North Fork Middle Fork American River 2011 Summary Report

August 2-4, 2011

State of California

California Department of Fish and Game

Heritage and Wild Trout Program

Prepared by Stephanie Hogan and Jeff Weaver

Introduction

The North Fork Middle Fork American River (North Fork), located approximately 20 miles northeast of Auburn, CA (Placer County) is tributary to the Middle Fork American River (Figure 1). The North Fork is a west-slope Sierra Nevada stream originating at an elevation of 5600 feet in the Sierra National Forest and flows in a south-southwest direction for approximately 19 miles. The California Department of Fish and Game (DFG) Heritage and Wild Trout Program (HWTP) is evaluating the North Fork 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.

The HWTP North Central Region conducted Phase 1 (initial resource) assessments in the North Fork in 2010 to determine whether it meets the minimum qualifications for designation. Based on the results of these assessments, the HWTP moved to a Phase 2 candidate water assessment in the North Fork in 2011 to collect baseline information on the fishery and habitat including species composition, size class structure, abundance, and catch rates. Surveys were conducted using direct observation and hook and line techniques.

Methods

Direct observation

The HWTP (Headquarters staff) conducted direct observation surveys on the North Fork (14 sections) and El Dorado Creek (two sections) using snorkeling methods, an effective survey technique in many small streams and creeks in California and the Pacific Northwest (Hankin and Reeves 1988). Surveys were conducted from August 2-4, 2011 and included the North Fork from its confluence with the Middle Fork American River upstream approximately five miles and El Dorado Creek from the confluence with the North Fork upstream one-half mile (Figure 2). Sections were spaced approximately every one-quarter mile and the start of each section was selected at random. Specific section boundaries were located at distinct breaks in habitat type and/or stream gradient. Surveys were conducted in an upstream direction with two to four divers; the number of divers per section 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 (≥ 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 are 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 size class.

Divers were instructed in both visual size class estimation and proper snorkel survey techniques prior to starting the survey (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.). For each section, surveyors measured section length along the thalweg (ft), water and air temperature (ºC), and average wetted width, water depth and water visibility (ft). 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 for each species and water by dividing the total number of fish observed (sum of all sections) by the total length of stream habitat surveyed (fish/mi).

Angling

An angling effort was conducted by HWTP staff (Headquarters) and volunteers in the North Fork throughout 2011 to better understand catch rates, species composition and size class distribution. Anglers used fly fishing gear and recorded total fishing effort (hours) and the number of fish captured by species and size using the size classes defined above for direct observation. Catch per unit effort (CPUE; fish/hr) was calculated for each angler and day and were averaged across all angers in 2011.

Results

Direct observation

The North Fork is a medium-gradient west-slope Sierra Nevada river flowing through a relatively confined canyon (Figure 3). Fourteen sections were surveyed in the lower five miles of the river, totaling 2270.7 feet and consisted of 22% riffle, 64% flatwater, and 15% pool habitat (Table 1). Substrate was dominated by boulders and cobble with some bedrock and gravel. During the survey effort, mean air temperature was 21 ºC and mean water temperature was 27 ºC. Mean wetted width was 51.9 feet, mean water depth was 1.9 feet and streamflow was estimated at approximately 60 cubic feet per second. A total of 671 coastal rainbow trout (*Oncorhynchus mykiss irideus*), one brown trout (*Salmo trutta*), 52

suckers (*Catostomus* sp.), 764 minnows (unknown species, Family Cyprinidae), 122 speckled dace (*Rhinichthys osculus*), and seven unknown fish were observed (Table 2). The latter were YOY less than 40 mm in total length and too small to identify. Size class distribution of coastal rainbow trout was 37% YOY, 40% small-, 21% medium-, and 1% large-sized fish (Figure 4). The one observed brown trout was in the small size class. Fish abundance was estimated at 1560 coastal rainbow trout/mi, two brown trout/mi, 121 suckers/mi, 1777 minnows/mi, 284 speckled dace/mi, and 16 unknown fish/mi (Figures 5 and 6).

The lower one-half mile of El Dorado Creek was surveyed via direct observation at two section locations. Habitat consisted of flatwater with substrate dominated by boulder, cobble and gravel (Figure 7). Mean wetted width and water depth were 23.0 feet and 1.3 feet, respectively. Water temperature was 18 ºC and air temperature was 27 ºC during the survey effort. The two sections totaled 268.6 feet in length and surveyors counted 117 coastal rainbow trout and three sculpin (*Cottus* sp.; Table 3). Size class distribution of coastal rainbow trout was 49% YOY, 32% small-, 15% medium- and 4% large-sized fish (Figure 8). Abundance was estimated at 2300 coastal rainbow trout/mi and 59 sculpin/mi (Figure 9).

Angling

Eight anglers (including two volunteers) participated in the hook and line assessment on the North Fork, with a cumulative fishing effort of 112.2 hours (Table 4; Figure 10). Anglers captured 240 coastal rainbow trout with a size class distribution of 12% small-, 78% medium-, and 10% large-sized fish. Catch rates on the North Fork ranged from zero to six fish/hr with a mean CPUE of 2.4 fish/ hr.

Discussion

The results of the 2011 direct observation surveys show a distribution of coastal rainbow trout, minnows, and suckers throughout the lower five miles of the North Fork. Coastal rainbow trout and minnows appear to be the most abundant species, in the terms of fish density, in this portion of the river. One brown trout was observed approximately 1.6 miles upstream of the confluence with the Middle Fork. Brown trout are found in the Middle Fork and anglers report catching them in the North Fork and El Dorado Creek during fall months. It is likely that high summer water temperatures limit the distribution of brown trout in the North Fork; however, they may exhibit a fluvial life history utilizing portions of the watershed during periods of lower water temperatures, such as during the fall spawning period. Speckled dace were only observed in the North Fork upstream of the confluence with El Dorado Creek. Due to the large number of unidentified minnows observed throughout the direct observation sections, speckled dace may have a greater distribution throughout the North Fork. Based on native species distributions in the watershed, the unidentified minnows may have included: Sacramento pikeminnow (*Ptychocheilus grandis*), hardhead (*Mylopharodon conocephalus*), and/or California roach (*Lavinia symmetricus*).

The surveys in El Dorado Creek identified the presence of coastal rainbow trout and sculpin. Sculpin are likely also present in the North Fork but, due to habitat preferences and small size, they may not have been observed during the direct observation surveys.

All coastal rainbow trout captured by hook and line appeared to be of wild origin. Size class distribution of coastal rainbow trout varied between direct observation and hook and line; the latter favored medium-sized fish, whereas nearly 60% of the coastal rainbow trout observed during the snorkel surveys were less than six inches in total length.

During the survey effort, active mining was observed at numerous locations in the forms of sluice box mining, sniping, gold panning, and power sluicing. Evidence of mining, including equipment, tailings, and diversions, were observed throughout the drainage.

Conclusion

The North Fork meets multiple criteria for Wild Trout Water designation, including the presence of wild trout populations with multiple age classes, no stocking of hatchery fish, suitable habitat, and public access. Current angling regulations for the North, South, and Middle Fork American rivers and their tributaries above Folsom Lake (Placer, El Dorado, Amador and Alpine counties) are open to year-round angling with a split season. From the last Saturday in April through November 15, there is a bag limit of five per day and ten in possession (no gear restrictions). For the remainder of the year, there is a zero-bag limit and a gear restriction of only artificial lures with barbless hooks may be used. The majority of the watershed falls within National Forest lands administered by the US Forest Service (USFS), with some roads and a trail network providing limited access; some portions of the North Fork are remote and require instream hiking. The HWTP recommends pursuing the North Fork watershed for designation as a Wild Trout Water through continued population-level monitoring and angler use assessments over a multi-year period. Consideration should be given to identifying the unknown minnows and to better understand brown trout distribution and potential seasonal utilization in the North Fork during cooler water temperatures and/or for spawning. The HWTP recommends increasing the geographic scope of sampling to include the upper portions of the watershed and tributaries throughout the system.

The use of Angler Survey Boxes (ASB) should be evaluated as a tool to monitor catch rates, catch size, angler use, angler satisfaction and gear preferences. The HWTP should collaborate with local stakeholders including the USFS, private landowners, miners, and recreational users (including anglers).

The American River has a rich history in gold mining and this activity still appears prevalent throughout the watershed. Currently, suction dredging, including the method known as “booming”, is prohibited within 100 yards of any California

river, stream or lake (Fish & Game. Code, § 5653 subd. (d).). Other legal forms of mining were observed in 2011. During the evaluation process for Wild Trout Water designation, the HWTP recommends monitoring potential aesthetic and biological effects of mining to the wild trout fishery.

References

Bloom, R., and J. Weaver. 2008. The California Heritage and Wild Trout Program Handbook (Draft). State of California 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 2011 North Fork drainage survey locations

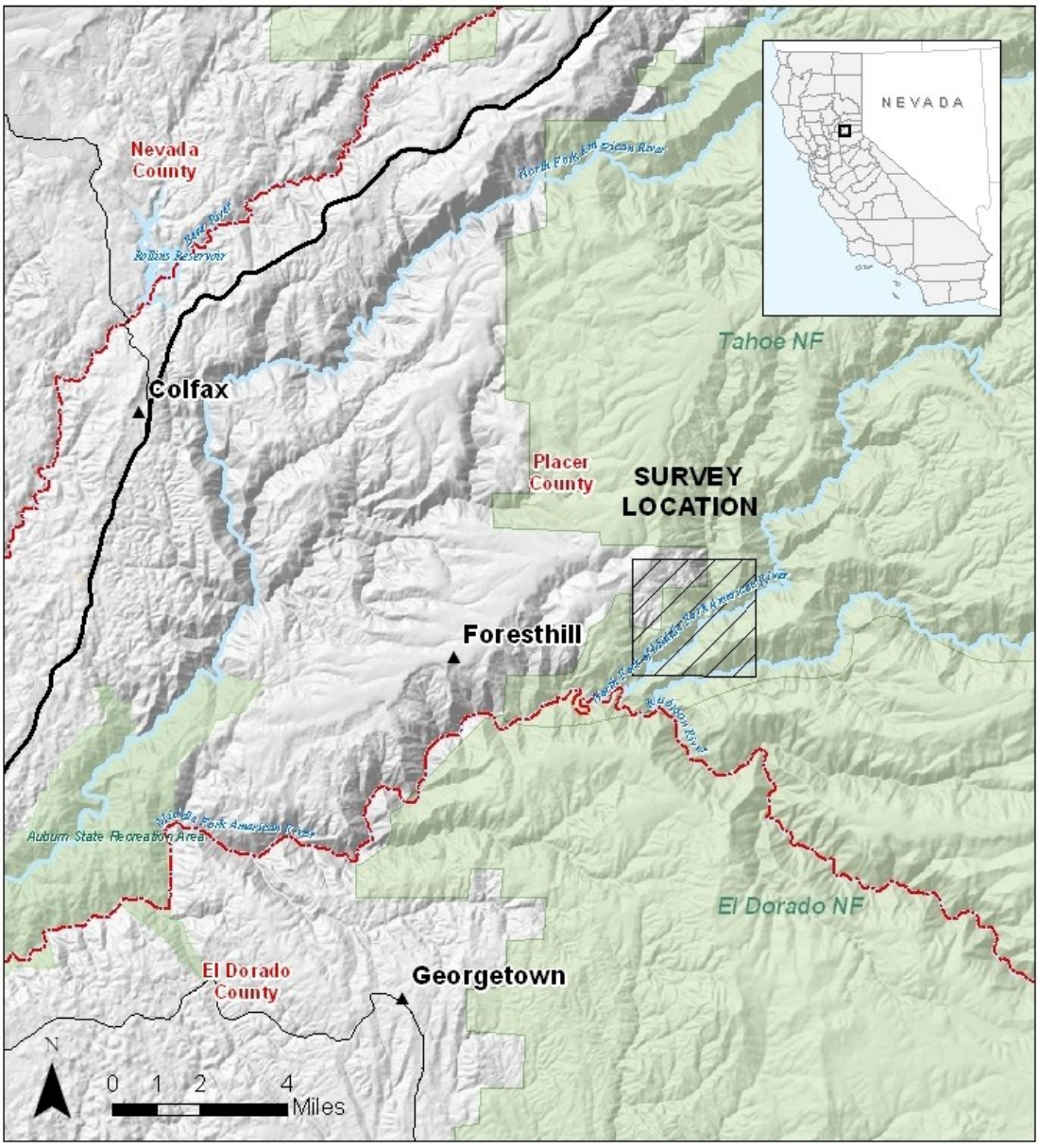

Figure 2. Map of 2011 North Fork drainage section locations

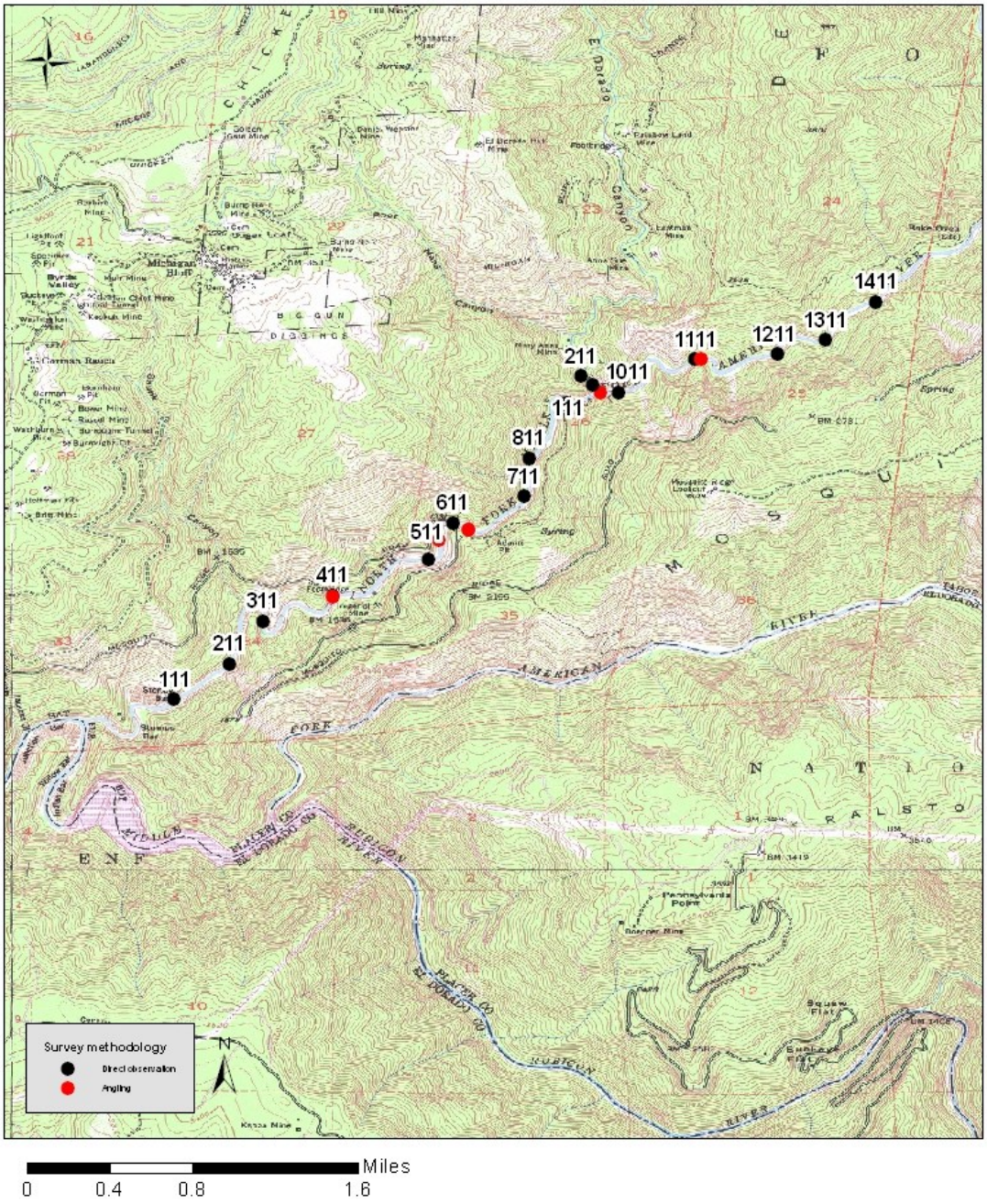

Figure 3. Representative photographs of the North Fork in 2011

Figure 4. 2011 size class distribution of trout observed in the North Fork via direct observation surveys

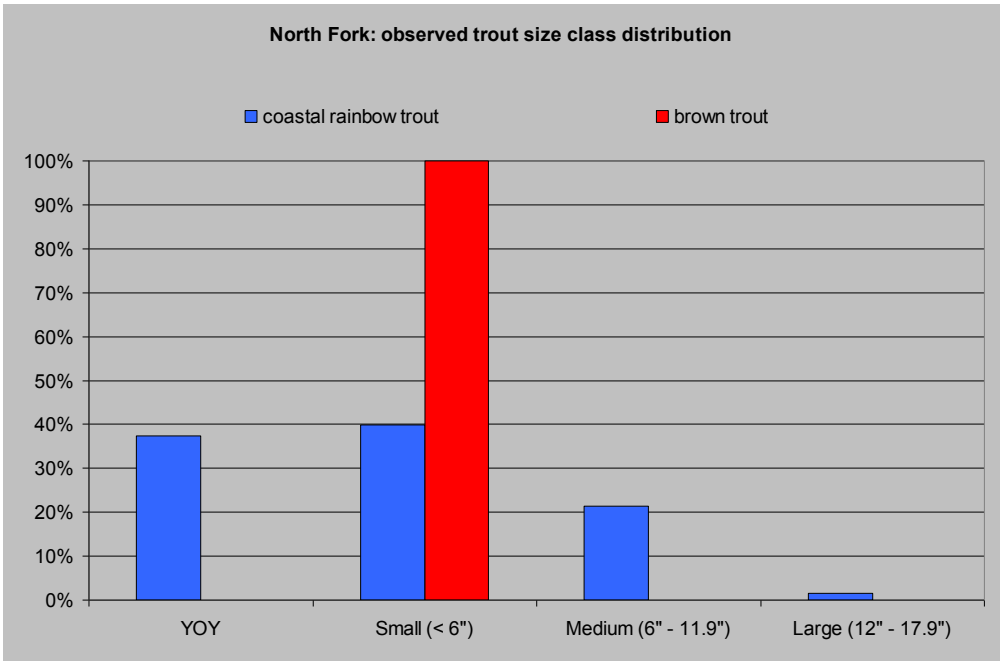

Figure 5. 2011 abundance of trout observed by section in the North Fork via direct observation

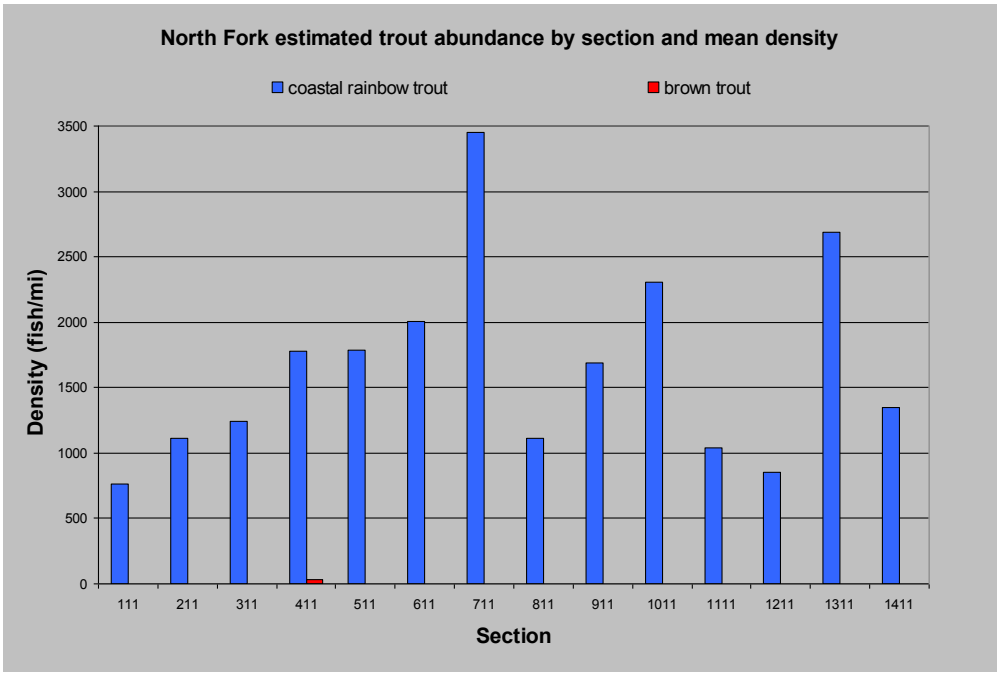

Figure 6. 2011 abundance of non-game fishes observed by section in the North Fork via direct observation

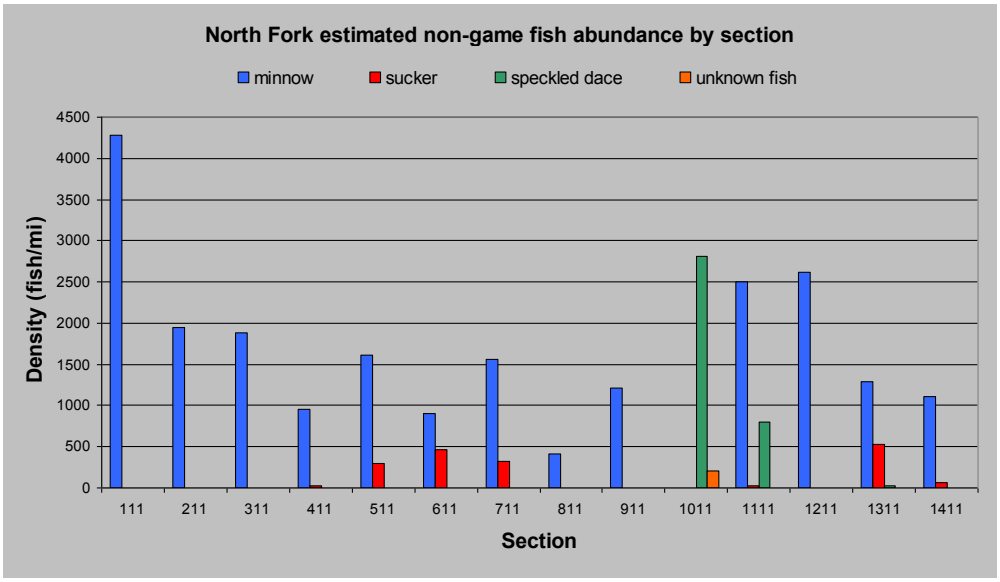

Figure 7. Representative photographs of El Dorado Creek in 2011

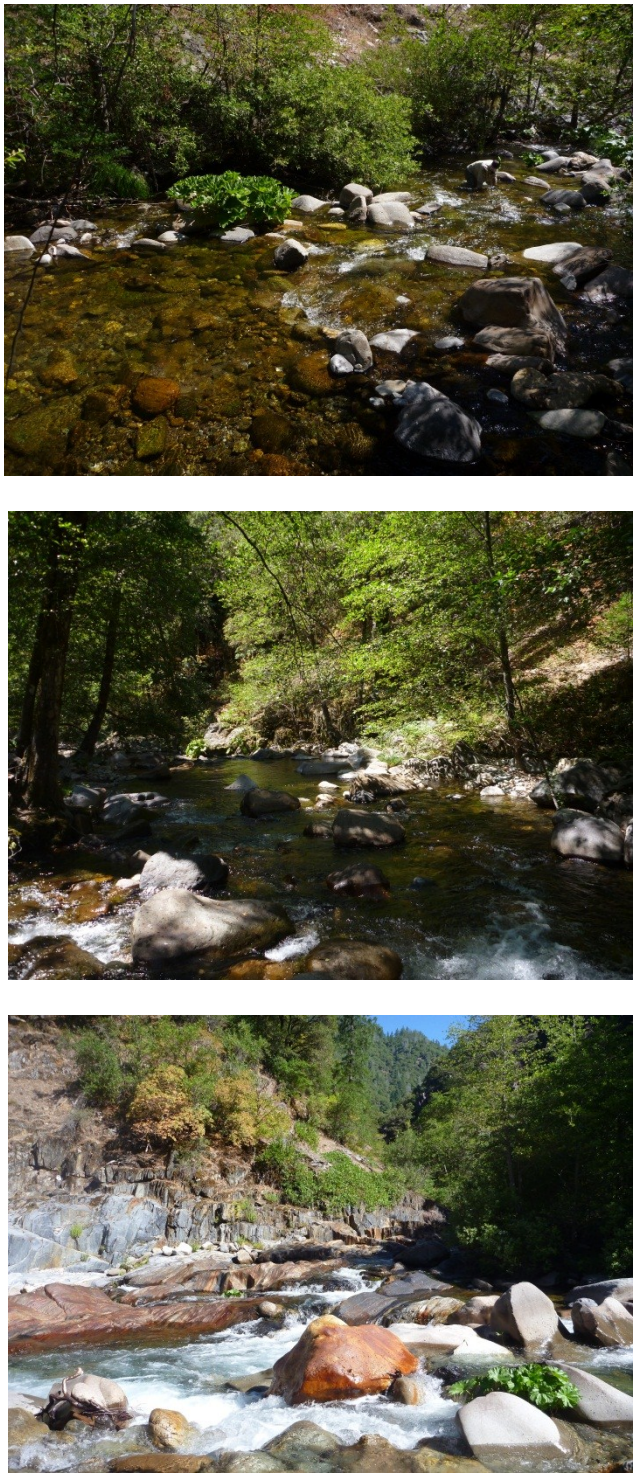

Figure 8. 2011 size class distribution of trout observed in El Dorado Creek via direct observation surveys

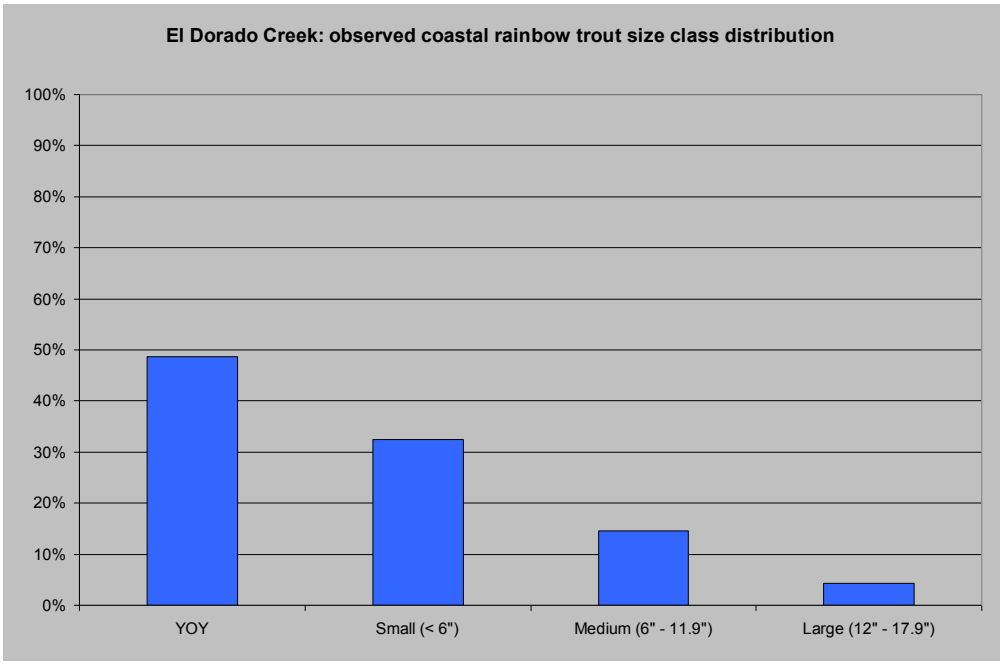

Figure 9. 2011 abundance of trout observed by section in El Dorado Creek via direct observation

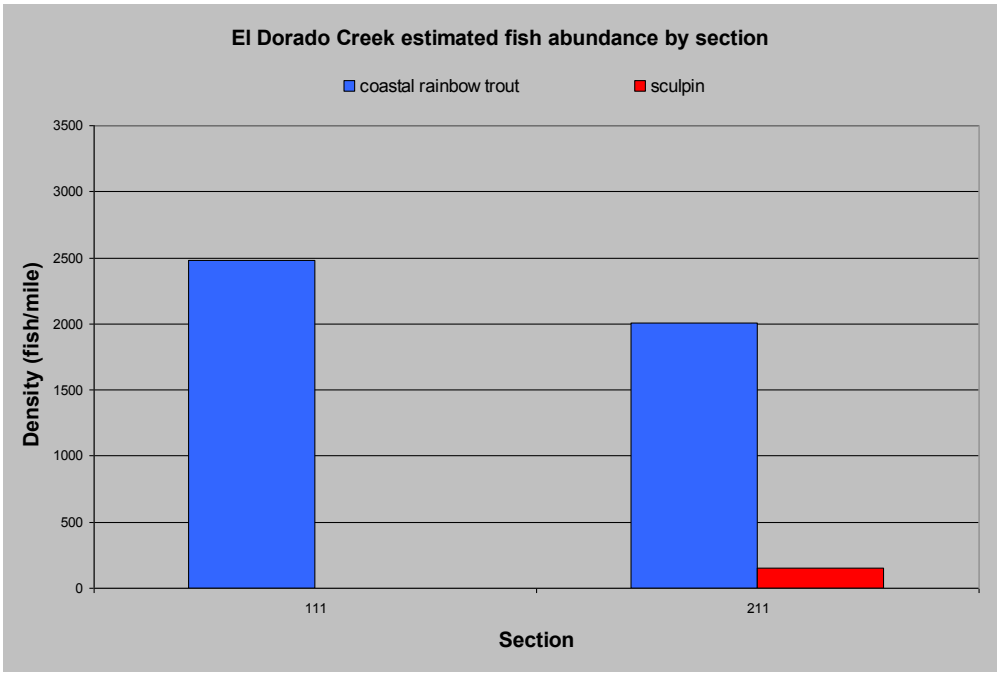

Figure 10. Representative photographs of the North Fork drainage 2011 angling effort

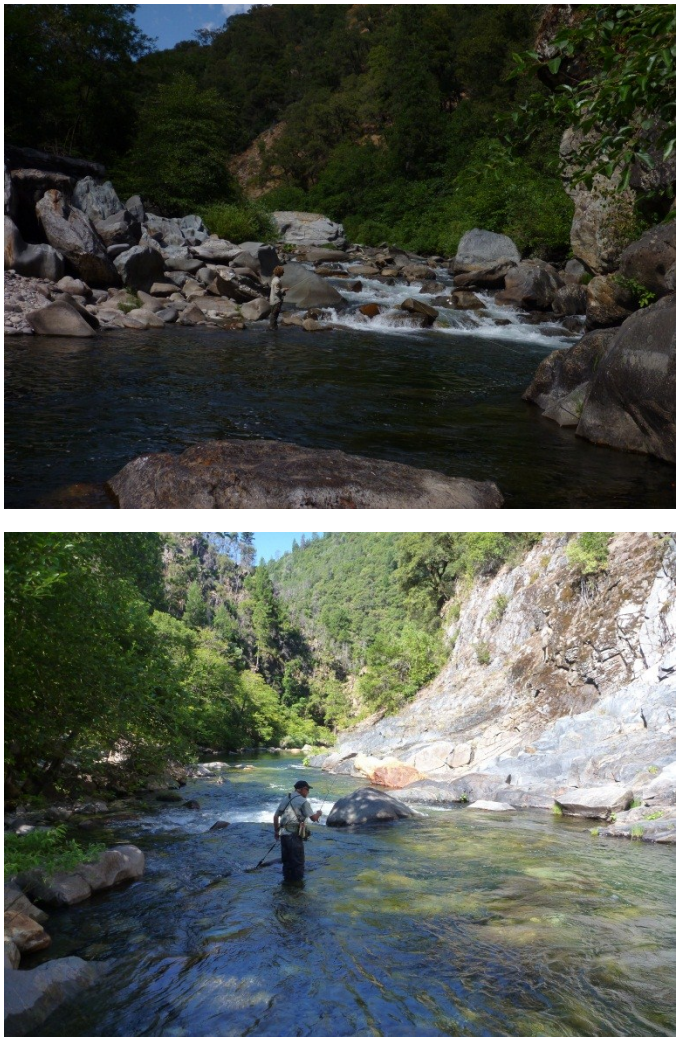

Figure 11. Size class distribution of trout observed in the 2011 North Fork angling surveys

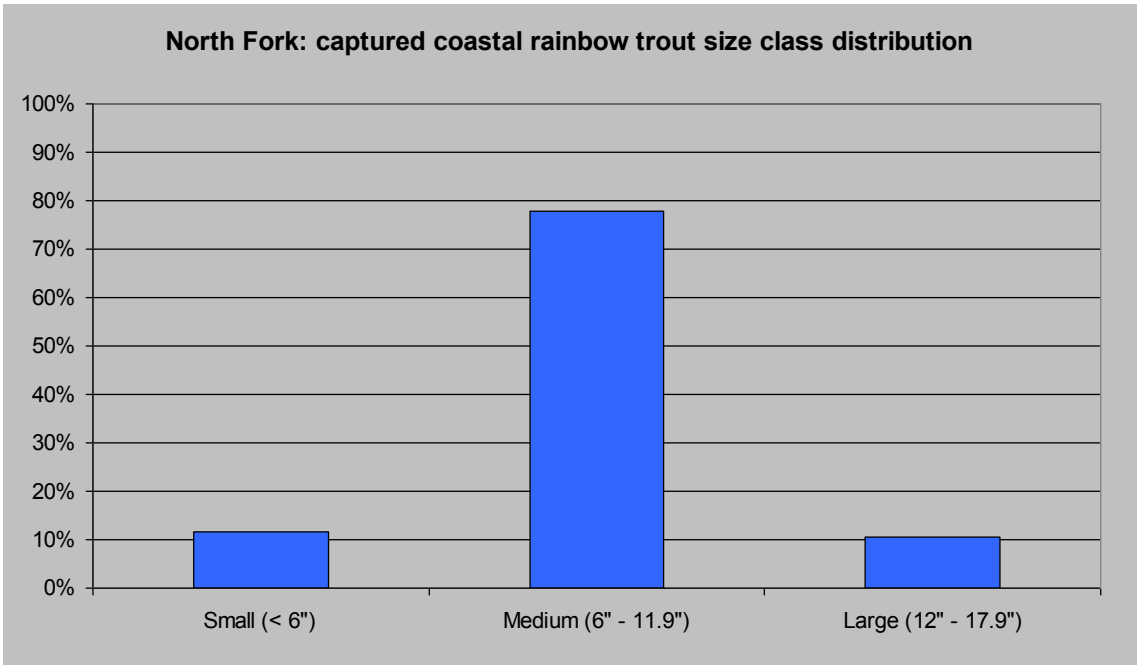

Table 1. Summary of North Fork 2011 direct observation data: number of fish observed by species, section, and habitat

Section	Section length (ft)	Habitat type	Species	Number observed	Estimated density (fish/mi)
111	326.0	flatwater	coastal rainbow trout	47	761
			minnow	264	4276
211	57.0	riffle	coastal rainbow trout	12	1112
			minnow	21	1945
311	132.0	flatwater	coastal rainbow trout	31	1240
			minnow	47	1880
411	172.2	flatwater	coastal rainbow trout	58	1778
			brown trout	1	31
			minnow	31	951
			sucker	1	31
511	177.0	pool	coastal rainbow trout	60	1790
			minnow	54	1611
			sucker	10	298
611	157.8	riffle	coastal rainbow trout	60	2008
			minnow	27	903
			sucker	14	468
711	98.0	riffle	coastal rainbow trout	64	3448
			minnow	29	1562
			sucker	6	323
811	194.0	flatwater	coastal rainbow trout	41	1116
			minnow	15	408
911	78.3	flatwater	coastal rainbow trout	25	1686
			minnow	18	1214
1011	167.2	flatwater	coastal rainbow trout	73	2305
			speckled dace	89	2811
			unknown	7	221
1111	213.0	flatwater	coastal rainbow trout	42	1041
			speckled dace	32	793
			minnow	101	2504
			sucker	1	25
1211	161.0	flatwater	coastal rainbow trout	26	853
			minnow	80	2624
1311	180.7	riffle	coastal rainbow trout	92	2688
			speckled dace	1	29
			minnow	44	1286
			sucker	18	526
1411	156.5	pool	coastal rainbow trout	40	1350
			minnow	33	1113
			sucker	2	67

Table 2. Summary of North Fork watershed 2011 direct observation data: total number of fish observed and mean estimated density among all sections

Water	Species	Total number observed	Estimated density (fish/mi)
North Fork	coastal rainbow trout	671	1560
	brown trout	1	2
	sucker	52	121
	minnow	764	1777
	speckled dace	122	284
	unknown	7	16
El Dorado Creek	coastal rainbow trout	117	2300
	sculpin	3	59

Table 3. Summary of El Dorado Creek 2011 direct observation data: number of fish observed by species, section, and habitat

Section	Section length (ft)	Habitat type	Species	Number observed	Estimated density (fish/mi)
111	166.1	flatwater	coastal rainbow trout	78	2479
211	102.5	flatwater	coastal rainbow trout	39	2009
			sculpin	3	155

Table 4. Summary of North Fork 2011 angling data

Angler	Survey date	Effort (hours)	number of coastal rainbow trout captured				Catch per unit effort (fish/hour)
			Small (< 5.9")	Medium (6" - 11.9")	Large (12" - 17.9")	Total	
Volunteer	6/28/11	2.00	0	1	1	2	1.0
Volunteer	7/7/11	3.50	0	6	3	9	2.6
Volunteer	7/9/11	2.00	0	3	1	4	2.0
Volunteer	7/10/11	1.00	0	3	1	4	4.0
Volunteer	7/13/11	2.50	0	5	1	6	2.4
Volunteer	7/14/11	7.00	0	11	1	12	1.7
Volunteer	7/20/11	2.00	5	0	0	5	2.5
Volunteer	7/21/11	3.50	0	8	1	9	2.6
HWTP	8/1/11	3.92	0	0	0	0	0.0
HWTP	8/1/11	1.50	2	2	0	4	2.7
HWTP	8/1/11	3.50	0	5	0	5	1.4
HWTP	8/1/11	3.75	7	8	0	15	4.0
HWTP	8/1/11	3.50	4	6	0	10	2.9
HWTP	8/1/11	4.00	0	1	0	1	0.3
Volunteer	8/2/11	7.50	0	14	1	15	2.0
Volunteer	8/4/11	4.25	0	9	2	11	2.6
HWTP	8/4/11	1.00	0	1	0	1	1.0
HWTP	8/4/11	2.00	0	0	0	0	0.0
HWTP	8/4/11	0.75	1	1	0	2	2.7
HWTP	8/4/11	0.75	1	0	0	1	1.3
HWTP	8/4/11	2.00	0	8	0	8	4.0
Volunteer	8/6/11	4.00	0	14	0	14	3.5
Volunteer	9/1/11	2.50	4	9	2	15	6.0
Volunteer	9/6/11	2.50	1	1	1	3	1.2
Volunteer	9/10/11	2.50	1	3	2	6	2.4
Volunteer	9/11/11	3.00	2	9	2	13	4.3
Volunteer	9/18/11	2.25	0	11	1	12	5.3
Volunteer	9/23/11	2.00	0	9	1	10	5.0
Volunteer	9/28/11	3.00	0	5	2	7	2.3
Volunteer	10/8/11	7.00	0	15	0	15	2.1
Volunteer	10/30/11	8.50	0	2	0	2	0.2
Volunteer	10/30/11	8.50	0	10	1	11	1.4
Volunteer	11/1/11	3.00	0	4	1	5	1.7
Volunteer	11/4/11	1.50	0	3	0	3	2.0
Total		112.17	28	187	25	240	-