

BULL CANYON CREEK

Alpine County, California

2006 Stream Habitat Survey Report



Prepared by:

Humboldt-Toiyabe National Forest, Carson Ranger District

Introduction

Bull Canyon Creek is located in Alpine County, California and the entire watershed falls within the boundaries of the Carson-Iceberg Wilderness and the Humboldt-Toiyabe National Forest. Bull Canyon Creek is a significant tributary to Wolf Creek, accounting for roughly 30 to 40 percent of the flow in that stream. The headwaters of Bull Canyon Creek are found at an elevation of approximately 10,000 feet, and the stream descends over a course of 2.5 miles to an approximate elevation of 7350 feet at the confluence with Wolf Creek.

Purpose and Need

The 1995 Lahontan Cutthroat Trout Recovery Plan requires that ecosystem management plans be developed for the Truckee and Walker River basins in order to both determine objectives for the future desired conditions of these watersheds, and to create strategies for achieving these objectives. Similar management plans are recommended for the Carson and Humboldt River basins. In 1998 Truckee and Walker River Basin Recovery Implementation Teams were organized to develop strategies for Lahontan cutthroat trout (LCT) restoration and recovery efforts in the Truckee and Walker River basins. In August 2003 both recovery teams completed Short-Term Action Plans for Lahontan Cutthroat Trout Recovery in the Truckee and Walker River Basins. The short-term action plans outline specific tasks to be completed within five years. Many of the short-term tasks identified in the Truckee and Walker River Basin Short-Term Action Plans are similar to one another and are applicable to recovery of LCT in the Carson River basin. The Carson Ranger District adopted some of the short-term tasks identified in the Truckee and Walker River Basin Short-Term Action Plans and began implementing these actions under an informal plan for the Carson River basin. These tasks include: (1) identifying and evaluating fish passage and existing barriers within the Carson River basin, (2) developing a watershed analysis of the physical components of the Carson River basin, and (3) initiating habitat surveys to evaluate potential LCT introduction streams and validating against existing LCT inhabited streams.

The Carson River watershed historically provided an estimated 405 miles of stream habitat (Kling and Mellison 2008) for the native Lahontan cutthroat trout (*Oncorhynchus clarki henshawi*). Populations of these salmonids within the watershed were interactive and interconnected, and therefore these metapopulations likely had high genetic diversity and were capable of long term persistence through adverse conditions.

At present, no self-sustaining populations of genetically pure LCT are known to occupy historic habitat within the Carson River basin and since all of the drainage has been surveyed it is doubtful that any such populations remain to be discovered. The introduction of nonnative trout before the turn of the century is believed to be largely responsible for the extirpation of LCT within the Carson River drainage.

Although naturally occurring Lahontan cutthroat trout populations have been eliminated from the Carson River drainage, small populations have been established in the formerly

fishless headwaters of the East Fork Carson River above Carson Falls and in the tributaries Murray Canyon Creek, Golden Canyon Creek, and Poison Flat Creeks above impassible barriers. Pure populations of LCT also occur in Red Lake, Heenan Lake, Heenan Creek, and possibly in Raymond Meadows Creek. Hybridized populations of LCT occur in Jeff Davis Creek and in Leviathan Creek upstream of Leviathan Mine. The artificially established pure populations of LCT in the East Fork Carson River watershed occupy about 17 miles of stream habitat: approximately 4.2% of the total miles that LCT presumably occupied historically.

The primary causes for the decline of LCT include: 1) reduction and alteration of stream discharge; 2) alteration of stream channels and morphology; 3) degradation of water quality; and 4) introductions of non-native fish species. The Carson River watershed downstream of Carson Falls is primarily inhabited by non-indigenous salmonids which include, but are not limited to: rainbow trout (*Oncorhynchus mykiss*), brook trout (*Salvelinus fontinalis*), and brown trout (*Salmo trutta*). These competitive and aggressive introduced fishes have displaced the endemic Lahontan cutthroat trout.

Long term survival and recovery of LCT within the Carson River watershed will require sustained cooperation and effort from multiple federal and state agencies, including the Forest Service and personnel of the Humboldt-Toiyabe National Forest. Gaining information through immediate action can aid in prioritizing future objectives for the restoration of LCT. The 2006 Carson River watershed surveys are being conducted to gain information about streams in the basin, and furthermore to provide an inventory of potential fish habitat for LCT. The surveys include the tasks of identifying potential fish passage barriers and evaluating physical characteristics that pertain to the success of the native LCT. Should recommendations be made to re-introduce LCT, these surveys can provide baseline information for future management of the fishery. Bull Canyon Creek was surveyed on July 18, 2006 by Brian Hodge of the Carson Ranger District: Humboldt-Toiyabe National Forest.

Materials and Methods

Forest Service personnel surveyed Bull Canyon Creek by hiking the watercourse in an upstream manner. Interesting and relevant features were documented, photographed, and recorded into a Trimble GPS unit. These features included but were not limited to: road crossings, trail crossings, fish sightings, permanent fish barriers, seasonal fish barriers, tributaries, springs, beaver dams, areas of erosion concern, grazing impacts, dispersed campsites, etc.

Fish passage barriers were noted and categorized into one of four categories: natural-permanent, natural-seasonal, artificial-permanent, and artificial-seasonal. A permanent barrier is categorized as an obstacle, waterfall, or drop in excess of 5ft that would prevent passage of fish year-round (specifically LCT). A stadia rod was used to measure barriers where applicable. Barriers categorized as permanent barriers may actually be seasonal barriers, and some seasonal barriers may actually act as a permanent barrier.

Results

Approximately 2.27 river miles of Bull Canyon Creek were surveyed (Sites 1-22). The gradient of the surveyed reach is approximately 11.2 percent. At the confluence with Wolf Creek the stream was running at a discharge rate of about 4.0 cubic-feet-per-second (cfs), and closer to 1.0 cfs in the upper reaches (July 18, 2006).

Four permanent barriers were documented in Bull Canyon Creek (Sites 3, 5, 17, & 18). These barriers are waterfalls of varying sizes. In addition, five seasonal barriers (Sites 1, 4, 11, 13, & 14) were recorded, making a total of nine fish passage barriers throughout the lower, middle, and upper reaches. In some instances several consecutive seasonal barriers were denoted by a single site number. Two trail crossings were identified where a path crosses Bull Canyon Creek (Sites 2 & 9). A trail crossing is illustrated on the topo map near Site 21, though this crossing was not clearly visible during the survey. Seven tributaries were documented, and most of these sources contributed less than 1% of total flow to Bull Canyon Creek (Sites 6, 7, 8, 10, 12, 16, & 21). Two generic photo points were used to illustrate characteristics of the stream (Sites 19 & 20). One large salmonid measuring an estimated 12+ inches was sighted in Bull Canyon Creek (Site 15).

Discussion

Bull Canyon Creek is a moderately steep watershed divided by the presence of four waterfalls. The stream provides approximately 2.2 miles of disconnected potential LCT habitat.

The lowermost 0.32 river miles of stream from Site 1 through Site 5 are steep and contain two sizeable permanent fish passage barriers. Site 1, also the survey start, includes a 3.6-foot drop with a maximum pool depth of 1.6 feet. At Site 3 a waterfall is divided into two adjacent barriers: the falls on river right are 10 feet high, whereas the falls on river left are comprised of two consecutive 5.5 foot drops. Between Site 3 and Site 5, multiple seasonal barriers were noted, ranging in height from 2.0 to 4.5 feet. The waterfall at Site 5 drops a total of approximately 100 vertical feet, with one single fall of over 40 feet.

Between the permanent barriers at Sites 5 and 17, a section of stream measuring 1.67 miles offers potential LCT habitat. This section includes three seasonal barriers ranging in height from 2.0-3.9 feet. Two waterfalls were identified at Sites 17 and 18, both measuring at least 15 feet in height, with maximum pool depths of less than 2.0 feet. These two permanent barriers effectively segment the stream into two sections of potential LCT habitat. The 0.54 mile section of stream between Site 18 and Site 22 offers the best potential habitat for LCT based on the gradient and absence of barriers. Upstream of Site 22, several snow-fed drainages converge to form the mainstem of Bull Canyon Creek.

The single largest tributary to Bull Canyon Creek is an unnamed stream fed by Bull Lake. Bull Lake is known to contain “cutt-bows”, a hybrid of LCT and rainbow trout. One adult salmonid was sighted at Site 15, proving that these fish can successfully survive in

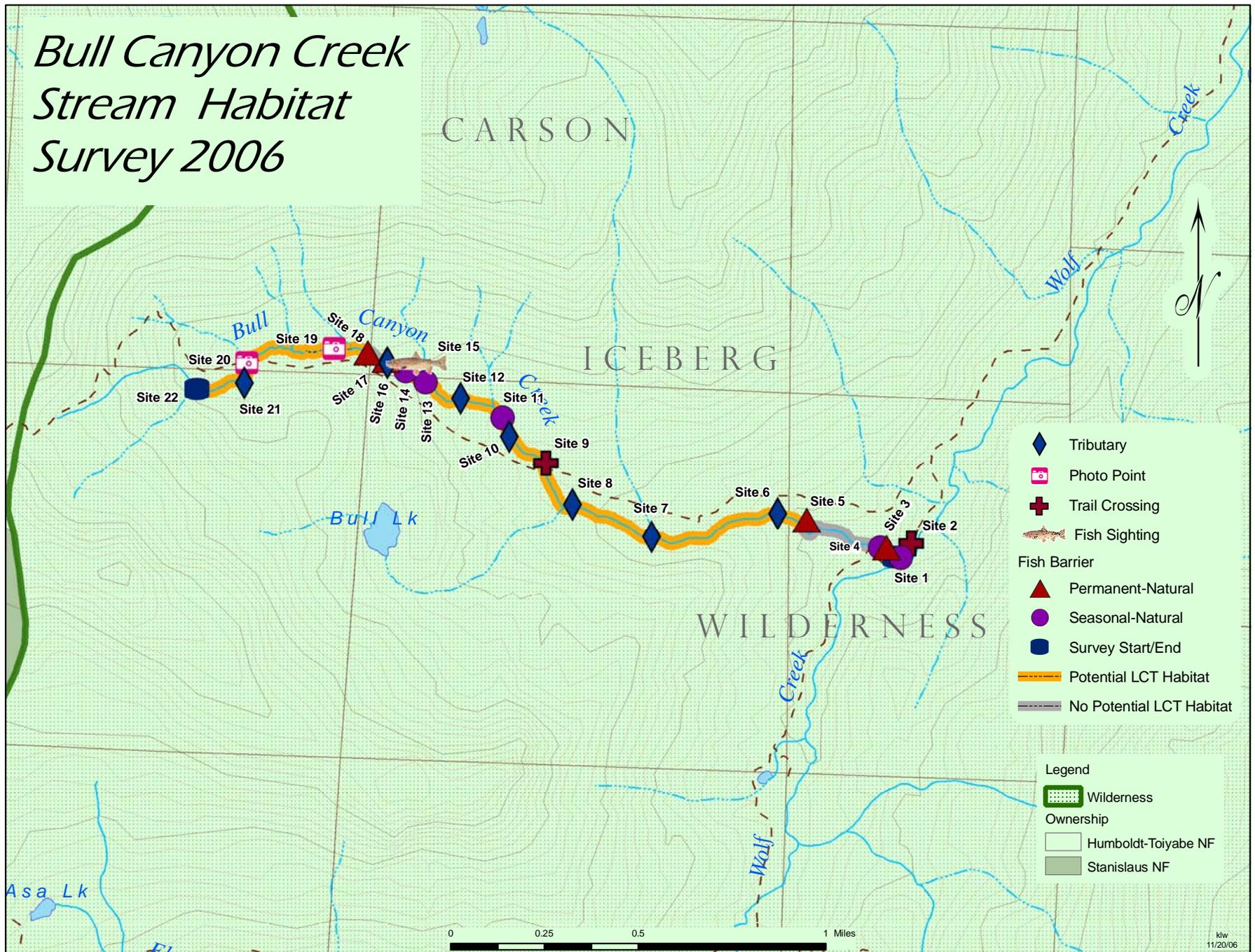
Bull Canyon Creek. Based on the appearance and location of the fish, it is believed to be a hybridized fish that migrated from Bull Lake.

As Bull Canyon is partially isolated by geography and by the seasonal presence of snow (Nov.-June), human impacts are minimal. Small numbers of hikers and range cattle have had a negligible impact on the watershed. The finite amount of potential LCT habitat is more a product of naturally occurring obstacles than of anthropogenic change. Therefore, the management recommendations for Bull Canyon Creek are focused on maintaining the status-quo.

Recommendations

1. Consider the 1.67 mile section of Bull Canyon Creek between Site 5 and Site 17, and the 0.54 mile section of stream between Sites 18 & 22 as potential LCT habitat, and consider Bull Canyon Creek a medium candidate for restoration.
2. Monitor Bull Canyon to ensure that the current integrity of the creek, trail, and ecosystem are upheld.

Bull Canyon Creek Stream Habitat Survey 2006





Site 1: Bull Canyon Creek, Carson Ranger District. Downstream view of confluence of Bull Canyon Creek (near) and Wolf Creek (far). This site is located at UTM: N: 4266600 & E: 262188, Elev.7810 feet (2381m).



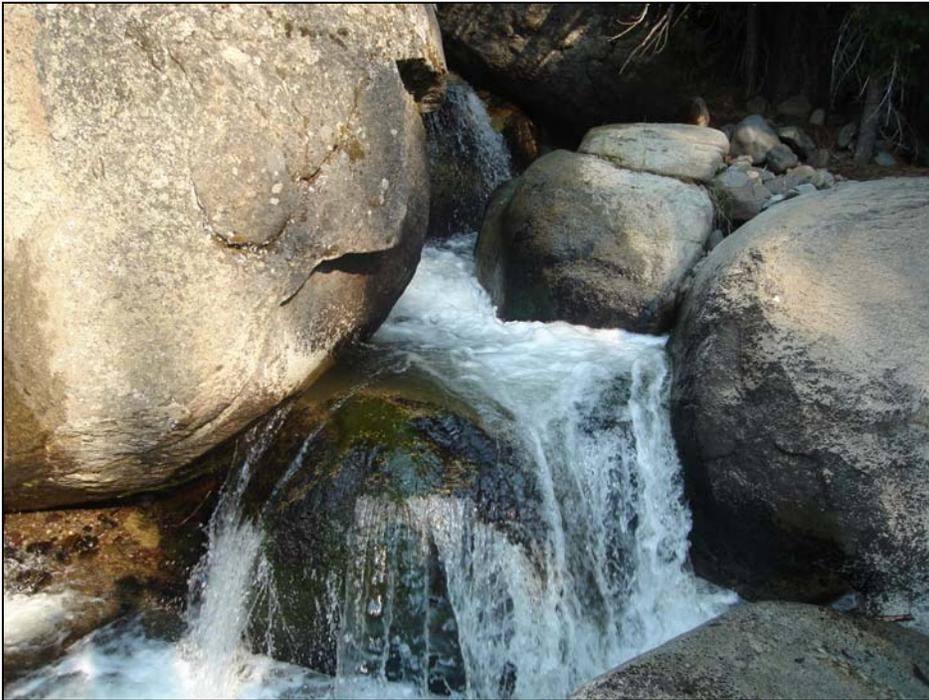
Site 1: Bull Canyon Creek, Carson Ranger District. A seasonal barrier just above the confluence with a height of 3.6 feet, and max. pool depth of 1.6 feet. This site is located at UTM: N: 4266600 & E: 262188, Elev.7810 feet (2381m).



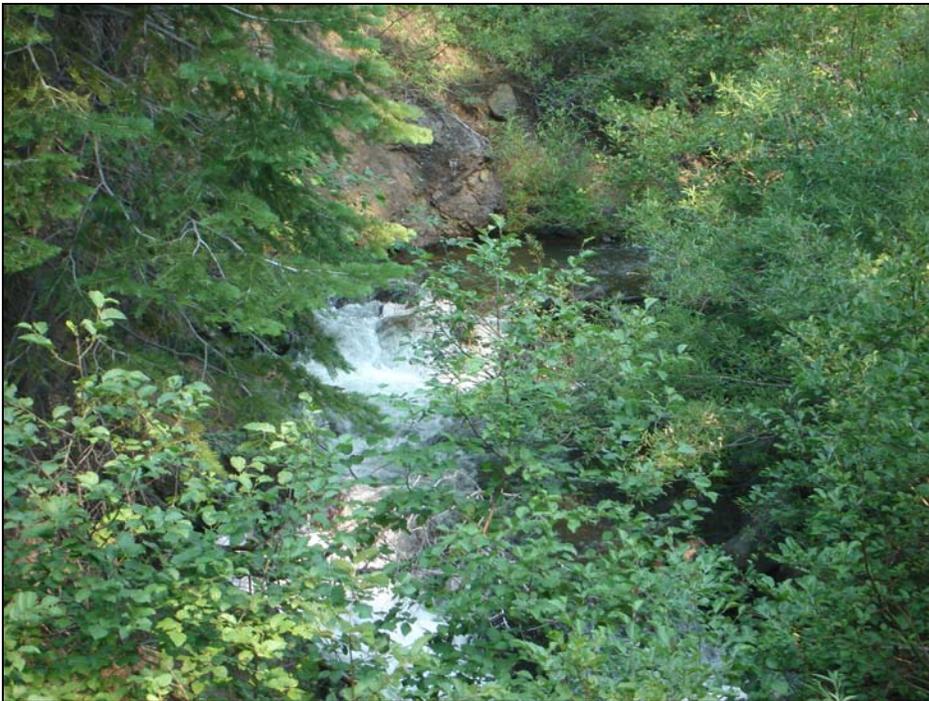
Site 2: Bull Canyon Creek, Carson Ranger District. Photo shows a ford crossing where the Wolf Creek trail intersects the stream. This site is located at UTM: N: 426656 & E: 262262.



Site 3: Bull Canyon Creek, Carson Ranger District. Permanent fish barrier. Photo shows river right: a drop of approximately 10 ft, with a max/ pool depth of approximately 1.5 feet. This site is located at UTM: N: 4266638 & E: 262155.



Site 3: Bull Canyon Creek, Carson Ranger District. Photo shows river left: two consecutive 5.5 foot drops, with a max pool depth of 3.0 feet. This site is located at UTM: N: 4266638 & E: 262155.



Site 4: Bull Canyon Creek, Carson Ranger District. Photo shows an upstream view of the stream where multiple seasonal barriers are present, ranging in height from 2.0-4.5 feet. This site is located at UTM: N: 4266624 & E: 262122, Elev. 7505 feet (2288m).



Site 4: Bull Canyon Creek, Carson Ranger District. Photo shows a downstream view of the stream where multiple seasonal barriers are present, ranging in height from 2.0-4.5 feet. This site is located at UTM: N: 4266624 & E: 262122, Elev. 7505 feet (2288m).



Site 5: Bull Canyon Creek, Carson Ranger District. Photo shows the upper section of a permanent fish barrier. The falls featured measure approximately 40-50 feet. This site is located at UTM: N: 4266759: & E: 261808, Elev.7646 feet (2331m).



Site 5: Bull Canyon Creek, Carson Ranger District. A comprehensive view of the permanent fish barrier, which drops a total of approximately 100 vertical feet. This site is located at UTM: N: 4266759 & E: 261808, Elev.7646 feet (2331m).



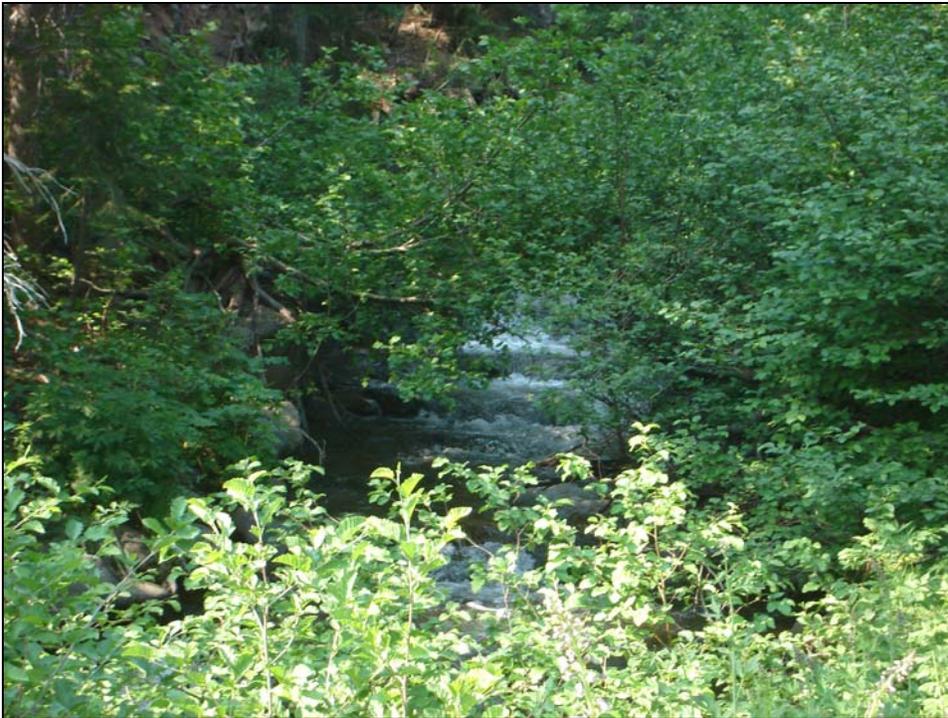
Site 5: Bull Canyon Creek, Carson Ranger District. The middle drop is 20-25 vertical feet. This site is located at UTM: N: 4266759 & E: 261808, Elev.7646 feet (2331m).



Site 5: Bull Canyon Creek, Carson Ranger District. The creek plunges an estimated 10 feet at the lowest section of falls. This site is located at UTM: N: 4266759 & E: 261808, Elev.7646 feet (2331m).



Site 6: Bull Canyon Creek, Carson Ranger District. A small tributary enters the creek on river left, and contributes 1-2% of flow to Bull Canyon Creek. This site is located at UTM: N: 4266785 & E: 261690.



Site 6: Bull Canyon Creek, Carson Ranger District. Upstream view of Bull Canyon Creek just above the confluence with the small tributary. This site is located at UTM: N: 4266785 & E: 261690.



Site 7: Bull Canyon Creek, Carson Ranger District. A tributary (<1% contribution to flow) enters river left. This site is located at UTM: N: 4266682 & E: 261152, Elev. 8029 feet (2448m).



Site 8: Bull Canyon Creek, Carson Ranger District. The tributary that drains Bull Lake enters the creek on river right, accounting for approximately 40% of the downstream flow in Bull Canyon. This confluence is located at UTM: N: 4266822 & E: 260811, Elev. 8059 feet (2457m).



Site 9: Bull Canyon Creek, Carson Ranger District. Upstream view from a trail crossing. This ford crossing is located at UTM: N: 4267003 & E: 260695, Elev.8200 feet (2500m).



Site 9: Bull Canyon Creek, Carson Ranger District. Cross-sectional photo of trail crossing. This ford crossing is located at UTM: N: 4267003 & E: 260695, Elev.8200 feet (2500m).



Site 9: Bull Canyon Creek, Carson Ranger District. Photo shows a small tributary that enters river left at the trail-stream crossing (1% contributing flow). This site is located at UTM: N: 4267003 & E: 260695, Elev.8200 feet (2500m).



Site 10: Bull Canyon Creek, Carson Ranger District. Viewpoint looking down a tributary that enters Bull Canyon Creek on river right (3% contribution to flow). This site is located at UTM: N: 4267116 & E: 260534, Elev. 8239 feet (2512m).



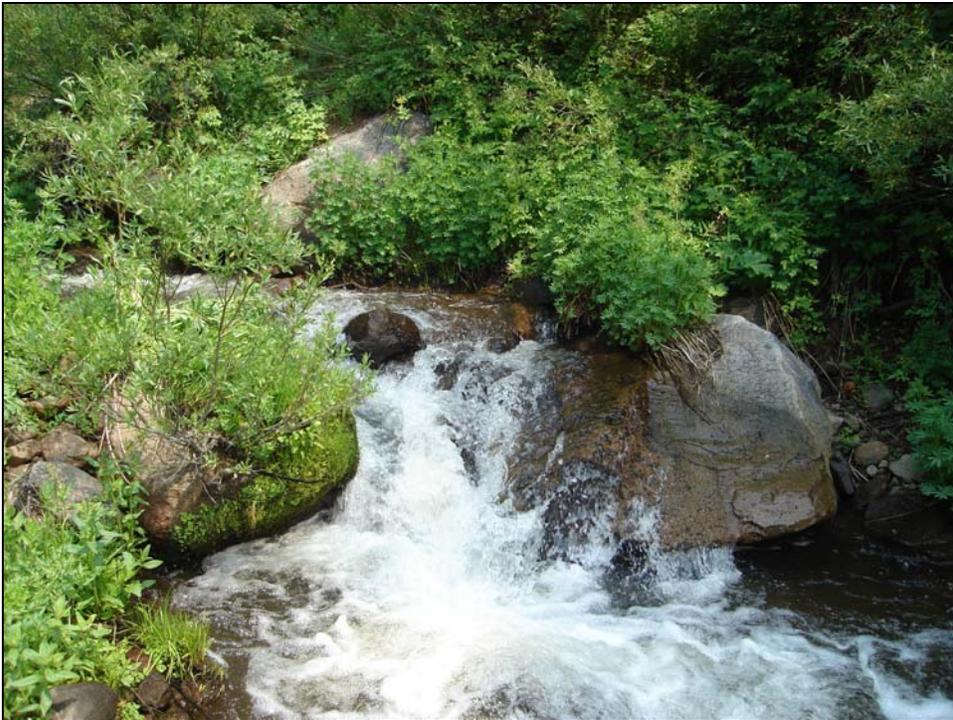
Site 11: Bull Canyon Creek, Carson Ranger District. Upstream view of a small seasonal barrier measuring 2.0 feet in height, with a max pool depth of approximately 1.0 foot. This site is located at UTM: N: 4267195 & E: 260328, Elev. 8226 feet (2508m).



Site 11: Bull Canyon Creek, Carson Ranger District. Upstream view of a seasonal barrier. This site is located at UTM: N: 4267195 & E: 260328, Elev. 8226 feet (2508m)



Site 12: Bull Canyon Creek, Carson Ranger District. Photo shows one braid of a tributary that enters from river left. Each braid contributes approximately 1% of flow to Bull Canyon. This is located at UTM: N: 4267282& E: 260328, Elev.8285 feet (2526m).



Site 13: Bull Canyon Creek, Carson Ranger District. Upstream view of a seasonal barrier measuring 3.1 feet high, with a max pool depth of 1.5 feet. This barrier is located at UTM: N: 4267345 & E: 260180, Elev. 8357 feet (2548m).



Site 13: Bull Canyon Creek, Carson Ranger District. Upstream view typical of this reach. This site is located at UTM: N: 4267345 & E: 260180, Elev. 8357 feet (2548m).



Site 14: Bull Canyon Creek, Carson Ranger District. A seasonal barrier with height 3.9 feet, and max. pool depth 1.6 feet. This site is located at UTM: N: 4267398 & E: 260091, Elev. 8394 feet (2559m).



Site 15: Bull Canyon Creek, Carson Ranger District. A large salmonid (estimated 12-15 inches) was sighted in this pool at the bottom of the barrier at Site 14: at UTM: N: 4267398 & E: 260091, Elev. 8394 feet (2559m).



Site 16: Bull Canyon Creek, Carson Ranger District. Cross-sectional view of a tributary entering on left bank. The tributary contributes an additional 4% of flow to Bull Canyon Creek. This site is located at UTM: N: 4267416 & E: 260015, Elev. 8407 feet (2563 m).



Site 17: Bull Canyon Creek, Carson Ranger District. Permanent fish barrier measuring approximately 15 feet in height, with a max. pool depth of 1.8 feet. This site is located at UTM: N: 4267439 & E: 260010, Elev. 8446 feet (2575m).



Site 17: Bull Canyon Creek, Carson Ranger District. The stream passes through a snow tunnel below the waterfall. This site is located at UTM: N: 4267439 & E: 260010, Elev. 8446 feet (2575m).



Site 18: Bull Canyon Creek, Carson Ranger District. Upstream photo of a permanent fish passage barrier with two sequential falls: 5.5 feet and 15.0 feet. This site is located at UTM: N: 4267474 & E: 259932, Elev. 8462 feet (2580m).



Site 18: Bull Canyon Creek, Carson Ranger District. A small, snow-fed tributary enters Bull Canyon Creek on river left. This site is located at UTM: N: 4267474 & E: 259932, Elev. 8462 feet (2580m).



Site 19: Bull Canyon Creek, Carson Ranger District. Upstream view shows a narrow and cascading stream. This site is located at UTM: N: 4267475 & E: 259788, Elev. 8623 feet (2629m).



Site 20: Bull Canyon Creek, Carson Ranger District. Steep headwaters converge in a low gradient meadow to form a meandering stream. This is located at UTM: N: 4267428 & E: 259414, Elev. 8633 feet (2632m).



Site 21: Bull Canyon Creek, Carson Ranger District. A headwater tributary enters Bull Canyon Creek on river right. This confluence is located at UTM: N: 4267343 & E: 259407, Elev. 8676 feet (2645m).



Site 22: Bull Canyon Creek, Carson Ranger District. Survey End. Photo shows the main headwater of Bull Canyon Creek entering a wet meadow. Above this elevation Bull Canyon Creek and the headwater tributaries are too small and steep to hold fish. This site is located at UTM: N: 4267320 & E: 259201, Elev. 8695 feet (2651m).



Site 22: Bull Canyon Creek, Carson Ranger District. Survey End. Photo shows the main headwater branch of Bull Canyon Creek in the upper edge of the wet meadow. This site is located at UTM: N: 4267320 & E: 259201, Elev. 8695 feet (2651m).



Site 22: Bull Canyon Creek, Carson Ranger District. Survey End. Barely visible as thin silver lines in the photo, are the steep drainages that form the headwaters of Bull Canyon Creek. This site is located at UTM: N: 4267320 & E: 259201, Elev. 8695 feet (2651m).