

Level 4 Potential Conservation Area (PCA) Report

Name Quartz Creek at East Fork San Juan River

Site Code S.USCOHP*9485

IDENTIFIERS

Site ID 176 Site Class PCA
 Site Alias East Fork Quartz Creek
 Site Alias Quartz Creek Trail

Network of Conservation Areas (NCA)

NCA Site ID	NCA Site Code	NCA Site Name
-		No Data

LOCATORS

Nation United States Latitude 372302N
 State Colorado Longitude 1064504W

Quad Code	Quad Name
37106-C6	Summit Peak
37106-D6	Elwood Pass
37106-D7	Wolf Creek Pass
37106-C7	Blackhead Peak

County

Archuleta (CO)

Mineral (CO)

Watershed Code	Watershed Name
14080101	Upper San Juan

SITE DESCRIPTION

Minimum Elevation	8,020.00 Feet	2,444.50 Meters
Maximum Elevation	11,640.00 Feet	3,547.87 Meters

Site Description

In the extreme northeast corner of Archuleta County, the Continental Divide rises to elevations averaging 12,500 feet along ridgelines, and up to a high point in this county corner of 13,300 feet, at Summit Peak. Draining to the northwest just below Summit Peak in the South San Juan Wilderness are several intermittent streams and rivulets that converge at the base of a large, semi-circular subalpine and alpine basin to form the East Fork of Quartz Creek. Flowing northwest, the East Fork joins Quartz Creek one mile downstream, crosses the Wilderness boundary into the San Juan National Forest, and joins the East Fork of the San Juan River approximately 7 miles downstream. The East Fork of the San Juan River then turns ninety degrees to Quartz Creek and drains to the southwest through a broad, U-shaped, glaciated valley with a wide floodplain. The watersheds of East Fork of Quartz Creek, Quartz Creek, and the East Fork of the San Juan River support a variety of unique riparian and wetland communities, one rare breeding bird population, and at least one rare plant species along their lengths. At the upper end of the site, in the snowmelt basin just below Summit Peak, steep alpine talus and meadows fed by snowmelt support lush stands of subalpine mesic forbs, dominated by a heartleaf bittercress - tall fringed bluebells (*Cardamine cordifolia* - *Mertensia ciliata*) community. The meadows are productive and pristine with little degradation. Quartz Creek Trail, used by horse riders and hikers, crosses above this riparian area, which has lead to some erosion of the hillside above the meadows. Cattle also graze in the area. As the tributary streams and Quartz Creek Trail continue downslope and enter treeline in the subalpine and montane zones, dense forests begin on the steep hillsides and are comprised of mature Engelmann spruce, Douglas-fir, and subalpine fir (*Picea engelmannii*, *Pseudotsuga menziesii*, and *Abies lasiocarpa*) forests with pockets of mature quaking aspen (*Populus tremuloides*). Within this forest, the trail crosses a very steep, open-tree-canopy rockfall chute or avalanche path where a perennial rivulet drops from a large rock face down to the East Fork of Quartz Creek. The drainage is heavily vegetated and is dominated by a planeleaf willow (*Salix planifolia*) / mesic forb community. Additional shrubs in the community include short-fruit willow, Wolf's currant and gooseberry currant (*Salix brachycarpa*, *Ribes wolfii* and *R. montigenum*). The dense herbaceous understory is dominated by arrowleaf ragwort and tall fringed bluebells, as well as fewflower meadow-rue, Reeves' bladderfern (*Thalictrum sparsiflorum*, *Cystopteris reevesiana*) and mosses. Continuing downstream, Quartz Creek Trail crosses the East Fork of Quartz Creek, and just downstream of the crossing a small area of rock cliffs occurs near a waterfall carrying the creek down the moderately steep ravine. Steller's cliff brake (*Cryptogramma stelleri*) was found growing in horizontal crevices in the rock, with mosses and mat saxifrage (*Cilaria austromontana*), kept moist by spray from the falls, or in

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one place by a seep in an alcove. The surrounding forest is Engelmann spruce and subalpine fir with an understory of whortleberry (*Vaccinium* spp.). Immediately downstream of this rock face, the dominant riparian community of narrowleaf cottonwood - blue spruce / thinleaf alder (*Populus angustifolia* - *Picea pungens* / *Alnus incana*) begins along the East Fork of Quartz Creek, and continues past the confluence with the main stem of Quartz Creek, a montane, sinuous, dynamic creek carrying a high load of cobble, sand and silt. The broad floodplain has numerous wide cobble and sand point bars, which along with the creek banks, are populated by high numbers of regenerating cottonwood, alder, and Drummond's willow (*Salix drummondiana*). Blue spruce encroaches into the riparian zone from the surrounding forests. The understory is comprised of a sparse canopy of mesic shrubs such as white-stem gooseberry (*Ribes inerme*) and shrubby cinquefoil (*Dasiphora floribunda*), except at the banks of the creek where the alder and willow cover is vigorous. The herbaceous understory is comprised mostly of native mesic forbs and graminoids such as mountain parsley, common cowparsnip, and bluejoint reedgrass (*Pseudocymopterus montanus*, *Heracleum maximum*, and *Calamagrostis canadensis*), with a low cover of exotic herbaceous species. At the lower end, the creek gradient steepens and enters a narrow canyon with steep, shale slopes before opening up into a one-half-mile wide valley where Quartz Creek joins the East Fork of the San Juan River. The valley narrows again some five miles downstream at the west end of the site. Through this broad valley the river is low gradient, shallow, and braided, with a cobble bottom. The riparian vegetation is composed of a mosaic of three vegetation types, including a continuation of the narrowleaf cottonwood-blue spruce/thinleaf alder community from Quartz Creek in the upper portion of the valley, a thinleaf alder - mixed willow shrublands (*Alnus incana* - mixed *Salix* species) and wet meadows of beaked sedge (*Carex utriculata*) in the lower half of the valley. Beavers (*Castor canadensis*) are found on the secondary channels and help to maintain the wetlands. Grassy-forb meadows, often weedy, dominate the terraces within the valley floor and the toe slopes of the valley hillsides. North-facing hillsides support old growth Douglas-fir forest with a moist forb dominated understory. Small natural ponds and wetlands within the forest provide excellent habitat for mule deer (*Odocoileus hemionus*), elk (*Cervus elaphus*), and possibly frogs and other amphibians. The south-facing slopes are dominated by aspen (*Populus tremuloides*), ponderosa pine (*Pinus ponderosa*), or Gambel oak (*Quercus gambelii*). Cattle grazing has been the dominant use of this site, although grazing is being eliminated by the current land manager within the valley. There are no ditches, dams, man-made ponds, or irrigated hay meadows at this site, an unusual event given the elevation and geomorphology of the river. North of the river at the west end, Waterfall Creek drops down a steep cliff face, creating Silver Falls, a popular hiking destination. These steep cliff faces along the waterfall provide good nesting habitat for a small population of Black Swifts. Through the majority of the site, a popular Forest Road parallels the river and Quartz Creek to the Quartz Creek Trailhead. Both the trail and the road are almost always 50 to 500 feet from the river or the creek. The road crosses the river a mile downstream of the site boundary, and both the road and the trail cross Quartz Creek.

Key Environmental Factors

Starting at the upper (east) end of the site, the geology of the upper snowmelt basin is mapped as Ash-Flow Tuff of Main Volcanic Sequence (Tertiary-Oligocene; Age in San Juan Mountains, 26-30 million years old) transitioning to Pre-Ash-Flow Andesitic Lavas, Breccias, Tuffs, and Conglomerates (Tertiary-Oligocene; General Age 30-35 million years old) along the East Fork of Quartz Creek as it flows through subalpine and upper montane ecosystems and steep and narrow canyons. As the East Fork of Quartz Creek joins the main stem, the valley broadens into Quartz Meadow, the gradient flattens, and the soil type shifts to Pictured Cliffs Sandstone and Lewis Shale (Late Cretaceous). One mile above the confluence of Quartz Creek with the East Fork of the San Juan River, the surface geology transitions briefly to Animas Formation (Late Cretaceous; Arkosic sandstone, shale, and conglomerate) in a steep, narrow canyon. Then near the confluence, the valley of the East Fork of the San Juan River broadens and flattens, and the surface geology becomes recently deposited (Pleistocene-aged) Gravels and Alluviums (Pinedale and Bull Lake Age). Outside the boundary the surrounding mountains and contributing watersheds are dominated by Pre-Ash-Flow Andesitic Lavas, Breccias, Tuffs, and Conglomerates (Tweto 1979). Regarding soil types, again starting at the upper end of the site, the soils in the snowmelt basin are mapped as Igneous outcrop-Cryorthents complex, with barren exposures of andesite and quartz latite bedrock (USDA 1981). Soil sampling within the heartleaf bittercress-tall fringed bluebells community determined that soils are shallow silt loam with roots; mostly, the substrate is rocky with angular and rounded cobble, gravel and sand deposits. Lower in the site at the planeleaf willow occurrence, soils are mapped as Igneous outcrop; with steep, barren exposures of andesite and quartz latite bedrock, and areas of granite and metamorphic rock (USDA 1981). Samples taken here showed that the soils are rocky with boulders, angular cobble/talus, and gravel deposits. Areas closer to the forest edge with better soil development have a thin, loamy upper horizon. Along Quartz Creek within the broad valley of Quartz Meadow, the soils are mapped as Pescar sandy loam, derived from alluvium of various sources, and Igneous outcrop-Cryorthents complex, barren exposures of andesite and quartz latite bedrock.

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Pockets of Grenadier Loam and Adel Loam occur within the larger matrix. Soil samples taken along the riparian community on Quartz Creek are alluvial and consist of large and small cobble with large sand deposits on point bars and creek banks. After exiting Quartz Meadow, the creek drops through a steep, narrow valley lined by shale Badlands, consisting of barren, exposed shale, then enters the upper end of the broad, flat East Fork of the San Juan River valley. As the creek gradient drops and it joins with the East Fork, they both drop their bedloads of sand, gravel and cobble, classified as Riverwash. As the East Fork of the San Juan River travels through this lowest 1/3 of the site, the main, braided riverbed remains Riverwash, with soils slightly higher in the floodplain mapped as Pescar sandy loam, with pockets of Hunchback clay loams and Histic Cryaquepts in marshy areas. The surrounding contributing watershed is made up of a patchwork of Adel loam, Grenadier loam, and Sambrito loam, all derived from a mixed source of alluvium and colluvium or from andesite and quartz latite. The steep hill toe slopes along the valley bottom are Typic Ustorthents, again mainly derived from andesite and quartz latite, with areas of bedrock outcrops (Igneous Outcrop-Cryorthents complex) such as near Silver Falls (USDA 1981).

Climate Description

No Data

Land Use History

No Data

Cultural Features

No Data

SITE DESIGN

Site Map Y - Yes

Mapped Date 01/27/2006

Designer Freeman, K.M.

Boundary Justification

Surface water and ground water were two primary ecological processes considered when designing the site boundary. Both are critical to the alpine wetland in its upper extremity, as well as the rare plant occurrence, the rare bird occurrence, and five riparian or wetland communities occurring in the lower part of the site. The boundary begins by capturing the snowmelt basin and its drainage that is so important to maintaining the viability of the alpine wetland. The boundary then incorporates the immediate watershed of the large narrowleaf cottonwood riparian community on Quartz Creek and East Fork San Juan River, the immediate watershed for the alder-willow community and the beaked sedge community on the East Fork San Juan River, the avalanche path supporting the planeleaf willow community, the cliffs where groundwater seepage and waterfall spray supports the slender rock-brake, and at a separate location, the waterfall and cliffs that provide nesting habitat for the Black Swift. Although the continuation of the current hydrology is essential to the long-term survival of the rock-brake and the persistence of the Black Swift breeding population, the larger watershed for each of those sites was not included in the boundary. Overall, the boundary generally reflects a 500 foot buffer that will aid in preventing direct disturbance of the riparian and wetland communities and rare species, and encompasses trails, roads, and dispersed campsites where surface runoff may contribute nutrients and sediment, and where impacts may promote weed invasion. It should be noted that not all the hydrologic processes necessary to all the element occurrences are contained within the boundary. This boundary indicates the minimum area that should be considered for any conservation management plan.

Primary Area 2,321.64 Acres

939.54 Hectares

SITE SIGNIFICANCE

Biodiversity Significance Rank B3: High Biodiversity Significance

Biodiversity Significance Comments

This site supports seven elements tracked by CNHP. Driving the biodiversity rank, a good (B-ranked), 8.5-mile-long example of the globally vulnerable (G3/S3) narrowleaf cottonwood - blue spruce / thinleaf alder (*Populus angustifolia* - *Picea pungens* / *Alnus incana*) montane riparian forest occurs along Quartz Creek and the East Fork of the San Juan River. This mid-seral community is reliant on continued fluvial activity and bank overflow to perpetuate the cottonwood component, and is typically dense and diverse in the shrub and herbaceous layer (Carsey et al. 2003). The site also contains an excellent (A-ranked) occurrence of a plant community that is apparently secure (G4/S4) on a global scale. As of 2005, this is the best-known occurrence of the heartleaf bittercress-tall fringed bluebells (*Cardamine cordifolia* - *Mertensia ciliata*) alpine wetland type in Archuleta County. Near a popular waterfall north of the river, a good (B-ranked) nesting population of the globally apparently secure (G4) but state-vulnerable breeding population (S3B) of Black Swift (*Cypseloides niger*) occurs. This site also contains a good (B-ranked) occurrence of planeleaf willow

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(*Salix planifolia*) / mesic forbs shrubland, a globally apparently secure (G4/S4) community occurring in montane and subalpine swales with persistent saturation from snowmelt (Carsey et al. 2003). This is the only documented occurrence of this community in the county as of 2005, but because it is a common community type, there are likely other undocumented examples. Near the midpoint of the site, a good (B-ranked) occurrence of slender rock-brake exists. This fern is rare in Colorado (S2), although globally secure (G5). This species of fern has a broad distribution throughout the north half of North America, but, as of 2005, is known from only 19 locations in Colorado. Lastly, a good (B-ranked) occurrence of the globally secure (G5/S4) beaked sedge (*Carex utriculata*) herbaceous vegetation community occurs along the East Fork of the San Juan River in saturated floodplain soils.

Other Values Rank No Data

Other Values Comments

No Data

LAND MANAGEMENT ISSUES

Land Use Comments

The Forest Service and Wilderness areas are closed to motorized vehicles except on designated Forest Roads. Hiking, horse riding, hunting, fishing, camping and wildlife use are the dominant land uses in moderate seasons. Grazing occurs on the Forest Service portion of the site. The private land at the west end currently is not being grazed, but there is moderate recreational use in the area in summer. Portions of the East Fork of the San Juan River on the private inholding have undergone river restoration techniques beginning in 1986. This river restoration was done on the mile of river just below its confluence with Quartz Creek. The goal was to minimize channel braiding, minimize bank erosion, and to increase riparian vegetation along the channel (Rosgen 1996). It is not known whether subsequent restoration projects have been done since the initial project.

Natural Hazard Comments

No Data

Exotics Comments

In the upper reaches weedy species are uncommon; however, grazing and horse packing in the area threaten to introduce exotic species into the subalpine meadows. Weeds are again uncommon in the mid-reaches, but red clover (*Trifolium pratense*) occurs along Quartz Creek Trail. Kentucky bluegrass (*Poa pratensis*) and common dandelion (*Taraxacum officinale*) are the most common weeds in the herbaceous understory of the riparian zone along Quartz Creek. Other weeds have not yet invaded the community in large numbers, but the possibility exists since adjacent meadows are heavily grazed. Much of the riparian system along the East Fork of the San Juan River is in need of weed management. The private property owner is aware and concerned about the weeds.

Offsite

No Data

Information Needs

Lynx (*Lynx canadensis*) have been historically documented as recently as 1994. New surveys for this species as well as wolverine (*Gulo gulo*) and Peregrine Falcon (*Falco peregrinus*), both occurring in this area of the San Juan Mountains, would benefit by possibly providing additional motivation for protection of the area from potential development in the downstream reaches. Some river restoration has occurred on the upper portion of the East Fork of the San Juan River on private lands, and more may be planned for additional reaches. We recommend researching the historical geomorphology in order to understand if the current braided stream is natural.

ASSOCIATED ELEMENTS OF BIODIVERSITY

Element State ID	State Scientific Name	State Common Name	Global Rank	State Rank	Driving Site Rank
18795	<i>Carex utriculata</i> Herbaceous Vegetation	Beaked Sedge Montane Wet Meadows	G5	S4	No
24679	<i>Cardamine cordifolia</i> - <i>Mertensia ciliata</i> Herbaceous Vegetation	Alpine Wetlands	G4	S4	No
22152	<i>Cryptogramma stelleri</i>	slender rock-brake	G5	S2	No
40641	<i>Salix planifolia</i> / Mesic Forbs Shrubland [Provisional]	Planeleaf Willow/Mesic Forbs	G4	S4	No
24823	<i>Populus angustifolia</i> - <i>Picea pungens</i> / <i>Alnus incana</i> Woodland	Montane Riparian Forests	G3	S3	Yes

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24912	<i>Alnus incana</i> - <i>Salix (monticola, lucida, ligulifolia)</i> Shrubland	Thinleaf Alder-Mixed Willow Species	G3	S3	No
23518	<i>Cypseloides niger</i>	Black Swift	G4	S3B	No

REFERENCES

Reference ID	Full Citation
160903	Carsey, K., D. Cooper, K. Decker, D. Culver, and G. Kittel. 2003. Statewide wetlands classification and characterization: Wetland plant associations of Colorado. Prepared for Colorado Department of Natural Resources, Denver, CO by Colorado Natural Heritage Program, Fort Collins, CO.
193633	Freeman, K.M., March, M.A. and D.R. Culver. 2006. Final Report: Survey of Critical Wetlands and Riparian Areas in Archuleta County. Colorado Natural Heritage Program, Fort Collins, CO.
166839	Lyon, P. 2001. Colorado Natural Heritage Program Field Surveys.
170844	Randolph, D., Smith, Kettler, Redders, Roy, and Aitken. 1994. San Juan National Forest Riparian Site Survey.
191383	Rosgen, D. 1996. Applied river morphology. Wildland Hydrology, Pagosa Springs, CO.
193472	Sovell, J., P. Lyon, and L. Grunau. 2003. Final Report: Upper San Juan Biological Assessment. 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.
193554	USDA, NRCS. 2002. Orthophoto Mosaic for Archuleta County, CO. USDA-NRCS, National Cartography and Geospatial Center, Geospatial Data Branch, Fort Worth, TX.
193423	USDA, SCS. 1981. Soil Survey of Piedra Area, Colorado; Parts of Archuleta, Hinsdale, La Plata, Mineral, and Rio Grande Counties. In cooperation with the United States Forest Service and the Colorado Agricultural Experiment Station.

ADDITIONAL TOPICS

Additional Topics

Original site design by Kettler, S.M. 1997-06-10. Modified by Lyon, M.J. 2002-02-15. Portions of the East Fork of the San Juan River on the private inholding have undergone river restoration techniques beginning in 1986. This river restoration was done on the mile of river just below its confluence with Quartz Creek. The goal was to minimize channel braiding, minimize bank erosion, and to increase riparian vegetation along the channel (Rosgen 1996). It is not known whether subsequent restoration projects have been done since the initial project.

VERSION

Version Date	01/27/2006
Version Author	Freeman, K.M.

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