

# **RAYMOND CANYON CREEK**

Alpine County, California

2006 Stream Habitat Survey Report



Prepared by:

Carson Ranger District: Humboldt-Toiyabe National Forest

## **Introduction**

Raymond Canyon Creek is located in Alpine County, California and the mainstem runs in a northerly direction for approximately 2.25 miles before reaching the confluence with Pleasant Valley Creek. To form the mainstem of Raymond Canyon Creek, an additional 2.0 miles of headwater tributaries flow down from Raymond Peak. The stream originates at an elevation of approximately 8800 feet and descends down to approximately 5900 feet where it feeds into Pleasant Valley Creek. Raymond Canyon Creek runs through federal, state, and private land holdings. The upper portions of the watershed are located within the boundaries of the Humboldt-Toiyabe National Forest, and specifically within the Mokelumne Wilderness. (See map for land ownership).

## **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 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. In accordance with this short-term action plan, 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 Lahontan Cutthroat Trout (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 restoration efforts be made to re-introduce LCT, these surveys can provide baseline information for future management of the fishery. Raymond Canyon Creek was surveyed on August 23, 2006 by Brian Hodge of the Carson Ranger District of the Humboldt-Toiyabe National Forest.

## **Methods and Materials**

Forest Service personnel surveyed Raymond Canyon Creek by hiking the watercourse in an upstream manner. Interesting and relevant features were documented, photographed, and recorded into a GPS unit. These features included but were not limited to: road crossings, fish sightings, permanent fish barriers, seasonal fish barriers, tributaries, springs, beaver dams, areas of erosion concern, grazing impacts, 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. Some permanent barriers may actually act as seasonal barriers and some seasonal barriers may actually act as a permanent barrier.

## **Results**

Approximately 1.43 miles of Raymond Canyon Creek were surveyed (Sites 1-13). The overall gradient of the surveyed reach is roughly 8.0 percent. Two diversions were documented in the lower reaches of the watershed (Sites 2 & 6). The diversion at Site 2 may be a natural split in the channel that has been enhanced to send a larger portion of water river left. One fish sighting was specifically noted at Site 4, though fish were also seen in the diversion canal at Site 2. One road-stream crossing was recorded at Site 3 and one tributary was documented on river right (Site 9). Four fish passage barriers were documented: two seasonal barriers (Site 5 & 7), and two permanent barriers (Sites 8 & 10). Photo points were used to capture stream characteristics at two locations (Sites 11 & 12), and in addition photos were taken at the survey start and endpoints (Sites 1 & 13, respectively).

## **Discussion**

Raymond Canyon Creek is located at the bottom of a deeply incised canyon. Approximately 1.43 miles of Raymond Canyon Creek were surveyed. A length of 0.23 miles was identified as potential LCT habitat. Additional LCT habitat may be present between Site 13 and the location where the headwater tributaries converge to form the mainstem. The upper headwater tributaries of Raymond Canyon Creek appear to be far too steep to sustain fish. The overall gradient of the 2.63 mile section of stream above Site 13 is approximately 15.0 percent (Elev. 6580-8800). The length of stream that may be suitable for LCT between Site 13 and the location where the headwater tributaries converge to form the mainstem is unknown. This section of creek was not surveyed because it occurs on private land.

The segment of stream between Site 5 and Site 10 is steep and divided by four significant barriers. The permanent barriers at Sites 8 & 10 are 8.0 and 5.2 feet tall, and the seasonal barriers at Sites 5 & 7 are 4.0 and 4.9 feet tall, respectively. Naturally occurring fish passage through this reach is impossible, and fish movement is severely inhibited.

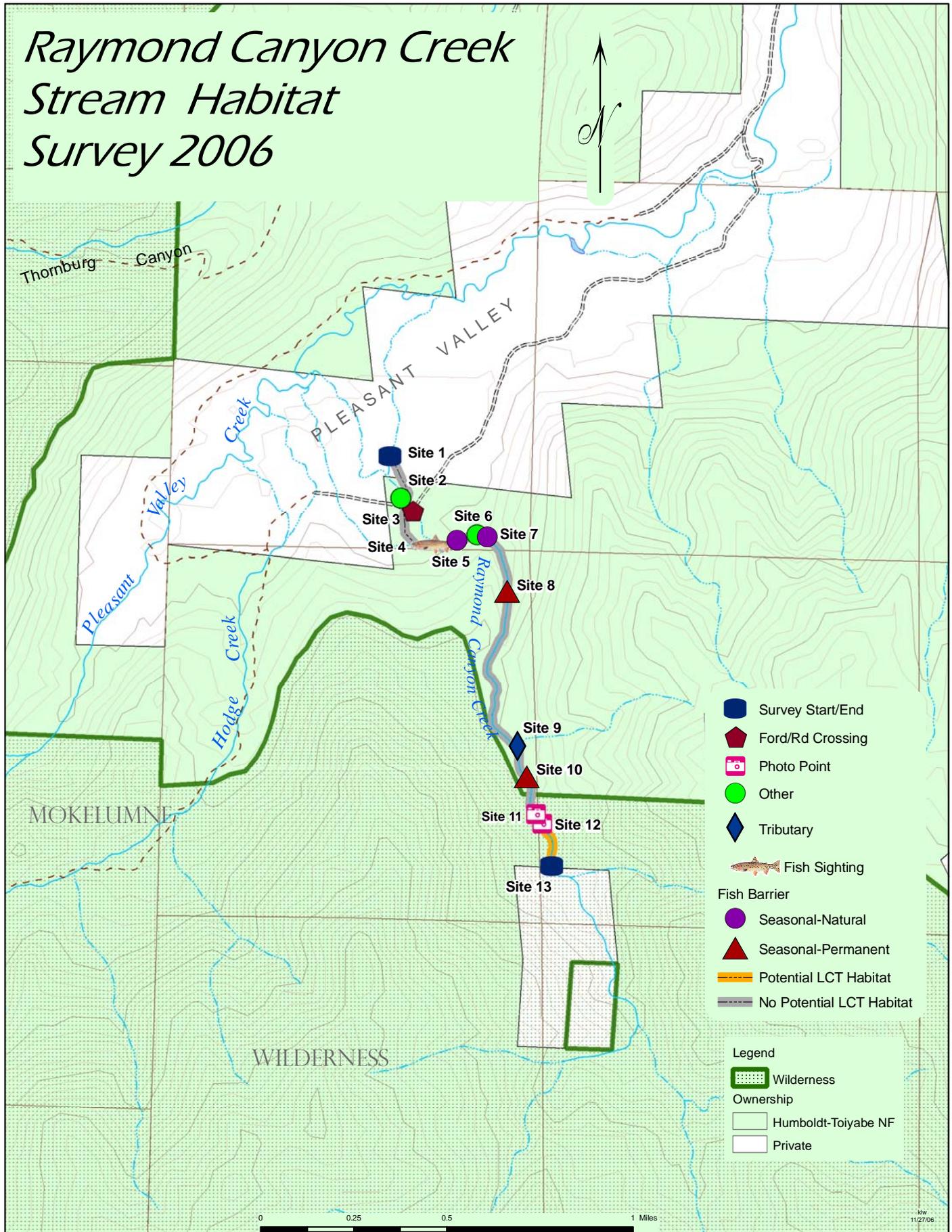
At the survey start point (Site 1) the stream goes subsurface and the main channel is dry downstream of that point. Upstream of this location are two diversions at Site 6 and at Site 2, which divert an estimated 25 percent and 80-90 percent of flow, respectively. Therefore, the discharge at Site 1 is approximately 12 percent of that value above Site 6. The diversion at Site 6 is clearly man-made, as it contains plastic sheeting and plywood. At Site 2 the stream may naturally braid; however, a disproportional amount of water flows river left and there is visible evidence that a gravel bar has been enhanced to create this disproportion.

The fish sighted at Sites 2 and Site 4 occupy the lower reach where the gradient is low to moderate, and between Site 11 and Site 13 the gradient is also low to moderate, though no fish were sighted in this reach. A road-stream crossing at Site 3 provides a potential source of sediment to the stream; however, because this road is located behind a locked gate on private property, the usage is likely minimal.

## **Recommendations**

1. Consider the 0.23 mile section of Raymond Canyon Creek between Site 11 and Site 13 as potential LCT habitat and consider Raymond Canyon Creek a low candidate for restoration.
2. Investigate the destination and impacts of the diversion canals located at Site 2 and Site 6. Ensure that fish are not subject to terminal trips into irrigated pasture, and similarly ensure that water users are staying within the confines of their adjudicated rights.
3. Contact the private landowner to obtain permission to survey Raymond Canyon Creek upstream of Site 13.

# Raymond Canyon Creek Stream Habitat Survey 2006



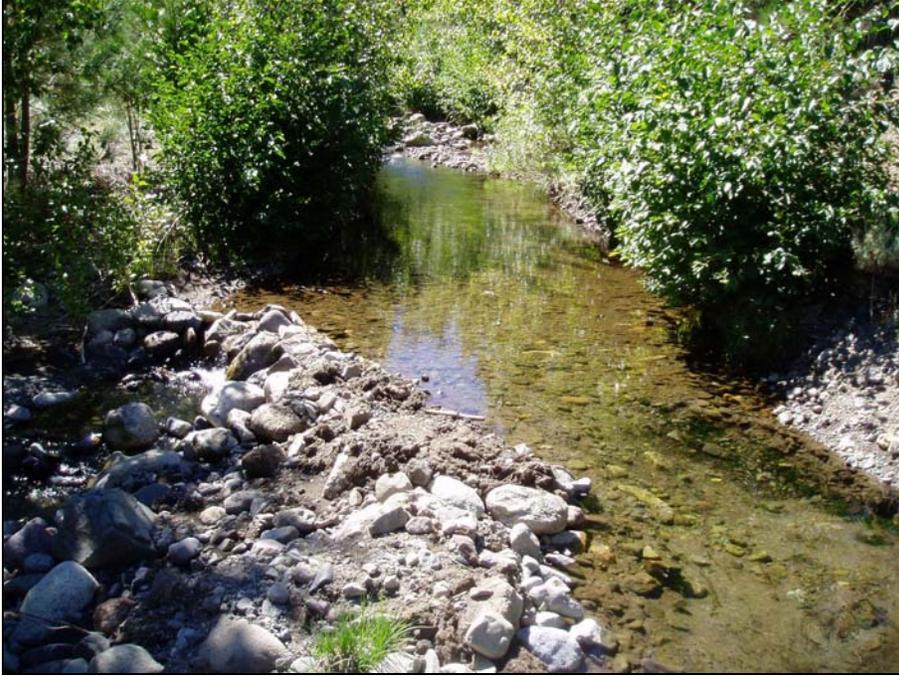
**Note: Due to the topography of the canyon, accurate GPS points were difficult to attain in some locations.**



**Site 1:** Raymond Canyon Creek, Carson Ranger District. Upstream photo shows a dry stream bed where the mainstem goes subsurface in the valley. Water has been diverted out of the main stem in two locations upstream. This site is located at UTM: N: 4281633 & E: 254599, Elev. 5973 feet (1821m).



**Site 1:** Raymond Canyon Creek, Carson Ranger District. Downstream photo of dry streambed. This site is located at UTM: N: 4281633 & E: 254599, Elev. 5973 feet (1821m).



**Site 2:** Raymond Canyon Creek, Carson Ranger District. Upstream photo of a diversion, which sends approximately 80-90% of flow into a side channel, the destination of which is unknown. This site is located at UTM: N: 4281454 & E: 254643, Elev. 5943 feet (1812m).



**Site 2:** Raymond Canyon Creek, Carson Ranger District. Photo shows a close-up look at a location within the diversion where several fish were seen. This site is located at UTM: N: 4281454 & E: 254643, Elev. 5943 feet (1812m).



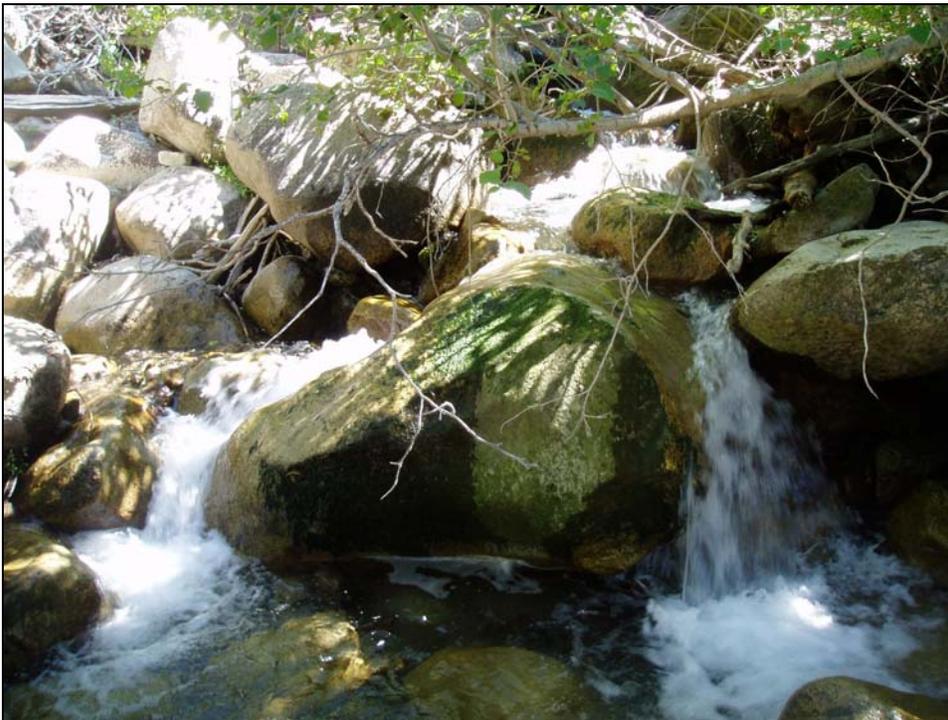
**Site 3:** Raymond Canyon Creek, Carson Ranger District. Cross-sectional view of ford crossing where Road 094 crosses the stream. Access to the road requires crossing private property. This site is located at UTM: N: 4281394 & E: 254717, Elev. 5888 feet (1795m).



**Site 3:** Raymond Canyon Creek, Carson Ranger District. Upstream view towards the road-stream crossing. This site is located at UTM: N: 4281394 & E: 254717, Elev. 5888 feet (1795m).



**Site 4:** Raymond Canyon Creek, Carson Ranger District. A large fish was sighted in this pool. This site is located at UTM: N: 4281262 & E: 254784, Elev. 5927 feet (1807m).



**Site 5:** Raymond Canyon Creek, Carson Ranger District. Upstream view of a 4.0 foot tall seasonal barrier (max. pool depth 1.75 feet). This point marks the downstream end of a steep section of stream. This barrier is located at UTM: N: 4281265 & E: 254893, Elev. 6078 feet (1853m).



**Site 5:** Raymond Canyon Creek, Carson Ranger District. Upstream view of another sizeable seasonal barrier. This barrier is located at UTM: N: 4281265 & E: 254893, Elev. 6078 feet (1853m).



**Site 6:** Raymond Canyon Creek, Carson Ranger District. Upstream view of a flashboard diversion. Note the use of plastic and plywood. Approximately 25% of total flow is diverted river right. This site is located at UTM: N: 4281298 & E: 254968, Elev. 6160 feet (1878m).



**Site 6:** Raymond Canyon Creek, Carson Ranger District. Downstream view of diversion. Mainstem is shown on left side of photo. This site is located at UTM: N: 4281298 & E: 254968, Elev.6160 feet (1878m).



**Site 7:** Raymond Canyon Creek, Carson Ranger District. Downstream view of a large seasonal fish barrier: height 4.9 feet and maximum pool depth 2.75 feet. This site is located at UTM: N: 4281285 & E: 255018, Elev. 6094 feet (1858m).



**Site 8:** Raymond Canyon Creek, Carson Ranger District. Distant upstream view of a permanent fish passage barrier. The waterfall is approximately 8.0 feet tall, with an estimated max. pool depth of 2.5-3.0 feet. This site is located at UTM: N: 4281051 & E: 255106.



**Site 9:** Raymond Canyon Creek, Carson Ranger District. A small tributary enters river right, contributing roughly 1.0 percent of flow. This site is located at UTM: N: 4280385 & E: 255152.



**Site 10:** Raymond Canyon Creek, Carson Ranger District. Photo shows a permanent barrier measuring 5.2 feet high with a pool depth of 3.2 feet. This site is located at UTM: N: 4280247 & E: 255191.



**Site 10:** Raymond Canyon Creek, Carson Ranger District. Just upstream of the first barrier are several other fish passage barriers. This site is located at UTM: N: 4280247 & E: 255191.



**Site 11:** Raymond Canyon Creek, Carson Ranger District. Upstream photo captures change in stream gradient. Potential LCT habitat exists in this reach. This site marks the upstream end of a steep section of stream (Sites 5-11). This site is located at UTM: N: 4280085 & E: 255228.



**Site 12:** Raymond Canyon Creek, Carson Ranger District. Potential fish habitat shown in photo. This site is located at UTM: 4280091 & E: 255252, Elev. 6452 feet (1967m).



**Site 13:** Raymond Canyon Creek, Carson Ranger District. Upstream photo taken near a private property boundary. This site is located at UTM: 4279895 & E: 255282, Elev. 6580 feet (2006m).