

Fish Creek and Agua Blanca Creek Summary Report  
June 16th-19th, 2008

Heritage and Wild Trout Program  
California Department of Fish and Game



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## **Introduction:**

Fish and Agua Blanca Creeks, located in Ventura County, are tributaries to Piru Creek in the Santa Clara River drainage (Figure 1). Piru Creek, located approximately one hour north of Los Angeles (within Ventura and Los Angeles Counties), is commonly divided into three sections: “upper”, “middle”, and “lower.” Upper Piru Creek includes the main-stem and all tributaries upstream of Pyramid Lake; middle Piru Creek exits Pyramid Lake and flows in a southerly direction into Lake Piru; and lower Piru Creek flows from Lake Piru into the Santa Clara River. Piru Creek and its tributaries are in the southern end of the native range of coastal rainbow trout (*Oncorhynchus mykiss irideus*). However, due to stocking efforts by the California Department of Fish and Game (DFG), hatchery-strain rainbow trout have been planted throughout the Piru Creek drainage.

The DFG’s Heritage and Wild Trout Program (HWTP) has been conducting fisheries, habitat, and angler studies throughout the watershed since the 1980s and recently proposed to the California Fish and Game Commission that the entire Upper Piru Creek watershed (above Pyramid Lake) be considered for Heritage Trout designation. This designation was accepted in September, 2008 and more than 60 miles of Upper Piru Creek, including tributaries, is now designated as a Heritage Trout Water. In June, 2008, the HWTP conducted fisheries assessments on multiple tributaries throughout both upper and middle Piru Creek. This report details the results of the Phase I (initial assessment) surveys conducted on Fish and Agua Blanca Creeks, both tributaries to middle Piru Creek. HWTP Phase I surveys are initial resource assessments to determine whether a stream or lake meets the minimum qualifications for candidacy as a designated Wild and/or Heritage Trout Water. Phase I assessments investigate species composition, quantity, and size of fish (specifically trout); public access; aesthetics of the fishery; basic habitat attributes; and whether the trout present are wild or hatchery-stocked.

## **Methods:**

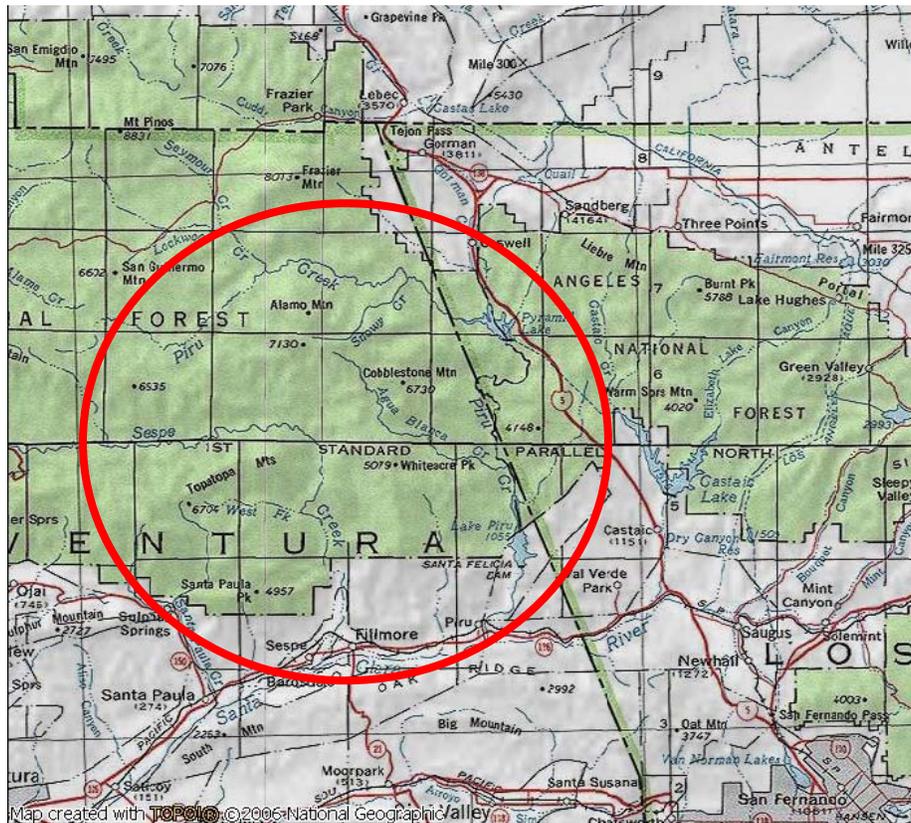
Direct observation surveys were conducted on Fish Creek (including the North Fork) and Agua Blanca Creek using snorkeling methods, an effective survey technique in many small streams and creeks in California and the Pacific Northwest (Hankin & Reeves, 1988). Sections were selected throughout the length of each stream based on habitat type. An initial reconnaissance identified dominant habitat types and sections were selected that represented these habitats. Sections were also spread throughout each system, to the extent possible, in order to provide greater geographic distribution of sampling. Specific site boundaries were located at distinct breaks between habitat types and/or stream gradient.

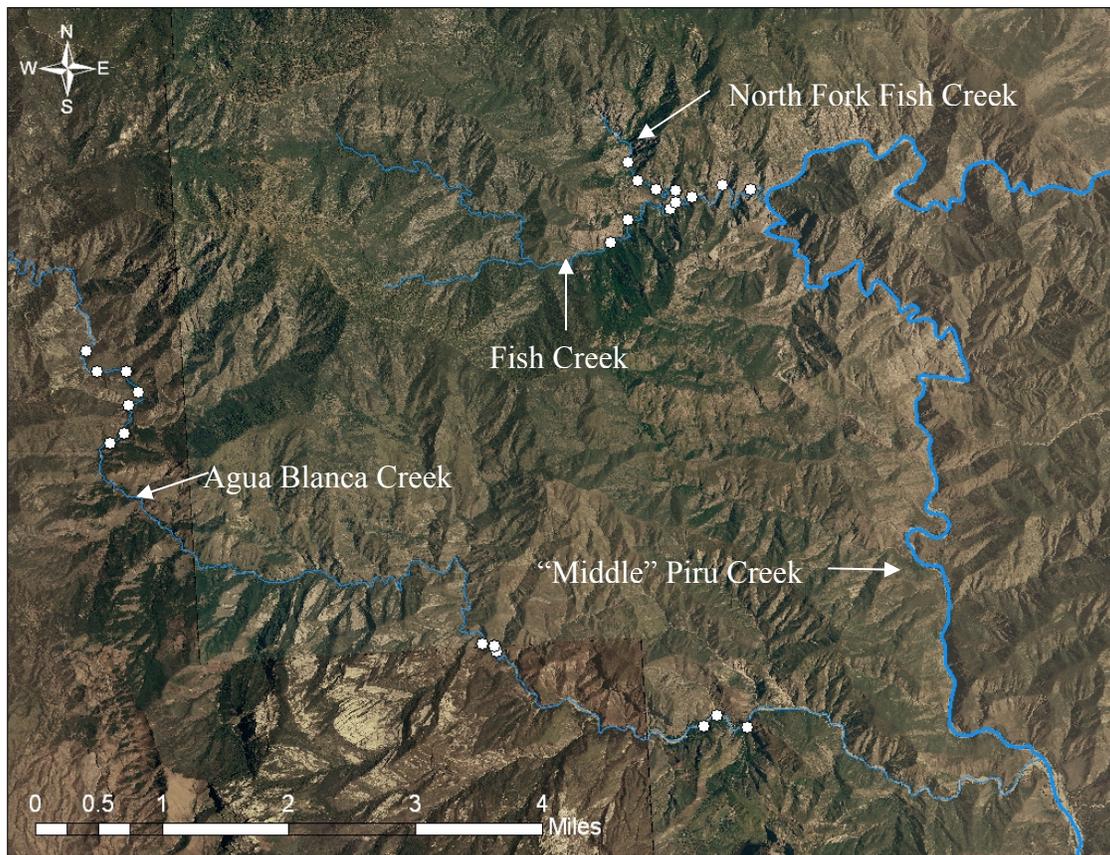
One diver, moving in an upstream direction, counted all fish within each section by species. All trout observed were also counted by size class. Size classes were divided into the following categories: young-of-year (YOY); small (< 5.9 inches); medium (6-11.9 inches); large (12-17.9 inches); and extra-large ( $\geq$  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 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 (<6 inches) size class. Divers were instructed in both visual size class estimation and proper snorkel survey techniques prior to starting the survey. For each of the survey sites, surveyors measured section length (along the thalweg), water and air temperature

(in the shade), average wetted width and water depth, and water visibility. We recorded habitat type (flatwater, riffle, or pool) and GPS coordinates for the section boundaries. Representative photographs were taken.

In addition, tissue samples were collected in each stream segment for cataloging and future genetic analyses. In conjunction with the direct observation surveys, tissue samples were collected at multiple sites throughout the system. Surveyors collected as many tissue samples as possible, based on time constraints and capture feasibility. Fish were captured either by hook and line or through the use of a landing net. All fish captured were measured to the nearest inch and tissue samples were collected by removing a portion of the caudal fin with a pair of scissors, per University of California at Davis's Genomic Variation Laboratory tissue collection protocols (Stephens, pers. comm.). Each tissue sample was placed in a labeled envelope with a unique identification number. Representative photographs were taken of the specimens collected. The HWTP has assumed responsibility of the tissue samples and is storing them until further analysis is necessary.

Figure 1. Piru Creek drainage area map (this page) and 2008 survey locations (shown as white dots) on Agua Blanca and Fish Creeks (following page)





## Results:

### Fish Creek

Fish Creek, including the North Fork, was surveyed from June 17th through 19th, 2008, from the headwaters downstream to Piru Creek. The lower two miles of Fish Creek (Sections 108 to 308) was low to medium gradient and consisted of flatwater and riffles, with some shallow pool habitat. Numerous small coastal rainbow trout were observed in this lower section. Upstream of the North Fork, gradient increased and habitat was mainly steep riffles interspersed with deep pools. Boulders and bedrock became more prevalent. Substrate was highly embedded. There were numerous bedrock sheets and small waterfalls within the vicinity of Section 408, some of which are likely barriers to upstream fish migration (Fig. 3). Zero fish were observed upstream of Section 408; however, there was abundant herpetofauna, including tree frogs (*Hyla* spp.), garter snakes (*Thamnophis* spp.), and various lizard species.

There was evidence of fire throughout the entire watershed, although in some areas both the forested and riparian vegetation were intact. The upper watershed had numerous downed trees, possibly from a wind event. Water temperatures ranged from 19° to 26° Celsius (C) and air temperatures were between 22° and 32° C. The weather was sunny and water visibility was high (greater than four feet) during the surveys. In Fish Creek, six sections were surveyed, with a total length of 488.5 feet (Table 1). The average wetted width was 10.8 feet and average water depth was 0.5 feet. A total of 288 coastal rainbow trout were observed; based on the total stream length surveyed, there are approximately 3113 coastal rainbow trout per mile in Fish Creek. The majority of fish were in the small size class. Seven tissue samples were collected from Section 108 upstream to Section 408.

Figure 2. Map of 2008 Fish Creek survey sections

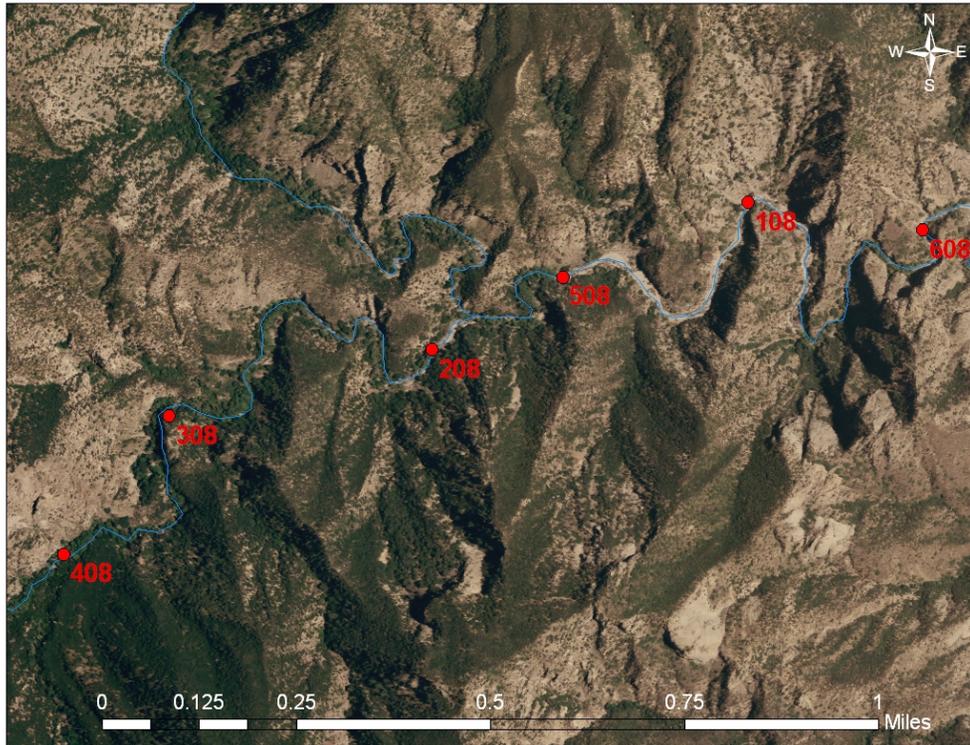


Figure 3. 2008 Fish Creek direct observation survey (left) and likely fish barrier (right)

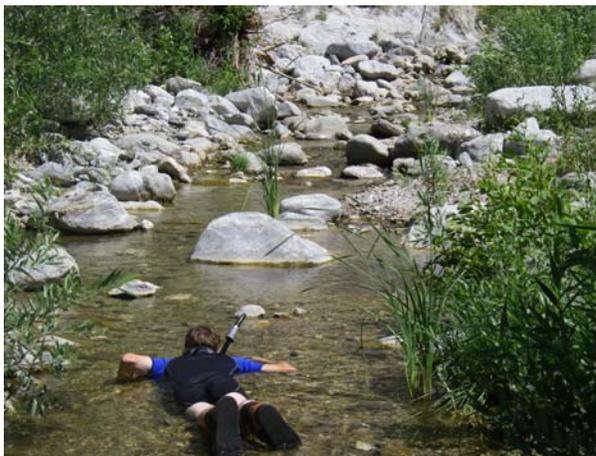


Table 1. 2008 Fish Creek direct observation survey data

Fish Creek 2008 Direct Observation Survey Results											
Section #	Section Length (ft)	Habitat Type F=flatwater R=riffle P=pool	Average Wetted Width (ft)	Average Water Depth (ft)	Water Visibility (ft)	Number of Coastal Rainbow Trout Observed					Totals
						YOY	Small < 5.9"	Medium 6" - 11.9"	Large 12" - 17.9"	Xlarge > 18"	
108	70.00	F/R	12.30	0.30	>4	0	60	1	0	0	61
208	68.00	F	14.10	0.30	>4	0	62	0	0	0	62
308	149.00	F/R/P	9.90	0.50	>4	0	77	1	0	0	78
408	24.50	P	9.50	1.10	>4	0	0	0	0	0	0
508	87.00	R	9.50	0.40	>4	0	62	1	0	0	63
608	90.00	R	9.50	0.30	>4	0	24	0	0	0	24
<b>Total</b>	<b>488.5</b>	<b>n/a</b>	<b>10.8</b>	<b>0.48</b>	<b>n/a</b>	<b>0</b>	<b>285</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>288</b>

### North Fork Fish Creek

HWTP staff surveyed five sections (Sections 108-508) on the North Fork of Fish Creek on June 19<sup>th</sup> (Fig. 4). This stream is a small, intermittent tributary which, at the time of the survey, had continuous flow. Habitat consisted mainly of riffles interspersed with small pools. This area appeared more severely affected by fire; there was little to no canopy cover, sparse riparian vegetation, and siltation within the streambed. One hundred and three (103) coastal rainbow trout were observed in a total of 304.3 feet (Table 2). The average wetted width was 7.4 feet and the average water depth was 0.88 feet. Based on the total length of stream surveyed and number of fish observed, there are approximately 1787 coastal rainbow trout per mile in the North Fork of Fish Creek. Ninety-six percent of the fish observed were in the small size class. Two tissue samples were collected in the vicinity of Section 408. This small number of genetic samples was due to difficult capture by angling methods (the majority of fish in the North Fork Fish Creek were too small to capture with hook and line).

Figure 4. Map of 2008 North Fork Fish Creek survey sections (left) and representative site photograph (right)

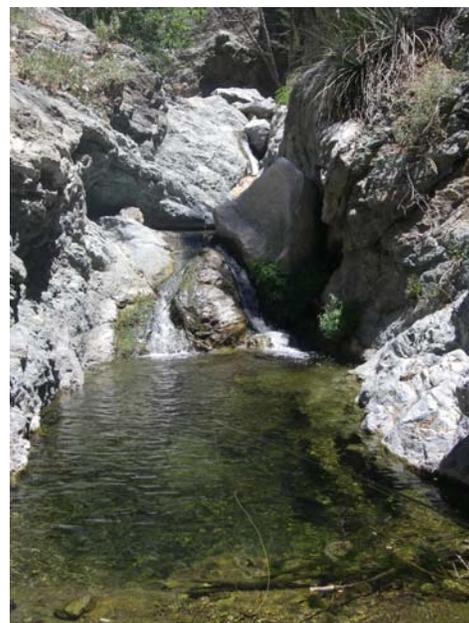
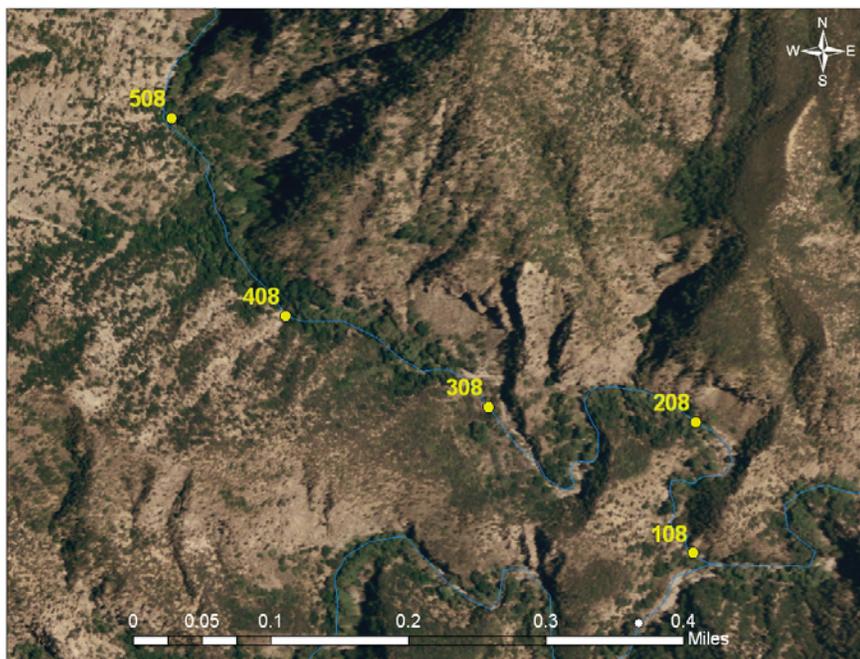


Table 2. 2008 North Fork Fish Creek direct observation survey data

North Fork Fish Creek 2008 Direct Observation Survey Results											
Section #	Section Length (ft)	Habitat Type F=flatwater R=riffle P=pool	Average Wetted Width (ft)	Average Water Depth (ft)	Water Visibility (ft)	Number of Coastal Rainbow Trout Observed					Totals
						YOY	Small < 5.9"	Medium 6" - 11.9"	Large 12" - 17.9"	Xlarge > 18"	
108	79.0	F/R	5.00	0.40	>4	0	35	0	0	0	35
208	54.4	F/R/P	7.28	0.56	>4	0	36	0	0	0	36
308	18.9	P	13.12	2.58	>4	0	25	2	0	0	27
408	94.0	R/P	5.46	0.61	>4	0	3	2	0	0	5
508	58.0	R	6.16	0.27	>4	0	0	0	0	0	0
<b>Total</b>	<b>304.30</b>	<b>n/a</b>	<b>7.40</b>	<b>0.88</b>	<b>n/a</b>	<b>0</b>	<b>99</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>103</b>

### Agua Blanca Creek

Agua Blanca Creek was surveyed from June 16th through 19th, 2008. Habitat throughout the system was varied and ranged from open, low-gradient meandering reaches to more confined and steep canyon areas (Fig. 6). Thirteen sections were selected throughout the watershed for direct observation surveys (Fig. 5), consisting of a combination of all habitat encountered (flatwater, riffle, and pool). Water temperatures ranged from 16.7° to 29° C; air temperatures were between 25.6° and 33.3°C. Two hundred and eight (208) coastal rainbow trout were observed in 834.4 total feet of stream surveyed, yielding an estimate of 1316 fish per mile (Table 3). The lower half of Agua Blanca Creek showed evidence of fire; there was little to no riparian or instream cover. During the surveys, there was wetted connectivity throughout the entire system and no apparent barriers to upstream fish migration. Thirty-two tissue samples were collected throughout Agua Blanca Creek.

Figure 5. Map of 2008 Agua Blanca Creek survey sections

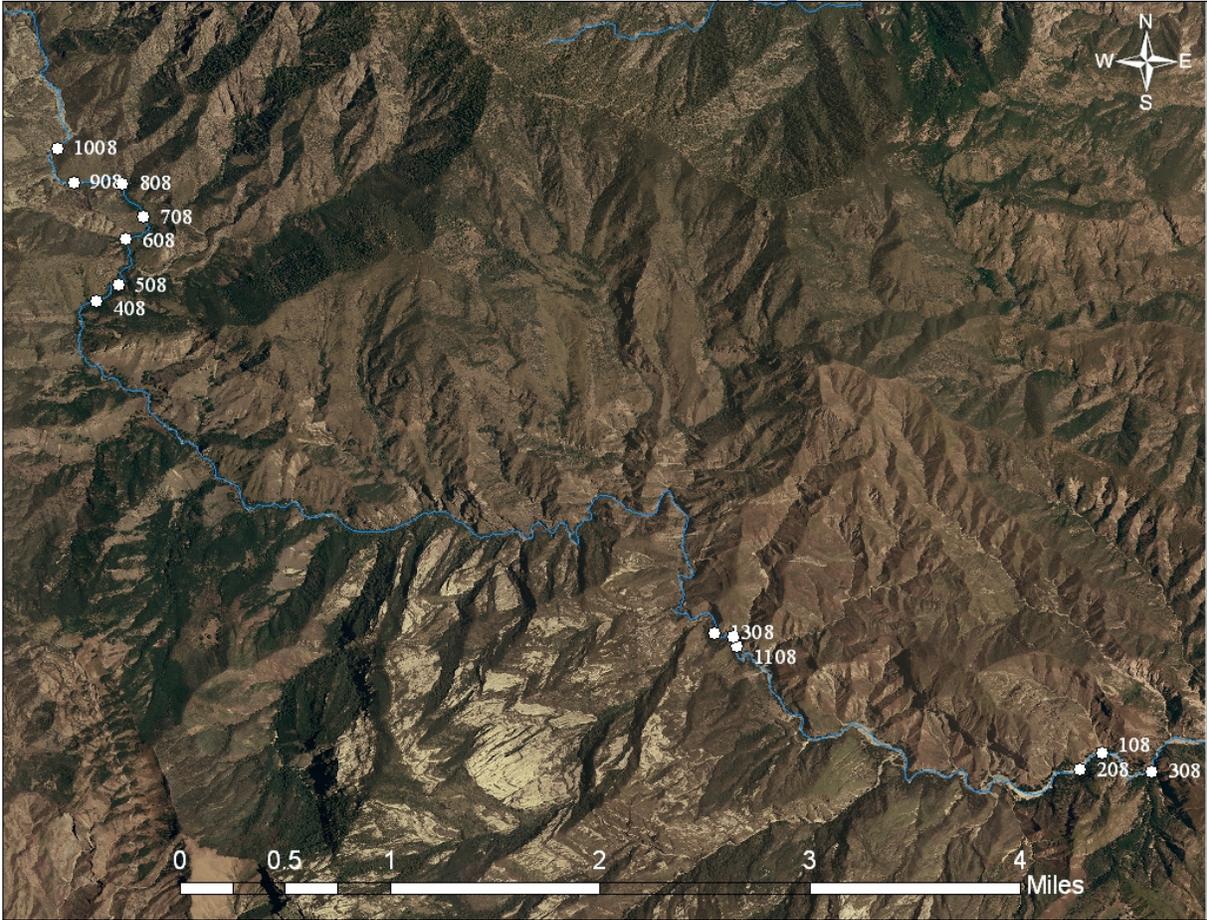


Figure 6. Representative Agua Blanca Creek site photographs

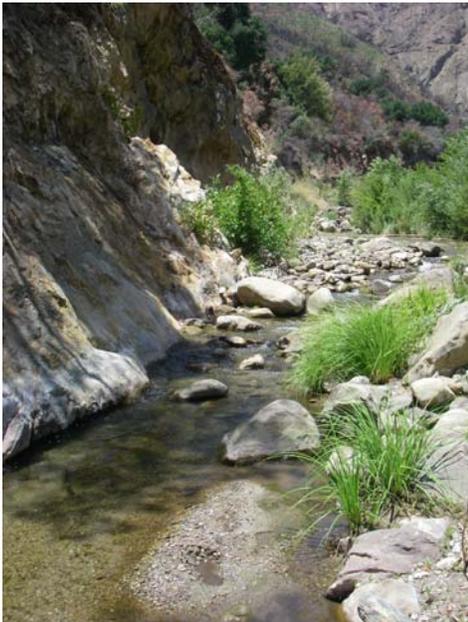


Table 3. 2008 Agua Blanca Creek direct observation survey data

Agua Blanca Creek 2008 Direct Observation Survey Results											
Section #	Section Length (ft)	Habitat Type F=flatwater R=riffle P=pool	Average Wetted Width (ft)	Average Water Depth (ft)	Water Visibility (ft)	Number of Coastal Rainbow Trout Observed					Totals
						YOY	Small < 5.9"	Medium 6" - 11.9"	Large 12" - 17.9"	Xlarge > 18"	
108	30.00	R	11.86	0.22	>10	0	0	0	0	0	0
208	104.00	R	15.42	0.22	>10	0	26	2	1	0	29
308	90.20	R	13.24	0.35	>10	0	1	0	0	0	1
408	58.00	R	10.74	0.31	>10	0	1	1	0	0	2
508	60.00	R	12.06	0.40	>10	1	16	1	0	0	18
608	26.80	P	14.10	0.66	>10	0	32	8	0	0	40
708	60.00	F	9.56	0.42	>10	0	23	3	0	0	26
808	40.50	R	11.04	0.43	>10	0	22	1	0	0	23
908	76.00	F	10.14	0.73	>10	0	16	6	1	0	23
1008	39.50	P	12.70	0.66	>10	0	25	4	0	0	29
1108	69.00	R	9.90	0.30	8	0	0	0	0	0	0
1208	145.40	F	9.20	0.19	8	0	5	0	0	0	5
1308	35.00	P	10.90	0.39	8	0	12	0	0	0	12
<b>Total</b>	<b>834.40</b>	<b>n/a</b>	<b>11.60</b>	<b>0.41</b>	<b>n/a</b>	<b>1</b>	<b>179</b>	<b>26</b>	<b>2</b>	<b>0</b>	<b>208</b>

### Discussion:

Both Fish and Agua Blanca Creeks contain relatively high densities of coastal rainbow trout, especially given the habitat limitations that salmonids face in this mountainous desert region. Based on outward appearance, all trout observed were identified as wild. Phylogenetic analyses of the tissue samples collected during this effort will be conducted pending available funding. All genetic samples collected in 2008 are currently stored at HWTP headquarters in Rancho Cordova, California. Both streams are publicly accessible and open to fishing, contain self-sustaining populations of native and wild fish, and are aesthetically pleasing. These small headwater streams provide rearing habitat and refugia for coastal rainbow trout in middle Piru Creek.

Although population estimates are high and these streams appear to be highly productive, these populations have likely been negatively affected by recent fires in the area. Larger fish were not encountered in these streams; this may be the result of habitat degradation from recent fires or these streams may not be able to support fish larger than approximately 12-13" total length under any conditions, due to natural habitat limitations. At the time of these surveys, both streams had continuous connectivity to the main-stem of Piru Creek. It is presumed that larger fish, given the right flow conditions, have the ability to travel downstream and colonize Piru Creek. Cold water tributary streams such as these appear to be critical to maintaining salmonid populations in the Piru Creek drainage. They provide spawning habitat, cold water influence and a substantial source population of wild-reared fish to supplement the main-stem, which supports populations of stocked rainbow trout as well as non-salmonid fishes and is subject to high temperatures and other stressors.

## **Conclusion:**

The wild coastal rainbow trout found within the upper Piru Creek drainage (above Pyramid Lake) show little to no introgression with hatchery fish (Girman and Garza 2006) and are worth protecting from both a conservation genetics and recreational angling perspective. The middle Piru Creek drainage appears to hold equal value, both in terms of providing important habitat at the southern end of the coastal rainbow trout's native range and in offering a quality wild trout fishery. The close proximity of these fisheries to California's largest metropolitan area makes them all the more valuable. The small tributaries of Piru Creek appear to be the lifeblood of the system and provide critical spawning habitat and thermal refugia. Multiple size classes of trout were present throughout the watershed, although Fish Creek had few medium-sized fish and zero large fish.

From an angling perspective, the majority of trout in Fish Creek are too small (between three and six inches) to support recreational fishing. Due to very difficult access and limited fishing opportunity, Fish Creek, alone, is not a likely candidate for Wild Trout designation. However, this stream is an important tributary to middle Piru Creek in the respect that it provides spawning and rearing habitat, as well as cold-water influence. Access on Agua Blanca Creek is also difficult and there is private property on the lower end at the confluence with Piru Creek. Fishing Agua Blanca Creek also requires extensive hiking in difficult terrain; it took the HWTP crew two full days of hiking to reach the upper portions of the stream where catch rates improved. There were more medium and large sized fish in this system and catch rates were higher than in Fish Creek. The HWTP supports pursuing Agua Blanca Creek as a candidate for Wild Trout designation; the next step is to initiate a Phase 2 (candidate water) assessment to provide a more comprehensive assessment of the fishery, habitat, and angler use. These data can be used to generate estimates of trout densities and productivity. The entire middle Piru Creek drainage should be further assessed for potential designation as a Wild Trout Water (or watershed) and both Fish and Agua Blanca Creeks should be considered as important components of this interconnected system.

## **References:**

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- Flosi, Gary; S. Downie; J. Hopelain, et al. 1998. California Salmonid Stream Habitat Restoration Manual. State of California Resources Agency. 3<sup>rd</sup> Edition. Department of Fish and Game. Vol 1.
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