Caples Creek 2011 Summary Report

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Heritage and Wild Trout Program

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Introduction

Caples Creek, in El Dorado and Alpine counties, drains the western slope of the Sierra Nevada Mountains in the vicinity of Kirkwood, California (Figure 1). Caples Creek originates from Caples Lake, flows westward for approximately nine miles, and is tributary to the Silver Fork American River. The Caples Creek Canyon is a proposed Wilderness Area (Eldorado National Forest) and contains wild populations of coastal rainbow trout (*Oncorhynchus mykiss irideus*), brown trout (*Salmo trutta*), and brook trout (*Salvelinus fontinalis*). The California Department of Fish and Game (DFG) Heritage and Wild Trout Program (HWTP) has been evaluating Caples Creek for designation as a Wild Trout Water since 2005 (Martin et al. 2005; Weaver and Mehalick 2007 and 2009). Wild Trout Waters are those that support self-sustaining (wild) populations of trout, are aesthetically pleasing and environmentally productive, provide adequate catch rates in terms of numbers or size of trout, and are open to public angling. Wild Trout Waters may not be stocked with catchable-sized hatchery trout (Bloom and Weaver 2008).

A continuation of HWTP Phase 2 candidate water assessments was conducted in 2011 to gather baseline trend data on the fishery, including species composition, size class structure, and estimates of abundance. Surveys were conducted via single- and multiple-pass electrofishing, angling, and associated habitat analysis.

Methods

Multiple-pass electrofishing

Multiple-pass electrofishing surveys were conducted by HWTP staff and volunteers from October 18th through 20th, 2011 at three locations (Sections 1-3) in Caples Creek between Caples Lake and the confluence with the Silver Fork American River. These sections included two historic electrofishing sites (Sections 1 and 2), for long-term population trend analysis, and one newly established site (Section 3) to increase the geographic extent of sampling. For historic sections, the HWTP used written descriptions, site sketches, photographs, and geographic coordinates to located section boundaries. Section 3 was established as far upstream from the confluence with the Silver Fork American River as feasible and was selected to represent lower-gradient slow water representative of this reach of the creek. Section boundaries were chosen at areas where mesh block nets could effectively be installed and maintained throughout the survey effort.

At each section boundary, nylon mesh block nets were installed across the wetted width, effectively closing the population within the section. Both ends of the nets were secured above bankful width, heavy rocks were placed side by side along the bottom of the nets, and the nets were secured in order to hold the top of the net out of the water. These nets were routinely monitored and

inspected throughout the survey to ensure their integrity and to prevent fish from moving into or out of the section during the course of the survey.

Prior to electrofishing, physical measurements of the stream and environmental conditions were taken, including air and water temperature (ºC) and conductivity (microsiemens). These factors were used to determine appropriate electrofisher settings. Coordinates were recorded for both the upstream and downstream boundaries of the survey using a hand-held Global Positioning System (GPS) unit (North American Datum 1983). Current weather conditions were noted and the section was visually surveyed to determine the presence or absence of any species of concern prior to commencing the surveys.

Personnel needs were determined based on stream width, habitat complexity, and water visibility. For each of the surveys, individuals were assigned to electroshock, net, and tend live cars for the duration of the effort. Surveys were initiated at the downstream block net and proceeded in an upstream direction, with netters capturing fish and placing them in live cars to be held until processed. Live cars consisted of 32-gallon plastic trash bins perforated with holes to allow water circulation. Three passes were conducted within each section using Smith Root backpack electrofishers, with fish from each pass stored separately. Over the course of the survey, fish were handled carefully to minimize injury and stress and were processed separately by pass number. Each fish was identified to species and total length (mm) and weight (g) were measured. Fish were then recovered in live cars secured in the stream (with fresh flowing water) and released back into the section.

A habitat assessment was conducted to document resource condition by collecting base-line data on habitat types and quality, water conditions, substrate, discharge, bank condition, and other attributes. The HWTP habitat assessment is a pared-down synthesis of Rosgen (1994) and the California Salmonid Stream Habitat Restoration Manual (CSSHRM; Flosi et al. 1988). Section length (ft) was measured along the thalweg. The length of the section was then divided into five cells of equal length. Wetted widths (ft) were measured at the center of each of the five cells. Across each width transect, five depths (ft) were taken (also at the center of five evenly divided cells), and both widths and depths were averaged for each section.

Stream characteristics, including active erosion (erosion occurring in the present), erosion at bankful, and canopy closure were measured as percentages of either the total stream area (canopy cover) or bank area (erosion). Section percentages were defined for each habitat type (riffle, flatwater, and pool) following Level II protocols as defined by the CSSHRM. Using visual observation, substrate size classes and the percentage of each class relative to the total bottom material within the wetted width were quantified. A rating (between poor and excellent) was given to the instream cover available to fish and cover types were identified and defined as percentages of total instream cover. The change in water surface elevation (section gradient; %) and streamflow (cubic feet per

second; cfs) were measured. Representative photographs of the section were taken.

Fish measurements were entered into DFG's Fisheries Information Sharing Host (FISH) database and were extracted into MicroFish (MicroFish Software). Based on the capture rate (number of fish captured per pass) and probability of capture, a population estimate was determined for each species in each section. MicroFish also calculated the average weight of each species by section. The population estimate was used to determine abundance in terms of both biomass (pounds per acre) and density (fish per mile) of each species. Fish biomass estimates incorporate habitat parameters such as section length, average wetted width, and average weight of fish (by species) and density estimates are determined based on section length and the estimated population.

Single-pass electrofishing

Single-pass electrofishing was conducted on October 21, 2011 upstream of Section 2 and downstream of Caples Lake to determine the presence or absence of non-game fishes that were previously observed in 2009. Heritage and Wild Trout Program staff surveyed in an upstream direction and opportunistically captured fish in habitats that were conducive to backpack electrofishing. All fish were identified to species, tallied by size (total length measured to the nearest inch using a calibrated landing net), and released downstream of the electrofishing effort.

Angling

An angling effort was conducted in Caples Creek on October 4 and 17, 2011 to better understand catch rates 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 class (total length measured to the nearest inch using a calibrated landing net). Size classes were divided into the following categories: small (< 6 inches); medium (6-11.9 inches); large (12-17.9 inches); and extra-large (≥ 18 inches).

Results

Multiple-pass electrofishing

Caples Creek from Caples Lake downstream to the confluence with the Silver Fork American River is approximately nine miles in length and includes both meadow and forested habitat. During the survey effort, water temperature was approximately 10º C and air temperatures ranged from 10º to 22º C, depending on the time of day. Among the three multiple-pass electrofishing sections, the HWTP surveyed a total of 1264 feet of stream habitat and captured 113 coastal rainbow trout (*Oncorhynchus mykiss irideus*), 69 brown trout (*Salmo trutta*), and 52 brook trout (*Salvelinus fontinalis;* Table 1). Mean wetted width was 38.0 feet, mean water depth was 0.9 feet, and mean streamflow was 11.75 cfs (Table 2).

Section 1 was located in the upper portion of the watershed in low-gradient (<1%) meadow habitat with no canopy cover, relatively high erosion levels, gravel and sand-dominated substrate, and good instream fish cover (Figure 3). Section 2 included medium-gradient (7%) habitat with little canopy cover, low erosion, excellent fish cover, and boulder-dominated substrate (Figure 4). Section 3 was located in low-gradient forested habitat with 80% canopy cover, high erosion, gravel and sand-dominated substrate, and poor fish cover (Figure 5). Captured coastal rainbow trout ranged in size from 18 to 242 mm total length, with a mean of 126 mm (Figure 6 and Table 3). Captured brown trout ranged in size from 49 to 284 mm, with a mean of 112 mm. Captured brook trout ranged in size from 58 to 177 mm, with a mean of 96 mm. Coastal rainbow and brown trouts appear to be distributed throughout the majority of Caples Creek, while brook trout are limited to the upper portion of the watershed. Zero coastal rainbow trout were captured in Section 1; however, ten were captured upstream of this location. Coastal rainbow trout appear to be the most abundant species in Caples Creek, with a mean density of 849 fish per mile (average of the three sections). Brown trout were captured in all three sections with an estimated density of 360 fish per mile. Brook trout were only captured in Section 1 and their density was estimated at 421 fish per mile.

Multiple-pass electrofishing surveys were previously conducted by the HWTP in in Sections 1 and 2 (2005). A comparison between the two efforts indicated that trout abundance was much lower for all species in 2011 (Table 4).

Single-pass electrofishing

The single-pass electrofish effort occurred in the upper portion of the watershed and spanned a distance of approximately 1.1 miles (Section 111; Figure 7). A total of ten coastal rainbow trout, two brown trout, five brook trout, one Lahontan redside (*Richardsonius egreguis*), and one lake trout (*Salvelinus namaycush*) were captured. The latter two species were captured within one-half mile of Caples Lake.

Angling

The angling effort was conducted at various locations from the confluence with the Silver Fork American River upstream approximately three miles. The total effort among the six anglers was 19.67 hours (Table 5). Twenty-three coastal rainbow trout (43% small and 57% medium-sized) and four brown trout (75% small and 25% medium-sized) were captured. Catch rates ranged from one to two fish per hour with a mean of 1.4 fish per hour.

Discussion

Based on the results of the 2009 Caples Creek assessment, the HWTP recommended continuing Phase 2 candidate water assessments to monitor potential impacts of introduced non-game species, gather population-level data

on the trout species present, and to evaluate the recreational fishery (Weaver and Mehalick 2009). In 2009, speckled dace (*Rhinichthys osculus*), suckers (*Catostomus* sp.), and Lahontan redside were observed in Caples Creek for the first time by the HWTP. It was presumed these fishes were introduced into Caples Lake as baitfish and entered the creek during the de-watering of Caples Lake by the El Dorado Irrigation District in 2008 for dam repairs. In 2011, zero suckers or speckled dace were captured. It is presumed these fishes were not able to survive in the more dynamic stream conditions. Lahontan redside were captured in 2011 but it appears that abundance decreased since 2009 and their distribution was more limited. This marks the first year in which lake trout were observed by the HWTP in Caples Creek. They may have been present in 2009 in low densities and were missed during surveys or the invasion may have been more recent.

In general, flow regime changes that occurred in 2008 due to the dewatering of Caples Lake likely had an effect on habitat (especially sedimentation), species composition, trout size class structure, and fish abundance.

Conclusion

Caples Creek is a west-slope Sierra Nevada stream with wild coastal rainbow, brown, and brook trouts. The stream is open to sport fishing from the last Saturday in April through November 15, with a daily bag and possession limit of five per day and ten in possession. From November 16 through the Friday preceding the last Saturday in April, it is open to sport fishing with a zero bag limit and special regulations specifying only artificial lures with barbless hooks may be used.

Due to the decreased trout abundance observed in 2011, the HWTP recommends continued Phase 2 candidate water assessments in Caples Creek to gather population-level data on the trout fishery and to better understand angling pressure. The HWTP recommends installing angler survey boxes at multiple access points throughout the Caples Creek canyon, including the Silver Fork American River and Margaret Lake trailheads. Consideration should be given to collaborative efforts with local volunteer groups to collect additional angling data to supplement information on catch rates and size classes over a broad spectrum of angler experience levels. Due to the anthropogenic changes to the flow regime and associated sedimentation, the HWTP recommends continued monitoring of introduced non-game species, changes in habitat and substrate composition, and potential impacts to fish populations.

References

Bloom, R. and J. Weaver. 2008. California Heritage and Wild Trout Program Handbook (Draft). State of California. Resources Agency. Department of Fish and Game. Rancho Cordova, CA.

Martin, C., S. Dietrich, and D. Contreras. 2005. Caples Creek Wild Trout Assessment 2005. State of California Resources Agency. Department of Fish and Game Region 2.

Moyle, P. B. 2002. Inland Fishes of California. University of California Press, CA: 135-162.

Weaver, J. and S. Mehalick. 2007. Caples Creek 2007 Summary Report. State of California. Resources Agency. Department of Fish and Game. Heritage and Wild Trout Program. Rancho Cordova, CA.

Weaver, J. and S. Mehalick. 2009. Caples Creek 2009 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 Caples Creek 2011 survey locations

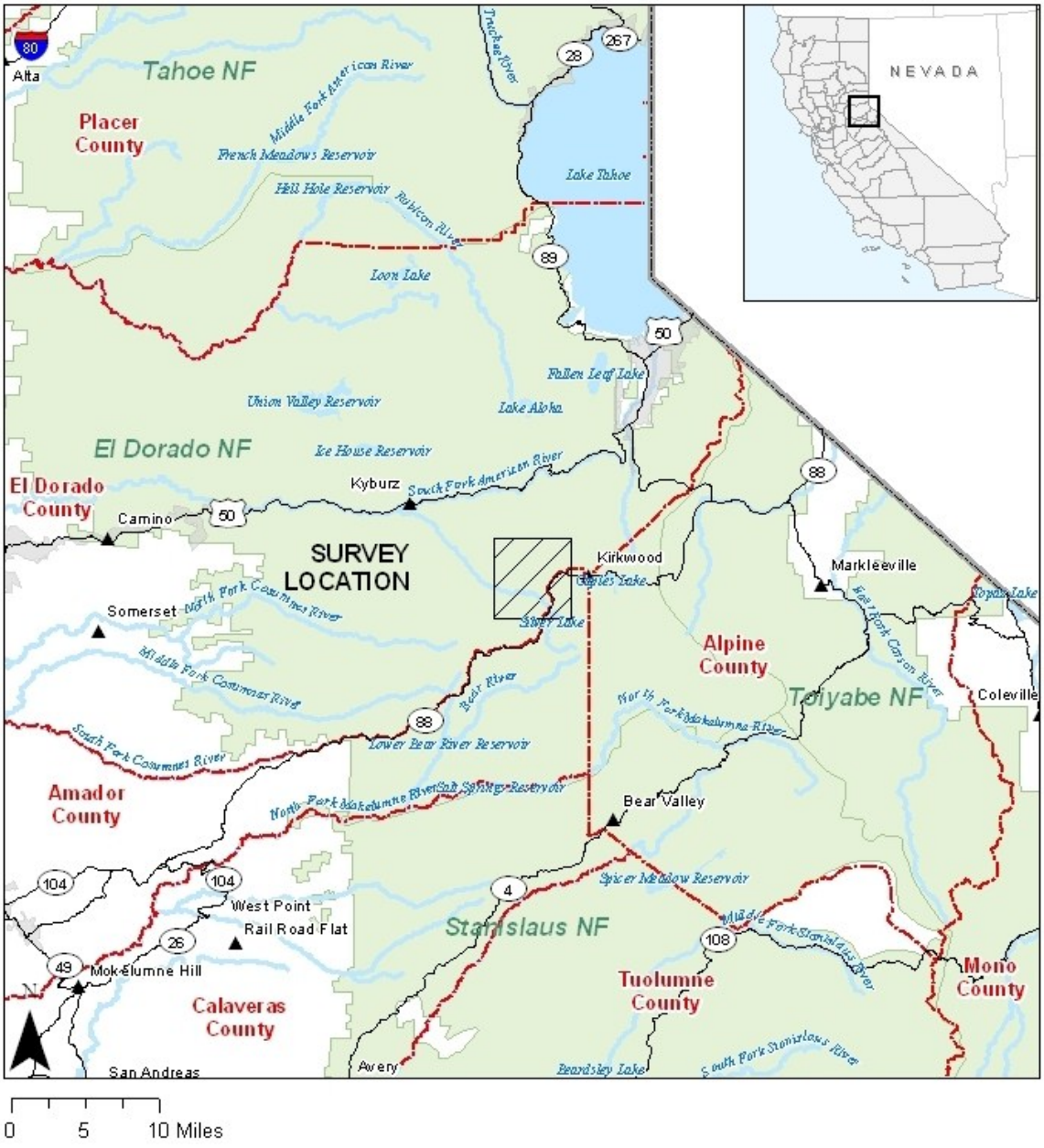

Figure 2. Detail map of Caples Creek 2011 survey locations

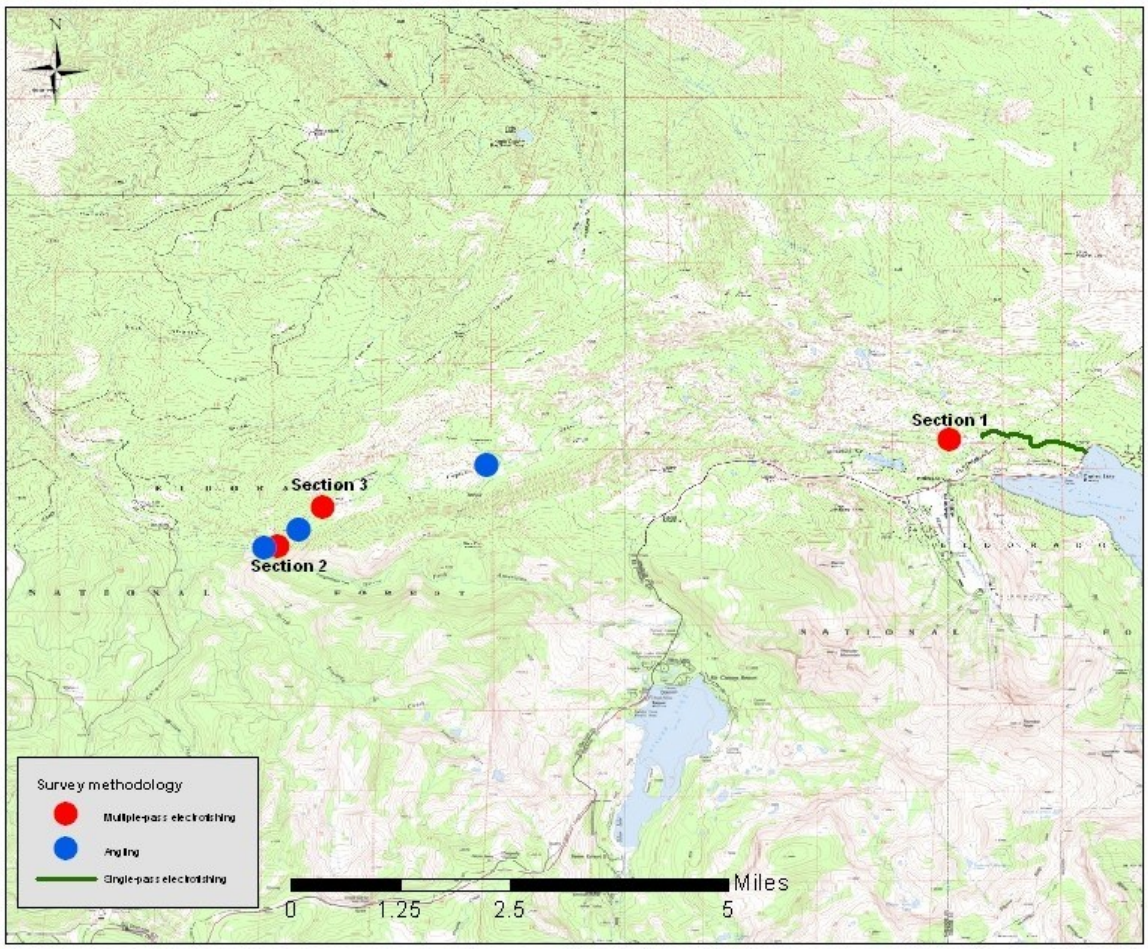

Figure 3. Representative photographs of Caples Creek Section 1

Figure 4. Representative photographs of Caples Creek Section 2

Figure 5. Representative photographs of Caples Creek Section 3

Figure 6. Representative photographs of fish captured in Caples Creek in 2011; clockwise from top left: brown trout, rainbow trout, lake trout, Lahontan redside, and brook trout

Figure 7. Representative photographs of Caples Creek Section 111 single-pass electrofish survey

Table 1. Summary of 2011 multiple-pass electrofishing abundance data in Caples Creek

Section	Section length (ft)	Species	Total number captured	Estimated population	Estimated density (fish/mile)	Estimated biomass (lbs/acre)	Capture probability
1	690.5	brook trout	52	55	421	4.46	60.5%
		brown trout	9	9	69	0.7	60.0%
2	219.5	coastal rainbow trout	64	68	1636	19.01	59.3%
		brown trout	7	8	192	4.04	43.8%
3	354.0	coastal rainbow trout	49	61	910	10.42	41.2%
		brown trout	53	55	820	11.85	63.9%

Table 2. Summary of 2011 multiple-pass electrofishing habitat data in Caples Creek

Section	Section length (ft)	Habitat type			Overall instream cover rating	Bankful erosion (%)	Active erosion (%)	Canopy closure (%)	Average wetted width (ft)	Average water depth (ft)	Streamflow (cfs)	Gradient (%)
		Riffle (%)	Flatwater (%)	Pool (%)								
1	690.5	0	85	15	Good	70	20	0	23.3	1.0	10.77	0.4
2	219.5	0	100	0	Excellent	5	0	5	56.8	0.7	12.80	6.7
3	354.0	0	100	0	Fair	70	15	80	34.0	1.0	11.68	0.1

Section	Instream cover type percentages						
	Aquatic vegetation	Boulders	Large woody debris	Water turbulence	Overhanging vegetation	Undercut banks	Water depth
1	5	0	30	2	8	20	35
2	0	35	10	25	5	0	25
3	10	7	50	5	0	5	23

Section	Substrate type percentages						
	Bedrock	Boulder (>10")	Cobble (2.5"-10")	Gravel (0.8"-2.5")	Sand (<0.8")	Silt/fines	Organic
1	0	0	0	45	30	20	5
2	0	70	9	5	15	1	0
3	0	5	0	40	40	10	5

Table 3. Summary of 2011 multiple-pass electrofishing size class distribution in Caples Creek

Section	Species	Total number captured	Total length min (mm)	Total length max (mm)	Total length mean (mm)	Weight min (g)	Weight max (g)	Weight mean (g)
1	brook trout	51	58	177	96	2.3	63.3	13.8
	brown trout	8	53	129	102	2.0	19.6	12.6
2	coastal rainbow trout	63	18	219	145	0.7	111.2	36.9
	brown trout	6	68	183	149	3.0	64.7	47.8
3	coastal rainbow trout	48	35	242	104	0.4	131.8	21.6
	brown trout	52	49	284	107	1.2	230.8	27.6
Total	coastal rainbow trout	111	18	242	127	0.4	131.8	30.3
	brook trout	51	58	177	96	2.3	63.3	13.8
	brown trout	66	49	284	110	1.2	230.8	27.6

Table 4. Summary of 2005 multiple-pass electrofishing abundance data in Caples Creek

Section	Survey date	Section length (ft)	Species	Total number captured	Estimated population	Estimated density (fish/mile)	Estimated biomass (lbs/acre)	Capture probability
1	9/7/2005	543.0	coastal rainbow trout	8	8	78	2.16	61.5%
			brook trout	84	96	933	8.15	49.4%
			brown trout	27	31	301	23.05	47.4%
2	9/8/2005	201.0	coastal rainbow trout	51	79	2075	91.67	29.0%
			brown trout	28	47	1235	29.6	25.7%

Table 5. Summary of 2011 angling data in Caples Creek

Angler	Date	Effort (hrs)	Species	Total number captured					Catch per unit effort (fish/hr)
				Small	Medium	Large	Extra-large	Total	
				< 6.0"	6" - 11.9"	12" - 17.9"	≥ 18"		
Hanson	10/4/2011	3.00	coastal rainbow trout	5	1	0	0	6	2.0
Silva	10/4/2011	5.00	coastal rainbow trout	0	1	0	0	5	1.0
			brown trout	3	1	0	0		
Zuber	10/4/2011	4.67	coastal rainbow trout	1	4	0	0	5	1.1
Drummond	10/17/2011	1.00	coastal rainbow trout	1	0	0	0	1	1.0
Rizza	10/17/2011	1.00	coastal rainbow trout	0	2	0	0	2	2.0
Silva	10/17/2011	1.00	coastal rainbow trout	1	0	0	0	1	1.0
Wassmund	10/17/2011	2.00	coastal rainbow trout	0	3	0	0	3	1.5
Zuber	10/17/2011	2.00	coastal rainbow trout	2	2	0	0	4	2.0