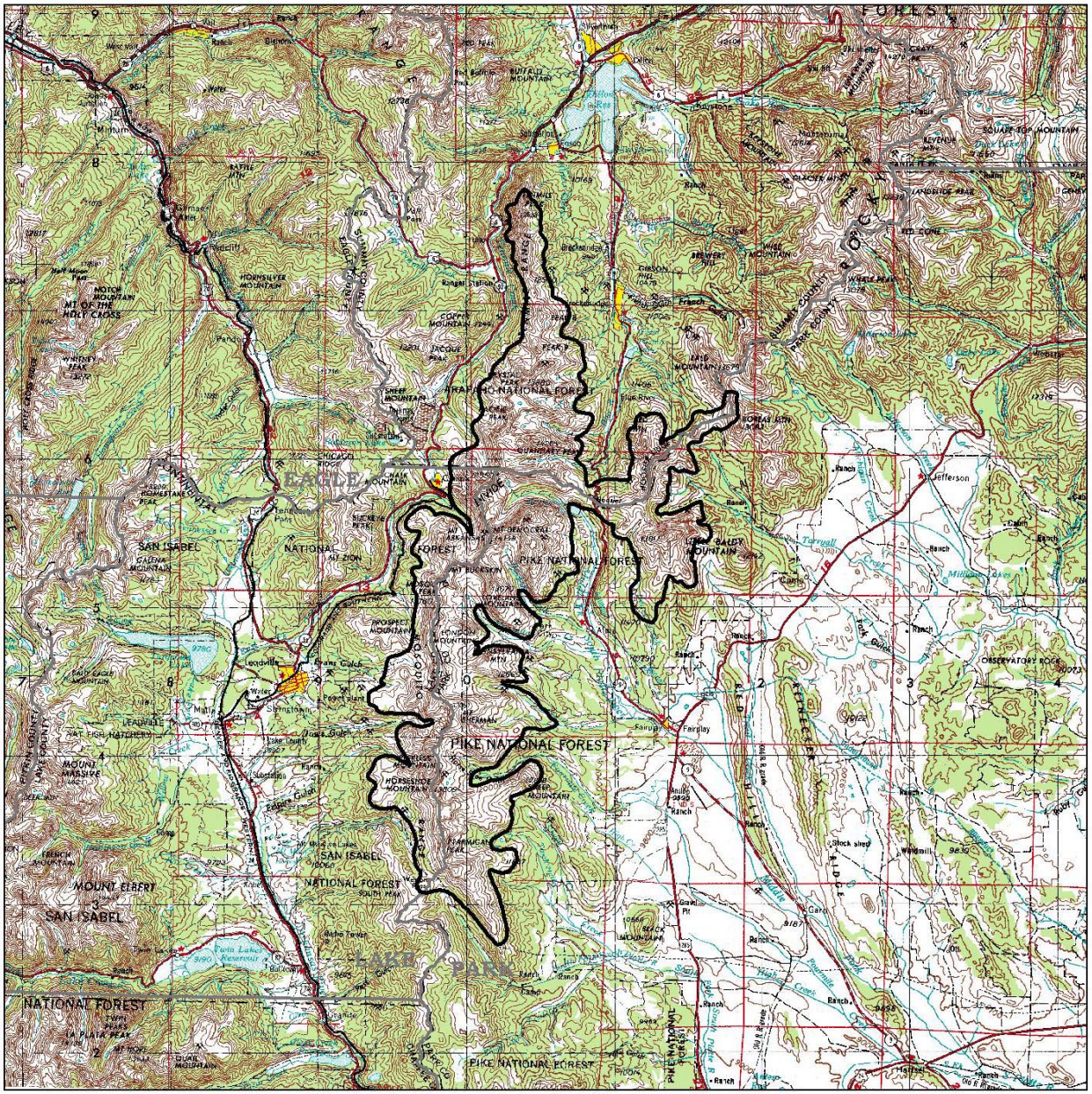
This is an excellent area for botanical research because of the high number of rare plant species that are found here, including species that are endemic to Colorado and species that are disjunct from their primary distributions. All research activities should be designed to have little or no impact on the imperiled species.

Photograph taken at Mosquito Range PCA

Lanate Willow (*Salix lanata* ssp. *calcicola*)

Lanate Willow (*Salix lanata* ssp. *calcicola*)

Seapink (*Armeria maritima* ssp. *sibirica*)



Mosquito Range Potential Conservation Area

The Colorado Natural Heritage Program

Colorado State University
254 General Services Bldg
Fort Collins, CO 80523

Map Date: 12 March 2001
GIS Dept: dcb

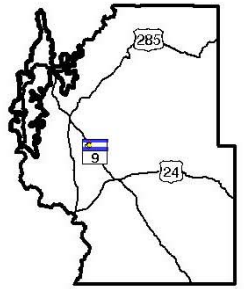
PCA Boundary

1 x 2 Degree Quadrangles:

Denver, 39104-A1
Leadville 39106-A1

Digital Raster Graphics (DRGs) produced by the U.S. Geological Survey, 1996

Location in Park County



5 0 5 Miles

Projection UTM, Zone 13, NAD27

OLD RAILROAD
POTENTIAL CONSERVATION AREA

Biodiversity Rank: B2
Protection Urgency Rank: P1
Management Urgency Rank: M1

Location: Park County, northwest of Antero Reservoir.

USGS 7.5 Minute Quadrangles: Garo and Antero Reservoir.
Legal Description: T12S R76W sections 7, 18, 19; T12S R77W sections 12, 13, 24.

General Description: This PCA encompasses an extreme rich fen complex on the northwest corner of Antero Reservoir, east and north of the South Fork of the South Platte River. An old, abandoned railroad grade cuts through the site from the northeast to the southwest, about 1/4 mile from the reservoir. Between the railroad grade and the reservoir is one of South Park's best developed examples of an extreme rich fen. This area contains most of the extreme rich fen rare plant species. In the peat area, hummocks are dominated by the *Kobresia simpliciuscula-Scirpus pumilus* plant associations. *Carex simulata* and other sedges, *Triglochin* spp., and fewflower spikerush *(Eleocharis quinqueflora)* dominate the swales. Canadian single-spike sedge (*Carex scirpoidea)* and few-flowered ragwort (*Packera pauciflorus)* occur mainly on the southern edge of the peat on a light colored soil, with much lower organic content.

West of the railroad grade the extreme rich fen has been destroyed by peat mining. Only scattered extreme rich fen species still occur there.

This PCA is approximately 1128 acres in size and is found at about 8,800-9100 feet in elevation.

Biodiversity Rank Justification: This PCA supports a fair (C-ranked) occurrence of one globally critically imperiled (G1?S1) community, *Kobresia myosuroides-Thalictrum alpinum* and one globally imperiled plant community, *Kobresia simpliciuscula-Scirpus rollandii*. Additionally the site supports several state significant plants. Peat has been removed from half of the fen, and the hydrology has been altered by the railroad grade and upstream diversion. Despite these alterations, the hydrology in the area east of the railroad grade appears sufficiently intact to support the elements.

Element occurrences at the Old Railroad PCA.

Element	Common name	Global rank	State rank	Federal status	State status	Federal sensitive	EO* rank	Last observed
Plant communities								

Kobresia myosuroides-Thalictrum alpinum	**extreme rich fens**	**G1?**	**S1**				**C**	**1995-08-04**
Kobresia simpliciuscula-Scirpus pumilus	extreme rich fen	G2?	S1				C	1995-08-04
Plants								
Carex scirpoidea	Canadian single-spike sedge	G5	S2			BLM	B	1995-08-04
Packera pauciflora	Few-flowered ragwort	G4G5	S1S2			BLM	AB	1995-08-04
Primula egaliksensis	Greenland primrose	G4	S2			FS/BLM	B	1995-08-04
Salix candida	Hoary or silver willow	G5	S2			BLM		1992-07-14
Salix candida	Hoary or silver willow	G5	S2			BLM	AB	1995-08-04
Salix myrtillifolia	Low blueberry willow	G5	S1			FS/BLM	AB	1995-08-04
Sisyrinchium pallidum	Pale blue-eyed grass	G2G3	S2			BLM	A	1992-07-14
Trichophorum pumilum	Little bulrush	G5	S2			FS/BLM	AB	1995-08-04

*Element occurrence

Boundary Justification: The PCA boundary includes the intact peatland, the mined peatland, and the seep area to the west that appears hydrologically connected to the peatland. The encompassed hydrology is vital for the support of the significant elements within the fen. The boundary is drawn to incorporate an area where natural processes (such as groundwater recharge, species reproduction) function in a manner that maintains viable populations of the elements associated with the fen. However, all hydrological processes necessary to the elements are not fully contained in the boundary. Upstream activities that alter hydrology or sediment loads could detrimentally affect the elements.

Protection Comments: This PCA includes a combination of private and state lands. The fen abuts Antero Reservoir and *any* increase in water levels will adversely affect the elements present. Denver Water is currently in the process of acquiring the lower portion of this PCA from the State Land Board for future expansion of Antero Reservoir (pers. comm. Gary Nichols 2001.)

The current moratorium on peat mining in Park County will protect the peatlands from mining at this time.

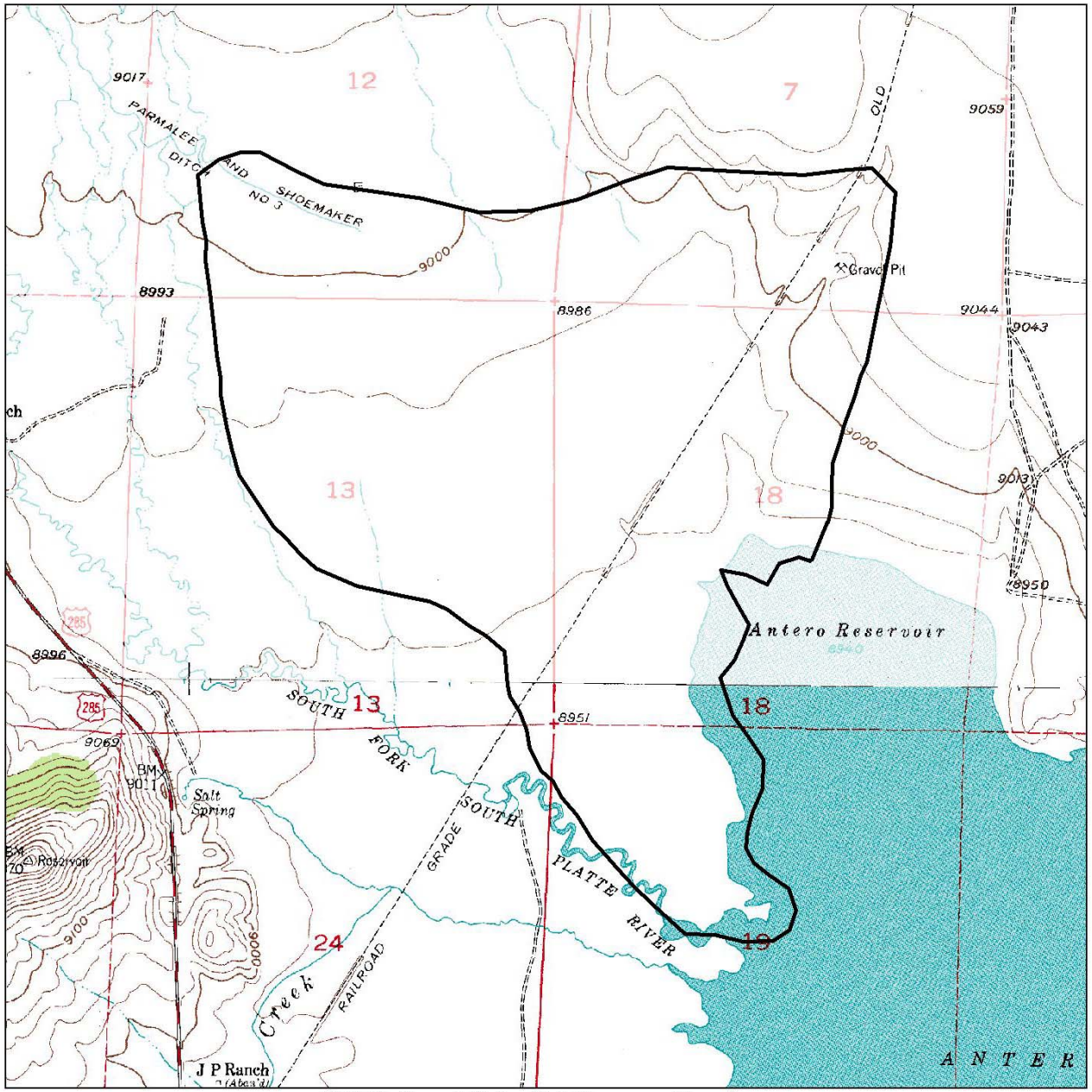
Management Comments: Peat has been removed from half of the fen, and the hydrology has been altered by the railroad grade and upstream diversion. Despite these alterations, the hydrology in the area east of the railroad grade appears sufficiently intact to support the elements. Within the western third of the PCA is a large seep area, perhaps at the end of a Pleistocene alluvial fan, that appears to be hydrologically connected to the fen area. Further hydrological alterations at this site could negatively impact the elements, and restoration of severely altered hydrology could be considered. Cattle grazing in the area does not appear to be having a strong adverse effect on the site.

Management of the area could include restoring the local hydrology, and planting the mined area with native fen species. Although restoration of the peat layer will require thousands of years, the fen plants may reestablish fairly quickly. Since so much of the fen has been mined for peat, it provides an excellent setting for research on plant succession in extreme rich fens.

A monitoring program designed to detect changes in the overall quality and condition of the elements would benefit the management of this important area.

Mountain plovers have been documented in the vicinity of this PCA. However, conservation efforts for this species would be better directed to other locations within South Park because the land use practices that benefit mountain plovers run contrary to practices that are beneficial to the wetland habitats. Mountain plovers will not use wetlands, rather they prefer dry barren uplands that are maintained by some disturbance process like grazing by cattle or bison, or burning. These disturbance processes can be detrimental to fen habitats. Please see South Park PCA for additional information about mountain plover.

Silver willow (*Salix candida*)



Old Railroad Potential Conservation Area

The Colorado Natural Heritage Program

Colorado State University
254 General Services Bldg
Fort Collins, CO 80523

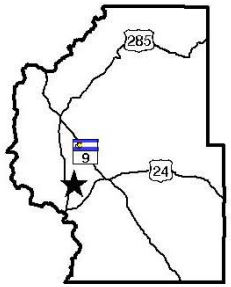
Map Date: 14 March 2001
GIS Dept: dcb

PCA Boundary

7.5 Minute Quadrangles:
Garo, 39105-A8
Antero Reservoir, 38105-H8

Digital Raster Graphics (DRGs) produced by the U.S. Geological Survey, 1996

Location in Park County



Disclaimer

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0.3 0 0.3 Miles

Projection UTM, Zone 13, NAD27

ANTERO RESERVOIR
POTENTIAL CONSERVATION AREA

Biodiversity Rank: B2
Protection Urgency Rank: P1
Management Urgency Rank: M2

Location: Park County, just south of Antero Reservoir.

30 x 60 Minute Quadrangle: Pikes Peak
Legal Description: T12S, R76W, sections 21, 22, 27, 28, 29 30, 31,32, 33, 34, 36, and T13S, R77W section 1, and T13 S, 76W section 6.

General Description: The southern portion of South Park is characterized by alkaline marshes and salt springs. This area was given the name 'bayou salado' by French explorers due to the presence of salts. Antero Reservoir and its surrounding area is a playa lake that has been enhanced for water storage. The plants and plant communities that dominate the alkaline flats are halophytes or salt-tolerant species, such as inland saltgrass (*Distichlis spicata)* and Pursh seepweed (*Suaeda calceoliformis*). This is the only known location in Colorado for the state critically imperiled salt lick mustard (*Thellungiella salsuginea),* which occurs in very limited areas on the salt flats. Salt Creek enters Antero Reservoir from the southwest. Salt Creek and several salt springs are the main contributors to the alkalinity of the area.

The surrounding uplands are dominated by montane grasslands dominated by slimstem muhly (*Muhlenbergia filiculmis),* Arizona fescue *(Festuca arizonica),* blue gramma (*Bouteloua gracilis),* yellow rabbitbrush (*Chrysothamnus viscidiflorus),* and fringed sage (*Artemisia frigida).* The globally imperiled Colorado tansy-aster (*Machaeranthera coloradoensis*) is found on gravelly substrates between the alkaline creeks.

This PCA includes approximately 2730 acres at about 8900-9200 feet elevation.

Biodiversity Rank Justification: This PCA supports a good (B-ranked) occurrence of a globally imperiled (G2) salt meadow community, one excellent (A-ranked) and two good (B-ranked) occurrences of two globally imperiled (G2) plant species, and several fair occurrences of state rare (S1) plants and plant communities. This is the only known location in Colorado for the state critically imperiled salt lick mustard (*Thellungiella salsuginea).*

Element occurrences at the Antero Reservoir PCA.

Elements	Common name	Global rank	State rank	Federal status	State status	Federal sensitive	EO* rank	Last observed
Plant communities								
Puccinellia airoides	salt meadow	G4	S1				B	2000-08-99
Salicornia rubra	**salt meadow**	**G2**	**S1?**				**B**	**2000-08-15**
Plants								
Machaeranthera coloradoensis	**Colorado tansy-aster**	**G2**	**S2**			**FS**	**B**	**2000-08-15**
Machaeranthera coloradoensis	**Colorado tansy-aster**	**G2**	**S2**			**FS**	**A**	**2000-08-15**
Packera pauciflora	Few-flowered ragwort	G4G5	S1S2			BLM		1995-08-05
Phlox kelseyi ssp *salina*	Marsh phlox	G4T3?Q	S1					1986-05-99
Sisyrinchium pallidum	**Pale blue-eyed grass**	**G2G3**	**S2**			**BLM**	**B**	**2000-07-11**
Thellungiella salsuginea	Salt-lick mustard	G4G5	S1				C	2000-08-16
Thellungiella salsuginea	Salt-lick mustard	G4G5	S1					1995-07-18

*Element occurrence

Boundary Justification: The PCA boundary encompasses the southern and eastern shores and adjacent uplands of Antero Reservoir. The boundary is drawn to incorporate an area where natural processes (such as groundwater recharge, species reproduction) function in a manner that maintains viable populations of the elements associated with the salt marsh. However, all hydrological processes necessary to the elements are not fully contained in the boundary. Upstream activities that alter hydrology or sediment loads could detrimentally affect the elements.

Protection Comments: This PCA is mostly privately owned; some of this area is owned by the Denver Water Board. The area also includes a State Wildlife Area, and some lands managed by the BLM. Raising of the water level in Antero Reservoir could threaten the elements of concern.

Conversations between Park County and some of the private landowners indicate a strong interest in developing conservation management strategies on their properties, if and when objectives are determined (pers. comm. Gary Nichols 2001.)

Management Comments: This area receives a high degree of recreational use, including camping, boating, and fishing activities. Trampling by foot and off road vehicle use has the potential to completely destroy the elements of concern and their habitats.

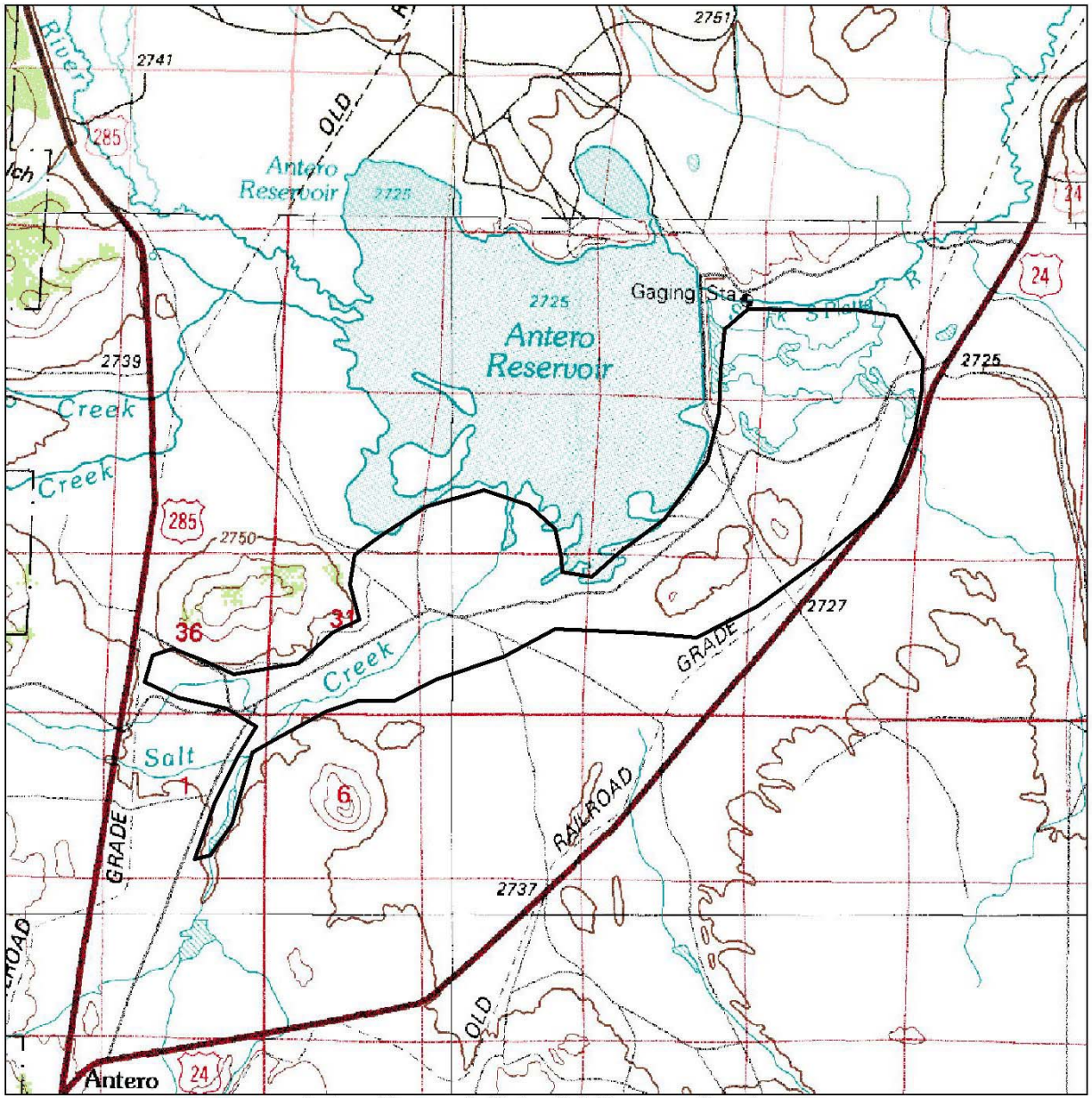
Trampling by cattle is also having a detrimental impact on the elements in the moist alkaline flats.

Canada thistle (*Breea arvense*) was noted in low cover along the roads. Prompt efforts to control the spread of this non-native would benefit the elements of concern in this area.

A monitoring program designed to determine the impacts of various levels of recreation and cattle grazing would benefit the management of this important area.

Mountain plovers have been documented in the vicinity of this PCA. However, conservation efforts for this species would be better directed to other locations within South Park because the land use practices that benefit mountain plovers run contrary to practices that are beneficial to the wetland habitats. Mountain plovers will not use wetlands, rather they prefer dry barren uplands that are maintained by some disturbance process like grazing by cattle or bison, or burning. These disturbance processes can be detrimental to wetland habitats. Please see South Park PCA for additional information about mountain plover.

Photograph taken at Antero Reservoir PCA



Antero Reservoir Potential Conservation Area

The Colorado Natural Heritage Program

Colorado State University
254 General Services Bldg
Fort Collins, CO 80523

Map Date: 13 March 2001
GIS Dept: ael

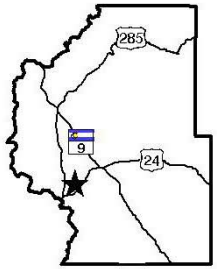
PCA Boundary

30 x 60 Minute Quadrangle:

Pikes Peak, 39105-E1

Digital Raster Graphics (DRGs) produced by the U.S. Geological Survey, 1996

Location in Park County



0.7 0 0.7 Miles

Projection UTM, Zone 13, NAD27

SOUTH FORK OF SOUTH PLATTE RIVER
POTENTIAL CONSERVATION AREA

Biodiversity Rank: B2
Protection Urgency Rank: P1
Management Urgency Rank: M2

Location: Park County. This PCA is located adjacent to Weston Pass Road 22, approximately 10 miles south of Fairplay.

USGS 30 x 60 Minute Quadrangles: Leadville, Bailey
Legal Description: T11S, R77W, sections18-23; T11S, R78W, sections 13, 22-28, 33, 34, 35; and T12S, R78W, sections 3, 4, 10.

General Description: This PCA is located along the south fork of the South Platte and its tributaries, Rough and Tumbling Creek, Willow Creek, Lynch Creek, and Twelvemile Creek. The western portion of the site is dominated by montane coniferous riparian forests. The main portion of the South Fork is dominated by willow communities and extreme rich fens along the southern edge of Black Mountain. All of the elements of concern in this PCA are associated with the fen and riparian habitats except for intermountain bitterweed (*Picradenia helenioides*) which is found scattered in a mesic meadow along Lynch Creek.

This PCA includes approximately 2233 acres with an elevation range from about 9000 to 10,700 feet.

Biodiversity Rank Justification: This PCA supports a good (B ranked) occurrence of a critically imperiled plant community (G1?). It also supports several good (B ranked) occurrences of imperiled (G2) to vulnerable (G3) plant occurrences.

Element occurrences at the South Fork at South Platte River PCA.

Elements	Common name	Global rank	State rank	Federal status	State status	Federal sensitive	EO* rank	Last observed
Plant communities								
Abies lasiocarpa-Picea engelmannii/Salix drummondiana	montane riparian forest	G5	S4				A	1996-08-07
Carex simulata	wet meadow	G4	S3				B	2000-09-09
Kobresia myosuroides-Thalictrum alpinum	**extreme rich fens**	**G1?**	**S1**				**B**	**1999-09-01**
Kobresia myosuroides-Thalictrum alpinum	extreme rich fens	G1?	S1				C	2000-09-09

Salix monticola/mesic forb	montane riparian willow carr	G3	S3				A	1996-07-19
plants								
Carex livida	Livid sedge	G5	S1			FS/BLM	C	1999-09-01
Carex scirpoidea	Canadian single-spike sedge	G5	S2			BLM	B	1999-09-01
Eriophorum gracile	Slender cottongrass	G5	S2			BLM	B	1999-09-01
Packera pauciflora	Few-flowered ragwort	G4G5	S1S2			BLM		1990-08-15
Packera pauciflora	Few-flowered ragwort	G4G5	S1S2			BLM	D	2000-09-09
Picradenia helenioides	Intermountain bitterweed	G3G4Q	S1				C	2000-08-15
Ptilagrostis porteri	Porter feathergrass	G2	S2			FS/BLM	E	1990-08-15
Ptilagrostis porteri	Porter feathergrass	G2	S2			FS/BLM	D	2000-09-09
Salix candida	Hoary or silver willow	G5	S2			BLM	B	2000-09-09
Salix myrtillifolia	Low blueberry willow	G5	S1			FS/BLM	B	2000-09-09
Sisyrinchium pallidum	Pale blue-eyed grass	G2G3	S2			BLM		1990-08-14
Sisyrinchium pallidum	Pale blue-eyed grass	G2G3	S2			BLM		1990-08-15
Sisyrinchium pallidum	Pale blue-eyed grass	G2G3	S2			BLM	C	2000-09-09
Trichophorum pumilum	Little bulrush	G5	S2			FS/BLM	C	1999-09-01

*Element occurrence

Boundary Justification: This boundary was developed to primarily address the extreme rich fens and riparian corridor. The boundary includes the major tributaries of the South Fork of the South Platte. The eastern boundary is defined by Hwy 285, the southern boundary extends to the Weston Pass Road. The boundary is drawn to incorporate an area where natural processes (such as groundwater recharge, species reproduction) function in a manner that maintains viable populations of the elements associated with the fen. However, all hydrological processes necessary to the elements are not fully contained in the boundary. Upstream activities that alter hydrology or sediment loads could detrimentally affect the elements.

Protection Comments: The majority of the PCA is privately owned; some National Forest and BLM lands are also included. The pressure to sell to developers is high. Several owners are interested in conservation easements. Conservation easements would ensure that this PCA and the elements of concern would be protected.

The desirability of the South Fork Valley is very high for residential development. As a result, construction is booming in subdivisions adjacent to the four cattle ranches that comprise most of this PCA (pers. comm. Gary Nichols 2001). If the integrity of fen and riparian resources are to be maintained, it is critical that conservation measures be employed as soon as possible.

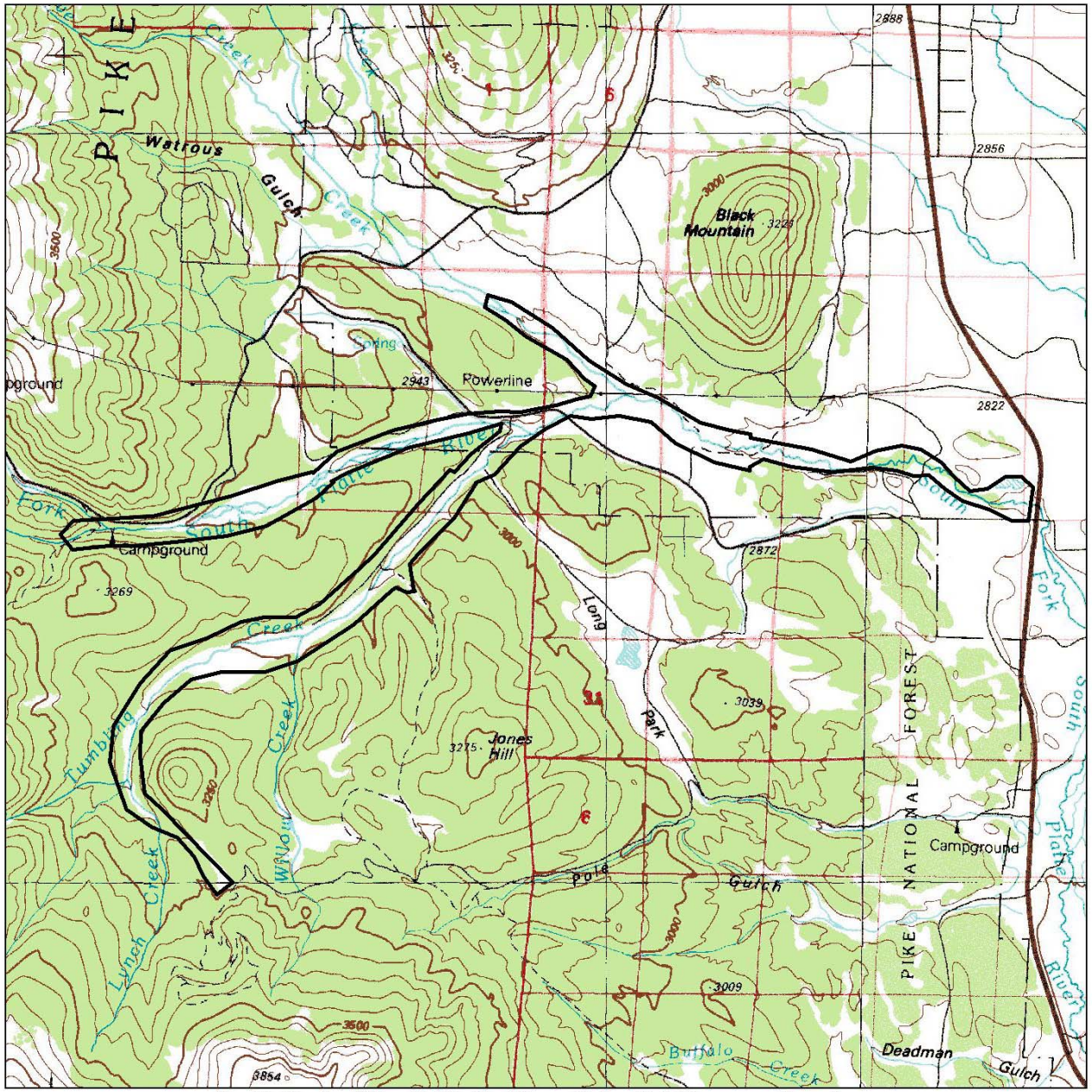
Management Comments: Grazing occurs in the adjacent wet meadows and does impact the rare elements moderately to heavily. Recreation uses such as car camping, hiking, and off-road vehicle use have the potential to impact the elements of concern on public lands. Road

improvements over Weston Pass could also impact the condition of the elements. Any hydrological alterations could impact the fens and riparian communities.

Low cover of dandelion (*Taraxacum officinale*) was noted as occuring in the upslope understory areas during site visit in 1996.

Mountain plovers have been documented in the vicinity of this PCA. However, conservation efforts for this species would be better directed to other locations within South Park because the land use practices that benefit mountain plovers run contrary to practices that are beneficial to the wetland habitats. Mountain plovers will not use wetlands, rather they prefer dry barren uplands that are maintained by some disturbance process like grazing by cattle or bison, or burning. These disturbance processes can be detrimental to fen habitats. Please see South Park PCA for additional information about mountain plover.

Photograph taken at South Fork of South Platte River PCA



South Fork of South Platte River Potential Conservation Area

The Colorado Natural Heritage Program

Colorado State University
254 General Services Bldg
Fort Collins, CO 80523

Map Date: 14 March 2001
GIS Dept: dcb

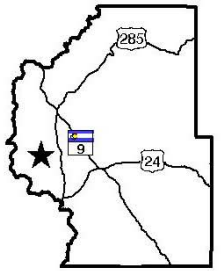
PCA Boundary

30 x 60 Minute Quadrangles:

Leadville, 39106-A1
Bailey, 39105-A1

Digital Raster Graphics (DRGs) produced by the U.S. Geological Survey, 1996

Location in Park County



0.9 0 0.9 Miles

Projection UTM, Zone 13, NAD27

FREMONT'S FEN
POTENTIAL CONSERVATION AREA

Biodiversity Rank: B2
Protection Urgency Rank: P2
Management Urgency Rank: M3

Location: Park County. This PCA is located at the north end of South Park, just east of Fremont Knoll and about 1 mile west of Michigan Hill (about 3 miles north of the town of Como.)

USGS 7.5 Minute Quadrangles: Milligan Lakes, Como.
Legal Description: T8S, R76W, sections 10,11,13,14, and 15.

General Description: The core of this PCA is an area nearly one mile long and about 1/5th of a mile wide containing large hummocks dominated by the *Kobresia myosuroides–Thalictrum alpinum* plant association. Porter feathergrass (*Ptilagrostis porteri)* occurs sparsely on the eastern end of this community, but toward the west it dominates many hummocks. The western edge of the intact hummock expanse is wetter than the rest and provides habitat for little bulrush (*Trichophorum pumilum)* and other extreme rich fen plant species.

The elements occur on the south side of what was formerly (before peat mining took place) a very large peatland. It is likely that many other extreme rich fen elements (e.g., silver willow-*Salix candida*) were once present in abundance. Extant elements are up-gradient of the mined area and it appears that they were not adversely affected by the mining.

This PCA includes approximately 983 acres with an elevation range from about 9500 to 9800 feet.

Biodiversity Rank Justification: This PCA contains a good (B-ranked) occurrence of a plant community which is globally critically imperiled (G1?). Seven significant elements occur at this site: 6 plant species and 1 community. Two of the plant species (*Ptilagrostis porteri* and *Sisyrinchium pallidum*) are considered to be globally imperiled. D. Cooper believes this is the largest occurrence of *Ptilagrostis porteri* (pers. comm. to J. Sanderson), and the results of J. Sanderson's 1995 field survey of South Park support this statement. This PCA also contains the largest and best occurrence of the *Kobresia myosuroides-Thalictrum alpinum* extreme rich fen plant association. South Park may be the only location of this community; and even in South Park, it is well-developed in only a few sites.

Element occurrences documented at Fremont's Fen PCA.

Element	Common name	Global rank	State rank	Federal status	State status	Federal sensitive	EO* rank	Last observed
Plant communities								
Kobresia myosuroides-Thalictrum alpinum	**extreme rich fens**	**G1?**	**S1**				**B**	**1995-08-24**
Plants								
Carex scirpoidea	Canadian single-spike sedge	G5	S2			BLM	C	1995-08-24
Packera pauciflora	Few-flowered ragwort	G4G5	S1S2			BLM	C	1995-08-24
Primula egaliksensis	Greenland primrose	G4	S2			FS/BLM	C	1995-08-24
Ptilagrostis porteri	Porter feathergrass	G2	S2			FS/BLM	B	1995-08-24
Sisyrinchium pallidum	Pale blue-eyed grass	G2G3	S2			BLM	C	1995-08-24
Trichophorum pumilum	Little bulrush	G5	S2			FS/BLM	C	1995-08-24

*EO=Element occurrence

Boundary Justification: The boundary drawn includes the entire extant and former peatland, encompassing the area of groundwater discharge that creates and supports the fen. The PCA boundary includes the mined area for two reasons. First, some activities in the mined area, such as creation of ponds, could affect the elements to the south. Second, the mined area may have restoration potential, perhaps allowing for recolonization of the area by the existing elements. The boundary also includes a buffer to prevent direct impacts and to minimize indirect impacts from areas adjacent to the wetlands.

Protection Comments: Ownership of the land within the PCA boundaries is shared by private individuals and the Colorado Division of Wildlife. If any of the landowners manipulate the hydrology of the area it could irreversibly and deleteriously affect the elements present. The PCA does fall within the maximum drawdown area of the South Park Conjunctive Use Project as modeled by Jehn Water Consultants, Inc. and Leanord Rice Consulting Water Engineers, Inc. (1998). Since any decrease in water could adversely effect the elements here; the South Park Conjunctive Use Project could detrimentally effect the elements at this PCA. About 80% of the Fremont Fen peatland has been destroyed by peat mining. The current moratorium on peat mining in Park County prevents mining of the remaining peatlands at this time.

Conversations between Park County and private landowners indicate that one or more of the landowners may be interest in conserving the fens if they could be compensated accordingly (pers. comm. Gary Nichols 2001.)

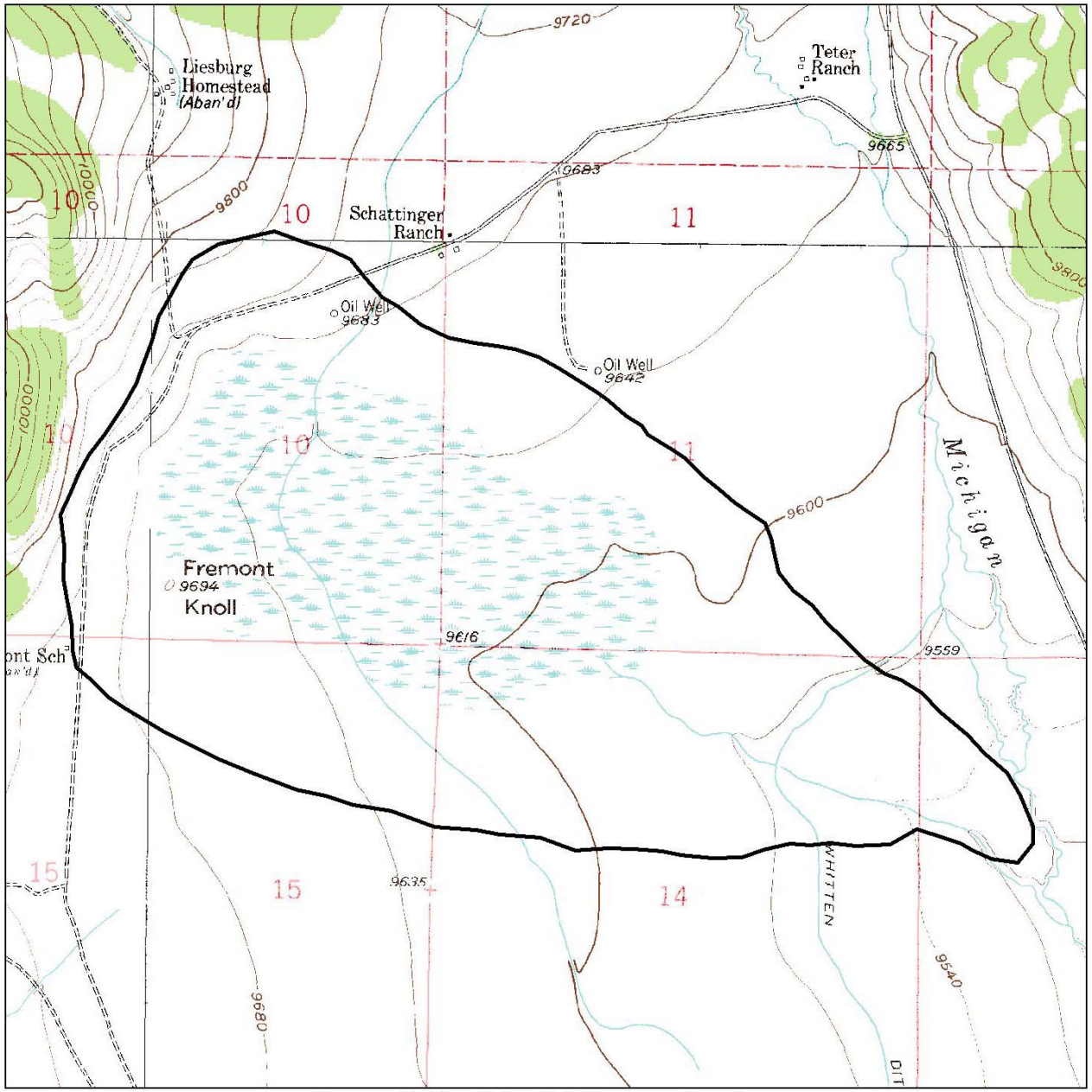
Management Comments: The most immediate threat to this PCA appears to be the potential for water manipulation. Ditching or diversion of water in the mined area may adversely affect the elements; these activities in or above the hummock area will likely have a deleterious effect on both the *Kobresia myosuroides–Thalictrum alpinum* plant association and the rare plant species,

including *Ptilagrostis porteri*. This system is predominantly groundwater driven, and groundwater pumping above or near these wetlands will likely negatively affect the extreme rich fen elements.

Management of the area could include planting the mined area with native fen species. Although restoration of the peat layer will require thousands of years, the fen plants may reestablish fairly quickly. Since so much of Fremont fen has been mined for peat, it provides an excellent setting for research on plant succession in extreme rich fens.

Parts of the Fremont Fen PCA are used for light cattle grazing, which does not appear to have a strongly adverse affect. Monitoring the fen for exotic plants is especially important because the disturbances caused by cattle grazing and historical mining provide conditions that are likely to be invaded by non-native plants.

Porter feathergrass (*Ptilagrostis porteri*)



Fremont's Fen Potential Conservation Area

The Colorado Natural Heritage Program

Colorado State University
254 General Services Bldg
Fort Collins, CO 80523

Map Date: 14 March 2001
GIS Dept: dcb

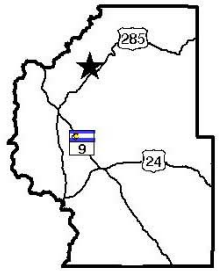
PCA Boundary

7.5 Minute Quadrangles:

Milligan Lakes, 39105-C7
Como, 39105-C8

Digital Raster Graphics (DRGs) produced by the U.S. Geological Survey, 1996

Location in Park County



0.2 0 0.2 Miles

Projection UTM, Zone 13, NAD27

SACRAMENTO CREEK
POTENTIAL CONSERVATION AREA

Biodiversity Rank: B2
Protection Urgency Rank: P2
Management Urgency Rank: M3

Location: This PCA is located in western Park County and is roughly five miles west of Fairplay. The PCA includes parts of Sacramento Creek and Little Sacramento Gulch.

USGS 30 x 60 Minute Quadrangle: Leadville
Legal Description: T9S, R78W, sections 19, 20, 21, 27, 28, 29, 32, 33, 34, 35, 36; and T9S, 77W, sections 31.

General Description: This PCA supports portions of two spectacular drainages on the east slope of the Mosquito Range. The wide willow carrs in the valley bottoms are in good to excellent condition, and support occurrences of the globally imperiled Porter feathergrass (*Ptilagrostis porteri)*, which is known only from a very narrow range in the Southern Rocky Mountains in the vicinity of South Park. The uplands of the PCA are dominated by high quality Engelmann spruce (*Picea engelmannii*) forests with small patches of native grasslands.

This PCA includes approximately 2167 acres with an elevation range from about 10,200-12,000 feet.

Biodiversity Rank Justification: This PCA supports an excellent (A-ranked) occurrence of a globally imperiled (G2) plant species.

Element occurrences at the Sacramento Creek PCA.

Elements	Common name	Global rank	State rank	Federal status	State status	Federal sensitive	EO* rank	Last observed
Plant communities								
Salix planifolia/Caltha leptosepala	subalpine riparian willow carr	G4	S4					1986-99-99
Salix planifolia/Carex aquatilis	subalpine riparian willow carr	G5	S4				A	1986-07-16
Plants								
Ptilagrostis porteri	Porter feathergrass	G2	S2			FS/BLM	B	2000-09-21
Ptilagrostis porteri	**Porter feathergrass**	**G2**	**S2**			**FS/BLM**	**A**	**2000-09-07**
Ptilagrostis porteri	Porter feathergrass	G2	S2			FS/BLM	C	1990-09-15
Trichophorum pumilum	Little bulrush	G5	S2			FS/BLM		1989-06-15

*Element occurrence

Boundary Justification: The PCA boundary includes the occurrences and adjacent potential habitat to allow the plants and plant communities to move through the drainages over time. Some upstream habitat is included to provide buffers in the hydrological processes. The long-term viability of this PCA will also depend on influences outside of this boundary, including hydrological processes and water quality.

Protection Comments: This PCA includes a mix of privately and publicly owned lands. Most of the public lands are managed by the South Park Ranger District of the Pike-San Isabel National Forest; and a small area is managed by the BLM. Special designation on public lands and conservation easements on private lands would likely benefit the long-term protection of this area.

Management Comments: Current management in Sacramento Gulch appears to be adequate. Occurrences in Sacramento Creek may need attention as there is considerable residential development occuring in this drainage, right along Sacramento Creek and in the adjacent uplands.

Hydrological processes originating outside of the planning boundary, including water quality, quantity, timing and flow must be managed to maintain site viability.

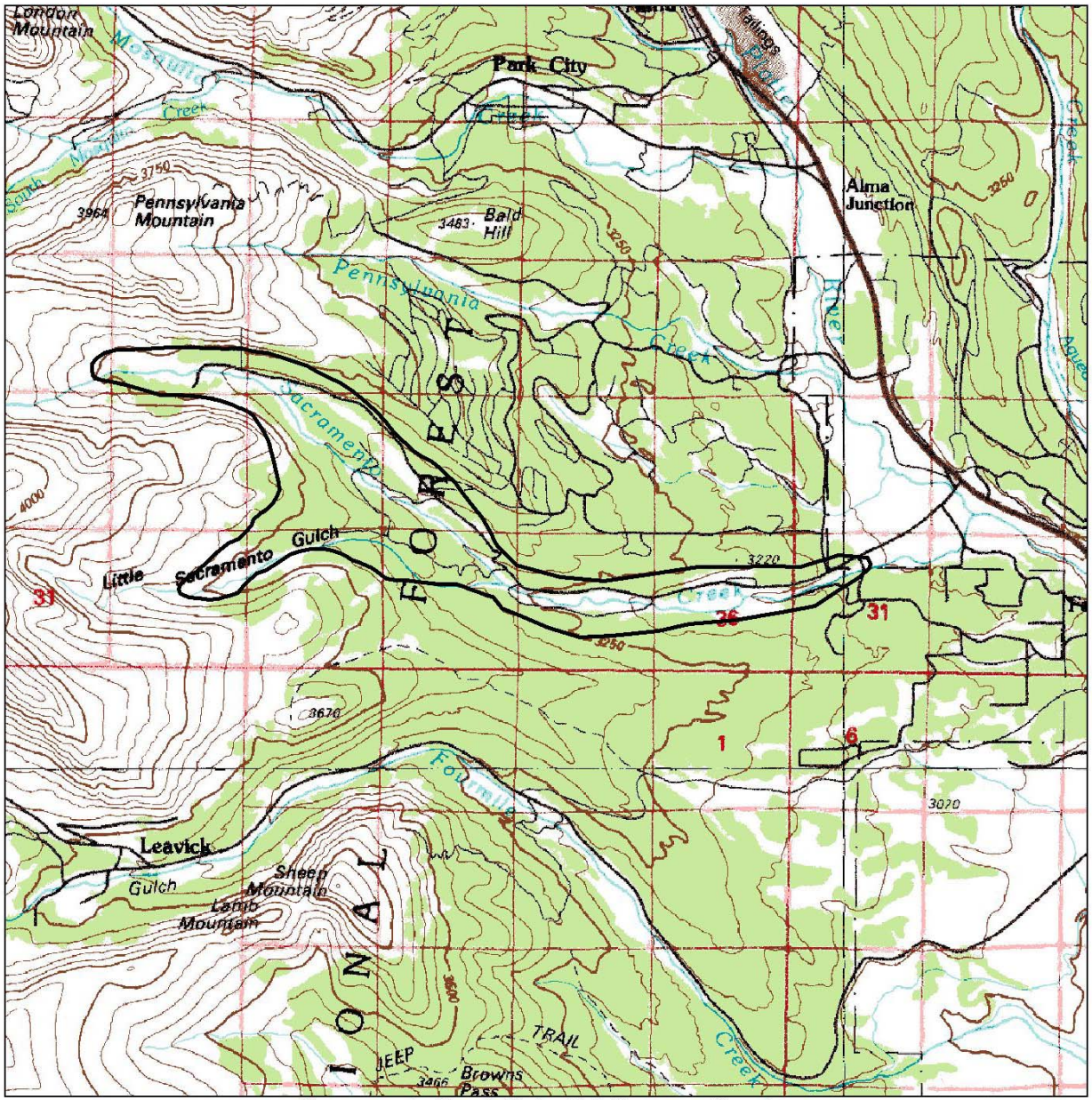
A few individuals of dandelion (*Taraxacum officinale*) were found in one of the occurrences of the Porter feathergrass. Early detection and control of non-native plants will benefit the management of this important area.

Additional inventory for Porter feathergrass, especially on the private lands in Sacramento Creek would benefit our understanding of the distribution and abundance of this species.

A monitoring program for the Porter feathergrass would help ensure that a decrease in size or condition of the occurrences would be detected early so that management could be adjusted.

Photograph taken at Sacramento Creek PCA

Porter feathergrass (*Ptilagrostis porteri*) in its habitat



Sacramento Creek Potential Conservation Area

The Colorado Natural Heritage Program

Colorado State University
254 General Services Bldg
Fort Collins, CO 80523

Map Date: 15 March 2001
GIS Dept: ael

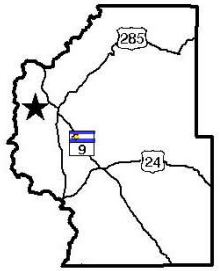
PCA Boundary

30 x 60 Minute Quadrangle:

Leadville, 39106-A1

Digital Raster Graphics (DRGs) produced by the U.S. Geological Survey, 1996

Location in Park County



Disclaimer

The data are provided on an as-is, as-available basis without warranties of any kind, expressed or implied, including (but not limited to) warranties of merchantability, fitness for a particular purpose, and noninfringement. CNHP, Colorado State University and the State of Colorado further expressly disclaim any warranty that the data are error-free or current as of the date supplied.

0.8 0 0.8 Miles

Projection UTM, Zone 13, NAD27

NORTH TARRYALL CREEK AT COMO
POTENTIAL CONSERVATION AREA

Biodiversity Rank: B2
Protection Urgency Rank: P2
Management Urgency Rank: M3

Location: Park County. Located adjacent to Tarryall Creek. Highway 285 bisects the PCA.

USGS 30 x 60 Minute Quadrangle: Bailey
Legal Description: T8S, R76W 22-27, 36; T8S, R75W, sections 29, 30, 31, 32; and T9S, R75W, sections 4, 5, 6, 8, 9.

General Description: This PCA includes the riparian and wetland habitat adjacent to Tarryall Creek and Packer Gulch. Several playa lakes as well as Milligan Lakes are included in the site. The PCA also includes areas that are irrigated and grazed by cattle. Highway 285 forms the northwest boundary.

This PCA includes about 3389 acres with an elevation range from about 9300 to 9700 feet.

Biodiversity Rank Justification: This PCA includes a good (B-ranked) occurrence of a globally imperiled (G1?) plant community. A fair occurrence of a state rare plant species, Greenland primrose (*Primula egaliksensis*) is also found at this location. This species is common in Canada and occurs in disjunct populations in Park County, Colorado and one location in Wyoming.

Element occurrences at the North Tarryall Creek at Como PCA.

Elements	Common name	Global rank	State rank	Federal status	State status	Federal sensitive	EO* rank	Last observed
Plant communities								
Kobresia myosuroides-Thalictrum alpinum	**extreme rich fens**	**G1?**	**S1**				**B**	**1990-08-15**
Kobresia myosuroides-Thalictrum alpinum	extreme rich fens	G1?	S1				C	1990-08-21
plants								
Primula egaliksensis	Greenland primrose	G4	S2			FS/BLM	C	1985-06-21
Ptilagrostis porteri	Porter feathergrass	G2	S2			FS/BLM	E	1990-08-15

*Element occurrence

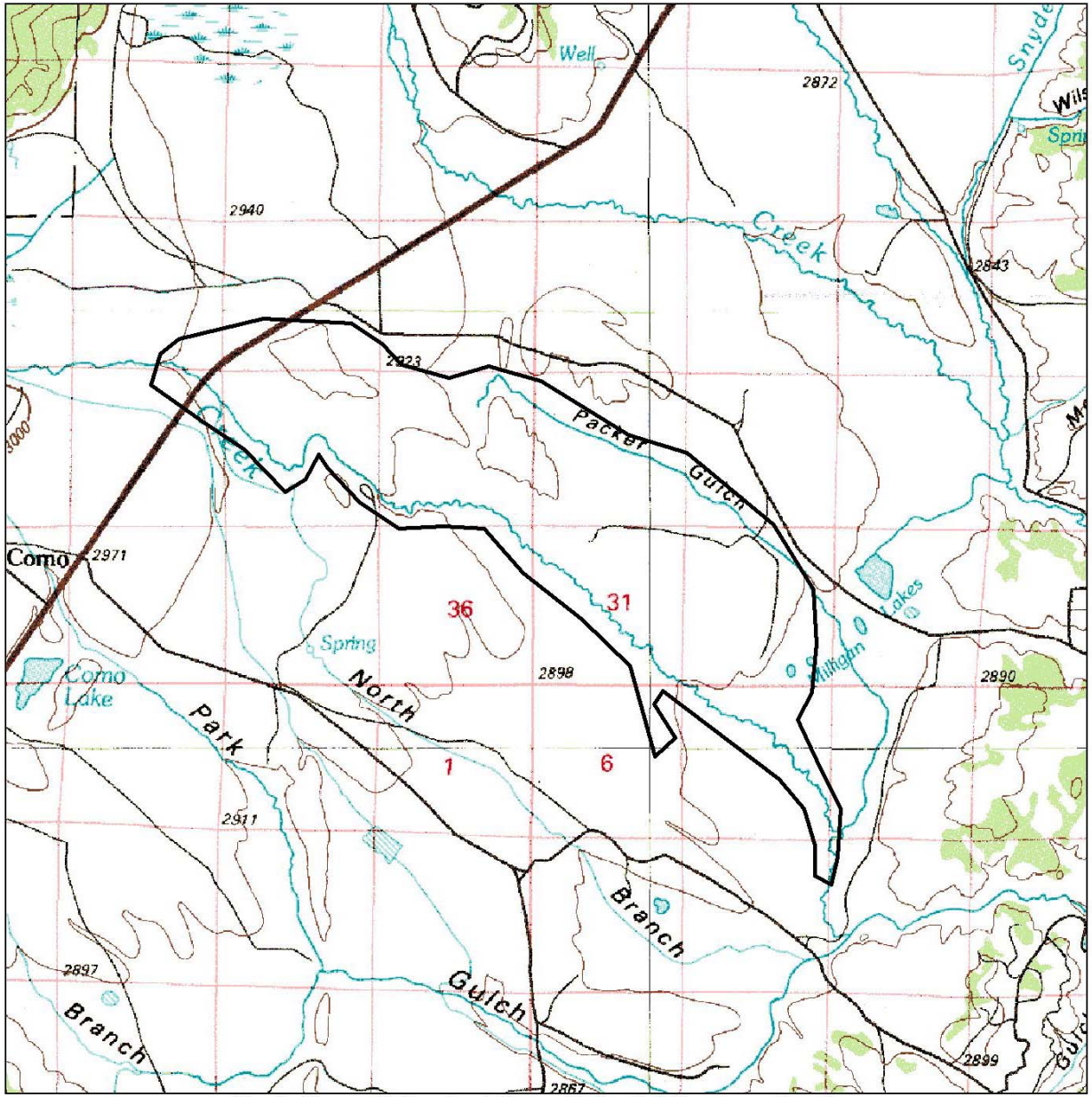
Boundary Justification: This PCA includes Tarryall Creek, Packer Gulch and the playa lakes between the two drainages. The boundary is drawn to incorporate an area where natural processes (such as groundwater recharge, species reproduction) function in a manner that maintains viable populations of the elements of concern. However, all hydrological processes necessary to the elements are not fully contained in the boundary. Upstream activities that alter hydrology or sediment loads could detrimentally affect the elements.

Protection Comments: This PCA includes private, state, and BLM lands. No formal protection exists for this PCA. A conservation easement may be a useful tool to ensure the long-term protection of the PCA. The current moratorium on peat mining in Park County will protect the fen habitat at this time. The PCA falls within the maximum drawdown area of the South Park Conjunctive Use Project as modeled by Jehn Water Consultants, Inc. and Leanord Rice Consulting Water Engineers, Inc. (1998). Any decrease in water could adversely affect the elements; therefore, the South Park Conjunctive Use Project could detrimentally affect the elements at this PCA.

Management Comments: Any changes in local water management or upstream water use could impact the integrity of the elements.

A monitoring program designed to detect changes in the overall quality and condition of the fen habitat would benefit management of this site. Early detection and control of non-native plants would help maintain the site quality.

Mountain plovers have been documented in the vicinity of this PCA. However, conservation efforts for this species would be better directed to other locations within South Park because the land use practices that benefit mountain plovers run contrary to practices that are beneficial to the fen habitats. Mountain plovers will not use wet habitats like fens and other wetlands, rather they prefer dry barren uplands that are maintained by some disturbance process like grazing by cattle or bison, or burning. These disturbance processes can be detrimental to fen habitats. Please see South Park PCA for additional information about mountain plover.



North Tarryall Creek at Como Potential Conservation Area

The Colorado Natural Heritage Program

Colorado State University
254 General Services Bldg
Fort Collins, CO 80523

Map Date: 15 March 2001
GIS Dept: ael

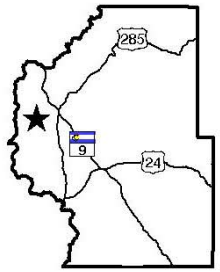
PCA Boundary

30 x 60 Minute Quadrangle:

Bailey, 39105-A1

Digital Raster Graphics (DRGs) produced by the U.S. Geological Survey, 1996

Location in Park County



0.7 0 0.7 Miles

Projection UTM, Zone 13, NAD27

BLACK MOUNTAIN AT ASPEN PARK
POTENTIAL CONSERVATION AREA

Biodiversity Rank: B2
Protection Urgency Rank: P3
Management Urgency Rank: M2

Location: Park and Jefferson counties. Northeast Park County. Area to the south of the summit of Black Mountain, including the headwaters of Black Mountain Creek.

Legal Description: USGS 7.5 minute Meridian Hill quadrangle. T6S R71W sections 7, 18 and T6S R72W sections 12, 13.

General Description: The Black Mountain PCA is contained mostly within a remote part of Staunton State Park. Within the PCA are riparian areas associated with Black Mountain Creek, quaking aspen (*Populus tremuloides*) meadows, montane lodgepole pine (*Pinus contorta*) and Douglas fir (*Pseudotsuga menziesii*) forests, subalpine forests of limber pine (*Pinus flexilis*) and Engelmann spruce (*Picea engelmannii*), rock outcrop communities, and a waterfall/granitic seep community. Near the headwaters of Black Mountain Creek are also limited areas of an interesting shrubland consisting of waxflower (*Jamesia americana*) and oceanspray (*Holodiscus dumosus*). Throughout the site the soils are gravelly and derived from the granitic parent material that underlies much of this area. Numerous cliffs and outcrops of granite flank the slopes of Black Mountain. A total of approximately 389 acres are included within the Black Mountain at Aspen Park PCA, within an elevation range of about 9100 to 10,600 feet.

Near the northernmost extent of Staunton State Park and the Black Mountain Creek headwaters is an occurrence of a globally rare plant that is endemic to Colorado, the Weber monkeyflower (*Mimulus gemmiparus*). About 100 individuals were found in 1999 under a seep at the base of a 200 foot high granite cliff. The entire population occupies an area of approximately 1 square meter, and is extremely vulnerable to trampling or alteration of the site. Granitic seeps are evidently extremely rare in the park. Six granitic seeps have been found in the Black Mountain PCA thus far. These were searched in 1992 during a previous biological inventory by CNHP (Pague *et al.* 1992), and three were relocated in 1999 and searched again for Weber monkeyflower (*Mimulus gemmiparus*). However, only one seep has been found to support a population of Weber monkeyflower. Unfortunately, this seep is quite scenic and would naturally attract many visitors if a trail were constructed in this area. The ledge on which the Weber monkeyflower resides is readily accessible from the creek.

The Weber monkeyflower is a globally rare Colorado endemic, with a limited distribution in the Front Range and Tarryall Mountains (CNHP 1999). It has only been found in Larimer, Jefferson, and Grand counties. It occurs in granite seeps, outcrops, and slopes, and on wet banks and rocks between 8400 and 10,500 feet in elevation (Spackman *et al.* 1997). In addition to being very rare, it is a very unusual plant because it is the only species of *Mimulus* that can reproduce

vegetatively. It accomplishes this with modified leaf petioles that form pockets containing dormant embryonic shoots (CNHP 1999). It seldom produces flowers but when it does they are seen in mid-July. The lack of flowers in this species makes it extremely difficult to find, and the potential for inadvertently trampling it is high.

Three large sub-populations of boykinia (*Telesonix jamesii*) were found in this PCA on the numerous cliffs and outcrops of granite flanking the south slopes of Black Mountain. These sub-populations range in elevation from 9800 to 10,680 feet, with occurrences in the state park, Pike National Forest, and on private land to the east of the park. These occurrences contain collectively approximately 3000 individuals. They were found in cracks on cliffs, boulder fields, and granitic gravel. The occurrences are surrounded by subalpine forests of Engelmann spruce (*Picea engelmannii*), lodgepole pine (*Pinus contorta*), limber pine (*Pinus flexilis*), and patches of quaking aspen (*Populus tremuloides*). Mat-forming plant species such as spotted saxifrage (*Ciliaria austromontana*), alumroot (*Heuchera bracteata*), twisted fruit whitlowwort (*Draba streptocarpa*), and chiming bells (*Mertensia lanceolata*), with boykinia, are the major components of the rock outcrop plant community. Boulder fields below and adjacent to cliffs also support boykinia, and shrublands of waxflower (*Jamesia americana*) and currant (*Ribes* sp.). Most cliffs within the PCA are south to southwest facing.

Biodiversity Rank Justification: This PCA contains a good (B-ranked) occurrence of Weber monkeyflower (*Mimulus gemmiparus*), a globally imperiled (G2) plant species narrowly endemic to Colorado. This species is documented from only eight locations in the world, all of them in Colorado.

The Black Mountain PCA also contains an excellent occurrence of boykinia (*Telesonix jamesii*), a plant species that is apparently secure on a global scale but rare in Colorado.

This PCA was selected as a likely habitat for the Mexican spotted owl (*Strix occidentalis lucida*). Though no occurrences were found within the park, this area represents good potential habitat for this species due to its relative seclusion and the availability of narrow rocky canyons.

Element Occurrences at the Black Mountain at Aspen Park PCA.

Element	Common name	Global Rank	State Rank	Federal Status	State Status	Federal Sensitive	EO* rank	Last observed
plants								
Mimulus gemmiparus	**Weber monkey-flower**	**G2**	**S2**			**FS**	**B**	**1999-07-13**
Telesonix jamesii	James' telesonix	G2G3	S2?				A	1999-07-13

*Element Occurrence

Boundary Justification: The boundary is drawn to include the extent of the occurrences of boykinia and Weber monkeyflower. Adjacent potential habitat is included where suitable rock outcrops and cliffs were noted. Because Weber monkeyflower could be extirpated by alterations

to the hydrological regime of Black Mountain, it is particularly important that no changes are made that would affect the source of water for the seep and waterfall that supports it. Management decisions within the upper Black Mountain Creek valley will affect both of the element occurrences within this PCA.

Protection Comments: Most of this PCA is on state land (Staunton State Park) or federal land (Pike National Forest). However, the northeastern portion lies on private land, and one occurrence of boykinia is located in this part of the PCA.

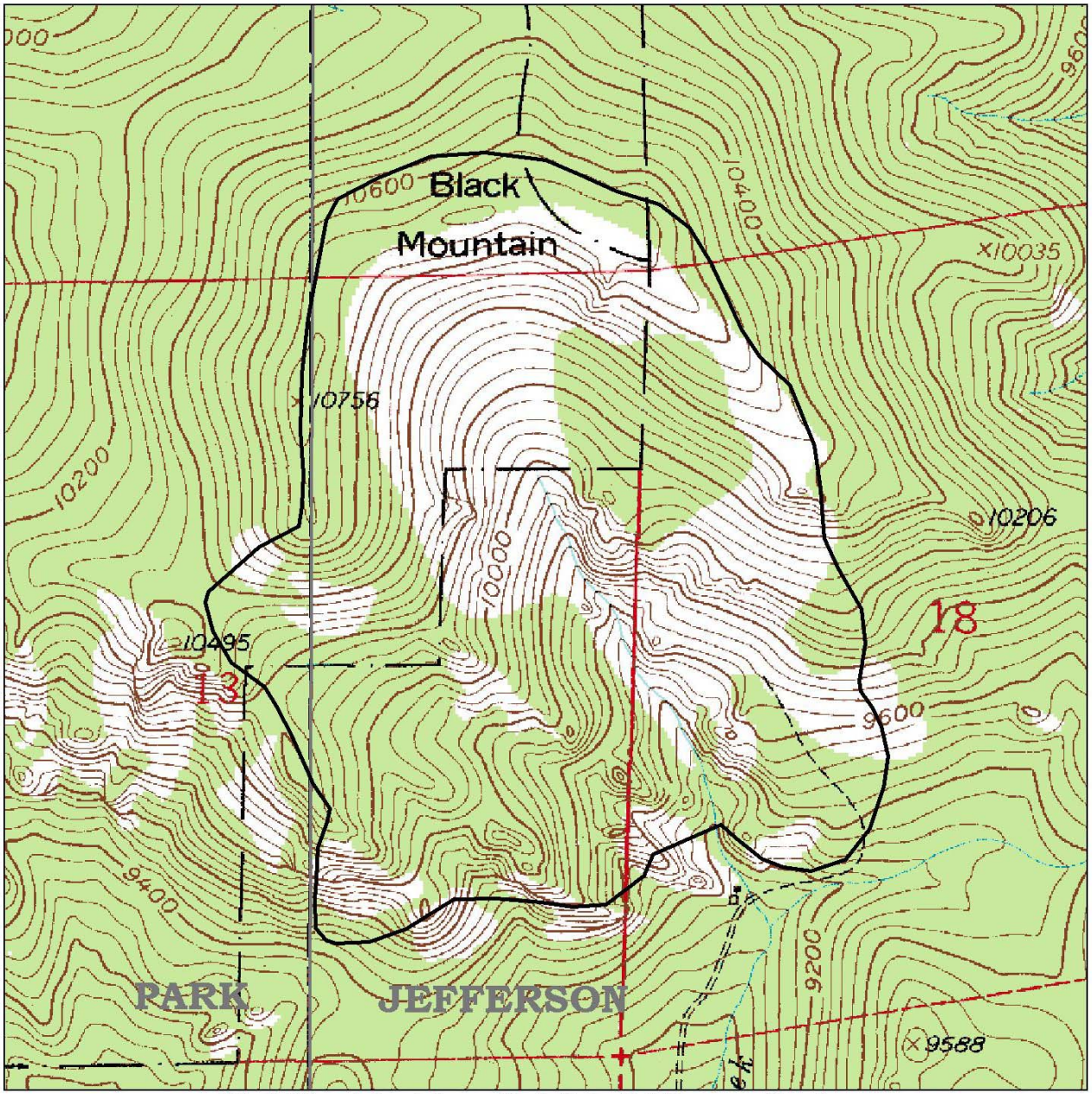
Management Comments: The fate of Weber monkeyflower in Staunton State Park depends largely on future management decisions. In order to maintain this small and vulnerable population, serious consideration must be given towards designing an effective protection strategy before visitation rates increase in this part of the park. If visiting hikers are ushered into the upper valley of Black Mountain Creek by a trail, many will certainly head straight to this waterfall, which is extremely inviting after a moderately difficult hike. It is thus suggested that visitors be discouraged from entering the upper reaches of this valley. This could be accomplished by not building a trail to it. However, with high visitation rates to the park, some people will inevitably forge their own path even if there is no trail. The area below the waterfall could be signed to ask hikers not to walk under it. A yearly monitoring program for the occurrence of Weber monkeyflower would detect changes to the overall quality and condition of the occurrence.

The populations of boykinia in this PCA are in little danger, since most of them are relatively inaccessible on cliffs and rock outcrops. They are not threatened by any exotic species. Rock climbing poses the greatest potential danger to this element. Climbing should be closely managed in this area, and no climbing routes should be established that would impact boykinia populations.

Habitat of Weber monkeyflower (*Mimulus gemmiparus*) in the Black Mountain at Aspen Park PCA

Weber monkeyflower (*Mimulus gemmiparus*)

Photograph taken at Black Mountain at Aspen Park PCA



Black Mountain at Aspen Park Potential Conservation Area

The Colorado Natural Heritage Program

Colorado State University
254 General Services Bldg
Fort Collins, CO 80523

Map Date: 14 March 2001
GIS Dept: dcb

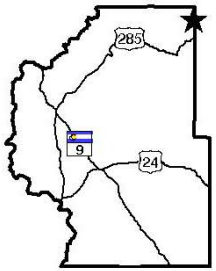
PCA Boundary

7.5 Minute Quadrangle:

Meridian Hill, 39105-E4

Digital Raster Graphics (DRGs) produced by the U.S. Geological Survey, 1996

Location in Park County



Disclaimer

The data are provided on an as-is, as-available basis without warranties of any kind, expressed or implied, including (but not limited to) warranties of merchantability, fitness for a particular purpose, and noninfringement. CNHP, Colorado State University and the State of Colorado further expressly disclaim any warranty that the data are error-free or current as of the date supplied.

0.1 0 0.1 Miles

Projection UTM, Zone 13, NAD27

LOST PARK
POTENTIAL CONSERVATION AREA

Biodiversity Rank: B2
Protection Urgency Rank: P3
Management Urgency Rank: M2

Location: Park County. This PCA is located at the Lost Park Campground and includes portions of North Fork Lost Creek and South Fork Lost Creek.

USGS 7.5 Minute Quadrangles: Topaz Mountain, Windy Peak.
Legal Description: T9S, R73W, sections 1, 2, 11, and 12.

General Description: This PCA supports a wetland riparian complex at the juncture of the north and south forks of Wigwam Creek. Soils are peaty and water logged, which provides habitat for the imperiled plant species, Porter feathergrass (*Ptilagrostis porteri)*. This wetland grass species is known only from Colorado, occuring within a very limited range in the mountains and fens around South Park. The adjacent upland communities are dominated by lodgepole pine (*Pinus contorta*) and Engelmann spruce (*Picea engelmannii*). A Forest Service access road bisects the area, providing access to a primitive campground.

This PCA includes approximately 228 acres with an elevation range from about 10,000 to 10,300 feet.

Biodiversity Rank Justification:
This site supports an excellent (A-ranked) occurrence of a globally imperiled (G2) plant species.

Element occurrences at the Lost Park PCA.

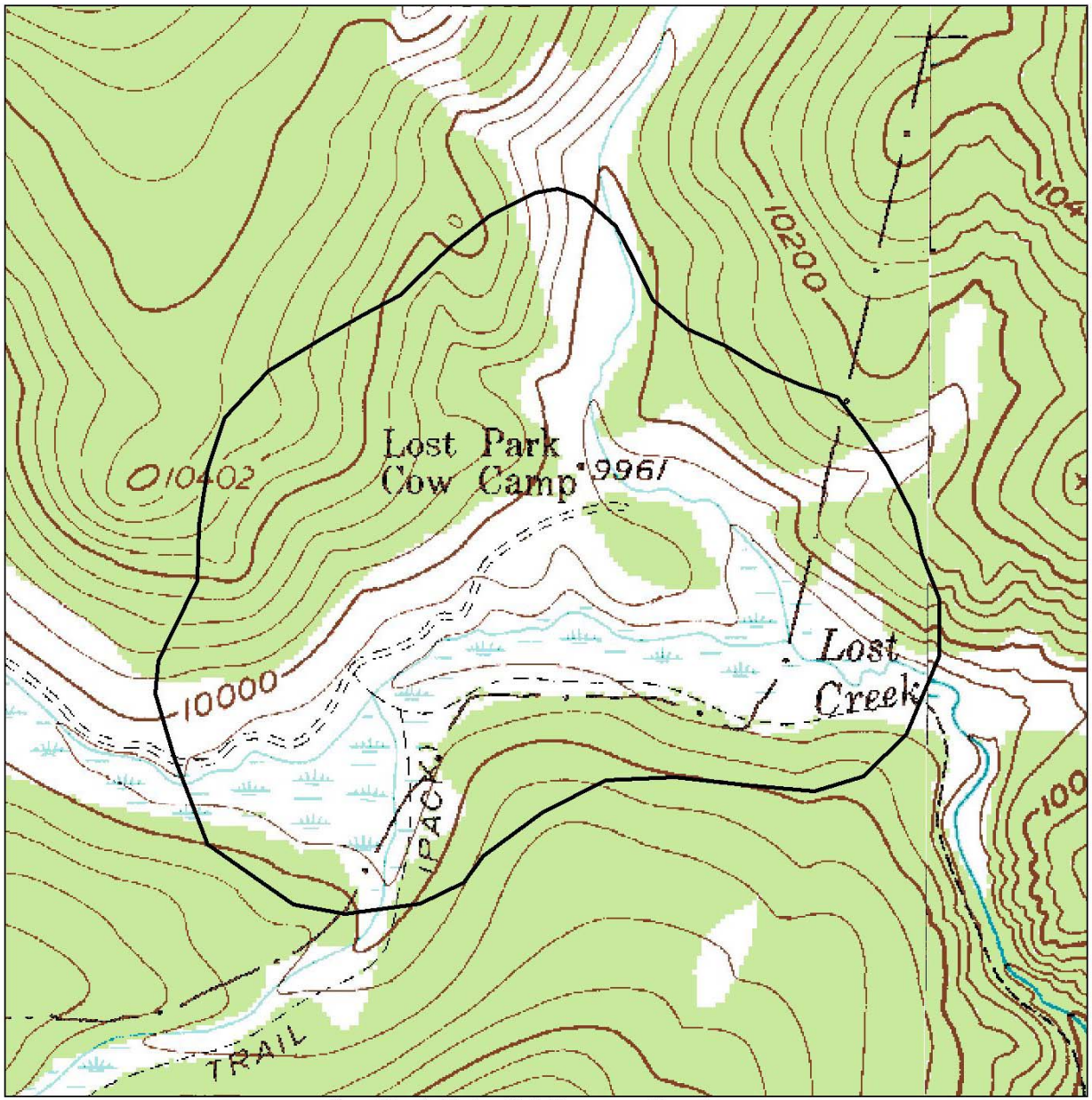
Element	Common name	Global rank	State rank	Federal status	State status	Federal sensitive	EO* rank	Last observed
plants								
Ptilagrostis porteri	**Porter feathergrass**	**G2**	**S2**			**FS/BLM**	**A**	**1998-09-22**

*Element occurrence

Boundary Justification: The boundary is drawn to incorporate an area where natural processes (such as groundwater recharge, species reproduction) function in a manner that maintains a viable population of Porter feathergrass. However, all hydrological processes are not fully contained in the boundary. Upstream activities that alter hydrology or sediment loads could detrimentally affect the elements.

Protection Comments: This PCA is predominantly managed by the South Park Ranger District of the Pike-San Isabel National Forest. Three acres are registered as a State Natural Area.

Management Comments: There is a campground and a trailhead in this area that present potential management concerns. This area receives fairly heavy recreational use including off-road vehicle use, horsepacking, backpacking, and hiking. Non-native plants such as dandelion (*Taraxacum officinale*), white clover (*Trifolium repens*), and timothy (*Phleum pratense*) were noted, mostly around the campground and roads. This area is grazed by cattle, and the impacts of this on the Porter feathergrass is not fully understood. Several researchers have noted that cattle do not appear to eat the feathergrass, but damage from trampling and habitat degradation is detrimental. This occurrence is being monitored by the USFS, and they are particularly interested in the effects of cattle grazing.



Lost Park Potential Conservation Area

The Colorado Natural Heritage Program

Colorado State University
254 General Services Bldg
Fort Collins, CO 80523

Map Date: 15 March 2001
GIS Dept: ael

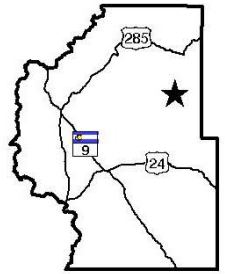
PCA Boundary

7.5 Minute Quadrangles:

Windy Peak, 39105-C4
Topaz Mountain, 39105-C5

Digital Raster Graphics (DRGs) produced by the U.S. Geological Survey, 1996

Location in Park County



0.1 0 0.1 Miles

Projection UTM, Zone 13, NAD27

BEAVER CREEK AT BEAVER RIDGE
POTENTIAL CONSERVATION AREA

Biodiversity Rank: B2
Protection Urgency Rank: P3
Management Urgency Rank: M3

Location: Park County. 3 miles north of Fairplay along USFS Road 413.

30 x 60 Minute Quadrangles: Denver West and Vail
Legal Description: T8S, R77W sections 19, 20, 29, 30, 31, 32, and T9S, R77W, sections 5, 6, 8, 9, 16, 17, 20.

General Description: This PCA is located in a glacially carved valley between Beaver Ridge and Mount Silverheels. The site consists of a meandering high elevation riparian corridor dominated by willows and sedges. Beaver are active along the Creek, creating oxbows and open water. Soils are peaty and water logged, which provides habitat for the imperiled plant species, Porter feathergrass (*Ptilagrostis porteri)*. This wetland grass species is known only from Colorado, occuring within a very limited range in the mountains and fens around South Park. The adjacent upland communities are characterized by lodgepole pine and Engelmann spruce (*Picea engelmannii*.)

This PCA includes approximately 516 acres, and has an elevation range from about10,400 to 12,000 feet.

Biodiversity Rank Justification:
This PCA supports two good (B-ranked) occurrences of a globally imperiled plant (G2), Porter feathergrass (*Ptilagrostis porteri*). The PCA also supports a good (B-ranked) occurrence of an imperiled (G2G3) subalpine riparian willow carr (*Salix brachycarpa/Carex aquatilis*) and a good (B-ranked) occurrence of a vulnerable (G3) montane riparian willow carr (*Salix monticola/Carex utriculata*.)

Element occurrences at the Beaver Creek at Beaver Ridge PCA.

Element	Common name	Global rank	State rank	Federal Status	State Status	Federal Sensitive	EO* rank	Last observed
Plant communities								
Salix brachycarpa/Carex aqualtils	subalpine riparian/wetland carr	G2G3	S2S3				B	2000-08-11
Salix monticola/Carex utriculata	montane riparian willow carr	G3	S3				B	2000-08-11

plants								
Ptilagrostis porteri	**Porter feathergrass**	**G2**	**S2**			**FS/BLM**	**B**	**2000-09-20**
Ptilagrostis porteri	**Porter feathergrass**	**G2**	**S2**			**FS/BLM**	**B**	**2000-09-18**

*Element occurrence

Boundary Justification: The PCA boundary is drawn to encompass the riparian corridor that contains the elements of concern. However, the boundary does not include the entire watershed that is important to the viability of the elements of concern.

Protection Comments: Most of this PCA is located on lands managed by the USFS, and there are private lands within and surrounding the site. There are several homes within the PCA, and more are projected for future construction (pers. comm. Gary Nichols 2001.)

There is a mining claim located within the PCA and the USFS will be doing an Environmental Analysis for the permit during the winter of 2000-2001 (pers. comm. Stephanie Howard). Special designation for this area would help to ensure protection of the Porter feathergrass and the riparian communities.

Management Comments: The Beaver Creek area receives heavy use in the summer for camping, hiking, fishing, and ORV recreation. Placer mining has occurred at various points along the creek and in the immediate vicinity of one of the occurrences of Porter feathergrass (*Ptilagrostis porteri)*. An unpaved road follows Beaver Creek through the extent of the PCA and could serve as a conduit for non-native plants.

A monitoring program designed to detect changes in the overall quality and condition of the significant plants and plant communities would benefit the management of this important area.

Photograph taken at Beaver Creek at Beaver Ridge PCA

FOURMILE CREEK AT PEART
POTENTIAL CONSERVATION AREA

Biodiversity Rank: B2
Protection Urgency Rank: P3
Management Urgency Rank: M3

Location: Park County. Drive south from Fairplay about 1 mile to Fourmile Creek Road (the road that eventually runs along the north side of Fourmile Creek). Park on the north edge of section 17, then walk south to the wetland. Alternatively, park on Route 285 where Fourmile Creek passes underneath and walk up Fourmile Creek to the site.

USGS 7.5 Minute Quadrangle: Fairplay West
Legal Description: T10S, R77W, sections 6, 7, 8, 16, 17, 18, and T10S, R78W, sections 1, 12.

General Description: Fourmile Creek emerges from a coniferous forest then spreads out into a large area of beaver ponds and willow stands. To the south of the creek is a large, seepy area where many of the extreme rich fen elements occur. The south side of the creek is also the location of the *Pentaphylloides floribunda-Salix brachycarpa/Kobresia myosuroides* community, which , in this particular location, is heavily dominated by shortfruit willow *(Salix brachycarpa).* Greenland primrose (*Primula egaliksensis)* is also quite common, as is Canadian single-spike sedge (*Carex scirpoidea)*. The fen community with its hummocks of *Kobresia simpliciuscula-Scirpus pumilus* is found in scattered areas to the north of Fourmile Creek, with heavy concentrations along a low-flow drainage.

The Fourmile Creek drainage provides an important wildlife migration corridor from the Mosquito Range to South Park (Carsey *et al.* 1999).

This PCA includes approximately 2008 acres with an elevation range from about 9800 to 10,500 feet.

Biodiversity Rank Justification: This PCA supports a good (B-ranked) occurrence of an extreme rich fen community that is globally imperiled (G1?). South Park may be the only location of this community; and even in South Park, it is well-developed in only a few sites. Several other state significant elements are also supported by this site.

Element occurrences at the Fourmile Creek at Peart PCA.

Element	Common name	Global rank	State rank	Federal Status	State Status	Federal Sensitive	EO* rank	Last observed
Plant communities								
Eleocharis quinqueflora-Triglochin spp.	alkaline spring wetland	GU	S2				B	1995-07-09
Kobresia myosuroides-Thalictrum alpinum	**extreme rich fens**	**G1?**	**S1**				**B**	**1990-09-06**
Kobresia simpliciuscula-Scirpus pumilus	extreme rich fen	G2?	S1				B	1995-07-09
Pentaphylloides floribunda/Deschampsia cespitosa	montane riparian shrubland	G4	S3S4				B	1995-07-09
Plants								
Carex scirpoidea	Canadian single-spike sedge	G5	S2			BLM	B	1995-07-09
Packera pauciflora	Few-flowered ragwort	G4G5	S1S2			BLM	C	1995-07-09
Primula egaliksensis	Greenland primrose	G4	S2			FS/BLM	B	1995-07-09
Trichophorum pumilum	Little bulrush	G5	S2			FS/BLM	C	1995-07-09

*Element occurrence

Boundary Justification: The boundary of the Fourmile Creek PCA encompasses the significant elements identified while including important seeps and springs to the north and south of Fourmile Creek, as well as contiguous wetlands along the creek. The boundary is drawn to incorporate an area where natural processes (such as groundwater recharge, species reproduction) function in a manner that maintains viable populations of the elements of concern. However, all hydrological processes necessary to the elements are not fully contained in the boundary. Upstream activities that alter hydrology or sediment loads could detrimentally affect the elements.

Protection Comments: This PCA includes private, state, BLM, and National Forest lands. The state land board lands includes a significant portion of the wetlands that are important to the PCA, and this area is being considered for the state Stewardship Trust lands. At least one of the private landowners has expressed interest in a conservation easement (Carsey and Decker 1999).

The southeastern portion of the PCA includes two of the most rapidly developing subdivisions in South Park (pers. comm. Gary Nichols 2001). The northwestern part of the PCA falls almost entirely in Pike National Forest.

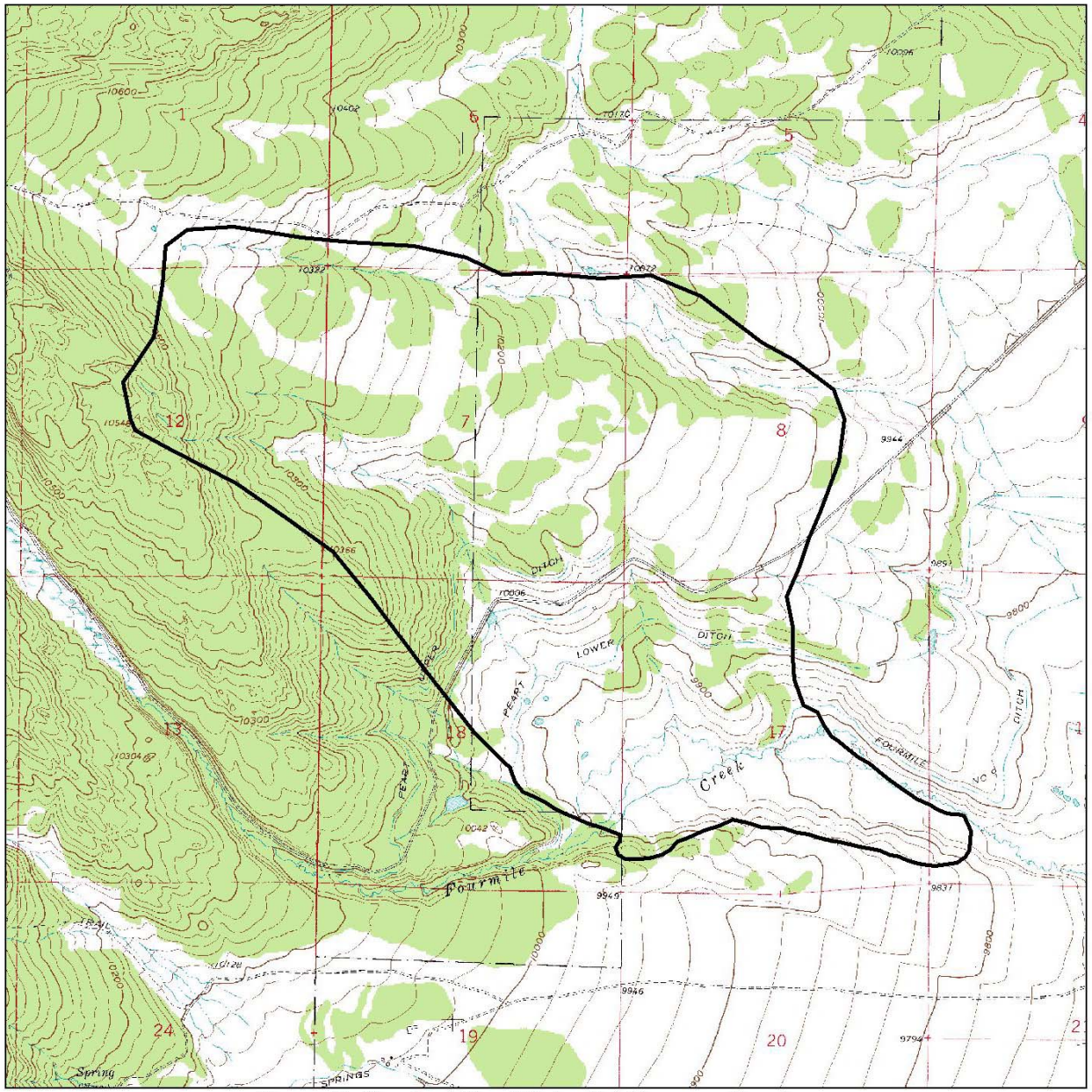
Management Comments: Much of the land within this PCA is used for moderate to heavy cattle grazing. The elements appear to be viable with this grazing pressure, but most of the occurrences are only of moderate size and a few are negatively impacted by grazing. From spring until mid summer is an important time frame for the significant plant species' success and viability. Limiting or avoiding grazing in the wetlands during this time would likely benefit the rare species and communities.

At least three irrigation ditches drain some of the water from Fourmile Creek in this area (Carsey and Decker 1999). The wetlands nonetheless seem to be well supported at this time by groundwater seepage from adjacent slopes. Increased residential development on private lands around the PCA could seriously impact the quality and condition of the wetlands by fragmenting habitat, increasing erosion, and altering the hydrological regimes (Carsey and Decker 1999). It is highly important that the hydrological regime remain intact, including the upstream portion of Fourmile Creek as well as the seeps and springs north and south of the creek. A monitoring program designed to detect changes to the overall quality and condition of the wetland complex and the rare species it supports would inform management of this important area.

Use of National Forest lands in this PCA has increased in recent years for hiking, mountain biking, and off-road vehicle use, as it is close to Fairplay and rapidly developing subdivisions.

Mountain plovers have been documented in the vicinity of this PCA. However, conservation efforts for this species would be better directed to other locations within South Park because the land use practices that benefit mountain plovers run contrary to practices that are beneficial to the fen habitats. Mountain plovers will not use wet habitats like fens and other wetlands, rather they prefer dry barren uplands that are maintained by some disturbance process like grazing by cattle or bison, or burning. These disturbance processes can be detrimental to fen habitats. Please see South Park PCA for additional information about mountain plover.

Photograph taken at Fourmile Creek at Peart PCA



Fourmile Creek at Peart Potential Conservation Area

The Colorado Natural Heritage Program

Colorado State University
254 General Services Bldg
Fort Collins, CO 80523

Map Date: 15 March 2001
GIS Dept: ael

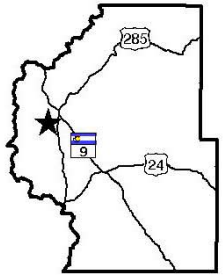
PCA Boundary

7.5 Minute Quadrangle:

Fairplay West, 39106-B1

Digital Raster Graphics (DRGs) produced by the U.S. Geological Survey, 1996

Location in Park County



0.4 0 0.4 Miles

Projection UTM, Zone 13, NAD27

N

GENEVA PARK NORTH
POTENTIAL CONSERVATION AREA

Biodiversity Rank: B2
Protection Urgency Rank: P3
Management Urgency Rank: M3

Location: Park County. Geneva Park. From the Park County line go South on FR 118 approximately three miles. The site is east of Geneva Creek, between Duck Creek and Scott Gomer Creek.

USGS 7.5 Minute Quadrangle: Mount Evans
Legal Description: T6S R74W sections 7, 18, 19, and T6S R75W sections 12, 13, 24.

General Description: This PCA includes the south facing slopes on the north side of Geneva Park. This area is dominated by bristlecone pine (*Pinus aristata*), with a combination of native species in the understory including wax currant (*Ribes cereum),* common juniper (*Juniperus communis),* and mountain muhly (*Muhlengergia montana*). The surrounding uplands also include stands of Engelmann spruce-subalpine fir (*Picea engelmannii-Abies lasiocarpa*) and quaking aspen (*Populus tremuloides*). The wetlands in Geneva Park are extensive willow carrs that support several imperiled plant species (please see Geneva Park PCA). A narrow band of native grasses is found along the base of the forested hillsides, above the wetlands. This area supports a high quality occurrence of the globally vulnerable grassyslope sedge (*Carex oreocharis.*)

This PCA includes approximately 567 acres with and elevation range from about 9500 to 11,000 feet.

Biodiversity Rank Justification: This PCA contains an excellent (A-ranked) occurrence of a globally vulnerable (G3) plant species and an excellent occurrence of a globally common but state vulnerable (G4S3) woodland community.

Element occurrence at the Geneva Park North PCA.

Element	Common name	Global rank	State rank	Federal status	State status	Federal sensitive	EO* rank	Last observed
Plant community								
Pinus aristata/Festuca arizonica	**montane woodlands**	**G4**	**S3**				**A**	**2000-09-12**
Plant								
Carex oreocharis	**Grassyslope sedge**	**G3**	**S1**				**A**	**1995-07-20**

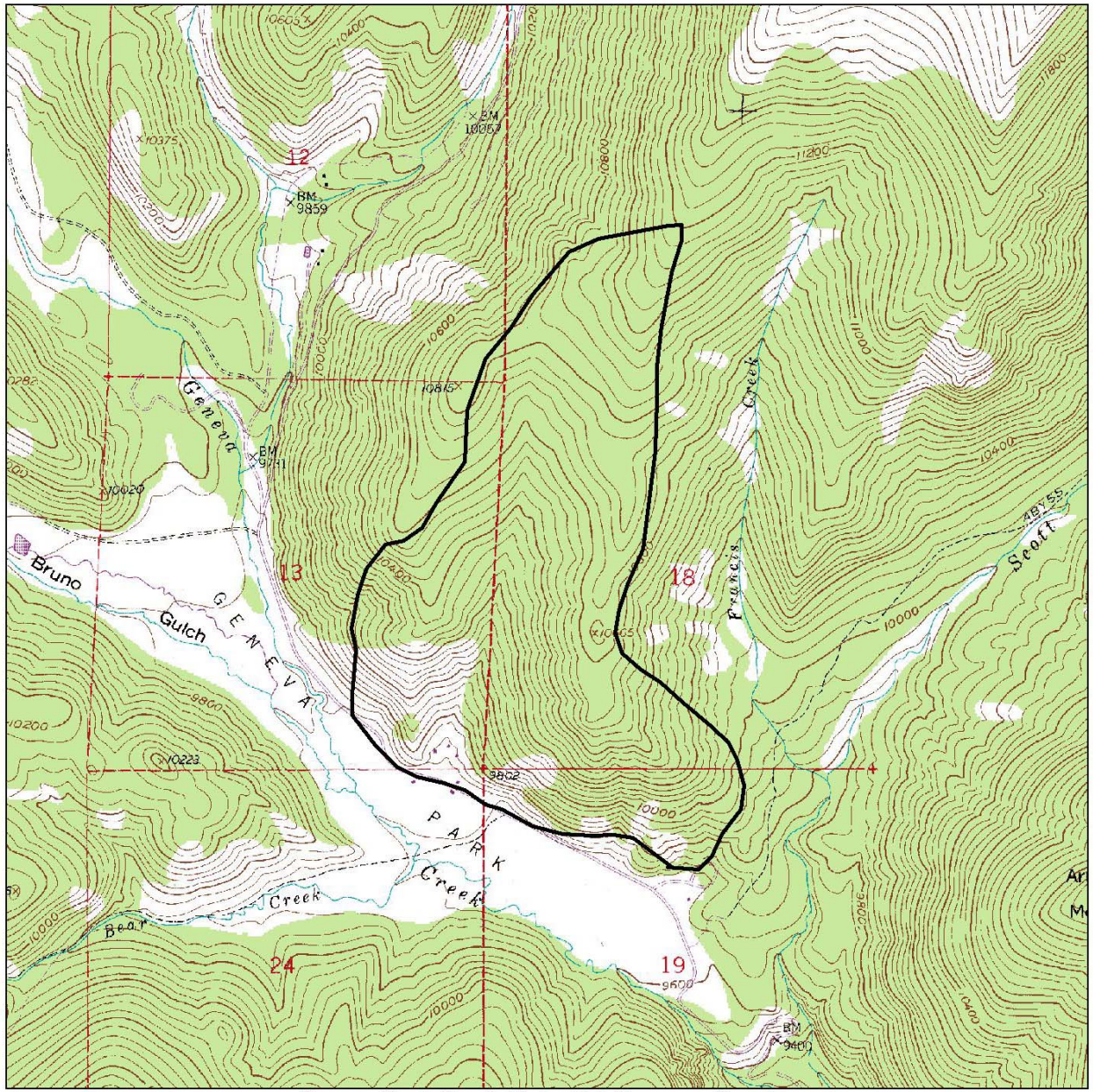
*Element occurrence

Boundary Justification: The boundary encompasses the bristlecone pine (*Pinus aristata*) stand and an upslope buffer delineated by Ranne and Baker, 1995. This considers direct impacts but does not incorporate large scale ecological processes.

Protection Comments: This PCA contains a mix of private lands and lands that are publicly owned and managed by the USFS. A small portion of the USFS lands are designated as Wilderness. Widening of the Guanella Pass road, which is immediately adjacent to the PCA, could impact the element occurrences, especially *Carex oreocharis.*

Management Comments: Cattle grazing and firewood cutting have been documented at this site, and could have a detrimental influence on the occurrences. A monitoring program designed to detect overall changes in the quality or condition of the occurrences would benefit the management of this area.

Photograph taken at the Geneva Park North PCA



Geneva Park North Potential Conservation Area

The Colorado Natural Heritage Program

Colorado State University
254 General Services Bldg
Fort Collins, CO 80523

Map Date: 15 March 2001
GIS Dept: ael

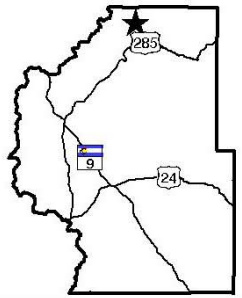
PCA Boundary

7.5 Minute Quadrangle:

Mount Evans, 39105-E6

Digital Raster Graphics (DRGs) produced by the U.S. Geological Survey, 1996

Location in Park County



0.3 0 0.3 Miles

Projection UTM, Zone 13, NAD27

HOLLTHUSEN GULCH/TARRYALL CREEK FEN
POTENTIAL CONSERVATION AREA

Biodiversity Rank: B2
Protection Urgency Rank: P3
Management Urgency Rank: M3

Location: Park County. About 2 miles north of Como.

USGS 7.5 Minute Quadrangle: Como
Legal Description: T8S, R76W, sections 16,17,20, and 21.

General Description: This PCA is a large wetland complex of an unusual nature. It appears as a mix of what may be called 'rich' fen and what could be called 'extreme rich' fen. For example, unlike at other sites, the *Kobresia myosuroides-Thalictrum alpinum* plant association and the Porter feathergrass (*Ptilagrostis porteri)* occur within a matrix of a taller willow community (all other occurrences of these are with low, or no, shrubs). This PCA also contains a very unusual, large stand of *Salix planifolia/Carex aquatilis* that may be one of the best examples of its type. This community occurs on a moderately steep slope within a mosaic of moss mounds and silver willow (*Salix candida)* with higher cover than almost anywhere else in Colorado.

This PCA includes approximately 585 acres with an elevation range from about 9800 to 10,300 feet.

Biodiversity Rank Justification: This PCA supports a fair (C-ranked) occurrence of a globally critically imperiled (G1?) community, *Kobresia myosuroides-Thalictrum alpinum*. It also supports a fair (C-ranked) occurrence of the globally imperiled (G2) *Ptilagrostis porteri*. Several state rare plants also contribute to the significance of this site. The *Salix planifolia/Carex aquatilis* plant association is an excellent example of this particular element. This element is widespread in the Southern Rockies, but in this case the relatively high cover (approximately 5%) of silver willow (*Salix candida)* illustrates its affinity to extreme rich fens.

Element occurrences at the Hollthusen Gulch/Tarryall Creek Fen PCA.

Element	Common name	Global rank	State rank	Federal status	State Status	Federal sensitive	EO* rank	Last observed
Plant communities								
Kobresia myosuroides-Thalictrum alpinum	**extreme rich fens**	**G1?**	**S1**				**C**	**1995-08-26**
Salix planifolia/Carex aquatilis	subalpine riparian willow carr	G5	S4				A	1995-08-26
Plants								
Carex livida	Livid sedge	G5	S1			FS/BLM	C	1995-08-26
Eriophorum gracile	Slender cottongrass	G5	S2			BLM		1990-99-99
Ptilagrostis porteri	Porter feathergrass	G2	S2			FS/BLM	C	1995-08-26
Salix candida	Hoary or silver willow	G5	S2			BLM	A	1995-08-26
Trichophorum pumilum	Little bulrush	G5	S2			FS/BLM	B	1995-08-26

*Element occurrence

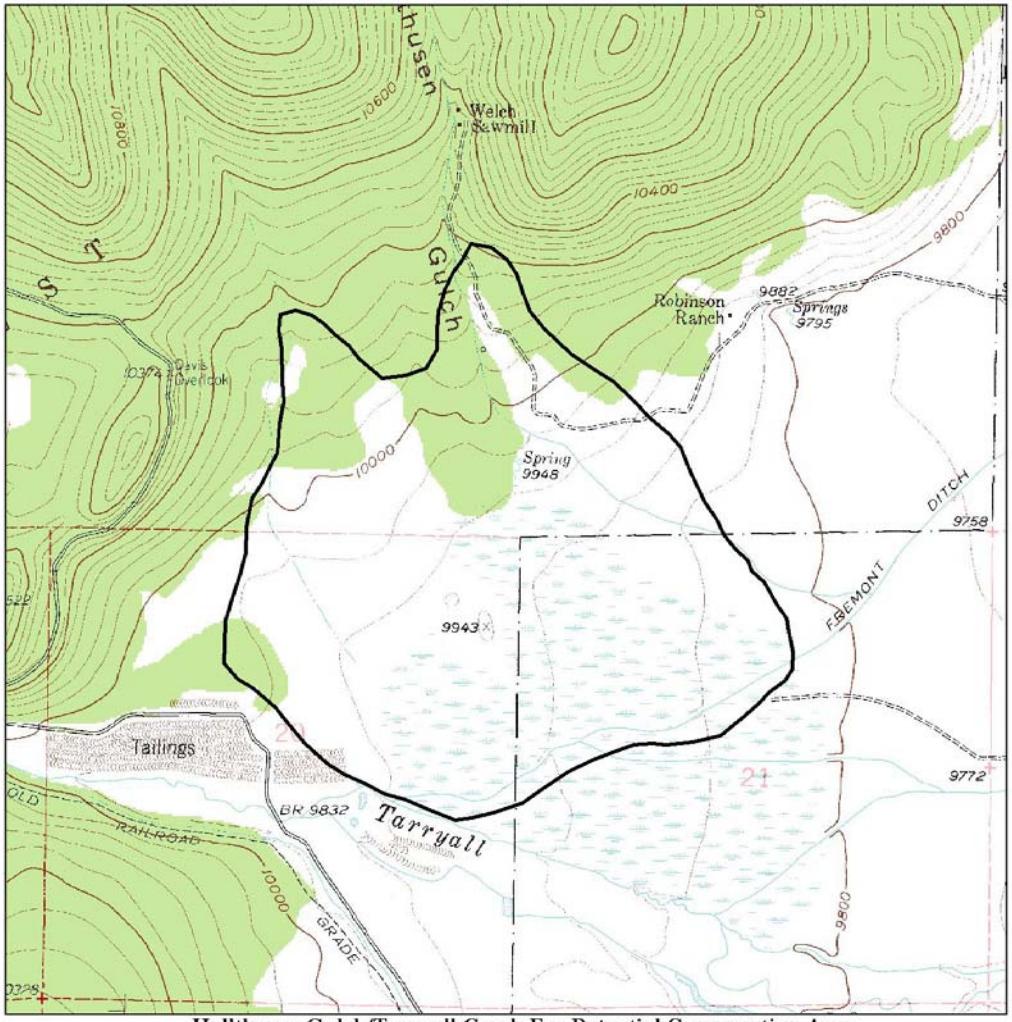
Boundary Justification: The boundary includes the entire peatland, the lower stretches of the creeks that feed water into the site, adjacent wetlands to the east and west, and the area extending out to a ditch below the fens. The ditch apparently severs the fen from Tarryall Creek. Tarryall Creek has not been visited by a CNHP scientist, but it is assumed not to contain peat. Since it is hydrologically below the fen, the creek is not included in the PCA boundary. A buffer of about 500 feet surrounds most of the fens for consideration of direct impacts such as cattle activity and vehicular damage.

Protection Comments: This PCA is located mostly on private lands and includes a small area of Pike-San Isabel National Forest. At least one ranch is currently under contract with a land developer. A conservation easement or management agreement with the landowners would benefit the long term protection of the fens and the significant species they contain.

Management Comments: Some water manipulation and moderate grazing have occurred on this site, but neither seems to have caused permanent negative impacts on the elements, and some of the element occurrences still merit an A rank because of their size or quality. However, grazing and especially water diversion could threaten the elements in the future. The elements look in good condition, but the effect of the current grazing regime is unclear. It is very important to maintain hydrological regimes, as these systems are vital to the viability of the peatland communities.

Park County is currently assessing the potential impacts from proposed water diversions at this site (pers. comm. Gary Nichols 2001.)

A monitoring program designed to detect changes in the overall quality and condition of the occurrences would benefit effective management of this PCA.



Hollthusen Gulch/Tarryall Creek Fen Potential Conservation Area

The Colorado Natural Heritage Program

Colorado State University
254 General Services Bldg
Fort Collins, CO 80523

Map Date: 13 March 2001
GIS Dept: ael

PCA Boundary

7.5 Minute Quadrangle:

Como, 39105-C8

Digital Raster Graphics (DRGs) produced by the U.S. Geological Survey, 1996

Location in Park County

0.2 0 0.2 Miles

Projection UTM, Zone 13, NAD27

MIDDLE FORK SOUTH PLATTE RIVER
POTENTIAL CONSERVATION AREA

Biodiversity Rank: B2
Protection Urgency Rank: P3
Management Urgency Rank: M3

Location: Park County. This PCA lies along 4.5 miles of the Middle Fork South Platte River. The northwest corner of the PCA is approximately 4 miles southeast of the junction of the Highway 285 and Highway 9, along Highway 9.

USGS 30 x 60 Minute Quadrangle: Bailey
Legal Description: T10S, R76W, sections 30, 31, 32; T10S, R77W, sections 23, 24, 25, 26, 36; T11S, R76W, sections 4, 5, 6, 8, 9.

General Description: This PCA is an extensive riparian and floodplain area in South Park. Much of the area is mesic grassland with good stands of riparian shrubs. The northwest portion of the PCA contains an unusual stand of blue spruce (*Picea pungens*) on a large nutrient-rich groundwater seep. This forest contains the largest known occurrence of *Carex scirpodea* in Colorado. A limited amount of peatland exists on this site, just south of Highway 9, a short distance west of the Middle Fork of the South Platte River. The entire area is used for moderate to heavy livestock grazing.

This PCA includes approximately 3406 acres with and elevation range from about 9100 to 9800 feet.

Biodiversity Rank Justification:
This PCA contains a good (B-ranked) occurrence of a plant species that is imperiled on a global scale (G2G3). Many other state rare plant and plant community occurrences are found within this PCA.

Element occurrences at the Middle Fork South Platte River PCA.

Elements	Common name	Global rank	State rank	Federal status	State status	Federal sensitive	EO* rank	Last observed
Plant communities								
Eleocharis quinqueflora-Triglochin spp.	alkaline spring wetland	GU	S2				C	1995-07-24
Pentaphylloides floribunda/Deschampsia cespitosa	montane riparian shrubland	G4	S3S4				B	1995-07-24

Plants								
Packera pauciflora	Few-flowered ragwort	G4G5	S1S2			BLM	C	1995-07-24
Primula egaliksensis	Greenland primrose	G4	S2			FS/BLM	C	1995-07-24
Carex scirpoidea	Canadian single-spike sedge	G5	S2			BLM	B	1995-07-24
Trichophorum pumilum	Little bulrush	G5	S2			FS/BLM	C	1995-07-24
Sisyrinchium pallidum	**Pale blue-eyed grass**	**G2G3**	**S2**			**BLM**	**B**	**1995-07-24**

*Element occurrence

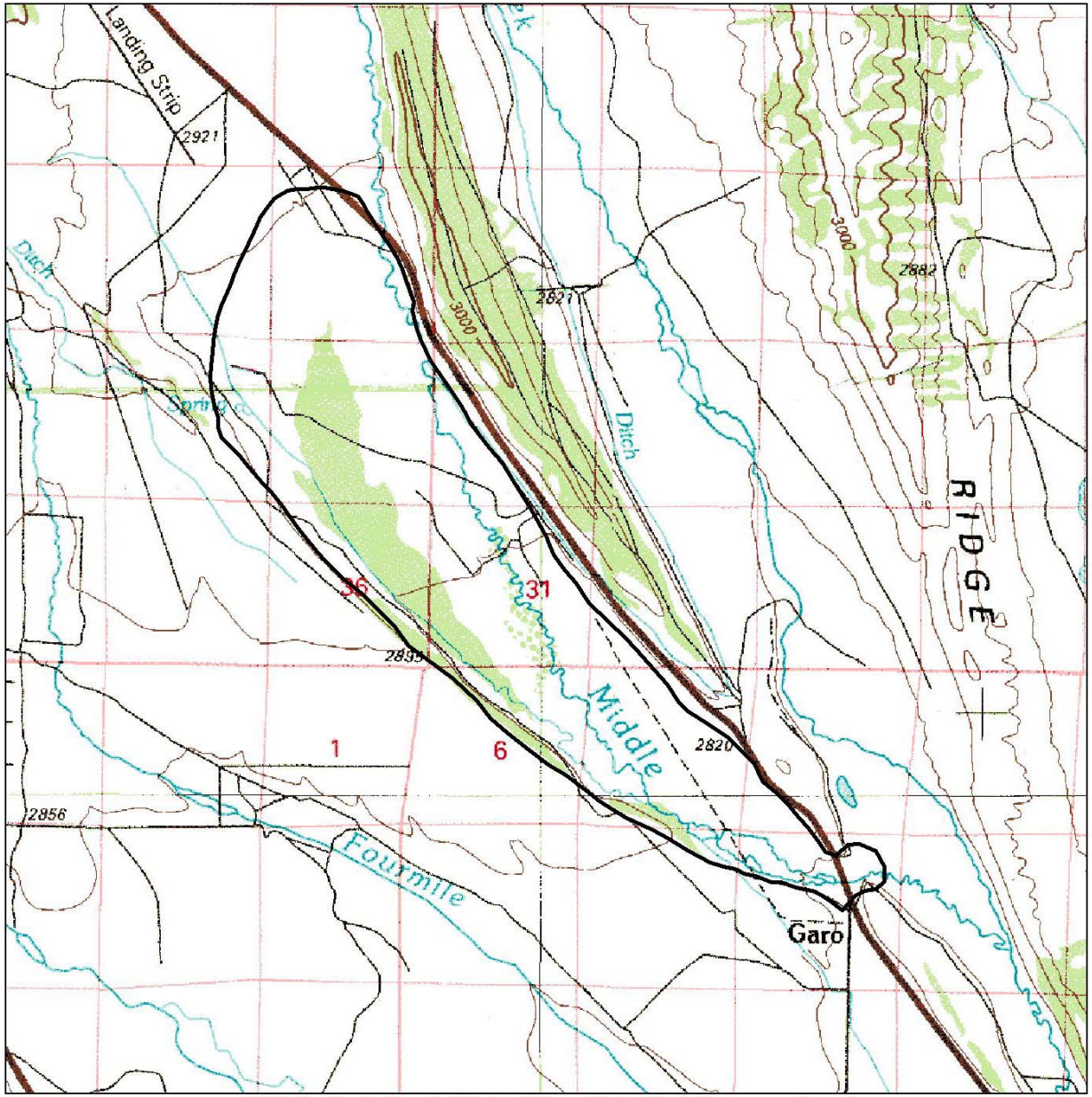
Boundary Justification: The PCA boundary includes the occurrences and a short distance up and downstream to include reaches of the same habitat. However, the viability of the PCA is dependent on ecological processes outside of the site boundaries, particularly hydrological processes.

Protection Comments: This PCA includes private, BLM, and state lands. The majority of this PCA is in single, private ownership, which is currently operated as a working cattle ranch, dude ranch, and fly fishing resort. There is also potential for residential developments on portions of the PCA (pers. comm. Gary Nichols 2001.)

Management Comments: Recreational use of this area has increased in recent years.

Mountain plovers have been documented in the vicinity of this PCA. However, conservation efforts for this species would be better directed to other locations within South Park because the land use practices that benefit mountain plovers run contrary to practices that are beneficial to the wetland habitats. Mountain plovers will not use wetlands, rather they prefer dry barren uplands that are maintained by some disturbance process like grazing by cattle or bison, or burning. These disturbance processes can be detrimental to fen habitats. Please see South Park PCA for additional information about mountain plover.

Photograph taken at the Middle Fork South Platte River PCA



Middle Fork South Platte River Potential Conservation Area

The Colorado Natural Heritage Program

Colorado State University
254 General Services Bldg
Fort Collins, CO 80523

Map Date: 15 March 2001
GIS Dept: ael

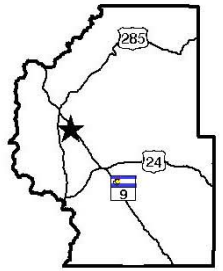
PCA Boundary

30 x 60 Minute Quadrangle:

Bailey, 39105-A1

Digital Raster Graphics (DRGs) produced by the U.S. Geological Survey, 1996

Location in Park County



Disclaimer

The data are provided on an as-is, as-available basis without warranties of any kind, expressed or implied, including (but not limited to) warranties of merchantability, fitness for a particular purpose, and noninfringement. CNHP, Colorado State University and the State of Colorado further expressly disclaim any warranty that the data are error-free or current as of the date supplied.

0.7 0 0.7 Miles

Projection UTM, Zone 13, NAD27

SOUTH FORK SOUTH PLATTE FEN
POTENTIAL CONSERVATION AREA

Biodiversity Rank: B2
Protection Urgency Rank: P3
Management Urgency Rank: M3

Location: Park County. About 11 miles south from Fairplay.

USGS 7.5 Minute Quadrangle: Garo.
Legal Description: T11S, R77W, sections 26, 35.

General Description: The upper, north end of this PCA supports a well-developed peatland with scattered blue spruce, with a deep ditch running down the middle of it. The state rare plants (silver willow-*Salix candida,* and others) and plant communities (fen communities such as *Kobresia myosuroides-Thalictrum alpinum*) on this northern end appear robust despite the ditch, probably because they still receive sufficient groundwater. This northern section is not currently heavily grazed, if grazed at all. Immediately south of the spruce trees is a small reservoir and patches of sedge meadow with only a few signs of extreme rich fen plants. This area was likely an extension of the peatland to the north, but it has been significantly altered by hydrologic modifications and grazing. Finally, on the southern end of the PCA there is a series of wetlands with small but well-developed examples of extreme rich fen plant communities. Several elements occur in the southern end as well, but most show signs of heavy, deleterious impacts from cattle. Surrounding lands are all mesic to dry grasslands. A small ranch with both cattle and horses operates on the west side of the site. The west bank of the river, which is included in the PCA, is a public fishing access area.

This PCA includes approximately 280 acres with an elevation range from about 9100 to 9200 feet.

Biodiversity Rank Justification: The biodiversity rank is based on a fair (C-ranked) occurrence of a plant community that is critically imperiled on a global scale (G1?). The site contains two fen communities and six other state rare (S1 and S2) elements. This may be the largest occurrence of green sedge (*Carex viridula)* known from South Park Colorado. This PCA probably was (a long time ago) a very good though small example of much of what is found at High Creek fen, but it has been highly altered from its historical state.

Element occurrences at the South Fork of the South Platte Fen PCA.

Element	Common name	Global rank	State rank	Federal status	State status	Federal sensitive	EO* rank	Last observed
communities								
Eleocharis quinqueflora-Triglochin spp.	alkaline spring wetland	GU	S2				C	1995-07-23
Kobresia myosuroides-Thalictrum alpinum	**extreme rich fens**	**G1?**	**S1**				**C**	**1995-07-23**
Kobresia simpliciuscula-Scirpus pumilus	extreme rich fen	G2?	S1				C	1995-07-23
plants								
Carex scirpoidea	Canadian single-spike sedge	G5	S2			BLM	C	1995-07-23
Carex viridula	Green sedge	G5	S1			BLM	B	2000-09-13
Packera pauciflora	Few-flowered ragwort	G4G5	S1S2			BLM	C	2000-09-13
Primula egaliksensis	Greenland primrose	G4	S2			FS/BLM	C	1995-07-23
Salix candida	Hoary or silver willow	G5	S2			BLM	C	2000-09-13
Salix myrtillifolia	Low blueberry willow	G5	S1			FS/BLM	C	2000-09-13

*Element occurrence

Boundary Justification:
The PCA boundary includes the upper, northern end of the fen, as well as the lower, southern end of the fen. It also includes the area in between that certainly was formerly continuous fen but is now a reservoir, some fill, and heavily grazed pasture (and virtually no elements are present in the middle section). The boundary also includes the seeps and springs upstream of the fen. The eastern boundary is the South Platte River (the area between the fen and the river is continuous wetland). The boundary is drawn to incorporate an area where natural processes (such as groundwater recharge, species reproduction) function in a manner that maintains viable populations of the elements associated with the fen. However, all hydrological processes necessary to the elements are not fully contained in the boundary. Upstream activities that alter hydrology or sediment loads could detrimentally affect the elements.

Protection Comments: This PCA includes a Colorado DOW fishing easement, and lands that are privately owned. One private land owner who owns most of the high quality portion of the fen is aware of the significance of the fen and is interested in protecting it.

Management Comments: Heavy grazing, especially during the spring and summer months, will have a negative impact on the occurrences. Winter grazing (when the ground is frozen) and possibly late summer to fall grazing (after plants have gone to seed) seems most appropriate for

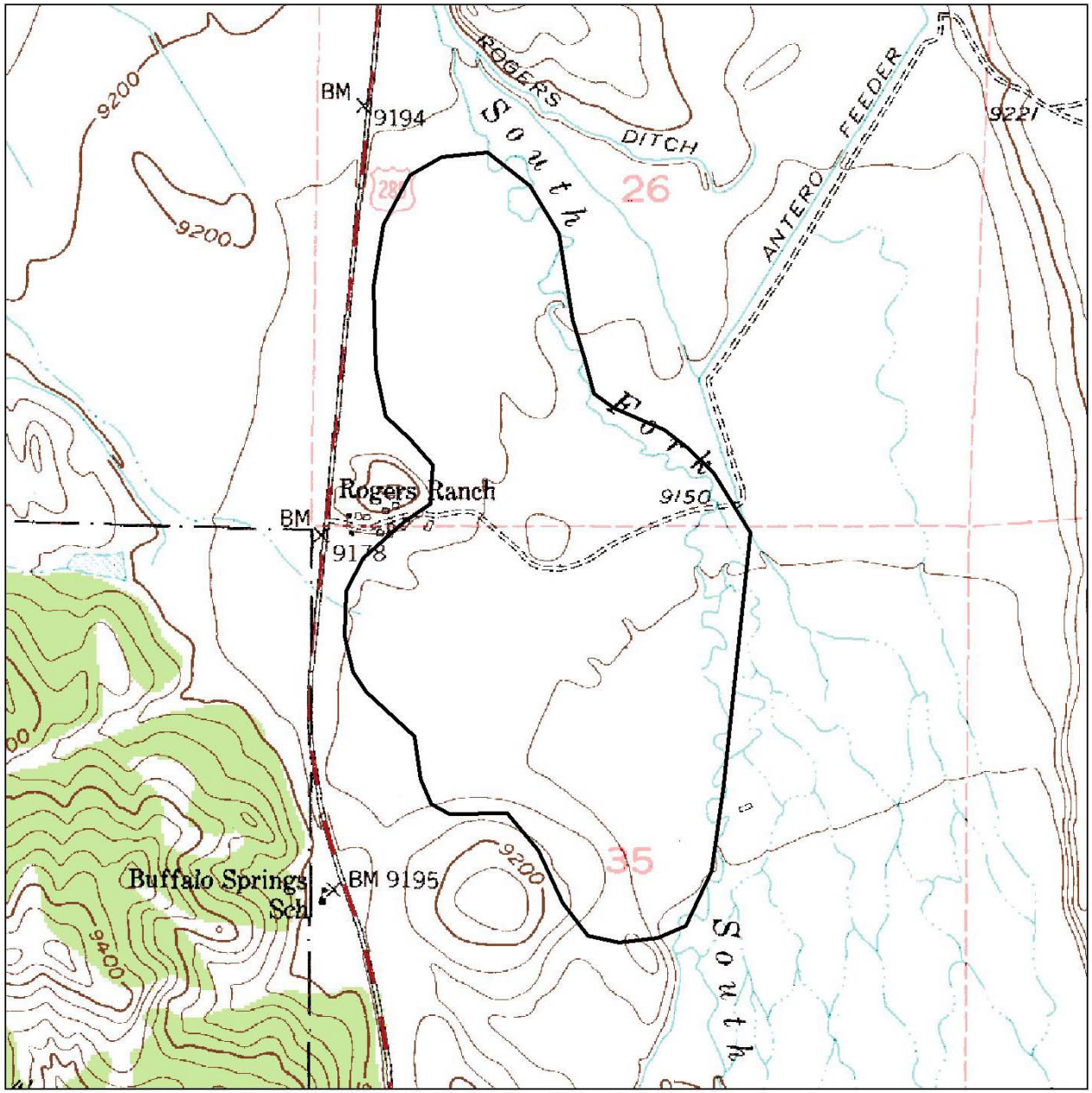
the fen. Grazing pressure has been reduced over the past 5 years (pers. comm. Bill Gordon), and the condition of the fen appears to be improving.

Management of the area could include planting the mined area with native fen species. Although restoration of the peat layer will require thousands of years, the fen plants may reestablish fairly quickly. Since so much of the fen has been mined for peat, it provides an excellent setting for research on plant succession in extreme rich fens.

Non-native plant species such as Russian thistle (*Salsola australis*), dandelion (*Taraxacum officinale*), timothy (*Phleum pratense*), Kentucky bluegrass (*Poa pratensis*), lamb's quarters (*Chenopodium* sp.), and white clover (*Trifolium repens*) were noted around the human-made structures of the ranch. A monitoring plan designed to detect spread of these and other non-natives into the fens would benefit the management of this important area. No exotic plants were noted in the fen in the year 2000.

Mountain plovers have been documented in the vicinity of this PCA. However, conservation efforts for this species would be better directed to other locations within South Park because the land use practices that benefit mountain plovers run contrary to practices that are beneficial to the fen habitats. Mountain plovers will not use wet habitats like fens and other wetlands, rather they prefer dry barren uplands that are maintained by some disturbance process like grazing by cattle or bison, or burning. These disturbance processes can be detrimental to fen habitats. Please see South Park PCA for additional information about mountain plover.

Photograph taken at South Fork South Platte Fen PCA



The Colorado Natural Heritage Program

Colorado State University
254 General Services Bldg
Fort Collins, CO 80523

Map Date: 14 March 2001
GIS Dept: dcb

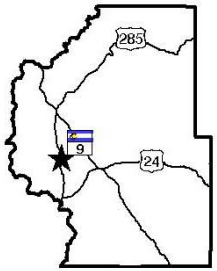
PCA Boundary

7.5 Minute Quadrangle:

Garo, 39105-A8

Digital Raster Graphics (DRGs) produced by the U.S. Geological Survey, 1996

Location in Park County



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0.2 0 0.2 Miles

Projection UTM, Zone 13, NAD27

South Fork South Platte Fen Potential Conservation Area

EAST LOST PARK
POTENTIAL CONSERVATION AREA

Biodiversity Rank: B2
Protection Urgency Rank: P4
Management Urgency Rank: M2

Location: Park County. East Lost Park.
USGS 30 x 60 Minute Quadrangle: Bailey
Legal Description: T9S, R72W, sections 7, 8, 9, 10, 16, 17, 18, 21, and T9S, R73W, sections 12, 13.

General Description: East Lost Park contains a system of wetlands that extend for about three miles along the Lost Creek drainage. The wetlands formed in a natural basin or park, which is created at the juncture of the Tarryall and Kenosha mountains. The basin gathers water from six perennial streams, which flow from the surrounding 11-12,000 foot peaks. Water flows out of the park through a steep and narrow drainage to the southeast. The wetlands are characterized by a combination of willow and sedge systems and support several globally and state imperiled plant species.

Uplands are dominated by lodgepole pine *(Pinus contorta)* and Engelmann spruce (*Picea engelmannii*), accentuated with patches of quaking aspen (*Populus tremuloides*) and outcrops of red granite. A narrow band of native grasses line the base of the mountains.

This PCA includes approximately 1368 acres with an elevation range from about 9700 to 10,500 feet.

Biodiversity Rank Justification: This PCA supports an excellent (A-ranked) occurrence of a plant species that is globally imperiled (G2). This is one of the largest populations of Porter feathergrass *(Ptilagrostis porteri)* ever documented. Several occurrences of state imperiled plant species are also found here.

Element occurrences at the Lost Park PCA.

Element	Common name	Global rank	State rank	Federal status	State status	Federal sensitive	EO* rank	Last observed
plants								
Carex livida	Livid sedge	G5	S1			FS/BLM	E	1989-08-16
Carex tenuiflora	Slender-flower sedge	G5	S1				E	1989-08-16
Eriophorum gracile	Slender cottongrass	G5	S2			BLM		2000-09-11
Ptilagrostis porteri	**Porter feathergrass**	**G2**	**S2**			**FS/BLM**	**A**	**2000-09-11**

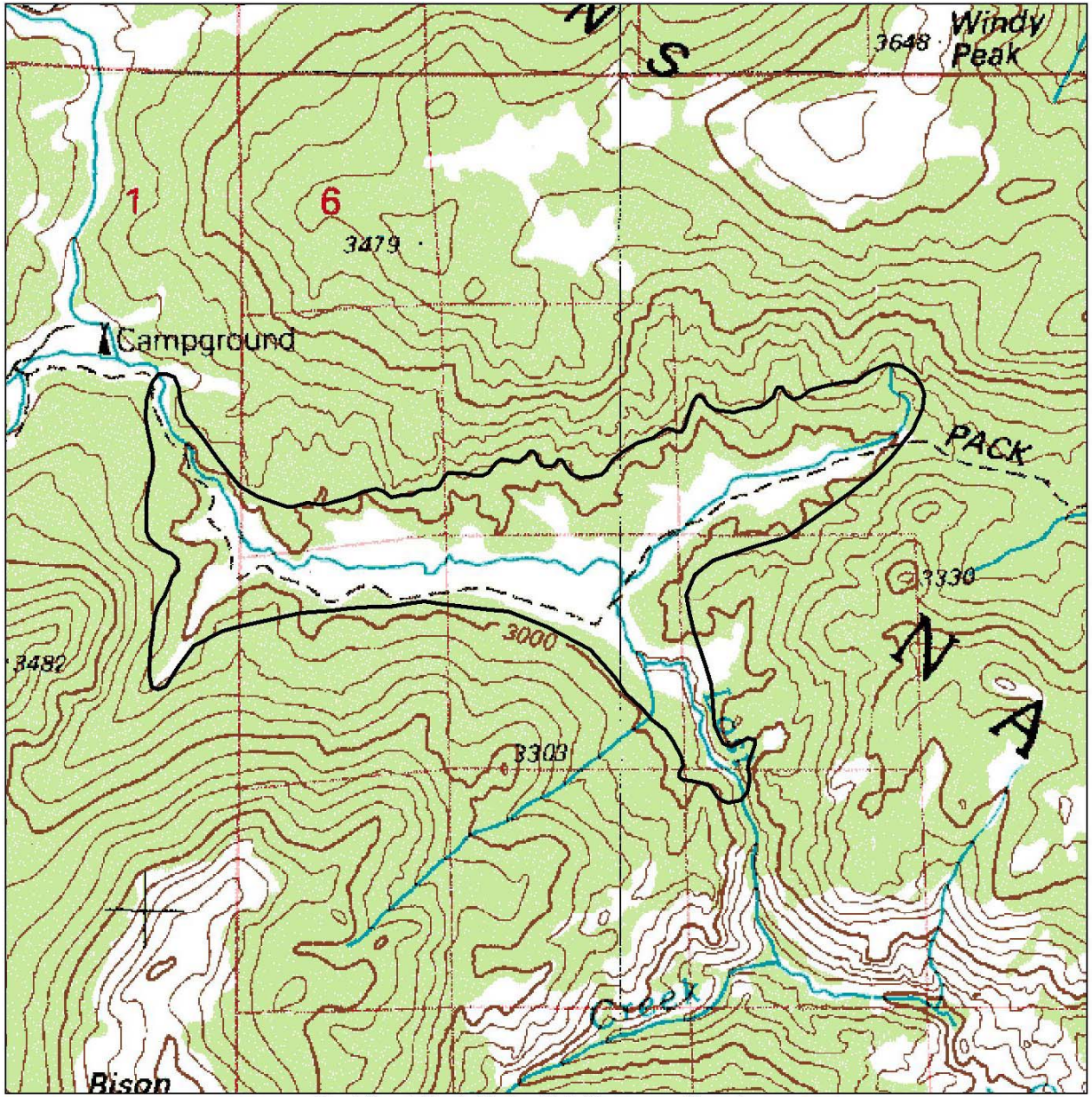
*Element occurrence

Boundary Justification:
Includes the entire park and at least a 1,000 ft. buffer into adjacent slopes and forests. The long-term viability of the PCA is also dependent on upstream watershed processes originating outside of this boundary.

Protection Comments: This PCA is publicly owned and managed by the South Park Ranger District of the Pike-San-Isabel National Forest. There are 280 acres within the PCA that have been registered as a State Natural Area.

Management Comments: Cattle grazing is severely degrading and changing local species compositions within the PCA, especially in areas of high cattle concentration such as where salt has been left for cattle. This area receives a moderate to heavy level of recreational use including hiking, backpacking, horse-packing, fishing and hunting. A trail runs through the PCA that could spread non-native plants. Dandelion (*Taraxacum officinale*), white clover (*Trifolium repens*), and timothy (*Phleum pratense*) were observed in the PCA in low cover, mostly along the trail.

Photograph taken at East Lost Park PCA



East Lost Park Potential Conservation Area

The Colorado Natural Heritage Program

Colorado State University
254 General Services Bldg
Fort Collins, CO 80523

Map Date: 15 March 2001
GIS Dept: ael

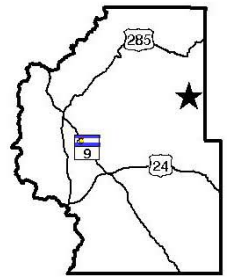
PCA Boundary

30 x 60 Minute Quadrangle:

Bailey, 39105-E1

Digital Raster Graphics (DRGs) produced by the U.S. Geological Survey, 1996

Location in Park County



0.5 0 0.5 Miles

Projection UTM, Zone 13, NAD27

GENEVA PARK
POTENTIAL CONSERVATION AREA

Biodiversity Rank: B2
Protection Urgency Rank: P4
Management Urgency Rank: M2

Location: Park County. Geneva Park. In Pike National Forest. From the Park County line go south on FR 119 approximately 2 miles. Site runs along Geneva Creek from Kirby Gulch south past Burning Bear Creek.

USGS 30 x 60 Minute Quadrangle: Denver West
Legal Description: T6S R75W sections 2, 11, 12, 13, 14, 24, and T6S R74W section 19.

General Description: The PCA includes a large park at the junction of Geneva Creek and Bruno Gulch. The stream valley includes willow carrs, wet meadows, and adjacent grasslands.

Uplands are dominated by bristlecone pine (*Pinus aristata*) and Engelmann spruce (*Picea engelmannii*) forests with patches of quaking aspen (*Populus tremuloides*) and native grasslands.

This PCA includes approximately 1207 acres with an elevation range of about 9400-10,300 feet.

Biodiversity Rank Justification: This PCA contains a good (B-ranked) occurrence of a globally imperiled (G2) plant species, Porter feathergrass (*Ptilagrostis porteri*).

Element occurrences at the Geneva Park PCA.

Element	Common name	Global rank	State rank	Federal status	State status	Federal sensitive	EO* rank	Last observed
animals								
Oncorhynchus clarki stomias	Greenback cutthroat trout	G4T2T3	S2	LT	T		H	1988-08-06
plants								
Carex scirpoidea	Canadian single-spike sedge	G5	S2			BLM		1995-07-20
Cylactis arctica ssp *acaulis*	Nagoon berry	G5T5	S1			FS		2000-09-12
Cylactis arctica ssp *acaulis*	Nagoon berry	G5T5	S1			FS	H	1966-06-26
Ptilagrostis porteri	**Porter feathergrass**	**G2**	**S2**			**FS/BLM**	**B**	**2000-09-12**
Ptilagrostis porteri	Porter feathergrass	G2	S2			FS/BLM	C	2000-09-12
Salix candida	Hoary or silver willow	G5	S2			BLM	B	1995-09-07
Salix candida	Hoary or silver willow	G5	S2			BLM	E	2000-09-12

*Element occurrence

Boundary Justification: Includes the elements and all connected suitable habitat. The hydrological processes originating outside of the PCA boundary are also important to the long-term viability of the elements of concern.

Protection Comments: This PCA contains a mix of private lands and public lands managed by the USFS. Peat mining has occurred at this PCA in the recent past. The current moratorium on peat mining in Park County will protect the remaining peatlands at this time. Potential widening of the Guanella Pass road could destroy some of the plants of concern.

As recently as 5 years ago, a water storage facility (Geneva Park Reservoir) was planned, that if constructed, would inundate much of this PCA. At the time it was proposed, the developers owned the water rights but had not determined if the site was hydro-geologically and politically suitable for the proposed impoundment (pers. comm. Gary Nichols 2001.)

Management Comments: This area receives a very high level of recreation use including off-road vehicle use, camping, fishing, hunting, and hiking.

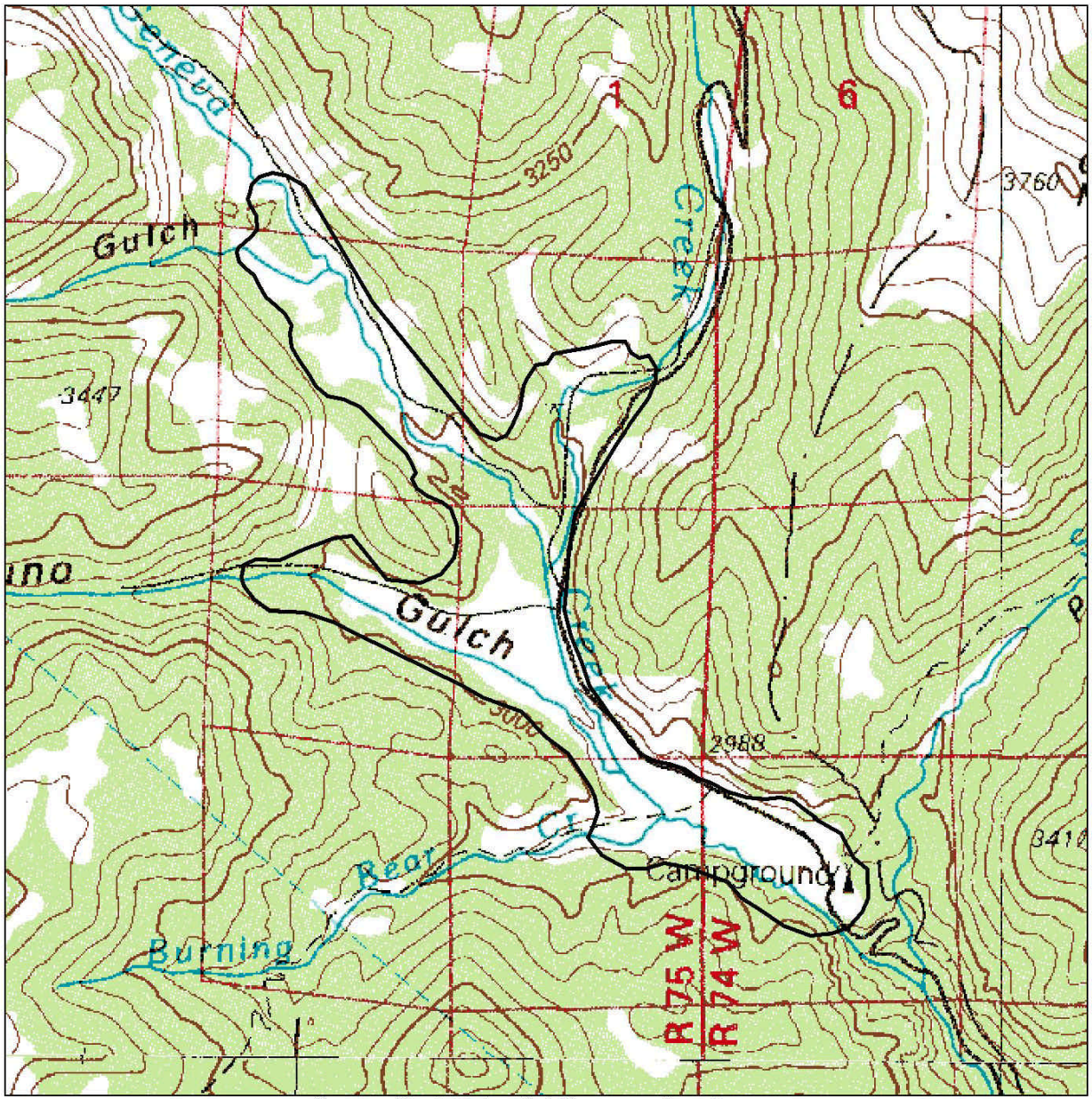
The occurrences are being moderately to heavily impacted by cattle grazing and trampling at this PCA. Relatively low levels of grazing seems to be compatible with the species of concern; the cattle tend to stay in the drier areas and evidently do not eat the Porter feathergrass (*Ptilagrostis porteri*). As the numbers of cattle are increased, the plants become vulnerable to trampling. Fencing cattle out of some areas may become necessary depending on the level of grazing intensity. A PCA wide grazing plan may be warranted.

Additional inventory for Porter feathergrass and the other elements of concern, particularly in Burning Bear Creek, Bruno Gulch, and Geneva Creek, would benefit our understanding of their distribution and abundance.

Red clover (*Trifolium pratense*) and dandelion (*Taraxacum officinale*) were noted in low cover in the PCA. Early detection and control of non-native plants will benefit the management of this area.

Hydrological processes originating outside of the planning boundary, including water quality, quantity, timing and flow must be managed to maintain site viability.

Photographs taken at Geneva Park PCA



Geneva Park Potential Conservation Area

The Colorado Natural Heritage Program

Colorado State University
254 General Services Bldg
Fort Collins, CO 80523

Map Date: 15 March 2001
GIS Dept: ael

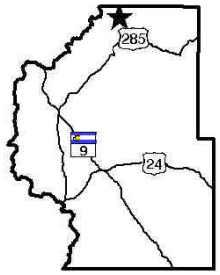
PCA Boundary

30 x 60 Minute Quadrangle:

Denver West, 39105-E1

Digital Raster Graphics (DRGs) produced by the U.S. Geological Survey, 1996

Location in Park County



0.4 0 0.4 Miles

Projection UTM, Zone 13, NAD27

SOUTH PARK
POTENTIAL CONSERVATION AREA

Biodiversity Rank: B2
Protection Urgency Rank: P4
Management Urgency Rank: M4

Location: Park County; the entire South Park grassland formation.

USGS 1 x 2 Degree Quadrangles: Pueblo, Denver, Montrose, Leadville.

General Description: South Park is one of three large intermontane valleys in Colorado. It is a faulted syncline between the Front Range and the Sawatch Uplift. An extensive Arizona fescue-slimstem muhly (*Festuca arizonica-Muhlenbergia filiculmis)* grassland is the dominant plant community on the valley floor. Much of the grassland habitat is fairly flat with gentle slopes. South Park is bounded on the west by the Mosquito Range, on the north and northwest by the southern end of the Park Range, on the east by the Tarryall Mountains and Puma Hills, and on the south by Black and Thirty-nine mile mountains. Tributaries of Tarryall Creek drain the northern park and the South Platte River and its tributaries drain the south portion of South Park. Ponderosa pine and bristlecone pine are found on the south facing hillsides, and on ridges within the Park. The north facing slopes are dominated by Engelmann spruce (*Picea engelmannii)* and subalpine fir (*Abies lasiocarpa)*.

The vegetation in South Park is generally short and sparse as a result of the dry, windy climate, historic and current grazing, fires, and/or prairie dog activity. The grassland of South Park evolved with fire and grazing by large and small mammals (Fitzgerald *et al*. 1994). Historically, bison and Gunnison prairie dogs were a significant component of this system (see Fitzgerald *et al*. 1994). Bison are reported as abundant in South Park prior to 1862 (Carey 1911). By 1871 only a few were seen, and the last four bison in Colorado were poached in 1897 (Meaney and Van Vuren 1993). Currently, the area is grazed by cattle and domestic bison.

The surrounding landscape is a mosaic of agricultural and residential-developed areas. Many access roads fragment the grassland.

This PCA includes approximately 448,235 acres with an elevation range from about 8540 to 10,558 feet.

Biodiversity Rank Justification: This PCA supports several excellent (A-ranked) occurrences of mountain plover, a bird species that is globally imperiled (G2). Preliminary estimates suggest that this area supports approximately 15-20% of the total breeding population for this species. This PCA also supports excellent (A-ranked) occurrences of a globally imperiled (G2) plant species, and a good (B-ranked) occurrence of a globally imperiled (G2) grassland plant community. This grassland occurrence is the world's largest at 1.3 million acres. Also, located

on the western edge of this PCA are occurrences of several extreme rich fens. These unique fens are globally rare (G2) wetland type. They support two globally rare plant communities and several globally rare plants (G2), as well as numerous state rare (S1-S2) plants that specifically adapted to the pH of the extreme rich fens.

Element occurrences at the South Park PCA.

Elements	Common name	Global rank	State rank	Federal status	State status	Federal sensitive	EO* rank	Last observed
animals								
Charadrius alexandrinus nivosus	Western snowy plover	G4T3	S1B,SZN	(PS:LT)	SC	BLM	H	1983-06-00
Charadrius montanus	Mountain plover	G2	S2B,SZN	PT	SC	FS/BLM	B	1995-08-10
Charadrius montanus	Mountain plover	G2	S2B,SZN	PT	SC	FS/BLM	E	1995-07-10
Charadrius montanus	Mountain plover	G2	S2B,SZN	PT	SC	FS/BLM	C	1997-06-29
Charadrius montanus	Mountain plover	G2	S2B,SZN	PT	SC	FS/BLM	E	2000-05-11
Charadrius montanus	Mountain plover	G2	S2B,SZN	PT	SC	FS/BLM	C	1998-05-17
Charadrius montanus	Mountain plover	G2	S2B,SZN	PT	SC	FS/BLM	E	1995-07-04
Charadrius montanus	Mountain plover	G2	S2B,SZN	PT	SC	FS/BLM	E	1998-06-13
Charadrius montanus	Mountain plover	G2	S2B,SZN	PT	SC	FS/BLM	C	1998-05-17
Charadrius montanus	Mountain plover	G2	S2B,SZN	PT	SC	FS/BLM	E	1996-05-16
Charadrius montanus	Mountain plover	G2	S2B,SZN	PT	SC	FS/BLM	E	1998-06-23
Charadrius montanus	Mountain plover	G2	S2B,SZN	PT	SC	FS/BLM	C	1999 06-08
Charadrius montanus	Mountain plover	G2	S2B,SZN	PT	SC	FS/BLM	A	2000-05-11
Charadrius montanus	Mountain plover	G2	S2B,SZN	PT	SC	FS/BLM	B	1998-06-13
Charadrius montanus	Mountain plover	G2	S2B,SZN	PT	SC	FS/BLM	A	2000-07-10
Charadrius montanus	Mountain plover	G2	S2B,SZN	PT	SC	FS/BLM	B	1997-06-30
Charadrius montanus	Mountain plover	G2	S2B,SZN	PT	SC	FS/BLM	B	2000-06-00
Charadrius montanus	Mountain plover	G2	S2B,SZN	PT	SC	FS/BLM	B	2000-06-99
Charadrius montanus	Mountain plover	G2	S2B,SZN	PT	SC	FS/BLM	B	2000-05-15
Charadrius montanus	Mountain plover	G2	S2B,SZN	PT	SC	FS/BLM	B	
Charadrius montanus	Mountain plover	G2	S2B,SZN	PT	SC	FS/BLM	C	1997-05-23
Charadrius montanus	Mountain plover	G2	S2B,SZN	PT	SC	FS/BLM	E	1999-06-07
Charadrius montanus	Mountain plover	G2	S2B,SZN	PT	SC	FS/BLM	B	2000-05-15
Charadrius montanus	Mountain plover	G2	S2B,SZN	PT	SC	FS/BLM	C	1998-06-12
Plant community								
Festuca arizonica-Muhlenbergia filiculmis	montane grasslands	G2	S2				E	1992-07-16
Plants								
Machaeranthera coloradoensis	Colorado tansy-aster	G2	S2			FS	C	2000-08-08

*****Element occurrence

Boundary Justification: This PCA includes known habitat for the mountain plover in South Park. Mountain plovers will move to different areas within this PCA in response to varying

management practices, but will likely show site fidelity to the general area included in the PCA, provided continuing compatible management practices are employed within the boundaries. Although the full area of this PCA needs to be considered for the conservation of this species, other land use activities can take place within the planning boundary. Numerous additional PCAs are included within these boundaries; these additional PCAs are designed primarily to encompass the significant wetland communities of South Park. The wetland PCAs have different management and protection needs than does this South Park PCA.

Protection Comments: This PCA contains a mix of private land, state land, and land managed by the BLM. Although the mountain plover has been proposed for listing as threatened by the US Fish and Wildlife Service, no formal protection is in place for this land area, and it is highly threatened by fragmentation and especially habitat conversion associated with residential and road development.

Since mountain plover move to different areas within this PCA over time, it is less useful to target specific conservation projects that benefit the birds. Overall, consideration of land management practices that support mountain plover habitat throughout South Park is probably the best protection strategy. However, mountain plover have been documented to nest on expanses of BLM and State lands in South Park, and ensuring that such lands remain in public domain and are properly managed would likely benefit the management of this species.

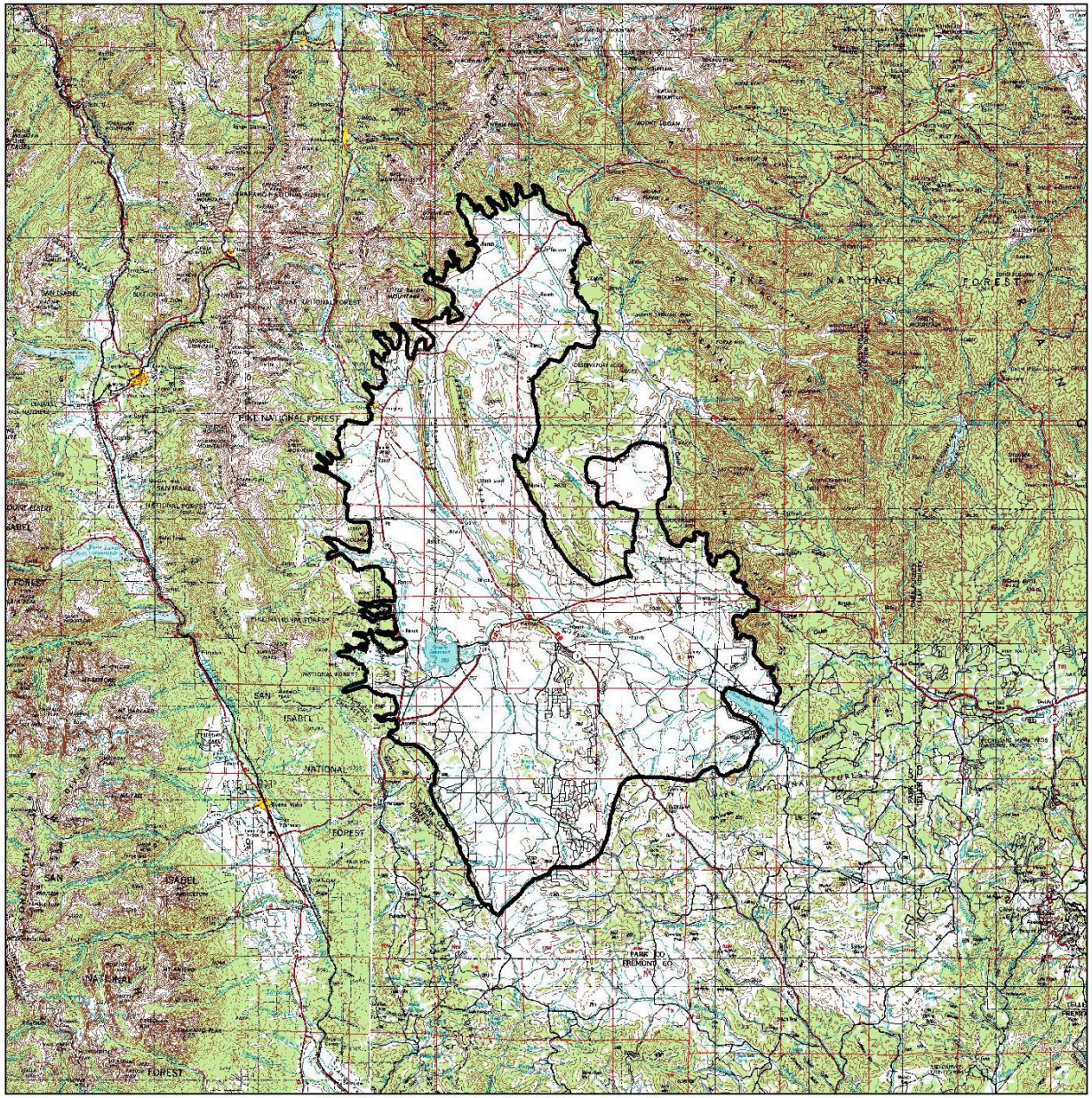
Management Comments: Mountain plover require habitat that is relatively flat open, and sparsely vegetated for nesting. Maintenance of these conditions is assured by a combination of disturbances including grazing by ungulates including domestic cattle, domestic bison, and wild antelope, prairie dog and ground squirrel activity, and fire. In South Park, mountain plover habitat is maintained primarily by moderate to heavy levels of cattle and bison grazing in the drier areas of the grasslands

Mountain plovers nest in South Park during May and June. Seasonal use generally extends from April through August.

Modern anthropogenic impacts have altered historic ecological processes in the grasslands of South Park. Bison have been extirpated by over-hunting, prairie dogs have been nearly extirpated by the Bubonic plague, a disease introduced to North America by European colonists, and fire has been suppressed for at least 50 years to protect human homes and areas of commerce. The current ecological processes, including the anthropogenic alterations do appear to benefit mountain plovers, but may provide for slightly different conditions than were known historically. Of greatest note, however, is that grazing has been a part of the grasslands of South Park for as long as history on the subject is documented. Continued grazing will help preserve the integrity of this short to mid-grass prairie system.

Photographs taken at the South Park PCA

Mountain Plover (*Charadrius montanus*)



South Park Potential Conservation Area

The Colorado Natural Heritage Program

Colorado State University
254 General Services Bldg
Fort Collins, CO 80523

Map Date: 15 March 2001
GIS Dept: ael

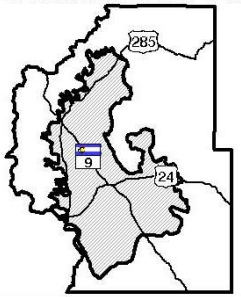
PCA Boundary

1 x 2 Degree Quadrangles:

Pueblo, 38104-A1
Montrose, 38106-A1
Denver, 39104-A1
Leadville, 39106-A1

Digital Raster Graphics (DRGs) produced by the U.S. Geological Survey, 1996

Location in Park County



Disclaimer

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8 0 8 Miles

Projection UTM, Zone 13, NAD27

N

TROUT CREEK
POTENTIAL CONSERVATION AREA

Biodiversity Rank: B3
Protection Urgency Rank: P2
Management Urgency Rank: M2

Location: Park County. Approximately five air miles southeast of Fairplay.

USGS 7.5 Minute Quadrangle: Fairplay East
Legal Description: T10S, R76W, 20, 28, 29, 32, and 33.

General Description: This PCA is located in a narrow valley between Red Hill and Reinecker Ridge. The hydrology is supported by Trout Creek and groundwater discharge or springs. This site supports peatlands with high mineral content.

This PCA is located at about 9400 feet and includes approximately 592 acres.

Biodiversity Rank Justification: This PCA supports two fair (C-ranked) occurrences of a globally rare wetland plant community. Additionally, there are four unranked occurrences of state rare plants.

Element occurrences at the Trout Creek PCA.

Element	Common name	Global rank	State rank	Federal status	State status	Federal sensitive	EO* rank	Last observed
Plant communities								
Kobresia simpliciuscula-Scirpus pumilus	**extreme rich fen**	**G2?**	**S1**				**C**	**1990-08-14**
Kobresia simpliciuscula-Scirpus pumilus	**extreme rich fen**	**G2?**	**S1**				**C**	**1995-03-15**
Plants								
Salix candida	Hoary or silver willow	G5	S2			BLM		1990-08-05
Salix candida	Hoary or silver willow	G5	S2			BLM		1990-08-14
Trichophorum pumilum	Little bulrush	G5	S2			FS/BLM		1990-08-05
Trichophorum pumilum	Little bulrush	G5	S2			FS/BLM		1990-08-14

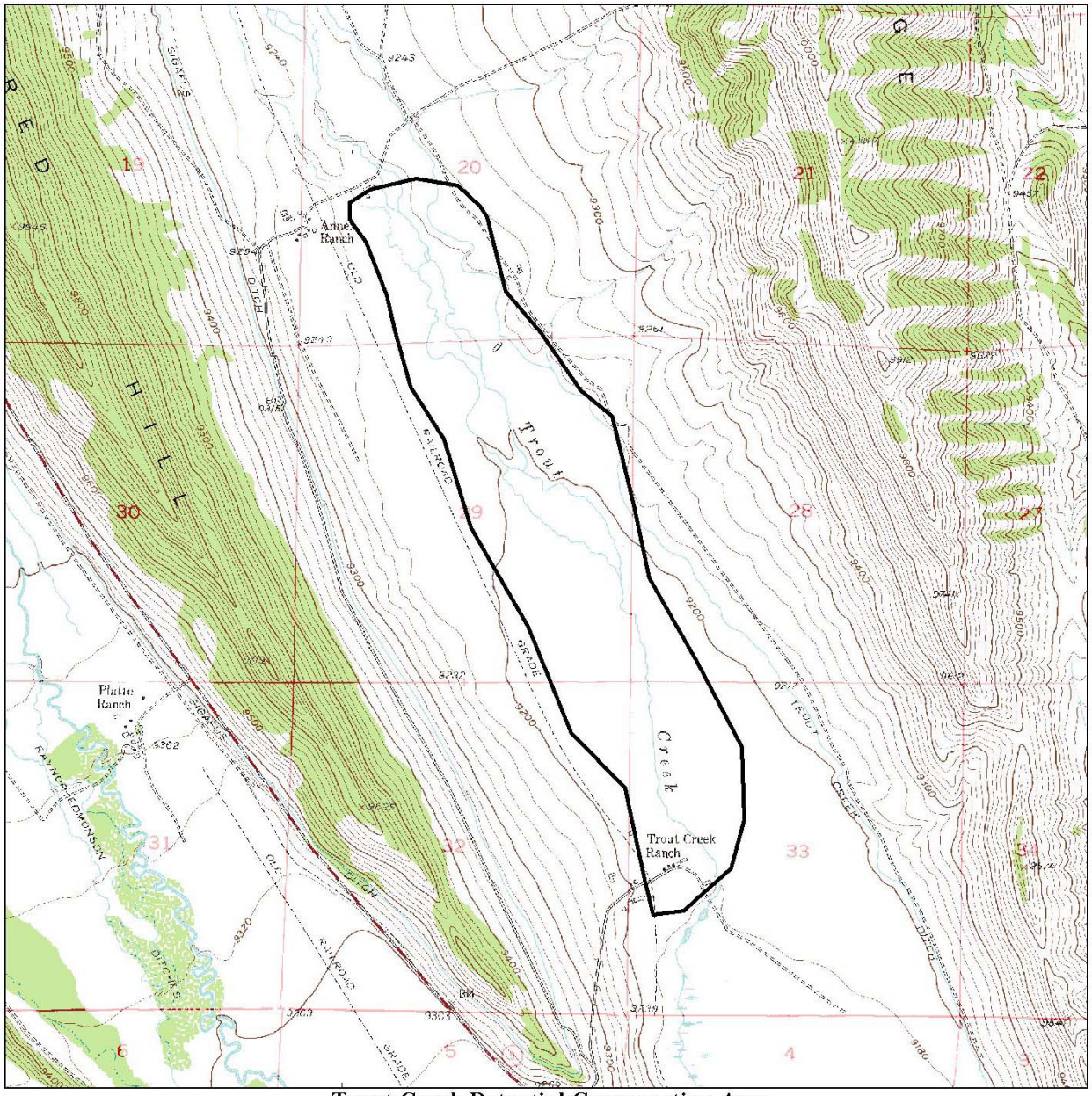
*Element occurrence

Boundary Justification: The eastern slope of Red Hill forms the western boundary and the west slope of Reinecker Ridge forms the eastern boundary. The boundary is drawn to encompass the elements and appropriate habitat that supports the peatland.

Protection Comments: The PCA is on privately owned lands. Development pressures and hydrologic alteration could threaten this site.

Management Comments: The PCA is grazed and irrigated. Many areas of the wetland have been drained.

Mountain plovers have been documented in the vicinity of this PCA. However, conservation efforts for this species would be better directed to other locations within South Park because the land use practices that benefit mountain plovers run contrary to practices that are beneficial to the wetland habitats. Mountain plovers will not use wetlands, rather they prefer dry barren uplands that are maintained by some disturbance process like grazing by cattle or bison, or burning. These disturbance processes can be detrimental to fen habitats. Please see South Park PCA for additional information about mountain plover.



Trout Creek Potential Conservation Area

The Colorado Natural Heritage Program

Colorado State University
254 General Services Bldg
Fort Collins, CO 80523

Map Date: 13 March 2001
GIS Dept: ael

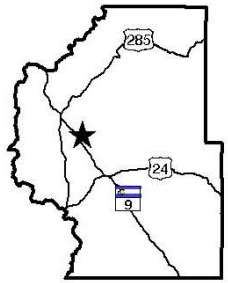
PCA Boundary

7.5 Minute Quadrangle:

Fairplay East, 39105-B8

Digital Raster Graphics (DRGs) produced by the U.S. Geological Survey, 1996

Location in Park County



Disclaimer

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0.3 0 0.3 Miles

Projection UTM, Zone 13, NAD27

CROOKED CREEK SPRING
POTENTIAL CONSERVATION AREA

Biodiversity Rank: B3
Protection Urgency Rank: P2
Management Urgency Rank: M2

Location: Park County. This PCA is located one mile west of Red Hill Pass. The easiest way to approach the site is to drive up Crooked Creek Road from the south, park at Crooked Creek or the creek just south of it, then walk down the hill to the spring/fen.

USGS 7.5 Minute Quadrangle: Como.
Legal Description: T9S, R77W, sections 10,15

General Description: Crooked Creek Spring appears to be only one of several fens that occur within the area one mile west of Red Hill. As described, the PCA contains the only fen known to occur northwest of the Circle V Bar (Silverheels) Ranch. Other fens are suspected to occur to the northeast and southeast. The fen that is the focus of this PCA is found just south of Crooked Creek and is partially fed by a small, unnamed creek. Tall willows (mostly park willow-*Salix monticola*) characterize the upper edge of the fen, but these grade quickly into the hummock/swale system that typifies South Park's extreme rich fens. Many elements of concern are present here, but in very small occurrences. The occurrences may be enlarged with survey of the Silverheels Ranch, but at present the site is ranked a B3 despite the presence of G2 elements because of the size of these occurrences. Also, the lower part of the fen dried up and presumably elements disappeared when a large ditch was dug across the bottom of the slope.

The uplands surrounding the PCA are dominated by Engelmann spruce (*Picea engelmannii*) and lodgepole pine (*Pinus contorta*), with patches of quaking aspen (*Populus tremuloides*.)

This PCA includes approximately 202 acres with an elevation range from about 9800 to 10,200 feet.

Biodiversity Rank Justification: This PCA supports a fair (C-ranked) occurrence of a plant community which is globally imperiled (G2?), and a fair (C-ranked) occurrence of a plant species that is globally imperiled (G2). The occurrences have been given fair ranks due to their small size; however, if surrounding areas are surveyed, this PCA could prove to be more significant than current information reflects.

Element occurrences at the Crooked Creek Spring PCA.

Elements	Common name	Global rank	State rank	Federal status	State status	Federal sensitive	EO* rank	Last observed
Plant communities								
Kobresia simpliciuscula-Scirpus pumilus	**extreme rich fen**	**G2?**	**S1**				**C**	**1995-08-05**
Plants								
Carex livida	Livid sedge	G5	S1			FS/BLM	D	1995-08-05
Carex scirpoidea	Canadian single-spike sedge	G5	S2			BLM	C	1995-08-05
Packera pauciflora	Few-flowered ragwort	G4G5	S1S2			BLM	D	1995-08-05
Primula egaliksensis	Greenland primrose	G4	S2			FS/BLM	C	1995-08-05
Ptilagrostis porteri	**Porter feathergrass**	**G2**	**S2**			**FS/BLM**	**C**	**2000-09-13**
Salix candida	Hoary or silver willow	G5	S2			BLM	C	2000-09-13
Trichophorum pumilum	Little bulrush	G5	S2			FS/BLM	C	1995-08-05

*Element occurrence

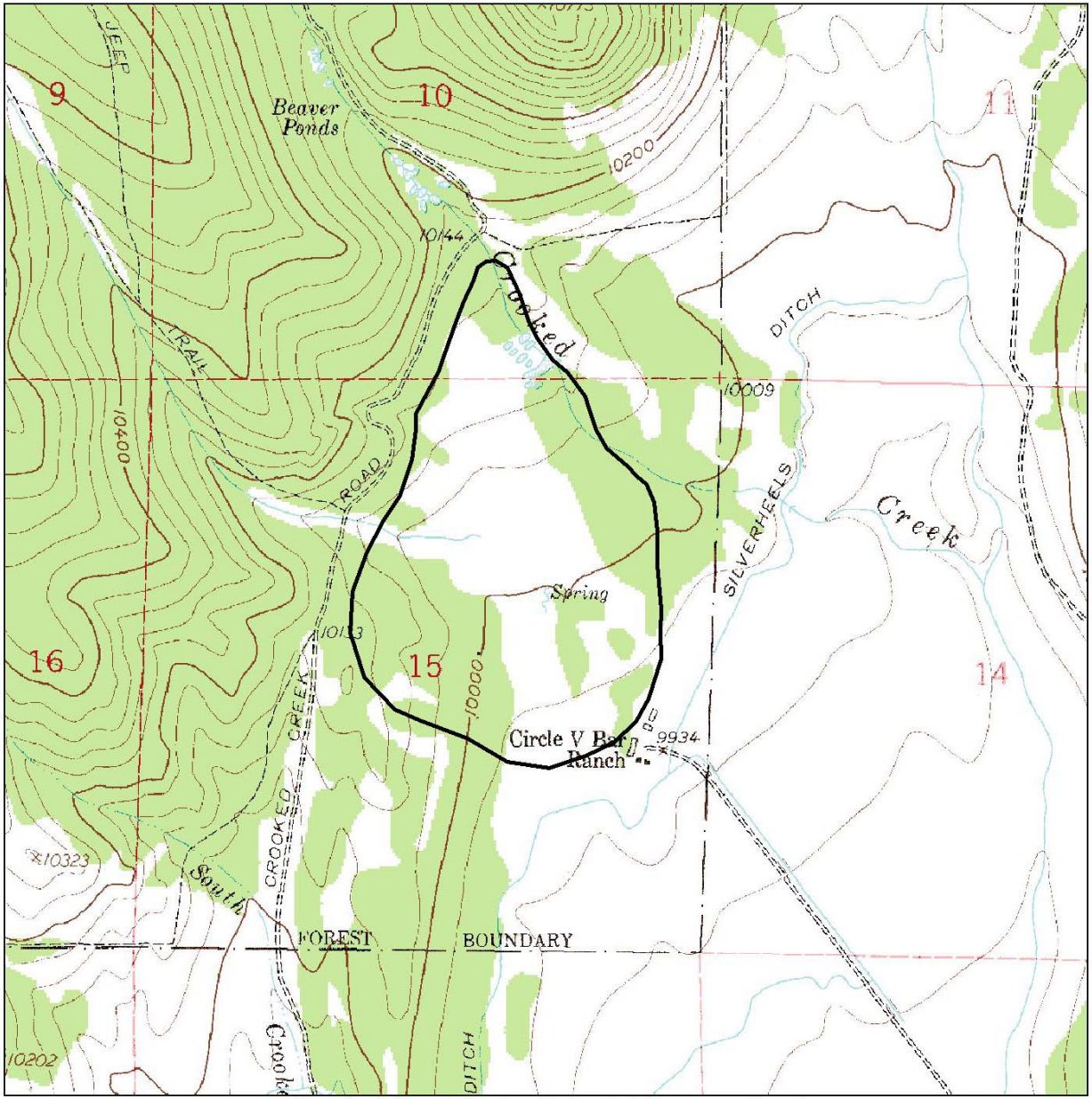
Boundary Justification: The PCA boundary includes the entire known fen area and an area of dried fen at the base where the water supply has been cut off by a ditch. The boundary also includes a buffer of 500-1,000' for consideration of direct impacts from vehicles, cattle, etc. The elements on this site require features of water supply that extend beyond the site and may include Crooked Creek and the creek feeding the west side of the PCA.

Protection Comments: Most of this PCA is publicly owned and managed by the USFS; some private lands are also included in the PCA boundary. The owner of the copious water on this site is unknown; removal of the water would probably result in the destruction of the elements as has already occurred on the lower end of the PCA. The current moratorium on peat mining in Park County will protect the fen from mining impacts at this time.

Management Comments: There is a fuel wood area on west side of PCA (upland portion), and locally heavy use by off-road vehicles and mountain bikes, though the fen area is not directly impacted. The fen is being damaged by cattle trampling and grazing. A ditch that runs through the PCA removes water from the lower end of the site, but it does not appear to adversely affect the upper portion of the peatland. Diversions of water from the creeks above this site could adversely affect the elements.

Additional surveys to the northwest, west and southwest of the PCA would improve our understanding of the distribution of the elements of concern in this area.

Photograph taken at Crooked Creek Spring PCA



Crooked Creek Spring Potential Conservation Area

The Colorado Natural Heritage Program

Colorado State University
254 General Services Bldg
Fort Collins, CO 80523

Map Date: 14 March 2001
GIS Dept: ael

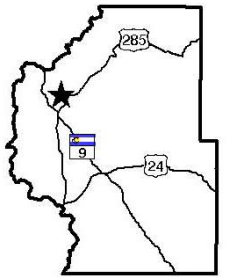
PCA Boundary

7.5 Minute Quadrangle:

Como, 39105-C8

Digital Raster Graphics (DRGs) produced by the U.S. Geological Survey, 1996

Location in Park County



0.2 0 0.2 Miles

Projection UTM, Zone 13, NAD27

SOUTH JEFFERSON
POTENTIAL CONSERVATION AREA

Biodiversity Rank: B3
Protection Urgency Rank: P2
Management Urgency Rank: M4

Location: Park County. The South Jefferson PCA lies just over 1 mile south of Jefferson, in the northern part of South Park.

USGS 7.5 Minute Quadrangle: Milligan Lakes.
Legal Description: T8S, R75W sections 7, 8, 17, 18.

General Description: The core of the PCA is a peatland, an extreme rich fen, with many disjunct boreal plant species, no trees, and only low shrubs. The significant elements occur in an area with large hummocks, with a *Kobresia myosuroides-Thalictrum alpinum* plant association, and with high (10%) cover of the globally imperiled (G2) Porter feathergrass (*Ptilagrostis porteri)*. Adjacent wetlands are wet meadows containing *Juncus ater, Carex* spp., and other common species. Surrounding uplands are primarily montane shortgrass prairie. The PCA lies between Jefferson and Michigan creeks, and is apparently supported by groundwater flowing in from the northwest. The only flowing water at the site is in a human-made ditch that slices from north to south through the site. A significant portion of this wetland (90% of the peatland, estimated 30+ acres) has been drastically altered by peat mining. It probably formerly held more of the significant elements than are currently present. The site hydrology is no longer entirely natural, mainly because of the ditch running through the site. However, the groundwater hydrology that is the main supporter of the elements appears sufficiently intact to support the elements.

This PCA is found at an elevation of about 9400-9500 feet and includes approximately 119 acres.

Biodiversity Rank Justification: This PCA contains a fair (C-ranked) occurrence of a plant community which is critically imperiled on a global scale (G1?), and a fair (C-ranked) occurrence of a globally imperiled (G2) plant species.

Element occurrences at the South Jefferson PCA.

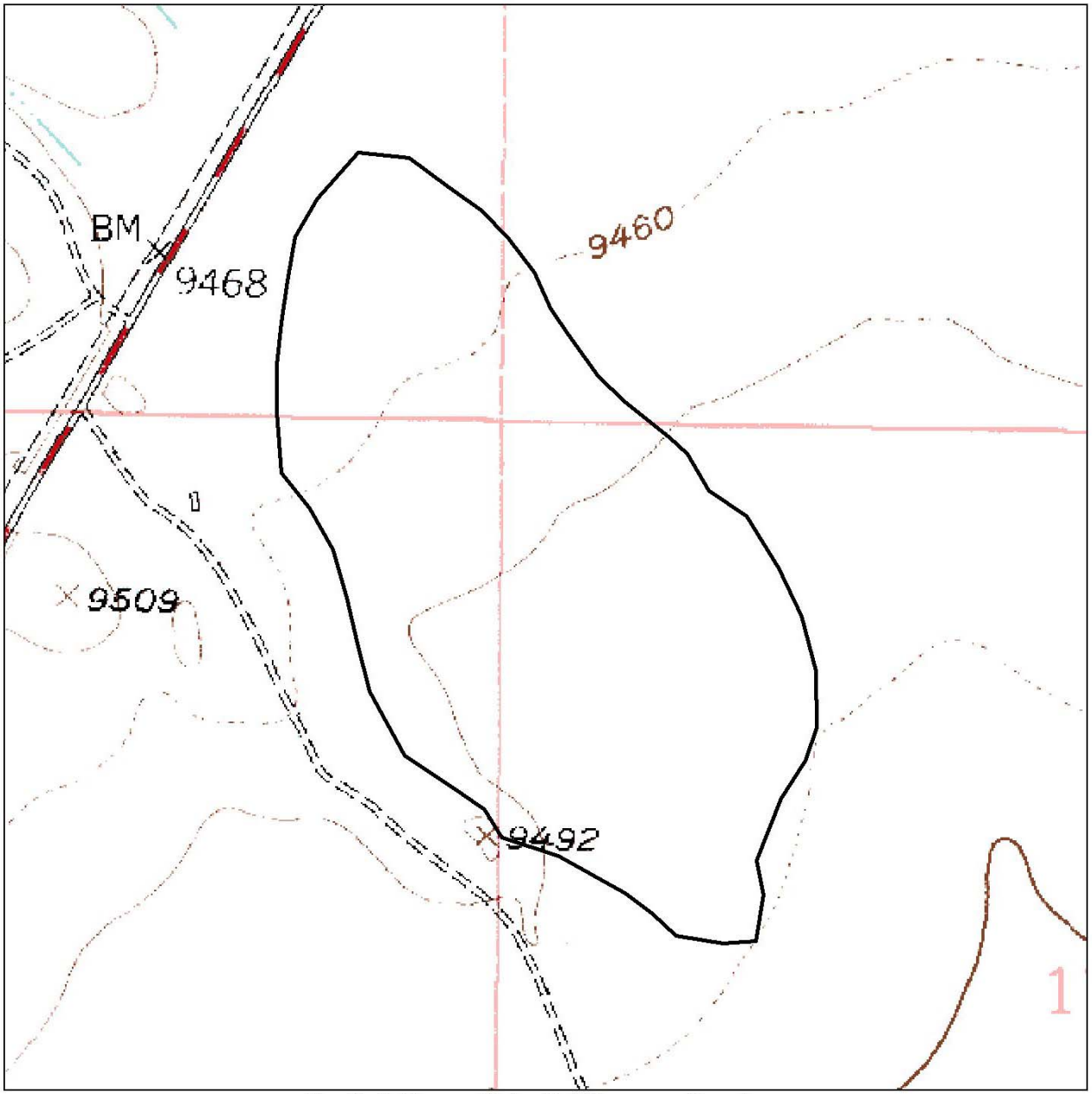
Element	Common name	Global rank	State rank	Federal status	State status	Federal sensitive	EO* rank	Last observed
Plant community								
Kobresia myosuroides-Thalictrum alpinum	**extreme rich fens**	**G1?**	**S1**				**C**	**1995-08-31**
plant								
Ptilagrostis porteri	Porter feathergrass	G2	S2			FS/BLM	C	1995-08-31

*Element occurrence

Boundary Justification: The boundary to the northwest (the assumed direction of water input) was drawn to include a wet meadow area that abuts Highway 285. The boundary is drawn to incorporate an area where natural processes (such as groundwater recharge, species reproduction) function in a manner that maintains viable populations of the elements associated with the fen. However, all hydrological processes necessary to the elements are not fully contained in the boundary. Upstream activities that alter hydrology or sediment loads could detrimentally affect the elements.

Protection Comments: There is currently a moratorium on peat mining in Park County. If the remaining peat at the site were removed, the elements would likely be destroyed. The PCA is privately owned. The PCA falls within the maximum drawdown area of the South Park Conjunctive Use Project as modeled by Jehn Water Consultants, Inc. and Leanord Rice Consulting Water Engineers, Inc. (1998). Any decrease in water could adversely effect the elements; therefore, the South Park Conjunctive Use Project could detrimentally effect the elements at this PCA.

Management Comments: No cattle were seen on the PCA, but it is probably grazed at some time in the year. Management may eventually be needed to restore the site's hydrology, and possibly to minimize grazing. Hydrologic modifications upslope from the PCA could affect the elements.



South Jefferson Potential Conservation Area

The Colorado Natural Heritage Program

Colorado State University
254 General Services Bldg
Fort Collins, CO 80523

Map Date: 14 March 2001
GIS Dept: dcb

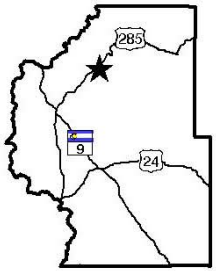
PCA Boundary

7.5 Minute Quadrangle:

Milligan Lakes, 39105-C7

Digital Raster Graphics (DRGs) produced by the U.S. Geological Survey, 1996

Location in Park County



0.1 0 0.1 Miles

Projection UTM, Zone 13, NAD27

HANDCART GULCH
POTENTIAL CONSERVATION AREA

Biodiversity Rank: B3
Protection Urgency Rank: P3
Management Urgency Rank: M2

Location: Park County. Approximately 8 miles northwest of the town of Grant.

USGS 30 x 60 Minute Quadrangles: Denver West, Bailey.
Legal Description: T6S, R 75W sections 7, 18, 19, 20, 29, 30, 31, 32, and T6S, R76W sections12, 13, 24.

General Description: Handcart Gulch occupies the floor of a weakly glaciated valley on the eastern slope of the continental divide. The valley floor extends from Webster Pass to the confluence with Hall Valley. Spruce (*Picea engelmannii)* forests cloak the valley walls below treeline; above treeline, tundra vegetation occupies stable ridgetops, while willow-krummholz thickets occupy slopes with additional moisture. Talus dominates the upper drainage, especially the slopes of Red Cone. The underlying bedrock is metamorphic and highly mineralized with veins of granite.

This PCA includes approximately 2101 acres with an elevation range from about 10,00 to 12,800 feet.

Biodiversity Rank Justification: This PCA supports a good (B-ranked) example of a bog birch/sphagnum iron fen which most likely is globally imperiled.

Element occurrence at Handcart Gulch PCA.

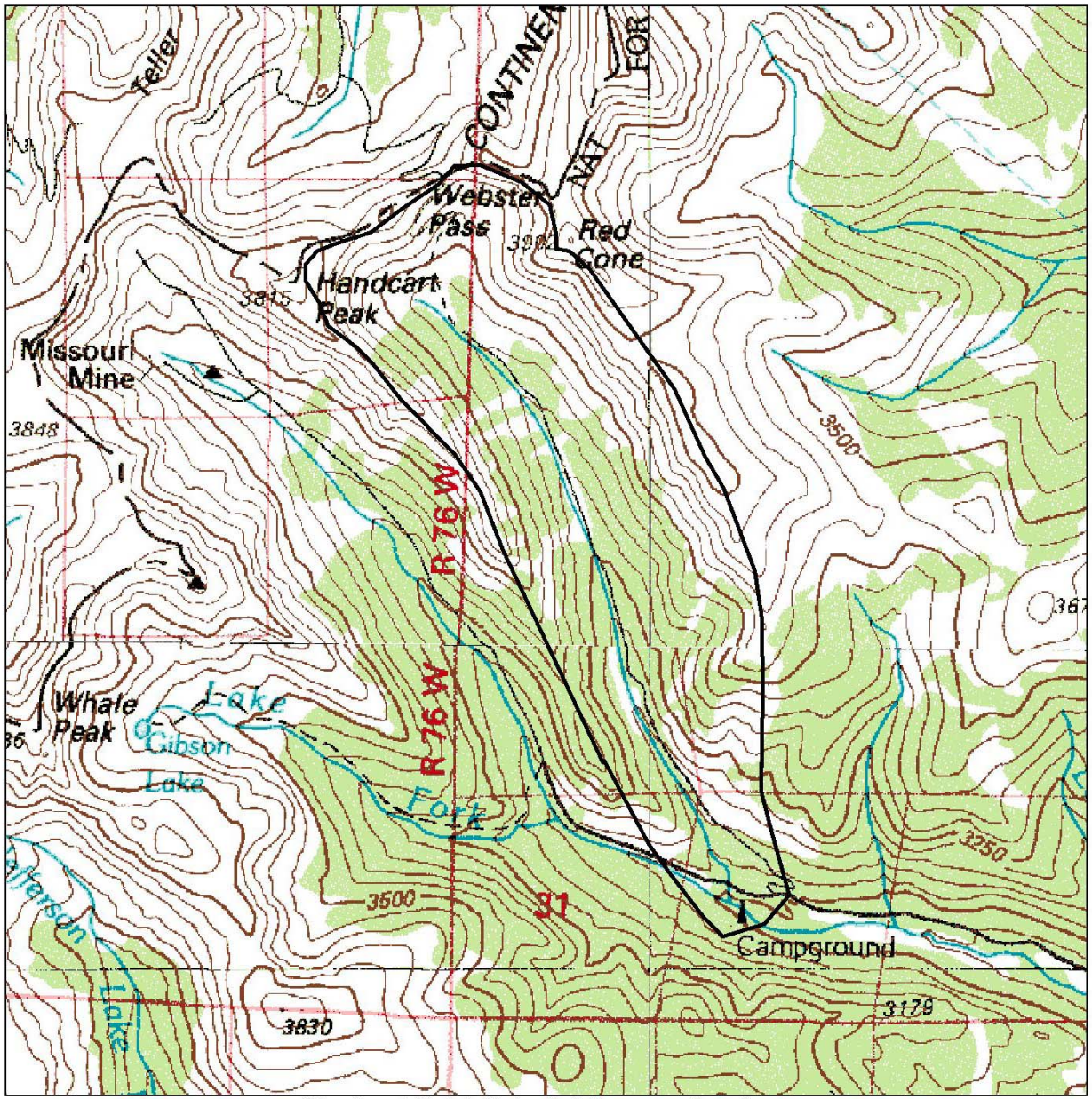
Element	Common name	Global rank	State rank	Federal status	State status	Federal sensitive	EO* rank	Last observed
Plant community								
***Betula glandulosa/Sphagnum* spp.**	**dwarf birch/sphagnum shrubland**	**GU**	**SU**				**B**	**1999-08-03**

*Element occurrence

Boundary Justification: The PCA boundary includes the watershed of Handcart Gulch to its confluence with the North Fork of the South Platte River.

Protection Comments: This PCA includes private lands and public lands managed by the USFS.

Management Comments: Recreational use of off-road vehicles into the fen pose the greatest threat; therefore, some fencing or signing may be required to maintain the viability of this PCA.



Handcart Gulch Potential Conservation Area

The Colorado Natural Heritage Program

Colorado State University
254 General Services Bldg
Fort Collins, CO 80523

Map Date: 15 March 2001
GIS Dept: ael

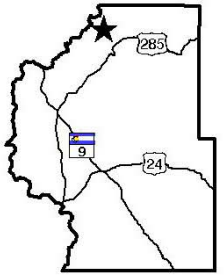
PCA Boundary

30 x 60 Minute Quadrangles:

Denver West, 39105-E1
Bailey, 39105-A1

Digital Raster Graphics (DRGs) produced by the U.S. Geological Survey, 1996

Location in Park County



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0.5 0 0.5 Miles

Projection UTM, Zone 13, NAD27

BUFFALO CREEK AT PONY PARK
POTENTIAL CONSERVATION AREA

Biodiversity Rank: B3
Protection Urgency Rank: P3
Management Urgency Rank: M3

Location: Park County. This PCA is located due west of Antero Reservoir, just west of Highway 285 on the south-facing slope, north of Pony Park Road.

USGS 7.5 Minute Quadrangle: Antero Reservoir
Legal Description: T12S, R77W, sections 22, 23, 24.

General Description: This PCA supports a hillside dominated by mountain mahogany (*Cercocarpus montanus*) and ponderosa pine (*Pinus ponderosa*). The area is grazed but there does not seem to be any other uses. Soils are rocky and thin, with bedrock exposed in several places.

This PCA includes about 261 acres with an elevation range from about 9000 to 9500 feet.

Biodiversity Rank Justification: This PCA supports a good (B ranked) occurrence of an imperiled (G2) foothills shrubland, mountain mahogany/needle and thread grass (*Cercocarpus montanus/Stipa comata*). This is the only known occurrence of this plant community in Park County.

Element occurrence at the Buffalo Creek at Pony Park PCA.

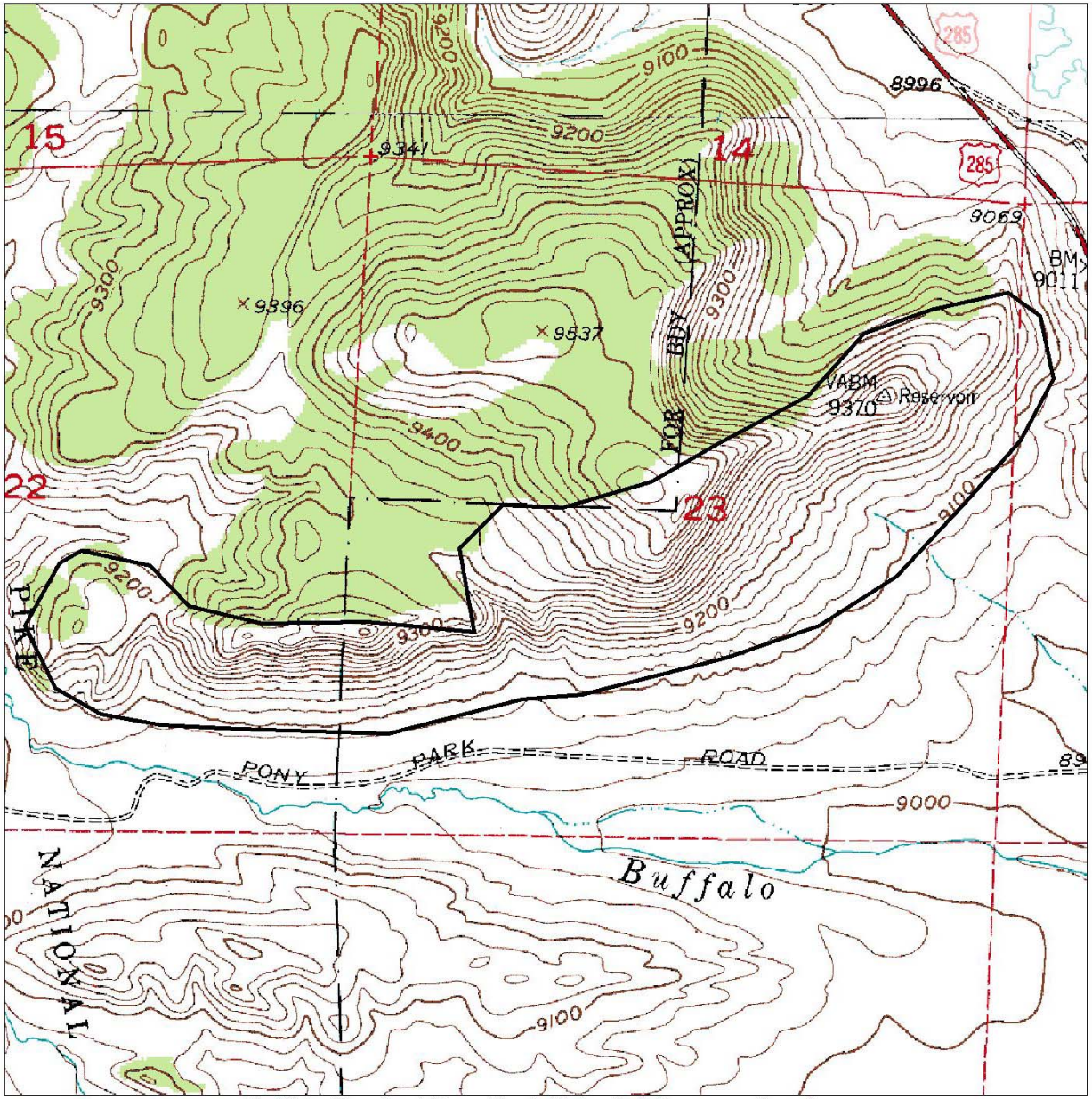
Element	Common name	Global rank	State rank	Federal status	State status	Federal sensitive	EO* rank	Last observed
Plant community								
Cercocarpus montanus/Stipa comata	mixed foothill shrublands	G2	S2				B	2000-09-20

*Element occurrence

Boundary Justification: The PCA boundary is drawn primarily to encompass the foothills shrubland.

Protection Comments: This PCA includes a mix of private, USFS, BLM, and state lands. Specific protection needs are not known.

Management Comments: Cattle grazing is heavy at the bottom of the slope. There is a large campground to the north of the PCA. Otherwise this PCA is in good condition. No non-native plants were noted.



Buffalo Creek at Pony Park Potential Conservation Area

The Colorado Natural Heritage Program

Colorado State University
254 General Services Bldg
Fort Collins, CO 80523

Map Date: 15 March 2001
GIS Dept: ael

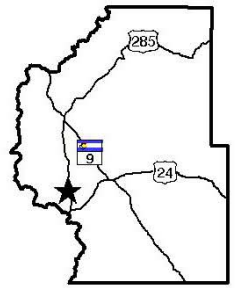
PCA Boundary

7.5 Minute Quadrangle:

Antero Reservoir, 38105-H8

Digital Raster Graphics (DRGs) produced by the U.S. Geological Survey, 1996

Location in Park County



0.2 0 0.2 Miles

Projection UTM, Zone 13, NAD27

JEFFERSON HILL
POTENTIAL CONSERVATION AREA

Biodiversity Rank: B3
Protection Urgency Rank: P3
Management Urgency Rank: M3

Location: Park County. Northern part of Park County along the south facing slopes.

USGS 30 x 60 Minute Quadrangle: Bailey
Legal Description: T6S, R75W, sections 27, 28, 29, 30, 31, 32, 33, 34, 35; T7S, R74W, section 6; T7S, R75W, sections 1-12,14-22, 27, 28, 29; and T7S, R76W, sections 1, 2, 3, 4, 9-17,21-27.

General Description: This PCA contains one of the largest (3630 acres) *Pinus aristata* forest ever documented. It spans a considerable range of *Pius aristata* habitats, including the erect, lower-elevation trees, the twisted, ancient trees of the upper elevations, and the dwarfed trees of the ridge tops. Both the *Pinus aristata/Festuca thurberi* and *Pinus aristata/Trifolium dasyphyllum* plant associations were identified at this site. Some *Pinus aristata* forests areas here also have understories dominated by *Vaccinium myrtillus*. Patches of *Pinus aristata* forests disturbed by fire and snow avalanches are included within the PCA.

Also included in the PCA is a narrow riparian corridor winding steeply through a spruce-lodgepole-aspen (*Picea engelmannii-Pinus contorta-Populus tremuloides*) forest with sparse, but diverse moss and graminoid ground cover. This area is virtually pristine with no livestock grazing or other anthropogenic disturbances noted.

This PCA is found at an elevation of about 9200-12,000 feet and includes approximately 19,627 acres.

Biodiversity Rank Justification: This PCA encompasses two very large areas (>2000 acres) of excellent (A-ranked) bristlecone pine forest (*Pinus aristata*) occurrences as well as two excellent occurrences of riparian forests.

Element occurrences at the Jefferson Hill PCA.

Elements	Common name	Global rank	State rank	Federal status	State status	Federal sensitive	EO* rank	Last observed
Plant communities								
Pinus aristata/Festuca thurberi	**lower montane woodlands**	**G3**	**S2**				**A**	**1994-07-26**

Pinus aristata/Trifolium dasyphyllum	upper montane woodlands	G3	S3				A	1994-06-26
Populus tremuloides/Lonicera involucrata	montane riparian forests	G3	S3				A	1996-06-08
Salix planifolia/Caltha leptosepala	subalpine riparian willow carr	G4	S4				A	1996-07-31

*Element occurrence

Boundary Justification: The boundary was developed primarily around the vast bristlecone pine forest occurrences, plus additional areas large enough to employ management techniques that mimic the historic natural disturbance process of fire. Hydrological processes originating outside of the planning boundary, including water quality, quantity, timing and flow must be managed to maintain site viability.

Protection Comments: This PCA contains both private and public lands managed by the USFS. There is a high threat of residential development to portions of the PCA. There is a need to determine current status of mining claims and access roads within the PCA.

Management Comments: The size of this PCA makes it especially valuable, as natural disturbances may occur in this *Pinus aristata* forest without affecting surrounding areas. Management for fire would benefit the elements by maintaining viability and reproductive success. Recreation use associated with the Colorado Trail and hunting activities may need to be managed. Hydrologic alterations have the potential to greatly impact the riparian communities. Hydrological processes originating inside and outside of the planning boundary, including water quality, quantity, timing and flow must be managed to maintain site viability.

Large patches of dandelions (*Taraxacum officinale*) were noted as occuring along the roadside during a 1996 site visit.

Jefferson Hill Potential Conservation Area

The Colorado Natural Heritage Program

Colorado State University
254 General Services Bldg
Fort Collins, CO 80523

Map Date: 13 March 2001
GIS Dept: ael

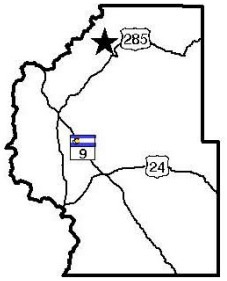
PCA Boundary

30 x 60 Minute Quadrangle:

Bailey, 39105-A1

Digital Raster Graphics (DRGs) produced by the U.S. Geological Survey, 1996

Location in Park County



1 0 1 Miles

Projection UTM, Zone 13, NAD27

LOWER TARRYALL CREEK
POTENTIAL CONSERVATION AREA

Biodiversity Rank: B3
Protection Urgency Rank: P3
Management Urgency Rank: M3

Location: Park County. The north boundary of this PCA begins three miles southeast of Tarryall Reservoir.

USGS 30 x 60 Minute Quadrangle: Bailey
Legal Description: T10S, R72W, section 19; T10S, R73W, sections 10, 13, 14, 15, 19, 23, 24.

General Description: This PCA is located just south of the Tarryall Reservoir. The Tarryall Mountains are to the northeast and the Puma Hills are located to the southwest. A blue spruce/river birch (*Picea pungens/Betula occidentalis*) plant community is located along Tarryall Creek between Tarryall Road and the Creek. It is likely that this riparian occurrence is more dependent on groundwater discharge than by surface overflow from the creek.

This PCA is found at an elevation of about 8600-9000 feet and includes approximately 412 acres.

Biodiversity Rank Justification: This PCA supports a good (B-ranked) occurrence of a globally imperiled (G2) montane riparian woodland, *Picea pungens/Betula occidentalis.* This is one of the highest quality examples of this plant association known from Park County.

Element occurrence at the Lower Tarryall Creek PCA.

Element	Common name	Global rank	State rank	Federal status	State status	Federal sensitive	EO* rank	Last observed
Plant community								
Picea pungens/Betula occidentalis	**montane riparian woodland**	**G2**	**S2**				**B**	**2000-09-18**

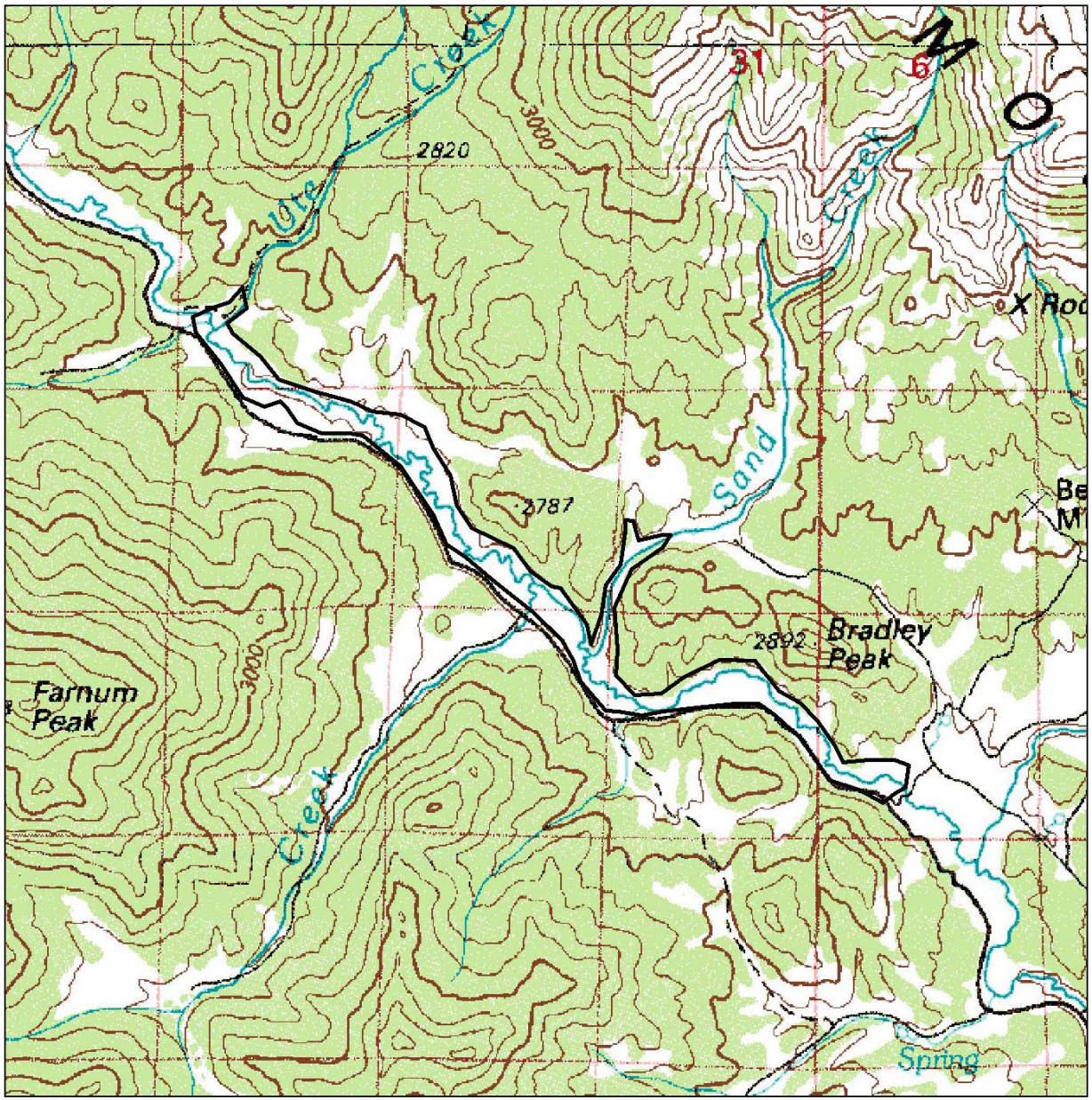
*Element occurrence

Boundary Justification: The boundary is drawn to encompass the riparian forest occurrence, tributaries to Tarryall Creek and provide a 1000 foot buffer. Hydrology, both surface and groundwater, are extremely important to the continued viability of the riparian forest. The entire watershed is not included within the boundary, but should be taken into consideration for planning purposes.

Protection Comments: The PCA includes both private and public lands managed by the USFS. An opportunity currently exists to structure conservation easements with some of the interested private landowners (pers. comm. Gary Nichols 2001). Special designation on National Forest lands may also benefit the riparian woodland.

Management Comments: Hydrology, both surface and groundwater, are extremely important to the continued viability of the riparian forest. The riparian area could be negatively impacted by road maintenance or expansion.

Photograph taken at Lower Tarryall Creek PCA



Lower Tarryall Creek Potential Conservation Area

The Colorado Natural Heritage Program

Colorado State University
254 General Services Bldg
Fort Collins, CO 80523

Map Date: 13 March 2001
GIS Dept: ael

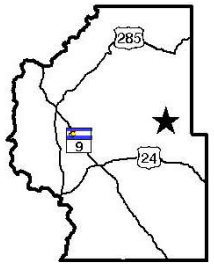
PCA Boundary

30 x 60 Minute Quadrangle:

Bailey, 39105-A1

Digital Raster Graphics (DRGs) produced by the U.S. Geological Survey, 1996

Location in Park County



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0.5 0 0.5 Miles

Projection UTM, Zone 13, NAD27

RUBY CREEK
POTENTIAL CONSERVATION AREA

Biodiversity Rank: B3
Protection Urgency Rank: P3
Management Urgency Rank: M3

Location: Park County. Drive east from Hartsel on Highway 24 to San Miguel Drive. Turn north and continue about nine miles into Pike National Forest. Walk southwest to Ruby Creek draw.

USGS 7.5 Minute Quadrangles: Eagle Rock, Farnum Peak
Legal Description: T10S, R74W, sections 25, 26, 35, 36.

General Description: This PCA occurs in an open draw that contains the intermittent Ruby Creek. Uplands are dominated by bristlecone pine (*Pinus aristata*), quaking aspen (*Populus tremuloides*), and native grasses. A globally vulnerable plant, grassyslope sedge (*Carex oreocharis)*, occurs on the slopes of the draw, predominantly on the west facing slope on the east side of Ruby Creek.

This PCA is found at an elevation of about 9500-9800 feet and includes approximately 434 acres.

Biodiversity Rank Justification:
This PCA includes an excellent (A-ranked) occurrence of a globally vulnerable (G3) plant species.

Element occurrence at the Ruby Creek PCA.

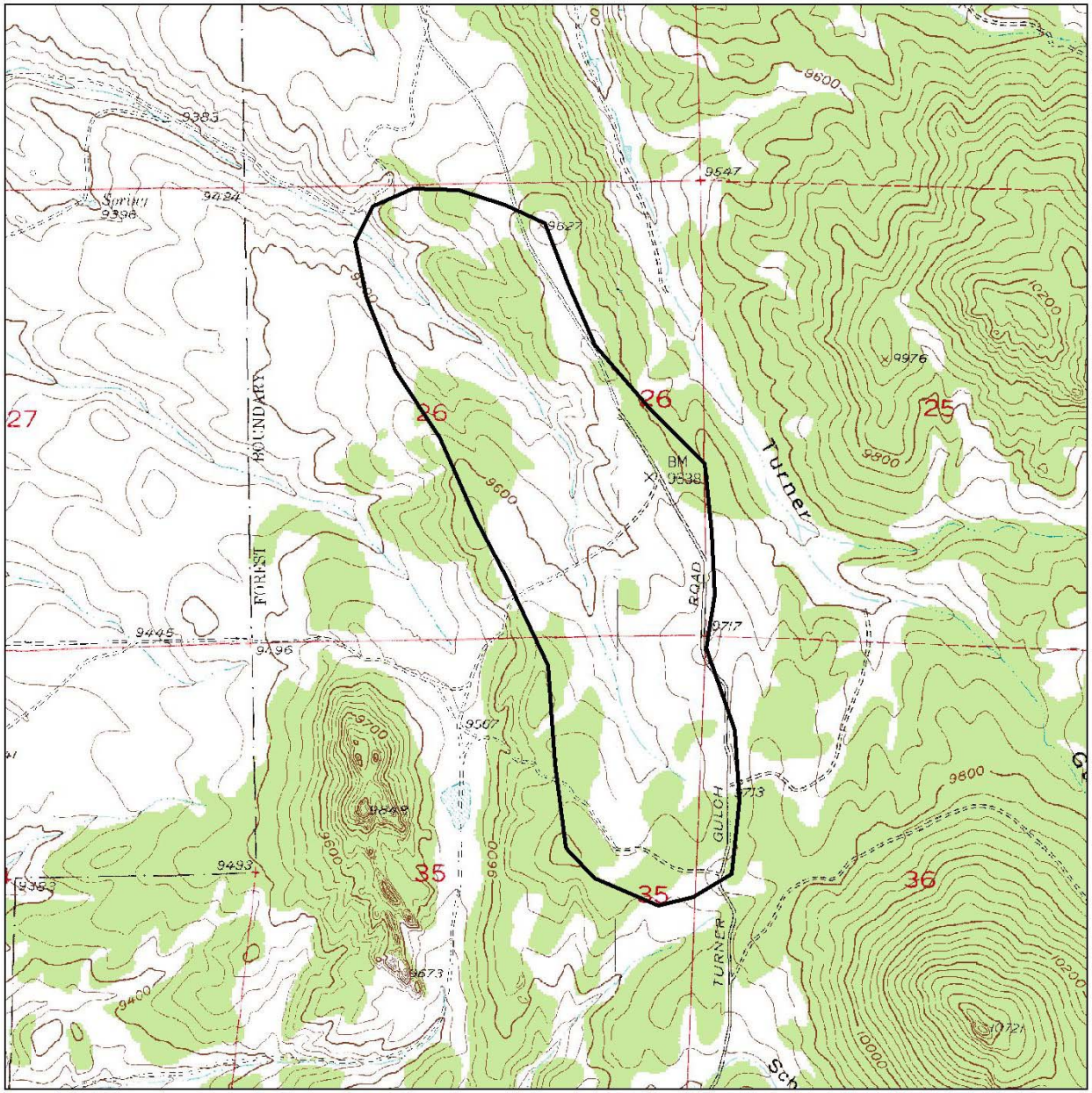
Element	Common name	Global rank	State rank	Federal status	State status	Federal sensitive	EO* rank	Last observed
plants								
Carex oreocharis	**Grassyslope sedge**	**G3**	**S1**				**A**	**2000-08-29**

*Element occurrence

Boundary Justification: The boundary includes the occurrence and some additional potential habitat that the plants may occupy over time. The ecological processes that support this species are not well understood, but it is likely that fire could play an important role. The full area necessary for consideration of a natural fire regime is not necessarily included within this planning boundary.

Protection Comments: This PCA is primarily managed by Pike-San Isabel National Forest, and also includes some private lands. No special protection measures are in place.

Management Comments: This area receives some recreational use, and is also used for cattle grazing. Impacts from these activities appear to be minimal at this time.



Ruby Creek Potential Conservation Area

The Colorado Natural Heritage Program

Colorado State University
254 General Services Bldg
Fort Collins, CO 80523

Map Date: 15 March 2001
GIS Dept: ael

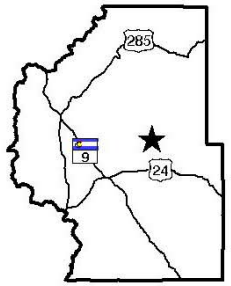
PCA Boundary

7.5 Minute Quadrangle:

Farnum Peak, 39105-B5
Eagle Rock, 39105-B6

Digital Raster Graphics (DRGs) produced by the U.S. Geological Survey, 1996

Location in Park County



0.2 0 0.2 Miles

Projection UTM, Zone 13, NAD27

TELLER MOUNTAIN
POTENTIAL CONSERVATION AREA

Biodiversity Rank: B3
Protection Urgency Rank: P3
Management Urgency Rank: M3

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 that 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.

USGS 30 x 60 Minute Quadrangle: Denver West.
Legal Description: T6S, R76W, sections 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 that 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 PCA includes approximately 1229 acres with an elevation range of about 11,400-12,600 feet.

Biodiversity Rank Justification: The Teller Mountain PCA is botanically significant and includes eight 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)* that 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 that is found on the steep scree slopes adjacent to the alpine meadow, is the northern rockcress (*Draba borealis*). Porter feathergrass (*Ptilagrostis 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 that has only been historically reported in the general area.

Element occurrences at the Teller Mountain PCA.

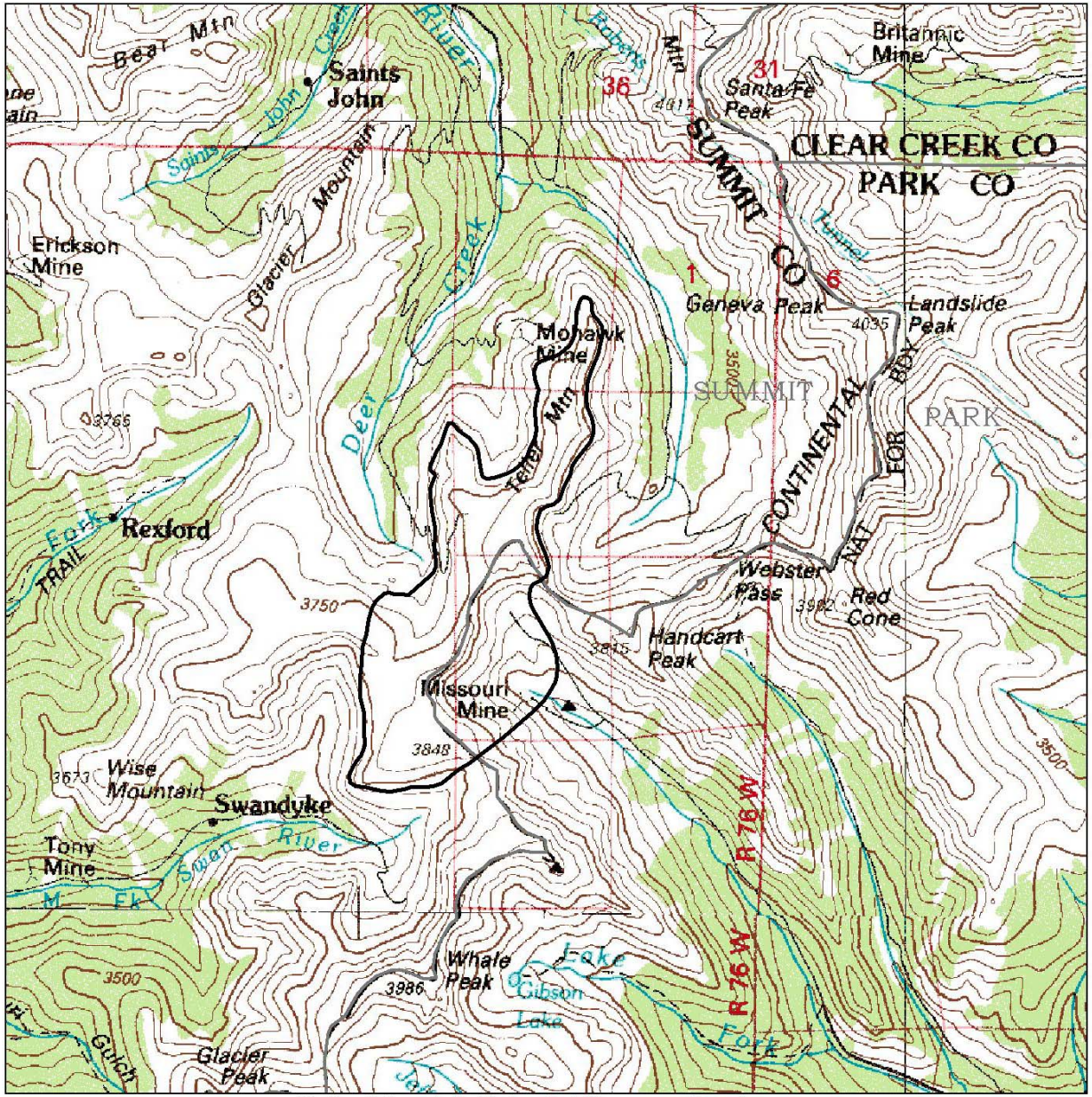
Element	Common Name	Global Rank	State Rank	Federal Status	State Status	Federal Sensitive	EO* Rank
Draba grayana	**Grays Peak whitlow-grass**	**G2**	**S2**				**C**
Ptilagrostis. porteri	Porter feathergrass	G3G5 T2	S2			FS	unranked
Saussurea weberi	Weber saussurea	G3Q	S2				C
Saussurea weberi	Weber saussurea	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

*Element Occurrence

Boundary Justification: This boundary is drawn for consideration of the following: 1) protection of the occurrences from direct impacts such as trampling or other surface disturbances; 2) providing suitable habitat where additional individuals can become established over time; and 3) including 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 PCA is publicly owned and managed by the U.S. Forest Service with the exception of small inholdings that 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 the rare plant occurrences. Exotic plant species should be controlled before they spread to the top of the ridge.



Teller Mountain Potential Conservation Area

The Colorado Natural Heritage Program

Colorado State University
254 General Services Bldg
Fort Collins, CO 80523

Map Date: 14 March 2001
GIS Dept: ael

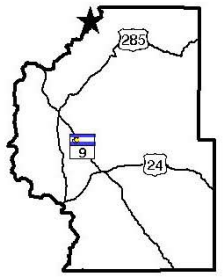
PCA Boundary

30 x 60 Minute Quadrangle:

Denver West, 39105-E1

Digital Raster Graphics (DRGs) produced by the U.S. Geological Survey, 1996

Location in Park County



0.7 0 0.7 Miles

Projection UTM, Zone 13, NAD27

SULLIVAN MOUNTAIN
POTENTIAL CONSERVATION AREA

Biodiversity Rank: B3
Protection Urgency Rank: P3
Management Urgency Rank: M4

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

USGS 7.5 Minute Quadrangle: Montezuma
Legal Description: T5, R75W, section 31; T6S, R75W, section 6; 7; and T6S R76W section 1.

General Description: The Sullivan Mountain PCA 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 415 acres in size and ranges in elevation from about 12,000 to the summit of Geneva Peak at 13,266 feet above sea level.

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

Element occurrences at the Sullivan Mountain PCA.

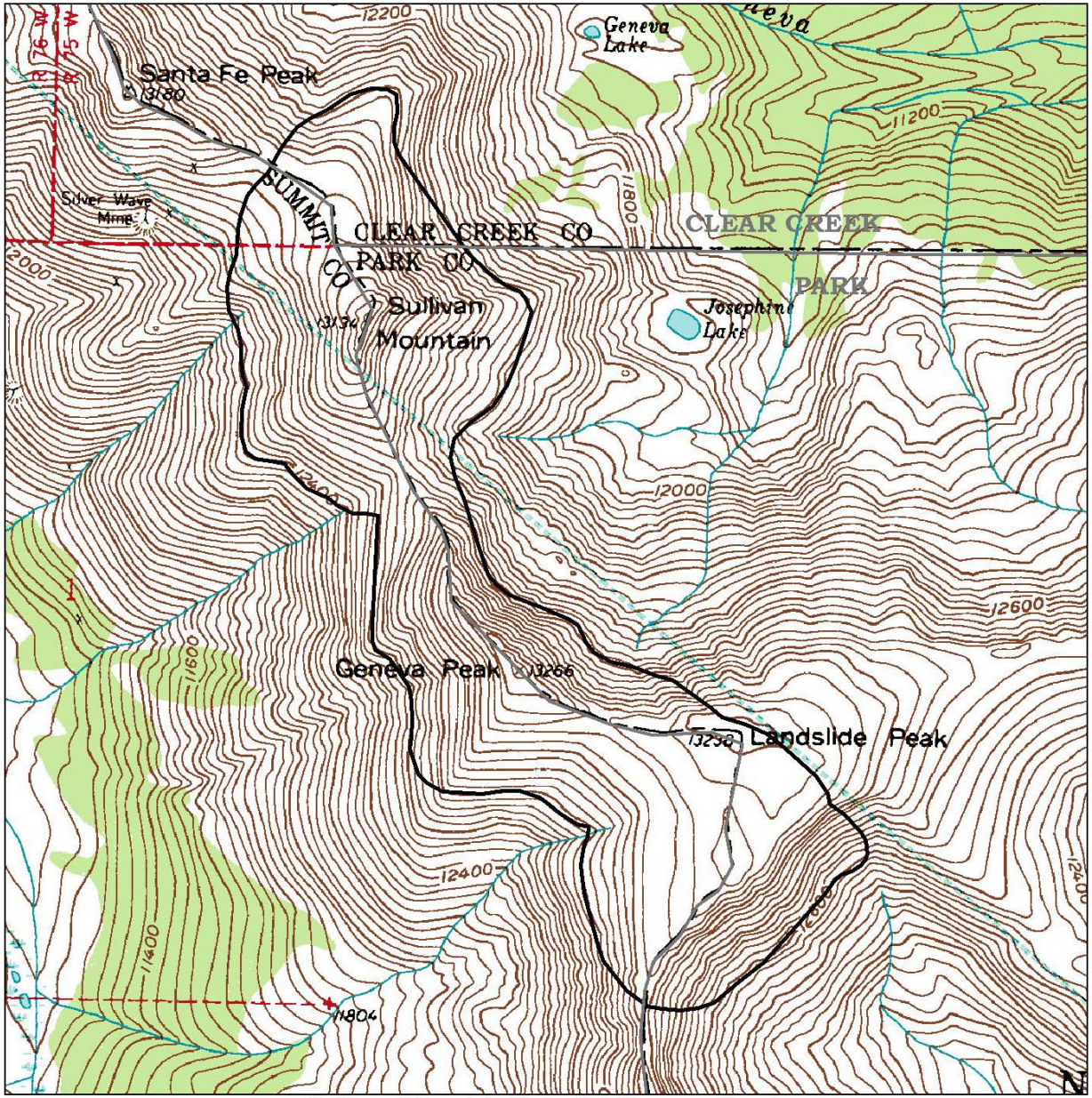
Element	Common Name	Global Rank	State Rank	Federal Status	State Status	Federal Sensitive	EO* Rank	Last observed
Draba grayana	**Grays Peak whitlow-grass**	**G2**	**S2**				**C**	**1997-08-08**
Draba exunguiculata	clawless draba	G3	S2				C	1997-07-23
Draba streptobrachia	Colorado Divide whitlow-grass	G3	S3				C	1997-08-08
Draba crassa	thick-leaf whtlow-grass	G3	S3				D	1997-07-23

*Element Occurrence

Boundary Justification: This boundary is drawn to consider the following: 1) protection of the occurrences from direct impacts such as trampling or other surface disturbances; 2) providing suitable habitat where additional individuals can become established over time; and 3) including representation from each of the local alpine plant communities that 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 Comments: 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.

Management Comments: 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 Potential Conservation Area

The Colorado Natural Heritage Program

Colorado State University
254 General Services Bldg
Fort Collins, CO 80523

Map Date: 15 March 2001
GIS Dept: ael

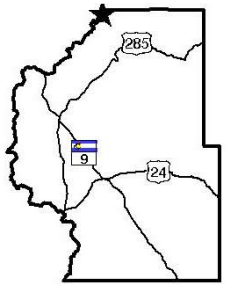
PCA Boundary

7.5 Minute Quadrangle:

Montezuma, 39105-E7

Digital Raster Graphics (DRGs) produced by the U.S. Geological Survey, 1996

Location in Park County



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0.2 0 0.2 Miles

Projection UTM, Zone 13, NAD27

BLACK MOUNTAIN
POTENTIAL CONSERVATION AREA

Biodiversity Rank: B3
Protection Urgency Rank: P3
Management Urgency Rank: M4

Location: Park County. Black Mountain.
USGS 7.5 Minute Quadrangle: Black Mountain
Legal Description: T15S, R74W, sections 28, 29, 30, 31, 32, 33, and T15S, R75W, section 36.

General Description: This is an isolated mountain in South Park. Ancient bristlecone pine (*Pinus aristata)*, some over 2,000 years old, grow on the mountain's steep scree slopes (Brunstein and Yamaguchi 1992). This PCA includes a large (1800 acres) contiguous bristlecone pine forest. It is the only site known to contain the *Ribes montigenum* plant association, and also contain the *Pinus aristata/Festuca thurberi* association.

This PCA includes about 1060 acres with an elevation range from about 9900 to 12,000 feet.

Biodiversity Rank Justification: This PCA contains an excellent (A-ranked) occurrence of a globally imperiled to globally secure (G2G4) plant community and two occurrences of globally vulnerable (G3) plant communities.

Element occurrences at the Black Mountain PCA.

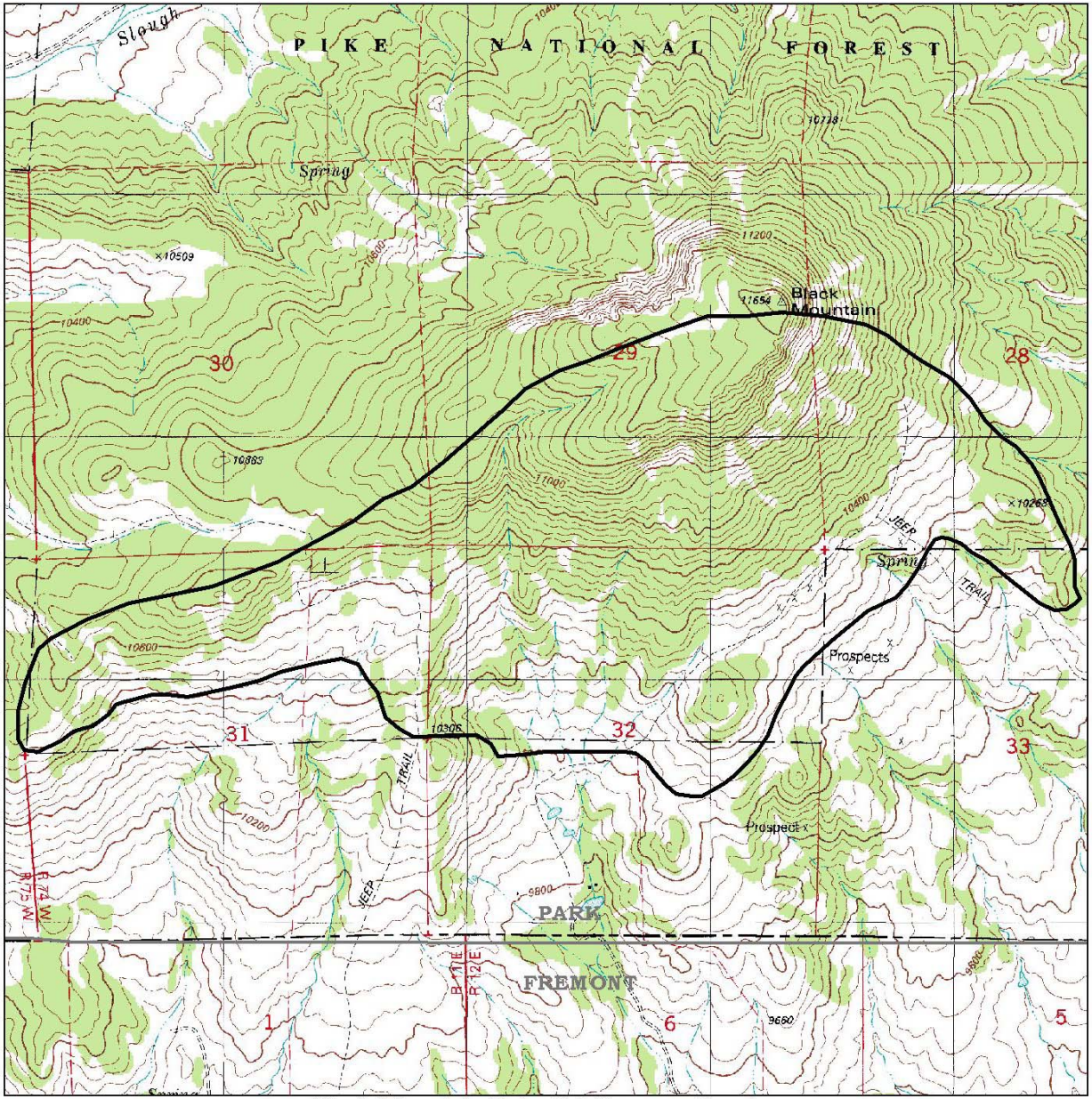
Elements	Common name	Global rank	State rank	Federal status	State status	Federal sensitive	EO* rank	Last observed
Plant communities								
Danthonia parryi	montane grasslands	G3	S3				E	1996-06-29
Pinus aristata/Festuca thurberi	lower montane woodlands	G3	S2				A	1994-08-03
Pinus aristata/Ribes montigenum	**upper montane woodlands**	**G2G4**	**S1**				**A**	**1994-08-03**

*Element occurrence

Boundary Justification: The boundary encompasses the occurrence from the ridgetop down to the lower elevation limits of the stand and includes a lower buffer delineated by Ranne and Baker 1995 as the proposed Research Natural Area boundary. Large scale ecological processes, such as a natural fire regime, are not necessarily incorporated by this boundary.

Protection Comments: This PCA is primarily managed by the USFS, but also includes a mix of private, BLM, and state lands. Black Mountain is an excellent example of a bristlecone pine forests. Its isolation from major road and towns makes it especially desirable as a Research Natural Area site.

Management Comments: Management of grazing near lower slopes may be needed to maintain current quality of this PCA. This area appears to receive fairly limited use.



Black Mountain Potential Conservation Area

The Colorado Natural Heritage Program

Colorado State University
254 General Services Bldg
Fort Collins, CO 80523

Map Date: 15 March 2001
GIS Dept: ael

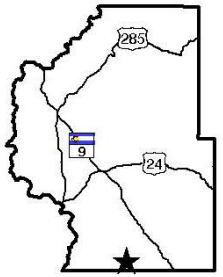
PCA Boundary

7.5 Minute Quadrangle:

Black Mountain, 39105-F6

Digital Raster Graphics (DRGs) produced by the U.S. Geological Survey, 1996

Location in Park County



0.3 0 0.3 Miles

Projection UTM, Zone 13, NAD27

MCCURDY PARK
POTENTIAL CONSERVATION AREA

Biodiversity Rank: B3
Protection Urgency Rank: P3
Management Urgency Rank: M4

Location: Park County. Approximately nine air miles east of Tarryall Reservoir along the Brookside/McCurdy trail.

USGS 30 x 60 Minute Quadrangle: Bailey
Legal Description: T10S, R72W, sections 4, 9, 16, 17, 20, 21.

General Description: This PCA is located within a river valley in the Tarryall Mountains. The site ranges from being a steep, narrow riparian area dominated by conifers and river birch (*Betula fontinalis*) to a wet meadow dominated by willows and herbs.

This PCA includes approximately 218 acres with an elevation range from about 8700 to 11,000 feet.

Biodiversity Rank Justification: This PCA supports excellent occurrences of a globally imperiled (G2G3) riparian forest community and a globally common subalpine riparian willow carr.

Element occurrences at McCurdy Park PCA.

Elements	Common name	Global rank	State rank	Federal status	State status	Federal sensitive	EO* rank	Last observed
Plant communities								
Populus tremuloides/Betula occidentalis		**G2G3**	**S2**				**A**	**1996-08-15**
Salix planifolia/Carex aquatilis	subalpine riparian willow carr	G5	S4				A	1996-08-15

*Element occurrence

Boundary Justification: The PCA boundary extends from McCurdy Park downstream along Hay Creek almost to Tarryall Road. This boundary encompasses the riparian plant communities and an approximately 100 meter buffer.

Protection Comments: The majority of this PCA is located on USFS lands. Some private lands are also located within the PCA boundary.

Management Comments: There do not appear to be any management needs at this time.

McCurdy Park Potential Conservation Area

The Colorado Natural Heritage Program

Colorado State University
254 General Services Bldg
Fort Collins, CO 80523

Map Date: 15 March 2001
GIS Dept: ael

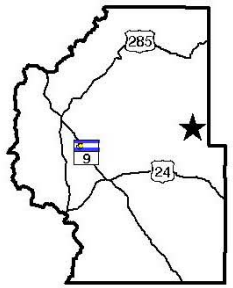
PCA Boundary

30 x 60 Minute Quadrangle:

Bailey, 39105-A1

Digital Raster Graphics (DRGs) produced by the U.S. Geological Survey, 1996

Location in Park County



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0.5 0 0.5 Miles

Projection UTM, Zone 13, NAD27

CRAIG PARK
POTENTIAL CONSERVATION AREA

Biodiversity Rank: B3
Protection Urgency Rank: P4
Management Urgency Rank: M3

Location: Craig Park is located in Park County, five air miles (8 km) southwest of the town of Bailey. It is part of the South Platte Ranger District of the Pike National Forest.

USGS 30 x 60 Minute Quadrangle: Bailey
Legal Description: T7S, R74W, sections 25, 26, 30, 35, 36; T7S, R73W, sections 5, 6, 31, 32; T8S, R74W, section 1; and T8S, R73W, sections 4, 7, 8, 9, 10, 15, 16.

General Description: Craig Park is a ridge and valley system cut into the granite of the Kenosha and Platte River mountains. The valley of Craig Park was not glaciated, unlike most other valleys at this elevation in Colorado. The drainage follows a zone of weak bedrock associated with a major fault, which eroded more easily than the surrounding ridges. Subsequent alluvial deposition created the valley's flat floor.

The floor of Craig Park is currently occupied by a 930-acre (376 ha) complex of fens, willow carrs, and wet meadows fed primarily by sideslope seepage and developed by centuries of beaver activity. These wetlands are surrounded by well-developed and high-quality subalpine grasslands dominated by Idaho fescue (*Festuca idahoensis*), a relatively uncommon plant in this part of Colorado.

Alpine areas are characterized by gentle rolling terrain alternating with frost-shattered rock outcrops. The coarse soils derived from granite do not lend themselves to the development of periglacial features such as patterned ground. Sheltered pockets alternating with exposed knobs support a rich variety of alpine cover types, including alpine willow thicket, turf, and meadow. The coarse soils also produce relatively xeric coniferous forest types below treeline.

On the southwest side of Craig Creek, much of the forest is old-growth Engelmann spruce (*Picea engelmannii*), with large, old trees, snags, and deadfall. Younger spruce forests occur in the northwest corner of the area and lodgepole stands are found on the northeast boundary. bristlecone pine (*Pinus aristata*) stands of all ages occupy the very dry, southwest-facing slopes northeast of Craig Creek.

Craig Park provides excellent representation of tundra, subalpine grassland, wetland, and coniferous forest cover types. Of the twenty-two plant associations noted, only the *Pinus aristata/Trifolium dasyphyllum* and *Kobresia myosuroides/Acomastylis rossii-Carex rupestris*

plant associations have been reported previously from the Pike National Forest. The other twenty plant associations represent a unique opportunity to greatly expand representation in the Rocky Mountain Region's Research Natural Area system in the subalpine fir (*Abies lasiocarpa*), Engelmann spruce (*Picea engelmannii*), bristlecone pine (*Pinus aristata*), Parry oatgrass (*Danthonia parryi*), Idaho fescue (*Festuca idahoensis*), tufted hairgrass (*Deschampsia caespitosa*), sedge (*Kobresia*), snow willow (*Salix nivalis*), water sedge (*Carex aquatilis*), and planeleaf willow (*Salix planifolia*) series. Craig Park is one of a number of important wetland complexes in the South Park region. Lost Park and East Lost Park, also located in the Lost Park wilderness southeast of Craig Park, contain a number of rare graminoids. High Creek Fen and other fens on the floor of South Park support a large number of endemic and Arctic disjunct plant species. Craig Park has the potential also to support such species, although further floristic inventory would be necessary to determine their presence.

This PCA includes approximately 2660 acres with an elevation range from about 10,500 to 12,000 feet.

Biodiversity Rank Justification: This PCA supports two excellent (A-ranked) occurrences of globally vulnerable (G3 and G2G4) plant communities.

Element occurrences at the Craig Park PCA.

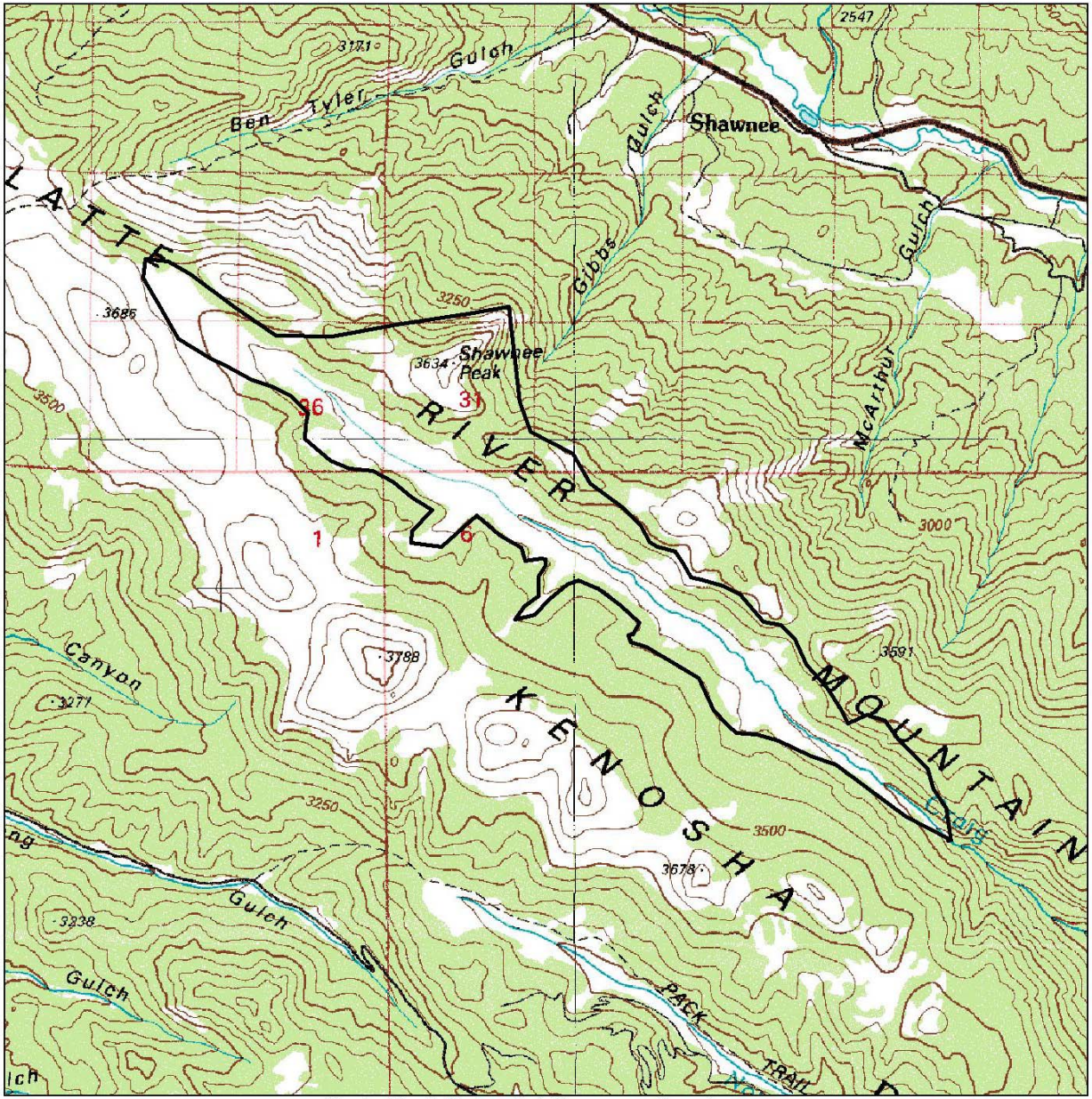
Element	Common name	Global rank	State rank	Federal status	State status	Federal sensitive	EO* rank	Last observed
Plant communities								
Danthonia parryi	montane grasslands	G3	S3				E	1996-07-28
Pinus aristata/Ribes montigenum	**upper montane woodlands**	**G2G4**	**S1**				**A**	**1996-07-99**
Pinus aristata/Trifolium dasyphyllum	**upper montane woodlands**	**G3**	**S3**				**A**	**1996-07-26**

*Element occurrence

Boundary Justification: The boundary is drawn to encompass the wet meadow and riparian wetlands, as well as the upland communities of bristlecone pine and Parry's oatgrass.

Protection Comments: This PCA is publicly owned and managed by the USFS, and is being considered for RNA designation.

Management Comments: Bristlecone pine forests need fire to remain viable. Prescribed burns may be necessary to maintain the quality of this PCA. Craig Park exhibits minimal evidence of human use and is in excellent condition. The area has not been logged or mined, and there is very little evidence of current and historic grazing of domestic livestock. Recreational use is limited to the two systems of trails. These trails provide relatively easy access to the area.



Craig Park Potential Conservation Area

The Colorado Natural Heritage Program

Colorado State University
254 General Services Bldg
Fort Collins, CO 80523

Map Date: 15 March 2001
GIS Dept: ael

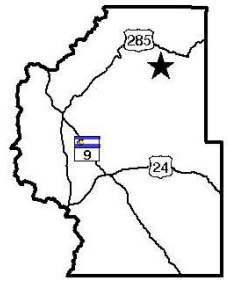
PCA Boundary

30 x 60 Minute Quadrangle:

Bailey, 39105-A1

Digital Raster Graphics (DRGs) produced by the U.S. Geological Survey, 1996

Location in Park County



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0.8 0 0.8 Miles

Projection UTM, Zone 13, NAD27

LONG GULCH AT PLATTE RIVER MOUNTAINS
POTENTIAL CONSERVATION AREA

Biodiversity Rank: B3
Protection Urgency Rank: P4
Management Urgency Rank: M3

Location: Park County. Junction of Long Gulch and Hooper trail.

USGS 7.5 Minute Quadrangle: Topaz Mountain
Legal Description: T8S, 74W, sections 12, 13, 14, 23, 24, 25, and T8S, R73W, sections 7, 18, 19, 30.

General Description: The PCA contains high quality wet meadows and willow carrs in the riparian zone of Long Gulch, as well as surrounding upland areas dominated by bristlecone pine (*Pinus aristata),* Engelmann spruce *(Picea engelmannii),* and quaking aspen *(Populus tremuloides*). Native grasslands dominated by mountain muhly (*Muhlenbergia montana)* and fringed sage (*Artemesia frigida)* form a narrow band between the wetlands and the forests. The area is within the Tarryall Mountains.

This PCA includes approximately 2081 acres with an elevation range from about 10,000 to 12,400 feet.

Biodiversity Rank Justification: This PCA contains a fair (C-ranked) occurrence of a plant species which is imperiled (G2) on a global scale.

Element occurrence at the Long Gulch at Platte River Mountains PCA.

Element	Common name	Global rank	State rank	Federal status	State status	Federal sensitive	EO* rank	Last observed
Plant								
Ptilagrostis porteri	**Porter feathergrass**	**G2**	**S2**			**FS/BLM**	**C**	**2000-09-06**

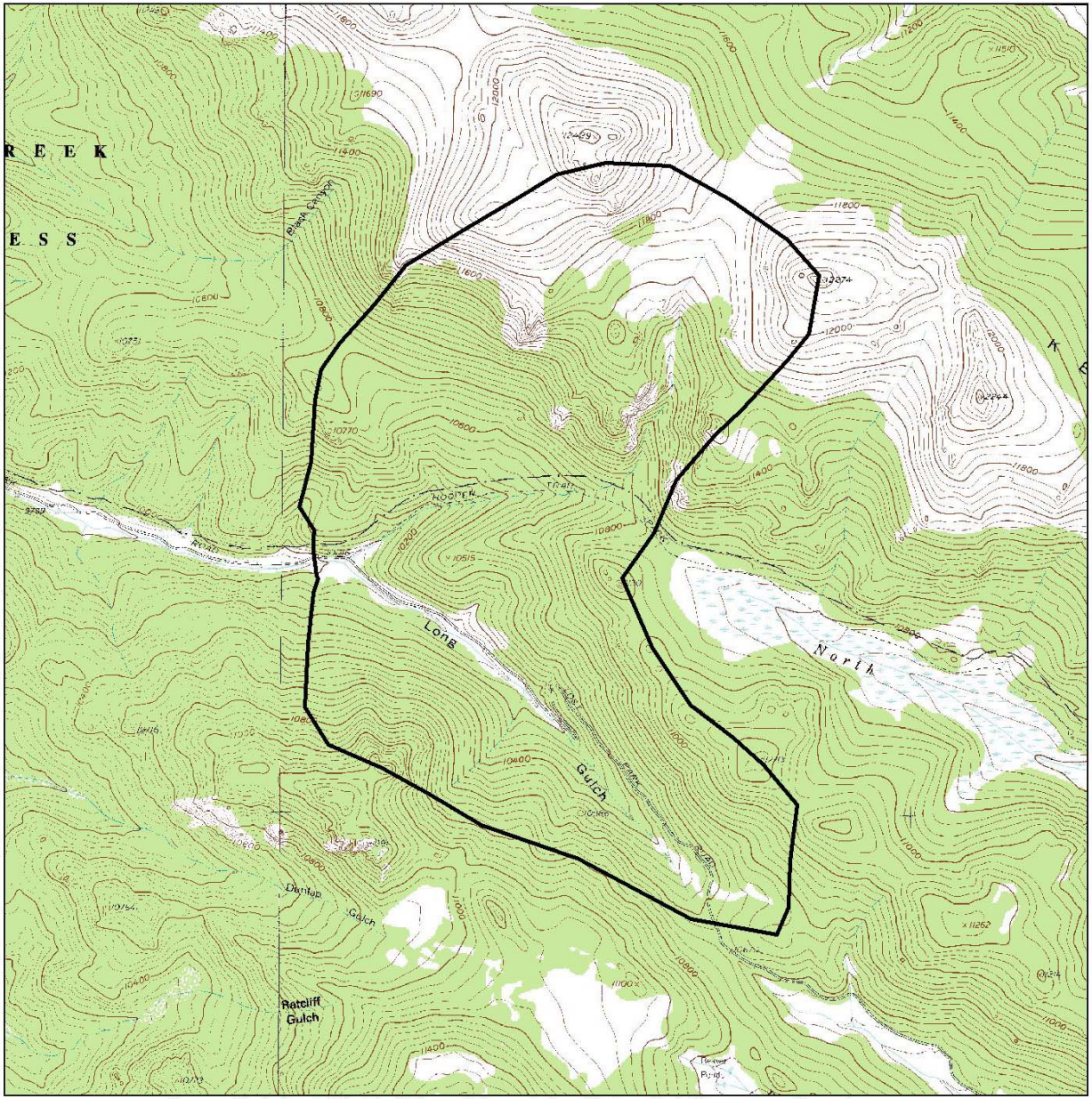
*Element occurrence

Boundary Justification: The planning boundary includes the occurrence, adequate adjacent habitat to provide a buffer, and the uplands areas that make up the local watershed most critical to the occurrence. Note that the entire watershed is not included, and upstream, watershed processes beyond the PCA boundary are also critical to the long-term protection of this site.

Protection Comments: This PCA primarily includes lands managed by the South Platte Ranger District of the Pike-San Isabel National Forest.

Management Comments: The USFS is monitoring this population to check for damage by cattle grazing. Lost Park Road runs through the PCA and receives fairly heavy use. The Colorado Trail runs through part of the PCA, but probably does not impact the Porter feathergrass (*Ptilagrostis porteri*).

Early detection and control of non-native plants would benefit this site.



Long Gulch at Platte River Mountains Potential Conservation Area

The Colorado Natural Heritage Program

Colorado State University
254 General Services Bldg
Fort Collins, CO 80523

Map Date: 15 March 2001
GIS Dept: ael

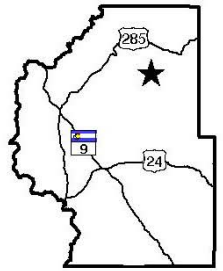
PCA Boundary

7.5 Minute Quadrangle:

Topaz Mountain, 39105-C5

Digital Raster Graphics (DRGs) produced by the U.S. Geological Survey, 1996

Location in Park County



Disclaimer

The data are provided on an as-is, as-available basis without warranties of any kind, expressed or implied, including (but not limited to) warranties of merchantability, fitness for a particular purpose, and noninfringement. CNHP, Colorado State University and the State of Colorado further expressly disclaim any warranty that the data are error-free or current as of the date supplied.

0.4 0 0.4 Miles

Projection UTM, Zone 13, NAD27

ELEVENMILE CANYON
POTENTIAL CONSERVATION AREA

Biodiversity Rank: B3
Protection Urgency Rank: P4
Management Urgency Rank: M4

Location: Park County. This PCA is located along the South Platte River through Elevenmile Canyon, beginning two miles southwest of Lake George, and continuing for about four miles.

USGS 30 x 60 Minute Quadrangle: Pike Peak
Legal Description: T12S, R71W, section 31; T12S, R72W, section 36; and T13S, R72W sections 1, 2, 10, 11, 12, 15, 16, 17, 20.

General Description: This PCA is located along the South Platte River from where it exits Elevenmile Canyon Reservoir to the canyon opening, approximately four linear miles. The steep canyon is has been carved through the Puma Hills by the South Platte River. The riparian area is dominated by a blue spruce/river birch (*Picea pungens/Betula occidentalis*) plant community. The site is bisected by a USFS scenic road that accesses several picnic and fishing areas.

This PCA is found at an elevation of about 8000-9000 feet and includes approximately 909 acres.

Biodiversity Rank Justification: This PCA supports a fair (C-ranked) occurrence of a globally imperiled (G2) montane riparian forest.

Element occurrence at the Elevenmile Canyon PCA.

Elements	Common name	Global rank	State rank	Federal status	State status	Federal sensitive	EO* rank	Last observed
Plant community								
Picea pungens/Betula occidentalis	**montane riparian woodland**	**G2**	**S2**				**C**	**2000-09-18**

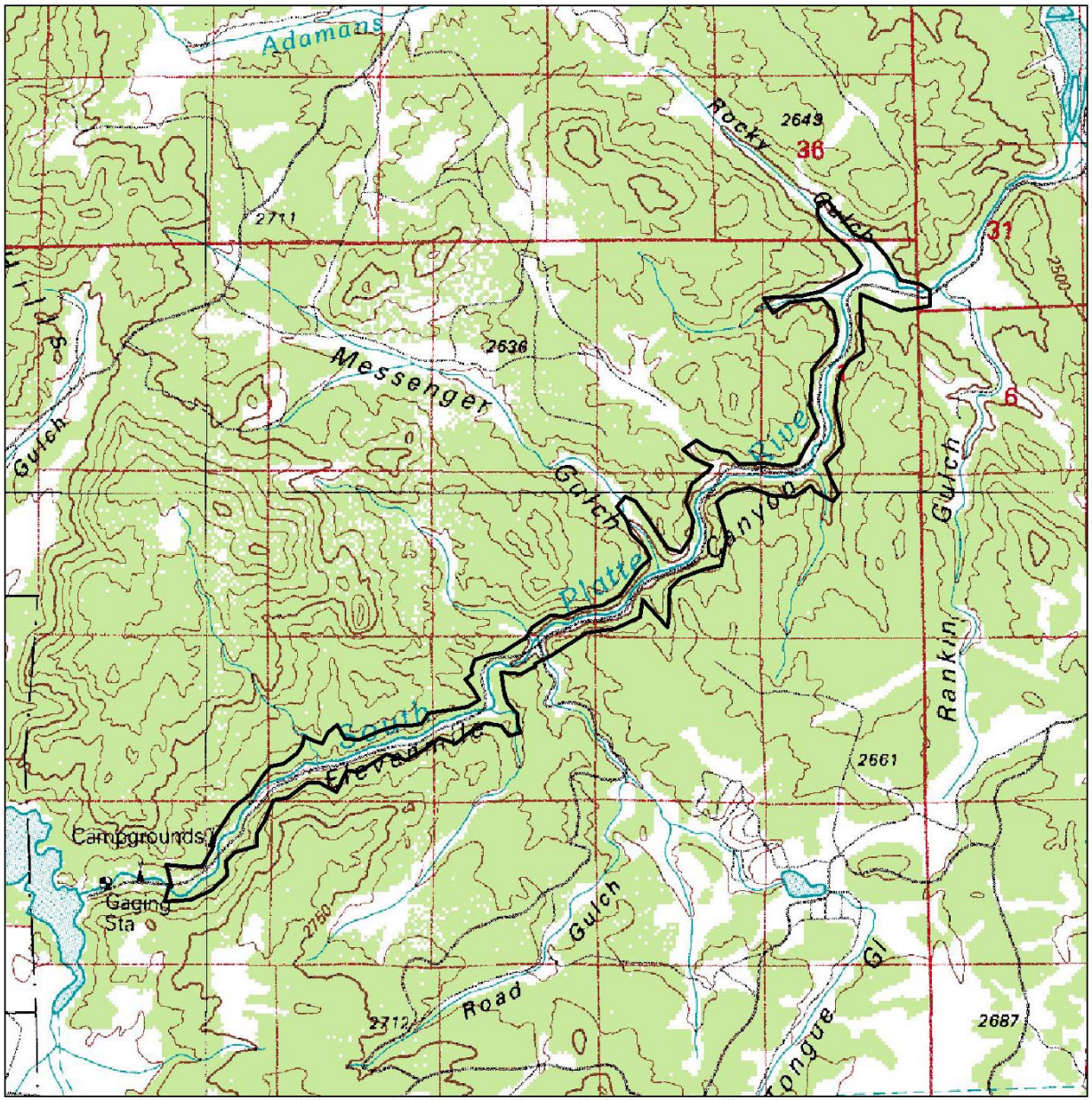
*Element occurrence

Boundary Justification: The PCA boundary is drawn primarily to include the riparian plant community with a 1000 foot buffer. However, hydrology is an essential attribute to the viability of this PCA and thus any impacts throughout the watershed would affect the condition and quality of the riparian forest.

Protection Comments: This PCA is primarily located on publicly owned lands managed by the USFS. Some private lands are also included in the PCA boundary. Upstream activities that alter hydrology or sediment loads could detrimentally affect the elements.

Management Comments: This area currently receives heavy recreational use for fishing, hiking, camping and rock climbing.

Photograph taken at Elevenmile Canyon PCA



Elevenmile Canyon Potential Conservation Area

The Colorado Natural Heritage Program

Colorado State University
254 General Services Bldg
Fort Collins, CO 80523

Map Date: 15 March 2001
GIS Dept: ael

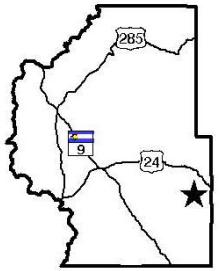
PCA Boundary

30 x 60 Minute Quadrangle:

Pikes Peak, 38105-E1

Digital Raster Graphics (DRGs) produced by the U.S. Geological Survey, 1996

Location in Park County



0.7 0 0.7 Miles

Projection UTM, Zone 13, NAD27

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