MOUNTAINEER CREEK

Alpine County, California

2006 Stream Habitat Survey Report

Prepared by:

Carson Ranger District: Humboldt-Toiyabe National Forest

Introduction

Mountaineer Creek is located in Alpine County, California, and flows approximately 7.0 river miles from Monitor Pass down to the confluence with Leviathan Creek (becoming Bryant Creek). Mountaineer Creek has two major tributaries: Big Springs and Poison Creek. Big Springs contributes 65-75 % of the total flow to the upper reaches of Mountaineer Creek. Above Big Springs, Mountaineer Creek is small, warm, and shallow. Poison Creek contributes approximately 30% of the flow to Mountaineer Creek in the last river mile. Mountaineer Creek originates at an approximate elevation of 8314 feet and the stream descends down to 6262 feet. With the exception of one private parcel, Mountaineer Creek is found entirely within the boundaries of the Humboldt-Toiyabe National Forest.

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. Mountaineer Creek was surveyed on May 23, 24, 30, 31 & June 1, 2006 by members of the Carson Ranger District of the Humboldt-Toiyabe National Forest. The surveyors were Brian Hodge and Robert Omann.

Materials and Methods

Forest Service personnel surveyed Mountaineer 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

The Forest Service crew surveyed approximately 6.1 miles of Mountaineer Creek (Sites 1-44). The gradient of the stream is roughly 5.1 percent. At the confluence with Leviathan Creek (forming of Bryant Creek), Mountaineer Creek was running at approximately 2.0 cfs (cubic feet/second) on May 23 with a water temperature of 13.5 ºC. The major tributary Big Springs had a water temperature of 9.5 ºC on June1, and Mountaineer Creek above the confluence with Big Springs had a water temperature of 22.5 ºC on June 1st.

One permanent fish passage barrier is located on Mountaineer Creek (Site 19): a 5.5 foot waterfall drops into a shallow and swift 1.0 foot deep hole before falling an additional 1.5 feet. At least 12 seasonal natural barriers were identified, and in some instances two barriers were located within close proximity so they were documented by a single site number with subheadings a, b, c, etc (Sites 6, 9, 11, 13a & 13b, 14, 17a & 17 b, 23, 29, 31, 32, & 35). Seven tributaries were identified in the surveyed reach (Sites 10, 15, 21, 24, 34, 39, & 41). One adjacent road impact was noted (Site 22), one erosion concern was noted (Site 18), and two road crossings were identified in the surveyed reach (Sites 42 & 43). One beaver dam (Site 28) and one remnant diversion or flashboard dam (Site 40) were identified, though both were ineffective at retaining water. Campsites were located at the lowest and uppermost stretches of Mountaineer Creek, where the stream is easily accessed by a road (Sites 2 & 37).

Salmonids were identified throughout Mountaineer Creek and fish sightings were documented at 11 locations (Sites: 3, 7, 8, 12, 20, 25, 26, 27, 30, 33, & 36). Photos were also taken at specific points and in some cases may include the notation of fish (4, 5, 16 & 38).

Discussion

Approximately 5.4 miles of Mountaineer Creek provide potential LCT habitat (Sites 1-41). One permanent fish barrier at Site 19 divides the drainage into two halves, both of which contain numerous seasonal barriers. The carrying capacity of Mountaineer Creek appears to be high. The highest densities of fish were observed in the meadow section between Sites 15 and 20 and also between Site 25 and Site 41.

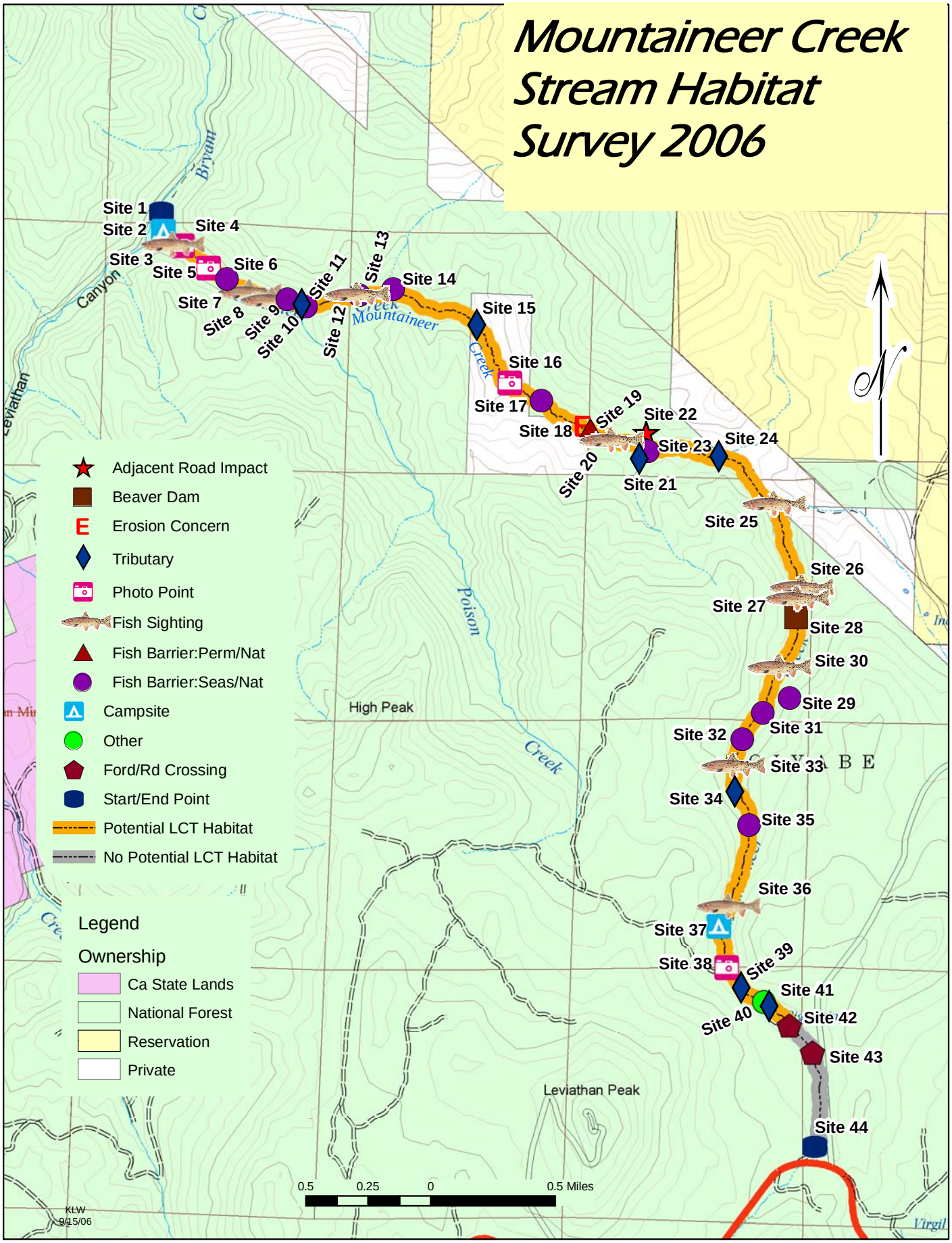
Mountaineer Creek flows through several noticeably distinct ecological sections. Between Highway 89 and Big Springs (Sites 41-44) the creek flows through sagebrush and lacks protection from incoming solar radiation. The stream is small and shallow, and the water is easily heated as represented by the 22.5 ºC water temperature. No fish were observed in this 0.7 mile section of water, and the streambed is likely dry during the late summer and fall of certain years.

Below Big Springs the stream is narrow and cool. Big Springs contributes a large source of water conducive to the establishment and growth of a salmonid population, and non-native trout were sighted in many locations downstream of this spring. Mountaineer Creek flows through two sections of Aspen forests where large woody debris is prevalent (Sites 1-15 & Sites 24-36). Many of the seasonal natural barriers were categorized based on complexity, not solely on the height of the barrier. In many instances the barrier height was only 1.5-2.5 feet high; however, the longitudinal distance was 4-5 feet or more, and passage would require fish to jump through root wads and an entangled mess. In addition, the maximum depth of the pools measured below seasonal barriers was always smaller than the barrier height. The stream also flows through two reaches of low gradient meadow where undercut banks provide refuge for fish (Sites 15-24 & Sites 36-41).

Current human activities seem to have little impact on Mountaineer Creek though a couple issues are worth examining. Campsites exhibit the most noticeable human impact on Mountaineer Creek, and several established sites are located within a few feet of the watercourse (Site 37). In addition, a single algal bloom was noticeable for 100m downstream of the campsite at Site 37, suggesting a point source of nutrients, etc.

Recommendations

1. Consider the 5.3 mile section of Mountaineer Creek between Site 1 and Site 41 as potential LCT habitat and consider Mountaineer Creek a high candidate for restoration. Mountaineer Creek could contribute towards restoring a small metapopulation of LCT in the area (See 2008 Carson River Summary Report).
2. Decommission and/or relocate the campsites at Site 37 to a place further away from the stream.
3. Investigate the algae blooms downstream of Site 37 to determine if the origin is natural, or the product of camping upstream.


Mountaineer Creek
Stream Habitat
Survey 2006
Site 1
Site 2
Site 3
Site 4
Site 5
Site 6
Site 7
Site 8
Site 9
Site 10
Site 11
Site 12
Site 13
Site 14
Site 15
Site 16
Site 17
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Site 43
Site 44
Bryant
Canyon
Leviathan
Mountaineer
Creek
Poison
Creek
High Peak
Leviathan Peak
Virgil
Adjacent Road Impact
Beaver Dam
Erosion Concern
Tributary
Photo Point
Fish Sighting
Fish Barrier:Perm/Nat
Fish Barrier:Seas/Nat
Campsite
Other
Ford/Rd Crossing
Start/End Point
Potential LCT Habitat
No Potential LCT Habitat
Legend
Ownership
Ca State Lands
National Forest
Reservation
Private
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0.25
0
0.5 Miles
KLW
9/15/06

Site 1: Mountaineer Creek, Carson Ranger District. Downstream view of Mountaineer Creek at the confluence with Leviathan Creek. This site is located at UTM: N: 4290649 & E: 270149, Elev. 6232 ft (1900 m).

Site 1: Mountaineer Creek, Carson Ranger District. Upstream view of the confluence of Mountaineer Creek (left) and Leviathan Creek (shown right). Note the visible difference in color and turbidity. This site is located at UTM: N: 4290649 & E: 270149, Elev. 6232 ft (1900 m).

Site 2: Mountaineer Creek, Carson Ranger District. A cross-sectional view of a campsite on river right of Mountaineer Creek, located just above the confluence. This site is located at UTM: N: 4290428 & E: 270152, Elev. 6252 ft (1900 m).

Site 2: Mountaineer Creek, Carson Ranger District. Cross-sectional view of a dispersed campsite located on river right. The fire ring was located 12-15 meters from the channel. This site is located at UTM: N: 4290428 & E: 270152, Elev. 6252 ft (1906m).

Site 3: Mountaineer Creek, Carson Ranger District. Photo shows an upstream view of a pool where a salmonid was observed. This site is located at the UTM: N: 4290358 & E: 270225, Elev. 6265 ft (1910m).

Site 4: Mountaineer Creek, Carson Ranger District. Upstream view of habitat characteristic of this reach. A fish was observed in this pool. This site is located at UTM: N: 4290338 & E: 270274, Elev. 6265 ft (1910m).

Site 5: Mountaineer Creek, Carson Ranger District. Upstream view of stream. Pools and undercut banks are present in this section of water. This site is located at UTM: N: 4290192 & E: 270444, Elev. 6275 ft (1913m).

Site 6: Mountaineer Creek, Carson Ranger District. Photo shows a small waterfall that creates a seasonal fish barrier with a height of 2.5 feet, max pool depth of 1.6 feet, and longitudinal length of 6.5 feet. This site is located at UTM: N: 4290057 & E: 270631, Elev. 6298 ft (1920m).

Site 7: Mountaineer Creek, Carson Ranger District, upstream view of a pool where fish (salmonids) were observed. This site is located at UTM: N: 4290030 & E: 270711, Elev. 6383ft. (1946m).

Site 8: Mountaineer Creek, Carson Ranger District. Photo shows a characteristic cascade and pool. A fish was observed adjacent to the rock in the photo. This site is located at UTM: N: 4289987 & E: 270854, Elev. 6380 ft (1945 m).

Site 9: Mountaineer Creek, Carson Ranger District. Photo shows a seasonal fish barrier. The barrier dimensions are: 2.6 feet high, 5-6 feet long, with a max pool depth of 1.65 feet. This site is located at UTM: N: 4289984 & E: 270946, Elev. 6435 (1962m).

Site 10: Mountaineer Creek, Carson Ranger District. Cross-sectional view shows the tributary Poison Creek entering Mountaineer Creek on river left. This site is located at UTM: N: 4289954 & E: 271045, Elev. 6412ft (1955m).

Site 11: Mountaineer Creek, Carson Ranger District, upstream view of a seasonal fish barrier. A small salmonid was observed in pool below the waterfall which measured 3 feet in height, with a max.pool depth of 1.8 feet. This site is located at UTM: N: 4289938 & E: 271074, Elev. 6429ft. (1960m).

Site 13: Mountaineer Creek, Carson Ranger District. Photo shows an upstream view of a root wad complex and small waterfall which create a seasonal fish barrier. The fall measured 3 feet in height with a max pool depth of approximately 2.5 feet. This site is located at UTM: N: 4290012 & E: 271418, Elev. 6550ft (1997m).

Site 14: Mountaineer Creek, Carson Ranger District. A seasonal fish barrier is created by a small waterfall. This site is located at UTM: N: 4290044 & E: 271636, Elev. 6567ft (2002m).

Site 15: Mountaineer Creek, Carson Ranger District. Upstream view shows where a small tributary enters from river right. The watercourse is marked by the dark tall grass in the upper left corner of the picture. This site is located at UTM: N: 4289818 & E: 272177, Elev. 6655ft (2029 m).

Site 16: Mountaineer Creek, Carson Ranger District. Photo shows an upstream view of a meadow setting. Fish were abundant throughout this section of stream. This site is located at UTM: 4289449 & E: 272301, Elev. 6734ft (2053m).

Site 17: Mountaineer Creek, Carson Ranger District. Seasonal fish barrier shown in photo has height 2.5 feet and max pool depth 2.1 feet. This site is located at UTM: N: 4289329 & E: 272594, Elev. 2071ft (6793m)

Site 18: Mountaineer Creek, Carson Ranger District. Photo shows an erosion concern on river left. The slump was naturally occurring, though it adds sediment at high flows. This site is located at the UTM: 4289165 & E: 272859, Elev. 6842ft (2086m).

Site 19: Mountaineer Creek, Carson Ranger District, photo not available. This site is a naturally occurring permanent fish barrier. The waterfall is composed of two sequential drops of 5.5 ft and 1.5 feet, with a max pool depth of 1 foot. This site is located at UTM: N 4289150 & E: 272910, Elev. 6852ft (2089m).

Site 20: Mountaineer creek, Carson Ranger District. Photo shows a stream section where several small salmonids were observed in the stream. This site is located at UTM: N: 4289077 & E: 273047, Elev. 6862 ft (2092m)

Site 21: Mountaineer Creek, Carson Ranger District. Cross sectional view of a small tributary (5% of flow) entering on river left. Several fish were oriented towards the incoming water. This site is located at UTM: N: 4288969 & E: 273207.

Site 22: Mountaineer Creek, Carson Ranger District. Adjacent road impact on river right. This site is located at UTM: N: 4289635 & E: 273262, Elev. 6918ft (2109m).

Site 23: Mountaineer Creek, Carson Ranger District. Photo shows a seasonal fish barrier with height 3.6 feet and a max pool depth of 1.2 feet. This site is located at UTM N: 4289004 & E: 273283, Elev. 6921 ft (2110m).

Site 24: Mountaineer Creek, Carson Ranger District, upstream view of a small tributary (<1% of flow) entering on river right. This site is located at UTM: N: 4288969 &E: 273740, Elev. 7019ft (2140m).

Site 25: Mountaineer Creek, Carson Ranger District. Upstream view of stream section where fish were sighted. This site is located at UTM: N: 4288661 & E: 274682.

Site 26: Mountaineer creek, Carson Ranger District. Photo shows a pool where 2 fish were observed. This site is located at UTM: N: 4288124 & E: 274275, Elev. 7298ft (2225m).

Site 27: Mountaineer Creek, Carson Ranger District. Side view of a small pool where fish were sighted. This site is located at UTM: N: 4288055 & E: 274247, Elev. 7196 ft (2194m).

Site 27: Mountaineer Creek, Carson Ranger District. Upstream view of a small pool where fish were sighted. This site is located at UTM: N: 4288055 & E: 274247, Elev. 7196 ft (2194m).

Site 28: Mountaineer Creek, Carson Ranger District. Photo shows a remnant beaver dam. The debris was not impeding flow or fish passage. This site is located at UTM: N: 4287928 & E: 274239, Elev. 7232ft (2205m).

Site 29: Mountaineer Creek, Carson Ranger District. Upstream view of a potential seasonal barrier. Barrier height measured 1.65 feet and max pool depth 1.3 feet. This site is located at UTM: N: 4287405 & E: 274198.

Site 30: Mountaineer Creek, Carson Ranger District. Fish were sighted in this pool, located at UTM: N: 4287612 & E: 274130, Elev. 7377ft (2249m).

Site 30: Mountaineer Creek, Carson Ranger District. Fish were sighted in this pool, located at UTM: N: 4287612 & E: 274130, Elev. 7377ft (2249m).

Site 31: Mountaineer Creek, Carson Ranger District. Photo shows an upstream view of a seasonal fish barrier. Barrier height measured at 2.8 feet and the max pool depth was 1.1 feet. This site is located at UTM: N: 4287398 & E: 274023, Elev. 7423 ft. (2263m).

Site 32: Mountaineer Creek, Carson Ranger District. Upstream photo of a seasonal fish barrier. This site is located approximately 60m upstream of Site 31. This site is located at UTM: N: 4287150 & E: 274884.

Site 33: Mountaineer Creek, Carson Ranger District, downstream view of creek where a fish was sighted. The UTM is N: 4286973 & E: 273834, Elev. 7472 ft. (2278m).

Site 34: Mountaineer Creek, Carson Ranger District. Bird's eye view of a small tributary (<2% of flow) that enters on river left. This site is located at the UTM: N: 4286803 & E: 273845, Elev. 7524 ft (2294m).

Site 35: Mountaineer Creek, Carson Ranger District, upstream view of a seasonal fish barrier created by cascades and root wads. The max pool depth was 0.6 feet under a barrier with 2.2 feet in height. This site is located at UTM: N: 4286593 & E: 273923.

Site 36: Mountaineer Creek, Carson Ranger District, upstream view of channel with willows thick on both sides of the stream. This site is located at UTM: N: 4286067 & E; 273798, Elev.7711ft (2351m).

Site 37: Mountaineer Creek, Carson Ranger District. Photo shows one of several campsites located in a 150 ft stretch adjacent to the stream. The camp was approximately 3m from the water edge. This site is located at UTM: N: 4285935 & E: 273738, Elev. 7741ft (2360m).

Site 37: Mountaineer Creek, Carson Ranger District, view from left bank towards camp This site is located at UTM: N: 4285935 & E: 273738, Elev. 7741ft (2360m).

Site 38: Mountaineer Creek, Carson Ranger District. Photo shows an upstream view of Mountaineer creek in a large meadow. This site is located at UTM: N: 4285665 & E: 273786, Elev. 7764ft (2367m).

Site 38: Mountaineer Creek, Carson Ranger District. Bird's eye view of the main channel. Cold water and undercut banks offered good habitat for fish. This site is located at UTM: N: 4285665 & E: 273786, Elev. 7764ft (2367m).

Site 39: Mountaineer Creek, Carson Ranger District, cross-sectional view of Mountaineer Creek, looking up a small tributary (5-10% of flow) which enters river left. This site is located at UTM: N: 4285535 & E: 273882, Elev. 7774ft (2370m).

Site: 40: Mountaineer Creek, Carson Ranger District. Photo shows an upstream view of an old diversion or flash-board dam. The structure, which does not effectively retain water, has the dimensions: 6.2 feet long x 3.95 feet tall x 8.9 feet wide. This site is located at UTM: N: 4285444 & E: 274029, Elev. 7793 ft (2376m).

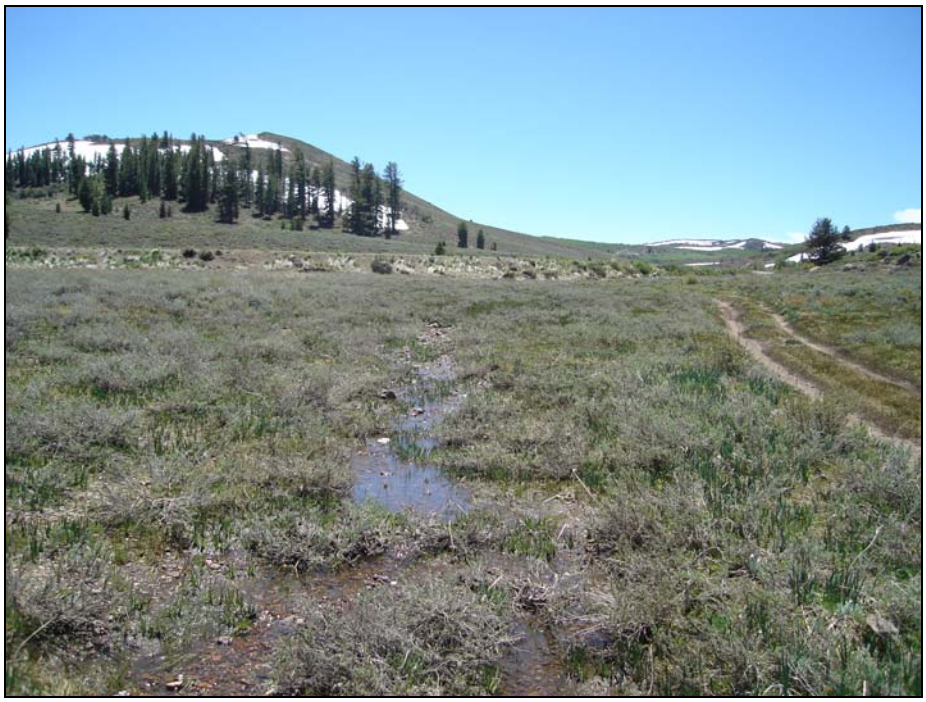
Site 41: Mountaineer Creek, Carson Ranger District. Photo shows the tributary Big Springs, which contributes the majority of flow (65-75%) to Mountaineer Creek. This site is located at UTM: N: 4285417 & E: 274062, Elev. 7790ft (2375m).

Site 41: Mountaineer Creek, Carson Ranger District. Photo shows the cold (9.5ºC) source of Big Springs, approximately 50m from the confluence, This site is located at UTM: N: 4285417 & E:274062, Elev. 7790ft (2375m).

Site 42: Mountaineer Creek, Carson Ranger District. Cross-sectional view (Northeasterly) of the crossing at the left braid. Flow was minimal. This site is located at UTM: N: 4285296 & E: 274195, Elev.7787ft. (2374m).

Site 42: Mountaineer Creek, Carson Ranger District. Cross-sectional view (Northeasterly) of the crossing at the right braid. Flow was minimal. This site is located at UTM: N: 4285296 & E: 274195, Elev.7787ft (2374m).

Site 43: Mountaineer Creek, Carson Ranger District. Cross-sectional view (Easterly) of a road-stream crossing. The flow is slow to stagnant and the substrate made of cobble. Note: this crossing has little impact on the creek. This site is located at UTM: N: 4285118 & E: 274343, Elev. 7823 ft. (2385m).



Site 44: Mountaineer Creek, Carson Ranger District. End Survey. The photo shows little water, as the channel is warm, shallow, and braided. Highway 89 is approximately 60 m upstream, and runs left to right in the photo. This site is located at UTM: N: 4284507 & E: 274357, Elev. 7888ft. (2405m).