Murphy Creek

Mono County, California

2005 Fish Survey Report and
2008 Stream Habitat Survey Report

Prepared by:

Bridgeport Ranger District
Humboldt-Toiyabe National Forest

Introduction

Murphy Creek, Mono County, California, Bridgeport Ranger District, supports an introduced population of Lahontan cutthroat trout (LCT), a federally-listed threatened species. Murphy Creek is located in northern Mono County, California on the east slope of the Sweetwater mountain range. Murphy Creek flows for approximately 7 miles in an easterly direction to its confluence with the East Walker River near Murphy Pond located approximately 4 miles north of Bridgeport Reservoir on County Road 182. The Murphy Creek watershed ranges from 6,725 feet elevation to 10,650 feet elevation. The entire Murphy Creek watershed is managed by the Humboldt-Toiyabe National Forest (HTNF). The Murphy Creek watershed occurs within an active grazing allotment. The Murphy Creek watershed has not been established as a Critical Aquatic Refuge in the 2004 Sierra Nevada Forest Plan Amendment.

No known chemical treatment has occurred within the Murphy Creek watershed. In 1977, LCT were captured from By-Day Creek and released into Murphy Creek. Murphy Creek was fishless prior to 1977.

In an effort to document LCT distribution, density, and genetic composition, the HTNF and California Department of Fish and Game (CDFG) decided to conduct fish distribution and density surveys in Murphy Creek. Lahontan cutthroat trout surveys were conducted on October 26-27, 2005.

In 2008, a stream habitat survey was also conducted to determine if potential habitat exists between Murphy Creek's confluence with the East Walker River and where the LCT distribution and density surveys took place (Sites 1-16).

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. Murphy Creek was surveyed on May 15th, 2008 by Kevin Rybacki and May 30th, 2008 by Jason Kling and Kevin Rybacki of the Carson and Bridgeport Ranger Districts: Humboldt-Toiyabe National Forest.

Methodology

Fish Distribution and Density Surveys:

Murphy Creek was broken into 1 reach. Reach 1 was separated into 5 evenly spaced units. Units 1, 2, 3, and 5 were 40 meters in length. Unit 4 was 100 meters in length. A backpack electroshocker was used to sample these units. Units 1, 2, 3, 4 and 5 were sampled with one pass. Block nets were used at the upstream and downstream ends of each unit sampled. Just upstream Reach 1 Unit 5 Murphy Creek splits into an East and West Fork. Both forks were spot shocked to determine if LCT were present.

Appendix 1 contains raw data filled out for each unit sampled. A new data form was prepared for each unit sampled. A Trimble GPS unit was used to document unit locations. The GPS locations were taken at the downstream (bottom) end of each unit. Unit length (measured), average width (to the closest 1 10 meter), and average depth (to the closest 1/10 meter) were recorded for each unit.

Notes regarding habitat quality/quantity, observations, morphological characteristics, management concerns, restoration opportunities, etc were recorded in the comments section.

A small piece of caudal fin was clipped from 28 different LCT and placed in separate envelopes to dry. Genetic samples were collected from each unit sampled to obtain spatial variation in the samples. Fin clips were also collected from different length LCT to obtain age class variation. To collect

enough fin clips, the area between Reach 1 Unit 4 and Reach 1 Unit 5 was spot shocked and fin clips were collected from all the LCT captured. All fin clips were kept by CDFG for analysis.

Photographs were taken at the upstream and downstream ends of each unit (looking upstream and downstream) and of important/interesting features.

Stream Habitat Survey:

Forest Service personnel surveyed Murphy 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

Fish Distribution and Density Surveys:

The distribution of LCT within the Murphy Creek watershed is limited to approximately 2.8 miles of Murphy Creek. Lahontan cutthroat trout are distributed between Site 16 and Reach 1 Unit 5, and then also in approximately the lower ¼ mile of both, the East and West Forks of Murphy Creek (Figures 2 & 3). The total length of LCT ranges from 38 to 224 mm total length with the average total length of LCT being 150 mm (Figure 1). The length frequency histogram (Figure 1) suggests that the Murphy Creek population is "top heavy" without many yearlings. The majority of the LCT captured were greater than 120 mm.

The mean number of LCT within Reach 1 is 396 (Figure 4). The upper 90% confidence interval is 657 and the lower 90% confidence interval is 134 (Figure 4). The mean number of LCT/mile in Murphy Creek is 158, the upper 90% confidence interval is 263, and the lower 90% confidence interval is 54 (Figure 5). The LCT in Murphy Creek are occupying approximately 2.8 miles of stream habitat.

The dominant overstory consists of lodgepole and willow, and the dominant understory consists of willow. The dominant Rosgen channel type is characterized as B. The average width of Murphy Creek is 1.46 meters and the average depth of Murphy Creek is 0.15 meters.

A HOBO Temperature (C) 1996 Onset data logger was used to collect temperature data in Murphy Creek. The HOBO Temp was located near Reach 1 Unit 5 at 9262 feet elevation. The HOBO Temp was located at UTM N: 4250490 & E: 300387. Temperature was collected from 1 Oct. 2003 to 25 Aug. 2004. The overall maximum temperature was 19.04 degrees Celsius, the overall average temperature was 4.37 degrees Celsius, and the overall minimum temperature was -0.61 degrees

Celsius. The average temperature between 1 Nov. 2003 and 31 March 2004 was 1.16 degrees Celsius. The average temperature between 1 Oct. 2003 and 31 Oct. 2003, and between 1 April 2004 and 25 Aug. 2004 was 6.58 degrees Celsius (Figure 7).

Stream Habitat Survey:

Approximately 3.9 miles of Murphy Creek were surveyed between its confluence with the East Walker River and Site 16. The most prevalent feature documented was fish barriers. Seven natural fish barriers were documented at Sites 4, 5, 9, 11, 13, 14, and 16. Of these barriers four (Sites 9, 11, 14 and 16) are permanent barriers and three (Sites 4, 5, and 13) are seasonal barriers. Two tributaries were documented at Sites 7 and 15. Erosion concerns were noted at Sites 8 and 12. County Road 182 crosses the stream at Site 2 via a culvert. Ford crossings occur at Sites 17 and 18. Two sites were listed as "Other" with Site 3 being a fence crossing the stream and Site 6 being a possible archaeological site. One fish sighting was documented at Site 10.

Discussion

Lahontan cutthroat trout are unlikely to extend their distribution upstream of their current distribution within the East and West Forks of Murphy Creek due to increased gradient. Habitat conditions downstream of Reach 1 were surveyed in 2008 and potential habitat exists. Of the 3.9 miles surveyed between Sites 1 and 16, 1.7 miles of potential LCT habitat exist between Sites 14 and 16 and 1.1 miles of potential LCT habitat exist between Sites 1 and 9. The section between Sites 14 and 16 consists of low gradient riffles along with several pools and highly vegetated stream banks. The section between Sites 1 and 9, although considered potential LCT habitat, this section is characterized as having long low gradient riffles with very few pools. The section of stream between Sites 9 and 14 is characterized as higher gradient with the presence of three permanent fish barriers; therefore, this section is not considered potential LCT habitat.

Habitat conditions in Murphy Creek within Reach 1 are fairly good. Typical habitat consists of riffles, pools, a lot of overhanging cover, and well vegetated stream banks. No permanent for seasonal fish barriers were identified within Reach 1.

Forest System Road 098 crosses Murphy Creek at two different locations (Sites 17 and 18) just upstream of Reach 1 Unit 5. Both road crossings are probably causing some erosion impacts on Murphy Creek, but due to the little vehicle use of the road at both road crossings, both road crossings are probably not having a significant impact on the stream condition or the LCT in Murphy Creek. Access to both road crossings is very difficult, so any proposed road work at the road-stream crossings would be very difficult for the engineering road crew to complete.

Impacts from electroshocking are a concern, and care was taken to limit LCT exposure to both handling and electrical currents. Lahontan cutthroat trout were closely monitored immediately after being netted. No fish mortality or obvious injuries were recorded. Most of the LCT appeared to respond well to the method of survey.

The 2005 Lahontan cutthroat trout population estimate is higher than the 1984 population estimate, but lower than the 1981 population estimate (Figure 6). In 1981 and 1984, depending on the site, survey efforts ranged from 1-3 pass depletion; therefore, the 213 LCT/mile in 1981 and 135 LCT/mile in 1984 are probably conservative. However, the distribution of LCT in Murphy Creek has

increased significantly since 1981. In 1981, LCT were occupying approximately 0.75 miles of stream habitat, and in 2005 LCT are occupying approximately 2.8 miles of stream habitat. Although the number of LCT/mile has only slightly increased since 1984, because the distribution has increased, the total number of LCT in Murphy Creek has also increased significantly since 1981.

In 2005 the length frequency histogram (Figure 1) suggests that the Murphy Creek population is "top heavy" without many yearlings. The majority of the LCT captured were greater than 120 mm. In 1984, 77% of the LCT observed were greater than 150 mm in length indicating the population at that time was also "top heavy" without many yearlings. These results suggest that the LCT in Murphy Creek are not spawning successfully every year, but are spawning successfully often enough to be self sustaining.

Recommendations

1. Consider the 1.1 mile section of Murphy Creek between Sites 1 and 9 and the 1.7 mile section between Sites 14 and 16 as potential LCT habitat and consider Murphy Creek a low candidate for restoration.

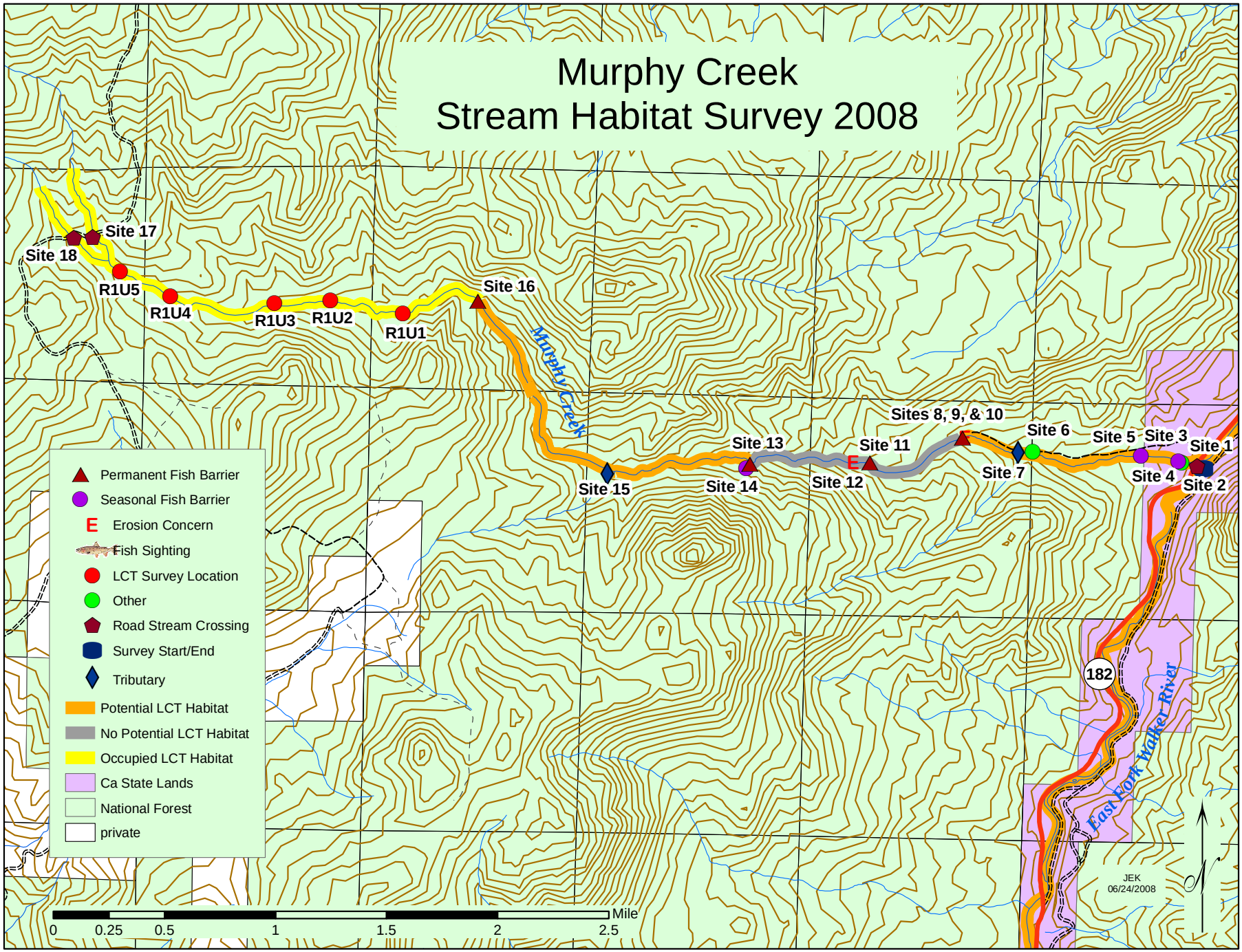
2. Conduct a fish survey between Sites 1 and 16. If no non native fish are found between Sites 14 and 16, consider stocking LCT into this section of stream to expand the distribution of LCT in Murphy Creek.

3. At the latest, in 2010 conduct another similar electrofishing LCT distribution and density survey within Reach 1.

4. This LCT report and all the annual grazing monitoring reports since 1994 for the Murphy Creek C&H Allotment need to be compared and analyzed to determine how effective the grazing standards set forth in the 1994 Biological Opinion for the Murphy Creek C&H Allotment have been on protecting the LCT in Murphy Creek.

5. Monitor water temperature within the Murphy Creek watershed.

6. Once the genetic analysis is completed, implement actions consistent with the conclusions made from the analysis.


Murphy Creek
Stream Habitat Survey 2008
Site 17
Site 18
R1U5
R1U4
R1U3
R1U2
R1U1
Site 16
Murphy Creek
Site 15
Site 14
Site 13
E
Site 12
Site 11
Sites 8, 9, & 10
Site 7
Site 6
Site 5
Site 4
Site 3
Site 2
Site 1
182
East Fork Walker River
Permanent Fish Barrier
Seasonal Fish Barrier
Erosion Concern
Fish Sighting
LCT Survey Location
Other
Road Stream Crossing
Survey Start/End
Tributary
Potential LCT Habitat
No Potential LCT Habitat
Occupied LCT Habitat
Ca State Lands
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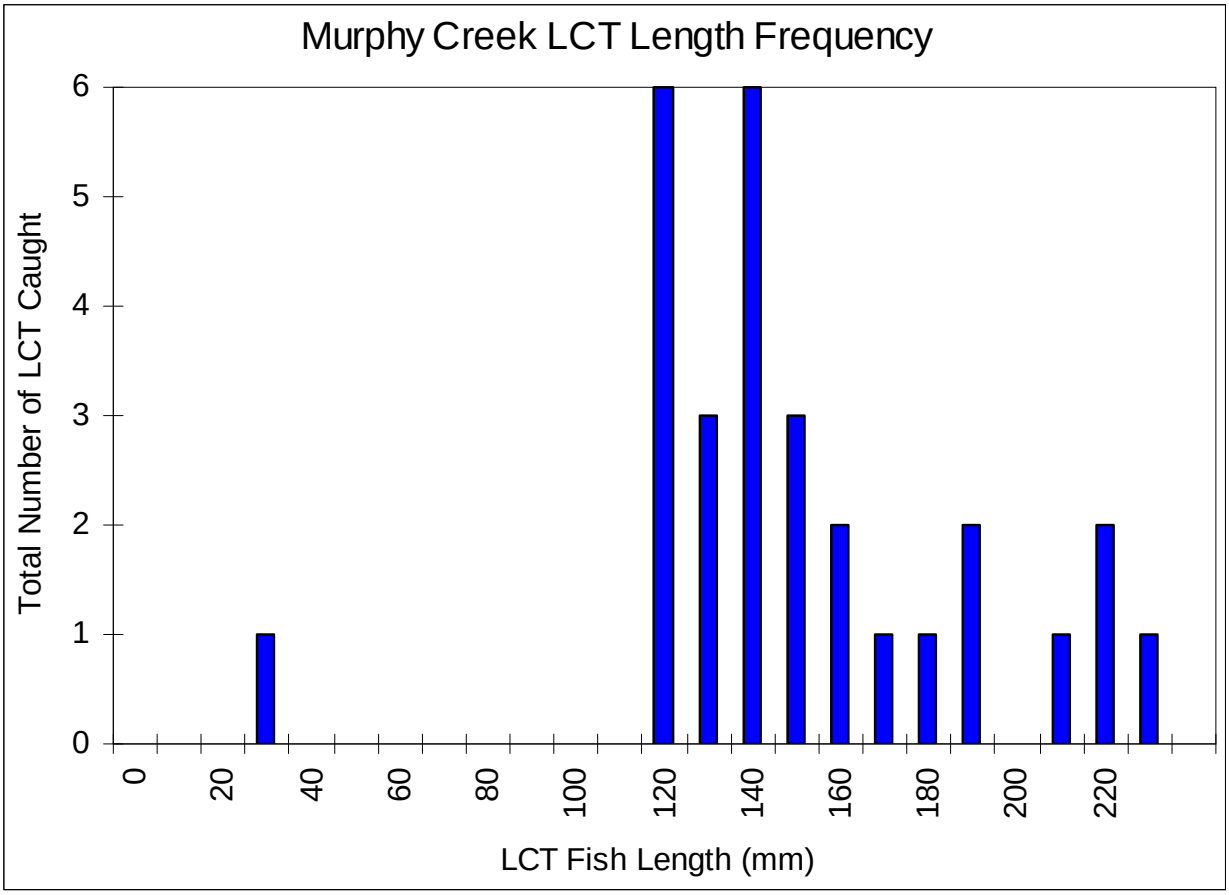

Figure 1: Length frequency of Lahontan cutthroat trout caught from Murphy Creek, Bridgeport Ranger District. Murphy Creek was surveyed on October 26 & 27 2005. The average length of LCT is 150 mm (5.9 inches).

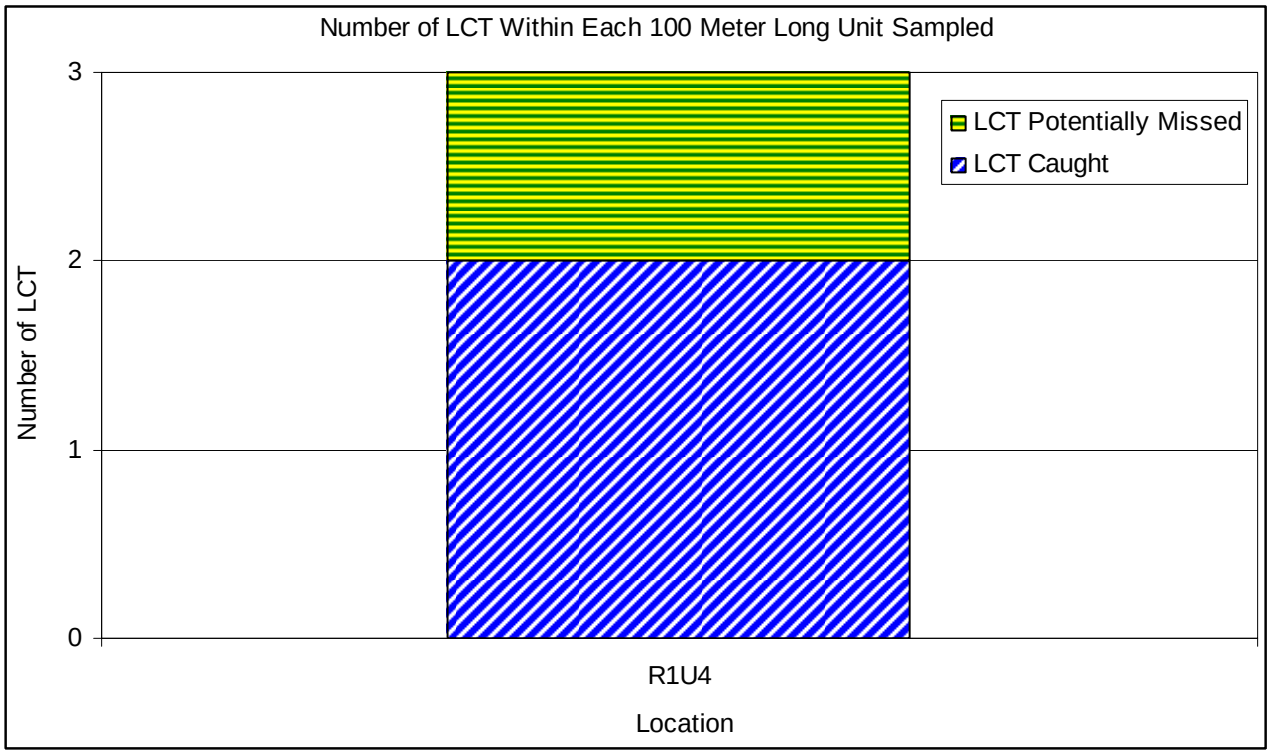

Figure 2: Number of LCT captured and potentially missed from Reach 1 Unit 4 sampled on Murphy Creek, Bridgeport Ranger District. The survey was conducted on 27 October 2005. Because only 2 LCT were captured on the first pass, a second pass was not completed. To be able to calculate a population estimate, it was assumed that 1 fish was missed. Block nets were set up at the top and bottom of the unit to keep fish from entering and leaving the sample area. Under the assumption that 1 fish was missed, two fish caught on the first pass is 67% of the estimated total number of LCT within Reach 1/Unit4; therefore, the estimated miss rate of LCT from Reach 1/Unit 4 is 33%.

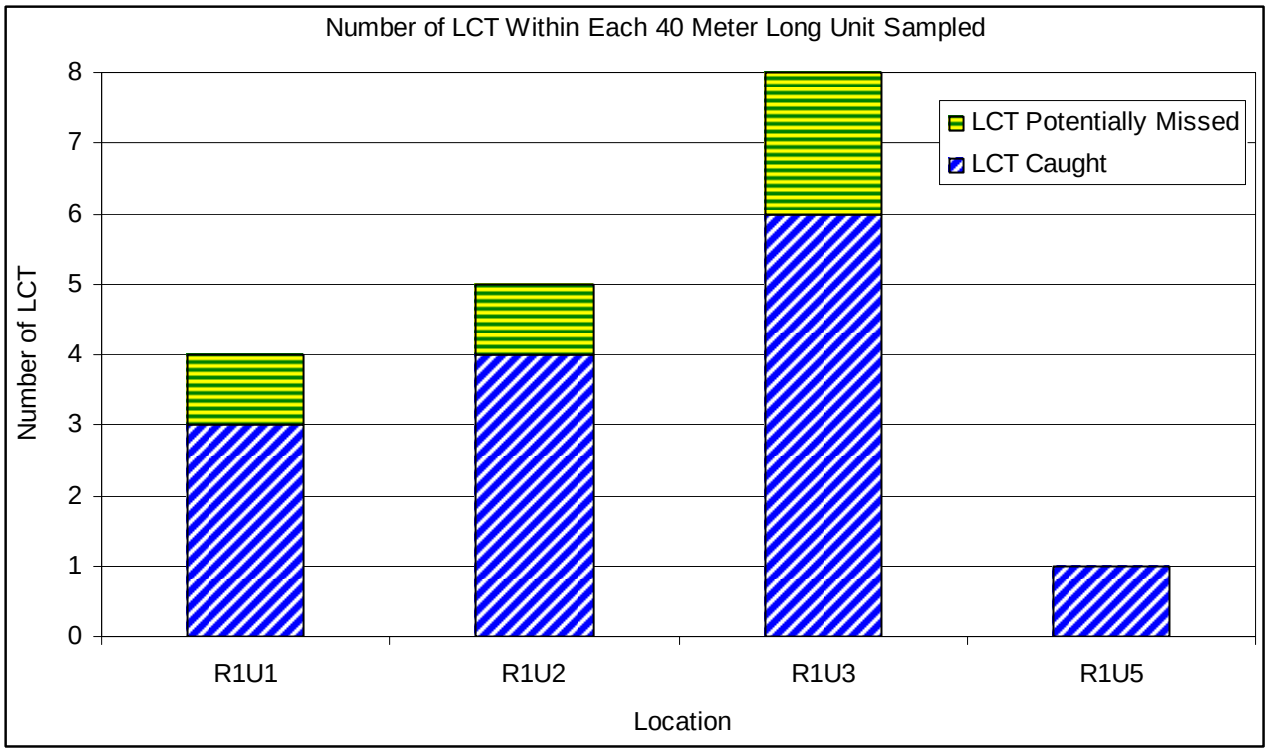

Figure 3: Number of LCT captured and potentially missed from each 40 meter long unit sampled on Murphy Creek, Bridgeport Ranger District. Surveys were conducted on October 26 & 27, 2005. Each unit was electrofished one time. Reach 1 Units 1, 2, 3, and 5 all had habitat similar to the habitat on Reach 1/Unit 4. Reach 1/Unit 4 had an assumed miss rate of 33% (Figure 2); therefore, an additional 33% of the captured LCT from each unit was added to Reach 1 Units 1, 2, 3, and 5 to account for potentially missed LCT from each unit. Based on Figures 2 and 3, approximately 5 total fish were missed. Five missed fish is consistent with what was seen in the field (see data sheets in Appendix 1).

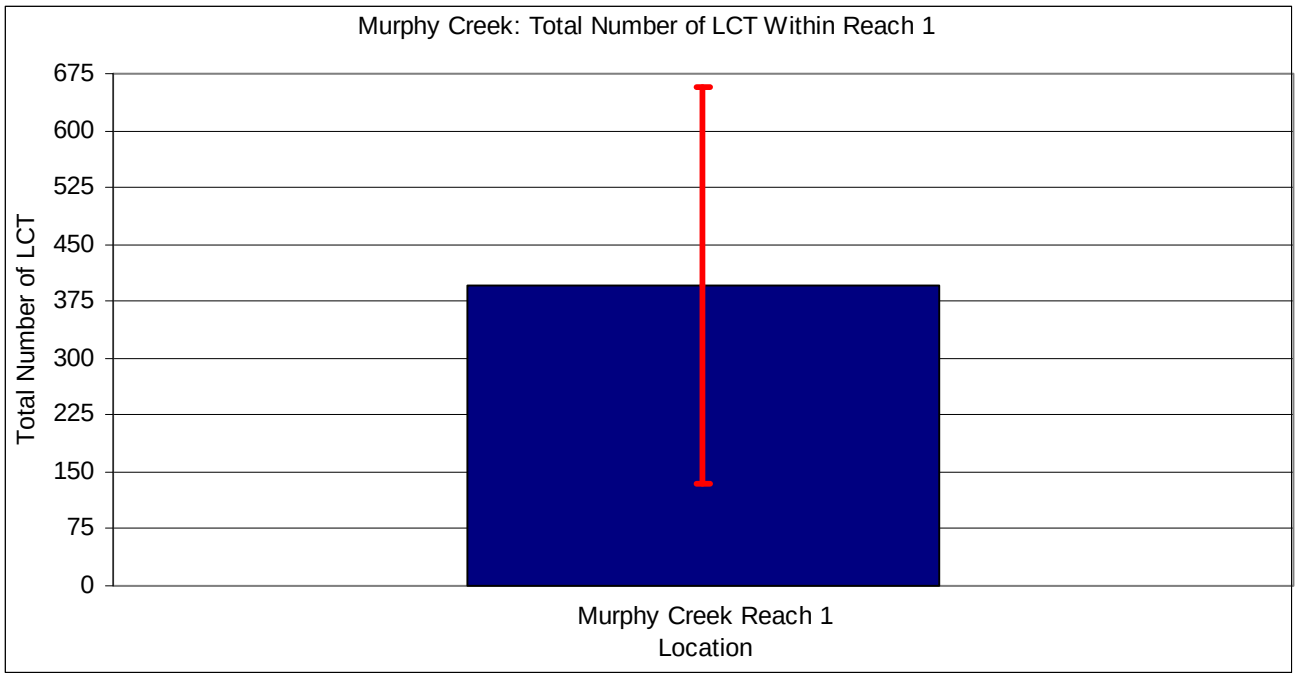

Figure 4: Mean and 90% confidence interval for the estimated total number of LCT within Reach 1, Bridgeport Ranger District. Murphy Creek was surveyed on October 26 & 27, 2005. The mean number of LCT is 396, the upper 90% confidence interval is 657, and the lower 90% confidence interval is 134. Lahontan cutthroat trout in Murphy Creek are occupying approximately 2.8 miles of stream habitat.

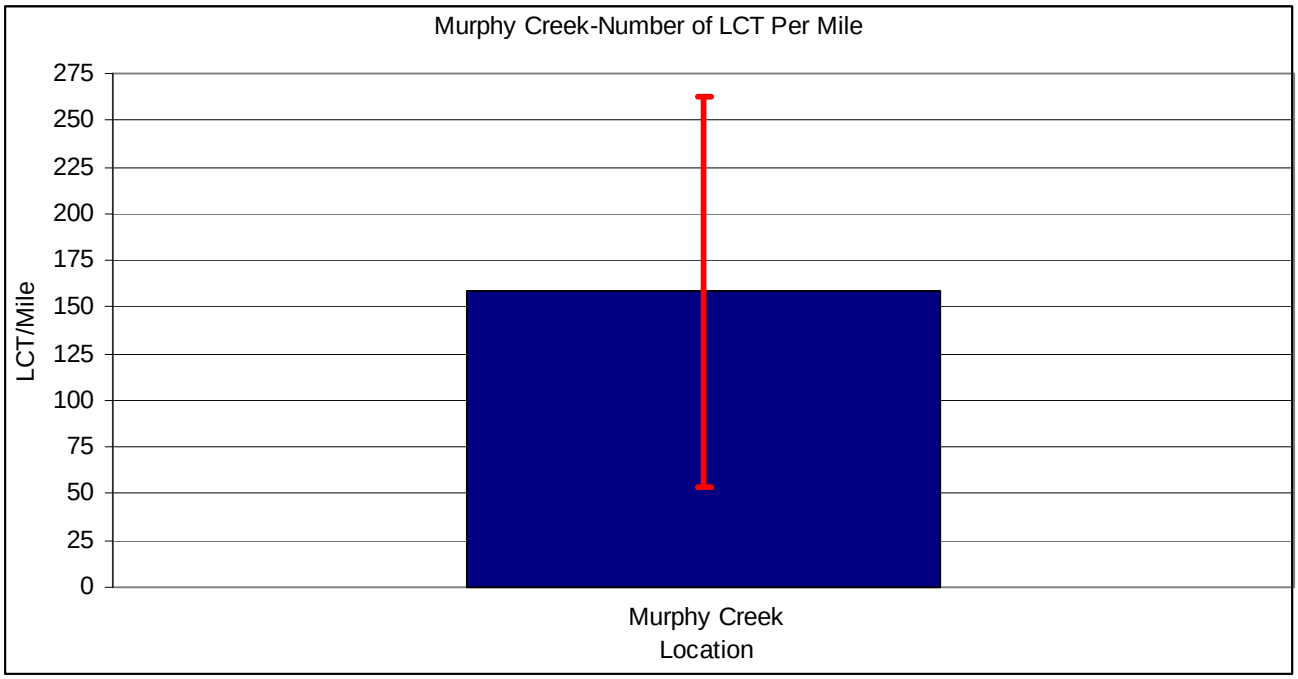

Figure 5: Mean number of LCT/mile and 90% confidence interval for LCT in Murphy Creek, Bridgeport Ranger District. Murphy Creek was surveyed on October 26 & 27, 2005. The mean number of LCT/Mile is 158, the upper 90% confidence interval is 263, and the lower 90% confidence interval is 54. Lahontan cutthroat trout in Murphy Creek are occupying approximately 2.8 miles of stream habitat.

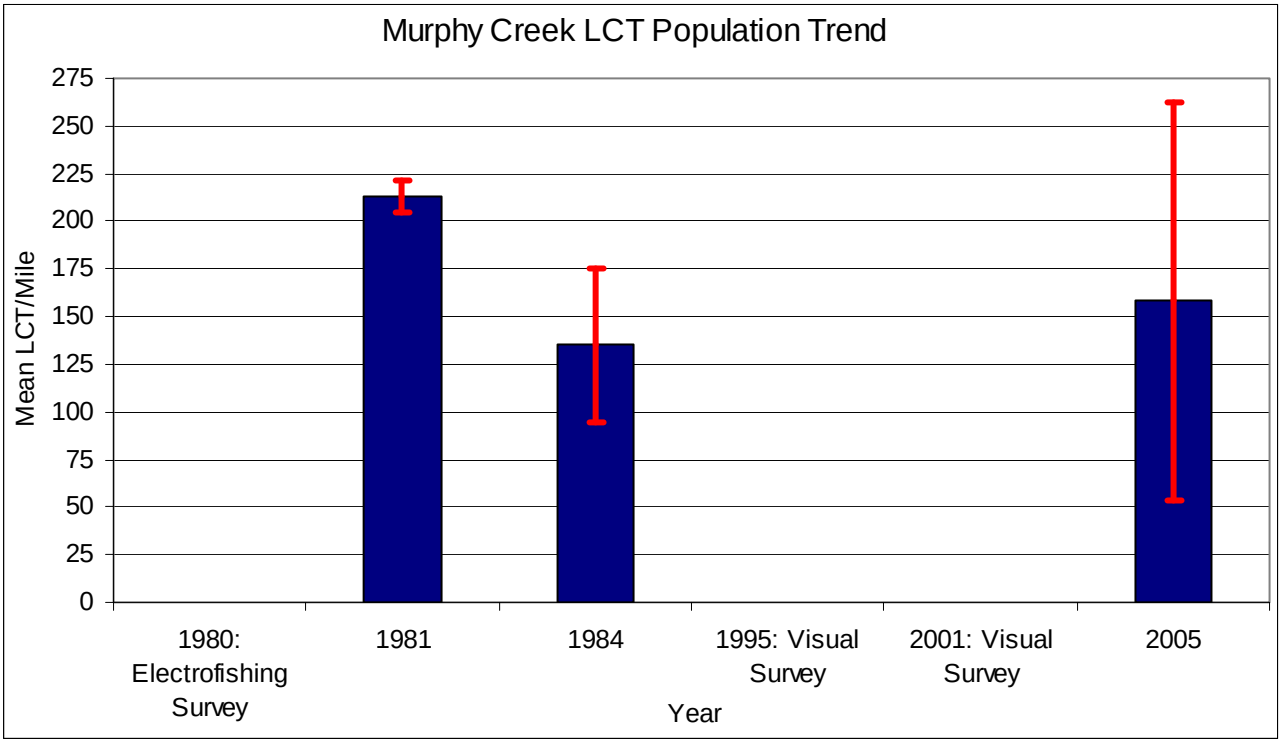

Figure 6: Mean number of LCT/mile and 90% confidence intervals for Lahontan cutthroat trout in Murphy Creek, Bridgeport Ranger District, between 1981 and 2005. In 1981 and 1984, depending on the site, survey efforts ranged from 1-3 pass depletion; therefore, the 213 LCT/mile in 1981 and 135 LCT/mile in 1984 are probably conservative. In 1981, LCT were occupying approximately 0.75 miles of stream habitat. In 1984, 77% of the LCT observed were greater than 150 mm in length indicating the population was "top heavy" without many yearlings. In 1980, a short electrofishing survey was conducted, but not enough information was collected to compute a population estimate. Visual surveys were conducted in 1995 and 2001. No known chemical treatment has occurred on Murphy Creek. In 1977, LCT were captured from By-Day Creek and released into Murphy Creek. Murphy Creek was fishless prior to 1977. The mean number of LCT/mile in 2005 was 158 indicating that the population has increased slightly since 1984. In 2005 the Lahontan cutthroat trout in Murphy Creek were also occupying approximately 2.8 miles of stream habitat indicating that their distribution has also increased since 1981.

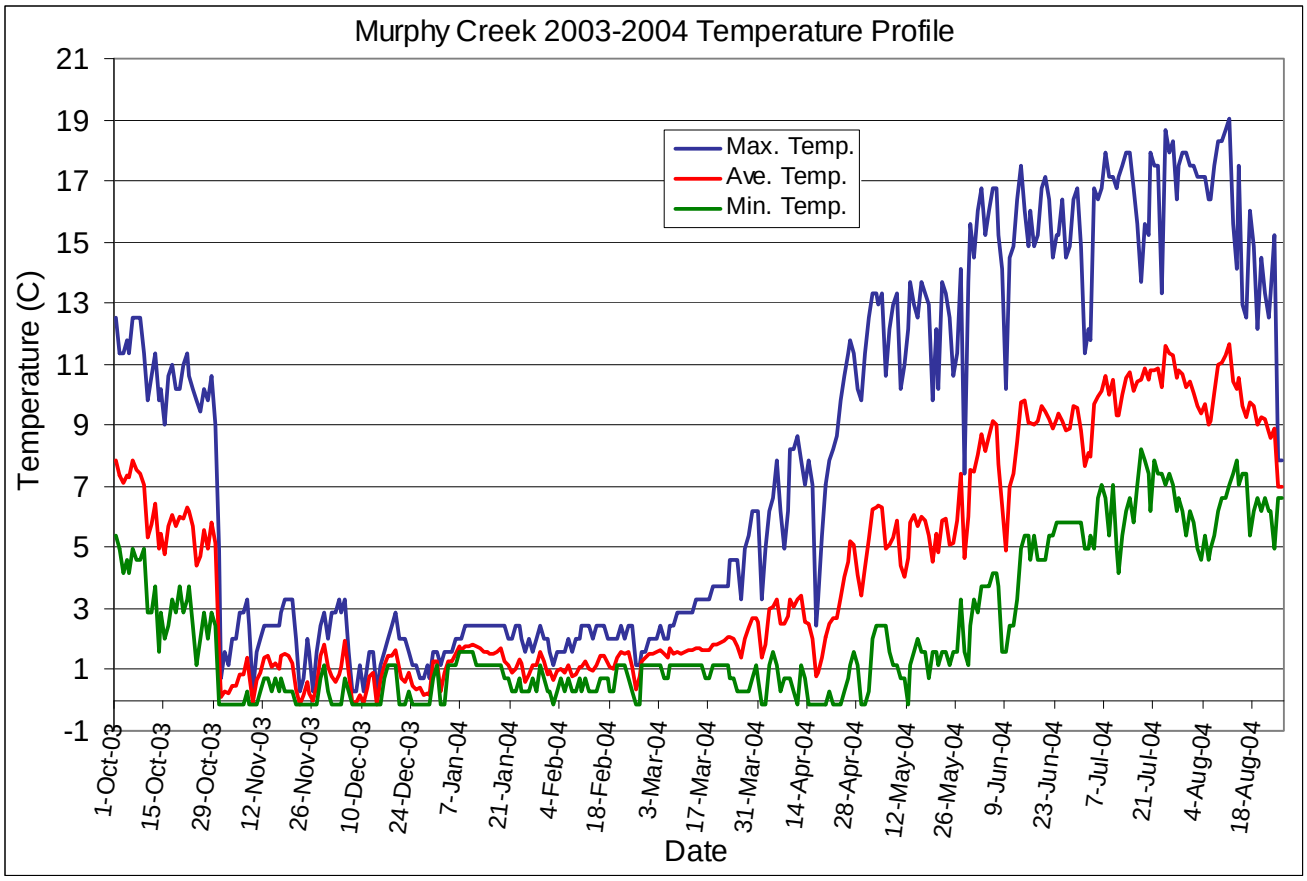

Figure 7: 2003-2004 temperature profile for Murphy Creek, Bridgeport Ranger District. The overall maximum temperature was 19.04 degrees Celsius, the overall average temperature was 4.37 degrees Celsius, and the overall minimum temperature was -0.16 degrees Celsius. The average temperature between 1 Nov. 2003 and 31 March 2004 was 1.16 degrees Celsius. The average temperature between 1 Oct. 2003 and 31 Oct. 2003, and between 1 April 2004 and 25 Aug. 2004 was 6.58 degrees Celsius. A HOBO Temperature (C) 1996 Onset data logger was used to collect the temperature data. The HOBO Temp was located near Reach 1 Unit 5 at 9262 feet elevation. The HOBO Temp was located at UTM N: 4250490 & E: 300387. Temperature was collected from 1 Oct. 2003 to 25 Aug. 2004.

Site 1: Murphy Creek, Bridgeport Ranger District. Survey starts at the confluence of Murphy Creek and the East Walker River. Murphy Creek adds less than 5% of the overall flow of the East Walker River. This site is located at UTM: N: 4249027 & E: 308327, Elev. 1906m.

Site 2: Murphy Creek, Bridgeport Ranger District. Hwy 182 crosses the creek via a culvert just upstream of the confluence with the East Walker River. This culvert does not act as a fish passage barrier. This site is located at UTM: N: 4249046 & E: 308280, Elev. 1922m.

Site 3: Murphy Creek, Bridgeport Ranger District. A barbed-wire fence stretches across the creek. This site is located at UTM: N: 4249070 & E: 308170, Elev. 1932m.

Site 4: Murphy Creek, Bridgeport Ranger District. This seasonal fish barrier is 0.75m high and the maximum pool depth is 0.5m deep. This site is located at UTM: N: 4249081 & E: 308145, Elev. 1935m.

Site 5: Murphy Creek, Bridgeport Ranger District. Another waterfall is documented as a seasonal barrier. This barrier is 1m high and it has a pool depth of 0.8m deep. This site is located at UTM: N: 4249122 & E: 307875, Elev. 2035m.

Site 6: Murphy Creek, Bridgeport Ranger District. Old motor oil cans are piled here approximately 12m from the river canyon. The rusty cans could possibly be an archaeological site. This site is located at UTM: N: 4249149 & E: 307090, Elev. 2035m.

Site 7: Murphy Creek, Bridgeport Ranger District. A small tributary enters river right and adds less than 5% to the overall flow. The tributary has a steep gradient and does not add potential fish habitat. This site is located at UTM: N: 4249145 & E: 306983, Elev. 2046m.

Site 8: Murphy Creek, Bridgeport Ranger District. This photo depicts an erosion concern as chunks of stream bank have fallen into the creek. The erosion is 3m high and 5m long. This site is located at UTM: N: 4249255 & E: 306597, Elev. 2071m.

Site 9: Murphy Creek, Bridgeport Ranger District. This seven foot high waterfall is a permanent fish barrier as the freefalling water falls into a shallow pool that could not be measured. This site is located at UTM: N: 4249250 & E: 306578, Elev. 2090m.

Site 10: Murphy Creek, Bridgeport Ranger District. Two 5-6 inch fish were seen in this pool just upstream of the permanent fish barrier. The glare from the sun made it difficult to see and therefore difficult to identify. This site is located at UTM: N: 4249226 & E: 306514, Elev. 2094m.

Site 11: Murphy Creek, Bridgeport Ranger District. This 6 foot high waterfall is a permanent fish barrier. The maximum pool depth is approximately 1 foot. This site is located at UTM: N: 4249069 & E: 305909, Elev. 2175m.

Site 12: Murphy Creek, Bridgeport Ranger District. At a location where the stream has a high gradient, the effects of erosion pictured above are estimated to be 10m in height and 11m in length. This site is located at UTM: N: 4249078 & E: 305785, Elev. 2181m.

Site 13: Murphy Creek, Bridgeport Ranger District. This 3 foot high waterfall is a seasonal fish barrier. This site is located at UTM: N: 4249061 & E: 305035, Elev. 2328m.

Site 14: Murphy Creek, Bridgeport Ranger District. A series of 5-6 waterfalls creates a permanent fish barrier. The biggest of the falls is estimated to be 25 feet tall. This site is located at UTM: N: 4249032 & E: 305011, Elev. 2158m.

Site 15: Murphy Creek, Bridgeport Ranger District. A moderately sized tributary enters the creek on river right and contributes 25% to the overall flow of Murphy Creek. This site is located at UTM: N: 4248995 & E: 304004, elev. 2450m.

Site 16: Murphy Creek, Bridgeport Ranger District. This 25 foot high waterfall flows at a 45º angle over bedrock with no depth. The waterfall acts as a permanent fish barrier. This site is located at UTM: N: 4250243 & E: 303063, Elev. 2600m.

R1U1 Upstream: Murphy Creek, Bridgeport Ranger District, looking upstream at Reach 1 Unit 1. Photo was taken on 26 October 2005. This unit is located at UTM N: 4250154 & E: 302521.

R1U1 Downstream: Murphy Creek, Bridgeport Ranger District, looking downstream at Reach 1 Unit 1. Photo was taken on 26 October 2005. This unit is located at UTM N: 4250154 & E: 302521.

R1U2 Upstream: Murphy Creek, Bridgeport Ranger District, looking upstream at Reach 1 Unit 2. Photo was taken on 26 October 2005. This unit is located at UTM N: 4250251 & E: 301994.

R1U2 Downstream: Murphy Creek, Bridgeport Ranger District, looking downstream at Reach 1 Unit 2. Photo was taken on 26 October 2005. This unit is located at UTM N: 4250251 & E: 301994.

R1U3 Upstream: Murphy Creek, Bridgeport Ranger District, looking upstream at Reach 1 Unit 3. Photo was taken on 26 October 2005. This unit is located at UTM N: 4250230 & E: 301588.

R1U3 Downstream: Murphy Creek, Bridgeport Ranger District, looking downstream at Reach 1 Unit 3. Photo was taken on 26 October 2005. This unit is located at UTM N: 4250230 & E: 301588.

R1U4 Upstream: Murphy Creek, Bridgeport Ranger District, looking upstream at Reach 1 Unit 4. Photo was taken on 27 October 2005. This unit is located at UTM N: 4250280 & E: 300833.

R1U4 Downstream: Murphy Creek, Bridgeport Ranger District, looking downstream at Reach 1 Unit 4. Photo was taken on 27 October 2005. This unit is located at UTM N: 4250280 & E: 300833.

R1U5 Upstream: Murphy Creek, Bridgeport Ranger District, looking upstream at Reach 1 Unit 5. Photo was taken on 26 October 2005. This unit is located at UTM N: 4250460 & E: 300468.

R1U5 Downstream: Murphy Creek, Bridgeport Ranger District, looking downstream at Reach 1 Unit 5. Photo was taken on 26 October 2005. This unit is located at UTM N: 4250460 & E: 300468.

Site 17: Murphy Creek East Fork, Bridgeport Ranger District, looking north at the road-stream crossing. Photo was taken on 27 October 2005.

Site 18: Murphy Creek West Fork, Bridgeport Ranger District, looking south at the road-stream crossing. Photo was taken on 27 October 2005.

Site 18 Continued: Murphy Creek West Fork, Bridgeport Ranger District, looking north at the road-stream crossing. Photo was taken on 27 October 2005.

Site 18 Continued: Overlooking the Murphy Creek watershed to the East, Bridgeport Ranger District. Photo was taken on 27 October 2005.

R1U2 LCT: Lahontan cutthroat trout caught from Murphy Creek, Reach 1 Unit 2, Bridgeport Ranger District. Photo was taken on 26 October 2005. The Lahontan cutthroat trout is 218 mm in length. Reach 1 Unit 2 is located at UTM N: 4250251 & E: 301994.

APPENDIX 1

HUMBOLDT-TOIYABE NATIONAL FOREST FISH DISTRIBUTION SURVEY DATA FORM

Stream Name: Murphy Creek **Watershed:** East Walker
Reach #: 1 **Unit #:** 1
Forest: Humboldt-Toiyabe National Forest **District:** Bridgeport
Date: 26 Oct. 05 **Surveyors:** J. Kling, D. Becker, D. Hawk
Legal Description: **GPS Coordinates:** N: 4250154
Dominant Overstory: Willow/Lodgepole E: 302521 2636 meters
Rosgen Channel Type: B **Dominant Understory:** Willow
Weather: Cloudy/Cold **Air Temp:** **Water Temp:** **Time:** 14:15-14:30 (474 Seconds)

			First Pass Time: 15 Min.		Second Pass Time:		Third Pass Time:	
Unit Length (feet)	Unit Avg Width (1/10m)	Unit Avg Depth (1/10m)	Species (CT, RB, BT, BW)	Total Length (mm)	Species (CT, RB, BT, BW)	Total Length (mm)	Species (CT, RB, BT, BW)	Total Length (mm)
136 ft	1.53	0.18	LCT	133 *				
			LCT	122 *				
			LCT	182 *				

Comments: At the bottom of this unit a tributary (5% of overall flow) enters on river left side. There is evidence of recent grazing in the upland meadows. Cattle trail crosses through this unit. Two LCT were missed, approximately 145 mm and 220 mm in length. (*) Small piece of the caudal fin was collected for genetic analysis.

HUMBOLDT-TOIYABE NATIONAL FOREST FISH DISTRIBUTION SURVEY DATA FORM

Stream Name: Murphy Creek **Watershed:** East Walker
Reach #: 1 **Unit #:** 2
Forest: Humboldt-Toiyabe National Forest **District:** Bridgeport
Date: 26 Oct. 05 **Surveyors:** J. Kling, D. Becker, D. Hawk
Legal Description: **GPS Coordinates:** N: 4250251
E: 301994
Dominant Overstory: Lodgepole **Dominant Understory:** Willow
Rosgen Channel Type: B
Weather: Cloudy/Cold **Air Temp:** **Water Temp:** **Time:** 15:14-15:26 (288 Seconds)

			First Pass Time: 12 Min.		Second Pass Time:		Third Pass Time:	
Unit Length (feet)	Unit Avg Width (1/10m)	Unit Avg Depth (1/10m)	Species (CT, RB, BT, BW)	Total Length (mm)	Species (CT, RB, BT, BW)	Total Length (mm)	Species (CT, RB, BT, BW)	Total Length (mm)
135 ft	1.37	0.15	LCT	150 *				
			LCT	178 *				
			LCT	185 *				
			LCT	218 *				

Comments: This is evidence of recent grazing in the upland meadows. (*) Small piece of the caudal fin was collected for genetic analysis.

HUMBOLDT-TOIYABE NATIONAL FOREST FISH DISTRIBUTION SURVEY DATA FORM

Stream Name: Murphy Creek **Watershed:** East Walker
Reach #: 1 **Unit #:** 3
Forest: Humboldt-Toiyabe National Forest **District:** Bridgeport
Date: 26 Oct. 05 **Surveyors:** J. Kling, D. Becker, D. Hawk
Legal Description: **GPS Coordinates:** N: 4250230
E: 301588 2705 meters
Dominant Overstory: Lodgepole **Dominant Understory:** Willow
Rosgen Channel Type: B
Weather: Cloudy/Cold **Air Temp:** **Water Temp:** **Time:** 16:10-16:25 (520 Seconds)

			First Pass Time: 15 Min.		Second Pass Time:		Third Pass Time:	
Unit Length (feet)	Unit Avg Width (1/10m)	Unit Avg Depth (1/10m)	Species (CT, RB, BT, BW)	Total Length (mm)	Species (CT, RB, BT, BW)	Total Length (mm)	Species (CT, RB, BT, BW)	Total Length (mm)
140 ft	1.72	0.11	LCT	165 *				
			LCT	115 *				
			LCT	136 *				
			LCT	116 *				
			LCT	120 *				
			LCT	120 *				

Comments: At the top of this unit a tributary (20% of overall flow) enters on river left side. There is evidence of recent grazing in the upland meadows. One LCT was missed, approximately 120 mm in length. (*) Small piece of the caudal fin was collected for genetic analysis.

HUMBOLDT-TOIYABE NATIONAL FOREST FISH DISTRIBUTION SURVEY DATA FORM

Stream Name: Murphy Creek **Watershed:** East Walker
Reach #: 1 **Unit #:** 4
Forest: Humboldt-Toiyabe National Forest **District:** Bridgeport
Date: 27 Oct. 05 **Surveyors:** J. Kling, D. Becker, D. Hawk
Legal Description: **GPS Coordinates:** N: 4250280
E: 300833 2773 meters
Dominant Overstory: Lodgepole **Dominant Understory:** Willow
Rosgen Channel Type: B
Weather: Snowing/Cold **Air Temp:** **Water Temp:** **Time:** 10:45-11:25 (804 Seconds)

			First Pass Time: 40 Min.		Second Pass Time:		Third Pass Time:	
Unit Length (feet)	Unit Avg Width (1/10m)	Unit Avg Depth (1/10m)	Species (CT, RB, BT, BW)	Total Length (mm)	Species (CT, RB, BT, BW)	Total Length (mm)	Species (CT, RB, BT, BW)	Total Length (mm)
315 ft	1.33	0.11	LCT	213 *				
			LCT	210 *				

Comments: A cattle trail crosses near the bottom of this unit. There is evidence of recent grazing in the upland meadows. (*) Small piece of the caudal fin was collected for genetic analysis. To collect more caudal fin clips for genetic analysis, we spot shocked between Reach 1 Unit 4 and Reach 1 Unit 5. The following fish lengths were recorded for captured fish: 132, 112, 140, 145, 125, 159, 142, 137, 224, 119, 153, and 135 mm.

HUMBOLDT-TOIYABE NATIONAL FOREST FISH DISTRIBUTION SURVEY DATA FORM

Stream Name: Murphy Creek
Watershed: East Walker
Reach #: 1
Unit #: 5
Forest: Humboldt-Toiyabe National Forest
District: Bridgeport
Date: 26 Oct. 05
Surveyors: J. Kling, D. Becker, D. Hawk
Legal Description:
GPS Coordinates: N: 4250460
E: 300468 2807 meters
Dominant Overstory: Willow
Rosgen Channel Type: B
Dominant Understory: Willow
Weather: Cloudy/Cold **Air Temp:** **Water Temp:** **Time:** 17:40-17:55 (367 Seconds)

			First Pass Time: 15 Min.		Second Pass Time:		Third Pass Time:	
Unit Length (feet)	Unit Avg Width (1/10m)	Unit Avg Depth (1/10m)	Species (CT, RB, BT, BW)	Total Length (mm)	Species (CT, RB, BT, BW)	Total Length (mm)	Species (CT, RB, BT, BW)	Total Length (mm)
130 ft	1.37	0.20	LCT	121 *				

Comments: There is evidence of recent grazing in the upland meadows. (*) Small piece of the caudal fin was collected for genetic analysis. Two LCT were missed. Two road-stream crossings, one on Murphy Creek South Fork, and the other on Murphy Creek North Fork, were photographed and had GPS locations recorded.