BRYANT CREEK

Douglas County, Nevada Alpine County, California

2006 Stream Habitat Survey Report

Prepared by:

Humboldt-Toiyabe National Forest, Carson Ranger District

Introduction

Bryant Creek is located in Alpine County, California and Douglas County, Nevada. The stream forms at the merging of Leviathan Creek and Mountaineer Creek: which respectively contribute 60% and 40% of the flow to Bryant Creek. Bryant Creek flows into the East Fork Carson River approximately 1.0 river mile downstream from where the Carson River crosses the California-Nevada border. Bryant Creek descends from 6265 feet to 5107 feet over a course of approximately 7.05 river miles, most of which is located on the Humboldt-Toiyabe National Forest (SEE MAP).

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. Bryant Creek was surveyed in May 2006 by members of the Carson and Bridgeport Ranger Districts of the Humboldt-Toiyabe National Forest. The surveyors included Jason Kling, Brian Hodge, Robert Omann, and Joel Ingram.

Materials and Methods

Forest Service personnel surveyed Bryant 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 4.82 miles of Bryant Creek. The downstream reach started at the East Fork Carson River and continued upstream for 1.77 miles, ending at a small tributary fed by Doud Springs. The upper reach started near the Barney Riley historical site and covered 3.05 miles up to the start of Bryant Creek (confluence of Mountaineer and Leviathan). The overall gradient of Bryant Creek is approximately 3.1%. At the USGS gauging station, at the confluence of Leviathan and Mountaineer Creeks, Bryant Creek was flowing at 4.6 cfs (cubic feet/second) on May 23: Mountaineer at an estimated 2.0 cfs and Leviathan at an estimated 2.6 cfs. At the confluence with the Carson River, Bryant was flowing at an estimated 4-5 cfs on May 18. Two permanent anthropogenic barriers were identified on Bryant Creek (Sites 15 & 35). On the lower reach a concrete diversion splits the stream into two waterfalls (Site 15). In addition to the headwater streams of Leviathan and Mountaineer, tributaries to Bryant included an unnamed creek flowing from Doud Springs (Site 16) and Barney Riley Creek (Site 22), which contributes approximately 20% of flow.

Seventeen road crossings were identified in the surveyed reaches of Bryant Creek (Sites 4, 5, 7, 11, 13, 17, 21, 23, 25, 26, 27, 28, 29, 31, 32, 33, & 35). One campsite, one gauging station, and one historical sight were noted (Sites 3, 37, & 19 respectively). Erosion concerns and adjacent road impacts were also documented (Sites 8 & 9, and 12, 14, & 36 respectively). No fish sightings were recorded.

Discussion

Based upon physically and visually ascertainable data, almost all of the surveyed 4.82 miles of Bryant Creek appear to provide potential LCT habitat. The stream between Site 17 and Site 22 and between Sites 1 and 15 has the longest continuous sections of virtually undisturbed water. The cool stream provides abundant cover in the form of vegetation and/or undercut banks, and in addition provides complexity in the number of pool, run, and riffle sequences. In evaluating the potential for LCT in Bryant Creek, one must consider the water chemistry. Leviathan Creek accounts for approximately 60% of the flow in the upper portions of Bryant Creek., and drainage from the Leviathan Mine Superfund Site is included in this 60%. A thorough chemical analysis would reveal the impact of the mine on the mainstem of Bryant Creek.

Two permanent fish passage barriers prevent continuity throughout Bryant Creek and into the headwater streams (Site 15 and Site 35). The barrier at Site 15 is formed by a concrete diversion that splits the stream into two channels. The waterfall on river right has an approximate height of 3.3 feet and a maximum pool depth of 2.9 feet, whereas the falls on river left are slightly smaller and have a maximum pool depth of 2.2 feet.

In the upper drainage, a permanent fish passage barrier is located where Forest Service Road 052 crosses Bryant Creek (Site 35). A large concrete box measuring approximately 8ft wide by 8 ft tall, and approximately 40 or more feet long has been placed on a slope to allow an unrestricted stream flow. The water drops 6-8 inches from the culvert into a

pool with a maximum depth of 1.5 feet. Three measurements of stream velocity resulted in an average figure of 3.28 ft/sec. The stream enters the upstream end of the culvert in a near 90 degree angle at high velocity and flows through the box at a depth of 1-2 inches (@4.6 cfs). Removal or alteration of the barrier at Site 35 would link 3.05 miles of Bryant Creek to the headwater streams, which provide an additional 7 miles of potential LCT habitat.

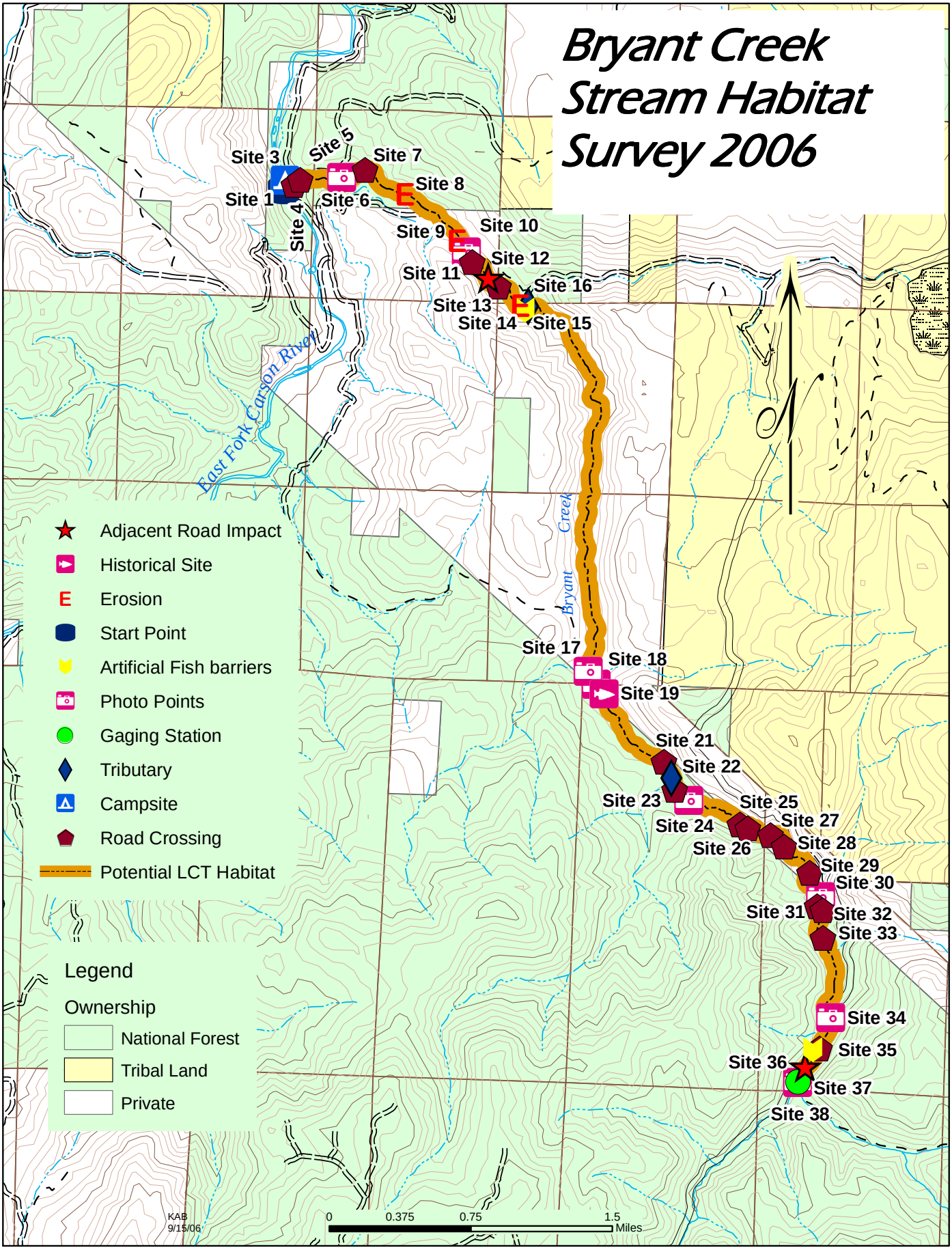
During our survey no fish were sighted in Bryant Creek, though high flows and high turbidity made visual surveys difficult. Salmonids were positively identified during a survey of the tributary Mountaineer Creek. Forest Service personnel reported sighting large brook trout in Bryant Creek in October, 2006.

The sixteen road-stream crossings may individually have a negligible effect on Bryant Creek; however, at some points the road runs through the streambed, and collectively the multiple crossings between Sites 23-33 introduce sediment into Bryant Creek and are likely having a negative impact on the Bryant Creek drainage.

The tributary Mountaineer Creek provides a large amount of potential LCT habitat (See report).

Recommendations

1. Consider the 4.8 mile section of Bryant Creek between Site 1 and Site 38 as potential LCT habitat and consider Bryant Creek a medium candidate for restoration.
2. Examine the possibilities of altering, enhancing, or replacing the box culvert under Forest Service Road 052 (Site 35) in order to assure a link between the main stem of Bryant Creek and the habitat in Mountaineer and Poison Creeks.
3. Work with Forest Service personnel and private land owners to close or restrict the OHV roads that parallel and repeatedly cross Bryant Creek between Site 23 and Site 35, in order to decrease erosion and the introduction of fine sediment.
4. Monitor the water quality and chemistry of Leviathan Creek to ensure that this tributary does not pose a threat to aquatic life in Bryant Creek.
5. Contact the owners/land managers of the section between Sites 16 and 17 in order to gain information about the habitat and presence/absence of fish barriers, or preferably to gain permission to survey this 2.23 mile section of stream.
6. Assess the efficiency and impact of the concrete diversion (Site 15) making sure it is not diverting a quantity of water that exceeds the adjudicated rights. Examine the possibilities of altering, enhancing, or replacing the diversion structure to provide fish connectivity through this site.


Bryant Creek Stream Habitat Survey 2006
Site 1
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
Site 18
Site 19
Site 21
Site 22
Site 23
Site 24
Site 25
Site 26
Site 27
Site 28
Site 29
Site 30
Site 31
Site 32
Site 33
Site 34
Site 35
Site 36
Site 37
Site 38
East Fork Carson River
Bryant Creek
Adjacent Road Impact
Historical Site
Erosion
Start Point
Artificial Fish barriers
Photo Points
Gaging Station
Tributary
Campsite
Road Crossing
Potential LCT Habitat
Legend
Ownership
National Forest
Tribal Land
Private
KAB
9/15/06
0
0.375
0.75
1.5
Miles

Site 1: Bryant Creek, Carson Ranger District. Bryant Creek enters the East Fork Carson River at this point. The survey started at this point, which is located at UTM: N: 4298168 & E: 265741, Elev. 5107 ft (1557m).

Site 1: Bryant Creek, Carson Ranger District. Downstream photo shows confluence of Bryant and E. Fork Carson River. This site is located at UTM: N: 4298168 & E: 265741, Elev. 5107 ft. (1557m).

Site 1: Bryant Creek, Carson Ranger District, looking across Bryant Creek and up the E. Fork Carson River. This site is located at UTM: N: 4298168 & E: 265741, Elev. 5107 ft. (1557m).

Site 3: Bryant Creek, Carson Ranger District. Photo of a fire ring and campsite located less than 50 feet from water and Site 1.

Site 3: Bryant Creek, Carson Ranger District. Photo of an abandoned vehicle.

Site 4: Bryant Creek, Carson Ranger District. An OHV road-stream crossing is located several meters upstream of the confluence (Site 1).

Site 5: Bryant Creek, Carson Ranger District. Cross-sectional view of a road-stream crossing. This site is located at UTM: N: 4282130 & E: 265827, Elev. 5090 ft. (1552m).

Site 6: Bryant Creek, Carson Ranger District, looking upstream from river right. This photo point is located at UTM: N: 4298272 & E: 266231, Elev. 5127 ft. (1563m).

Site 7: Bryant Creek, Carson Ranger District, looking downstream. An old culvert remains in streambed. This site is located at UTM: N: 4298839 & E: 266433, Elev. 5166 ft. (1575m).

Site 8: Bryant Creek, Carson Ranger District. Photo looking upstream at bank erosion on river right. This site is located at UTM: N: 4298130 & E: 266772, Elev. 5189 ft. (1582m).

Site 9: Bryant Creek, Carson Ranger District. Looking upstream at bank erosion on the left bank exacerbated by the adjacent road. This site is located at UTM: N: 4298130 & E: 266776, Elev. 5192 ft (1583m).

Site 10: Bryant Creek, Carson Ranger District. Looking upstream at a deep pool located between Sites 9 and 11. This site is located at UTM: N: 4297639 & E: 267298.

Site 11: Bryant Creek, Carson Ranger District. Cross-sectional view of a road-stream crossing with moderate impact on waterway. This site is located at UTM: N: 4297512 & E: 267433, Elev. 5117ft (1560m).

Site 12: Bryant Creek, Carson Ranger District. Looking upstream at an adjacent road impact along river right. This site is located at UTM: N: 4297421 & E: 267489, Elev. 5235 ft (1596m).

Site 13: Bryant Creek, Carson Ranger District. Looking south across a low-use road-stream crossing. This site is located at UTM: N: 4297346 & E: 267574, Elev. 5294 ft (1614m).

Site 13: Bryant Creek, Carson Ranger District. Looking north at entry to low-use road-stream crossing.

Site 14: Bryant Creek, Carson Ranger District. Cross-sectional view, looking south at an erosion concern. This site is located at UTM: N: 4297182 & E: 267760, Elev. 5304 ft (1617m).

Site 15: Bryant Creek, Carson Ranger District. Bird's eye view of a permanent fish barrier with height 3.3 feet. This site is located at UTM: N: 4297152 & E: 267791, Elev. 5304 ft (1617m).

Site 15: Bryant Creek, Carson Ranger District. Permanent fish barrier, looking upstream from below barrier. This site is located at UTM: N: 4297152 & E: 267791, Elev. 5304 ft (1617m).

Site 15: Bryant Creek, Carson Ranger District. Permanent fish barrier, looking south from right bank. This site is located at UTM: N: 4297152 & E: 267791, Elev. 5304 ft (1617m).

Site 16: Bryant Creek, Carson Ranger District. Small tributary to Bryant Creek, where fish were sighted. Photo taken looking upstream from right bank of Bryant Creek. This creek is located at UTM: N: 4297188 & E: 267822, Elev. 5314 ft. (1620m).

Site 17: Bryant Creek, Carson Ranger District. Small road crossing adjacent to an historical site. Photo taken looking downstream. This site is located at UTM: N: 4294062 & E: 268332, Elev. 5625 (1715 m).

Site 17: Bryant Creek, Carson Ranger District. Photo taken looking upstream at a small road crossing adjacent to an historical site. This site is located at UTM: N: 4294062 & E: 268332, Elev. 5625 (1715 m).

Site 17: Bryant Creek, Carson Ranger District. Small road crossing adjacent to an historical site. Photo is cross-sectional view taken at UTM: N: 4294062 & E: 268332, Elev. 5625 (1715 m).

Site 18: Bryant Creek, Carson Ranger District. Downstream view of undercut banks. This site is located at UTM: N: 4293944 & E: 268401, Elev. 5628 ft (1716m).

Site 19: Bryant Creek, Carson Ranger District. Orchard at the Barney Reilly Historical Site. This site is located at UTM: N: 4294062 & E: 268332, Elev. 5625 ft (1715m).

Site 19: Bryant Creek, Carson Ranger District. View of old stone and barbed-wire fences. This site is located at UTM: N: 4294062 & E: 268332, Elev. 5625 ft (1715m).

Site 19: Bryant Creek, Carson Ranger District. View of old stone and barbed-wire fences. This site is located at UTM: N: 4294062 & E: 268332, Elev. 5625 ft (1715m).

Site 19: Bryant Creek, Carson Ranger District. Zoomed view of old stone fence. This site is located at UTM: N: 4294062 & E: 268332, Elev. 5625 ft (1715m). This site is located at UTM: N: 4294062 & E: 268332, Elev. 5625 ft (1715m).

Site 21: Bryant Creek, Carson Ranger District. Cross-sectional view of road-stream crossing. Impact negligible. This site is located at UTM N: 4293291 & E: 268975, Elev. 5740ft (1750m).

Site 22: Bryant Creek, Carson Ranger District. Tributary: Barney Riley Creek enters on river left, and contributes approximately 20% of flow. Photo shows confluence from left bank, looking up Bryant Creek. This site is located at UTM: N: 4293144 & E: 269044, Elev. 5832 ft. (1778m).

Site 22: Bryant Creek, Carson Ranger District. A fish passage barrier on Barney Reilly Creek, just upstream of confluence with Bryant Cr. Photo taken looking upstream at UTM: N: 4293144 & E: 269044, Elev. 5832 ft. (1778m).

Site 22: Bryant Creek, Carson Ranger District. Photo shows upstream view of the Tributary Barney Reilly Creek. This site is located at UTM: N: 4293144 & E: 269044, Elev. 5832 ft. (1778m).

Site 23: Bryant Creek, Carson Ranger District. Photo shows left bank entry point of an ATV road crossing. This site is located at UTM: N: 4293053 & E: 269068, Elev. 5809 ft (1771m).

Site 24: Bryant Creek, Carson Ranger District. A downstream view shows dense overhanging vegetation. This site is located at UTM: N: 4292956 & E: 269192, Elev. 5796 ft (1767m).

Site: 25: Bryant Creek, Carson Ranger District. Cross-sectional view of a road-stream crossing. Photo shows the fine sediment on the bank. This site is located at UTM: N: 4292754 & E: 269626, Elev. 5861 ft. (1787m).

Site: 26: Bryant Creek, Carson Ranger District. Cross-sectional view of a road-stream crossing. The photo captures the steep banks which are more susceptible to erosion. This site is located at UTM: N: 4292719 & E: 269695, Elev. 5861 ft. (1787m).

Site 27: Bryant Creek, Carson Ranger District. Cross-sectional view of a road-stream crossing 100m upstream of Site 26. This site is located at UTM: N: 4292659 & E: 269887, Elev. 5897 ft (1798m).

Site 27: Bryant Creek, Carson Ranger District. Upstream view of a road-stream crossing 100m upstream of Ste 26. This site is located at UTM: N: 4292659 & E: 269887, Elev. 5897 ft (1798m).

Site 27: Bryant Creek, Carson Ranger District. Downstream view of a road-stream crossing 100m upstream of Ste 26. This site is located at UTM: N: 4292659 & E: 269887, Elev. 5897 ft (1798m).

Site 28: Bryant Creek, Carson Ranger District. Cross-sectional view of a road-stream crossing located 100m upstream of Site 27. This site is located at UTM: N: 4292568 & E: 270006.

Site 28: Bryant Creek, Carson Ranger District. Cross-sectional view of a road-stream crossing located 100m upstream of Site 27. This site is located at UTM: N: 4292568 & E: 270006.

Site 29: Bryant Creek, Carson Ranger District. Cross-sectional view of a road-stream crossing located 200m upstream of Site 28. This site is located at UTM: N: 4292342 & E: 270222.

Site 29: Bryant Creek, Carson Ranger District. Photo shows vehicle impact on vegetation adjacent to the streambed, approximately 200m upstream of Site 28. This site is located at UTM: N: 4292342 & E: 270222.

Site 30: Bryant Creek, Carson Ranger District. Cross-sectional view of stream looking southwest. This site is located at UTM: N: 4292128 & E: 279318, Elev. 5937 ft. (1810m).

Site 31: Bryant Creek, Carson Ranger District. Photo shows a cross-sectional view of a road-stream crossing, looking south. Both banks are sandy, though any impact on the stream looks minimal. This site is located at UTM: N: 4292058 & E: 279287, Elev. 5956 ft. (1816m).

Site 32: Bryant Creek, Carson Ranger District. Photo shows a cross-sectional view of a road-stream crossing. Both banks are cobble and impacts are minimal. This site is located at UTM: N: 4292025 & E: 279331, Elev. 6012 ft. (1833m).

Site 33: Bryant Creek, Carson Ranger District. Cross-sectional view of a road-stream crossing. Small sign of erosion are present. This site is located at UTM: N: 4291788 & E: 270335, Elev. 6048 ft (1844m).

Site 34: Bryant Creek, Carson Ranger District. Photo shows an upstream view of a braided channel. This site is located at UTM: N: 4291102 & E: 279398, Elev. 6098 ft (1859m).

Site 35: Bryant Creek, Carson Ranger District. Permanent fish barrier. The photo shows a concrete box culvert at a road-stream crossing. The box is approximately 8 feet high x 8 feet wide, and 40+ feet long. The downstream drop is 6-9 inches and the water depth in the culvert is 1-2 inches with an average water velocity of approximately 3.28 feet/sec (@ 4.6 cfs) This site is located at UTM: N: 4290845 & E: 270306, Elev. 6183 ft (1885m).

Site 35: Bryant Creek, Carson Ranger District. Permanent fish barrier. Viewpoint looking downstream from atop the Forest Service road. This site is located at UTM: N: 4290845 & E: 270306, Elev. 6183 ft (1885m).

Site 35: Bryant Creek, Carson Ranger District. Permanent fish barrier. The photo shows the upstream entrance to the box culvert. This site is located at UTM: N: 4290845 & E: 270306, Elev. 6183 ft (1885m).

Site 36: Bryant Creek, Carson Ranger District. Photo shows a downstream view of an adjacent road impact. Erosion is present and exacerbated by the proximity of the road to the channel. This site is located at UTM: N: 4290709 & E: 270180, Elev. 6265ft (1910m).

Site 37: Bryant Creek, Carson Ranger District. The photo shows a gauging station monitored by the USGS California Water Science Center. The gauging staff read 4.39 cfs This site is located at UTM: N: 4290561 & E: 270123, Elev. 6265ft (1910m).

Site 38: Bryant Creek, Carson Ranger District. Photo shows a downstream perspective of the confluence of Leviathan and Mountaineer Creeks. Mountaineer is shown to the upper right (clear), and Leviathan (murky) flowing from left to right on the lower portion of the picture. This site is located at UTM: N: 4290552 & E: 270115, Elev. 6265ft (1910m).

Site 38: Bryant Creek, Carson Ranger District. Photo shows a cross-sectional perspective of the confluence of Leviathan and Mountaineer Creeks. Mountaineer is on the left (clear), and Leviathan (murky) on the right This site is located at UTM: N: 4290552 & E: 270115, Elev. 6265 ft. (1910m).

Site 38: Bryant Creek, Carson Ranger District. Upstream view of Leviathan, which contributes approximately 60% of flow to Bryant Creek. This site is located at UTM: N: 4290552 & E: 270115, Elev. 6265ft. (1910m).