

Upper Truckee River 2008 Summary Report

Heritage and Wild Trout Program
California Department of Fish and Game

September 8th-12th, 2008



Prepared by Jeff Weaver and Stephanie Mehalick

Introduction:

Lahontan cutthroat trout (LCT) (*Oncorhynchus clarki henshawi*) are native to the Lahontan Basin in northern Nevada, eastern California, and southern Oregon. Habitat destruction and the introduction of non-native species have caused significant LCT declines throughout their range and, in 1970, this species was first listed as Endangered under the Federal Endangered Species Act. In 1975, LCT were reclassified to Threatened status to facilitate management and restoration efforts.

In California, LCT are native to the Truckee, Carson, Susan, and Walker River systems, including the Upper Truckee River (UTR). The UTR is located in both Alpine and El Dorado Counties and is a snow-fed headwater tributary to Lake Tahoe which provided historic spawning grounds for LCT. The introduction of non-native eastern brook trout (*Salvelinus fontinalis*) contributed to the extirpation of LCT in the Upper Truckee River.

In cooperation with the United States Fish and Wildlife Service (USFWS) and the United States Forest Service (USFS), the California Department of Fish and Game (DFG) has been part of an ongoing LCT restoration effort on the UTR since 1988, when the system was first chemically treated to remove invasive trout species. In 1990 and 1991, LCT from Macklin Creek (Sierra and Nevada Counties) were translocated to reseed the system with the native trout species. During routine snorkel surveys in the UTR in 1996, the USFS again observed brook trout. Since then, DFG has been using electrofishing as a tool to locate and physically remove the invasive brook trout. Zero brook trout were captured during our annual electrofishing survey in 2007, marking the first time since 1996 that brook trout had not been found in the system. DFG continues to monitor the upper reaches of the UTR annually to assess the LCT population and document the presence or absence of brook trout and remove them as necessary.

The UTR and tributaries upstream of the confluence with Showers Creek are designated by the California Fish and Game Commission as a Heritage Trout Water for its self-sustaining population of LCT within their historic (native) waters. Angling is open from July 1st through September 30th and special regulations stipulate that only artificial lures with barbless hooks may be used. There is a zero trout bag limit. In 2008, DFG's Heritage and Wild Trout Program (HWTP) worked in collaboration with the USFS and volunteers, surveying the UTR and tributaries within current LCT habitat.

Methods:

Survey protocol was established by DFG North Central Regional staff (Somer, pers. comm.). The survey area includes the mainstem UTR from "Falls 1" upstream to the Pacific Crest Trail (PCT) Crossing 1 and nine associated tributaries within this part of the system (Figure 1). The 2008 survey was conducted from September 8th-12th and consisted of single pass electrofishing throughout the basin.

Figure 1. Topographical Map of Survey Area (W. Somer, DFG North Central Region).



Figure 1. Map of 2008 Upper Truckee River survey sections

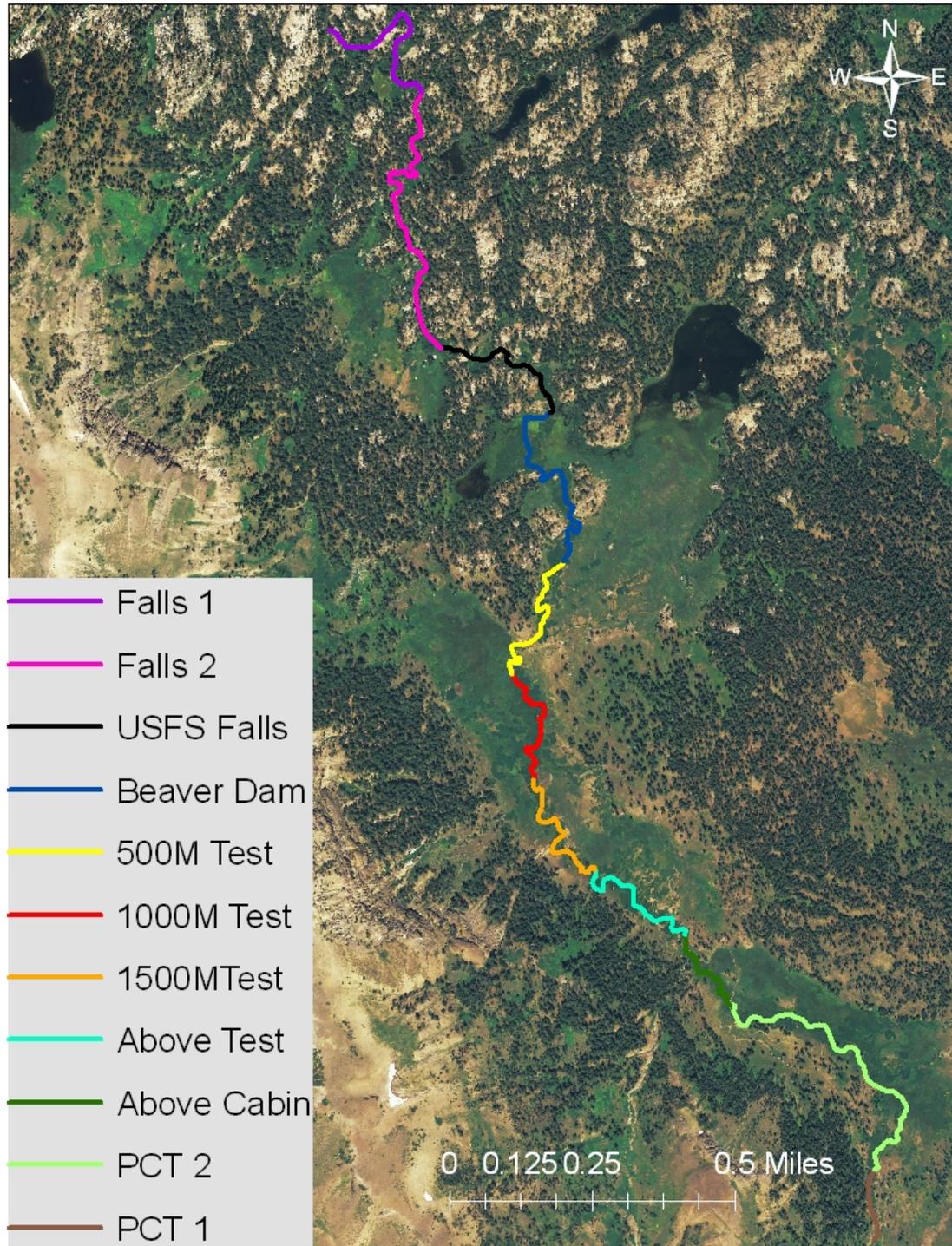
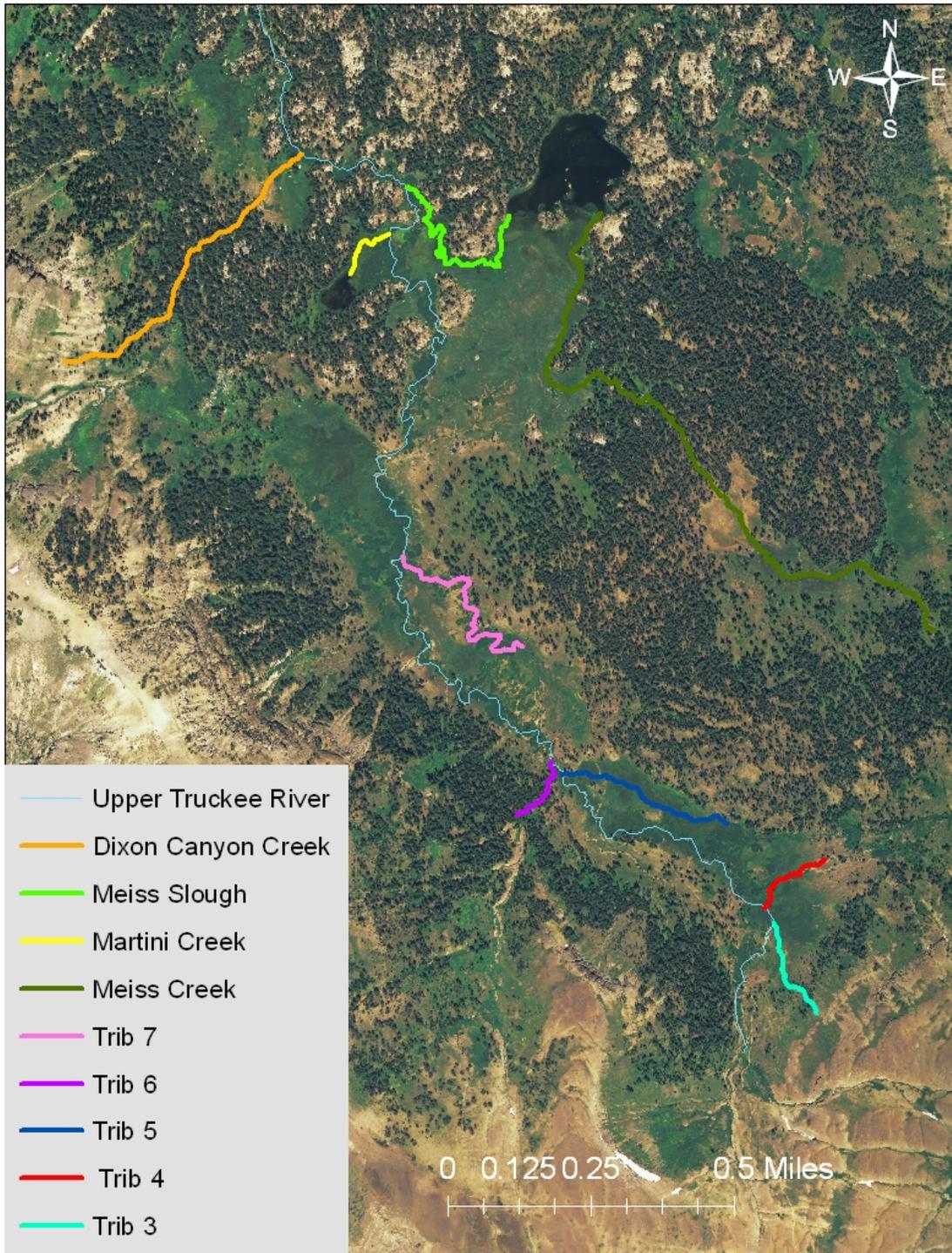


Figure 3. Map of Upper Truckee River Tributaries



Beaver dams are numerous along the UTR in the survey area and, due to the formation of deep pools from the dams, it was necessary to remove the dams prior to the start of electroshocking (Figure 2). USFS personnel visited the UTR during the week of September 2nd to assess the extent of beaver dam distribution and begin the process of dam removal. Dams were removed using a Pulaski and pick axe. During the electrofishing effort, it was again necessary to break down portions of each dam in order to lower water levels and increase water visibility (the beavers had rebuilt these dams in the short period between initial dam removal and electrofishing). As the electrofishing effort progressed upstream and individual dams were encountered, we stopped sampling until the dams could again be removed and water levels lowered. The removal of dams released sediment and increased turbidity downstream of the dam; once a dam was torn apart, electrofishing was not feasible downstream of the dam and, therefore, dams were either removed on days prior to the electrofishing effort, or in the process of electrofishing upstream (thereby avoiding the sediment plume and associated turbidity by continuing upstream of the newly removed dam).

Figure 2. Photographs depicting beaver dams before (left) and after (right) removal



Sections were located based on GPS coordinates, historic knowledge, and written survey plans. At the start of the survey effort, physical measurements of the stream and environmental conditions were taken, including air and water temperature (in the shade) and conductivity (both specific and ambient). These factors were used to determine appropriate electroshocker settings. Surveys were initiated at the downstream extent of each section and proceeded in an upstream direction, with netters capturing stunned fish and placing them in five-gallon buckets to be held until processed. Captured fish, not including brook trout, were identified to species, measured with a calibrated landing net to the nearest ½ inch (total length), and were tallied based on size class and by section (Tables 1 and 2). Fish measured from 1.5 inches to 1.99 inches were tallied in the 1.5 inch size class; fish measured as 2.0 inches to 2.49 inches were tallied as two-inch fish and so forth. All fish less than 1.49 inches were recorded as fry. Processed fish were released downstream of the electrofishing effort. One of the primary objectives of this survey is to find and remove invasive brook trout; thus, brook trout were processed

differently from LCT or other native species encountered. All brook trout captured were sexed, measured to the nearest millimeter (total length), and then dispatched (buried or dispersed in dense vegetation).

An assessment of electrofishing injury from current and past survey efforts was conducted by keeping a tally (separate from the population count) of visible injury by size class for LCT (Table 3). Injury types were classified as: deformed spine (a curvature as viewed from above); short body (perch-like body form); tail or body fungus; mortality; or other (Figure 3). The tally of injury type by size class was totaled for the entire survey and was not differentiated by section.

Figure 3. Photographs depicting perch-like body form (left); spinal injury (right); and LCT without deformities (bottom)



Results:

Table 1. 2008 summary of LCT captured by size class and section on main-stem Upper Truckee River

Size Class	Falls 1	Falls 2	USFS Falls	Beaver Dams	500M Test	1000M Test	1500M Test	Above Test	Above Cabin	PCT 2	PCT 1	Total	% Total
<1.5	24	115	12	74	44	4	84	79	123	30	0	589	39
1.5	0	0	9	0	0	0	1	0	0	0	0	10	1
2	0	0	0	0	0	1	2	2	2	1	0	8	1
2.5	1	0	0	2	1	8	19	6	20	9	0	66	4
3	2	13	2	9	9	11	34	8	26	36	0	150	10
3.5	13	21	2	10	12	8	20	6	9	13	1	115	8
4	20	36	29	16	10	10	6	2	5	10	0	144	10
4.5	12	11	11	13	19	10	13	2	3	2	0	96	6
5	9	25	11	25	23	20	8	2	1	5	0	129	9
5.5	9	10	11	11	18	7	5	2	3	0	0	76	5
6	9	16	9	15	15	11	6	5	4	4	0	94	6
6.5	3	5	9	14	11	10	7	4	1	2	0	66	4
7	4	18	9	14	16	25	18	7	4	6	0	121	8
7.5	7	13	5	14	13	22	15	2	8	9	0	108	7
8	4	19	12	18	21	42	10	6	6	10	2	150	10
8.5	2	6	5	6	6	9	1	2	7	1	1	46	3
9	5	7	10	11	4	6	6	0	3	2	0	54	4
9.5	2	8	2	2	1	4	1	0	2	1	0	23	2
10	0	4	7	1	1	4	1	1	1	0	0	20	1
10.5	0	0	1	1	0	0	0	0	0	0	0	2	0
11	0	1	0	0	0	0	0	0	0	0	0	1	0
11.5	0	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	126	328	156	256	224	212	257	136	228	141	4	2068	139

Table 2. 2008 summary of total number of LCT captured by size class and section on Upper Truckee River tributaries

Size Class	Dixon Canyon Creek	Martini Creek	Meiss Slough	Meiss Creek	Trib 7	Trib 6	Trib 5	Trib 4	Trib 3	Total	% Total
<1.5	0	0	0	103	2	0	6	0	0	111	42
1.5	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	4	0	0	0	0	0	4	2
2.5	0	0	0	15	1	0	1	0	0	17	6
3	0	0	0	30	7	0	3	0	0	40	15
3.5	0	0	0	9	3	0	2	0	0	14	5
4	0	0	0	2	1	0	1	0	0	4	2
4.5	0	0	0	1	0	0	0	0	0	1	0
5	0	0	0	1	4	0	1	0	0	6	2
5.5	0	0	0	1	2	0	0	0	0	3	1
6	0	0	0	3	4	0	0	0	0	7	3
6.5	0	0	0	2	0	0	0	0	0	2	1
7	0	0	0	10	1	0	3	0	0	14	5
7.5	0	0	0	7	2	0	1	0	0	10	4
8	0	0	0	7	0	0	1	0	0	8	3
8.5	0	0	0	4	1	0	1	0	0	6	2
9	0	0	0	5	1	0	3	0	0	9	3
9.5	0	0	0	2	0	0	2	0	0	4	2
10	0	0	0	0	0	0	1	0	0	1	0
10.5	0	0	0	1	0	0	1	0	0	2	1
11	0	0	0	1	0	0	0	0	0	1	0
11.5	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	208	29	0	27	0	0	264	100

Figure 4. Histogram of 2008 electrofishing data on main-stem Upper Truckee River; comparison of total number of Lahontan cutthroat trout captured by size class.

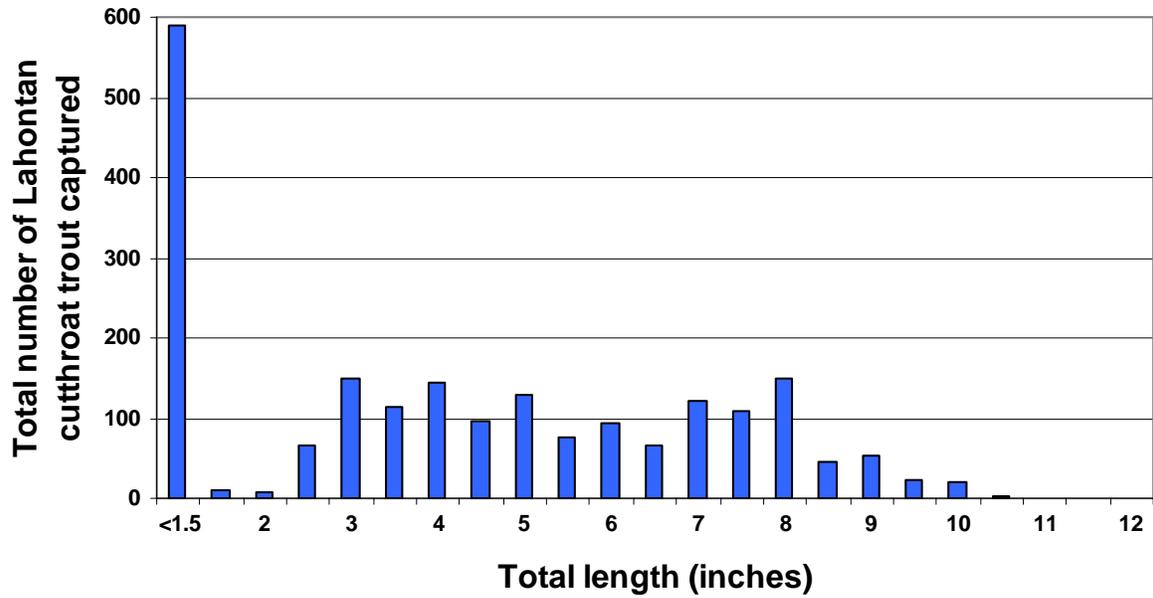
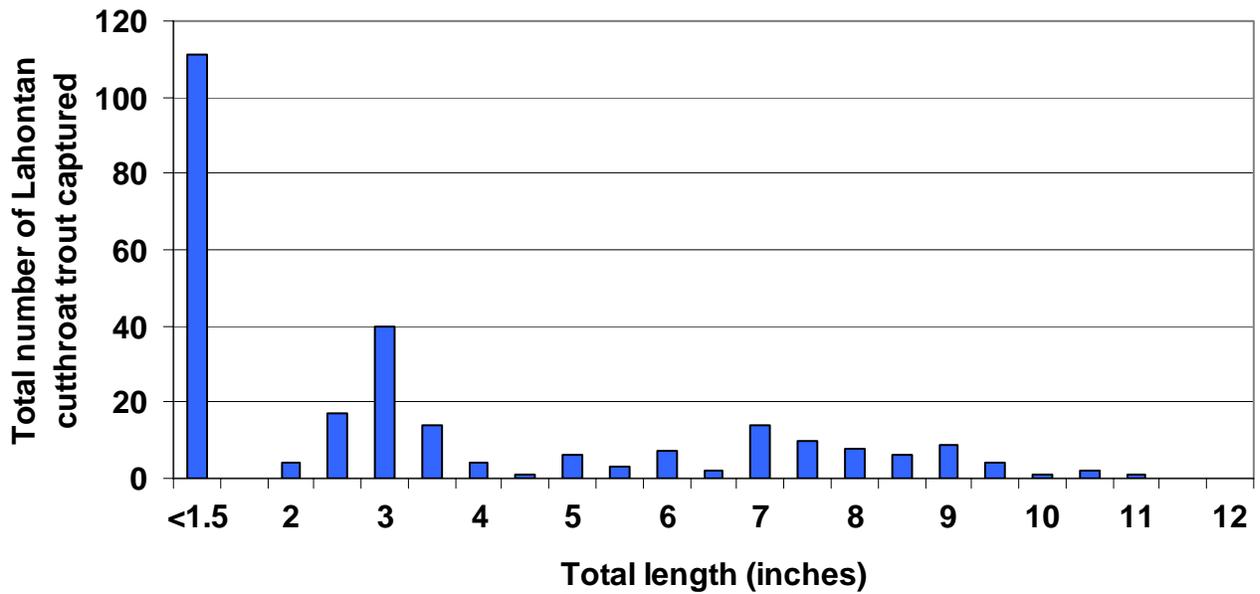


Figure 5. Histogram of 2008 electrofishing data on Upper Truckee River tributaries; comparison of total number of Lahontan cutthroat trout captured by size class



As noted, one of the main objectives of this survey was to find and remove brook trout in an ongoing effort to restore native Lahontan cutthroat trout to one of its historic waters. Zero brook trout were captured in 2008. As part of this process, basic data on LCT size class distribution and injury rates caused by yearly electrofishing are also collected. In 2008, a total of 2068 LCT and 241 speckled dace (*Rhinichthys osculus*) were captured on the main-stem Upper Truckee River, from Falls 1 upstream to PCT 1 (Table 1). The speckled dace were relegated to the lower two sections (Falls 1 and 2), downstream of the confluence with the outflow of Four Lakes. These dace measured between zero and five inches total length, with the majority (59%) being between two and three inches.

These surveys do not include measurement of stream habitat attributes such as widths or survey lengths; thus, density and biomass estimates for LCT are not calculated. However, total numbers of fish captured (by size class and/or by survey section) can be compared across time. In addition to the sections surveyed in 2007, we surveyed an additional section in 2008 (Falls 1); this should be noted when comparing total numbers of LCT captured between years. Also, in 2007 we conducted two passes throughout the system; for comparison purposes in this report, we examined only first pass information from 2007. There was a slight increase in total LCT captured on the main-stem Upper Truckee River from Falls 2 upstream to PCT 2 from 2007 to 2008 (an increase of 449 LCT; this does not include fish captured in 2008 in the Falls 1 Section). Size classes of LCT captured in 2008 ranged from fry to eleven inches, with the largest proportion consisting of fish less than 1.5 inches (fry) (Figure 4).

Water temperatures in the main-stem ranged from 7.5° to 10° Celsius and air temperatures during the survey effort were between 19° and 25° C, depending on the time of day. Flow was intermittent throughout most of the main-stem from the Beaver Dam Section upstream to the headwaters.

In 2008, a total of 264 LCT were captured in the nine tributaries that were surveyed (Table 2). The largest fish captured in the tributaries was 11 inches and the size class with the highest abundance was fish less than 1.5 inches (fry) (Figure 5). There was an increase in total LCT captured in the tributaries in 2008, up from 128 fish captured in 2007.

LCT injury was quantified for the entire system, including the main-stem and all tributaries. Out of the 2332 LCT captured in 2008, 104 showed signs of injury (0.05%). The majority of these injured fish had some type of spinal abnormality (71% perch-like body form and 17% deformed spine; see Table 3).

Table 3. 2008 occurrence of LCT injury by type and size class

Size Class	LCT Injury Type			
	Deformed Spine	Short Body	Tail/Body Fungus	Mortality
Fry	0	1	0	6
1.5	0	1	0	0
2	0	3	0	0
2.5	1	17	0	2
3	1	10	0	6
3.5	0	0	0	0
4	0	0	0	1
4.5	1	1	0	2
5	2	1	0	2
5.5	1	2	0	1
6	0	8	0	1
6.5	1	2	0	0
7	2	3	0	2
7.5	2	4	0	1
8	4	7	0	0
8.5	2	0	0	1
9	1	0	1	0
9.5	0	0	0	0
10	0	0	0	0
10.5	0	0	0	0
11	0	0	0	0
11.5	0	0	0	0
12	0	0	0	0
Total	18	60	1	25

Discussion:

This was the second consecutive year since 1996 that zero brook trout were captured in the entire survey area of the UTR. In 2006, only two yearling brook trout were captured in the UTR. DFG's HWTP is dedicated to protecting this important heritage trout resource and will continue monitoring the UTR in 2009 and beyond to ensure that non-native brook trout are eliminated and the restored LCT population continues to thrive.

References

Somer, William. 2007. California Department of Fish and Game, North Central Region. Personal communication.