

Level 4 Potential Conservation Area (PCA) Report

Name Lower South Boulder Creek

Site Code S.USCOHP*7831

IDENTIFIERS

Site ID 1284 Site Class PCA
 Site Alias Winiger Gulch
 Site Alias South Boulder Creek
 Site Alias South Boulder Creek above Gross Reservoir

Network of Conservation Areas (NCA)

<u>NCA Site ID</u>	<u>NCA Site Code</u>	<u>NCA Site Name</u>
-		No Data

LOCATORS

Nation United States Latitude 395611N
 State Colorado Longitude 1052422W

Quad Code Quad Name

39105-H4 Tungsten

County

Boulder (CO)
 Gilpin (CO)

Watershed Code Watershed Name

10190005 St. Vrain

SITE DESCRIPTION

Minimum Elevation	7,320.00 Feet	2,231.14 Meters
Maximum Elevation	8,448.00 Feet	2,574.95 Meters

Site Description

The Lower South Boulder Creek site is located in the northeast corner of Gilpin County and southeast Boulder County, Colorado, in a steep-walled, east-west trending canyon. The headwaters of South Boulder Creek are on the eastern slope of the Continental Divide in the mountains of the Front Range in the James Peak Wilderness. From its snowmelt origins in the alpine tundra, South Boulder Creek flows steeply downhill through spruce - fir forests to emerge in the montane zone on the valley floor. Where the stream leaves the mountains and flows into this wide, low-gradient valley, it is joined by flows from the Moffat water tunnel, which diverts water from the Williams Fork basin and Fraser River on the Western Slope to the East Slope, through the tunnel and into South Boulder Creek. From here the stream flows eastward, for approximately 20 km, across generally moderate to low gradient open terrain, to the Foothills of the lower montane zone before entering the steep-gradient, narrow canyon that characterizes the landscape of this site. The stream flows through the canyon for approximately 4.6 km before entering Gross Reservoir and the lower boundary of this site. Geology throughout the site is characterized by Precambrian age (1,650-1,730 M.Y.) granitic rocks (Tweto 1979). Soils are characterized primarily four soil types. Riparian soils occupy a narrow zone, 20-70 m wide, in the bottom of the drainages in the riparian zone and are classified as Pachic Argiustolls-Aquic Argiudolls complex, 0 to 15 percent slopes. Pachic Argiustolls occur on stream terraces; the parent material consists of alluvium derived from igneous, metamorphic, and sedimentary rock; the natural drainage class is well drained and organic matter content in the surface horizon is about 2 percent. Aquic Argiudolls occur on alluvial flats; parent material consists of alluvium derived from igneous metamorphic and sedimentary rock; the natural drainage class is poorly drained; this soil is occasionally flooded and the organic matter content in the surface horizon is about 2 percent (USDA 2010). Soils on north-facing upland slopes are classified as Bullwark-Catamount families-Rock outcrop complex, 40 to 150 percent slopes. Soils on south-facing slopes are typically Ratake-Cathedral families-Rock outcrop complex, 40 to 150 percent slopes. Ridge-tops are typically comprised of Legault-Hiwan families complex, 5 to 40 percent slopes (USDA 2010). The South Boulder Creek watershed is one of two major sub-watersheds in Gilpin County and drains northern Gilpin County and approximately 30% of the entire Boulder Creek Watershed (BASIN 2010). South Boulder Creek originates as snowmelt in the James Peak Wilderness on the east slope of the Continental Divide. Shallow ground and surface water flow as well as numerous streams and summer rains maintain the natural flow regime in South Boulder Creek as it journeys eastward. South Boulder Creek hydrology has, however, been altered by diversions both into and out of the stream, by ground water withdrawals, by channel modification and by alteration of upland habitat. Where the stream leaves the high mountains and flows onto the valley floor, it is joined by water diverted from the west-slope, through the Moffat water tunnel and into South Boulder Creek. Numerous diversions out of South Boulder Creek and its tributaries occur across the watershed for

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agricultural, residential, and industrial purposes (CDSS 2010). Additionally, hundreds of wells located throughout the watershed withdraw water from the groundwater system (CDSS 2010). Habitat is a complex mosaic of plant communities that vary with slope, aspect, and soil characteristics. Upland landscape is characterized by steep (55% slope) canyon walls and rocky outcrops. Soils on these steep hillslopes are typically stable, with a thick layer of humus and duff that helps retain soil moisture and prevent erosion. Upland habitat on mesic north-facing slopes is dominated by Douglas-fir (*Pseudotsuga menziesii*) and on drier, south-facing slopes by ponderosa pine (*Pinus ponderosa*). Riparian habitat appears as a streak of bright green vegetation in the moist canyon bottom, starkly contrasting with the surrounding reds and browns of the canyon walls. Riparian habitat is dominated by a Douglas-fir / river birch (*Pseudotsuga menziesii* / *Betula occidentalis*) woodland that occurs as a narrow band of vegetation along the main stream channel and also occupies several side channels. Additionally, small pockets of blue spruce (*Picea pungens*) dominated woodland as well as non-willow shrublands and herbaceous wet meadows are interspersed within the Douglas-fir / river birch woodlands along both the main channel and tributaries. Other trees commonly present in the riparian zone include ponderosa and lodgepole pine (*P. contorta*) and blue spruce, which often forms, an emergent super-canopy. Woodland shrub cover is dominated by river birch but includes several willow and non-willow species such as coyote willow (*Salix exigua*) and planeleaf willow and Rocky Mountain maple (*Acer glabrum*), thinleaf alder (*Alnus incana*), red-osier dogwood (*Cornus sericea*) and wild sarsaparilla (*Aralia nudicaulis*). Herbaceous cover is a mix of xeric, mesic, and hydric forbs and graminoids occurring in a patchy distribution along a soil moisture gradient. Common species in moist sites along streambanks include Hall's rush (*Juncus hallii*), Merten's rush (*J. mertensianus*), shooting star (*Dodecatheon pulchellum*) and sweet Cicely (*Osmorhiza depauperata*). Moist cliff faces are occupied by dotted saxifrage (*Saxifraga bronchialis*), littleleaf alumroot (*Heuchera parvifolia*), and common brittle fern (*Cystopteris fragilis*). Commonly occurring species on slightly drier sites includes star Solomonplume (*Maianthemum stellatum*) and spreading dogbane (*Apocynum androsaemifolium*). Shrublands include willow and non-willow dominated communities. Willow shrublands include mountain willow (*Salix monticola*) and Drummond's willow (*Salix drummondiana*) shrublands and non-willow communities include river birch shrublands each with an herbaceous layer dominated by a diverse cover of forbs. Other shrubs that are present include Booth's willow (*S. boothii*), Rocky Mountain maple (*Acer glabrum*) and twinberry honeysuckle (*Lonicera involucrata*). Herbaceous cover is a rich and dense layer of xeric, mesic, and hydric species dominated by forbs but that also includes graminoids. Moist sites, along streambanks and in depressions, are occupied by forb species such as brook saxifrage (*Saxifraga odontoloma*), giant angelica (*Angelica ampla*), and green bog orchid (*Platanthera huronensis*) and by small patches of graminoids including water sedge (*Carex aquatilis*), and wooly sedge (*Carex lanuginosa*). Mesic sites are occupied by species such as baneberry (*Actaea rubra*), false Solomon's seal (*Maianthemum racemosum*), pink pyrola (*Pyrola asarifolia*), shooting star and Fendler waterleaf (*Hydrophyllum fendleri*), soft-leaved sedge (*Carex disperma*), and narrowleaf sedge (*C. eleocharis*). Margins of the shrublands, where soils are somewhat drier, are occupied by forbs such as fireweed (*Chamerion angustifolium*), and golden banner (*Thermopsis montana*). This habitat mosaic of upland habitats in juxtaposition with relatively undisturbed riparian habitat provides potential breeding habitat and refugia for a diversity of bird species. Breeding birds observed at the site include Hairy Woodpecker (*Picoides villosus*), Downy Woodpecker (*Picoides pubescens*), Rufous Hummingbird (migratory) (*Selasphorus rufus*), Broad-tailed Hummingbird (*Selasphorus platycercus*), Mountain Chickadee (*Poecile gambeli*), Pygmy Nuthatch (*Sitta pygmaea*), Steller's Jay (*Cyanocitta stelleri*), Cordilleran Flycatcher (*Empidonax occidentalis*), Warbling Vireo (*Vireo gilvus*), Dark-eyed Junco (*Junco hyemalis*), Yellow-rumped Warbler (*Dendroica coronata*), Hermit Thrush (*Catharus guttatus*), Townsend's Solitaire (*Myadestes townsendi*), American Robin (*Turdus migratorius*), American Dipper (feeding young) (*Cinclus mexicanus*), Western Tanager (*Piranga ludoviciana*) and Black-headed Grosbeak (*Pheucticus melanocephalus*).

Key Environmental Factors

Hydrology is the key environmental factor that enables the maintenance of biota at this site. Specifically, sufficient out of bank flows for an adequate duration of time are essential to the maintenance of soil moisture and other ecological processes, such as nutrient replenishment, that are essential to the long-term sustainability of this site. Annual and episodic flooding is extremely important for system maintenance and alteration of the flooding regime due to water impoundment, diversions, etc. may produce changes to plant composition as well as community composition (Rondeau 2001).

Climate Description

Temperature and precipitation vary in Gilpin County with elevation, time of year and from the east to the west. In general, lower elevations to the east and south are drier and warmer while higher elevations to the north and west are wetter and colder. Temperature also varies from the east to the west corresponding to changes

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in elevation. Additionally, precipitation does not fall at the same time during the year everywhere in Gilpin County. Western locations at higher elevations receive the majority of their precipitation during late winter and early spring whereas the Front Range foothills receive the majority of their moisture during spring and early summer but both mountains and foothills also receive precipitation from mid-summer thunderstorms (Siemer 1977). The lower South Boulder Creek site is located in the lower montane foothills in the northeast corner of Gilpin County at elevations between approximately 8,400 and 7,300 feet. Here, average annual precipitation from 1971 through 2000 was 22.43 inches with May, June, July and August the wettest months; coldest temperatures occurred in January with an average maximum temperature of 36.27 °F and an average minimum of 16.63 °F; warmest temperatures occurred in July with an average maximum of 77.22 °F and an average minimum of 50.4 °F (Prism 2010).

Land Use History

Historic development at the turn of the 20th century included the building of a railroad on the north-facing slopes with associated infrastructure and, on the opposite hillslope, a flume. Along this reach both the railroad and flume are located on the hillslope high above the stream but do not currently impact stream channel condition, or riparian habitat. Rural residential development was enabled by the building of the railroad at the turn of the century and is now ubiquitous throughout the surrounding landscape.

Cultural Features

None known.

SITE DESIGN

Site Map Y - Yes

Mapped Date 11/29/2010

Designer Malone, D.G.

Boundary Justification

Boundaries were drawn to encompass the immediate watershed surrounding and including the occurrences to protect against disturbance and to enable the natural ecological processes, including especially natural hydrologic processes including hydroperiod and flow regime, that are essential to the maintenance of these riparian wetlands.

Primary Area 2,251.70 Acres

911.23 Hectares

SITE SIGNIFICANCE

Biodiversity Significance Rank B3: High Biodiversity Significance

Biodiversity Significance Comments

This site is drawn for good (B-ranked) occurrences of two globally vulnerable (G3/S3) plant communities, Douglas-fir / river birch woodland (*Pseudotsuga menziesii* / *Betula occidentalis*) and thinleaf alder (*Alnus incana*) / mesic forbs riparian shrubland. Additionally, a fair occurrence (C-ranked) of the globally vulnerable (G3/S2) river birch (*Betula occidentalis*) / mesic graminoids shrubland, an excellent (A-ranked) occurrence of the state rare (G5?/S2S3) Sprengel's sedge (*Carex sprengelii*) and a good (B-ranked) occurrence of the state imperiled (G5/S1) variegated scouringrush (*Hippochaete variegata*) occur here.

Other Values Rank No Data

Other Values Comments

No Data

LAND MANAGEMENT ISSUES

Land Use Comments

In addition to the main dirt road that follows the creek and the railroad line, there are numerous trails in the area that are used by horses, hikers, mountain bikers, and dirt bikes. A small portion to the south is in Gilpin County.

Natural Hazard Comments

No Data

Exotics Comments

Canada thistle (*Cirsium arvense*), common mullein (*Verbascum thapsus*) and hay grasses such as Kentucky bluegrass (*Poa pratensis*), timothy (*Phleum pratense*) and smooth brome (*Bromus tectorum*) are evident along the road, but less common close to the stream.

Offsite

No Data

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Information Needs

No Data

ASSOCIATED ELEMENTS OF BIODIVERSITY

<u>Element State ID</u>	<u>State Scientific Name</u>	<u>State Common Name</u>	<u>Global Rank</u>	<u>State Rank</u>	<u>Driving Site Rank</u>
24645	<i>Alnus incana</i> / Mesic Forbs Shrubland	Thinleaf Alder/Mesic Forb Riparian Shrubland	G3	S3	Yes
24962	<i>Pseudotsuga menziesii</i> / <i>Betula occidentalis</i> Woodland	Montane Riparian Forest	G3?	S3	No
22501	<i>Carex sprengeii</i>	Sprengel's sedge	G5?	S2S3	No
24637	<i>Betula occidentalis</i> / Mesic Graminoids Shrubland	Lower Montane Riparian Shrublands	G3	S2	No
21454	<i>Hippochaete variegata</i>	variegated scouringrush	G5	S1	No

REFERENCES

<u>Reference ID</u>	<u>Full Citation</u>
198656	Boulder Area Sustainability Information Network (BASIN) (Web Page). Accessed 2010. http://bcn.boulder.co.us/bsin/index.html
198657	Colorado's Decision Support System (CDSS) (Web Page). Accessed 2010. http://cdss.state.us
195190	Neid, S., J. Lemly, K. Decker and D. Culver. 2009. Final Report: Survey of Critical Biological Resources in Boulder County 2007-2008. Colorado Natural Heritage Program, Fort Collins, CO.
198649	Prism Climate Group (Web Page). Accessed 2010. Spatial Climate Analysis. http://www.prism.oregonstate.edu/
190863	Rondeau, R. 2001. Ecological system viability specifications for Southern Rocky Mountain ecoregion. First Edition. Colorado Natural Heritage Program, Colorado State University, Fort Collins, CO. 181 pp.
198318	Siemer, E. 1977. Colorado Climate. Colorado Experiment Station, Colorado State University.
198683	Stevens, J. E., D.R. Culver and D.G. Malone. 2011. CNHP Final Report: Survey of Critical Biological Resources in Gilpin County, Colorado. Colorado Natural Heritage Program, Fort Collins, CO.
192747	Tweto, O. 1979. Geologic Map of Colorado, 1:500,000. United States Geological Survey, Department of Interior, and Geologic Survey of Colorado, Denver, CO.
198651	U.S. Department of Agriculture (Web Page). Accessed 2010. Natural Resource Conservation Service, Soil Data Mart. http://soils.usda.gov/survey/

ADDITIONAL TOPICS

Additional Topics

Original site design by Kittel, G.M. 1997-03-27. Updated by Malone, D. 11/29/2010; previously by Decker, K.L. and J.M. Lemly 2008-06-12.

VERSION

Version Date	11/29/2010
Version Author	Malone, D.G.

Disclaimer

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