Warner Creek 2009 Summary Report

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State of California

Natural Resources Agency

Department of Fish and Game

Heritage and Wild Trout Program

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Introduction:

Warner Creek (Plumas County), tributary to the North Fork Feather River is a west-slope Sierra Nevada stream northwest of Chester, California (Figure 1). Warner Creek is approximately eight miles in length and flows through state (Warner Valley State Wildlife Area), federal (Lassen National Forest), and private lands. The headwaters of Warner Creek are located within Lassen Volcanic National Park. In 2007, the California Department of Fish and Game (DFG) Heritage and Wild Trout Program (HWTP) conducted Phase 1 (initial resource assessment) direct observation surveys at three locations on Warner Creek to gather baseline data on the presence and origins of trout populations (wild versus hatchery), species distribution and size class structure, and habitat attributes (Weaver and Mehalick 2007). The result of this survey was a recommendation to move to a Phase 2 candidate Wild Trout Water assessment within the Warner Valley State Wildlife Area. Wild Trout Waters are those that support self-sustaining trout populations, are aesthetically pleasing and environmentally productive, provide adequate catch rates in terms of numbers or size of fish, and are open to public angling. Wild Trout Waters may not be stocked with catchable-sized hatchery trout (Bloom and Weaver 2008). HWTP Phase 2 assessments provide a comprehensive evaluation of the fishery, habitat, and angler use, including estimates of trout abundance and delineation of species distribution. The Phase 2 process generally occurs over a multi-year period and 2009 was the first year of Phase 2 assessments on Warner Creek.

Methods:

Direct observation surveys were conducted at six locations on Warner Creek on July 22, 2009 using snorkeling methods, an effective survey technique in many small streams and creeks in California and the Pacific Northwest (Hankin and Reeves, 1988; Figures 2 and 3). Sections were spaced throughout the Warner Valley State Wildlife Area approximately every half-mile and the start of each section was selected at random. Specific section boundaries were located at distinct breaks in habitat types and stream gradient. Surveys were conducted in an upstream direction with three divers. The number of divers was determined based upon wetted width, water visibility, and habitat complexity. Divers, maintaining an evenly-spaced line perpendicular to the current, 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 is generally between zero and three inches in total length. If a trout was observed to be less than six inches 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 (establishing diver lanes, 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, water and air temperature (in the shade), average wetted width and water depth, and water visibility. Habitat type (flatwater, riffle, or pool) was identified and GPS coordinates were recorded for the section boundaries. Representative photographs were taken.

Figure 1. National Geographic Topo! © map showing general location of Warner Creek in relation to Chester, California.

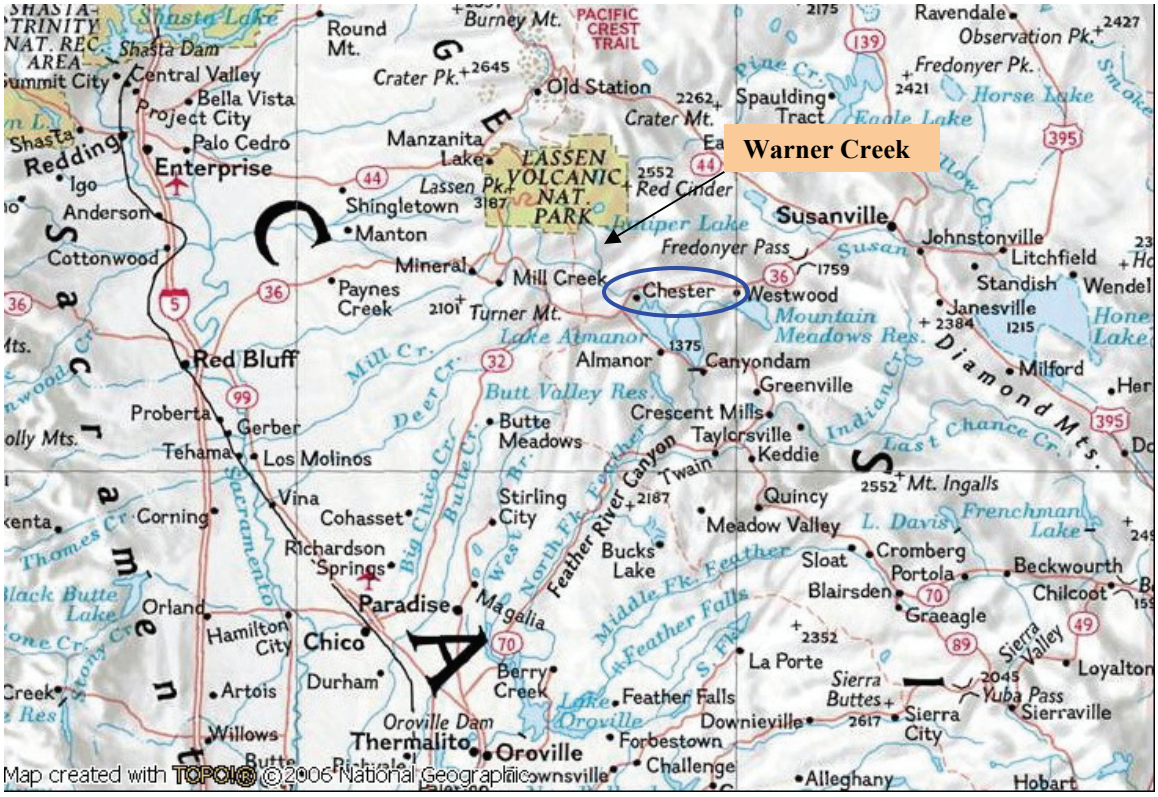


Figure 2. National Geographic Topo! © map of Warner Creek 2009 direct observation survey locations.

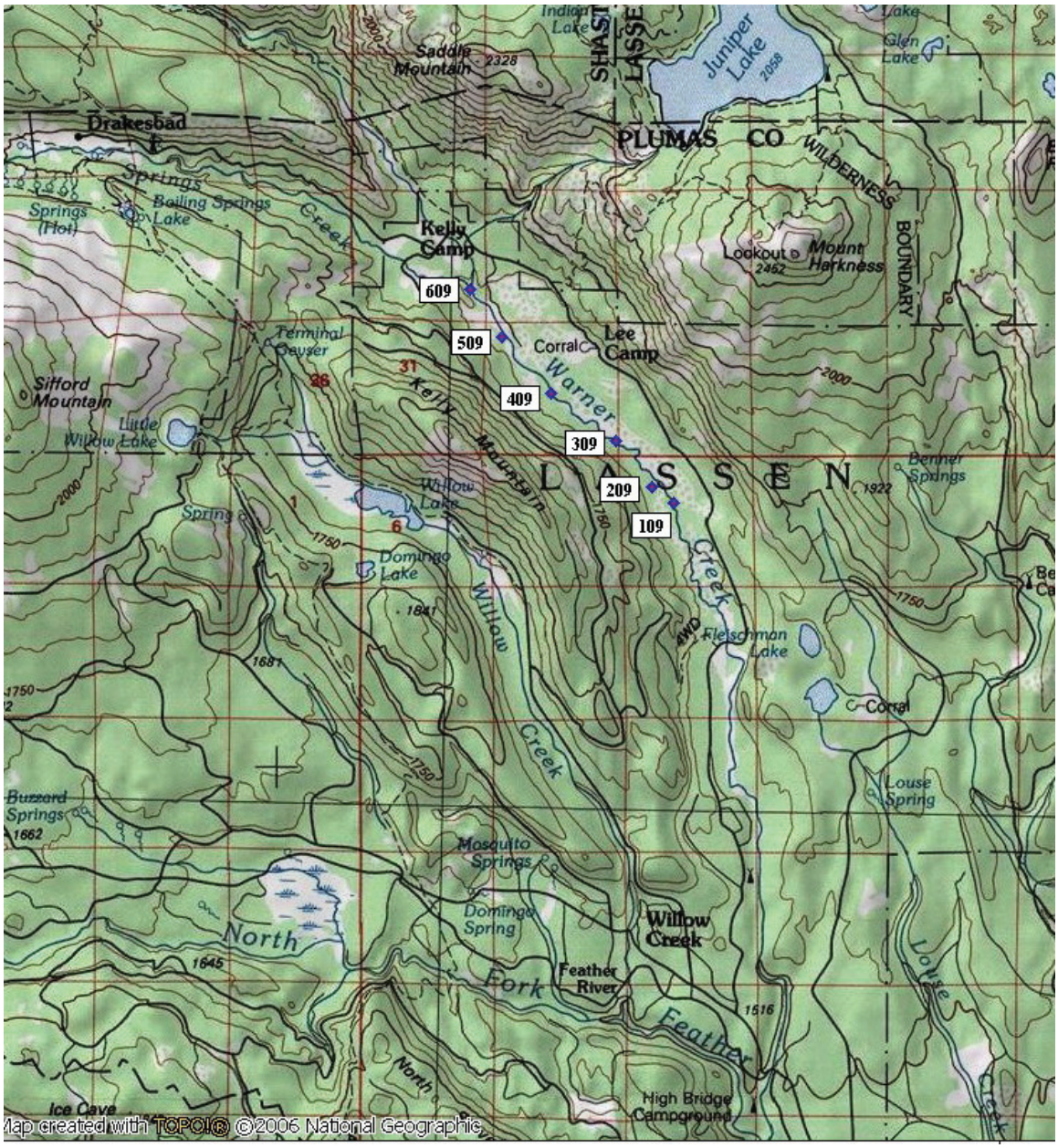
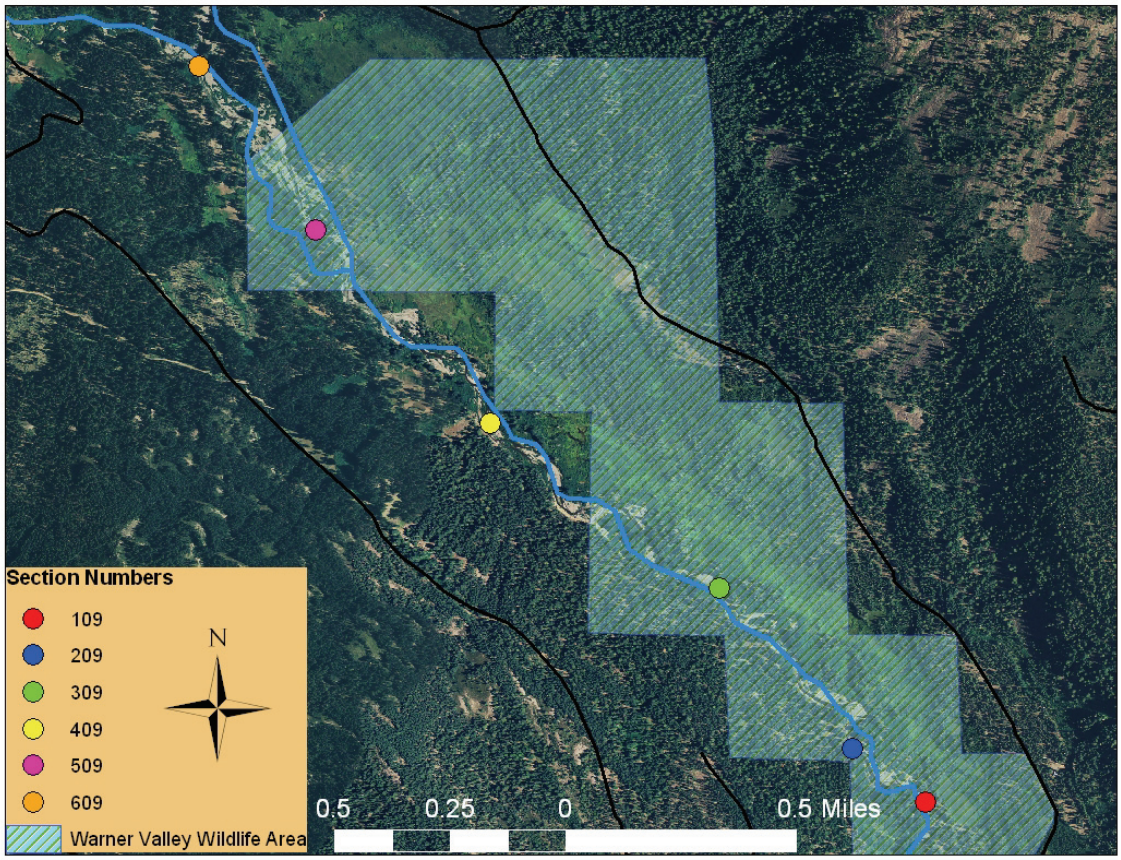


Figure 3. Detail map of Warner Creek 2009 direct observation survey locations (Sections 109-609) and Warner Valley State Wildlife Area.



Results:

The weather was sunny and warm on July 22, 2009. Air temperatures ranged between 22 ºC and 28 ºC and water temperatures ranged from 17 ºC to 19 ºC. Substrate was dominated by cobble and gravel and habitat was predominantly flatwater with some riffles and pools. A total of 1206.2 feet of stream habitat was surveyed (Sections 109-609 combined) with an average water depth of 1.3 feet and an average wetted width of 30.6 feet. Water visibility ranged from four to ten feet, with an overall average of eight feet (Table 1). A total of 59 rainbow trout (*Oncorhynchus mykiss*), 81 brown trout (*Salmo trutta*), 63 unknown trout, and one sculpin (*Cottus* spp.) were observed (Table 2). One of the trout not identified to species was under a large woody debris pile with poor light conditions; the remainder of unidentified trout were YOY. The one sculpin observed was dead and too decomposed to identify to species. The majority of both the coastal rainbow and brown trout observed were in the small size class (80% and 75% respectively). All fish were presumed to be wild. One frog (*Rana* sp.) was also observed in the vicinity of Sections 309 and 409; based on species distribution and native range accounts, it was likely a Cascade frog (R. *cascadae*).

Table 1. Summary of Warner Creek 2009 habitat data including section length, water visibility, habitat type, average water depth, and average wetted width by section.

Section number	Section length (ft)	Water visibility (ft)	Habitat type percentage			Average water depth (ft)	Average wetted width (ft)
			Flatwater	Riffle	Pool		
109	379.8	8	65	0	35	1.1	32.6
209	186.7	10	100	0	0	2.0	27.6
309	203.0	10	100	0	0	1.2	20.8
409	229.7	8	100	0	0	0.8	53.1
509	99.0	6	100	0	0	0.9	27.0
609	108.0	4	100	0	0	1.5	22.5
Average		**8**	**-**	**-**	**-**	**1.3**	**30.6**

Fish densities were calculated for each species by dividing the total number of fish observed (Sections 109-609 combined) by the total survey length of 1206.2 feet and converting feet to miles. The mean estimated densities for Warner Creek in 2009 were 258 rainbow trout per mile, 355 brown trout per mile, 276 unknown trout per mile, and four sculpin per mile (Table 2).

Table 2. Summary of Warner Creek 2009 direct observation survey results including the number of fish observed by species and size class per section and estimated densities.

Section	Section Length (ft)	Species	Number of fish observed						Estimated Density (fish/mile)
			YOY	Small 0"-5.9"	Medium 6"-11.9"	Large 12"-17.9"	Extra-large >18"	Total	
109	379.8	rainbow trout	0	24	4	0	0	28	389
		brown trout	0	10	1	0	0	11	153
		unknown trout	0	0	1	0	0	1	14
209	186.7	rainbow trout	0	3	1	1	0	5	141
		brown trout	0	9	1	1	2	13	368
		unknown trout	2	0	0	0	0	2	57
309	203.0	rainbow trout	0	4	1	0	0	5	130
		brown trout	0	3	0	1	0	4	104
409	229.7	rainbow trout	0	11	1	0	0	12	276
		brown trout	9	31	3	0	0	43	988
		unknown trout	60	0	0	0	0	60	1379
		sculpin			n/a			1	23
509	99.0	rainbow trout	0	1	1	0	0	2	107
		brown trout	2	4	0	0	0	6	320
609	108.0	rainbow trout	2	4	1	0	0	7	342
		brown trout	0	4	0	0	0	4	196
Total	**1206.2**	**rainbow trout**	**2**	**47**	**9**	**1**	**0**	**59**	**258**
		brown trout	**11**	**61**	**5**	**2**	**2**	**81**	**355**
		unknown trout	**62**	**0**	**1**	**0**	**0**	**63**	**276**
		sculpin			**n/a**			**1**	**4**

Figure 4. Warner Creek Section 609 site photograph at the confluence of Kings Creek and Hot Springs Creek.

Discussion:

The area of Warner Creek surveyed in 2009 either falls within or adjacent to public (state) lands and is open to public angling. DFG Sierra District General fishing regulations apply. Fishing is permitted from the last Saturday in April through November 15 and there is a five-fish bag limit per day with ten fish in possession allowed. Due to the presence of YOY, it is presumed that natural reproduction is occurring here in both brown and rainbow trout populations; there appeared to be good spawning habitat with cobble and gravel as the dominant substrates and all fish observed appeared to be of wild origin. Warner Creek was stocked by DFG with rainbow trout in 2008; however, this water was subsequently removed from the DFG's list of waters to stock (Don Ward, personal communication, 2010). Adjacent to the stream were large meadow complexes and associated channels. These habitats presumably provide good rearing habitat for juvenile fishes. Fish cover was fair and was composed of large woody debris, undercut banks, over-hanging vegetation, and limited areas of deeper water habitat. In addition to numerous small trout, a few medium and large fish were observed. In 2007, brook trout (*Salvelinus fontinalis*) were observed in both the main-stem and meadow complexes. None were observed in

2009; however, the meadow channels adjacent to the main-stem were not examined during the 2009 surveys.

Conclusion:

Warner Creek meets multiple criteria for Wild Trout designation including the presence of wild trout populations with multiple age classes, no stocking of hatchery fish, suitable habitat, and public accessibility. Warner Creek is aesthetically pleasing in the section that flows through Warner Valley State Wildlife Area; however, the publicly accessible portion is limited to less than three miles of stream habitat. As such, the HWTP recommends expanding Phase 2 candidate water assessments to a watershed level by including the North Fork Feather River and other headwater tributaries. In 2009, the HWTP conducted Phase 2 candidate water assessments on North Arm Rice Creek, a tributary to the North Fork Feather River and recommended continuing Phase 2 assessments on this water (Weaver and Mehalick 2009). The North Fork Feather River is currently stocked with hatchery trout at Lake Almanor but little is known about the distribution of these hatchery fish farther upstream in the watershed. The HWTP recommends pursuing Phase 2 candidate water assessments on the North Fork Feather River watershed, including Warner Creek and North Arm Rice Creek to better understand the influence and distribution of hatchery fish in the system and to gain population-level information including estimates of trout abundance. These surveys should also include first and second-order headwater streams of Warner Creek located within Lassen Volcanic National Park such as Kings and Hot Springs creeks to assess their role(s) in trout population dynamics in this watershed, as well as to evaluate their potential as recreational fisheries.

Since little is currently known about angling pressure within this watershed, the Phase 2 assessments should include installation of Angler Survey Boxes in one or more locations in order to collect voluntary angler information including angler effort, catch rates, numbers of trout caught by size class and species, and angler satisfaction. A creel census may also be of value in order to determine angling pressure and possible impacts to the wild trout population in this drainage.

References:

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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.

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