RAPID RESOURCE ASSESSMENT AND MANAGEMENT PLAN KHALSA OPEN SPACE BOULDER COUNTY, COLORADO

Prepared for—

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SUMMARY

KHALSA PROPERTY		
APPROXIMATE SIZE	**ACQUISITION DATE**	**CURRENT ZONING**
39 acres	November 22, 2005	Forestry
MANAGEMENT DESIGNATION		**PUBLIC ACCESS**
Habitat Conservation Area		Access only with HCA off-trail permit

GENERAL DESCRIPTION OF SITE RESOURCES

The property lies on the southwest side of the slope below Kossler Lake. Topography on the property generally slopes to the south and southwest. A ponderosa pine wood characterizes the southern aspects of the property. A ponderosa pine/Douglas-fir woodland dominates the southwestern quarter of the property with Douglas fir dominating north facing slopes and shaded areas. The property encompasses a drainage that feeds into Woods Gulch.

OPEN SPACE VALUES BASED ON RESOURCE ASSESSMENT

The property is important for open space because it maintains—

- Contiguous forested habitat within the Boulder Mountain Park system
- Winter range for mule deer; winter range and severe winter range for elk
- A winter concentration area for wild turkey

MANAGEMENT ISSUES BASED ON RESOURCE ASSESSMENT

Some management issues that could adversely affect the open space values on the property include—

- Fire hazard due to current and future fuel loading
- Noxious weed infestations

INTRODUCTION

PURPOSE

The City of Boulder Open Space and Mountain Parks Department (OSMP) retained ERO Resources Corporation (ERO) to conduct a rapid resource assessment and develop a property management plan for the 39-acre tract of land known as the Khalsa Property ("property") near the City of Boulder in Boulder County, Colorado (Figure 1). The conditions on the property have generally been documented through photo points (Appendix A). The purpose of this rapid resource assessment and management plan for the property is to—

- Summarize the physical/ecological characteristics and conditions
- Document and record existing conditions and open space values
- Identify and prioritize management needs and opportunities
- Prescribe management actions
- Classify the property into a management area

The OSMP Visitor Master Plan directs that plans be completed for properties before they are opened and that visitor access be considered. Specific guidance for new properties is as follows:

> ***New Property Planning and Facilities.*** Complete planning and infrastructure improvements in a timely manner, prior to opening newly acquired properties to public access. However, as appropriate, preserve existing public access during the planning and improvement process. Open Space and Mountain Parks will complete a site management plan recommending appropriate locations, types of uses and visitor infrastructure, and how to provide adequate visitor infrastructure and services.

Property plans direct immediate planning and improvement needs, while Trails Study Areas (TSA) planning will be used to periodically update visitor access needs based on conditions at the time.

METHODS

OSMP supplied records, documents, and GIS data applicable to the property. On June 20, 2008, a team of natural resource planners and ecologists from ERO walked the extent of the property documenting ecological and physical characteristics and identifying management needs and opportunities.

ERO consulted several organizations, agencies, and databases including the Colorado Natural Heritage Program (CNHP), Colorado Office of Archeology and Historic Preservation (OAHP), the Colorado Natural Diversity Information Source (NDIS), and Boulder County pertaining to resources on the property. Published information, such as U.S. Geological Survey (USGS) and Natural Resources Conservation Service (NRCS) maps, also was used to prepare the inventory.

REPORT ORGANIZATION

This report presents a summary of the information gathered for the rapid resource assessment and describes the results of ERO's evaluation of the resources and open space values on the property.

The report is organized into five narrative sections and three appendices. Following the *Summary* and *Introduction*, the *General Description* section provides information on the setting. The *Site Resources* section summarizes the ecological and cultural resources; existing trails and access; land use and management; and improvements and legal considerations on the property. The *Property Management Plan* describes short- and long-term management needs, management actions, and Management Area designation.

Appendix A contains photographs of the property with narrative descriptions and a corresponding photo point map. Appendix B presents plant species identified during the site visit, and Appendix C includes report references.

GENERAL DESCRIPTION

The property is located within the Southern Rocky Mountain physiographic province. The property encompasses about 39 acres characterized by forested slopes surrounding a drainage that flows from northeast to southwest with a seasonally flooded herbaceous plant community.

LOCATION AND ACCESS

The property is located in south Boulder County about 4 miles southwest of downtown Boulder (Figure 1). Specifically, the property is located in Sections 10 in Township 1 South, Range 71 West of the 6th P.M. (Figure 2).

Primary access is from Bison Drive near the northeast corner of the property. From downtown Boulder, travel west on Baseline Road to Flagstaff Road. Follow Flagstaff Road for about 5 miles to Bison Drive. Turn left (south) on Bison Drive and travel about ½ mile to the property. A driveway traverses the property from northeast to southwest to the private residence immediately west of the property. OSMP holds a conservation easement on the private property to the west. This driveway provides both management and emergency access to the property.

ACQUISITION

The City of Boulder acquired the Khalsa Property on November 22, 2005. The total price for the 39-acre parcel and a 42-acre conservation easement was $400,000.

LAND USE

The property was previously logged and likely grazed to some extent. OSMP manages the property as undeveloped open space land. There is currently no active management.

LANDSCAPE CONTEXT

The property is located in rural Boulder County, and is bordered on three sides by City of Boulder Open Space. Woods Gulch is about ¼ mile to the southwest of the property. Kossler Lake is located about ¼ mile to the northwest.

NEIGHBORING PROPERTIES

NEIGHBORING RESIDENTIAL PROPERTIES

Residential properties and basic land uses identified near the property during the site visit and with a property record search available through the Boulder County Assessor's Office (Boulder County 2008a) are summarized below.

OWNER	LOCATION AND LAND USE
Heath, Andrew & Hensler, Tia A. 5545 Flagstaff Rd. Boulder, CO 80302 Parcel No. 157910000025	Northwest of property Single family rural residence
Sorenson, Eric & Jeannine 5541 Flagstaff Rd. Boulder, CO 80302-9513 Parcel No. 157910000026	North of property Single family rural residence
Staggs, Thomas W. & Nova N. 3608 Bison Dr. 7817 Oakridge Rd.; Sherwood, AZ 72120 Parcel No. 157910000027	North of property Undeveloped land
Vaughn III, Paul 5533 Flagstaff Rd PO Box 4132; Boulder, CO 80306-4132 Parcel No. 157910000028	North of property Single family rural residence
Gray, James E. 3604 Bison Dr. 942 7th St.; Boulder, CO 80302-7102 Parcel No. 157910000030	North of property Undeveloped land
Singh, Khalsa Mahan & Mahan Kaur 3555 Bison Dr. 73-1387 Konoula Place; Kailua Kona, HI 96740 Parcel No. 157910000037	West of property Single family rural residence Conservation Easement held by OSMP

NEIGHBORING GOVERNMENT PROPERTIES

Government-owned properties and basic land uses identified near the property during the site visit and with a property record search available through the Boulder County Assessor's Office (Boulder County 2008a) are summarized below.

OWNER	LOCATION AND LAND USE
City Of Boulder 3104 Bison Dr. 1777 Broadway; Boulder, CO 80302 Parcel No. 157900000013 *City of Boulder Open Space*	Northeast of property Undeveloped land McIntosh Property
City Of Boulder 3203 Bison Dr. 1777 Broadway; Boulder, CO 80302 Parcel No. 157900100015 *City of Boulder Open Space*	East of property Undeveloped land Olson Property
City Of Boulder 1596 Bison Dr. 1777 Broadway; Boulder, CO 80302 Parcel No. 157900100023 *City of Boulder Open Space*	Southeast of property Undeveloped land Fallon Property
City of Boulder 3771 Bison Dr. PO Box 791 Boulder, CO 80306 Parcel No. 157915000041 *City of Boulder Open Space*	South of property Undeveloped land Stoy Property
City of Boulder 3779 Bison Dr. 1777 Broadway, Boulder, CO 80302-6220 Parcel No. 157915000043 *City of Boulder Open Space*	Southwest of property Undeveloped Land McIntosh Property

SITE RESOURCES

This section documents in more detail the basic physical and ecological characteristics and conditions that directly support the open space values of the property. Key features are shown on Figure 3.

TOPOGRAPHY

Topography on the property generally slopes to the southwest. The property encompasses several ridges with elevations reaching about 7,660. An unnamed drainage bisects the property from northeast to southwest at a minimum elevation of about 7,420 feet. The USGS topographical map of the property is shown in Figure 2.

GEOLOGY

The property occurs along the eastern margin of the Front Range of north-central Colorado, which contains igneous rocks of Precambrian age. The area is composed primarily of granitic rocks. Granitic rocks contain areas of granites, quartz monzonites, and unnamed granitic rocks (Tweto 1979).

SOILS

The Natural Resources Conservation Service (NRCS) has mapped three soil types on the property. Each mapping unit is described below and Figure 4 shows the NRCS soil mapping. All soil information was gathered from the NRCS soil survey (NRCS 1975).

Mapping Unit PgE. Peyton-Juget very gravelly loamy sands (5 to 20 percent slopes). This soil includes area of rock outcrop and a few small areas of Allens Park soils. Runoff is slow to medium and the erosion hazard is moderate to high. Native vegetation is bluestem, sandreed grass, blue grama, and needleandthread grass.

Mapping Unit FcF. Fern Cliff-Allens Park-Rock outcrop complex (15 to 60 percent slopes). This soil includes small areas of Fern Cliff stony loam sand, Juget soils, Peyton soils, and narrow bands of alluvial soils along drainageways. Runoff is medium to rapid and the erosion hazard is high. Native vegetation is mainly pine and fir woodland with an understory of fescue, mountain muhly, and pine dropseed.

Mapping Unit JrF. Juget-Rock outcrop (9 to 55 percent slopes). This soil includes small areas of Peyton soils near drainageways and a few small areas of Allens Park soils. Runoff is high and the erosion hazard is high. Native vegetation consists of spruce and fir at higher elevations and ponderosa pine, Gambel oak, mountain mahogany, and grasses at lower elevations.

HYDROLOGY

SURFACE HYDROLOGY

No mapped streams or drainages are located on the property. The property is not located within a designated floodplain area. According to topographic information from the USGS 7.5 minute quadrangle map, surface waters flow north and south towards the drainage near the center of the property, and southwest towards Woods Gulch (USGS 1965, revised 1994).

SUBSURFACE HYDROLOGY

Based on a review of the USGS Eldorado Springs Quadrangle, shallow ground water would flow in a southerly direction towards the South Boulder Creek drainage (USGS 1965, revised 1994). There are no permitted water wells on the property (CDWR 2008), and no seeps or springs were identified on the property.

WETLANDS

Wetland vegetation was observed along the small drainage on the property. The most common wetland vegetation includes Nebraska sedge (*Carex nebraskensis*), Baltic rush (*Juncus articus* ssp. *ater*), and broom sedge (*Carex scoparia*).

VEGETATION

GENERAL VEGETATION DESCRIPTION

The property is dominated by ponderosa pine wooded mixed herbaceous alliance, Douglas-fir forest alliance, Douglas-fir woodland alliance, ponderosa pine woodland alliance, and a ponderosa pine tallgrass savannah herbaceous alliance. The lowland areas are dominated by smooth brome semi-natural herbaceous alliance and Nebraska sedge seasonally flooded herbaceous alliance.

PONDEROSA PINE WOODED MIXED HERBACEOUS ALLIANCE (PMTH)

The northern half of the property is dominated by a ponderosa pine wooded mixed herbaceous alliance. The dominant overstory species in this community type is ponderosa pine (*Pinus ponderosa* ssp. *scopulorum*). Dominant understory species include introduced grasses such as smooth brome (*Bromopsis inermis*), cereal rye (*Secale cereale*), cheatgrass (*Anisantha tectorum*), and orchard grass (*Dactylis glomerata*); native perennial forbs such as little sunflower (*Helianthus pumilus*), Rocky Mountain penstemon (*Penstemon strictus*), and pale bastard toadflax (*Comandra umbellate* ssp. *pallida*); native grasses such mountain brome (*Ceratochloa carinata*), needle and thread (*Hesperostipa comata*), green needlegrass (*Nassella viridula*) and mountain muhly (*Muhlenbergia montana*); and native shrubs/subshrubs such as black chokecherry (*Padus virginiana* ssp. *scopulorum*) and fringed sage (*Artemisia frigida*).

NEBRASKA SEDGE SEASONALLY FLOODED HERBACEOUS ALLIANCE (NSH)

Along the drainage that flows from northeast to southwest in the property a Nebraska sedge seasonally flooded herbaceous alliance is present. This alliance is dominated by Nebraska sedge (*Carex nebrascensis*), a native sedge. Other common species include grayleaf red raspberry (*Rubus idaeus* ssp. *melanolasius*) a native shrub, wild mint (*Mentha arvensis*) a native forb, Baltic rush (*Juncus articus* ssp. *ater*) a native rush, and western yarrow (*Achillea lanulosa*), a native forb. Two rare sedges are known to occur in this area: Sprengel's sedge (*Carex sprengelii*) and Torrey's sedge (*Carex torreyi*). No rare sedges were observed during the rapid resource assessment.

SMOOTH BROME SEMI-NATURAL HERBACEOUS ALLIANCE (SBH)

Most of the lower portions of the property, surrounding the drainage, consist of a smooth brome semi-natural herbaceous alliance. This community is dominated by smooth brome, an introduced pasture grass. Other dominant species include cheatgrass, cereal rye, and orchard grass.

PONDEROSA PINE WOODLAND ALLIANCE (PPW)

In the northwest corner and the eastern edge a ponderosa pine woodland alliance is present. This community type is dominated by ponderosa pine but other native woodland species are also present such as Douglas fir (*Pseudotsuga menziesii*) and lodgepole pine (*Pinus contorta* ssp. *latifolia*). Common understory species include native forbs such as sanddune wallflower (*Erysimum capitatum*), mintleaf bergamont (*Monarda fistulosa* var. *menthifolia*), hairy false goldenaster (*Heterotheca villosa*), and narrowleaf stoneseed (*Lithospermum incisum*).

DOUGLAS FIR FOREST ALLIANCE (DFF)

In the southern portion of the property along north facing slopes, the Douglas-fir forest alliance is present. This community type is dominated by Douglas fir. Common understory species include native forbs such as Britton's skullcap (*Scutellaria brittonii*), prairie bluebells (*Mertensia*

lanceolata), and maiden blue eyed Mary (*Collinsia parviflora*). Native grass or grass like plants included Geyer's sedge (*Carex geyeri*) and muttongrass (*Poa fendleriana*). Native shrubs such as kinnikinnick (*Arctostaphylos uva-ursi*) are common.

DOUGLAS FIR WOODLAND ALLIANCE (DFW)

In the southern portion of the property where the Douglas fir forest meets the ponderosa pine community a Douglas-fir woodland alliance is present. This community type is dominated by Douglas fir but ponderosa pine is also common. Common understory species include hairy false goldenaster, Geyer's sedge, and kinnikinnick.

PONDEROSA PINE TALLGRASS SAVANNAH HERBACEOUS ALLIANCE (PTSH)

The southern portion of the property is dominated by a ponderosa pine tallgrass savannah herbaceous alliance. This community type is dominated by ponderosa pine but tallgrass species are also present. Dominant species include native grasses/grass-like such as blue wildrye (*Elymus glaucus*), western wheatgrass (*Pascopyrum smithii*), slender wheatgrass (*Elymus trachycaulus*), and Geyer's sedge. Native forbs such as Britton's skullcap, sanddune wallflower, and hairy false golden aster are common. Introduced forbs such as yellow sweetclover (*Melilotus officinalis*) and common dandelion (*Taraxacum officinale)* are present.

RARE PLANTS AND PLANT COMMUNITIES

Two rare sedges may occur in this area: Sprengel's sedge (*Carex sprengelii*) and Torrey's sedge (*Carex torreyi*) (VanDervort pers. comm. 2008). No rare sedges were observed during the rapid resource assessment. The property falls within the Boulder Foothills Potential Conservation Area (PCA).

STATE NOXIOUS WEEDS

Based on the site visit, no species from List A of the Colorado noxious weed species list was found on the property – five List B noxious weed species occur on the property: Canada thistle (*Cirsium arvense*), Dalmatian toadflax (*Linaria genistifolia* ssp. *dalmatica*), diffuse knapweed (*Acosta diffusa*) and redstem stork's bill (*Erodium cicutarium*). Canada thistle occurs in the northeastern corner along the road, Dalmatian toadflax is found in two patches one is located in the northwestern corner of the property and the other is located along the road, diffuse knapweed was found along the road and in the northwest, and redstem stork's bill occurs along the road and in disturbed areas.

Three List C noxious weed species were found on the property – field bindweed (*Convovulus arvensis*), cheatgrass (*Anisantha tectorum*), and common mullein (*Verbascum thapsus)*. Field bindweed is found scattered throughout the property. Cheatgrass and common mullein is found primarily along the road and in the northern half of the property. Smooth brome is not a state noxious weed but is considered an OSMP priority weed and is dominant in the SBH alliance.

Table 1. Noxious weeds present on the property.

Common Name	Scientific Name	OSMP Priority	Boulder County Weed List	State of Colorado Noxious Weed List
Canada thistle	*Breea arvensis*	Moderate	x	B
cheatgrass	*Anisantha tectorum*	Moderate	not listed	C
common mullein	*Verbascum thapsus*	None	not listed	C
Dalmatian toadflax	*Linaria genistifolia ssp. dalmatica*	Moderate	x	B
diffuse knapweed	*Acosta diffusa*	High	x	B
field bindweed	*Convolvulus arvensis*	None	not listed	C
houndstongue	*Cynoglossum officinale*	Low	x	B
redstem stork's bill	*Erodium cicutarium*	None	not listed	B
smooth brome	*Bromopsis inermis*	Moderate	not listed	not listed

The Colorado Noxious Weed Act §§ 35-5.5-101 through 119, C.R.S. (2003) states that "List A species are species for which the Commissioner of Agriculture has designated for eradication. List B noxious weed species are species for which the Commissioner of Agriculture, in consultation with the state noxious weed advisory committee, local governments, and other interested parties, develops and implements state noxious weed management plans designed to stop the continued spread of these species.

List C weed species are species for which the Commissioner, in consultation with the state noxious weed advisory committee, local governments, and other interested parties, will develop and implement state noxious weed management plans designed to support the efforts of local governing bodies to facilitate more effective integrated weed management on private and public lands. The goal of such plans will not be to stop the continued spread of these species but to provide additional education, research, and biological control resources to jurisdictions that choose to require management of List C species."

FOREST CONDITION

The three most common conifer species on the property are ponderosa pine, Douglas-fir, and lodgepole pine. Each of these species has different characteristics for management consideration summarized in Table 2. During the site visit, stridulations (i.e., noises made by insects rubbing body parts together) were evident and likely indicate recent infestation by mountain pine beetle. Some dead individual trees were noted; however, overall forest condition did not indicate widespread mountain pine beetle activity as of yet.

The dense ponderosa pine/Douglas-fir forest that dominates the southeast corner of the property is likely the result of long-term fire suppression. The high, contiguous canopy along with significant fuel loading (e.g., ladder fuels and down material) make the area a severe wildfire hazard.

Table 2. Common characteristics of conifer species on the property.

Characteristic	Ponderosa Pine	Lodgepole Pine	Douglas-fir
Drought tolerance	High	Moderate	Moderate
Reaction to competition	Intolerant of shade	Very intolerant of shade and competition from other plant species	Ability to tolerate shade in the seedling stage, intermediate in overall shade tolerance
Susceptibility to windthrow	Low	Moderate — thinning can contribute to snow breakage, particularly if previously dense stands are opened suddenly	Low to moderate
Resistance to fire	High for mature trees in open woodlands due to thick bark	Low with entire stands replaced and 100 percent mortality at times	Crown fires, when they occur, destroy stands of all ages; the thick bark of older Douglas-firs, however, makes them fairly resistant to ground fires
Fire interval (presettlement)	1 to 47 years apart with most at 5- to 20-year intervals	100 or more years	Intermediate between ponderosa pine and lodgepole pine based on stand structure and composition
Typical fire intensity (presettlement)	Low intensity ground fires	High intensity crown fires	Variable, low intensity ground fires in association with ponderosa pine, higher intensities elsewhere
Primary insect pathogens	Mountain pine beetle (*Dendroctonus ponderosa*)	Mountain pine beetle (*Dendroctonus ponderosa*)	Douglas-fir beetle (*Dendroctonus pseudotsugae*) and western spruce budworm (*Choristoneura occidentalis*)
Dwarf mistletoe	*Arceuthobium vaginatum* subsp. *crypyopodum* in the Southwest	*Arceuthobium americanum* is the most widespread and serious parasite affecting lodgepole pine	*Arceuthobium douglassii* occurs throughout most of the range of Douglas-fir

Based on: Burns, Russell M., and Barbara H. Honkala (tech. cords.). 1990. Silvics of North America: 1. Conifers. Agriculture Handbook 654. U.S. Department.

WILDLIFE

GENERAL DESCRIPTION

The property provides habitat for a variety of wildlife species that are typical of the forested system in the Boulder Mountain Park system. Notable mammal species that are likely to occur include black bear, mountain lion, elk, mule deer, fox, bobcat, and coyote. During the site visit, mule deer and red fox were observed. Widely-distributed sign (i.e., scat and game trails) from elk and mule deer was observed throughout the property. The property contains habitat elements for black bear, including dense forest cover, berry-producing shrubs, riparian habitat, and rock bands and outcrops that provide potential denning sites. Woods Gulch is likely a concentration point

and movement corridor for bears in the area. It is likely that most of the property is widely traversed by bears. Other common mammals include mountain cottontail rabbit, western spotted skunk, raccoon, Abert's squirrel, and least chipmunk.

The dense forests and open meadow on the property provides habitat for a variety of migratory songbirds such as mountain bluebird, Stellar's jay, and evening grosbeak. Common raptors potentially include sharp-shinned hawk and flammulated owl. The property also supports potential habitat for the northern goshawk, which characteristically nests in coniferous forests including those dominated by ponderosa pine or lodgepole pine or in mixed forests dominated by various coniferous species. Bird species observed during the site visit included white-breasted nuthatch, broad-tailed hummingbird, and gray-headed junco.

THREATENED, ENDANGERED, OR CANDIDATE WILDLIFE SPECIES

According to the Colorado Division of Wildlife Natural Diversity Information Source (NDIS) and CNHP databases for the area, there are no threatened or endangered species on the property (NDIS 2008).

COLORADO DIVISION OF WILDLIFE DESIGNATIONS

According to the NDIS database, the property is considered to be elk winter and elk severe winter range; mule deer winter range; a black bear-human conflict area; and turkey winter range and a turkey winter concentration area.

BOULDER COUNTY COMPREHENSIVE PLAN DESIGNATIONS

The property does not contain any county-designated Critical Wildlife Habitats or other designations related to wildlife.

CULTURAL RESOURCES

OFFICE OF ARCHAEOLOGY AND HISTORIC PRESERVATION FILE SEARCH

The Colorado Historical Society Office of Archaeology and Historic Preservation conducted a search of the Colorado Inventory of Cultural Resources database for the property (OAHP 2008). This database contains information on documented federal or state studies or findings regarding any cultural resources. According to the search, no sites or surveys occur on the property (OAHP 2008). Other potential unidentified cultural resources may exist within the property boundaries.

OTHER RESOURCES AND DESIGNATIONS

No structures exist on the property. The property is not located within any areas designated for cultural resources in the Boulder County Comprehensive Plan (Boulder County 2008b).

RECREATION

Public access is not permitted on the property.

PROPERTY INFRASTRUCTURE

STRUCTURES

No structures exist on the property.

INFRASTRUCTURE AND UTILITIES

Barbed-wire fencing, generally concentrated in the northwest corner of the property, is in disrepair. There is a power line that services the residence on the west side of the property. This utility line follows the driveway right-of-way.

ROADWAYS AND TRAILS

A driveway traverses the property from northeast to southwest. This driveway provides access to the private residence on the west side of the property. There is evidence of an old road bed that also traverses the property from northeast to southwest. This road bed occurs along the base of the west side of the forested area in the southeastern quarter of the property. A old road traverses the property in the open meadow in the southeastern corner of the property.

LEGAL CONSIDERATIONS

WATER RIGHTS

Purchase of the property did not include any water rights.

MINERAL RIGHTS

Purchase of the property included all oil, gas, coal, coal bed methane, sand, gravel, and other minerals owned by seller.

EASEMENTS AND RIGHTS-OF-WAY INFORMATION

See OSMP property file. Bison Drive is a private road with no general public access. OSMP shares maintenance costs on the road.

LOCAL PLANNING DESIGNATIONS

The entire property is currently zoned Forestry (Boulder County 2008c). Boulder County Comprehensive Plan designations on the property include—

- Boulder Mountain Park/South Boulder Environmental Conservation Area

The property is also considered to have moderate geologic constraints due to the potential for flash flooding or debris fans.

PROPERTY MANAGEMENT PLAN

MANAGEMENT AREA DESIGNATION

Recommended management area designation: Habitat Conservation Area

The location and features of the property are generally consistent with the characteristics, goals, and strategies outlined for Habitat Conservation Areas in the OSMP Visitor Master Plan, including naturally functioning ecosystems, lower levels of visitor use opportunities, and compatibility with adjacent land uses (OSMP 2005). This management area designation is consistent with the historic and current uses of the property and its primary open space values, and with the management designation of other nearby OSMP properties.

PUBLIC ACCESS

Recommended status: Access only with HCA off-trail permit.

The goal of this access status is to allow off-trail use by permit only, consistent with existing regulations for Habitat Conservation Areas. Off-trail permits can be obtained for OSMP-sponsored activities or other limited and approved public use. Use of designated trails is allowed without a permit. Should permitted or non-permitted public access result in a Class 2 undesignated trail (trail obvious; vegetation cover lost and/or organic litter pulverized in primary use area – see Manning et al. 2006) or other resource damage, the property may be closed at the sole discretion of the OSMP department. External gates will be locked to prevent unauthorized vehicle access. Public access and facilities on this property will be evaluated further in a future Trail Study Area or other planning processes.

MANAGEMENT ISSUES

The following management issues were identified on the property based on observations during the site visit, existing documentation, and input from OSMP staff.

Fencing. A barbed-wire fence along the northwest corner is in disrepair and serves no purpose.

Noxious Weeds. Bison Drive and the driveway through the property are the primary vectors for the spread of noxious weeds in the area.

Forest Condition. The forested area that dominates the southeastern quarter of the property is overgrown due to fire suppression and historic management with some trees stressed making them susceptible to beetle attacks.

Wildfire Hazard. Current and future (i.e., due to mountain pine beetle kill) fuel loading make the area susceptible to wildfire.

MANAGEMENT STRATEGIES

Management objectives and recommended management actions for various resources on the property are outlined below. In general, management objectives are a concise statement of what

OSMP wants to achieve in protecting open space values, addressing management issues related to a particular resource type. Management actions are the specific tasks or tools that can be used to fulfill the objective and address the issue.

FENCING AND SIGNING

Objective 1: Identify property as OSMP land through clear and defined signing of the property boundary.

Action: Install OSMP signs along property boundary.

Action: Remove unnecessary fence in northwest corner.

VEGETATION

Objective 1: Prevent the spread of noxious weeds from current conditions documented in the resource assessment.

Action: Coordinate with landowners and Boulder County to address weed management along Bison Drive.

Action: Coordinate with landowners to address weed management along the driveway from Bison Drive.

Action: Consider herbicide spraying along the driveway.

FOREST CONDITION

Objective 1: Where access is feasible, improve forest condition by managing ecosystems and age structure.

Action: Conduct a complete assessment of overall forest conditions through a forest inventory and survey.

Action: Implement prescriptions based on the results of the inventory and survey.

Objective 2: Where access is feasible, maintain an open forest through some initial thinning, prescribed burning, and disease inspection.

Action: Focus on removing the heavy regeneration and breaking up the continuous canopy fuels on the southeastern quarter of the property.

Action: Remove ladder fuels.

Action: Monitor forest stand structure and composition with permanent photo points and overstory inventories.

WILDLIFE

Objective 1: Protect and enhance important wildlife habitat on the property.

Action: Remove fencing in northeast corner of property to facilitate wildlife movement.

CONSERVATION AND COORDINATION

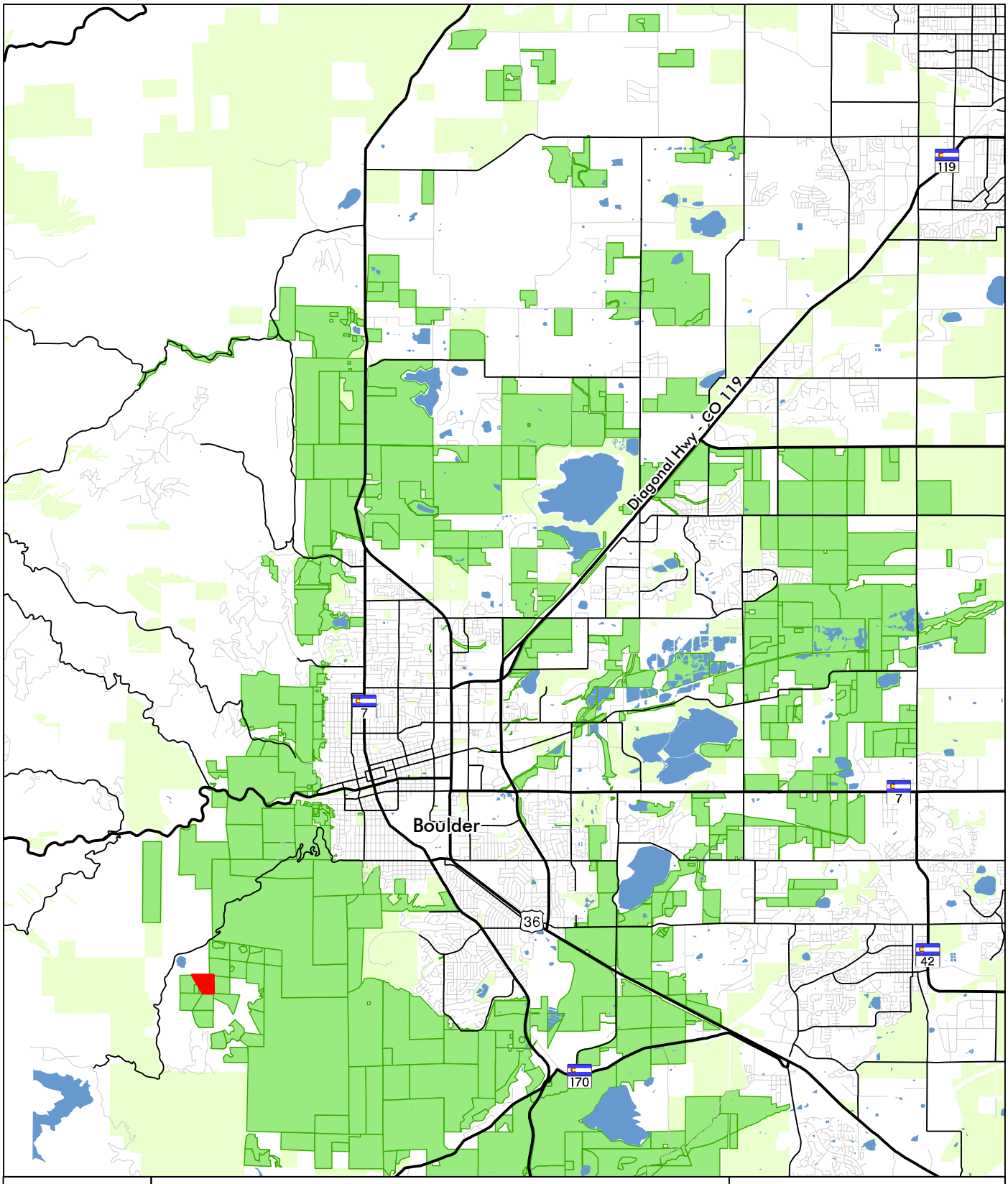
Objective 1: Work with adjacent landowners to provide consistent, sustainable management to the area accessed by Bison Drive.

Action: Establish and maintain lines of communication with adjacent landowners.

Action: Monitor resource conditions (e.g., noxious weeds, bear-human conflicts) on adjacent properties and identify potential issues or opportunities.

Action: Allow OSMP to become a resource for landowners seeking knowledge or advice on various land management topics.

FIGURES



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Khalsa Property RRA and Management Plan

- Khalsa Property
- City of Boulder Open Space
- Other Open Space

0 2 4 Miles

1 inch = 2 miles

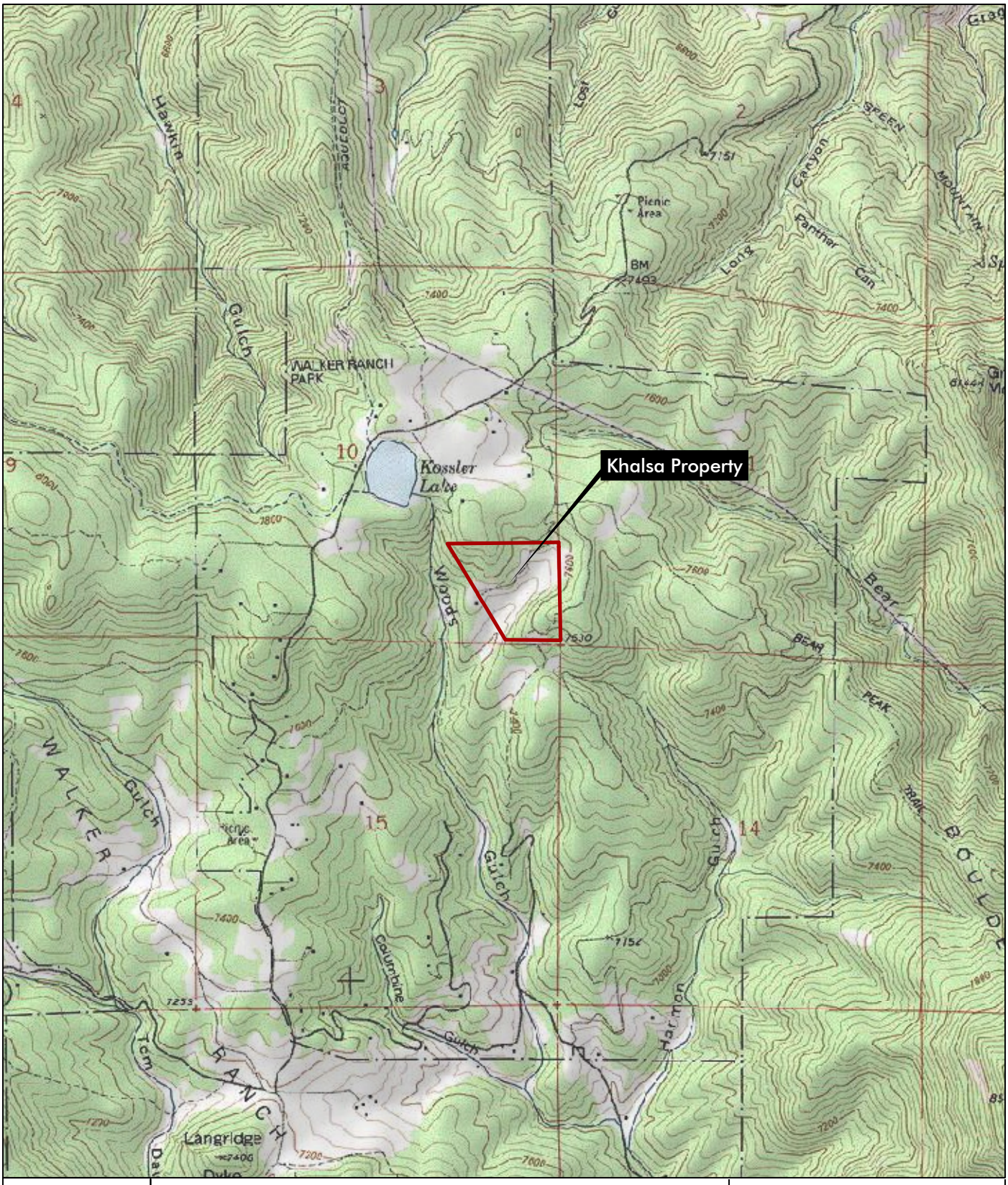
N

Figure 1
Vicinity Map

Prepared for: City of Boulder Open Space and Mountain Parks

File: 4089 Figure1.mxd

March 2008



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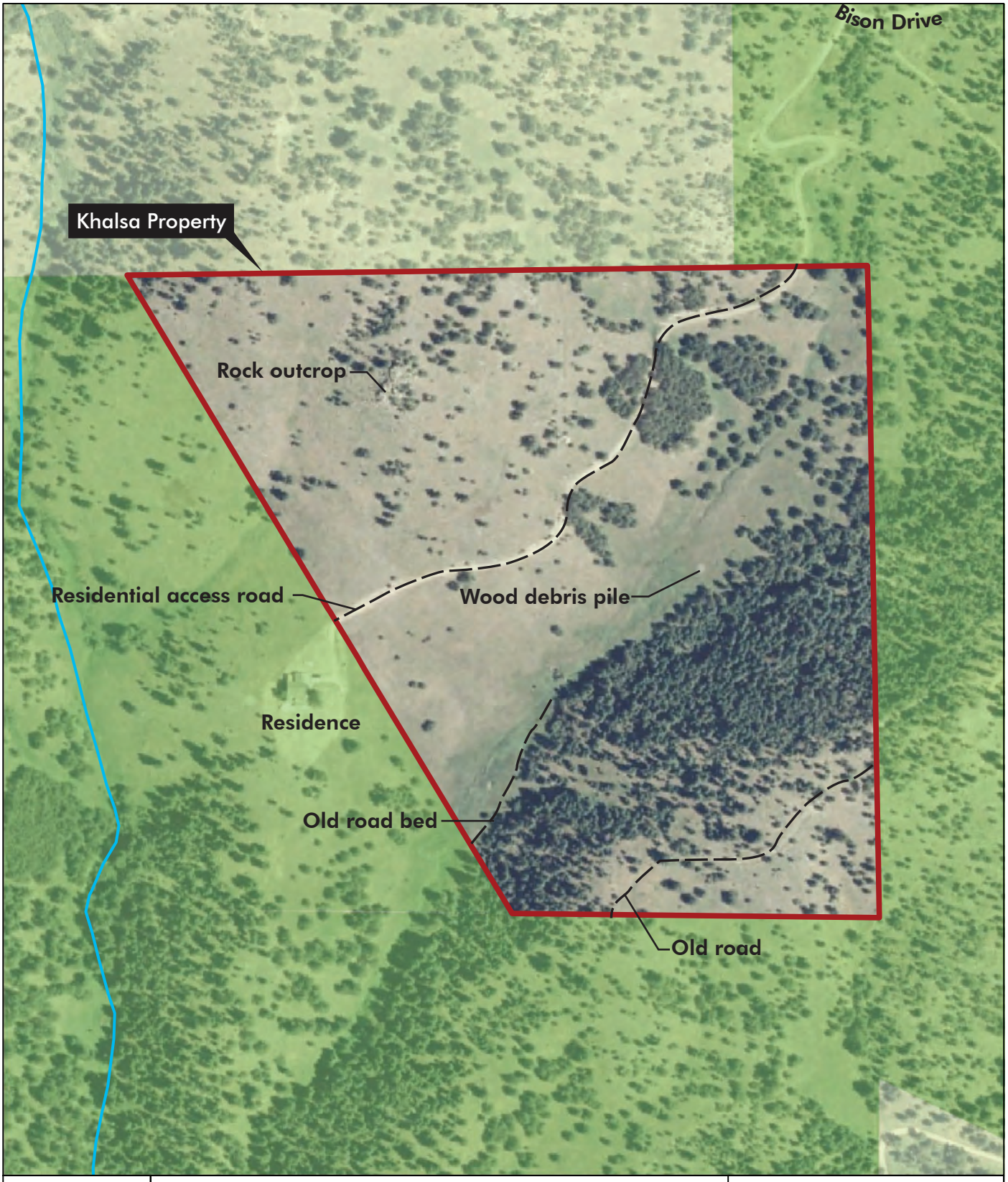
Khalsa Property RRA and Management Plan
Section 10, 11, 14 & 15, T1S, R71W
UTM NAD83 Coordinate Zone 13N; 472214mE, 4424924mN
USGS Eldorado Springs CO, Quadrangle
Boulder County, Colorado

Feet
0 2,000 4,000
1 inch = 2,000 feet

N

Figure 2
Location

Prepared for: City of Boulder Open Space and Mountain Parks
File: 4089 Figure 2.mxd
February 2008



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City of Boulder Open Space
Other Open Space

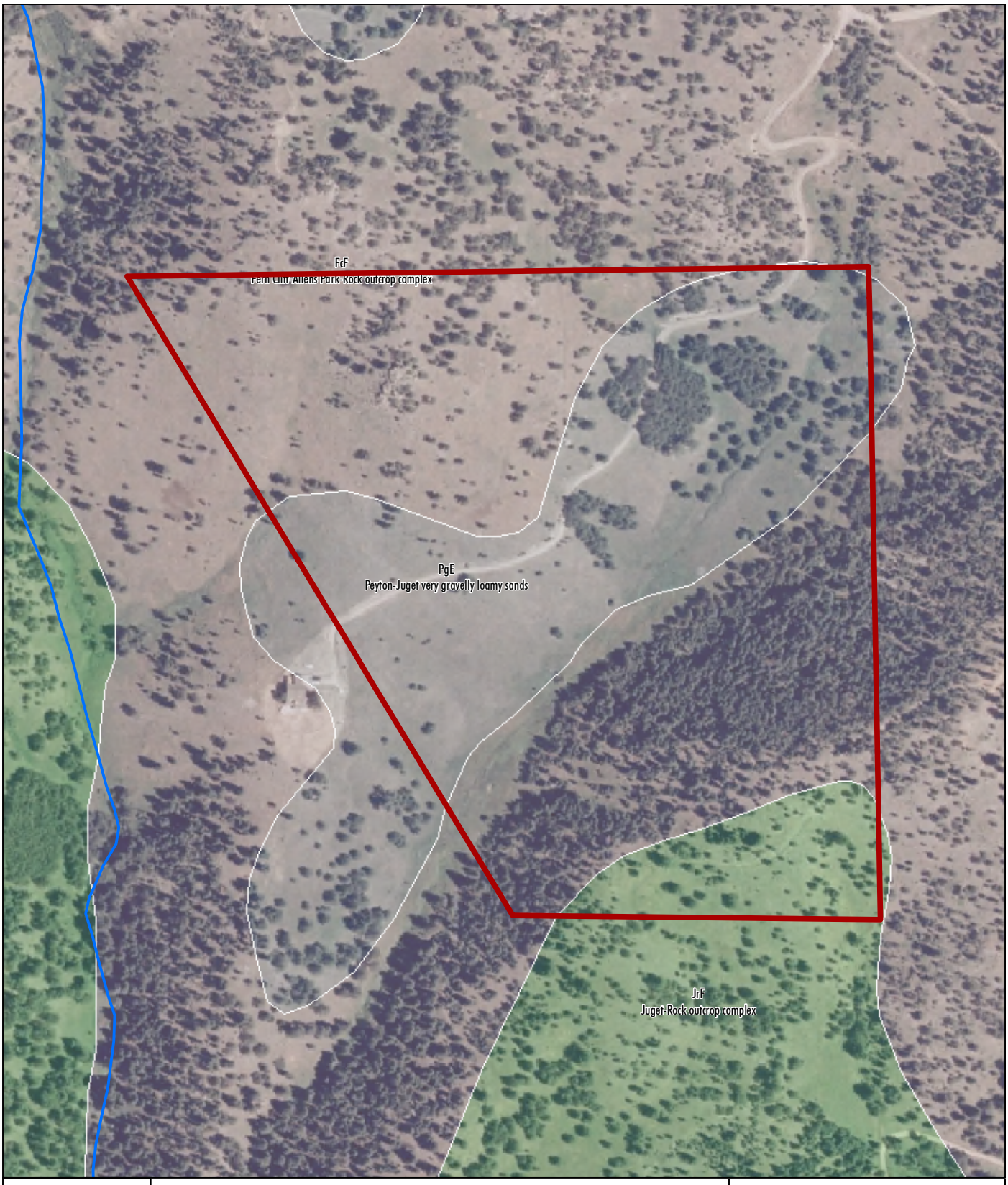
0 300 600 Feet

1 inch = 300 Feet

N

Figure 3
Property Features

Prepared for: City of Boulder Open Space and Mountain Parks
File: 4089 Figure 3 Khalsa.pdf
July 2008



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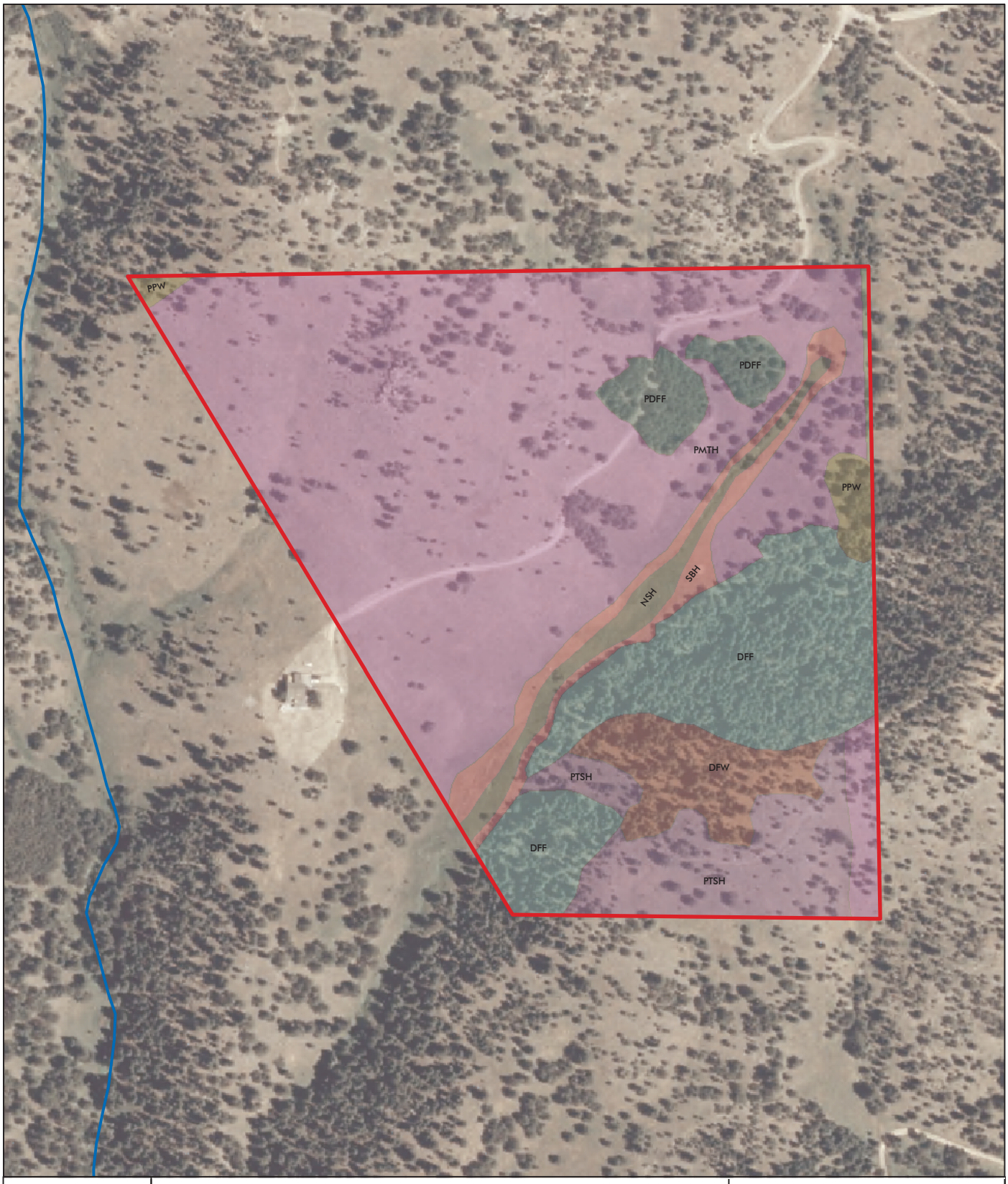
0 300 600 Feet

1 inch = 300 Feet

N

Figure 4
Soils

Prepared for: City of Boulder Open Space and Mountain Parks
File: 4089 Figure 4.mxd
February 2008



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Khalsa Property RRA and Management Plan

(See following page for for vegetation community names)

0 300 600 Feet

1 inch = 300 Feet

N

Figure 5
Vegetation Communities

Prepared for: City of Boulder Open Space and Mountain Parks

File: 4089 Figure 5.mxd

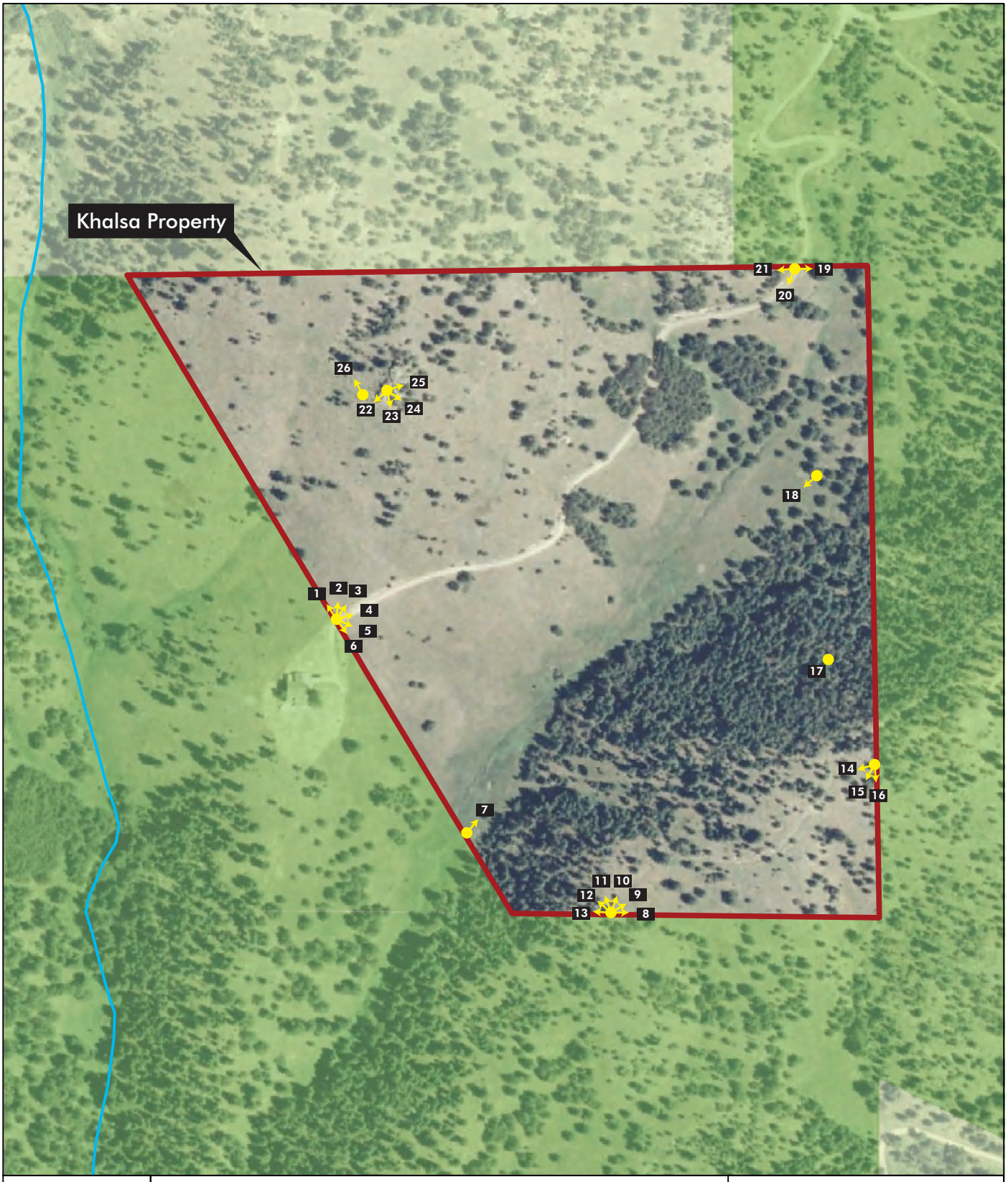
June 2008

Vegetation Communities

Acronym, CmnName

- ADUD, Annual-domintated Upland Disturbance
- APS, American Plum Shrubland Alliance
- BBYH, Big Bluestem - (Yellow Indiangrass) Herbaceous Alliance
- BRSH, Baltic Rush Seasonally Flooded Herbaceous Alliance
- CFSH, Clustered Field Sedge Seasonally Flooded Herbaceous Alliance
- CHSH, Cattail Herbaceous Semipermanently Flooded Alliance
- CTH, Canada Thistle Weedy Forb Great Plains Herbaceous Vegetation [Provisional]
- CWH, Crested Wheatgrass Semi-Natural Herbaceous Alliance
- CWTS, (Coyote Willow, Sandbar Willow) Temporarily Flooded Shrubland Alliance
- CWW, Crack Willow (introduced) Temporarily Flooded Woodland Alliance
- DCAP, Disturbed Cultivated Agricultural Pasture
- DEV, Developed
- DFF, Douglas Fir Forest Alliance
- DFW, Douglas-fir Woodland Alliance
- ECTW, Eastern Cottonwood Temporarily Flooded Woodland Alliance
- ESSH, Emory Sedge Seasonally Flooded Herbaceous Alliance
- ETCW, Eastern Cottonwood Temporarily Flooded Woodland Alliance
- FBH, Foxtail Barley Temporarily Flooded Herbaceous Alliance
- FH, (Tall Fescue, Meadow Fescue) Herbaceous Alliance
- FSBH, Fourwing Saltbush Herbaceous Alliance
- GAH, Cultivated Alfalfa / Smoothe Brome Hay
- GH, Cultivated Grass Hay
- IC, Irrigated Cropland
- ISAP, Introduced Species Agricultural Pasture
- KBH, Kentucky Bluegrass Semi-Natural Herbaceous Alliance
- NNH, New Mexico Needlegrass Herbaceous Alliance
- NSH, Nebraska Sedge Seasonally Flooded Herbaceous Alliance
- NTH, Needle-and-Thread - Blue Grama Herbaceous Alliance
- OT, Ornamental Trees
- PDFF, Ponderosa Pine - Douglas-fir Forest Alliance
- PDFW, Ponderosa Pine - Douglas-fir Woodland Alliance
- PFDC, Perennial Forb Disturbance Community
- PMTH, Ponderosa Pine Wooded Mixed Herbaceous Alliance (Savannah)
- PPF, Ponderosa Pine Forest Alliance
- PPW, Ponderosa Pine Woodland Alliance
- PTSH, Ponderosa Pine Tallgrass Savannah Herbaceous Alliance
- PTW, Ponderosa Pine Temporarily Flooded Woodland Alliance
- QADF, Quaking Aspen - Douglas-fir Forest Alliance
- ROW, Russian Olive Semi-Natural Woodland Alliance
- SBH, Smooth Brome Semi-Natural Herbaceous Alliance
- SDS, Snakeweed Dwarf-shrubland Alliance
- SKBH, Sun Sedge-Agassiz Kentucky Bluegrass Herbaceous
- SYS, Soapweed Yucca Evergreen Shrubland
- SYSH, Soapweed Yucca Shrub Savannah Herbaceous Alliance
- THA, Threesquare Herbaceous Alliance
- TSIS, Ill-scented Sumac Intermittently Flooded Shrubland Alliance
- TSSH, Three-leaved Sumac Shrub Savannah Herbaceous Alliance
- TSUS, Three-leaved Sumac Upland Shrubland Alliance
- WATER, Water
- WBSS, Water Birch Seasonally Flooded Shrubland Alliance
- WTFH, Western Wheatgrass Temporarily Flooded Herbaceous Alliance
- WWH, Western Wheatgrass Herbaceous Alliance

APPENDIX A
PHOTO POINT MAP AND DOCUMENTATION



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Khalsa Property RRA and Management Plan

1 Photo Point

0 300 600 Feet

1 inch = 300 Feet

N

Appendix A
Photo Points

Prepared for: City of Boulder Open Space and Mountain Parks

File: 4089 Khalsa photo points.pdf

July 2008

Appendix B
Plant Species

APPENDIX B
PLANT SPECIES

Plant Species Observed during the June 20, 2008 Site Visit

Species Name	Synonym	Common Name	Ponderosa Pine Wooded Mixed Herbaceous Alliance (PMTH)	Nebraska Sedge Seasonally Flooded Herbaceous Alliance (NSH)	Smooth Brome Semi-Natural Herbaceous Alliance (SBH)	Douglas Fir Forest Alliance (DFF)	Douglas Fir Woodland Alliance (DFW)	Ponderosa Pine Tallgrass Savannah Herbaceous Alliance (PTSH)
Native Annual/Biennial Forbs								
Collinsia parviflora		maiden blue eyed Mary				■	■	■
Introduced Annual/Biennial Forbs								
Acosta diffusa	Centaurea diffusa	diffuse knapweed	■					■
Cynoglossum officinale		houndstongue	■	■				■
Erodium cicutarium		redstem stork's bill	■		■			
Melilotus officinalis		yellow sweetclover					■	■
Sisymbrium altissimum		tall tumblemustard	■					■
Tragopogon dubius ssp. major		yellow salsify	■					■
Verbascum thapsus		common mullein	■					■
Introduced Annual Grasses								
Anisantha tectorum	Bromus tectorum	cheatgrass	■					■
Secale cereale		cereal rye	■					■
Native Perennial Forbs								
Achillea lanulosa	Achillea millefolium	western yarrow		■			■	■
Amerosedum lanceolatum	Sedum lanceolatum	spearleaf stonecrop				■	■	
Artemisia ludoviciana		white sagebrush	■					■

Species Name	Synonym	Common Name	Ponderosa Pine Wooded Mixed Herbaceous Alliance (PMTH)	Nebraska Sedge Seasonally Flooded Herbaceous Alliance (NSH)	Smooth Brome Semi-Natural Herbaceous Alliance (SBH)	Douglas Fir Forest Alliance (DFF)	Douglas Fir Woodland Alliance (DFW)	Ponderosa Pine Tallgrass Savannah Herbaceous Alliance (PTSH)
Cerastium strictum	Cerastium arvense	field chickweed	■					■
Comandra umbellata ssp. pallida		pale bastard toadflax	■					■
Erysimum capitatum		sanddune wallflower			■		■	
Geranium richardsonii		Richardson's geranium	■					■
Helianthus pumilus		little sunflower	■					■
Heterotheca villosa		hairy false goldenaster			■		■	
Iris missouriensis		Rocky Mountain iris	■					■
Lithospermum incisum		narrowleaf stoneseed			■		■	
Lupinus sp.		lupine				■		
Mentha arvensis		wild mint		■				
Mertensia lanceolata		prairie bluebells				■	■	■
Monarda fistulosa var. menthifolia		mintleaf bergamot			■		■	
Penstemon strictus		Rocky Mountain penstemon	■					■
Rubus idaeus ssp. melanolasius		grayleaf red raspberry		■				
Scutellaria brittonii		Britton's skullcap				■	■	
Introduced Perennial Forbs								
Breea arvensis	Cirsium arvense	Canada thistle			■			
Convolvulus arvensis		field bindweed	■					■
Linaria genistifolia ssp. dalmatica	Linaria dalmatica	Dalmatian toadflax	■					

Species Name	Synonym	Common Name	Ponderosa Pine Wooded Mixed Herbaceous Alliance (PMTH)	Nebraska Sedge Seasonally Flooded Herbaceous Alliance (NSH)	Smooth Brome Semi-Natural Herbaceous Alliance (SBH)	Douglas Fir Forest Alliance (DFF)	Douglas Fir Woodland Alliance (DFW)	Ponderosa Pine Tallgrass Savannah Herbaceous Alliance (PTSH)
Rumex acetosella	Acetosella vulgaris	common sheep sorrel	■					■
Taraxacum officinale		common dandelion					■	
Native Perennial Cool Season Grass and Grasslike								
Carex geyeri		Geyer's sedge				■	■	
Carex nebrascensis		Nebraska sedge		■				
Carex praegracilis		clustered field sedge		■				
Carex scoparia		broom sedge		■				
Carex simulata		analogue sedge		■				
Carex utriculata		Northwest Territory sedge		■			■	
Ceratochloa carinata	Ceratochloa marginata	mountain brome, California brome	■					■
Elymus glaucus		blue wildrye			■		■	
Elymus trachycaulus	Agropyron trachycaulum	slender wheatgrass				■	■	
Hesperostipa comata	Stipa comata	needle and thread	■					■
Juncus arcticus ssp. ater	Juncus balticus	Baltic rush		■				
Nassella viridula	Stipa viridula	green needlegrass	■					■
Pascopyrum smithii	Agropyron smithii	western wheatgrass					■	
Poa fendleriana		muttongrass				■	■	
Introduced Perennial Cool Season Grasses								
Bromopsis inermis	Bromus inermis	smooth brome	■					■
Dactylis glomerata		orchardgrass	■					■
Phleum pratense		timothy	■					■

Species Name	Synonym	Common Name	Ponderosa Pine Wooded Mixed Herbaceous Alliance (PMTH)	Nebraska Sedge Seasonally Flooded Herbaceous Alliance (NSH)	Smooth Brome Semi-Natural Herbaceous Alliance (SBH)	Douglas Fir Forest Alliance (DFF)	Douglas Fir Woodland Alliance (DFW)	Ponderosa Pine Tallgrass Savannah Herbaceous Alliance (PTSH)
Native Perennial Warm Season Grass								
Muhlenbergia montana		mountain muhly	■					■
Native Shrubs								
Acer glabrum		Rocky Mountain maple					■	
Amorpha fruticosa var. angustifolia		desert false indigo	■					■
Arctostaphylos uva-ursi		kinnikinnick				■	■	
Artemisia frigida		prairie sagewort	■					■
Padus virginiana ssp. melanocarpa	Prunus virginiana ssp. melanocarpa	black chokecherry	■					■
Native Trees								
Pinus contorta ssp. latifolia		lodgepole pine			■		■	
Pinus ponderosa ssp. scopulorum		ponderosa pine	■		■			■
Pseudotsuga menziesii		Douglas-fir			■		■	
Sabina scopulorum	Juniperus scopulorum	Rocky Mountain juniper				■		■

Appendix C
References

APPENDIX C
REFERENCES

Boulder County. 1996. County Open Space Plan. <http://www.co.boulder.co.us/lu/bccp/bccpmap/osplan.pdf>. January 25.

Boulder County. 2008a. Boulder County Assessor's Office. <http://www.co.boulder.co.us/assessor/asrproprecords/assess_input.asp>. January 24.

Boulder County. 2008b. Boulder County Comprehensive Plan, Archaeologically Sensitive Areas. <http://www.co.boulder.co.us/lu/bccp/cult_res.htm>. January 25.

Boulder County. 2008c. Boulder County Zoning District Map. <http://www.co.boulder.co.us/lu/pdf/zoningmap.pdf>. January 25.

Burns, Russell M., and Barbara H. Honkala (tech. cords.). 1990. Silvics of North America: 1. Conifers. Agriculture Handbook 654. U.S. Department.

CDWR (Colorado Division of Water Resources). 2008. Online Mapping. <http://165.127.23.116/website/lttool>. January 24.

CNHP. (Colorado Natural Heritage program). 2006. Potential Conservation Area GIS database.

Manning, R., C. Jacobi, and J.L. Marion. 2006. Recreation Monitoring at Acadia National Park. The George Wright Forum. Volume 23, Number 2 (2006).

NDIS (Natural Diversity Information Source). 2008. GIS mapping of significant habitat elements for various wildlife species. Prepared by the Colorado Division of Wildlife.

NRCS (National Resource Conservation Service). 1975. Soil Survey of Boulder County Area, Colorado. Denver, CO.

OAHP (Colorado Historical Society, Office of Archeology and Historic Preservation). 2008. Records Search. January 28. Denver, CO.

OSMP (City of Boulder Open Space and Mountain Parks). 2005. Visitor Master Plan.

Tweto, Ogden. 1979. Geologic Map of Colorado. U.S. Geological Survey. Denver, CO.

USGS (U.S. Geological Survey). 1965, revised 1994. Eldorado Springs Quadrangle. Denver, CO.

VanDervort, Linda. 2008. Conservation Easement Specialist, City of Boulder Open Space and Mountain Parks. Telephone conversation with Andy Cole, Natural Resource Planner, ERO Resources. June 5.

Photo 1 - View northwest along west side of property.

Photo 2 - View north from residential access road on west side of property.

Photo 3 - View northeast from residential access road on west side of property.

Photo 4 - View east from residential access road on west side of property.

Photo 5 - View southeast from residential access road on west side of property.

Photo 6 - View southeast along west side of property.

Photo 7 - View northeast across meadow near base of transition to Douglas fir forest.

Photo 8 - View east along south side of property.

Photo 9 - View east northeast from southwest corner of property.

Photo 10 - View north northeast from southwest corner of property.

Photo 11 - View north northwest from southwest corner of property.

Photo 12 - View west northwest from southwest corner of property.

Photo 13 - View west along south side of property.

Photo 14 - View west southwest along old road from east side of property.

Photo 15 - View south southwest along old road from east side of property.

Photo 16 - View south along west side of property.

Photo 17 - Typical fuel loading within Douglas fir forest community on the property.

Photo 18 - View southwest across seasonally-flooded meadow in center of property.

Photo 19 - View east along north side of property from residential access road.

Photo 20 - View southwest along residential access road from north side of property.

Photo 21 - View west along north side of property from residential access road.

Photo 22 - View southwest from rock outcrop on north side of property.

Photo 23 - View south from rock outcrop on north side of property.

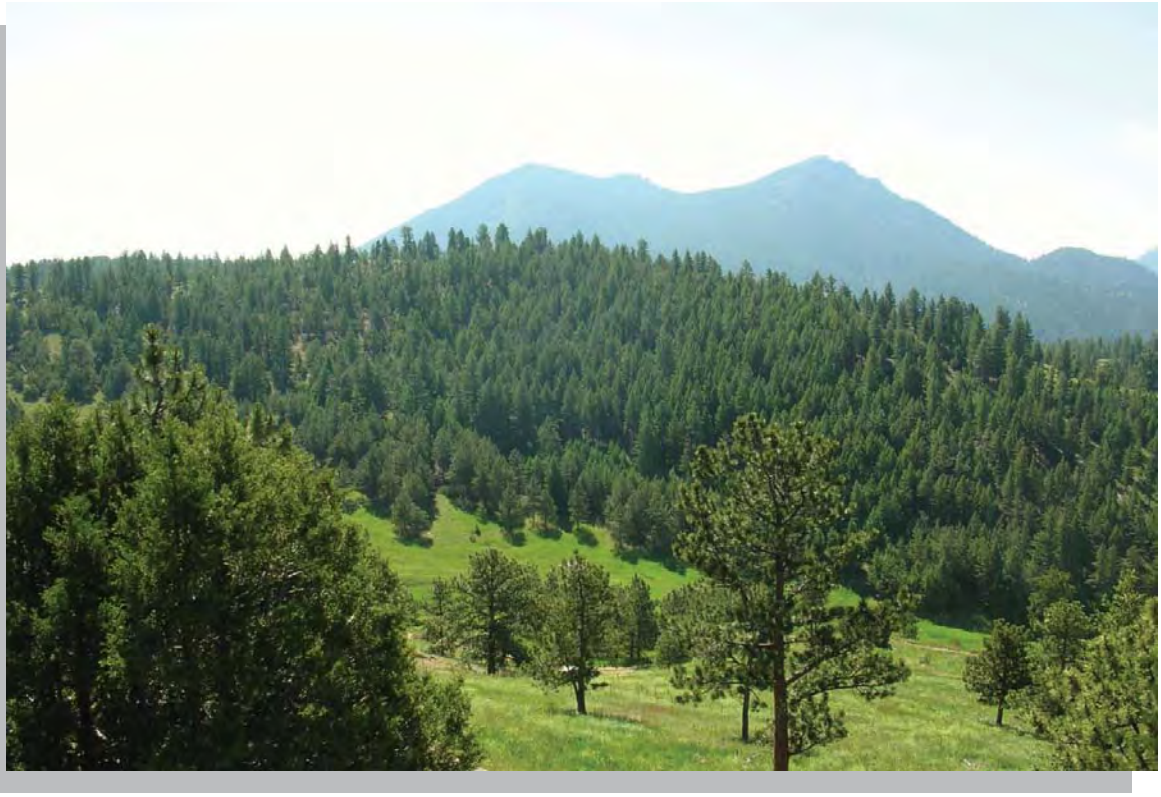

Photo 24 - View southeast from rock outcrop on north side of property.

Photo 25 - View east from rock outcrop on north side of property.

Photo 26 - View northwest from below rock outcrop on north side of property.