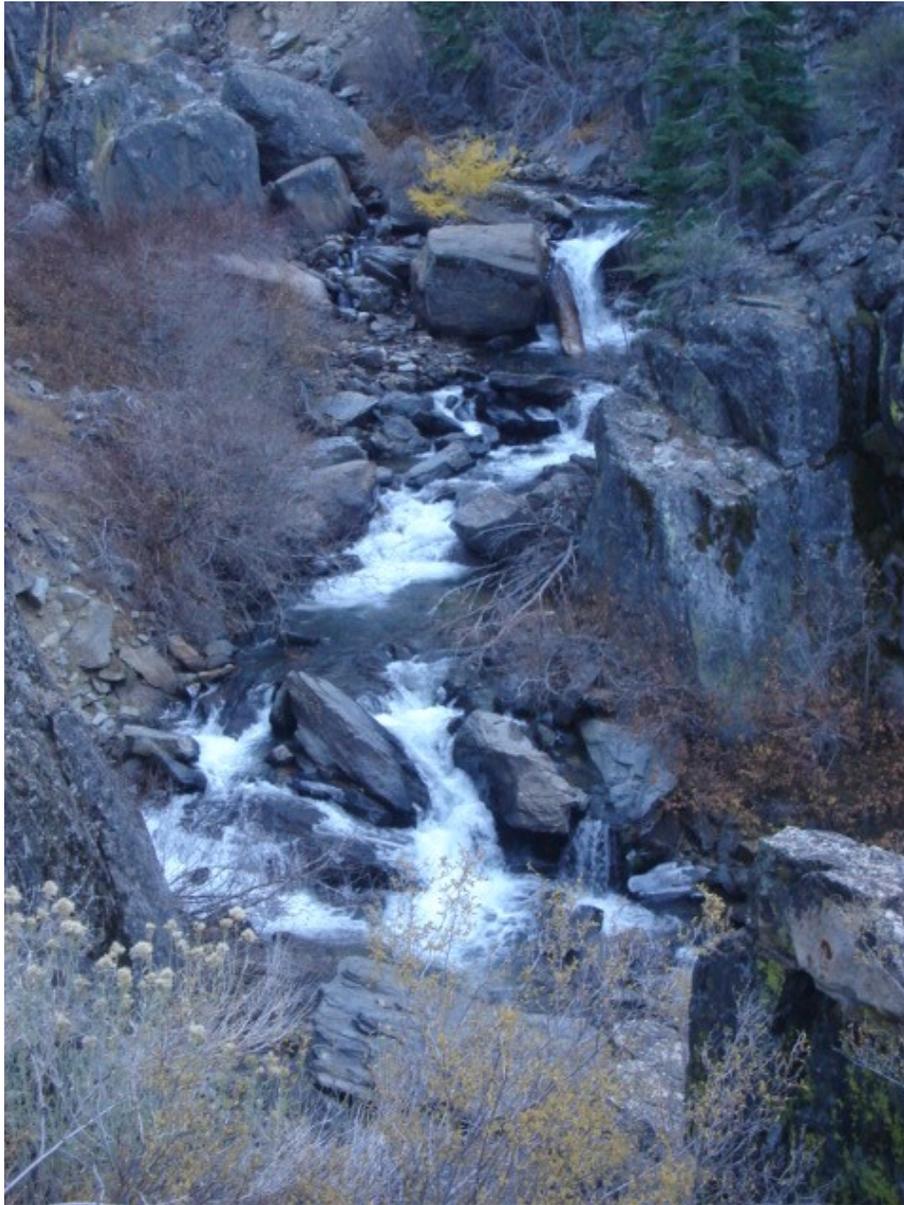


SILVER KING CREEK

Alpine County, California

2006 Stream Habitat Survey Report



Prepared by:

Carson Ranger District: Humboldt-Toiyabe National Forest

Introduction

Silver King Creek is located in Alpine County, California and flows for approximately 19 miles in a northerly direction to its confluence with the East Fork Carson River. The stream originates at an elevation of approximately 10,000 feet, and descends to 6409 feet upon the convergence with the East Fork Carson River. Silver King Creek lies mostly within the boundaries of the Carson-Iceberg Wilderness and the Humboldt-Toiyabe National Forest (See Attached Map). Approximately 6.3 miles of Silver King Creek were surveyed between the East Fork Carson River and the confluence of Silver King Creek and Corral/Coyote Creeks. Silver King Creek upstream of Corral/Coyote Creeks was not surveyed because much of this area is historic habitat to the Paiute cutthroat trout.

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. Silver King Creek was surveyed on October 30, 2006 by members of the Carson Ranger District: Humboldt-Toiyabe National Forest. The surveyors were Brian Hodge and Jason Kling.

Materials and Methods

Forest Service personnel surveyed Silver King Creek by hiking the watercourse in a downstream manner. Fish barriers were documented, photographed, and recorded into a Trimble GPS unit. 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 6.3 miles of Silver King Creek were surveyed between the East Fork Carson River and the confluence of Silver King Creek and Corral/Coyote Creeks. Seven fish passage barriers were identified throughout this 6.3 mile section. Four natural seasonal barriers were documented (Sites 1, 2, 3, & 7), and three natural permanent fish passage barriers were documented (Sites 4, 5, & 6).

Discussion

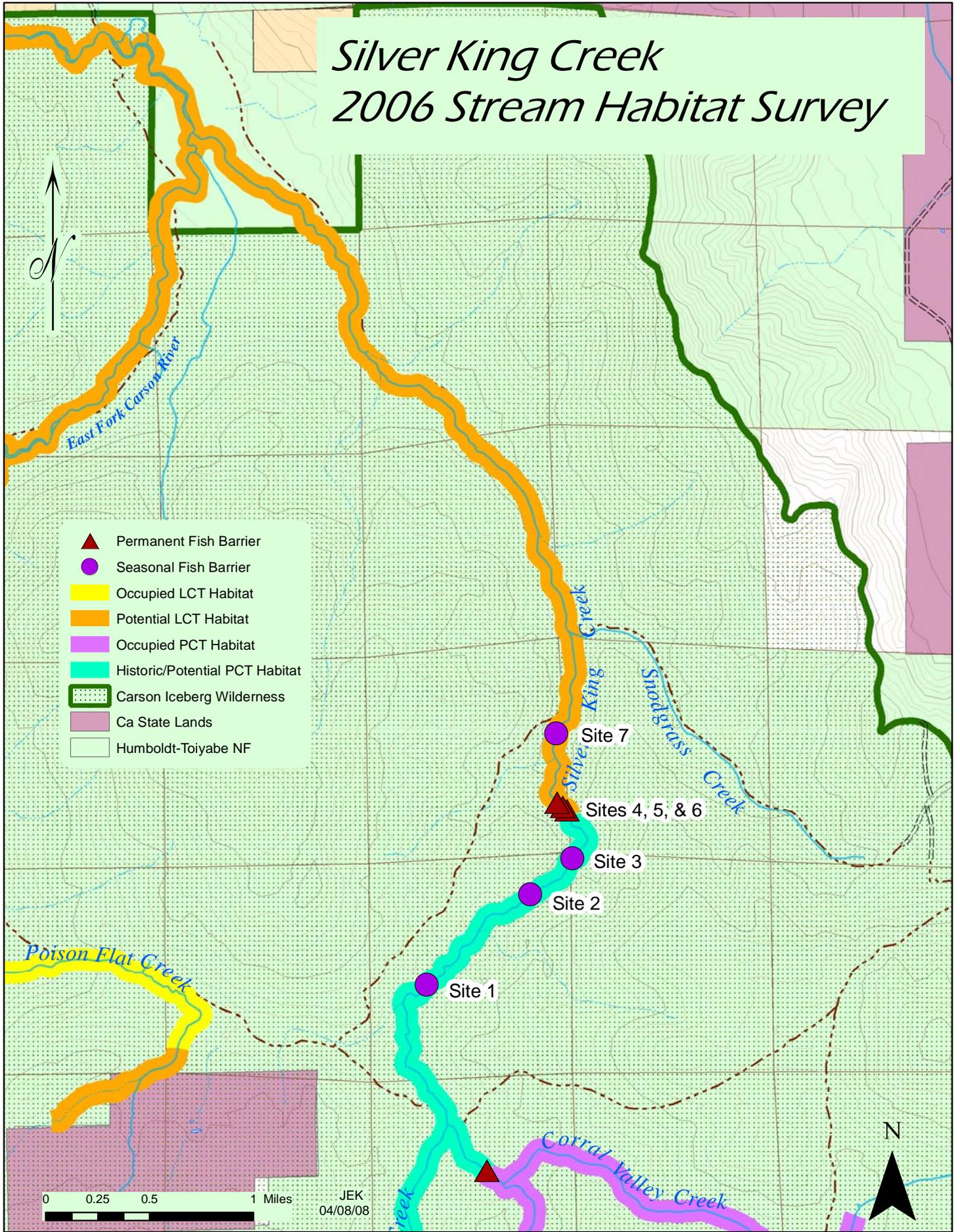
The lower section of Silver King Creek provides 4.2 miles of potential LCT habitat; however, this section does not provide any opportunity for restoring a metapopulation of LCT. To restore a self-sustaining population of LCT in the lower section of Silver King Creek, a barrier would need to be constructed near the East Fork Carson River to prohibit non-native fish from the river moving into the lower Silver King Creek watershed. Due to the flat meadow topography near the East Fork Carson River, building a barrier would be very difficult and expensive. For these reasons restoring the lower section of Silver King Creek to LCT is listed as a low candidate for restoration.

The 1.7 mile section between Site 1 and Site 7 is a high gradient narrow canyon gorge. Through this section we found seven different fish passage barriers; four seasonal barriers and three permanent barriers. Waterfall heights ranged from 3.3 feet to 11 feet. Due to the high gradient, high velocity flows, and the seven different waterfalls documented it would be very difficult (probably impossible) for fish from the East Fork Carson River to move up through that section of stream between Sites 1 and 7.

Recommendations

1. Consider the 4.2 mile section of Silver King Creek between the East Fork Carson River and Site 6 as potential LCT habitat and consider this section of Silver King Creek a low candidate for restoration.

Silver King Creek 2006 Stream Habitat Survey





Site 1: Silver King Creek, Carson Ranger District. Upstream photo of a seasonal fish barrier with height 4.2 feet, and a max. pool depth of 6.0 feet. This site is located at UTM: N: 4265253 & E: 272798, Elev. 2320m.



Site 2: Silver King Creek, Carson Ranger District. Upstream photo of a 4.0 foot tall seasonal barrier (max. pool depth 4.5 feet). This site is located at UTM: N: 4265929 & E: 273619, Elev. 2298m.



Site 2 continued: Silver King Creek, Carson Ranger District. Photo shows the uppermost part of a 4.0 foot tall seasonal barrier (max. pool depth 4.5 feet). This site is located at UTM: N: 4265929 & E: 273619, Elev. 2298m.



Site 2 continued: Silver King Creek, Carson Ranger District. Downstream photo taken from just below the barrier. This site is located at UTM: N: 4265929 & E: 273619, Elev. 2298m.



Site 3: Silver King Creek, Carson Ranger District. Upstream photo of 1 of 2 large seasonal barriers. This upstream barrier is approximately 3.5-4.0 feet tall. This site is located at UTM: N: 4266206 & E: 273959, Elev. 2270m.



Site 3a: Silver King Creek, Carson Ranger District. Upstream photo of 1 of 2 large seasonal barriers. This downstream barrier is approximately 3.5 feet tall. This site is located at UTM: N: 4266206 & E: 273959, Elev. 2270m.



Site 3b: Silver King Creek, Carson Ranger District. Photo shows recent beaver activity, which was evident from this point down through the confluence with Snodgrass Creek.



Site 4: Silver King Creek, Carson Ranger District, upstream photo. This site is located at UTM: N: 4266571 & E: 273927.



Site 5: Silver King Creek, Carson Ranger District. Zoomed in upstream photo of a permanent fish passage barrier with height 5.0 feet and a max. pool depth of 3.5 feet. Several permanent barriers are located within a short section of stream. Together these 4-8 foot barriers create one large fish passage barrier. This site is located at UTM: N: 4266598 & E: 273897.



Site 5a: Silver King Creek, Carson Ranger District. Zoomed out upstream photo of a permanent fish passage barrier with height 5.0 feet and a max. pool depth of 3.5 feet. Several permanent barriers are located within a short section of stream. Together these 4-8 foot barriers create one large fish passage barrier.



Site 5b: Silver King Creek, Carson Ranger District. Upstream photo of another tier of barriers.



Site 5c: Silver King Creek, Carson Ranger District. Upstream photo of an approximately 6.0 foot tall waterfall.



Site 5d: Silver King Creek, Carson Ranger District. Upstream view of several tiers of fish passage barriers.



Site 5e: Silver King Creek, Carson Ranger District. Zoomed-in photo of several consecutive fish passage barriers.



Site 6: Silver King Creek, Carson Ranger District. Upstream photo of the largest individual waterfall within the gorge. This permanent barrier has a height of 11.0 feet. This site is located at UTM: N: 4266634 & E: 273851.



Site 6a: Silver King Creek, Carson Ranger District. Upstream photo of the waterfall at Site 6 and the steep canyon downstream of the barrier.



Site 6b: Silver King Creek, Carson Ranger District. A zoomed out photo of the waterfall at Site 6 and the steep canyon downstream of the barrier.



Site 7: Silver King Creek, Carson Ranger District. Upstream photo of a seasonal barrier with a height of approximately 3.3 feet, and a maximum pool depth of 3.5 feet. This site is located at UTM: 4267170 & E: 273863, Elev. 2144m.