

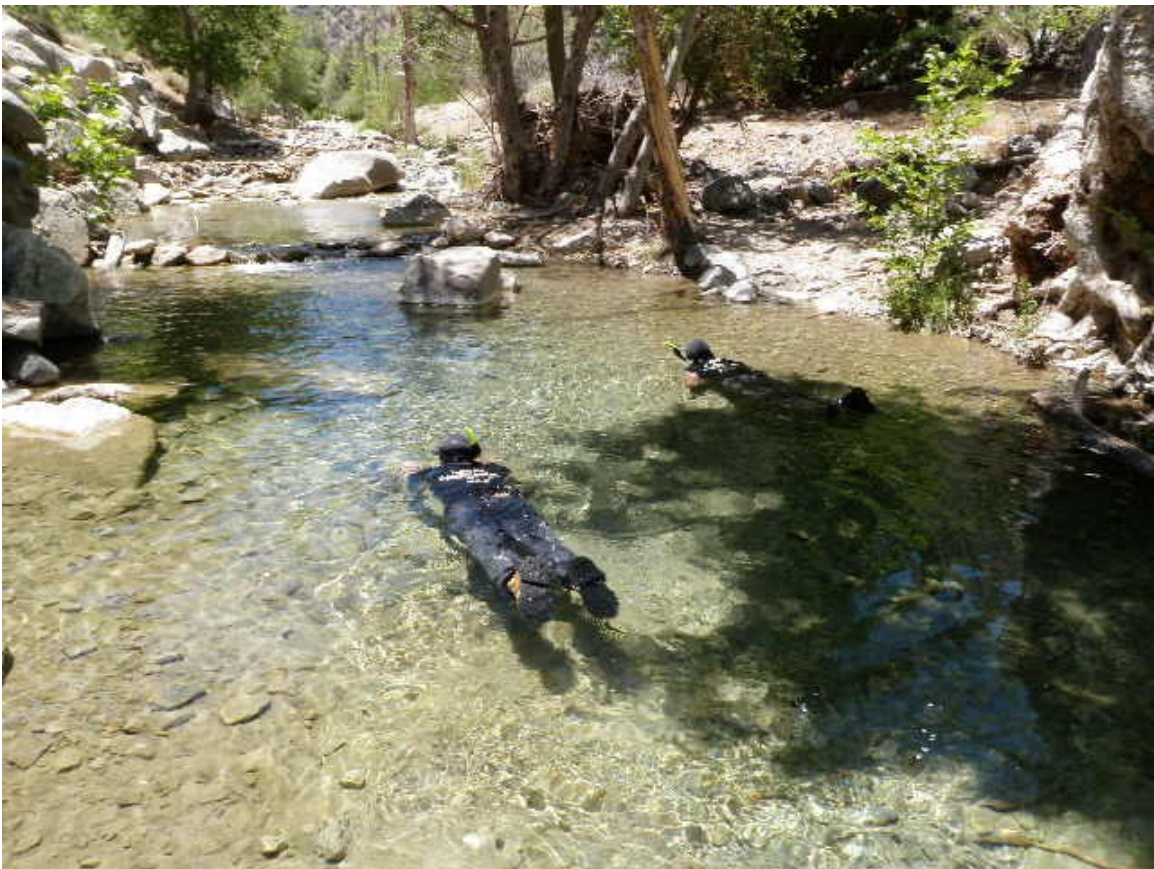
# **Big Rock Creek 2012 summary report**

*June 2012*

**State of California**

**Department of Fish and Wildlife**

**Heritage and Wild Trout Program**



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## Introduction

Big Rock Creek, located approximately ten miles southeast of Pearblossom, CA (Los Angeles County; Figure 1) supports a wild population of rainbow trout (*Oncorhynchus mykiss*) outside their native range. Big Rock Creek flows into the Mojave Desert and was historically fishless. It is located on both private and public lands (US Forest Service (USFS) Angeles National Forest) and is within the native range of mountain yellow-legged frogs (MYLF; *Rana muscosa*), which is listed as endangered under the Federal Endangered Species Act. In 2012, the California Department of Fish and Wildlife (CDFW) Heritage and Wild Trout Program (HWTP) evaluated the Big 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 Wildlife 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.

In June 2012, the HWTP conducted Phase 1 (initial resource) assessments in the Big Rock Creek drainage to determine whether it meets the minimum qualifications for designation. Survey methodology included an initial site reconnaissance, visual encounter surveys, direct observation using snorkeling techniques, and hook and line angling. These assessments provided information on species composition, size class structure, and estimates of fish abundance, as well as field training for new HWTP staff.

## Methods

### *Visual observation*

On June 5<sup>th</sup> and 19<sup>th</sup>, 2012 CDFW South Coast Region staff conducted an initial reconnaissance of Big Rock and South Fork Big Rock creeks to aid in survey planning, identify the presence or absence of federally endangered MYLF and determine survey methodology (electrofishing versus direct observation). Surveyors conducted visual encounter surveys by walking and visually examining the stream banks and wetted channel to document MYLF. All observed MYLF were geo-referenced with hand-held Global Positioning System (GPS) units (North American Datum 1983) and photographed. Water and air temperature (°C) were measured and habitat condition was documented and described (Hovey and O'Brien 2012a and Hovey and O'Brien 2012b).

Due to the presence of MYLF observed in the lower reach of the South Fork Big Rock Creek, additional VES surveys were conducted on June 26<sup>th</sup>, 2012 to

extend the geographic scope of sampling to include the upper portion of the South Fork Big Rock Creek. Along with visual encounter surveys for MYLF, fish distribution (via angling) and barriers to upstream fish migration were documented (Hovey and Barabe 2012).

### *Direct observation*

Due to the presence of MYLF in the South Fork Big Rock Creek, direct observation survey methodology was chosen instead of electrofishing to limit potential take of MYLF. Each section was scouted for any species of concern, including MYLF, prior to the start of a survey. If MYLF were observed, surveys were immediately ceased to limit any potential take.

Direct observation surveys were conducted on June 21<sup>st</sup>, 2012 in Big Rock Creek (five sections) and South Fork Big Rock Creek (three sections) using snorkeling methods, an effective survey technique in many small streams and creeks in northern California and the Pacific Northwest (Hankin and Reeves 1988). Sections were spaced approximately every one-half mile and the start of each section was selected at random (Figures 2-3). Specific section boundaries were located at distinct breaks in habitat type and/or stream gradient. Surveys were conducted in an upstream direction with one or 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 the 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 ( $\geq$  18 inches). YOY 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, water depth and water visibility (ft). Water and air temperature ( $^{\circ}\text{C}$ ) were measured and 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 GPS hand-held units (North American Datum 1983). Estimates of fish abundance were calculated by species and section and were averaged across all sections (fish/mi). For the latter, all

observed fish were summed by species across all sections and divided by the total survey length.

### *Angling*

Angling assessments were conducted by HWTP personnel in Big Rock Creek on June 24<sup>th</sup>, 2012 (Figures 2-3). Anglers recorded total fishing effort (hrs) and the number of fish caught by species and size class. All captured fish were measured for total length using a calibrated landing net and were counted by size class (using size classes as defined above for direct observation surveys). Catch per unit effort (CPUE; fish/hr) was calculated for each effort and was averaged across all anglers.

## **Results**

### *Visual observation*

On June 19<sup>th</sup>, 2012, surveyors observed two MYLF on South Fork Big Rock Creek, approximately 2.0 miles upstream of the confluence with Big Rock Creek. Water temperature was 15.5 °C and both MYLF were observed out of the water.

Previous surveys conducted in this watershed (2011) identified a barrier to upstream fish migration on the South Fork Big Rock Creek approximately 3.8 miles upstream of the confluence with Big Rock Creek (Figures 1-2; Hovey and O'Brien 2012a). In 2012, surveyors revisited this location to document and geo-reference the barrier. It was approximately 12 ft high with a maximum pool depth of 2 ft. Several fish were observed in this pool. Visual observation surveys were conducted from the barrier upstream approximately one-half mile and neither trout nor MYLF were observed.

### *Direct observation*

Big Rock Creek was surveyed at five locations (Sections 112-512), from its confluence with the South Fork Big Rock Creek downstream approximately 1.5 miles (Figures 2-3 and Table 1). A total of 333.4 ft were surveyed, which consisted of 8% riffle, 84% flatwater, and 8% pool habitat with substrate dominated by cobble and boulder (Figure 4). Some silt, sand, and gravel were present in lesser quantities. Water temperature ranged from 13 to 20 °C and air temperature was between 27 and 32 °C. Mean wetted width was 13.8 ft and mean water depth was 0.5 ft. A total of 88 rainbow trout were observed with a size class distribution of 30% YOY, 68% small-, 1% medium-, and 1% large-sized fish (Figure 6). Rainbow trout abundance was estimated at 1394 fish/mi.

South Fork Big Rock Creek was surveyed at three locations (Sections 112-312), spanning 0.7 miles (Figures 2-3 and Table 1). The three sections totaled 194.0 ft and consisted of low-gradient flatwater with substrate dominated by cobble and boulder (Figure 5). Water temperature ranged from 15 to 17 °C and air temperature was between 26 and 28 °C. Mean wetted width was 19.2 ft and

mean water depth was 0.3 ft. A total of 30 rainbow trout were observed with a size class distribution of 40% YOY, 57% small-, and 3% medium-sized fish (Figure 6). Rainbow trout abundance was estimated at 816 fish/mi. One MYLF was observed approximately 2.0 miles upstream of the confluence with Big Rock Creek, near the same location where previously observed earlier in the month. Direct observation surveys did not occur farther upstream of this location nor within the vicinity of the MYLF. Divers also observed aquatic snails (not identified to species) and caddis pupae (Order Trichoptera).

### *Angling*

Two anglers participated in an angling assessment in Big Rock Creek on June 24<sup>th</sup>, 2012 and captured six rainbow trout in six hours of effort (Figures 2-3; Table 2). Catch per unit effort ranged 0.3 to 1.7 fish/hr with an average of 1.0 fish/hr. All captured fish were in the small-size class and were between three and six inches in total length (Figure 7).

### **Discussion**

Surveys were limited in scope due, in part, to concurrent field training and documentation of MYLF within the drainage. All observed rainbow trout appeared wild and Big Rock Creek is not currently stocked with hatchery fish. Rainbow trout are not native to this drainage but provide a wild trout angling opportunity. The majority of observed trout were in the small-size class and catch rates were low to moderate, although both anglers were relatively new to fishing.

Big Rock Creek and tributaries fall within the Southern District Freshwater Sport Fishing regulations and are open to year-round angling with a daily bag and possession limit of five fish (no gear restrictions).

The majority of the watershed is on public land administered by the USFS; there are some private property parcels along the lower portion of Big Rock Creek. A road parallels Big Rock Creek and provides easy access with numerous parking areas, campgrounds, and picnic areas. A private youth camp is located near the headwater springs to Big Rock Creek. The majority of the South Fork Big Rock Creek is roadless and difficult to access with steep terrain. A large number of recreationalists were observed utilizing this area during the survey for swimming and camping.

Currently, the USFS conducts annual MYLF surveys on a tributary to the South Fork Big Rock Creek and are undergoing a fish removal project to protect MYLF within this drainage. The CDFW supports conservation and recovery of MYLF and the HWTP does not recommend pursuing Big Rock Creek and tributaries for designation as a Wild Trout Water. The MYLF observed in 2012 were outside of the area the USFS currently surveys and the HWTP recommends expanded amphibian assessments to better understand the distribution and abundance of MYLF and to identify potential refuge locations for translocation of MYLF within

the watershed. The HWTP further recommends fisheries assessments upstream of presumed barriers to fish migration to better understand the upper extent of fish distribution.

## **References**

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Hovey, T.E. and O'Brien J. 2012a. Inland Fisheries Survey Memorandum Drainage: Big Rock Creek June 5<sup>th</sup>, 2012. State of California Resources Agency. Department of Fish and Game. Region 5.

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

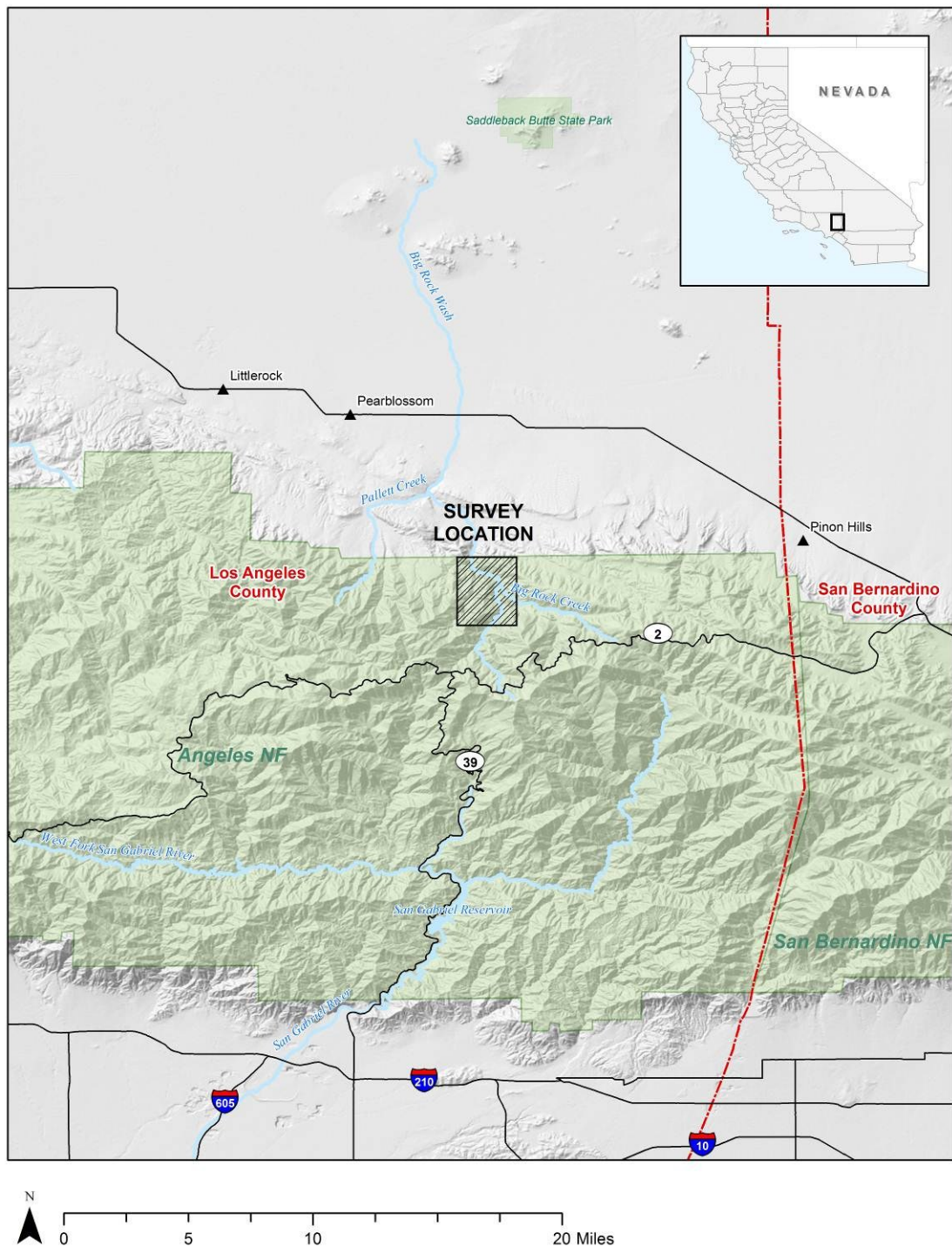




Figure 2. Detail map of 2012 Big Rock Creek watershed survey locations

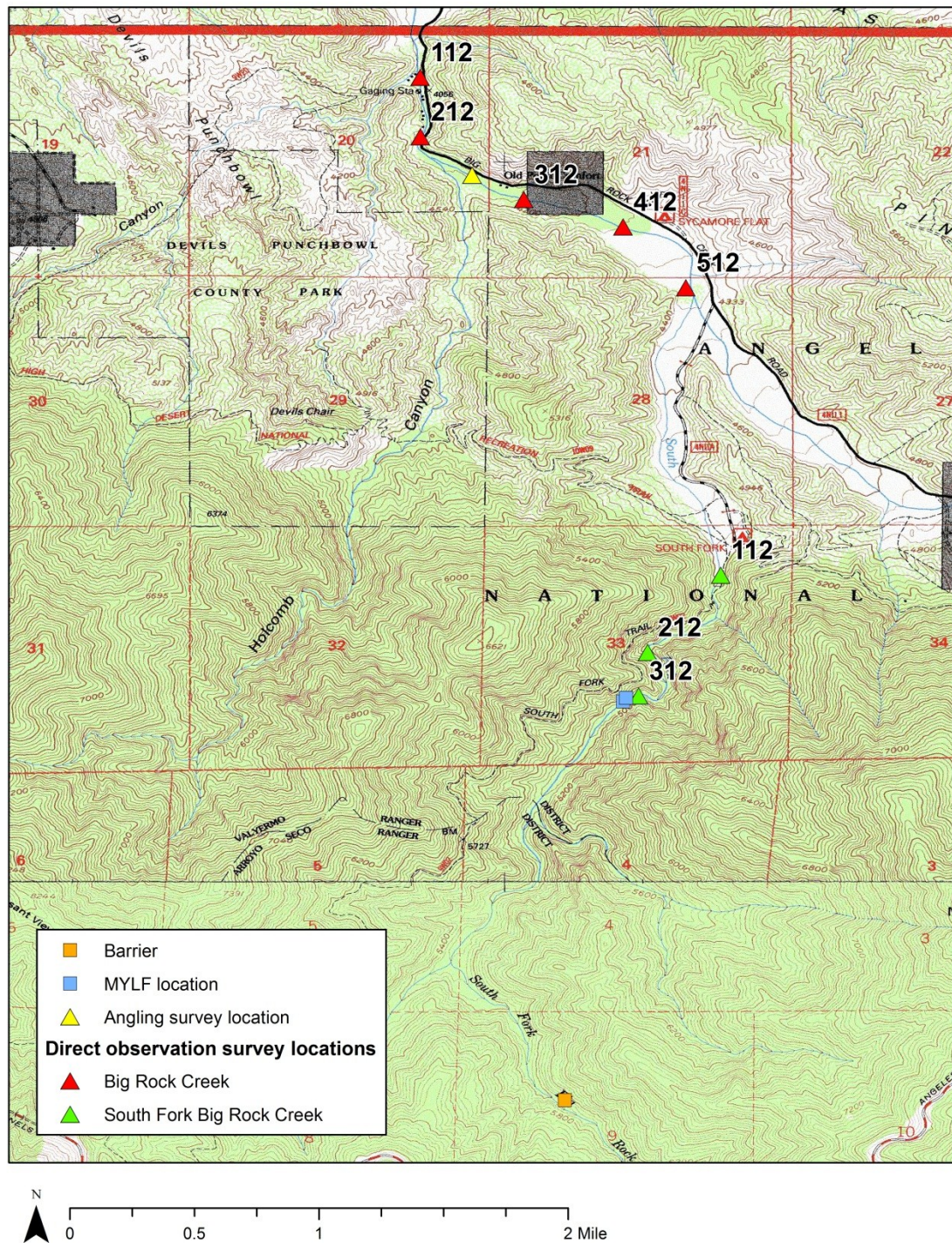




Figure 3. Aerial map of 2012 Big Rock Creek watershed survey locations

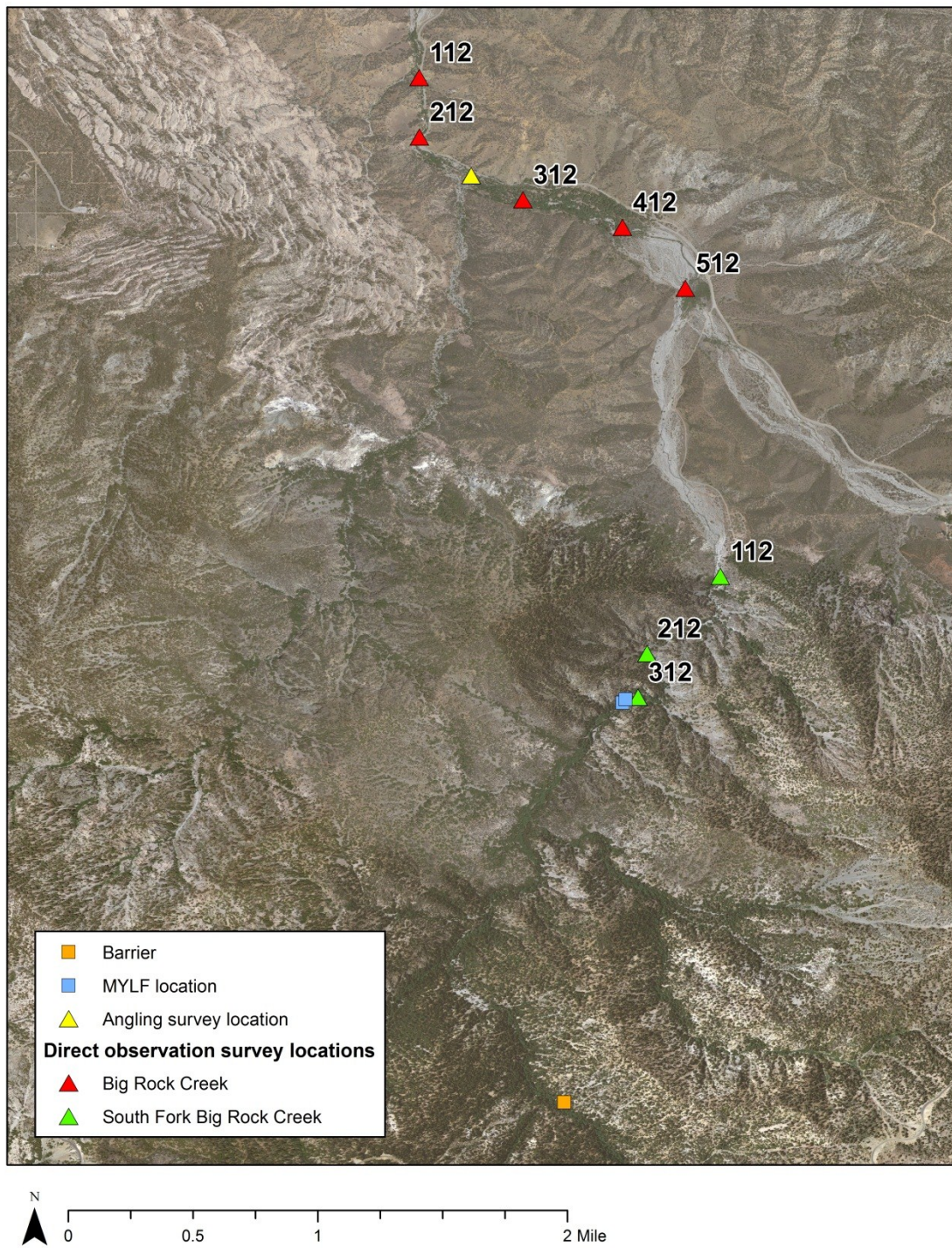




Figure 4. Representative photographs of Big Rock Creek in 2012





Figure 5. Representative photographs of the South Fork Big Rock Creek in 2012



Figure 6. Graph of rainbow trout size class distribution observed in Big Rock Creek watershed in 2012

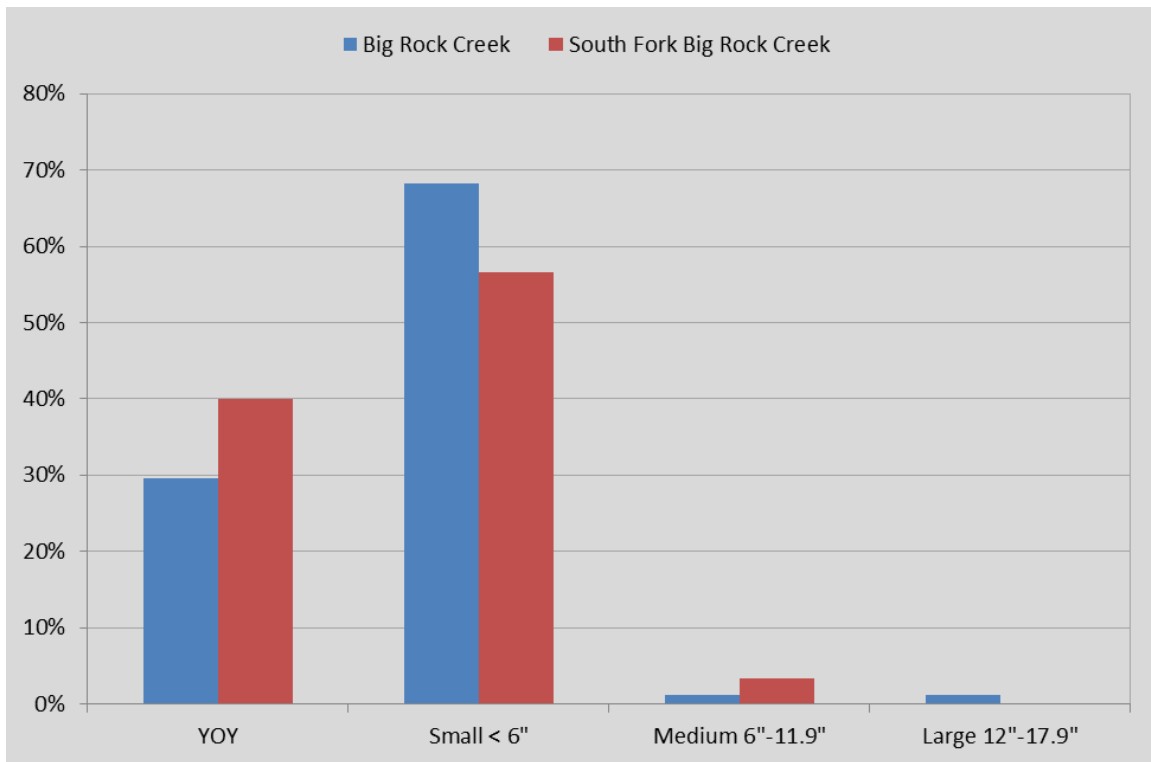


Figure 7. Photograph of rainbow trout captured in 2012 angling survey in Big Rock Creek





Table 1. 2012 Big Rock Creek watershed direct observation data

Water	Section	Section length (ft)	Habitat type	Number of rainbow trout observed					Estimated density (fish/mi)
				YOY	Small < 6"	Medium 6"-11.9"	Large 12"-17.9"	Total	
Big Rock Creek	112	74.0	flatwater	8	11	1	0	20	1427
	212	63.1	flatwater	3	12	0	0	15	1255
	312	79.8	flatwater	11	34	0	1	46	3044
	412	63.0	flatwater	3	2	0	0	5	419
	512	53.5	pool/riffle	1	1	0	0	2	197
	Total			26	60	1	1	88	-
South Fork Big Rock Creek	112	33.9	flatwater	10	1	0	0	11	1713
	212	59.6	flatwater	0	1	0	0	1	89
	312	100.5	flatwater	2	15	1	0	18	946
	Total			12	17	1	0	30	-

Table 2. 2012 Big Rock Creek angling data: number of fish caught, total effort, and CPUE

Angler	Date	Effort (hrs)	Total rainbow trout captured	CPUE (fish/hr)
Higginson	6/24/2012	3.00	1	0.3
Webster	6/24/2012	3.00	5	1.7
Average				1.0