

# **Sardine Creek**

Mono County, California

## **2007 Stream Habitat Survey Report**



Prepared By:

Carson Ranger District: Humboldt-Toiyabe National Forest

## **Introduction**

Sardine Creek begins near the Mono County-Tuolumne County border in California near Sonora Pass. The stream flows in a southeasterly direction for approximately 4.14 miles until it flows into Leavitt Creek in the Sardine Meadows area. The entire length of Sardine Creek occurs on National Forest lands managed by the Humboldt-Toiyabe National Forest, Bridgeport Ranger District. The survey for this stream started at the confluence with Leavitt Creek and continued upstream approximately 3.27 miles until water levels deemed it unnecessary to continue.

## **Purpose and Need**

The 1995 Lahontan Cutthroat Trout Recovery Plan recommended that an ecosystem management plan be developed for the Walker River Basin in order to both determine objectives for the future desired conditions of the watershed, and to create strategies for achieving these objectives. In 1998 a Walker River Basin Recovery Implementation Team was organized to develop strategies for Lahontan cutthroat trout (LCT) restoration and recovery efforts in the Walker River Basin. In August 2003 the recovery team completed a Short-Term Action Plan for Lahontan Cutthroat Trout Recovery in the Walker River Basin. The short-term action plan outlines specific tasks to be completed within five years. Some of the tasks that were identified include: (1) identifying and evaluating fish passage and existing barriers within the Walker River Basin, (2) developing a watershed analysis of the physical components of the Walker River Basin, and (3) initiating habitat surveys to evaluate potential LCT introduction streams and validating against existing LCT inhabited streams.

The Walker River Basin historically provided an estimated 595 miles of stream habitat (Kling and Mellison 2008) and 49,400 acres of lake habitat 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.

Within the Walker River basin, LCT currently occupy one stream that is within their historic range; By-Day Creek. Lahontan cutthroat trout have also been introduced into the formerly fishless headwaters of five other Walker River basin streams; Wolf Creek, Silver Creek, Mill Creek, Slinkard Creek, and Murphy Creek. Together, LCT within these 6 streams occupy approximately 17 miles of stream habitat, approximately 2.9% 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, (4) reduction of lake levels and concentrated chemical components in natural lakes, and (5) introductions of non-native fish species. The Walker River Basin is primarily inhabited by non-native salmonid species that include but are not limited to: Rainbow Trout (*Oncorhynchus mykiss*), Brook Trout (*Salvelinus fontinalis*), and Brown

Trout (*Salmo trutta*). These competitive and aggressive introduced fish have displaced the endemic LCT. A small native population of LCT can be found in By-Day Creek part of the East Walker River system.

Long term survival and recovery of LCT with the Walker River Basin 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 2007 Walker 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 reintroduce LCT, these surveys can provide baseline information for future management of the fishery. Sardine Creek was surveyed on June 30, 2007 by Joel Ingram and Kevin Rybacki of the Carson and Bridgeport Ranger Districts: Humboldt-Toiyabe National Forest.

### **Methods and Materials**

Forest Service personnel surveyed Sardine 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 3.27 miles of Sardine Creek were surveyed between Sites 1 and 20. Throughout the survey of Sardine Creek the most prevalent feature documented was permanent fish barriers which were found at Sites 2, 5, 6, 7 and 18. Most of the permanent natural fish barriers were found just upstream of the creek's confluence with Leavitt Creek. Tributaries entering Sardine Creek were found at Sites 12, 13, 14 and 16. Hwy 108 crossed paths with the creek at Sites 4, 10, 17, and 19. There were also a couple of campsites found on Sardine Creek located at Sites 3, 8, 9 and 11. The only erosion concern found on the stream can be viewed at Site 15. The average stream gradient between Sites 1 and 20 is 5.6% and the average stream gradient between Sites 7 and 18 is 4%.

## **Discussion**

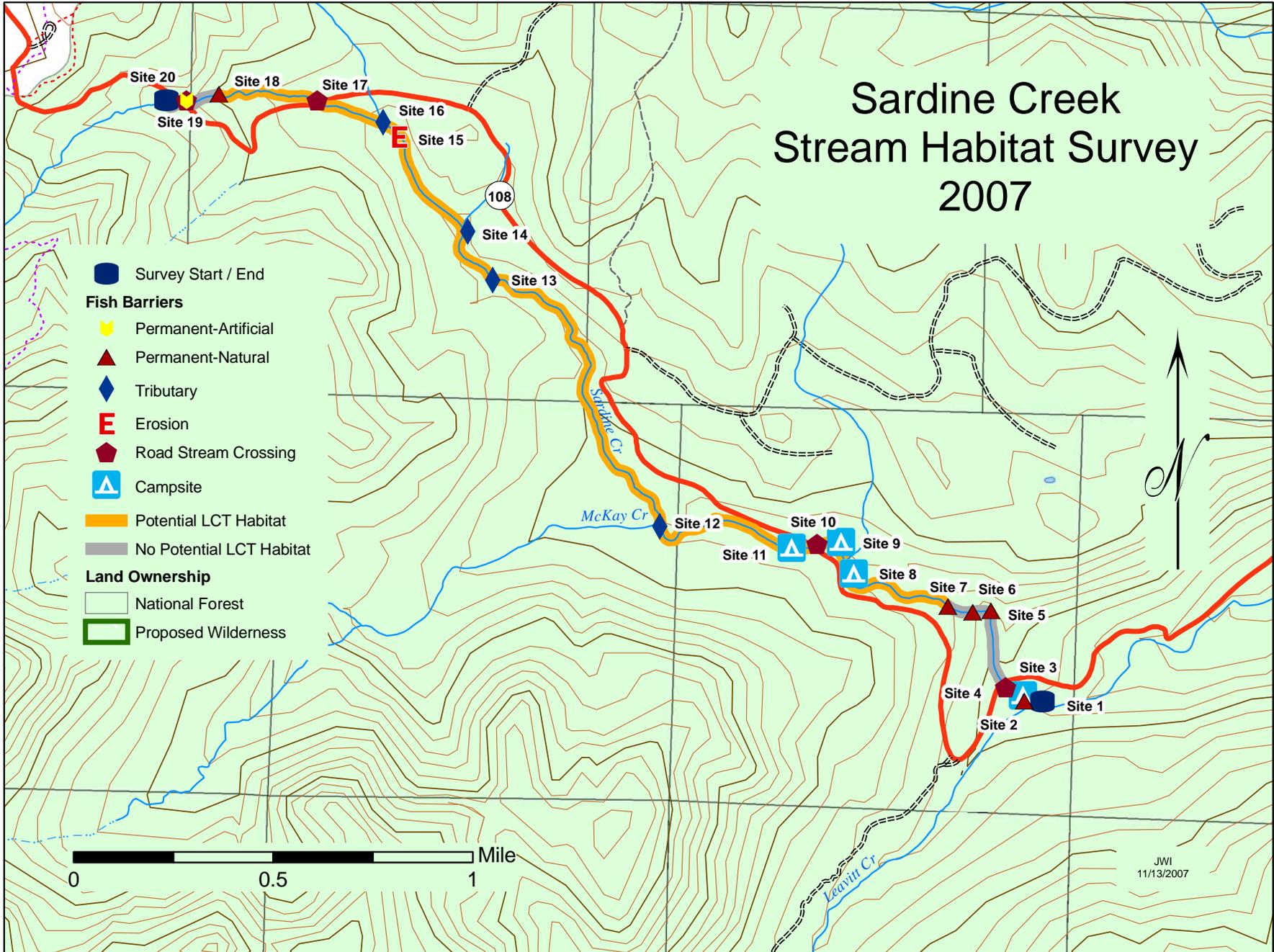
The 2.72 mile stretch of Sardine Creek located between Sites 7 and 18 provides potential LCT habitat. The area downstream of Site 7 is considered unsuitable fish habitat because of the numerous waterfalls that are located throughout this section. The portion of the stream that is considered potential habitat is a popular area for recreational camping and sees many visitors that are on trips over Sonora Pass. There are 3 campsites located within this stretch of stream that appear to get heavy use throughout the summer months. The campsites were noted as having several areas where vegetation has been matted down by vehicles (including ATV's) traveling on non-designated pullouts and routes. The survey of Sardine Creek was ended due to the lack of water and sufficient pools to sustain fish. No fish were seen while conducting the survey.

McKay Creek is a tributary to Sardine Creek, and McKay Creek offers 0.9 miles of potential LCT habitat. Combined McKay and Sardine Creeks offer 3.62 miles of potential LCT habitat. Although both of these streams provide an opportunity for restoring a small metapopulation of LCT, the relatively short distance (3.62 miles) and high elevation of both streams probably doesn't warrant making this restoration opportunity a high priority. Instead, this opportunity should be considered a low priority for restoration.

## **Recommendations**

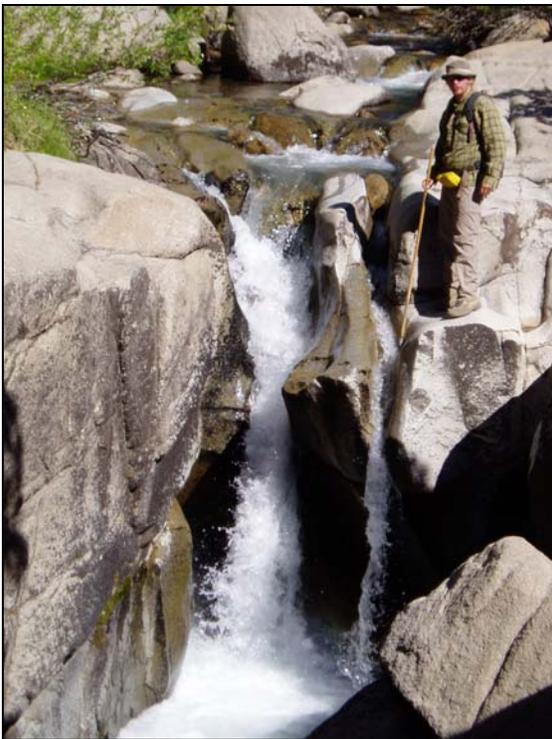
1. Consider the 2.72 mile section of Sardine Creek located between Sites 7 and 18 as potential LCT habitat and consider Sardine Creek a low candidate for restoration.
2. Close and decommission all dispersed campsites within 100 feet of McKay Creek. Only allow camping to occur more than 100 feet away from the streams edge.

# Sardine Creek Stream Habitat Survey 2007





**Site 1:** Sardine Creek, Bridgeport Ranger District. Photo shows an upstream view from the survey start point. Survey starts at the confluence of Sardine Creek and Leavitt Creek with Sardine Creek entering on river left side doubling the size of Leavitt Creek. This site is located at UTM: N: 4242855 & E: 273692, Elev. 2544m.



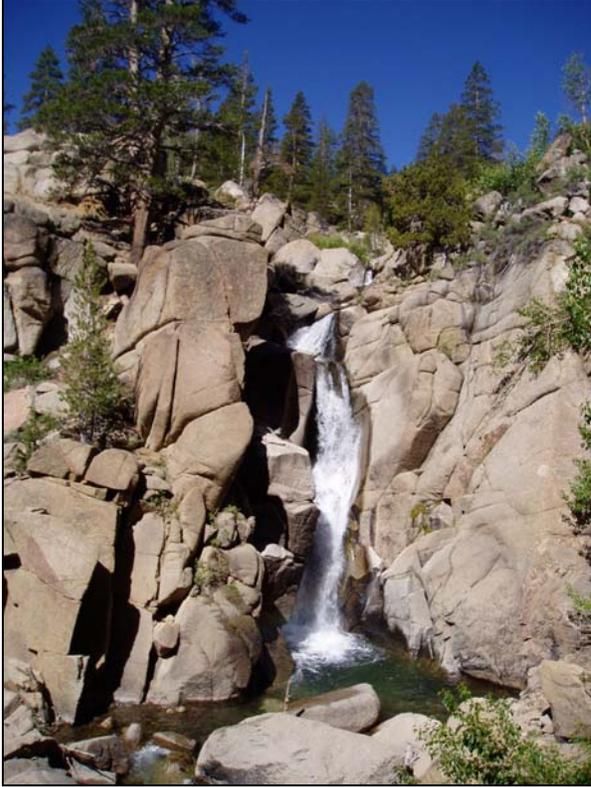
**Site 2:** Sardine Creek, Bridgeport Ranger District. Just upstream of its confluence with Leavitt creek, a 4m high waterfall acts as a permanent barrier preventing fish passage. This site is located at UTM: N: 4242890 & E: 273677, Elev. 2541m.



**Site 3:** Sardine Creek, Bridgeport Ranger District. A small campsite is located 5m from the edge of the creek. There is a flat area and a fire ring present. This site is located at UTM: N: 4242881 & E: 273613, Elev. 2544m.



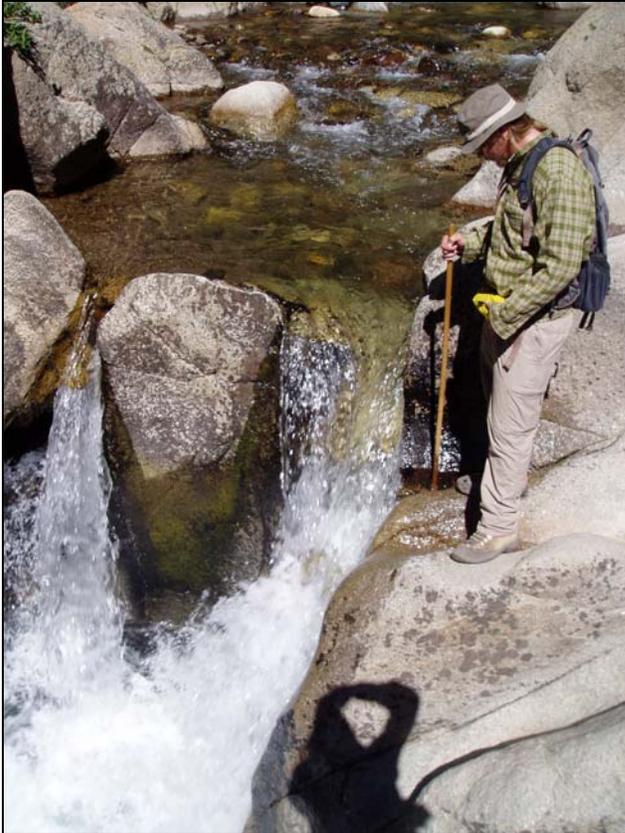
**Site 4:** Sardine Creek, Bridgeport Ranger District. The stream crosses paths with Hwy 108 for the first time. At this junction the stream flows under the road through two large culverts. This site is located at UTM: N: 4242914 & E: 273545, Elev. 2552m.



**Site 5:** Sardine Creek, Bridgeport Ranger District. This large waterfall is about 15m high and falls down the canyon wall into a deep pool. This site is located at UTM: N: 4243221 & E: 273484, Elev. 2578m.



**Site 6:** Sardine Creek, Bridgeport Ranger District. Another waterfall lies just upstream of Site 5. This particular falls is 5.5m high and the stream is forced through a 1ft wide channel. This site is located at UTM: N: 4243214 & E: 273410, Elev. 2597m.



**Site 7:** Sardine Creek, Bridgeport Ranger District, looking upstream at a permanent fish barrier 3m high. This site is located at UTM: N: 4243239 & E: 273309, Elev. 2617m.



**Site 8:** Sardine Creek, Bridgeport Ranger District, looking at a campsite consisting of a fire ring, sitting stone, and some logs. Campsite looks as if it's seen little use recently. This site is located at UTM: N: 4243372 & E: 272929, Elev. 2642m.



**Site 9:** Sardine Creek, Bridgeport Ranger District. A very large pullout acts as a day use area/camping area. Pullout is currently occupied with 3 vehicles, tents, and several fire rings that are less than 5m from the water. This site is located at UTM: N: 4243495 & E: 272880, Elev. 2637m.



**Site 10:** Sardine Creek, Bridgeport Ranger District. Hwy 108 crosses the creek again. This time a large bridge made of brick and cement is construed over the width of the river. This site is located at UTM: N: 4243493 & E: 272782, Elev. 2644m.



**Site 11:** Sardine Creek, Bridgeport Ranger District. Several campsites are lined up along the stream where a dirt road off Hwy 108 provides easy access. The closest fire ring lies 3m from the creek. This site is located at UTM: N: 4243477 & E: 272679, Elev. 2648m.



**Site 12:** Sardine Creek, Bridgeport Ranger District. McKay Creek enters the creek on river right side and doubles the flow of Sardine Creek. This site is located at UTM: N: 4243558 & E: 272150, Elev. 2666m.



**Site 13:** Sardine Creek, Bridgeport Ranger District. A small stream comes out of a well formed drainage system and enters Sardine Creek on river right side and contributes 5-10% of overall stream flow. This site is located at UTM: N: 4244552 & E: 271475, Elev. 2719m.



**Site 14:** Sardine Creek, Bridgeport Ranger District. This tributary entering Sardine Creek contributes 20% to the overall flow. The tributary forks and enters the creek in two different locations. This site is located at UTM: N: 4244752 & E: 271373, Elev. 2730m.



**Site 15:** Sardine Creek, Bridgeport Ranger District, looking at a large erosion concern. This site is located at UTM: N: 4245123 & E: 271111, Elev. 2756m.



**Site 16:** Sardine Creek, Bridgeport Ranger District. A tributary enters the main stream and it contributes approx. 40% to the total flow in Sardine Creek. This site is located at UTM: N: 4245216 & E: 270954, Elev. 2762m.



**Site 17:** Sardine Creek, Bridgeport Ranger District. Hwy 108 crosses the stream again near Sonora Pass. This time the stream flows under the road through a couple of culverts. This site is located at UTM: N: 4245242 & E: 270707, Elev. 2768m.



**Site 18:** Sardine Creek, Bridgeport Ranger District. This steep section of the creek shows water flowing over bedrock causing a waterslide effect which is impossible for fish to swim up. This site is located at UTM: N: 4245307 & E: 270371, Elev. 2794m.



**Site 19:** Sardine Creek, Bridgeport Ranger District. Hwy 108 crosses over the stream again. This time through a large culvert that is anchored in place with cement and stone. This site is located at UTM: N: 4245277 & E: 270240, Elev. 2833m.



**Site 20:** Sardine Creek, Bridgeport Ranger District. Survey ends at this site due to the steep gradient upstream. This site is located at UTM: N: 4245282 & E: 270162, Elev. 2838m.