D R A F T

Summary of Major Findings for the Marshall Mesa-Southern Grasslands Trail Study Area (TSA) Planning Inventory Report

8/12/05

Synthesis Information

Map 1 (Marshall Mesa-Southern Grasslands Trail Study Area Subareas Map) delineates the Trail Study Area and shows the relevant Visitor Master Plan Management Area designations.

"Big-Picture" Opportunities for Expansion of Public Access and Trail Improvements

- Construction of the "missing trail links" in this TSA, which will provide a long-distance, loop trail system in the Trail Study Area offering multiple-use opportunities and scenic vistas and important interconnections with trails west of S.H. 93 on OSMP lands, and east to Boulder County open space lands and to the Coal Creek Trail in Superior, Lafayette, and beyond.
- Possible new education / interpretation facilities for area history, geology, ranching, and grassland ecosystems.
- Possible regional trail connections to Boulder County Open Space, Jefferson County Open Space, and Rocky Flats National Wildlife Refuge.
- Safe trail crossing at an underpass under S.H. 93 from Marshall Mesa Trail to the Community Ditch Trail.
- Improved and safer trailheads (i.e., construction of the new City Limits Trailhead and improvement of Greenbelt Plateau Trailhead).
- Potential for new trailheads—determine the status of the Marshall Mesa Trailhead and options for new trailheads in the vicinity of S. 66th Street south of S.H. 170 and at the existing western terminus of the Coalton Trail and S.H. 128.

"Big-Picture" Opportunities for Resource Protection

- Preservation of the large size and ecological function of the core wildlife habitat block and the Coal Creek riparian area in the Southern Grasslands Habitat Conservation Area (HCA), which provide diverse habitats remote from development and connected with other undeveloped natural areas managed by Boulder County, Jefferson County, and the Rocky Flats National Wildlife Refuge.
- Protection of rare, imperiled, and highly-vulnerable resources listed by the Colorado Natural Heritage Program (CNHP).
- Ecological restoration of the Coal Creek riparian / aquatic ecosystem and the tallgrass, mixed-grass, and short-grass prairie complex in the Southern Grasslands.

Factors that Suggest Favorable Opportunities for Public Access and Trail Improvements ("Green Lights")

- Availability of the Community Ditch culvert under S.H. 93 as a possible trail under-crossing.
- Availability of the City Limits Trailhead site to address the crowding and unsafe conditions at the Marshall Mesa Trailhead.

- Availability of suitable alignments for the Marshall Mesa to S. 66th trail connection and the new trail from the City Limits Trailhead to the Community Ditch Trail.

Factors that Suggest Caution When Considering Public Access Alternatives ("Caution Signs" or "Yellow Flags")

- Large patches of big bluestem plant communities.
- Rare butterfly habitat associated with the xeric tallgrass prairies.
- Prairie dog colonies that have room to move across the prairie landscape.
- Occupied habitat for a rare subspecies of the Northern Pocket Gopher.
- High-quality habitat for, and high-density of, ground-nesting grassland birds.
- Important hunting areas for wintering and nesting raptors.
- Prairie escarpment and north-facing shrubland habitats.
- Wetland / stream crossing of Coal Creek and other wetland areas.
- Doudy Draw-Greenbelt Plateau concentration of high avian diversity.
- Large size of the un-fragmented habitat block in the Southern Grasslands.
- Potential reintroduction areas for Plains sharp-tailed grouse and pronghorn antelope.
- Local infestations of State-listed priority A and B weeds.
- Safety concerns associated with the Marshall Mesa Trailhead.
- Safety concerns associated with visitors crossing S.H. 93 to continue travel on the Community Ditch Trail.
- Unknowns about the ground stability of the City Limits Trailhead site.

Factors that Suggest Looking Elsewhere for Public Access Opportunities ("Warning Signs" or "Red Flags")

- Preble's meadow jumping mouse habitat.
- Bald eagle nesting closure area.
- Burrowing owl nesting area.
- Local occurrences of Colorado Natural Heritage Program-listed rare and sensitive species.
- Contaminated areas closed to public access due to historical use of Marshall Landfill and other industrial use impacts.
- Varra active mining and mine reclamation closure area (smaller than the combination of areas identified on the OSMP Trails Map because reclamation has been completed).
- Eggleston Reservoir # 4 Wildlife Preservation Area closure.
- Coal Creek restoration area.
- Privately-owned conservation easement properties and privately-owned Marshall Lake properties that do not allow public access.

Composite Map of Key Natural and Cultural Resources

Map 2 (Composite Map of Key Natural and Cultural Resources) shows a composite of key natural and cultural resources. Documentation of how Geographic Information Analysis (GIS) was used to develop this map is located in Attachment A. This composite map is a spatial overlay of several key resources that affect the suitability of visitor access and trails. The map only includes resources that can be located with specific locations on the map; it does not include

other resources that are non-specific in location because of their wide-ranging or transient nature. The purpose of the map is to show where the highest concentration of important mappable resources is located. The color categories on the map show how many different mapped resources are present in any given area. No weighting of these resources is factored into the numerical ratings, just the presence or absence of the resource.

The results show that the highest concentration of resources is located in the following areas:

- A limited portion of the Marshall Mesa area, which includes important cultural resources, rare plant and wildlife species identified by the Colorado Natural Heritage Program, prairie dog colonies, and riparian or wetland vegetation.
- The northern part of the Southern Grasslands HCA, which includes CNHP-listed big bluestem tallgrass plant communities and other rarities, prairie dog colonies, nesting burrowing owls, and riparian or wetland vegetation.
- The Coal Creek restoration area, and the Rocky Flats area south of S.H. 128., which include co-occurrence of many of key resources: Bald eagle nest sites, many CNHP-listed communities or species, prairie dogs colonies, Preble's meadow jumping mouse habitat, Coal Creek riparian restoration area, wetlands, and important cultural resources.

Two other areas do not show up with a high concentration of multiple mapped resources, but they are very valuable because they are the largest tallgrass and mixed grass prairie habitat blocks that support high quality native grassland ecosystems. The first of these areas, the Greenbelt Plateau area, contains a big bluestem habitat block that is particularly valuable because of the excellent nesting grassland bird habitat it offers. In the portion of the Southern Grasslands HCA south of Coal Creek, this habitat block supports several large complexes of prairie dog colonies with abundant predator populations that require large patches of interior habitat, and also several types of CNHP-listed species.

Some of the high resource concentration areas include important late prehistoric, Pre-European and European settlement features.

On this map, certain areas are identified as closed to public access and therefore are not open to consideration for trails. These areas include: the Eggelston Reservoir # 4 Wildlife Preservation Area around Eggelston reservoir # 4, the still active Varra clay mining pit, and the chemical contamination area on the eastern portion of the Damyanovich property (east of S. 66th Street).

Inventory Information Summarized by Visitor Master Plan Management Areas and Subareas

Map 1 shows the boundaries of the Visitor Master Plan Management Areas and the subareas used in this inventory.

West Marshall Mesa Passive Recreation Area

Existing Visitor Use

- This management area is a very heavy visitation area. Marshall Mesa Trail and Community Ditch Trail are popular with pedestrians, dog walkers, mountain bikers, and horseback riders. An extensive network of undesignated trails has developed here.
- The Marshall Mesa Historic Mining Area is a popular destination, with interpretive signs provided by OSMP.
- Dog management is on-leash or voice-and-sight control.
- The Marshall Mesa Trailhead is frequently congested, and parking backs up onto S.H. 170, which can be dangerous at times.
- The at-grade road crossing of S.H. 93 by visitors traveling on the Community Ditch Trail is a significant safety hazard.

Natural Resources

- This management area includes patches of ponderosa pine forest (farthest extension of foothills forest into the prairie of any area in the Open Space and Mountain Parks system), a rich diversity of shrubs, and relatively wet meadows and savannas. Riparian areas are present in the Cowdrey drainage and along the ditches, and wetlands exist in low-lying areas.
- While this management area was severely disturbed by mining activity in the 19th and 20th centuries, native plant communities have recovered in some areas. The management area includes some rare plants and butterflies listed by the Colorado Natural Heritage Program.
- Marshall Mesa geology includes sandstone outcrops, plant fossils, and a coal seam. Evidence from historic Marshall Mesa coal mining activities is present, and interpretative signs provide highlights to visitors.

Planned Major Access Opportunities

- Further evaluation of the status of the Marshall Mesa Trailhead and its associated crowding and unsafe conditions.
- A new City Limits Trailhead that would be connected to the Community Ditch Trail.
- Potential for potable water and restrooms at the City Limits Trailhead.

Major Trail Requests Identified in the Public Questionnaire (See Map 3. Marshall Mesa-Southern Grasslands Trail Study Area Planned and Requested Trail Improvements)

- New City Limits Trailhead with visitor services such as potable water and public toilets.
- Connection of the City Limits Trailhead with Community Ditch Trail
- Designation of some of the undesignated trails to historical or geological features.

Major Access Constraints

City Limits Trailhead

- Possible need for an engineering solution to ground subsidence and / or contamination at the City Limits Trailhead.

Marshall Mesa Trailhead

- Planned S.H. 170 road widening and new bike lanes will reduce the width of the current parking area and may affect the existing parking at the trailhead.

East Marshall Mesa Natural Area

Existing Visitor Use

- No designated trails currently exist.
- Considerable visitor use occurs on undesignated trails heading toward Marshall Lake and Superior.
- Dog management is on-leash or voice-and-sight control.

Natural Resources

- This management area includes drier upland grasslands (mostly Western wheat-mixed grass prairie), but also some wetter big bluestem tallgrass patches, and patches of green needle grass (a rare Front Range endemic species) and shrublands. Diverse riparian areas are present in the Cowdrey drainage and along the ditches, and wetlands exist in low-lying areas.
- While this management area was severely disturbed by mining activity in the 19th and 20th centuries, many native plant communities have recovered to varying degrees.

Planned Major Access Opportunities

- Extension of the Marshall Mesa Trail East to South 66th Street and then connection to Coal Creek Drive, providing new multiple-use recreational opportunities (including bicycling) and completing the northern part of the trail loop in the TSA. These trail improvements are identified in the Boulder Valley Comprehensive Plan.

Major Trail Requests Identified in the Public Questionnaire (See Map 3)

- Extension of the Marshall Mesa Trail east to S. 66th Street and then farther east and south to Boulder County Open Space properties.
- New connecting trail from the Marshall Mesa Trail eastern extension north (across S.H. 170) to the Davidson Mesa area.

Major Access Constraints

South 66th Trail Connection

- Cowdrey drainage wetlands and riparian areas.
- Some rare plant communities (e.g., green needle grass) and plant species (dwarf leadplant), a small prairie dog colony (not yet mapped), and pockets of shrub bird habitat.

- Contaminated area on the east side of S. 66th Street: need for stabilization of contaminated soils, fencing, and continuation of an area closure to provide safe public trail access through the Damyanovich property to S. 66th.

Southern Grasslands Habitat Conservation Area (HCA) / Doudy Draw Natural Area

The Southern Grasslands HCA contains the largest relatively intact block of grassland habitat in the Open Space and Mountain Parks system (a mosaic of plains riparian, tallgrass, mixed grass, and short grass habitats). It is a diverse complex of many different kinds of prairie grassland communities. Natural processes and functions occur in this grassland to a greater extent than elsewhere because of the large size of this un-trailed habitat block, its remoteness from development, and proximity to other large expanses of natural prairie lands owned by other public entities. This large block of prairie habitat supports a very diverse suite of wildlife species that depend on little human disturbance and various natural processes that can only occur in large habitat blocks.

Coal Creek Subarea

Existing Visitor Use

- The Coal Creek riparian restoration area is currently fenced and closed to public access. Historically, the Coal Creek corridor has received a low level of off-trail travel by visitors.
- Some current off-trail visitation occurs on the Varra access road and other undesignated trails outside the restoration area.

Natural Resources

The Coal Creek riparian restoration area contains a multitude of highly valuable and vulnerable resources that are unique and sensitive, and are in the process of being restored. Some of the reasons that this riparian area is so important ecologically is the un-trailed seven-mile stretch of the creek (Coal Creek is one of the only un-trail plains streams in the Front Range), the abrupt transition from foothills to plains riparian ecosystems, the contiguity of the riparian area with adjacent large patches of high-quality grassland, which supports diverse habitats for different life-cycle stages and foraging needs of reptiles, amphibians, birds, and large and small mammals. Specific important resources present in this subarea include:

- Rare un-trailed plains riparian ecosystem with a high level of biodiversity due to: the steep-gradient stream transition from foothills to plains; hybridization of upper- and lower-elevation cottonwood riparian species (which increases habitat diversity); and a rich variety of wetland, riparian, and upland plant communities that support a high diversity of insects and riparian and shrubland birds.
- Refuge for rare and imperiled plant communities and species listed by the Colorado Natural Heritage Program.
- Occupied and potential habitat for the federally-listed threatened Preble's meadow jumping mouse.
- Many natural hydrologic processes are in place with dynamic Coal Creek's stream channels and flood plain complex.

- Undisturbed raptor nesting, perching, and hunting area and site for nesting of federally-listed bald eagles.
- Undisturbed habitat for amphibians, including Northern Leopard Frogs that are a species of concern.
- Riparian forest and shrubland that is an important shelter for small mammals and birds.
- Important wildlife movement corridor from the foothills to the plains.
- Major restoration focus for stream channel and flows, wetlands, fish passage, and riparian and other native plant communities.

Planned Major Access Opportunities

- None.

Major Trail Requests Identified in the Public Questionnaire (See Map 3)

- Trails in the Coal Creek restoration area or parallel to it.
- Trails crossing through the restoration area.

Major Access Constraints

- The high ecological value of this rare stretch of un-trailed prairie riparian corridor, along with the major commitment of funds for its ecological restoration, make trails in the area or trail crossings of the riparian corridor have a higher resource impact potential.

Greenbelt Plateau Subarea

Existing Visitor Use

- The Greenbelt Plateau subarea currently has only one trail in it: the Greenbelt Plateau Trail that forms the boundary between the Doudy Draw Natural Area and the Southern Grasslands Habitat Conservation Area. This trail receives a moderate amount of visitor use.
- Some off-trail visitation occurs on various undesignated trails. A separate user-created undesignated trail runs parallel to the Greenbelt Plateau Trail is used mainly by bicyclists who want a "single-track" trail. Concerns have been raised that these parallel trails foster the spread of weeds and expand the "trail effect" that fragments and reduces the value of habitat.
- A recently installed stoplight at the intersection of State Highways 128 and 93 now provides a safe road crossing and connection from the Greenbelt Plateau Trail to the Doudy Draw Trail .
- Dog management in this subarea is a combination of dogs on-leash or under voice-and-sight control in the Doudy Draw Natural Area portion of this subarea and on the Greenbelt Plateau Trail and dogs on-trail and on-leash in the Southern Grasslands HCA portion of the subarea.

Natural Resources

- The Greenbelt Plateau subarea contains large patches of native xeric tallgrass dominated by various big bluestem plant communities—some of the best occurrences in the OSMP system.

- This subarea provides a refuge for rare and imperiled plant communities and species listed by the Colorado Natural Heritage Program, as well as occurrences of rare CNHP-listed butterflies.
- The Greenbelt Plateau subarea is a very important area for grassland nesting birds. The area supports both high avian species richness (i.e., many different kinds of species including those of special concern) and high overall bird nesting density; the area is only one of two known places on OSMP lands that supports the full suite of the five primary grassland bird species.
- In the northern part of the Southern Grasslands HCA, a large complex of prairie dog colonies is located south of Marshall Lake.

Planned Major Access Opportunities

- None.

Major Trail Requests Identified in the Public Questionnaire (See Map 3)

- New trail that would allow visitors to travel from the Greenbelt Plateau Trail to an under-crossing of S.H. 93 and then connect with the Doudy Draw Trail. This under-crossing would go through the existing culvert that allows livestock to cross under S.H. 93.
- New trail from Marshall Mesa to the area south of Marshall Lake that would form a "stacked trail loop" system with the Marshall Mesa Trail.
- New flat and easy loop trail accessible to people with disabilities from the Greenbelt Plateau Trailhead and offering scenic vistas.
- Modification of the flat, wide, straight Greenbelt Plateau Trail (an old roadbed) by narrowing the trail and building in some higher-interest serpentine curves. These modifications would be designed to slow down bicyclists, reduce conflict between bikes and pedestrians and horses, and encourage visitors to stay on trail.
- A northern or interior alignment of the trail connection between Greenbelt Plateau Trailhead to a mid section of the Coalton Trail. This alignment would basically run east-west from the trailhead and would connect with other requested north-south trails in the eastern part of the Trail Study Area. This alignment would run south of the Coal Creek subarea and would cut through the interior of the Southern Grasslands HCA.

Major Access Constraints

- This subarea's high-quality big bluestem xeric tallgrass prairie provides very important relatively undisturbed habitat for grassland nesting birds.
- Public access is not allowed in the Hayes conservation easement / Eggelston Reservoir # 4 Wildlife Preservation Area, the Varra active mining and mine reclamation closure area, and the Rothman conservation easement.
- Currently, private entities lease Marshall Lake for private recreational use. In addition, the large complex of prairie dog colonies south of Marshall Lake is a significant constraint to increased public access to the lake.

Southern Grasslands Core Area

Existing Visitor Use

- This subarea currently has no designated trails in it, except for the Coalton Trail that forms the eastern boundary of the Southern Grasslands HCA and receives a low level of visitation.
- Undesignated trails are minimal, and the amount of off-trail use is low.
- A launch site for beginning-level hang gliders has historically been located on the north side of State Highway 128 on the Waneka property. The area of landing activity is relatively small.
- Dog management in this subarea is dogs on-trail and on-leash.

Natural Resources

- This subarea is a large block of high-quality unfragmented grassland habitat, which is remote from development and adjacent to other large stretches of similar protected habitat (i.e., other OSMP lands to the north and west, Boulder County Open Space to the east and south, and Rocky Flats National Wildlife Refuge to the south). This subarea is drier than Greenbelt Plateau, and the prairie grasses are dominated by Western wheatgrass and blue grama. The value of this large un-trailed grassland habitat block (the largest single block of intact grassland in OSMP) lies in being able to support a very diverse suite of wildlife species that depend on little human disturbance and various natural processes that can only occur in large habitat blocks.
- This grassland includes several rare and imperiled plant communities listed by the Colorado Natural Heritage Program. Rare plant communities includes those on mesa tops (such as several big bluestem types, New Mexico feathergrass) and in other locations (such as blue grama-buffalo grass). The grassland supports CNHP-listed rare and imperiled butterflies that depend on large expanses of native prairie.
- This subarea includes several large important undisturbed prairie dog colonies and is the largest designated Prairie Dog Habitat Conservation Area in Open Space and Mountain Parks. The extensive prairie dog colonies, because of the large habitat block, can expand, contract, and migrate over the landscape naturally over time, and natural predator-prey relationships and behaviors can be maintained.
- The grassland is large enough and intact enough to be a site for threatened and endangered species reintroductions (e.g., Plains sharp-tailed grouse and pronghorn antelope).
- Prescriptive grazing is used as a management tool in the dominant mixed-grass community to suppress weedy species and stimulate the growth of native species.

Planned Major Access Opportunities

- Trail connection from the Coalton Trail to Greenbelt Plateau Trail completing the southern part of the loop trail at the periphery of the TSA. This trail connection is identified in the Boulder Valley Comprehensive Plan.

Major Trail Requests Identified in the Public Questionnaire (See Map 3)

- Trail connection from the Coalton Trail to the Greenbelt Plateau Trailhead.
- Several trails in the interior of this habitat block connecting to the Coalton Trail and the planned Coalton-Greenbelt Plateau trail link.
- Improvement of Greenbelt Plateau Trailhead with better ingress to the site, extension of paving, and accommodation of horse trailer parking.
- Improvement of the Coalton Trail parking area off S.H. 128.

Major Access Constraints

- Ecological value of this core habitat block that derives from its remoteness and current undisturbed condition.
- The high-quality grassland nesting bird habitat and prairie dog habitat.
- The potential for Plains sharp-tailed grouse reintroduction.
- A significant threat of weed dispersal into the three rare plant community types present in the current hang gliding landing site along S.H. 128, with the possibility of weeds being carried in from other local launch and landing sites, e.g., jointed goat grass to the Southern Grasslands area.

Possible Expansion of the Greenbelt Plateau Trailhead

- The trailhead is adjacent to tallgrass communities on the north, west, and east.

Coalton to Greenbelt Plateau Trail Connection

- CDOT has ruled that an OSMP trail cannot be placed in the S.H. 128 R.O.W.
- Several natural resources will need to be protected or mitigated: rare plant communities, prairie dogs, wetlands, riparian areas, and grassland bird habitat.
- Large continuous habitat block.

Rocky Flats Subarea

Existing Visitor Use

- No designated trails in this subarea. Overall visitor use levels are low.
- Some off-trail visitor activities have historically occurred in this subarea, including hiking and occasional model airplane use and dog training activities.
- Dog management in this subarea is dogs on-trail and on-leash.

Natural Resources

- This subarea is a high quality block of unfragmented grassland habitat (including extensive big bluestem communities), which are adjacent to similarly protected lands owned by the federal government to the south and east (i.e., National Wind Technology Center and Rocky Flats National Wildlife Refuge).
- This subarea includes several rare and imperiled plant communities listed by the Colorado Natural Heritage Program, as well as high-quality habitat for the Preble's meadow jumping mouse and a rare pocket gopher subspecies.

- The subarea contains extensive wetlands and riparian areas, which are fed by springs, seeps, and Coal Creek. The Coal Creek riparian restoration area extends south into this subarea.
- In addition to important nesting grassland bird habitat, this subarea includes important shrubland habitat on prairie escarpments and north-facing slopes. These shrubland areas are valuable habitat for many birds and small mammals.

Planned Major Access Opportunities

- None.

Major Trail Requests Identified in the Public Questionnaire (See Map 3)

- New trail along the east side of S.H. 93 and a spur trail connecting to the culvert under S.H. 128.

Major Access Constraints

- Major concentration of wetlands, seeps, and springs.
- Coal Creek riparian restoration corridor.
- Federally-listed Preble's meadow jumping mouse habitat.
- Potential site for Plains sharp-tailed grouse reintroduction.
- Cultural resource locations.

Attachment A

Explanation of Grid-Based Spatial Overlay Analysis Used in Developing the Composite Map of Key Natural and Cultural Resources

In order to determine the suitability of proposed trail alignments, it is necessary to create a suitability model that examines the coincidence of natural resource spatial datasets for the area. This is made possible by completing an unweighted grid-based analysis using GIS to compile all pertinent data in order to display the suitability model in a single data layer. For this particular analysis we used the following 12 datasets:

- ½-Mile Bald Eagle Nest Site Buffer Zone
- Burrowing Owl Breeding Area
- Coal Creek Riparian Restoration Area (fenced exclosure)
- Colorado Natural Heritage Program's (CNHP) Rare Plants Occurrences
- CNHP Plant Communities of Special Concern
- CNHP Rare Animal Occurrences
- Cultural / Historical Occurrences (Colorado Historical Society)
- Eggleston Reservoir #4 Wildlife Preservation Area
- Preble's Meadow Jumping Mouse Conservation Zones
- Riparian Vegetation
- Wetland Vegetation
- 2004 Prairie Dog Colonies

Each dataset was converted separately to raster, or grid format, with a cell size of 0.25 acre (each side of the cell is 104.36 ft). Where the resource was present, the grid cells were assigned a value of 1, and when the particular resource was not present, the grid cell received a value of 0. This step was completed for each of the 12 datasets; and then all resulting grids were added together to determine the number of resources present within each grid cell. For example, a grid cell receiving a score of four could be the result of containing the following four resources: Bald eagle nest, Coal Creek Riparian Restoration Area, a CNHP tracked vegetation community, and the Preble's meadow jumping mouse Conservation Zone.

The results of this analysis show the relative differences in the number of Key Cultural and Natural Resources within the Trail Study Area.