North Yuba River 2012 summary report

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State of California

Department of Fish and Wildlife

Heritage and Wild Trout Program

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Introduction

The North Yuba River, tributary to the Yuba River, originates at an elevation of approximately 6800 feet near Yuba Pass on the crest of the Sierra Nevada Mountains six miles northwest of Sierraville, CA (Sierra and Yuba counties; Figure 1). It flows approximately 40 miles in a west and southwest direction and is impounded at New Bullards Bar Reservoir, two miles upstream of the confluence with the Yuba River (35 miles north of Auburn, CA). The majority of the North Yuba River is currently not stocked with hatchery trout; however, an allotment of rainbow trout *(Oncorhynchus mykiss*) exists in the vicinity of Downieville, CA to increase angling opportunities for the opening day of the general trout season (last Saturday in April), as well as for a youth fishing event.

In 2012, the California Department of Fish and Wildlife Heritage and Wild Trout Program (HWTP) conducted Phase 1 (initial resource) assessments in the North Yuba River to determine if it meets criteria for designation as a Wild Trout Water. The HWTP is mandated to annually identify waters to be managed as wild trout fisheries. 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 utilizes a phased approach when evaluating waters for potential designation and Phase 1 assessments are designed to gather baseline information on fish species composition, relative abundance and size of fishes (specifically trout), public access, aesthetics of the fishery, basic habitat attributes and whether the trout present are of wild or hatchery origin. This report summarizes the findings from the 2012 assessment including direct observation snorkel surveys and data collected from an Angler Survey Box (ASB) located at the Loganville Campground.

Methods

Direct observation

The HWTP conducted direct observation surveys on the North Yuba River from July 17th through 20th, 2012 using snorkeling methods, an effective survey technique in many small streams and creeks in California and the Pacific Northwest (Hankin and Reeves 1988). A total of 34 sections were surveyed on the North Yuba River from the Highway 49 bridge near Indian Valley Campground upstream to Downieville, CA (Sections 112-2812; Figures 2-3) and in the vicinity of Ladies Canyon (Sections 2912-3412; Figure 4). Specific section boundaries were located at distinct breaks in habitat and/or stream gradient. Individual sections consisted of one to three habitat units, based on access locations and time constraints. Habitat types were identified following Level 2 protocol as defined in the California Salmonid Stream Habitat Restoration Manual (CSSHRM; Flosi et al. 1998). Sections were surveyed with between two and five divers; the number of divers per section was determined based on

wetted width, water visibility and habitat complexity. Surveys were conducted in either an upstream or downstream direction dependent upon streamflow.

Divers maintained an evenly-spaced line perpendicular to the current and counted fish by species. All observed trout were further categorized 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 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. Surveyors measured water and air temperature (°C), length of each habitat unit (ft), and water visibility (ft). Due to time constraints and to increase the number of sections surveyed, average wetted width and water depth (ft) were only measured in Sections 2912 through 3412. Habitat type (flatwater, riffle, or pool) was identified following Level 2 protocol as defined in the CSSHRM. Representative photographs were taken and coordinates of the section boundaries were recorded using a Global Positioning System hand-held unit (North American Datum 1983). To calculate estimates of abundance, the HWTP summed all observed trout by species in all sections and divided by the total survey length (fish/mi).

Angler use

One ASB is installed at the Loganville Campground and voluntary data from this location were examined for the years 2007 through 2011 to better understand angler use, catch rates and catch sizes (Figure 5). Forms missing pertinent information (date, number of hours fished and/or fish size classes) were not included in the analysis; all complete forms were examined. Size classes of trout reported caught were grouped into the size classes described above for direct observation surveys. Catch per unit effort (CPUE; fish/hr) was calculated for each form and averaged across all forms for each year analyzed.

Results

Direct observation

Direct observation surveys were conducted at 34 locations (Sections 112-3412) covering 21490 feet (four miles) of habitat (Figure 6). Weather was primarily clear and sunny, with the exception of cloudy and overcast conditions during the

survey effort in Sections 112 through 712. Water visibility ranged from 4 to 15 feet. Among all sections, habitat type was identified as 28% riffle, 59% flatwater, and 13% pools. Water temperature ranged from 12 to 16 ºC and air temperature was measured between 15 and 30 ºC. Divers observed a total of 6447 coastal rainbow trout (*O. m. irideus*), 18 unknown trout, six suckers (*Catostomus* sp.), 611 minnows (Family Cyprinidae) and 1382 unknown fishes (Table 1). Suckers and minnows were not identified to species. Divers also observed foothill yellow-legged frogs (*Rana boylii*), aquatic garter snakes (*Thamnophis atratus*) and tadpoles (not identified to species). Coastal rainbow trout size class distribution was 5% YOY, 49% small-, 38% medium-, 7% large-, and 1% extra-large-sized fish (Figure 7). Estimated abundance was 1584 coastal rainbow trout/mi, 4 unknown trout/mi, 1 sucker/mi, 150 minnows/mi and 340 unknown fishes/mi. Wetted widths and water depths were only measured in Sections 2912 through 3412 and averaged 61.0 and 1.8 feet, respectively.

Angler use

A total of 56 ASB forms were analyzed and CPUE ranged from 0.6 trout/hr (2011) to 3.0 trout/hr (2007) with an average of 1.8 trout/hr (Figure 8 and Table 2). Coastal rainbow trout were reported caught in all years with a size class distribution of 30% small-, 67% medium-, and 3% large-sized fish (Figure 9). Brown trout were only reported caught in 2007 and 2008 and included a size class distribution of 44% small- and 56% medium-sized fish (Figure 10). One medium brook trout was reported caught in 2007.

In 2011, anglers reported catching 50 coastal rainbow trout with a size class distribution of 36% small-, 58% medium-, and 6% large-sized fish (Table 3). Angler survey box data show coastal rainbow trout were the dominant trout species reported caught in all years.

Discussion

The results of the direct observation surveys indicate that coastal rainbow trout are the most abundant species in the North Yuba River with the majority falling into the small- and medium-size classes. Coastal rainbow trout were observed in all sections and appear to be distributed throughout the entire length of the North Yuba River. YOY were also observed, indicating natural reproduction is occurring and a wild trout fishery exists. All trout appeared wild, although there are limitations in the ability to differentiate wild from hatchery fish using direct observation methodology.

Suckers were observed in approximately 11 miles of habitat (Sections 212-2512). Surveyors were unable to identify suckers to species; however, based on historic distribution, the North Yuba River is within the native range of Sacramento suckers (*Catostomus occidentalis*). Minnows were observed in approximately nine miles of habitat (Sections 112-1712) and were generally not identified to species. Directly upstream of Section 1712, divers observed three Sacramento

pikeminnow (*Ptychocheilus grandis*); these were not included in the total fish count by section. Other native minnow species that may be present in this drainage include speckled dace (*Rhinichthys osculus*), California roach (*Lavinia symmetricus*), golden shiner (*Notemingonus crysoleucas*) and hitch (*Lavinia exilicauda*).

Based on the voluntary ASB data, the majority of fish reported caught were coastal rainbow trout and size class distribution appears relatively consistent over time. The majority of rainbow trout reported caught were in the medium-size class for all years except for 2010 (small-sized trout were the dominant size class); however, only three forms were completed and analyzed in 2010 and may or may not be representative of the fishery and/or all angler experiences. These data mirror the size classes observed during direct observation (Figure 11). Neither brown nor brook trouts were reported caught since 2008 and zero were observed via direct observation in 2012, even though surveyors made a concerted effort to verify the presence of brown trout by targeting likely habitat (undercut banks, areas with large woody debris, etc.).

Conclusion

The North Yuba River drainage meets numerous criteria for Wild Trout Water designation including the presence of wild trout populations with multiple size classes, suitable habitat and public access. Highway 49, a Scenic Byway, parallels the majority of the North Yuba River providing easy access with numerous public campgrounds (>10). Land ownership is a mixture of private and public (US Forest Service Tahoe National Forest).

California Freshwater Sport Fishing Regulations for the North Yuba River (Sierra and Yuba counties) allow year-round angling with differing gear and bag restrictions depending on season and location. From the last Saturday in April through November 15th there are no gear restrictions for the entire North Yuba River. The portion of river from the western boundary of Sierra City to the confluence with Ladies Canyon Creek includes a two-bag limit and from Ladies Canyon Creek downstream to New Bullards Bar Reservoir there is a bag limit of five per day. For the remainder of the year, there is a zero-bag limit and gear is restricted to artificial lures with barbless hooks. The portion of the North Yuba River upstream of Sierra City follows the Sierra District general regulations (open to angling from the last Saturday in April through November 15th with a bag limit of five trout per day and ten in possession and no gear restrictions). The portion of the North Yuba River downstream of New Bullards Bar Reservoir follows the Valley District general regulations and is open all year with a daily bag and possession limit of five fish.

The HWTP recommends implementing a Phase 2 candidate water assessment in the North Yuba River to gather baseline data on the fishery, habitat and angler use including species composition, size class structure, abundanceand catch rates. Heritage and Wild Trout Program Phase 2 assessments generally occur

over a multi-year period. Special consideration should be given towards determining distribution and abundance of hatchery trout. Zero hatchery trout were observed in 2012; however, characteristics of hatchery trout (fin erosion, deformed fin rays, etc.) are difficult to identify utilizing direct observation snorkel survey methods. The HWTP recommends consideration of other survey techniques such as electrofishing and/or hook and line angling to capture trout, identify origins, and determine hatchery trout distribution. During this process, current angling regulations should be evaluated.

Lavezolla Creek, a tributary to the North Yuba River, is currently designated as a Wild Trout Water and the HWTP is evaluating Pauley Creek, a tributary to Lavezolla Creek for potential designation (Weaver and Mehalick 2010). Historically, approximately four miles of the North Yuba River upstream of Ladies Canyon was designated as a catch and release fishery (the designation 'catch and release' was abolished in 2007 and replaced with a mandate to designate Wild Trout Waters; Fish and Game Code Section 1727).

The HWTP recommends a watershed-level approach to Wild Trout designation in the North Yuba River drainage and consideration should be given to expanding the geographic scope of future sampling in this basin. The HWTP recommends identifying public angler access areas for installation of additional ASBs throughout the North Yuba River to better understand angler use, catch rates, and catch sizes.

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.

Weaver, J. and S. Mehalick. 2010. Pauley Creek 2010 summary report. State of California Natural Resources Agency. Department of Fish and Game. Heritage and Wild Trout Program. Rancho Cordova, CA.

Figure 1. Vicinity map of 2012 North Yuba River survey location

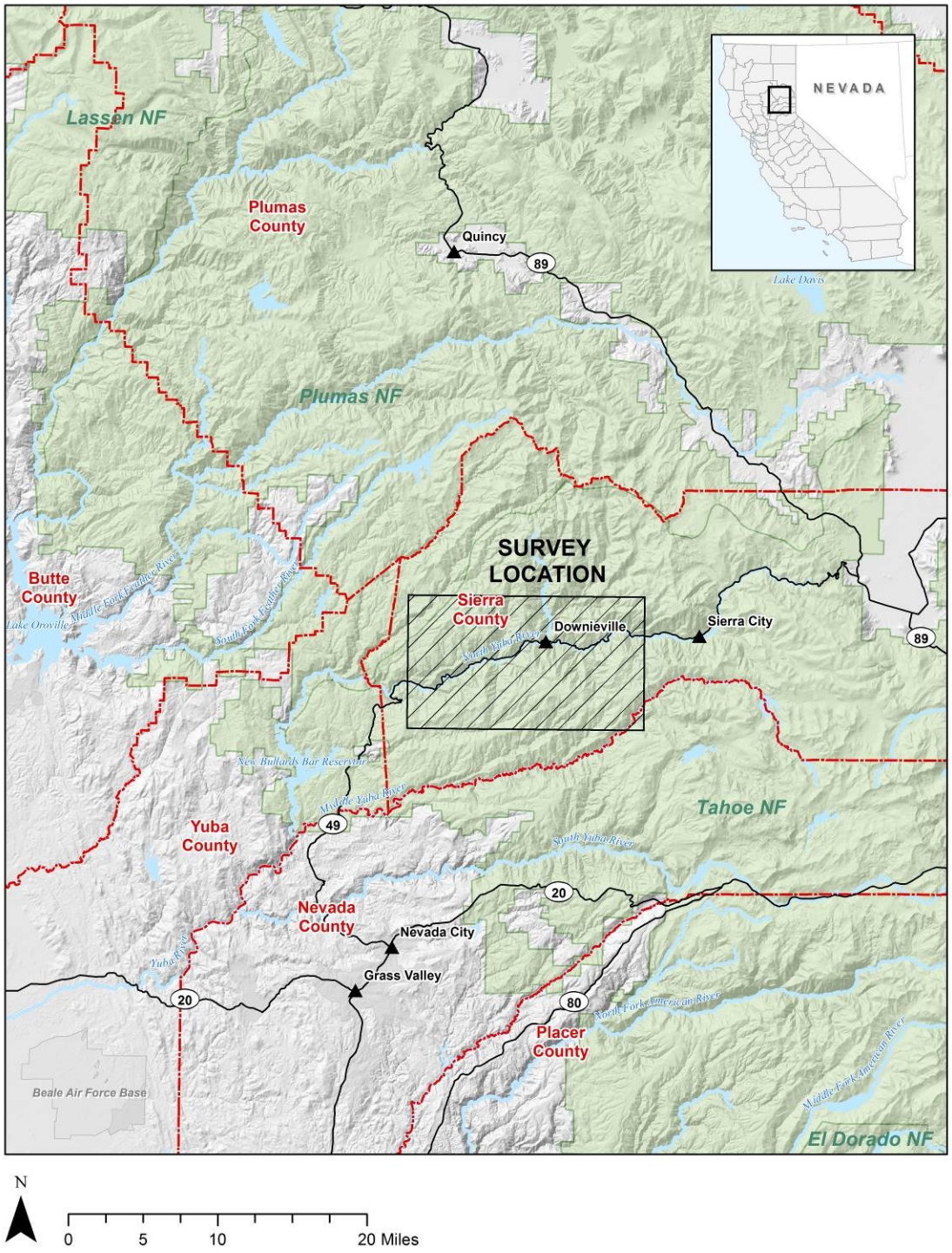

Figure 2. Detail map of 2012 direct observation sections for the North Yuba River upstream of Highway 49 bridge

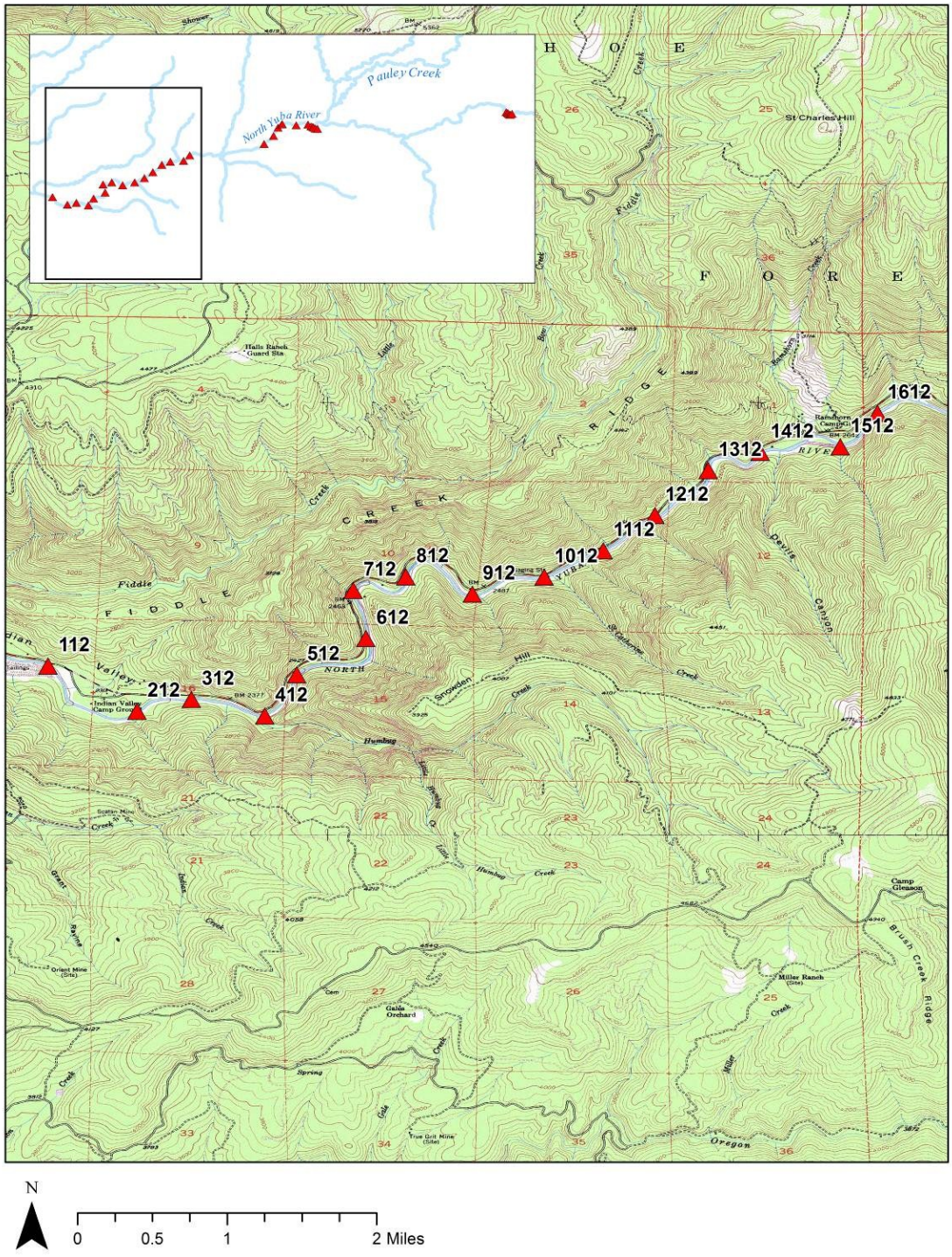

Figure 3. Detail map of 2012 direct observation sections for the North Yuba River downstream of Downieville, CA

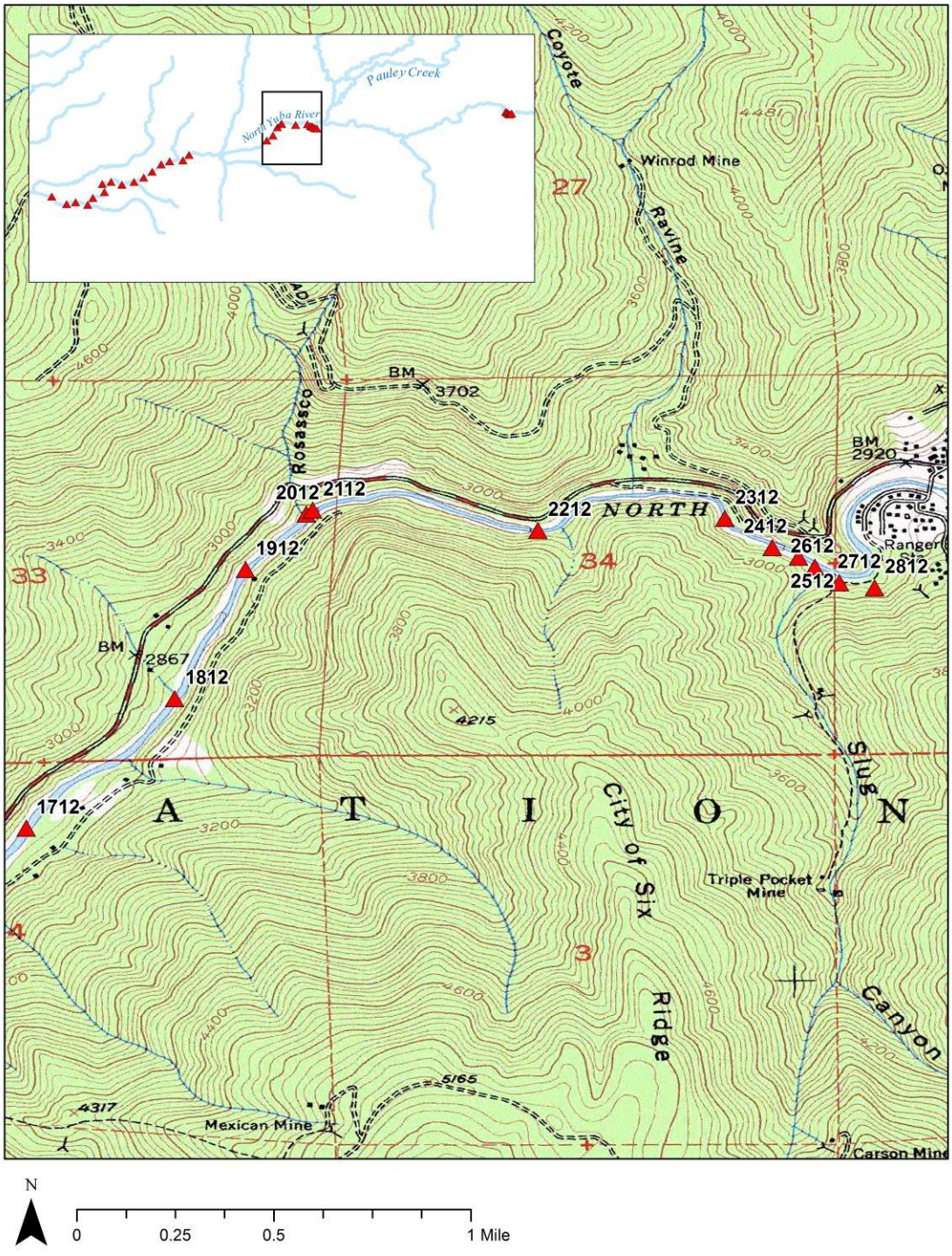

Figure 4. Detail map of 2012 direct observation sections for the North Yuba River upstream of Little Ladies Canyon

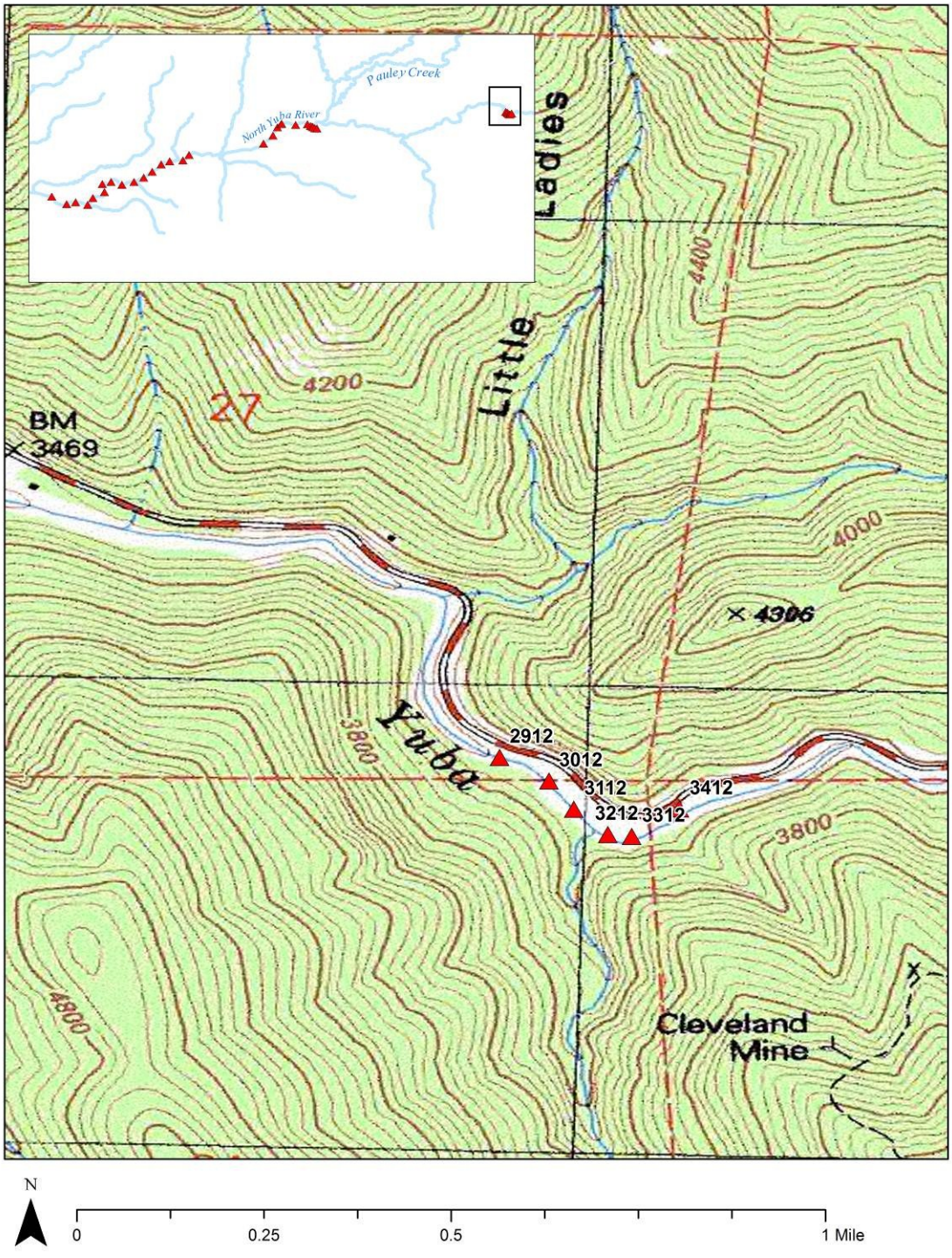

Figure 5. Detail map of the North Yuba River ASB located at the Loganville Campground

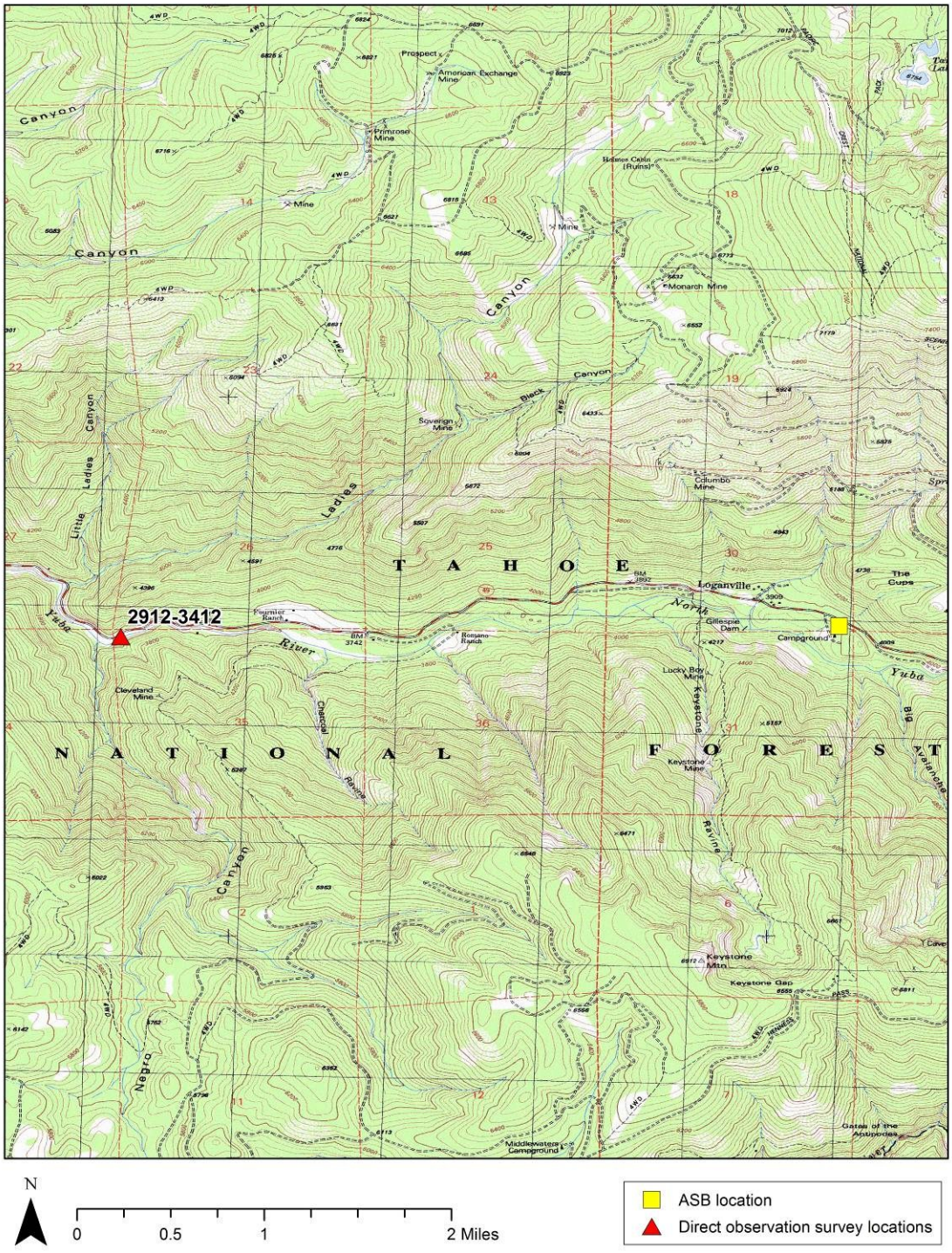

Figure 6. Representative photographs of the North Yuba River in 2012

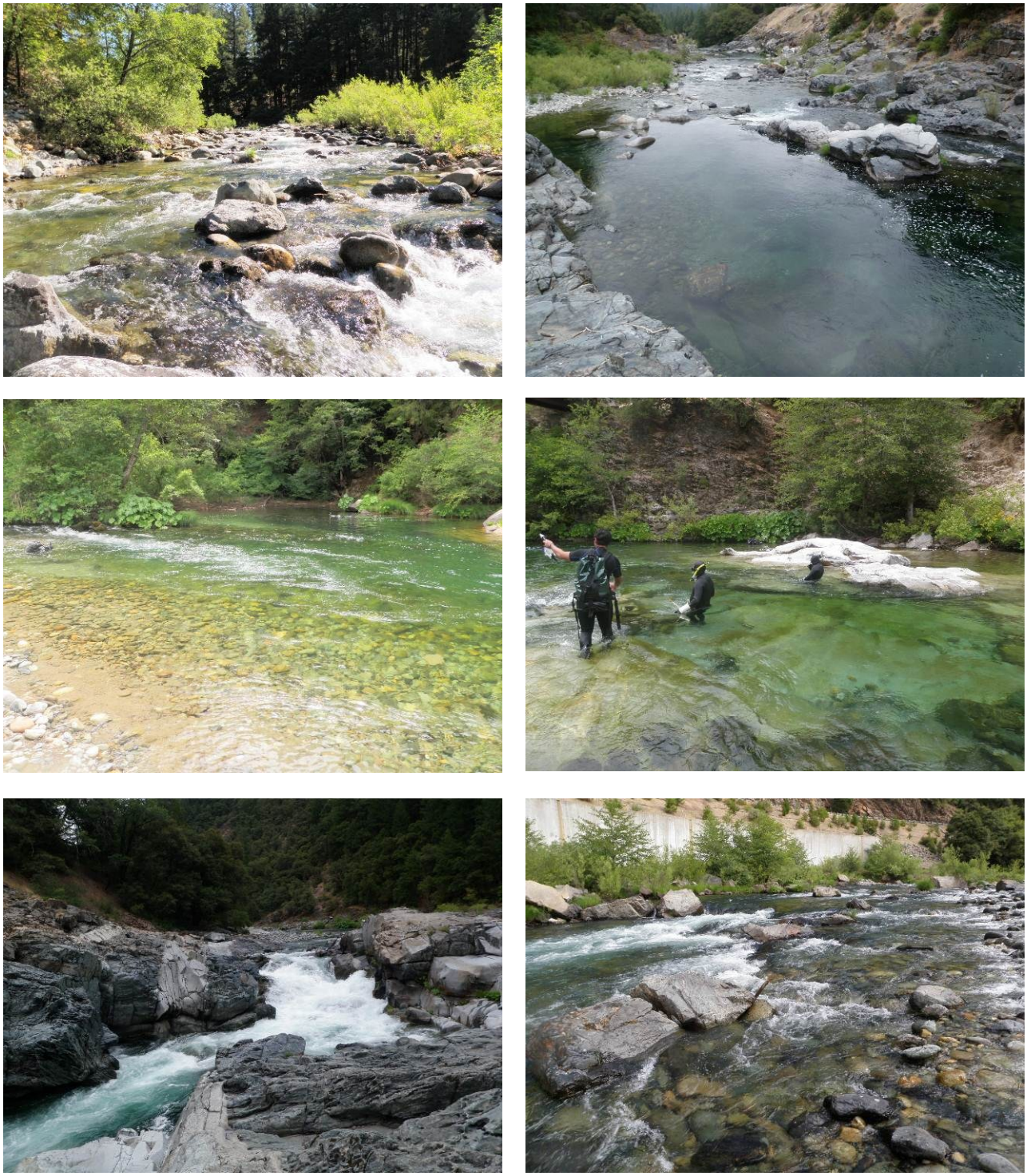

Figure 7. Graph of North Yuba River 2012 direct observation data: percent of coastal rainbow trout observed by size class

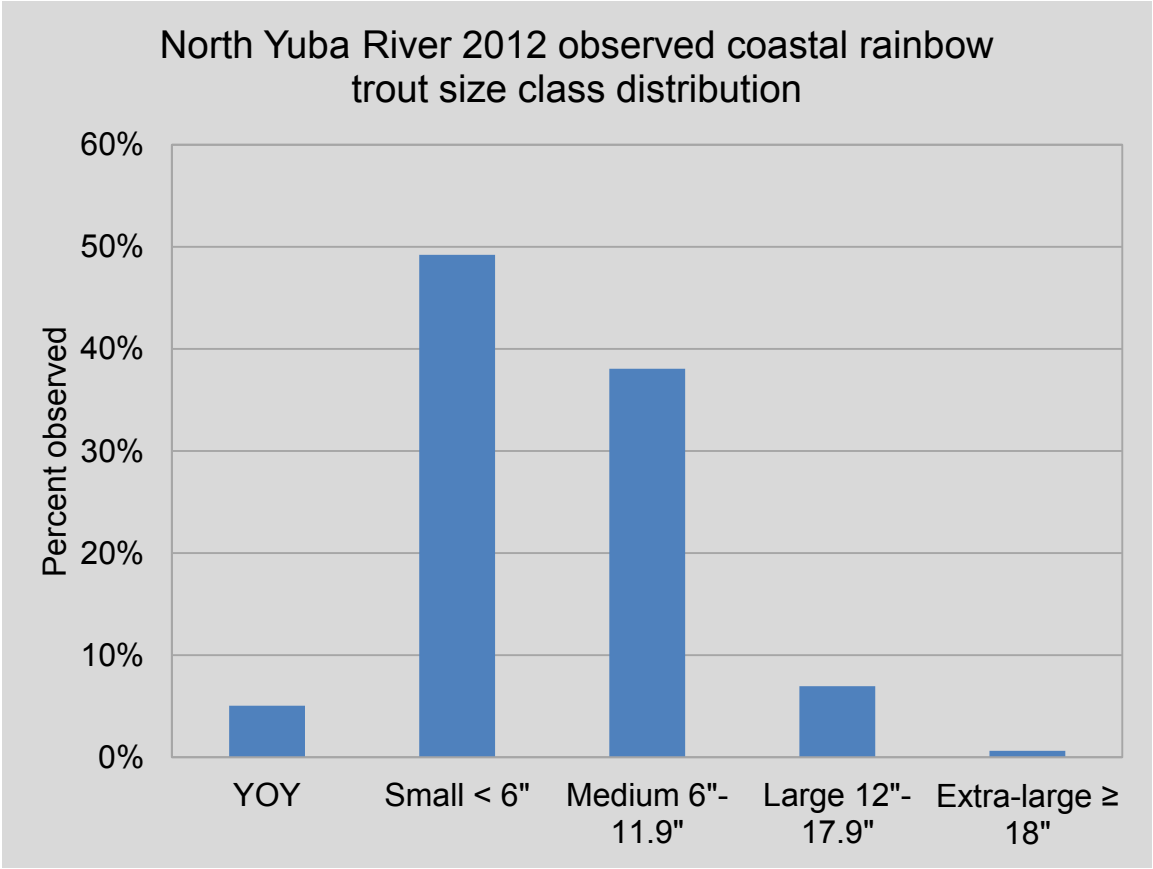

Figure 8. Graph of North Yuba River 2007-2011 ASB data: average CPUE (fish/hr) by year (long-term average in red)

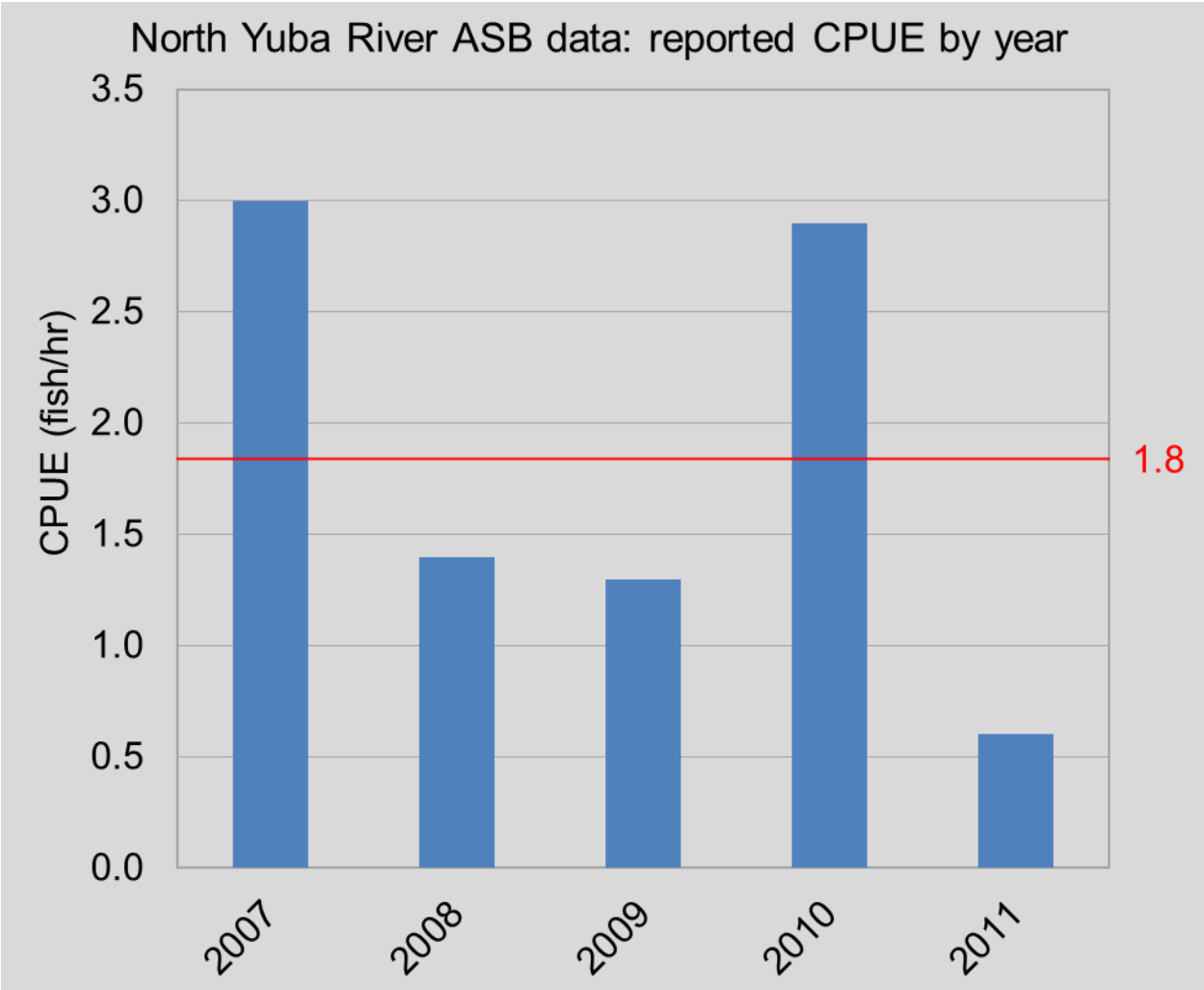

Figure 9. Graph of North Yuba River 2007-2011 ASB data: number of coastal rainbow trout reported caught by size class and year

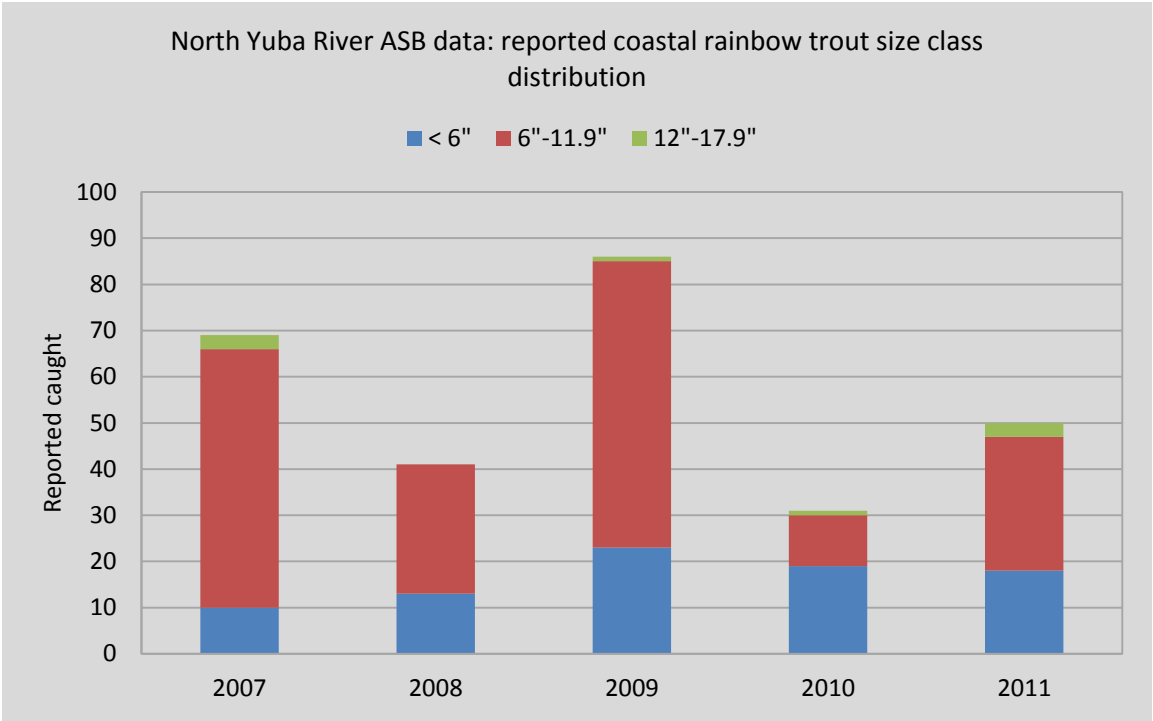

Figure 10. Graph of North Yuba River 2007-2011 ASB data: number of brown trout reported caught by size and year

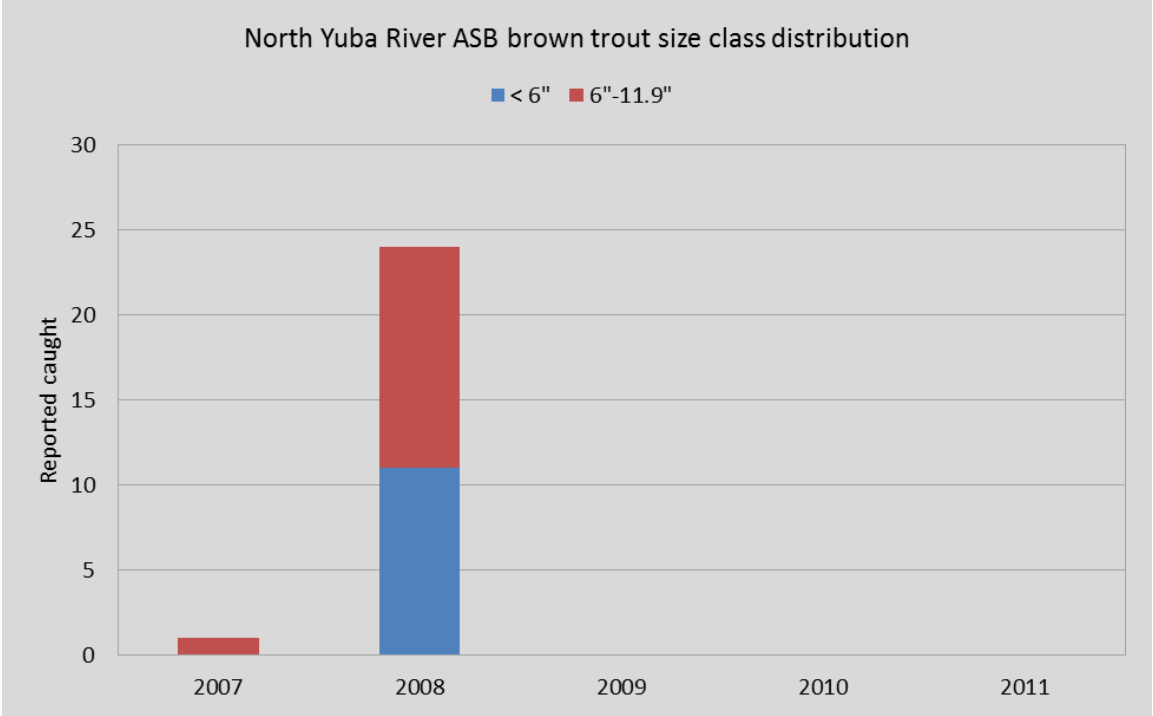

Figure 11. Graph of North Yuba River 2012 direct observation and 2007-2011 ASB data: percent of observed coastal rainbow trout by size class

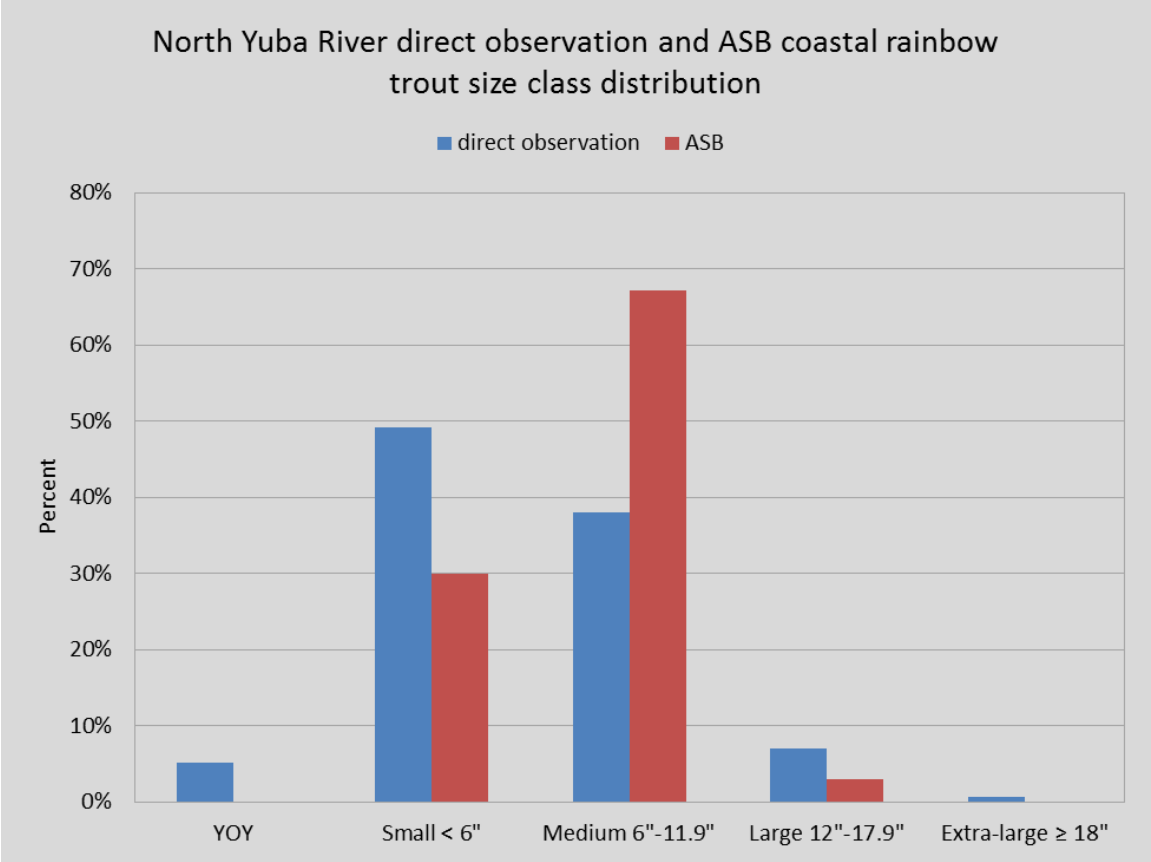

Table 1. North Yuba River 2012 direct observation survey data

Section	Section length (ft)	Habitat type	Species	Number of fish observed						Estimated density (fish/mi)
				YOY	Small < 6"	Medium 6"-11.9"	Large 12"-17.9"	Extra-large ≥ 18"	Total	
112	2259.0	flatwater/ riffle/pool	coastal rainbow trout	0	444	314	25	1	784	1832
			minnow	-	-	-	-	-	600	1402
			unknown fishes	-	-	-	-	-	343	802
212	855.0	flatwater	coastal rainbow trout	0	47	53	17	2	119	735
			sucker	-	-	-	-	-	2	12
			unknown fishes	-	-	-	-	-	1000	6175
312	783.0	flatwater/ riffle	coastal rainbow trout	3	229	126	25	0	383	2583
			unknown fishes	-	-	-	-	-	3	20
412	270.0	pool	coastal rainbow trout	0	42	30	4	0	76	1486
512	975.0	flatwater/ riffle	coastal rainbow trout	0	197	75	10	3	285	1543
			sucker	-	-	-	-	-	1	5
			unknown fishes	-	-	-	-	-	30	162
612	831.0	flatwater/ riffle	coastal rainbow trout	5	120	105	19	1	250	1588
712	885.0	flatwater/ riffle	coastal rainbow trout	45	218	64	14	1	342	2040
			unknown fishes	-	-	-	-	-	6	36
812	1017.0	flatwater/ riffle	coastal rainbow trout	2	127	99	10	6	244	1267
			minnow	-	-	-	-	-	5	26
			sucker	-	-	-	-	-	1	5
912	648.0	flatwater/ pool	coastal rainbow trout	31	16	10	9	0	66	538
1012	678.0	flatwater/ pool	coastal rainbow trout	0	92	49	6	0	147	1145
1112	1149.0	flatwater/ riffle/pool	coastal rainbow trout	0	138	106	52	4	300	1379
			minnow	-	-	-	-	-	6	28
1212	951.0	flatwater/ pool	coastal rainbow trout	90	155	75	13	1	334	1854
1312	756.0	flatwater	coastal rainbow trout	80	96	90	19	0	285	1990
1412	630.0	flatwater	coastal rainbow trout	0	68	54	9	0	131	1098
1512	1230.0	flatwater/ riffle	coastal rainbow trout	0	267	189	28	17	501	2151
1612	253.0	flatwater/ riffle	coastal rainbow trout	40	206	143	14	1	404	8431
1712	480.0	flatwater/ pool	coastal rainbow trout	1	86	108	16	0	211	2321
1812	648.0	flatwater/ riffle	coastal rainbow trout	6	30	30	4	0	70	570
1912	570.0	flatwater	coastal rainbow trout	2	35	32	2	0	71	658
2012	144.0	flatwater	coastal rainbow trout	0	11	12	2	0	25	917
2112	330.0	flatwater	coastal rainbow trout	0	118	67	4	0	189	3024
2212	489.0	riffle	coastal rainbow trout	0	36	44	5	3	88	950
			sucker	-	-	-	-	-	1	11

Table 1 continued

2312	615.0	riffle	coastal rainbow trout	8	87	76	24	0	195	1674
			unknown trout	1	0	0	0	0	1	9
2412	510.0	flatwater	coastal rainbow trout	0	22	13	5	1	41	424
			unknown trout	11	0	0	0	0	11	114
2512	300.0	flatwater	coastal rainbow trout	0	28	83	4	0	115	2024
			sucker	-	-	-	-	-	1	18
2612	399.0	riffle	coastal rainbow trout	8	92	42	20	0	162	2144
			unknown trout	2	2	0	0	0	4	53
2712	492.0	pool	coastal rainbow trout	0	57	59	16	0	132	1417
2812	600.0	riffle	coastal rainbow trout	0	52	48	19	0	119	1047
2912	345.0	flatwater	coastal rainbow trout	0	5	41	6	0	52	796
3012	267.0	riffle	coastal rainbow trout	0	15	8	11	0	34	672
3112	243.0	flatwater	coastal rainbow trout	0	6	64	12	0	82	1782
			unknown trout	2	0	0	0	0	2	43
3212	162.0	riffle	coastal rainbow trout	0	7	21	4	0	32	1043
3312	339.0	flatwater	coastal rainbow trout	5	8	46	2	0	61	950
3412	387.0	flatwater/ riffle	coastal rainbow trout	0	17	79	20	1	117	1596

Table 2. Summary of North Yuba River 2007-2011 ASB data including the number of forms analyzed, total reported trout caught, and average CPUE by year

Year	Number of forms analyzed	Effort (hrs)	Total trout reported caught	Total brook trout reported caught	Total brown trout reported caught	Total coastal rainbow trout reported caught	CPUE (fish/hr)
2007	10	38.5	71	1	1	69	3.0
2008	13	39.0	65	0	24	41	1.4
2009	17	62.0	86	0	0	86	1.3
2010	3	10.0	31	0	0	31	2.9
2011	13	80.9	50	0	0	50	0.6

Table 3. Summary of North Yuba River 2007-2011 ASB data including total number of trout reported caught by size class and year

Year	Number of forms analyzed	Effort (hrs)	Species	Number trout captured				Total trout captured	CPUE (fish/hr)
				Small < 6"	Medium 6"-11.9"	Large 12"-17.9"	Total		
2007	10	38.5	brook trout	0	0	1	1	71	3.0
			brown trout	0	1	0	1		
			coastal rainbow trout	10	56	3	69		
2008	13	39.0	brown trout	11	13	0	24	65	1.4
			coastal rainbow trout	13	28	0	41		
2009	17	62.0	coastal rainbow trout	23	62	1	86	86	1.3
2010	3	10.0	coastal rainbow trout	19	11	1	31	31	2.9
2011	13	80.9	coastal rainbow trout	18	29	3	50	50	0.6