Little Rock Creek 2012 summary report

June 25-27, 2012

State of California

Department of Fish and Wildlife

Heritage and Wild Trout Program

Prepared by Stephanie Hogan and Cameron Zuber

Introduction

Little Rock Creek, located approximately eight miles southwest of Pearblossom, CA (Los Angeles County) is within the US Forest Service (USFS) Angeles National Forest and supports a wild population of rainbow trout (*Oncorhynchus mykiss*) and brown trout (*Salmo trutta*; Figure 1). The California Department of Fish and Wildlife (CDFW) Heritage and Wild Trout Program (HWTP) is evaluating portions of the Little Rock Creek watershed for candidacy as a designated Wild Trout Water. On an annual basis, the HWTP is responsible for recommending to the California Fish and Game Commission 25 miles of stream and one lake that fit the criteria for designation as Wild Trout Waters. Wild Trout Waters are those that support self-sustaining wild trout populations, are aesthetically pleasing and environmentally productive, provide adequate catch rates in terms of numbers or size of trout, and are open to public angling (Bloom and Weaver 2008). Wild Trout Waters may not be stocked with catchable-sized hatchery trout. The HWTP evaluates candidate waters using a phased approach to systematically collect data and evaluate whether or not a stream or lake meets designation criteria.

Between 2001 and 2002 the USFS, in coordination with CDFW (formerly the Department of Fish and Game), built a barrier to upstream fish migration in the upper portion of Little Rock Creek (Figures 2-4). Manual trout removal efforts were conducted upstream of this barrier to increase habitat for federally endangered mountain yellow-legged frog (MYLF; *Rana muscosa*).

In 2012, the HWTP and South Coast Region staff conducted Phase 1 initial resource assessments in Little Rock Creek and tributaries downstream of this barrier to collect baseline information on the fishery and habitat and to document the presence or absence of MYLF. Survey methodology included direct observation snorkel surveys, hook and line angling, and visual encounter surveys.

Methods

Direct observation

Direct observation surveys were conducted from June 25th through 27th, 2012 in Little Rock Creek (eight sections) and two unnamed tributaries using snorkeling methods, an effective survey technique in many small streams and creeks in northern California and the Pacific Northwest (Hankin and Reeves 1988). For the purposes of this report, Unnamed Tributary 1 is the tributary whose confluence with Little Rock Creek is approximately one-quarter mile downstream from the USFS barrier. Unnamed Tributary 2 is in Cooper Canyon and joins with Unnamed Tributary 1 approximately one-quarter mile upstream from its confluence with Little Rock Creek. Sections were spaced approximately every one-half mile on Little Rock Creek and one-quarter mile on the two unnamed tributaries (Figures 2-3). The start of each section was selected at random. Specific section boundaries were located at distinct breaks in habitat type and/or

stream gradient. The surveys were conducted in an upstream direction with one to two divers. The number of divers was determined based on wetted width, water visibility, and habitat complexity. Divers maintained an evenly-spaced line perpendicular to current and counted fish by species. All observed trout were further separated and counted by size class. Size classes were divided into the following categories: young of year (YOY); small (< 6 inches); medium (6-11.9 inches); large (12-17.9 inches); and extra-large (≥ 18 inches). Young of year are defined by the HWTP as age 0+ fish, emerged from the gravel in the same year as the survey effort. Depending on species, date of emergence, relative growth rates, and habitat conditions, the size of YOY varies greatly, but is generally between zero and three inches in total length. If a trout was observed to be less than six inches in total length but it was difficult to determine whether it was an age 0+ or 1+ fish, by default it was classified in the small (< 6 inches) size class.

Divers were instructed in both visual size class estimation and proper snorkel survey techniques (establishing a dominant side, determining the extent of their visual survey area, how and when to count (or not count) fish observed, safety considerations, etc.) prior to starting the survey. For each section, surveyors measured section length along the thalweg (ft), average wetted width and water depth (ft), and water visibility (ft). Water and air temperature (ºC, in the shade) were also measured. Habitat type (flatwater, riffle, or pool) was identified following Level 2 protocol as defined in the California Salmonid Stream Habitat Restoration Manual (Flosi et al. 1988). Representative photographs were taken and coordinates were recorded for the section boundaries using Global Positioning System (GPS) hand-held units (North American Datum 1983). Fish abundance was estimated in each section (fish/mi) and was averaged for each water (for the latter, all observed fish were summed by species and divided by the total length of all survey sections).

Angling

Angling assessments were conducted in Little Rock Creek and Unnamed Tributary 1 on June 25th and 26th, 2012 (Figures 2-3). Anglers recorded total fishing effort (hrs) and the number of fish caught by species and size class, using the size classes as defined above in direct observation methodology. Catch per unit effort (CPUE; fish/hr) was calculated for each angler and averaged across each water.

Visual encounter surveys

Visual encounter surveys were conducted concurrent with the direct observation surveys. Surveyors walked along or within the wetted channel and visually searched for any aquatic species, with a focus on identifying MYLF. All occurrences of species of concern were geo-referenced using hand-held GPS units (North American Datum 1983). In addition, potential barriers to upstream fish migration and the observed upstream extent of fish distribution were documented, photographed, and geo-referenced.

Results

Direct observation

Little Rock Creek was surveyed at eight locations (Sections 112-812) from its confluence with Unnamed Tributary 1 downstream approximately 2.7 miles (Figures 2-3 and Table 1). A total of 409.8 ft were surveyed and consisted of flatwater-habitat with substrate dominated by cobble and boulder with lesser amounts of gravel and sand (Figure 4). Water temperature ranged from 9 to 18 ºC and air temperature ranged from 18 to 24 ºC. Mean wetted width was 11.2 ft and mean water depth was 0.6 ft. A total of 267 rainbow trout, 20 brown trout, and 1 unknown trout were observed. Rainbow trout size class distribution was 21.3% YOY, 73.4% small- and 5.2% medium-sized fish (Figure 5). Brown trout size class distribution was 75.0% YOY, 20.0% small- and 5.0% medium-sized fish. The one unknown trout was in the small size class. Abundance was estimated at 3440 rainbow trout/mi, 258 brown trout/mi and 13 unknown trout/mi. One large- or extra-large-sized brown trout was observed in Little Rock Creek during the visual encounter surveys.

Unnamed Tributary 1 was surveyed at four locations (Sections 112-412) from its confluence with Little Rock Creek upstream approximately 0.9 miles. A total of 249.7 ft were surveyed, which consisted of 53% riffle- and 47% flatwater-habitat (Figure 6). Substrate was dominated by cobble and boulder with some gravel. Water temperature ranged from 9.5 to 10 ºC and air temperature was between 16 and 18 ºC. Mean wetted width was 16.7 ft and mean water depth was 0.3 ft. A total of seven rainbow trout, one brown trout, and ten unknown trout were observed. Rainbow trout size class distribution was 85.7% YOY and 14.3% small-sized fish (Figure 7). All observed brown and unknown trouts were YOY. Abundance was estimated at 148 rainbow trout/mi, 21 brown trout/mi and 211 unknown trout/mi. One large- or extra-large-sized brown trout was observed in Unnamed Tributary 1 outside of the direct observation sections.

Unnamed Tributary 2 was surveyed at two locations (Sections 112-212) from its confluence with Unnamed Tributary 1 upstream approximately 0.4 miles. A total of 83.6 ft were surveyed and consisted of flatwater-habitat (Figure 8). Substrate was dominated by cobble and boulder with some sand. Water temperature ranged from 8 to 14 ºC and air temperature was between 20 and 25 ºC. Mean wetted width was 5.2 ft and mean water depth was 0.3 ft. Zero trout were observed in the two direct observation survey sections. One YOY trout (unknown species) was observed approximately 0.1 miles downstream of Section 112.

Angling

An angling assessment was conducted in Little Rock Creek and Unnamed Tributary 1 to provide information on species composition, size class structure, and catch rates. Six anglers fished Little Rock Creek for a total of 14.22 hrs of effort and captured 50 rainbow trout and one brown trout (Figure 9). Catch rates

ranged from 0.5 to 7.8 fish/hr with an average CPUE of 3.7 fish/hr. All captured trout were in the small and medium size classes.

Four anglers fished Unnamed Tributary 1 for a total of 5.89 hrs of effort and captured four rainbow trout and one brown trout. Catch rates ranged from zero to 5.2 fish/hr with a mean CPUE of 1.5 fish/hr.

Visual encounter surveys

Zero fish and one MYLF were observed approximately 30 ft upstream of the USFS barrier. During the direct observation survey, potential natural barriers to fish migration were observed (Figure10), including three on Unnamed Tributary 1 and four on Unnamed Tributary 2. These barriers were between 6- and 30-foot waterfalls, cascading over bedrock and/or boulders.

Discussion

Portions of the Little Rock Creek watershed meet multiple criteria for Wild Trout Water designation, including the presence of wild trout populations with multiple size classes, no stocking of hatchery fish and suitable habitat (Figure 11). Little Rock Creek falls within the Southern District California Freshwater Fishing Regulations and is open year-round with a bag and possession limit of five fish and no gear restrictions. It supports a fast-action fishery (> 2 fish/hr) with the possibility of catching trophy-size trout (≥ 18 inches).

The majority of the watershed falls within national forest lands administered by the USFS. Little Rock Creek is remote and access is limited. There is currently a USFS closure in the lower portion of Little Rock Creek upstream of Little Rock Creek Reservoir and adjacent to Little Rock Road, to protect federally endangered arroyo toad (*Bufo californicus*) populations. The Pacific Crest Trail provides access to the upper portion of the watershed; the remainder of the creek is located within a remote and confined canyon and may only be accessed via instream hiking.

Wild trout fisheries in this portion of the state are limited and, although it meets numerous criteria for Wild Trout Water designation, Little Rock Creek is currently being managed to protect and conserve endangered amphibian populations. The HWTP recommends further collaboration with the USFS to determine restoration plans for MYLF downstream of the engineered barrier. If restoration is not implemented, the HWTP recommends pursuing portions of Little Rock Creek for designation as a Wild Trout Water through continued population-level monitoring and angler use assessments over a multi-year period. The HWTP recommends increasing the geographic scope of sampling to include portions of the watershed not surveyed in the 2012. The use of angler survey boxes should be evaluated as a tool to monitor catch rates, catch size, angler use, angler satisfaction and angler preferences. The HWTP should collaborate with local stakeholders including the USFS, private landowners and recreational users.

References

Bloom, R., and J. Weaver. 2008. The California Heritage and Wild Trout Program Handbook (Draft). State of California Natural Resources Agency. Department of Fish and Game. Heritage and Wild Trout Program.

Flosi, G., S. Downie, J. Hopelain, M. Bird, R. Coey and B. Collins. 1998. California Salmonid Stream Habitat Restoration Manual. 3rd Edition. Vol. 1. State of California Resources Agency. Department of Fish and Game. Inland Fisheries Division.

Hankin, D.G. and G.H. Reeves. 1988. Estimating total fish abundance and total habitat area in small streams based on visual estimation methods. Canadian Journal of Fisheries and Aquatic Sciences. 45:834-844.

Figure 1. Vicinity map of 2012 Little Rock Creek watershed survey location

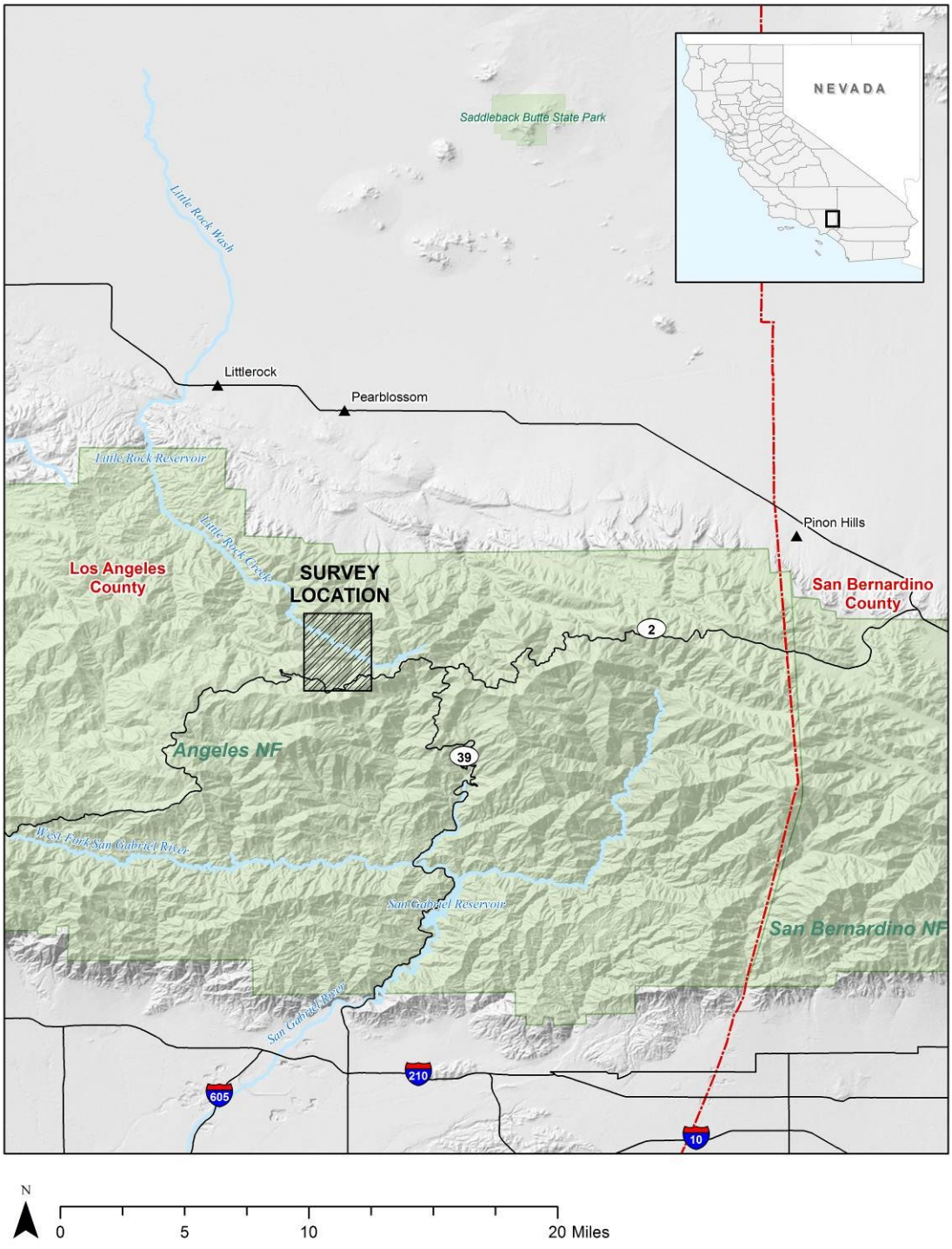

Figure 2. Detail map of 2012 Little Rock Creek and tributary survey locations

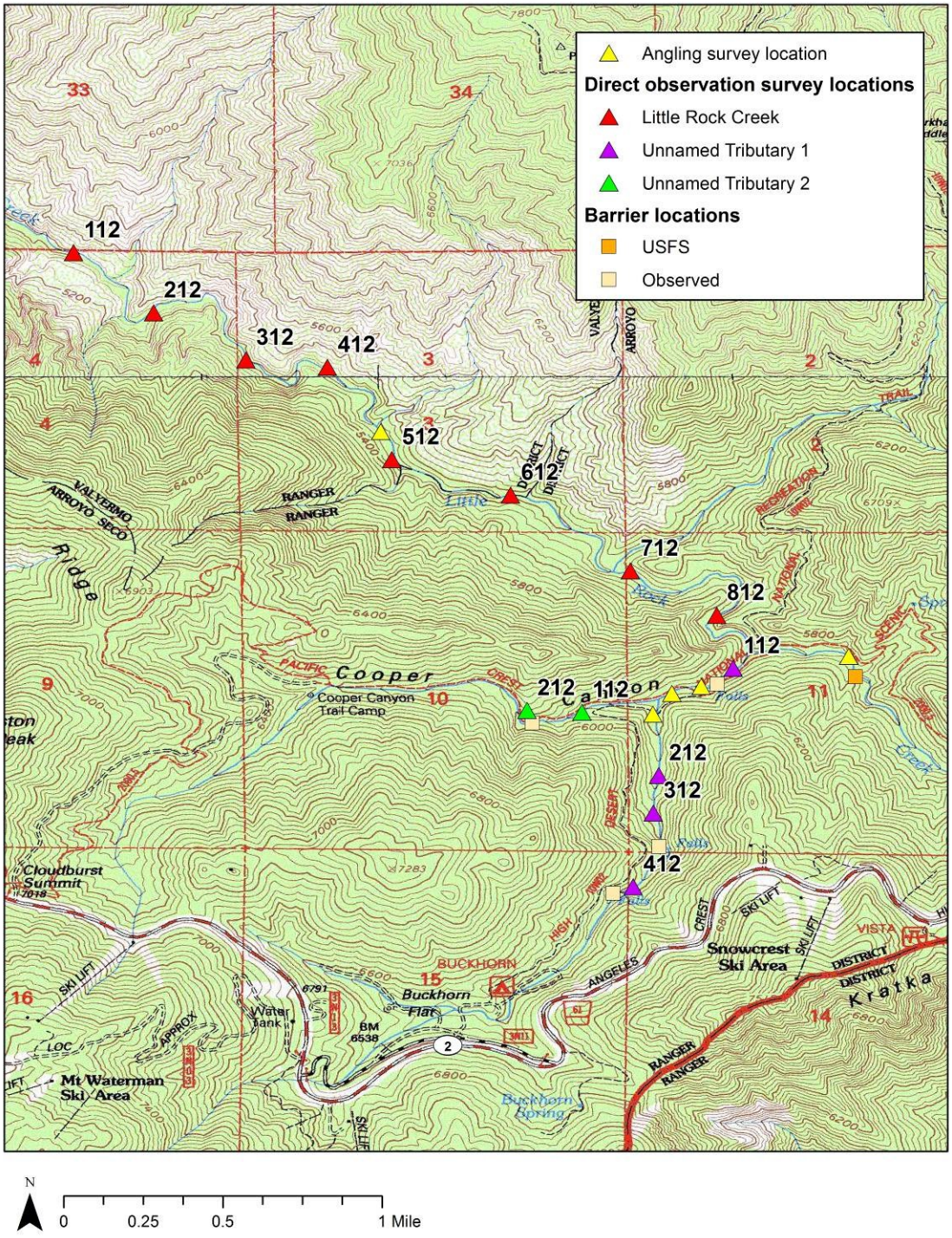

Figure 3. Photographs of the USFS barrier on Little Rock Creek in 2012

Figure 4. Representative photographs of Little Rock Creek in 2012

Figure 5. Graph of 2012 trout size class distribution observed during direct observation surveys in Little Rock Creek

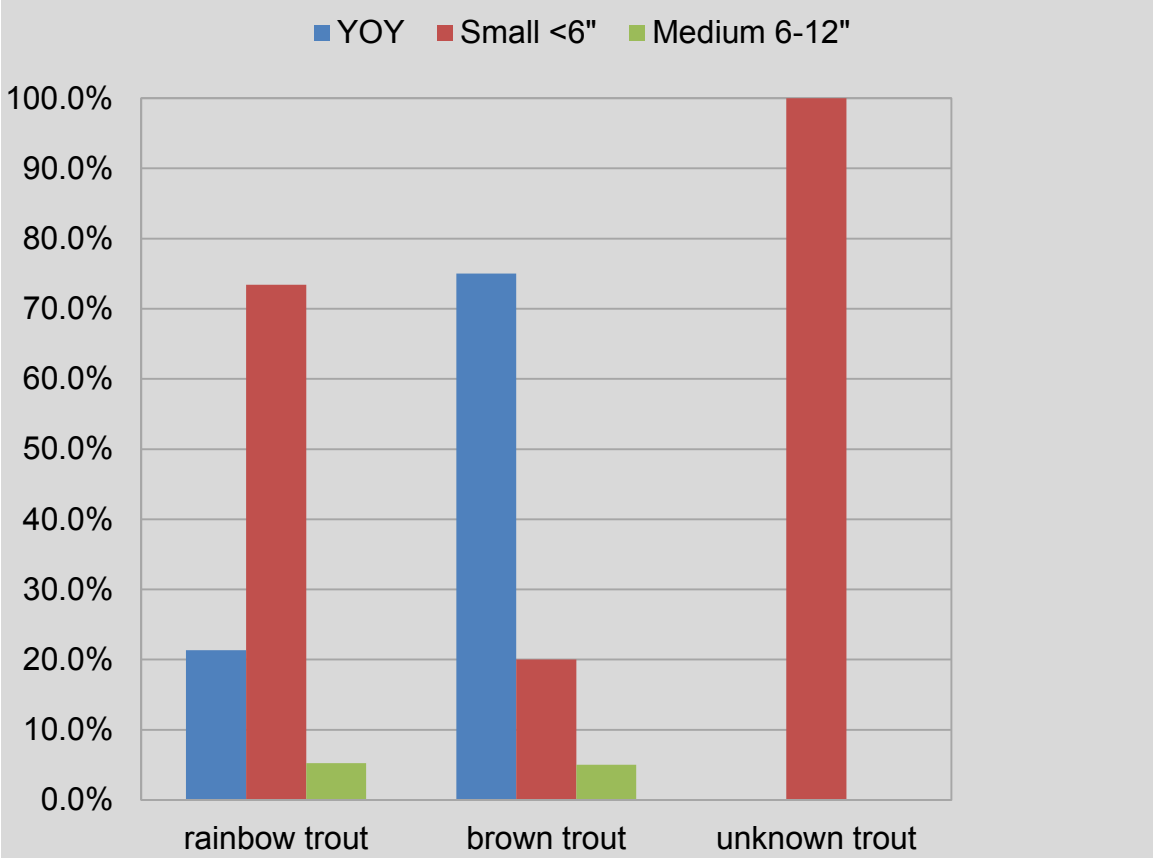

Figure 6. Representative photographs of Unnamed Tributary 1 in 2012

Figure 7. Graph of 2012 trout size class distribution observed during direct observation surveys in Unnamed Tributary 1

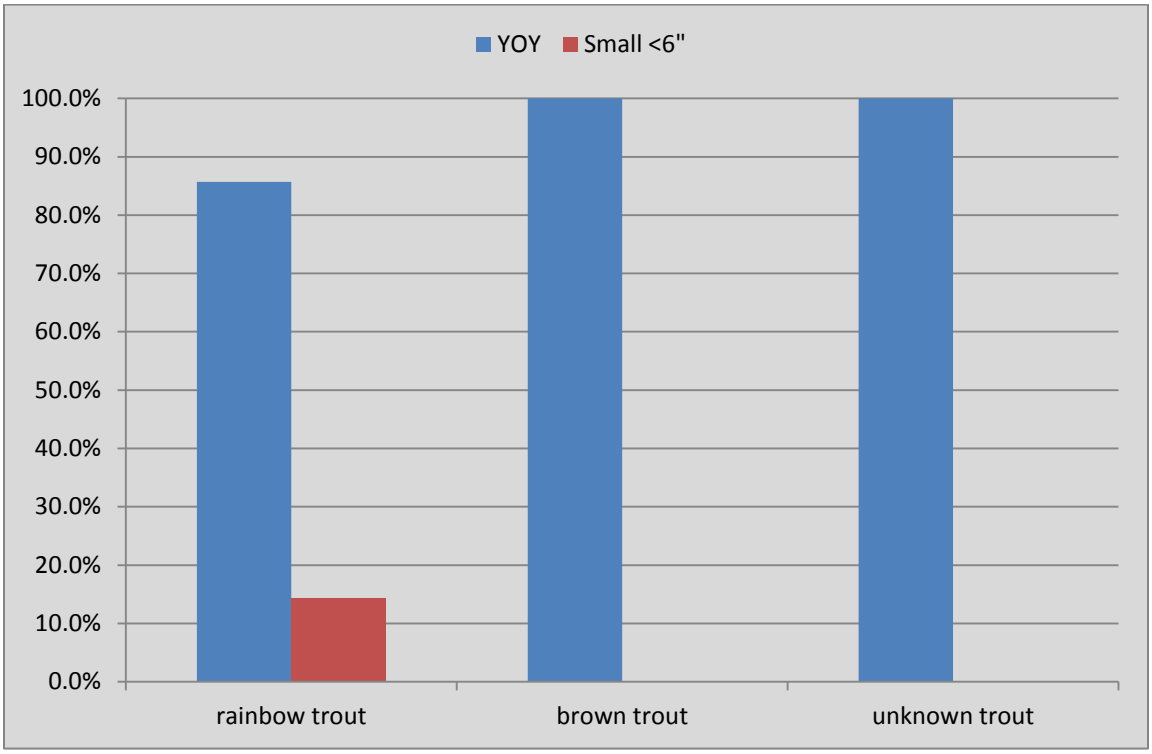

Figure 8. Representative photographs of Unnamed Tributary 2 in 2012

Figure 9. Photographs of trout captured or observed in 2012: medium-sized rainbow trout (top), medium-sized brown trout (bottom left) and large- to extra-large-sized brown trout (bottom)

Figure 10. Photographs of potential barriers to upstream fish migration observed in the Unnamed Tributary 1 (top and middle) and Unnamed Tributary 2 (bottom)

Table 1. Little Rock Creek watershed 2012 direct observation data

Water	Section	Section length (ft)	Habitat type	Species	Number of fish observed				Estimated density (fish/mi)
					YOY	Small < 6"	Medium 6"-11.9"	Total	
Little Rock Creek	112	45.6	flatwater	rainbow trout	2	5	0	7	811
	212	92.5	flatwater	rainbow trout	12	38	1	51	2911
				brown trout	4	1	0	5	285
	312	22.1	flatwater	rainbow trout	0	6	0	6	1433
				brown trout	1	0	0	1	239
	412	27.5	flatwater	rainbow trout	2	1	1	4	768
	512	33.0	flatwater	rainbow trout	1	27	2	30	4800
	612	122.8	flatwater	rainbow trout	26	100	9	135	5805
				brown trout	6	0	1	7	301
	712	32.7	flatwater	rainbow trout	12	16	0	28	4521
				brown trout	4	0	0	4	646
	812	33.6	flatwater	rainbow trout	2	3	1	6	943
				brown trout	0	3	0	3	471
				unknown trout	0	1	0	1	157
	Total	409.8	-	rainbow trout	57	196	14	267	3440
				brown trout	15	4	1	20	258
				unknown trout	0	1	0	1	13
Unnamed Tributary 1	112	60.7	flatwater	rainbow trout	5	1	0	6	522
	212	24.0	flatwater	rainbow trout	1	0	0	1	220
				brown trout	1	0	0	1	220
	312	132.0	riffle	unknown trout	10	0	0	10	400
	412	33.0	flatwater	-	-	-	-	0	0
	Total	249.7	-	rainbow trout	6	1	0	7	148
				brown trout	1	0	0	1	21
				unknown trout	10	0	0	10	211
Unnamed Tributary 2	112	40.1	flatwater	-	-	-	-	0	0
	212	43.5	flatwater	-	-	-	-	0	0
	Total	83.6	-	-	-	-	-	0	0

Table 2. Little Rock Creek watershed 2012 angling data

Water	Angler	Date	Effort (hrs)	Species	Number of fish captured			CPUE (fish/hr)
					Small	Medium	Total	
					< 6"	6" - 11.9"		
Little Rock Creek	Barabe	6/25/2012	2.05	rainbow trout	5	11	16	7.8
	O'Brien	6/25/2012	1.08	rainbow trout	3	1	4	3.7
	Mehalick	6/25/2012	3.42	rainbow trout	7	7	15	4.4
				brown trout	0	1		
	Vanderburg	6/25/2012	2.17	rainbow trout	0	1	1	0.5
	Corbett	6/26/2012	3.00	rainbow trout	4	2	6	2.0
	Webster	6/26/2012	2.50	rainbow trout	5	4	9	3.6
				Average				3.7
Unnamed Tributary 1	O'Brien	6/25/2012	0.17	-	0	0	0	0.0
	Vanderburg	6/25/2012	0.58	rainbow trout	0	3	3	5.2
	O'Brien	6/26/2012	2.47	rainbow trout	0	1	2	0.8
				brown trout	0	1		
	Vanderburg	6/26/2012	2.67	-	0	0	0	0.0
				Average				1.5