

Santa Paula Creek Watershed Planning Project: Steelhead Habitat and Population Assessment

TECHNICAL MEMORANDUM

Prepared for Santa Paula Creek Fish Ladder Joint Powers Authority California Department of Fish and Game

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1 INTRODUCTION

Coastal populations of *Oncorhynchus mykiss* may be composed of both anadromous and freshwater resident life histories. Individuals expressing anadromous life histories are referred to as steelhead, while those that remain in freshwater for the duration of their life cycle are referred to as rainbow trout. In Santa Paula Creek, a tributary to the Santa Clara River, Ventura County, California, opportunities for expression of the anadromous life history are restricted by migration barriers preventing the upstream return of adult steelhead. A residual population of *O. mykiss* now persists in suitable stream habitat above the Harvey Diversion (Stoecker and Kelley 2005). Restoring the migratory component of *O. mykiss* within the watershed has been identified as a priority management goal. In support of feasibility studies concerning the restoration of migratory fish passage within Santa Paula Creek, the California Department of Fish and Game requested an assessment of the residual rainbow trout population be conducted to meet the following objectives:

- 1. Determine the spatial distribution of *O. mykiss* in Santa Paula Creek and key tributaries.
- 2. Determine key habitat characteristics of stream reaches occupied by O. mykiss.
- 3. Determine the relative abundance and age class structure of *O. mykiss*.

This report describes the methods and results of work completed to date, consisting of a reconnaissance-level field effort conducted in May 2007 and a more detailed population assessment of *O. mykiss* during November 2007. Results from these field efforts provide baseline information on *O. mykiss* distribution, habitat, and abundance in the Santa Paula Creek watershed under conditions which do not allow anadromy.

2 METHODS

Stream habitat and fish surveys were conducted in May and November 2007 within the Santa Paula Creek watershed. Stream habitat surveys were conducted to identify dry stream reaches, determine maximum daily stream temperatures throughout the watershed, and continuously monitor temperature throughout the summer months. Fish surveys were conducted to determine the distribution, relative abundance, and age class structure of O. mykiss. High stream temperatures have been identified as a factor that may limit availability of summer rearing for O. mykiss in the southern end of their range (Boughton et al. 2006), and was therefore chosen as a key characteristic of summer rearing habitat to monitor within the Santa Paula Creek watershed. Surveys were conducted in three portions of the Santa Paula Creek watershed (Map 1). Each portion was selected to include potential rearing habitat for anadromous O. mykiss above Harvey Diversion Dam (RM 3.9), and therefore did not extend past natural (e.g., waterfall) migration barriers identified by previous surveys (Stoecker and Kelly 2005). Accessible portions of Santa Paula Creek extend from Harvey Diversion Dam (RM 3.9) to the natural waterfall barrier upstream (RM 9.8). Accessible portions of Sisar Creek extend from the confluence (RM 0.0) to barriers identified by Stoecker and Kelly (2005) in Sisar Creek (RM 5.9) and East Fork Sisar Creek (RM 0.5). The survey reaches are:

- **Little Santa Paula Creek:** from the confluence with Sisar Creek (RM 6.6) to the East Fork of Santa Paula Creek just upstream of the natural waterfall barrier (RM 9.8).
- **Sisar Creek:** beginning at the confluence with Santa Paula Creek (RM 0.0) upstream past the Forest Service Gate (RM 4.1).
- Mainstem Santa Paula Creek: downstream of the Sisar Creek confluence, near the downstream end of Steckel Park (RM 4.5) upstream to the confluence with Santa Paula Creek and Sisar Creek (RM 6.6).

2.1 Dry Reach and Stream Temperature Surveys

Dry stream reaches were identified in May and November by walking the stream channel and mapping the extents of completely dry stream channel on aerial photographs (scale of 1:1,274). The field maps were then digitized in a geographic information system (GIS) and the length of dry channel was measured from using 2005 color orthophotos and 1 meter LIDAR DEM.

Summer stream temperature monitoring consisted of detailed mapping of maximum daily stream temperatures at the beginning of the dry summer season and continuous temperature monitoring at selected sites throughout the watershed. On May 23, 2007, instantaneous measurements of maximum daily stream temperature were collected with a YSI 85 thermometer and mapped on aerial photographs at 1°C intervals. All instantaneous measurements were taken between 2:00pm–4:30pm, when stream temperatures were hottest and temperature fluctuation was lowest. Preliminary continuous temperature data from confirmed that maximum daily stream temperatures occurred during the afternoon hours between 2:00pm and 4:30pm (Figure 2-1).

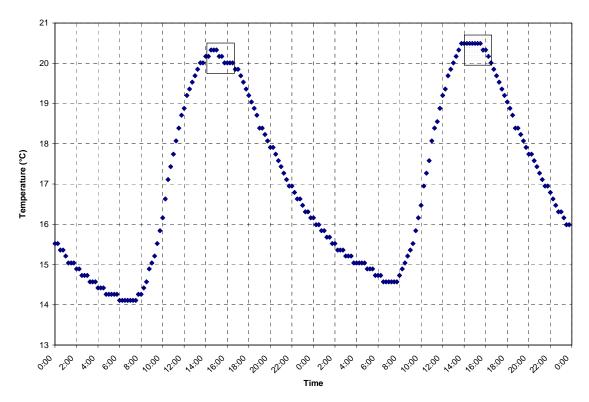


Figure 2-1. Continuous stream temperature in 15-minute intervals in Sisar Creek, above the confluence with Santa Paula Creek, May 2007. The time period during which instantaneous measurements of maximum daily stream temperature were taken is highlighted.

In addition to the maximum daily stream temperature measurements, continuous stream temperature monitoring was initiated during our May survey. Continuous temperature loggers were deployed at 22 locations throughout the watershed (Map 1). Sites were selected based on the results of maximum temperature mapping to capture the range of temperatures in potentially suitable summer rearing habitat. Thermographs used were Stowaway TidBits (Onset Computer Corporation, Pocasset, MA) and were set to record water temperature at 15-minute intervals. Two additional thermographs were attached to riparian vegetation to record ambient air temperature in areas adjacent to stream temperature monitoring sites. Upon retrieval in November, two thermographs were not recovered and six were no longer submerged (Table 2-1).

Table 2-1. Location and condition of continuous temperature monitors placed throughout the Santa Paula Creek watershed, from May to November 2007.

Creek	Thermograph ID	River Mile	Condition
Mainstem	1A (air)	3.9	air temp
Santa Paula	1B (water)	3.9	missing
Creek	2	6.6	in water
	3	6.7	missing
	4	6.9	in water
	5	7.3	dry channel bed
	6	7.4	in water
T. C.	7	7.6	in water
Little Santa Paula Creek	8	8.0	in water
r auta Cieek	9	8.3	in water
	10	8.5	in water
	11	8.8	in water
	12	9.0	in water
	13	9.5	in water
	14	0.0	in water
	15	0.5	dry channel bed
	16	0.6	dry channel bed
	17	1.6	not submerged
Signa Cungli	18 A (air)	2.2	air temp
Sisar Creek	18 B (water)	2.2	in water
	19	2.4	in water
	20	3.3	not submerged
	21	3.8	not submerged
	22	4.1	in water

2.2 *O. mykiss* Presence and Absence Surveys

To identify the distribution of *O. mykiss* during May, a protocol for quickly determining presence of *O. mykiss* in pool habitats within study reaches was developed using a combination of visual surveys and electrofishing. Although age 0+ *O. mykiss* were documented during the survey, we focused our effort on age 1+ and older *O. mykiss* (defined as fish >75 mm at the time of the May survey) because we believed that their survival through the previous summer made their presence a more reliable indicator of reaches providing suitable summer rearing habitat. Additionally, age 0+ *O. mykiss* may still have been emerging during the May survey, and so their potential absence from stream reaches might not be a reliable indicator of summer habitat quality.

Presence and absence surveys proceeded in a stepwise fashion. First, streamside observations were made by slowly walking upstream along the streambank and observing all pool habitat for *O. mykiss*. In pools where no age 1+ or older fish were observed during streamside observations, the pool was snorkeled to search for age 1+ and older fish. If age 1+ and older fish were still not observed while snorkeling, the pool was subsequently electrofished using a single pass to verify the absence of fish. An exception to this protocol occurred in mainstem Santa Paula Creek where we relied solely on electrofishing to determine fish presence because water visibility was not sufficient for streamside or underwater observations.

The extent of stream surveyed varied by study reach. In Sisar Creek, where habitat quality and stream temperatures were relatively consistent, we focused pool habitat in areas near the upstream and downstream extent of wetted reaches to document where *O. mykiss* persisted in relation to stream de-watering. Presence and absence surveys in pool habitat was continuous in Little Santa Paula Creek (*i.e.*, all pools were sampled) to verify the presence of *O. mykiss* within portions of the stream that exhibited high temperature variability and habitat quality over relatively short distances. All pools sampled were given unique identification numbers, and locations were documented on aerial photographs and recorded using a GPS unit. Sample pools were then digitized in GIS.

In November, we revisited pool habitat within the warmest portions of Little Santa Paula Creek to determine if pools where fish were present in May still contained fish at the end of the dry season. We did not differentiate between age classes during the November survey because the sizes of some age 0+ and age 1+ fish were similar by the end of summer and we therefore did not have a practical sized-based determination of fish age to use in the field. Because the survey was inclusive of all age classes, it provides a conservative assessment of fish persistence over the summer (*i.e.*, the absence of fish of any age class should be a more reliable indicator of unsuitable habitat than the absence of a particular age class of fish).

2.3 O. mykiss Population Surveys

In November 2007, habitat and electrofishing surveys were conducted to determine *O. mykiss* densities and age class structure with Little Santa Paula Creek and Sisar Creek. Population surveys were conducted at three reaches within the Santa Paula Creek watershed (Map 2):

Little Santa Paula Creek:

Middle Little Santa Paula Creek: from RM 8.0 to RM 8.3.

Sisar Creek:

- Lower Sisar Creek: just upstream of the Osborn road crossing (RM 2.2) to ~ 200 ft below the Koenigstein Road crossing (RM 2.4).
- Upper Sisar Creek: ~ 500 ft upstream of the Sisar Road crossing (RM 3.9) upstream to the confluence with a dry tributary (RM 4.0).

Study reaches were chosen to represent locations within Little Santa Paula Creek and Sisar Creek that appeared to provide relatively high quality habitat. The Little Santa Paula Creek and Lower Sisar Creek reaches were chosen because of relatively cool stream temperatures and previous observations of *O. mykiss* during the May survey. The Upper Sisar Creek reach was selected to determine whether densities or age classes of *O. mykiss* differed in a portion of Sisar Creek with different channel conditions (*e.g.*, higher channel gradient). However, we combined estimates in Sisar Creek after we determined that habitat-specific densities were similar in the two reaches. These population surveys were intended to compare densities of "good habitat" within the two creeks, and were not necessarily intended to provide values to extrapolate throughout the watershed. A more comprehensive population survey including a number of sites over a variety of reaches designated by differences in slope, confinement, and substrate would allow for extrapolation of densities to a watershed-wide population estimate.

Reach-level habitat measurements occurred by obtaining general habitat parameters such as habitat type, average length and average width to determine habitat type frequency and area

within each reach. Habitat types were determined using definitions described by the California Department of Fish and Game (Flosi *et al.* 1998). Four habitat types were identified during the course of the survey: pools, pocketwater, riffles, and runs. Pocketwaters were defined as a unit with exposed boulders creating eddies and scour holes throughout the unit (Flosi *et al.* 1998). Pools exhibited slow velocity habitat with consistent depth and scour throughout the majority of the channel width. Riffle and runs were rare habitat types, where riffles were shallow with little surface flow with exposed substrate, whereas runs had more volume, little surface agitation and exposed substrate. In cases where sections of creek seemed to be distinct habitat types but were not as long as they were wide, they were lumped in with adjacent habitat units.

Units chosen for electrofishing surveys were selected by identifying the two most dominant habitat types that existed within each reach that likely provided suitable habitat for *O. mykiss*. The two dominant habitat types were identified by the habitat measurements for each reach, and were determined to be pool and pocketwater habitat. Within each reach up to four units of the dominant habitat types (pools and pocketwater) were selected. These units were selected by choosing representative sample units that were spatially distributed throughout the length of each reach. Additional detailed habitat measurements were taken at each electrofished unit and included average lengths, widths, depths, maximum depth, and percent cover. All units were given a unique identification number, and locations were documented on aerial photographs and recorded using a GPS unit.

Electrofishing surveys occurred in each sample unit by using a Smith-Root LR-24 backpack electrofisher. Each unit was blocked off with nets to prevent movement of fish in or out of the sampling areas. The bottoms of the block nets were sealed off with rocks, and the tops of the nets were propped above the water surface with dowels or PVC pipe. Each field technician carrying a backpack electrofisher was accompanied by one or two netters. One backpack electrofisher with two netters was sufficient for coverage of the sampling areas. The sampling crew, to the degree possible, maintained a line perpendicular to the stream channel while moving upstream to maximize capture probabilities. A multiple-pass depletion method was employed at each sample unit, starting with a minimum of three passes and continuing with additional passes if a sufficient depletion was not obtained. After each pass, all fish were processed by measuring fork length (FL) to the nearest millimeter (mm) and weight to the nearest 0.1 gram. Scales were taken from a subset of *O. mykiss* over 80 mm (FL) to archive for aging if desired at a later date. After processing, fish were kept in a live well in an adjacent habitat unit and were released into their original habitat once they had sufficiently recovered from the effects of handling.

Densities were calculated by determining estimates of abundance for each sampled unit based on multiple-pass depletion electrofishing. A robust, jackknife estimator of abundance was applied (Pollock and Otto 1983), as proposed by Mohr and Hankin (2005) for estimation of fish abundance in small streams:

$$\widetilde{y}_J = \sum_{i=1}^{r-1} c_i + rc_r \,,$$

where \tilde{y}_J is the estimate of abundance for unit J, c_i is the number of fish captured on the ith pass, r is the total number of passes, and c_r is the number of fish captured on the final pass. These estimates of unit abundance were then divided by the respective measured habitat areas to obtain fish densities by unit.

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Density estimates are often calculated separately for each age class of *O. mykiss* to determine variations of abundance for each age class. These calculations were not possible for the Santa Paula Creek watershed due to the difficulty of determining age class delineations by length frequency histograms (see *O. mykiss* Age Class Structure). Scale samples taken during electrofishing surveys could be analyzed at a later date to determine age class specific densities.

3 RESULTS AND DISCUSSION

3.1 Stream Temperature Surveys

The following sections provide results and discussion for stream temperature surveys conducted in May and November 2007.

3.1.1 Dry Reaches

In May 2007, all tributaries to the Little Santa Paula Creek reach were completely dry, with the exception of Sisar Creek. An additional dry reach of 0.06 miles was identified within Little Santa Paula Creek (near RM 7.1) and two dry reaches were identified within Sisar Creek (RM 0.6 to RM 1.4 and RM 2.5 to RM 3.2). Dry reaches observed in May 2007 are shown in Map 1.

By the end of summer, the length of the dry reaches in Little Santa Paula and Sisar creeks increased significantly (Map 2). In Little Santa Paula Creek, the extent of the dry reach increased from a 0.06 miles in May to 0.3 miles in November, extending from RM 7.0 to RM 7.3. In Sisar Creek, the two dry reaches increased in length by 0.6 miles combined, with one reach extending from RM 0.2 to RM 1.4, and the other reach extending from RM 2.4 to RM 3.3. Cumulatively, the dry reaches in Sisar Creek reduced the available summer rearing habitat by 2.1 miles, which is equivalent to 32% of the stream length potentially accessible to anadromous *O. mykiss* in Sisar Creek. Recent surveys during the beginning of a wet water year, in November 2004, reported no dry reaches in either Little Santa Paula Creek or Sisar Creek (Stoecker and Kelley 2005). Although these surveys were not continuous in each creek, some of their sites were within reaches that were dry during our November 2007 surveys, indicating the extent of available habitat for *O. mykiss* may vary considerably from year to year.

3.1.2 May Maximum Daily Stream Temperatures

Maximum daily stream temperatures in May ranged from 16 to 28 °C within the study reaches. Little Santa Paula Creek had the highest maximum daily stream temperatures and the highest variability in daily temperature. Maximum daily stream temperatures in Little Santa Paula Creek ranged from 19 to 28 °C. Measurements in Little Santa Paula Creek demonstrate a repeating pattern of cooling and warming of surface temperatures (Map 3). This pattern appears to correspond with variation in valley-bottom width (defined as the distance between valley walls perpendicular to the stream channel) and surface flow volume. As the valley-bottom widens, surface flow diminishes and maximum daily stream temperatures increase rapidly due to a combination of diminishing flow and direct insolation to the entire wetted channel (riparian shading is currently negligible). In areas where the valley-bottom width narrows, surface flow increases and temperatures cool abruptly, presumably due to increasing groundwater contributions to surface flow. The relationship of valley-bottom width (measured from using 2005 color orthophotos and 1 meter LIDAR DEM in GIS) and maximum daily stream temperature is illustrated in Figure 3-1.

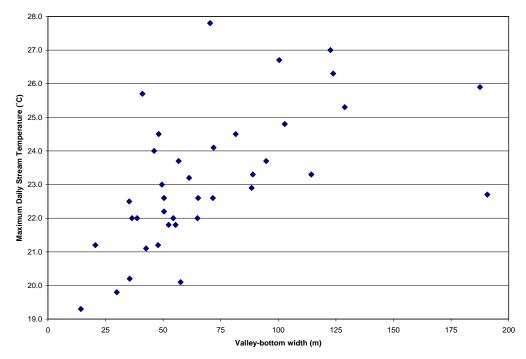


Figure 3-1. Relationship of valley-bottom width and maximum daily stream temperature in Little Santa Paula Creek, May 2007.

Sisar Creek maintained cooler and less variable stream temperatures than Little Santa Paula Creek, likely due to the extensive riparian cover throughout Sisar Creek. Maximum daily stream temperatures in May were below 18.0°C (Map 3) with the exception of the lower 0.6 miles of Sisar Creek, in which temperatures reached 21°C. Within this portion of Sisar Creek stream temperature increased from 16.0°C to 19.0°C within 330 ft, likely due to a near total absence of riparian shading. Variation in valley-bottom width was less significant in Sisar Creek than in Little Santa Paula Creek, and although groundwater recharge was observed, it was less obvious from field observations how the geology and geomorphology of Sisar Creek contribute to patterns of surface flow. Dry reaches tended to be found in areas where water diversions or in-channel pumping occurred, suggesting that human water use contributes to stream drying in Sisar Creek.

Mainstem Santa Paula Creek had consistently high maximum daily stream temperatures ranging from 21.6°C to 26°C (Map 3), although fewer stream measurements were taken in this reach due to the small number of *O. mykiss* observed (see *O. mykiss presence and absence surveys* below).

3.1.3 Continuous Temperature Monitoring

Temperature was monitored continuously from May through November. Stream temperatures reached maximum weekly average temperatures (MWAT) in early September. The greatest variability in MWAT occurred in Little Santa Paula Creek, ranging from 21.4°C to 25.8°C. Sisar Creek had lower and more consistent MWAT values than Little Santa Paula Creek, ranging from 20.4°C to 21.8°C (Figure 3-2). Longitudinal patterns in MWAT were similar to the repeated cooling and warming observed in maximum daily temperature in May (Figure 3-2; Map 3).

Two thermographs were deployed in mainstem Santa Paula Creek but only one was retreived in November 2007. The only retrieved thermograph was immediately below the confluence and

was not representative of the reach, therefore preventing comparisons of MWAT to other creeks. The retreived thermograph was located just downstream of the confluence with Little Santa Paula Creek and resulted in an MWAT of 22.0°C, a value in-between the most downstream sites in both creeks above the confluence. Although the most downstream thermograph was not retrieved, we can infer by the close relationship of MWAT to maximum daily measurements in May, that stream temperatures warm with distance downstream from the confluence of Sisar Creek and Santa Paula Creeks.

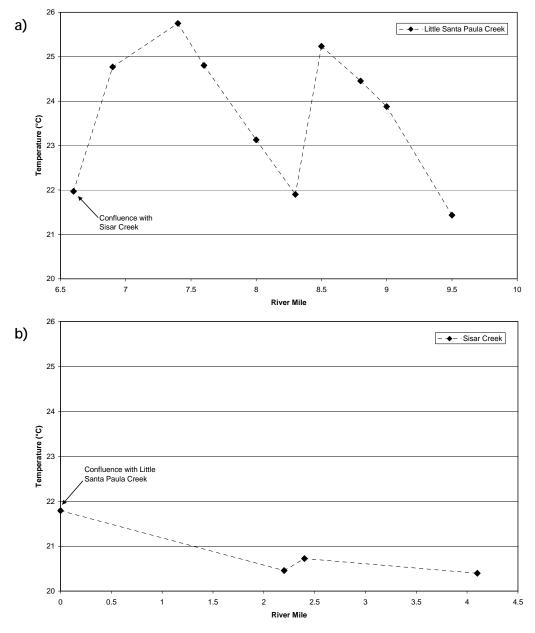


Figure 3-2. Maximum Weekly Average Temperature (MWAT) in a) Little Santa Paula Creek and b) Sisar Creek. All MWATS occurred during weeks ending in early September (9/4, 9/5, or 9/6), 2007.

Instantaneous data during the warmest week of the year indicated that sites with the highest stream temperatures also had the greatest daily fluctuation. Figure 3-3 show a daily fluctuation in stream temperature from representative "hot", "warm", and "cool" sites in Little Santa Paula Creek and a representative site in Sisar Creek. Instantaneous measurements indicate that at sites where MWAT remains below reported lethal limits for *O. mykiss*, instantaneous stream temperatures may exceed these limits for a significant portion of the day. Sites 6 (RM 7.4) and 7 (RM 7.6) exceeded critical thermal maximum temperatures in early September (Figure 3-3), defined as 29.6°C for the Central Valley steelhead (Myrick and Cech 2001).

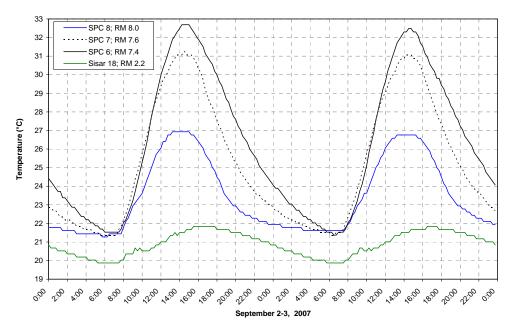


Figure 3-3. Continuous stream temperature in 15-minute intervals at four locations within the Santa Paula Creek watershed, September 4-5, 2007.

3.2 O. mykiss Presence and Absence Surveys

Potential summer rearing habitat for anadromous fish is primarily limited to Little Santa Paula Creek extending upstream 3.2 miles from the confluence with Sisar Creek to waterfall barriers, and all portions of Sisar Creek below the barriers at RM 5.9 All other tributaries to Santa Paula Creek were completely dry by May. A total of 278 pools were surveyed for *O. mykiss* within the Santa Paula Creek watershed. The rates of observation for age 1+ *O. mykiss* in May were highest in Sisar Creek (75 out of 86 pools), lower in Little Santa Paula Creek (102 out of 148 pools), and extremely low in mainstem Santa Paula Creek, where only two age 1+ *O. mykiss* were observed (2 out of 44 pools). A summary of pools with observed age 1+ *O. mykiss* is provided in Table 3-1.

Table 3-1. Age 1+ *O. mykiss* presence in pools within the Santa Paula Creek watershed, May 2007.

Reach	# of Pools with Age 1+	Total Pools Surveyed	% of Total Pools with Age 1+
Little Santa Paula	102	148	69%
Sisar Creek	75	86	87%
Mainstem Santa Paula	2	44	<1%
Totals	179	278	64%

The mainstem Santa Paula Creek, downstream of the confluence with Sisar Creek, supported age 1+ *O. mykiss* in only 2 out of the 44 pools surveyed in this reach (Table 3-1; Map 4), but also provided habitat for other species such as Santa Ana Sucker, Arroyo Chub, and threespine stickleback. This is consistent with observations made by Stoecker and Kelley (2005), where stream bank and direct observation surveys below the confluence of Sisar Creek and Little Santa Paula Creek resulted in zero observations of *O. mykiss* and the most consistent observations of non-salmonid species. This reach had the lowest pool frequency and exhibited warmer temperatures in comparison to locations throughout Little Santa Paula Creek and Sisar Creek. In addition to these habitat characteristics, natural oil and tar seeps, as well as milky sulfur seeps contribute to poor habitat quality for *O. mykiss* in the mainstem Santa Paula Creek.

Of the three main reaches surveyed, Sisar Creek contained the highest percentage of pools containing age 1+ *O. mykiss* (87%; Table 3-1, Map 5). In wetted reaches between RM 0.6 and RM 4.1, almost every pool surveyed contained age 1+ *O. mykiss*. Riparian cover was more consistent in this section of Sisar Creek, resulting in cooler stream temperatures that provided habitat for a higher frequency of age 1+ *O. mykiss* than the first 0.6 mile of Sisar Creek. Our May 2007 surveys did not extend upstream of RM 4.1 to the two barriers identified by Stoecker and Kelley in 2005 (Sisar Creek at RM 5.9 and East Fork Sisar Creek RM 0.5). Within this reach, Stoecker and Kelley (2005) observed the highest densities of *O. mykiss* over 6", indicating good habitat quality and suggesting *O. mykiss* presence would likely extend to the two barriers. Our May 2007 field work did not repeat Soecker and Kelley's (2005) survey of this upper reach because our objective was to survey areas that had not already been surveyed.

Fewer observations of age 1+ *O. mykiss* within the first 0.6 miles of Sisar Creek may be a result of lower surface flow and decreased riparian shading. Although this reach exhibited the warmest temperatures in Sisar Creek, temperatures did not exceed 21.0° C (a temperature at which *O. mykiss* were commonly observed in Little Santa Paula Creek) indicating other factors may be acting in concert with stream temperature to influence habitat quality for age 1+ *O. mykiss* within this reach (Map 3, Map 5).

In Little Santa Paula Creek, age 1+ *O. mykiss* were observed throughout the reach for the exception of one portion, between the confluence with Sisar Creek (RM 6.6; Map 6) and La Broche Creek (RM 7.9). The relatively low rate of occurrence in this section of Little Santa Paula Creek could be related to high stream temperatures in that reach. At the time of the May survey, maximum daily stream temperatures were already at 27.8°C, approaching previously reported lethal limits for *O. mykiss* (29.6°C; Myrick and Cech 2001). Even though there was a low rate of occurrence in this reach, *O. mykiss* were present, indicating these temperatures did not exceed lethal values during May.

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During our November 2007 survey, *O. mykiss* were not present in the warmest location where relatively low rate of occurrence was observed in May, near thermograph Site 6 (RM 7.4; Map 7). This location consistently exceeded 30.0°C for three months, from July through August, with maximum temperatures over 33°C during the hottest day of the year (Figure 3-3; Map 7). However, *O. mykiss* were observed just upstream near thermograph Site 7 (RM 7.6), where temperatures exceeded 30°C for a much shorter duration (only 6 days out of the summer), but reached 31.4°C during the hottest day of the year (Figure 3-3; Map 7). These temperatures and the presence of *O. mykiss* are not consistent with laboratory experiments where 29.6°C is defined as the critical thermal maximum temperature for steelhead (Myrick and Cech 2001), and indicates southern steelhead may have higher critical thermal maximum temperature than northern populations.

An exception to these patterns of temperature and O. mykiss presence was the observation of one age 1+ O. mykiss that was observed in an isolated pool in the middle of the dry reach (RM 7.1; Map 7). Although data on small seeps was not gathered, some observations of local pockets of cool water in warm pools was observed during the previous survey, and may explain the rare presence of age 1+ O. mykiss within the dry reach. Stream temperature data is not available within the proximity of this isolated pool, making it difficult to come to conclusions on thermal tolerances at this location.

3.3 *O. mykiss* Population Surveys

The following sections provide results and discussion for *O. mykiss* habitat and population surveys conducted in May and November 2007.

3.3.1 Habitat measurements

Reach-level habitat measurements identified pool and pocketwater habitat as the most common habitat types in both Little Santa Paula Creek and Sisar Creek and were therefore chosen as the two habitat types to compare *O. mykiss* densities for the November 2007 population surveys. Riffles occurred infrequently, and quick single-pass electrofishing in these habitats confirmed they provided little or no habitat for *O. mykiss* within our surveyed reaches. Run habitat was present at only one site, and comprised a small percentage of the stream channel when it was present. Table 3-2 summarizes the area of each habitat type within each reach.

Table 3-2. Habitat type areas (m² and percent of total) in reaches of Little Santa Paula Creek (SPC) and Sisar Creek (Lower Sisar Creek [LSC] and Upper Sisar Creek [USC]), November 2007.

Creek	Reach Pool Area						Rı Ar	in ea	Total Area	
		m²	%	m²	%	m²	%	m²	%	m²
Little Santa Paula Creek	SPC	401	22.4	1,305	73.0	0	0.0	82.5	4.6	1,788
Sigar Craak	LSC	237	32.3	468	63.9	28	3.8	0	0.0	733
Sisar Creek	USC	174	42.8	223	54.6	10	2.6	0	0.0	408

Detailed habitat measurements were taken at each habitat unit that was electrofished. Maximum depths in the units sampled in Little Santa Paula Creek ranged from 2.1 to 2.8 ft (0.64 to 0.85 m) deep for pools and from 1.0 to 1.8 ft (0.30 to 0.55 m) deep for pocketwater habitat. Maximum

pool depth in units sampled in Sisar Creek ranged from 2.0 to 2.5 ft (0.61 to 0.76 m) at the lower sample reach and 2.7 to 3.2 ft (0.82 to 0.98 m) at the upper sample reach. Pocketwater depth in Sisar Creek was consistent at all sites, ranging from 1.2 to 1.4 ft (0.36 to 0.43 m) deep. The amount of available cover varied little between reaches and primarily consisted of unembedded cobble/boulder complexes and some aquatic vegetation at most sampled units. One exception was a unit in Little Santa Paula Creek, that was a bedrock dominated pool with little cobble/boulder substrate for cover. This unit also resulted in the lowest *O. mykiss* densities out of all the sites, indicating cobble/boulder substrate may provide the majority of usable cover within the Santa Paula Creek watershed.

Sample site selection was not random. We chose relatively "good habitat" in both Little Santa Paula Creek and Sisar Creek and these habitat measurements are not necessarily representative of habitat in other reaches potentially supporting *O. mykiss*. Extrapolations of our densities could lead to an overestimate of the *O. mykiss* population in Santa Paula Creek. A more comprehensive habitat and population survey including representative reaches would be necessary to determine the *O. mykiss* population throughout the watershed.

3.3.2 *O. mykiss* Density Surveys

A total of 18 units (nine pools and nine pocketwaters) were surveyed for *O. mykiss* densities within Little Santa Paula Creek and Sisar Creek. Densities were similar in Little Santa Paula Creek (ranging from 0.10 fish/m² to 0.96 fish/m²) and in Sisar Creek (ranging from 0.31 fish/m² to 0.87 fish/m²). Densities were also similar between habitat types, although pool habitats resulted with the highest densities of *O. mykiss* in both creeks. Since age classes were difficult to distinguish (see *O. mykiss* Age Class Structure), *O. mykiss* densities were inclusive of all age classes. Figure 3-4 shows densities for both habitat types in each reach.

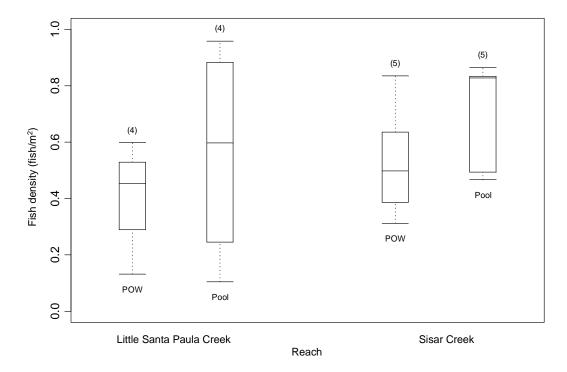


Figure 3-4. Boxplots for *O. mykiss* densities in pocket water (POW) and pool habitat types between Little Santa Paula Creek and Sisar Creek. Center line of the box is the median; upper and lower edges are upper quartile and lower quartile respectively. The range is represented by horizontal bars above and below the boxes. Sample sizes are in parentheses above the boxplots.

Pool habitat in Little Santa Paula Creek exhibited the largest range of *O. mykiss* densities, ranging from 0.10 fish/m² to 0.96 fish/m². The pool with the lowest density was in the only unit that was a bedrock controlled pool and provided little cobble/boulder complexes for cover. Pocketwater habitat ranged from 0.13 fish/m² to 0.60 fish/m² and resulted in slightly lower *O. mykiss* densities than pool habitat, but field observations during electrofishing surveys noted sections of pocketwater that provided a combination of depth and cobble/boulder cover often provided habitat for *O. mykiss*. This suggests that *O. mykiss* use both pool and pocketwater habitat as long as cobble/boulder cover and depth are available. More detailed habitat measurements within each unit would be required to determine if there is a minimum depth requirement for *O. mykiss* in this reach.

Sisar Creek had similar ranges for *O. mykiss* densities in both pool and pocketwater habitat, ranging from 0.47 fish/m² to 0.87 fish/m² and 0.31 fish/m² to 0.84 fish/m², respectively. When compared to Little Santa Paula Creek, *O. mykiss* densities in Sisar Creek are similar, indicating both creeks provide important habitat for juvenile rearing.

O. mykiss densities observed in pool habitat in the Santa Paula Creek watershed resulted in higher densities than most tributaries in Sespe Creek, the neighboring watershed east of Santa Paula Creek (Dvorsky 2000). Although snorkel surveys were used in Sespe Creek, we have used them as a comparison to densities in Santa Paula Creek because previous studies within the region show results from electofishing and snorkel surveys are similar (Chubb, USFS, unpublished data, as cited in Dvorsky 2000). The relatively high densities in Santa Paula creek are consistent with

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previous reports that suggest Santa Paula Creek has high habitat quality relative to other Santa Clara River tributaries, and has been identified as one of the greatest potential creeks for recovery of the Southern California *O. mykiss* DPS (Stoecker and Kelley 2005).

3.3.3 *O. mykiss* Age Class Structure

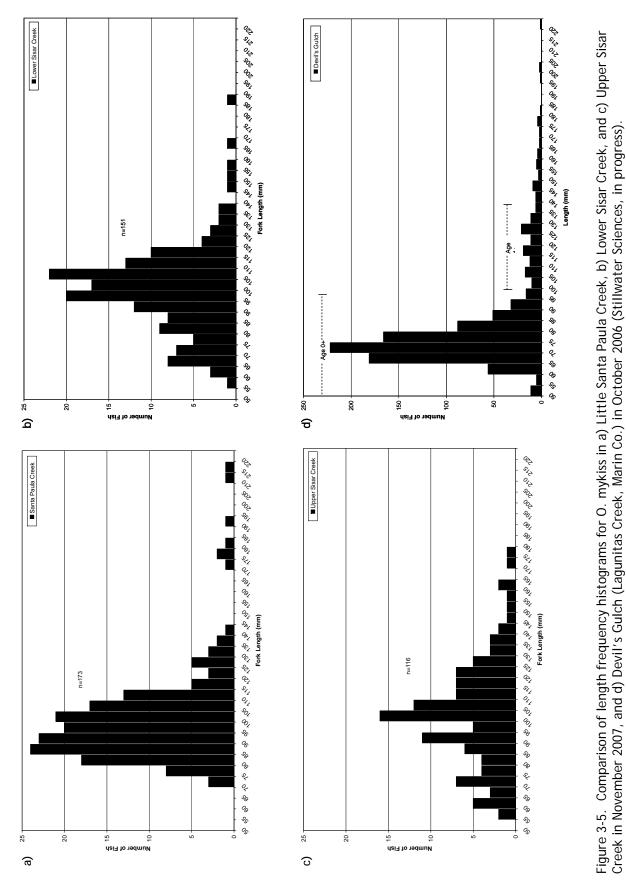
A total of 440 *O. mykiss* were captured during the electrofishing surveys. Throughout the watershed, fork lengths ranged from 52–214 mm, with over 90% of all captured *O. mykiss* measuring between 70–140 mm. Length frequency histograms can usually be used to determine length at age for *O. mykiss* populations, however differentiating length at age for populations in Santa Paula Creek watershed is difficult.

Up to four age classes are potentially identifiable from the length frequency data. In Little Santa Paula Creek, over 62% of the *O. mykiss* measured ranged from 70–145 mm (FL) and most likely were comprised of a combination of age 0+ and age 1+fish (Figure 3-5). Similar to Little Santa Paula Creek, a majority of *O. mykiss* were in a similar range of 55–145 mm and also display a possible overlap of age 0+ and age 1+ fish. The exact size range of each age class is difficult to determine because of the lack of obvious modes in length frequencies. In more northern populations such as Devil's Gulch, a tributary to Lagunitas Creek (Marin County, California), length at age is better identifiable because seasonality separates growing seasons and results in a clearer separation in modes for each age class (*Figure 3-5*).

The difficulty in distinguishing between the age 0+ and age 1+ fish length frequency graphs could indicate that sublethal effects of temperature have influenced the growth potential for *O. mykiss*. The length frequencies indicate age 0+ *O. mykiss* are large at the end of their first summer suggesting good growth opportunities, however, age 1+ fish are relatively small. Previous studies in the Napa River (Napa County, California) have found that smaller fish are able to achieve positive growth under warm conditions whereas the larger age 1+ fish have difficulty achieving bioenergetic demands in warm reaches. Without scale analyses, it is impossible to reach conclusions about age class structure and to determine whether the growth of age 1+ *O. mykiss* is reduced due to bioenergetic limitations in Santa Paula Creek.

Another pattern apparent of the length frequency is the observation of few *O. mykiss* over 145 mm in both creeks. From Figure 3-5, fish above 145 mm could be potentially separated into two additional age classes, with an age 2+ class ranging from 170–195 mm (FL) and an age 3+ class with lengths above 210 mm (FL). There are two possible explanations for the few observations of *O. mykiss* in these age classes. The first possibility is that food availability was not sufficient for larger fish (*e.g.*, >145 mm) to meet the metabolic demands required to forage in the relatively warm reaches, and resulted in reduced survival. The second possibility is the high flows in January and February 2005 (maximum flood of record) resulted in redd scour and displacement of fry in 2005, which would have represented the age 2+ and older age classes we observed few of during our 2007 surveys. Conclusions regarding these hypotheses cannot be reached without aging from scale samples to determine growth and age class structure.

Scale samples were taken from each unit during the electrofishing surveys, but the limitations of the scope of this project did not include analyses of these samples. Future studies could potentially analyze these scale samples, resulting in determination of age class specific densities and to determine difference in growth rates for each age class.



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4 CONCLUSIONS

Potential summer rearing habitat for restored anadromous populations of *O. mykiss* is limited to the extent of Little Santa Paula Creek from the confluence with Sisar Creek upstream to the natural waterfall barrier at the confluence of Little Santa Paula Creek and East Fork Santa Paula Creek (RM 9.8), and in Sisar Creek from its mouth upstream to barriers on Sisar Creek (RM 5.9) and East Fork Sisar Creek (RM 0.5). These creeks provided consistent observations of age 1+ *O. mykiss* during our May survey, and similar densities during our November survey. This indicates both creeks provide important juvenile rearing habitat for these species and passage restoration efforts should focus on access allowing migration to upstream of their confluence. The densities observed were high compared to neighboring streams and supports previous reports suggesting Santa Paula Creek as having some of the highest potential for restoration of anadromous *O. mykiss* within the Santa Clara watershed. In the few locations where *O. mykiss* were not observed in these reaches, it was a result of either a dry channel or relatively warm stream temperatures, indicating dry reaches and temperature are the primary environmental controls on juvenile rearing habitat quality.

The mainstem Santa Paula Creek appeared to provide poor habitat for *O. mykiss* based on the few observations of age 1+ fish during our May survey. Although temperatures were relatively warm in this reach, qualitative observations of poor visibility and water quality also likely contribute to the lack of *O. mykiss*. Natural oil and tar seeps, as well as milky sulfur seeps throughout the mainstem Santa Paula Creek contribute to poor habitat quality for *O. mykiss*.

Spatial patterns of stream temperature are markedly different between Sisar Creek and Little Santa Paula Creek. In Sisar Creek, extensive riparian shading maintains relatively cool stream temperatures in the majority of the wetted reaches despite the stream losing surface flow in two locations. The effects of riparian shading are evident in the lower portion of Sisar Creek which in May heated from approximately 16.0°C to 19.0°C in just 330 ft in a reach that completely lacked riparian vegetation. In comparison to Sisar Creek, Little Santa Paula Creek had much greater variability in stream temperature. In contrast to a more typical pattern in which stream temperature gradually increases as a stream flows to lower elevations, temperature in Little Santa Paula Creek exhibits a repeated pattern of cooling and warming. This pattern is predictable, with warmer temperatures occurring in reaches with wider valley-bottom widths and diminishing surface flow, and cooler temperatures occurring in reaches with narrower valley-bottom widths where cool hyporheic flow resurfaces. Because Little Santa Paula Creek currently has virtually no riparian vegetation, water temperature heats rapidly in wider valley segments, approaching 33°C maximum daily temperature in some areas.

The consequence of these temperature dynamics is that *O. mykiss* may be restricted from some reaches due to high stream temperatures. In Little Santa Paula Creek, we found *O. mykiss* in habitat with stream temperatures exceeding 29.6°C, the reported lethal limit for the Central Valley steelhead (Myrick and Cech 2001). Central Valley steelhead temperature thresholds were used for comparison because we are not aware of published temperature thresholds for southern steelhead, and the presence of *O. mykiss* in temperatures exceeding this published value provides evidence for higher thermal tolerances in southern populations. However, despite potential adaptation for warmer conditions, we also found that fish did not persist over the summer in the warmest reach of Little Santa Paula Creek. The results of a comparison of fish presence in May and November suggests that fish were found in pools where maximum daily stream temperature

approached 31.5°C, but were absent in pools exceeding in 33°C, suggesting upper thermal limits for *O. mykiss* in Santa Paula Creek may be within this range.

In addition to acute effects of temperature on fish persistence, there may be sublethal effects of high stream temperature on fish growth. Length frequency histograms may provide some evidence for sublethal effects of high stream temperatures. Although we were not able to conclusively differentiate between age 0+ and age 1+ fish from their length frequencies, the unimodal pattern in November suggests that growth of age 0+ fish was good but opportunities for age 1+ and older fish may be limited.

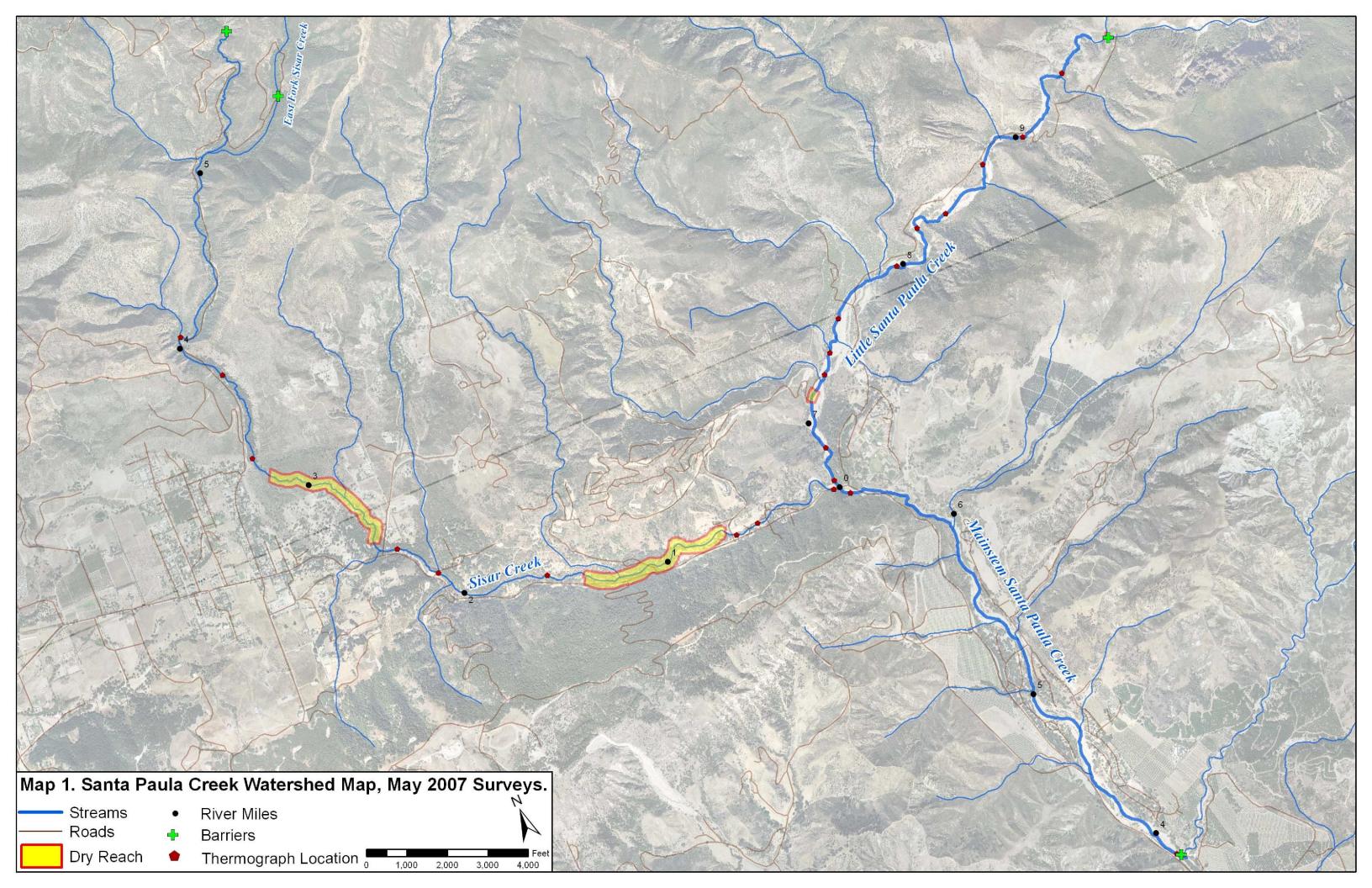
Together, these results provide important information on habitat conditions and fish abundance in the Santa Paula Creek watershed that can be readily incorporated into an expanded study of factors limiting the O. mykiss populations. In and of themselves, the results suggest that, to the extent possible, maintenance of riparian vegetation and protection of groundwater resources would be important components of a management plan for O. mykiss in the watershed. The results also suggest several future studies that could reduce uncertainty about factors limiting the O. mykiss populations. First, we recommend that scale samples be analyzed to confirm the length-at-age for fish. This information would help test hypotheses regarding growth potential and bioenergetic limitations for fish. If high warm temperatures are preventing large fish from reaching suitable sizes for successful smolting, then bioenergetic studies including analyses of macroinvertebrate food availability could help identify reasons for limited growth. The information could also be used to develop age-class specific density information from the data already collected and could be an important tool for identifying potential recruitment bottlenecks for fish populations. Second, continuous stream temperature monitoring could be paired with additional studies to document the persistence of O. mykiss using pit tags. Individually marked fish in different thermal environments would provide more detailed empirical evidence for stream temperature thresholds for southern populations of O. mykiss.

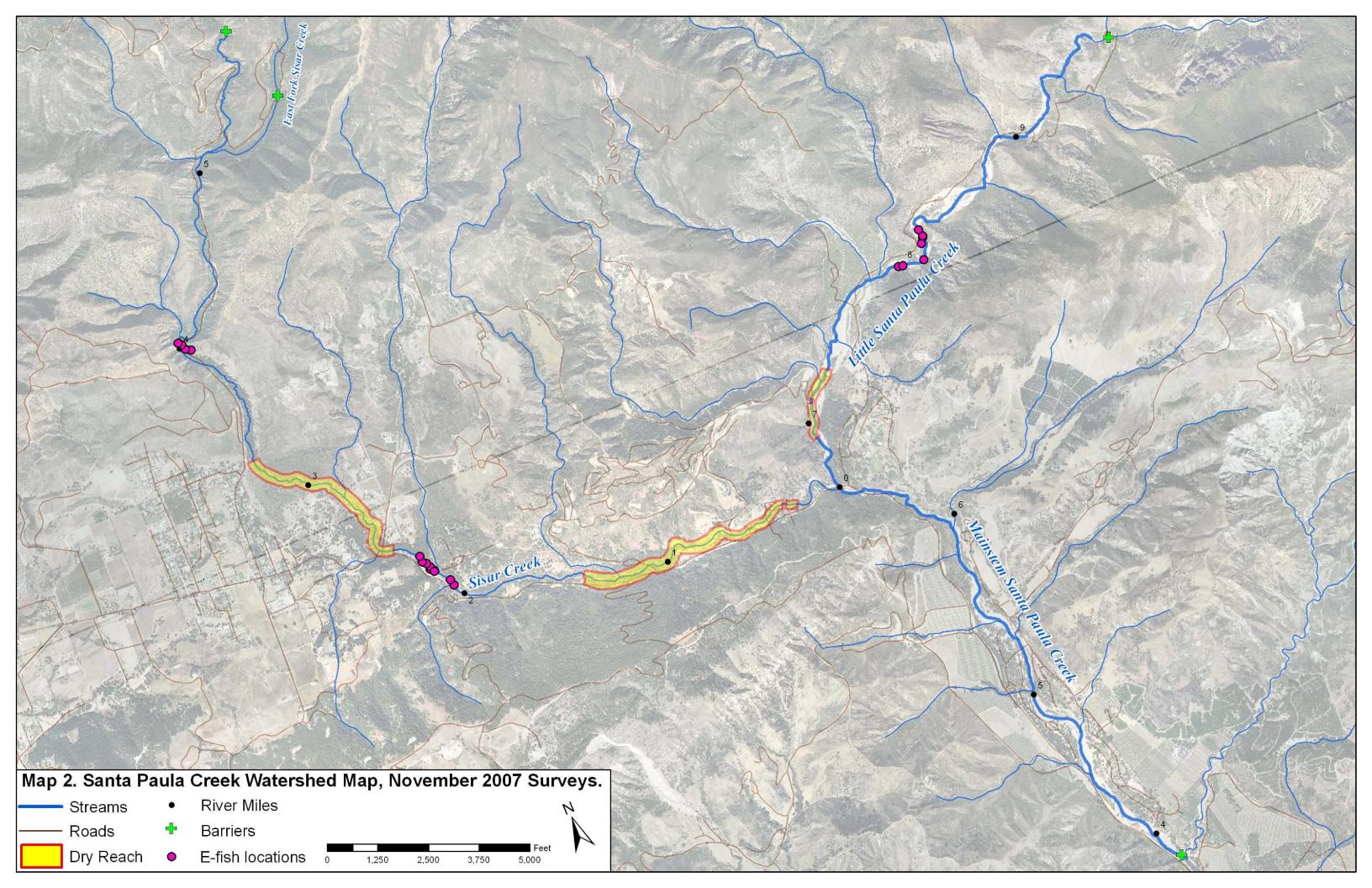
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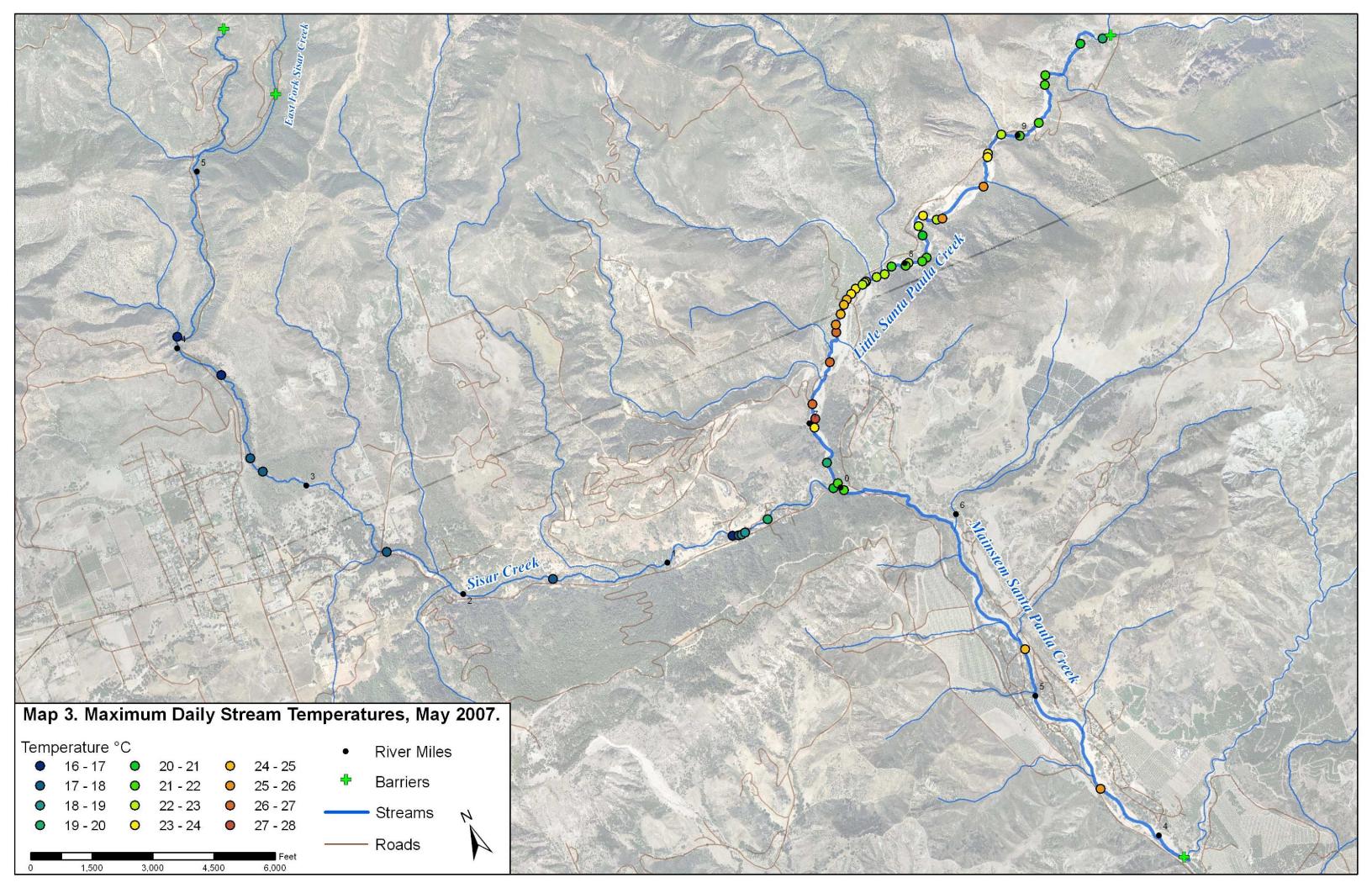
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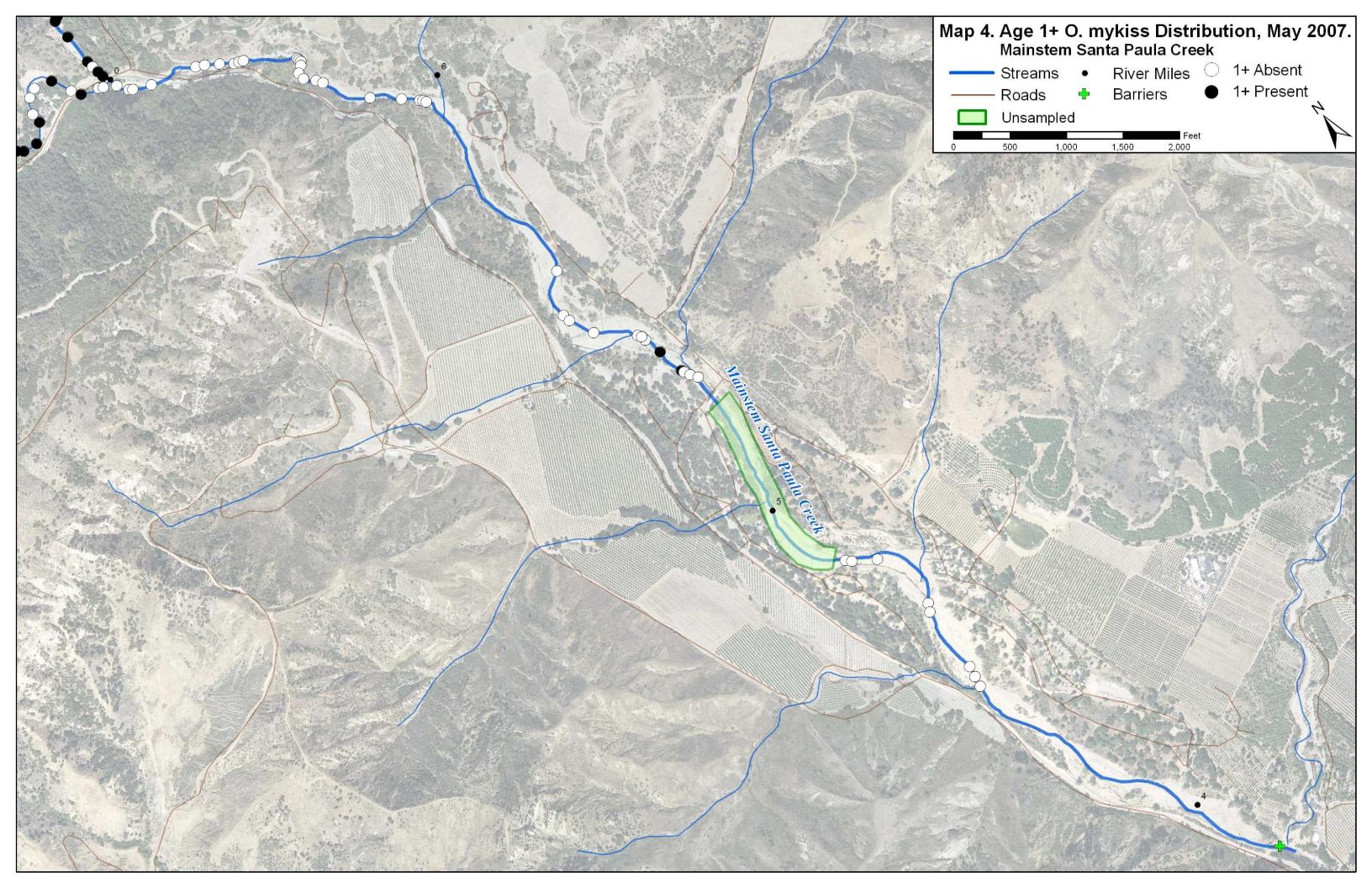
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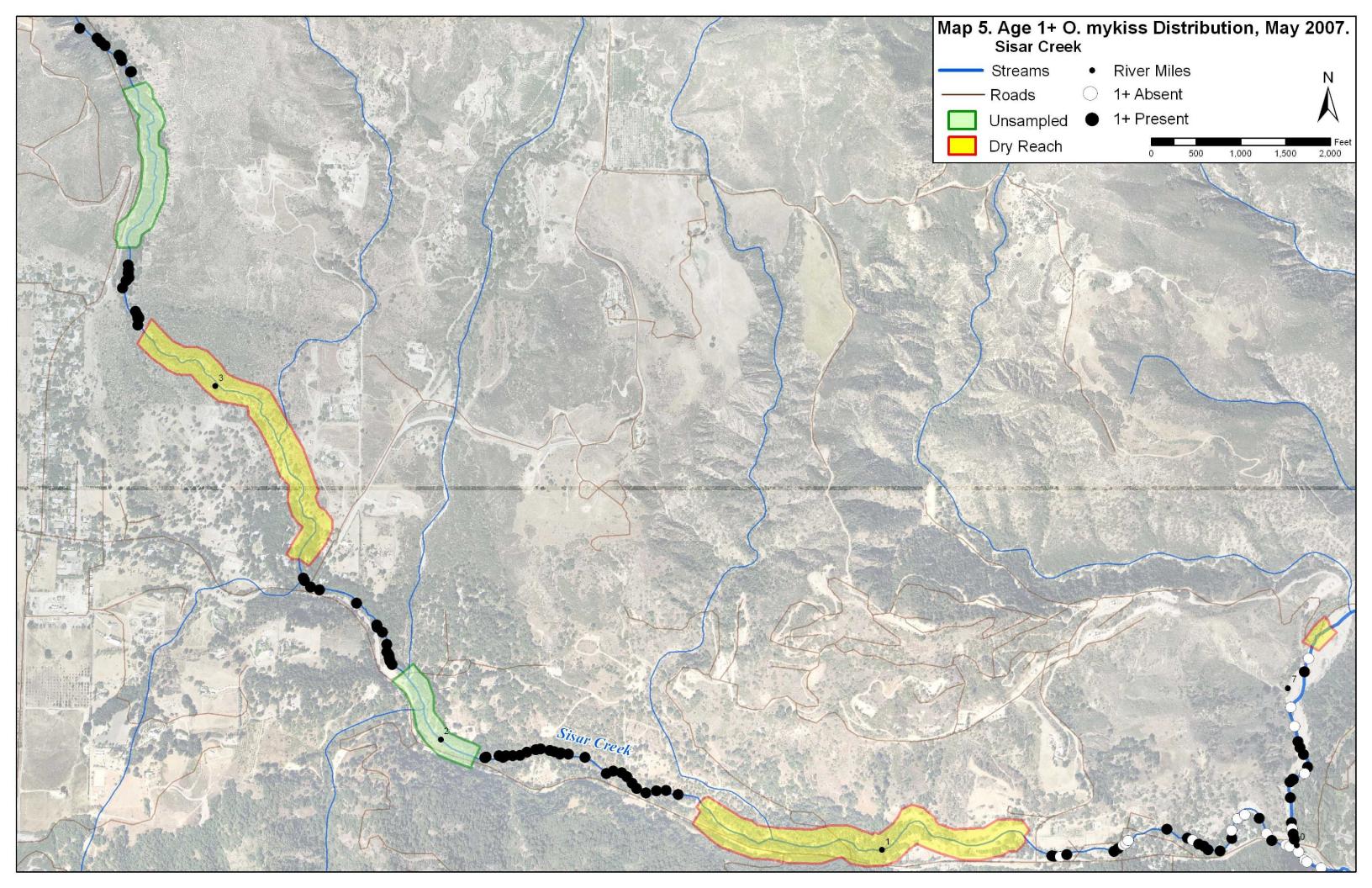
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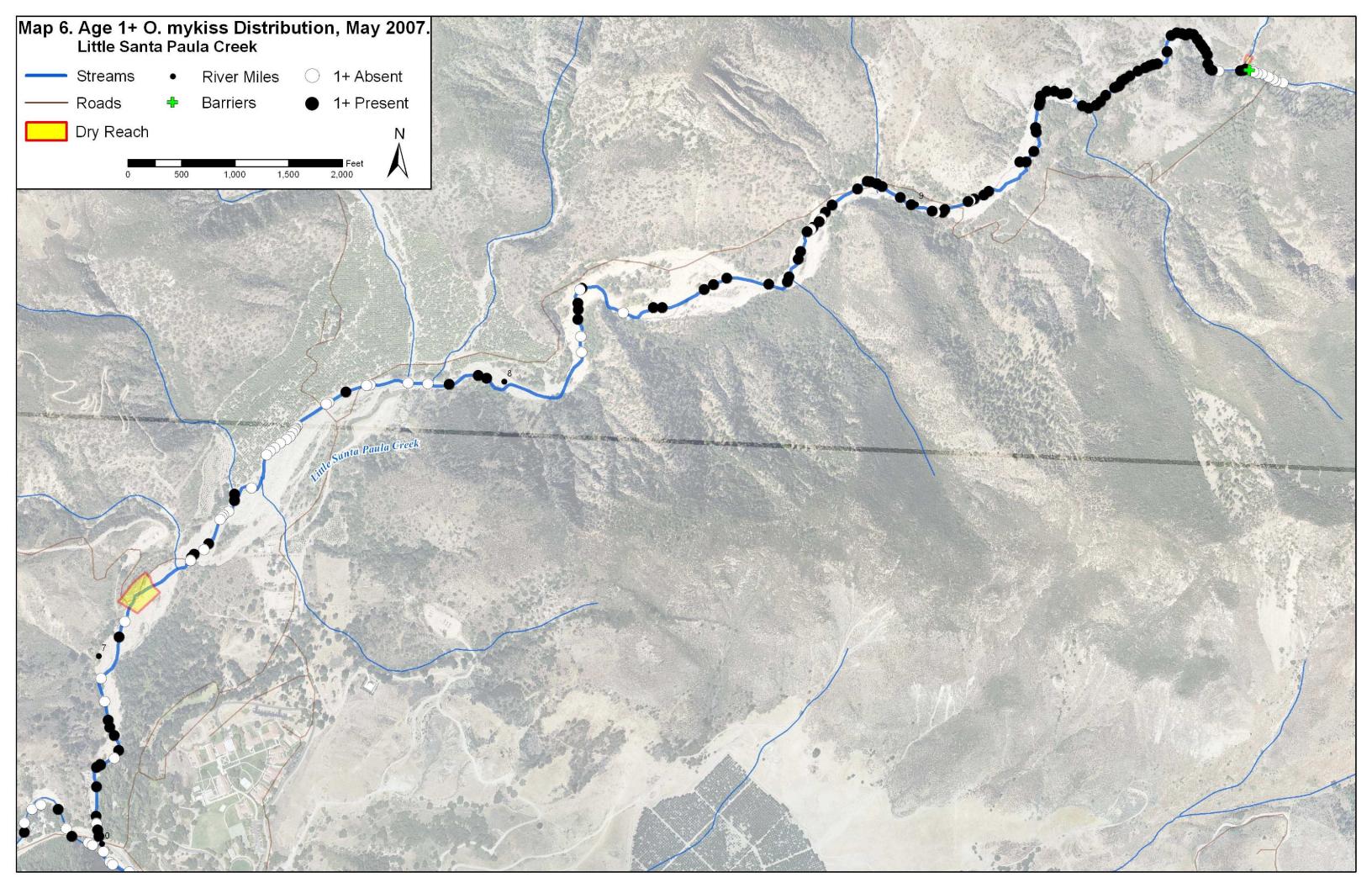












River Miles

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Stream Temperature Comparisons.

Santa Paula Creek Fish Rescues (September 4 and 11, 2014)

Date: 9/4/20141

Participating Personnel (affiliation): Dana McCanne (CDFW), Kate McLaughlin (PSMFC), Patrick Saldana (PSMFC), Terra Dressler (CDFW), Erin McCann (CDFW)

Results:

Species	# Rescued/collected	# Released	# Retained	# Mortalities
O. mykiss	16	16	0	0

Summary:

On September 4, 2014, the CDFW performed a fish rescue at Santa Paula Creek in the Santa Clara watershed. Trout (*O. mykiss*) were collected from drying isolated pools just behind Thomas Aquinas College at 34.42966°N, -119.09052°W. The main rescue pool was 17.23°C with a conductivity of 0.08 ms/cmc and 7.65 mg/l dissolved oxygen. The main rescue pool was 4m long and 3m wide with a maximum depth of 0.3m. Fish were captured by electro-fishing and transported upstream in buckets. No mortalities occurred during collection, transport, or release of the trout to the relocation pool. Lengths of each fish were taken and genetic samples were taken from 7 fish in the form of fin clips. The fish were relocated to a step pool upstream of the rescue site at 34.44571°N, -119.06346°W. The pool had a length of 4m, an average width of 3.05m, and a maximum depth of 0.52m. The water quality was 19.25°C, 0.648ms/cmc conductivity, and 8.77 mg/l dissolved oxygen. The fish ranged from 59mm to 137mm in length.

Date: 9/11/2014

Participating Personnel (affiliation): Dana McCanne (CDFW), Tim Hovey (CDFW), John O'Brian (CDFW), Sam Bankston (PSMFC), Tom VanMeeuwen (PSMFC), Ben Lakish (PSMFC), Kate McLaughlin (PSMFC), Patrick Saldana (PSMFC), Erin McCann (CDFW), Terra Dressler (CDFW)

Results:

Species	# Rescued/collected	# Released	# Retained	# Mortalities
0. mykiss	96	95	1	1
C. santaanae	24	24	0	0

Summary:

On September 11, 2014, CDFW performed a fish rescue at Santa Paula Creek in the Santa Clara watershed. O. mykiss and C. santaanae were collected from a pool located behind the Thomas Aquinas College (34.42956, -119.09068). This pool had a significant decrease in depth and was in immediate risk of drying up. On the day of the rescue, the rescue pool had a max depth of 0.67m, a length of 12.2m, and an average width of 2.3m. The temperature was 59.4 °C, dissolved oxygen was 9.76mg/l, and conductivity was 0.831mS/cm°. The rescue team used a combination of

electrofishing and seining as the primary methods for fish capture. Once the fish were collected, they were transported in buckets equipped with aerators to a series of relocation pools.

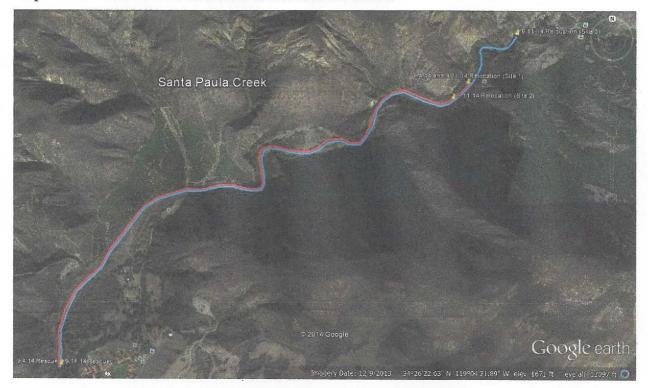
A total of 96 *O. mykiss* ranging in size from 50mm to 225mm were collected from the rescue pools including one mortality. Therefore 95 *O. mykiss* were released into the relocation pools while the deceased trout was brought back to the lab. The relocation site is a 0.34 mile stretch of the creek located approximately 2.18 miles upstream of the rescue pool. This stretch consists of several pools that are very well connected. Due to the large quantity of fish captured during this rescue, we chose three relocation pools within this 0.34 mile stretch. At Site 1 (34.44572, -119.06354), 20 *O. mykiss* were released (size range = 53mm to 89mm). No genetics were taken of these fish due to their small size. At Site 2 (34.44496, -119.06476), 44 *O. mykiss* were released (size range = 55mm to 184mm). Genetics were taken from nine of these fish. At Site 3 (34.44827, -119.06057), the remaining 31 O. mykiss were released (size range = 50mm to 225mm). No genetics were taken of these fish due to the fact that we ran out of genetics collection materials. This information, along with pool measurements and water quality measurements for each of the relocation sites can be found in the table on the next page.

A total of 24 C. santaanae were collected from the rescue pools. The relocation pool for these fish is located approximately 1.3 miles upstream of the rescue pools. Tim Hovey and John O'Brian released 21 of the suckers into their designated relocation pool. They also took genetics samples of all 21 of these fish. Once we reached the steelhead relocation sites, we realized that three Santa Ana suckers remained in the *O. mykiss* buckets. We released one of them into Relocation Site 2 while the final two were released into Relocation Site 3. No genetics were taken on these final three C. santaanae. Pool measurements and water quality measurements of the C. santaanae Relocation Pool can be found in the table below.

The pool measurements and water quality at all relocation sites will continue to be monitored by CDFW in order to ensure the wellbeing of these fish.

Relocation Site	Number of O. mykiss released	Number of C. santaanae released	Size range	Max Depth	Average Depth	Length	Average Width	Temperature	Dissolved Oxygen	Conductivity
1	20	0	53 - 89mm	0.55m	0.30m	3.96m	3.05m	18.19 °C	9.56 mg/l	0.665 mS/cm ^c
2	44	1	55 – 184mm	0.55m	0.24m	9.14m	3.66m	20.44 ℃	8.4 mg/l	0.675 mS/cm ^c
. 3	31	2	50 – 225mm	1.10m	0.55m	10.67m	2.44m	18.44 °C	9.28 mg/l	0.667 mS/cm ^c
C. santaanae Relocation Pool	0	21	100 M	0.79m	0.43m	16.46m	2.44m		-	

Map of Rescue and Relocation Sites at Santa Paula Creek:





Steelhead Pre-Rescue Data Form

Fill in form to the maximum extent feasible. If information is not readily available, place 'NA' in the field. Additional data collection may be necessary prior to determining if a rescue is warranted. Please call Rick @ 562.980.3562 to relay this information, and email form to: Long_Beach_Steelhead_Team@noaa.gov.

1.	Date of First Steelhead Observation: 5/14/2014 TIME:
2.	Date of Follow Up Observation: 9/2/2014 TIME: 12:00
	Point of Contact (include both NMFS & CDFG staff person contacted):
	NAME: Senjamin Lakish DATE/TIME: 9/3/2014 10:00
	AFFILIATION: CDFW/PSMFC PHONE: 218 256 6151
	NMFS CONTACT: Rick Bush CDFG CONTACT: Dana Mc Canne
4.	Location of Proposed Rescue Site:
	WATERSHED: Santa Clara STREAM: Santa Pania
	ACCESS: Behind Thomas Aguinas College GPS: 34, 43009 -119,09068
5.	Reason for Rescue Situation (i.e., loss of flow, anthropogenic cause, pool drying up, etc.):
6.	Estimated time before fish rescue needs to occur:
	WEEKS: DAYS: HOURS:
7.	Number of steelhead observed in each size class: (Guesstimate or Actual Count) >400 mm: 200-400 mm: <200 mm: 5 - 10
8.	Rescue Habitat (circle one): POOL GLIDE / RIFFLE
U.	Maximum Depth: 0.3 m Average depth: 0.18 m
	Length: 4 M Average Width: 3 m
	Temperature (@ 0.3m above substrate): 17,7°C Time of Day: 8/27/204 10:30
	Can you install a temperature logger (@ 0.3m above substrate)? YES /NO When?
	Dissolved Oxygen: 4.5 mg/l Conductivity: 0.868 mS/cm
	Cover Present (circle all that apply): LWD / RIPARIAN / BOULDER DUNDERCUT / BRIDGE
	Flow entering habitat? No Inflow channel width: Inflow depth:
9.	Feasibility of Capture (circle one): High / Medium / Low
	Potential Problems for Capture: Excessive Depth / Boulder-Riprap / Large Area / Access
10.	Proposed relocation areas (In Downstream CDS length width may doubt town DO in C. O.
	a.) 34.44571-119.06346 See additional Word Document b.) Um light 3m width, O. 4m Are Dooth, O. 6m Max Dooth 20.5°C, 8.5mg/ll DO. good in flow.



Steelhead Relocation Data Form

Capture Site Information

Location: 34.42966° N, -	-119.0902°W
Rescue Date: 09/04/14	Time Period: 9:45 - 13:17
Personnel Present During Rescue (Affiliation):
Dana McCanne	Kate Mclaughlin Patrick Saldana
Terra Dressler	Erin McCann
Flow entering habitat? Nove	Inflow channel width: Nove Inflow depth: Nove
Max depth: 0.3 m	Length: Width: 3M
Temp: 13.23 ℃	DO: 7.65 mg/1 Cond: 0.0800 ms/cmc
Capture: Seine / Dip Net / E-fish	ning (Initial V: 100 Hz: 20 Pulse: Duty Cycle: 15)
Steelhead Transported in: Cooler v	v/aerator / Buckets / Hatchery Truck
Number of Steelhead Rescued: AI	DULTS O SMOLTS O PARR/FRY 6
Observed Mortalities: ADULTS_	O SMOLTS 6 PARR/FRY 6
Tissue Samples Taken: YES / 1	NO Description: 7 caudal fin clippings
Relocation Site Information	
Same Watershed: VES / NO	Relocate (circle one): Upstream / Downstream / Estuary / Ocean
	ubble curtain enead; 20% cover from boulders
	ek trail. 1.3 mi from oil rigs
GPS Coordinates: 34.4457	
): POOL / GLIDE / RIFFLE
Maximum Depth: 0.52m	Average depth: 043m
Length: 430m	Average Width: 3,05m
Temperature (@ 0.3m above substra	ate): 19.25 °C Time of Day: 13:17
Temperature Logger Installed: Y	/ N Description:
Dissolved Oxygen: 8.77 W	Time of Day: 13:17
Cover Present (circle all that apply)	LWD / RIPARIAN BOULDER UNDERCUT / BRIDGE
Will site monitoring occur: (Y)/	N Who will monitor: CDFW
Description of monitoring activities	water quality and measurements
Comments: Picture # 26	41-2643

NMFS STEELHEAD CAPTURE & MONITORING FORM

DATE 9/4/14 WATERSHED Santa Clara	TEMP 19.25 °C DO 8.77 mg/L COND D. 1048 us/cm
	DEAT 34.44571 LONG -119.06346
REACH	CAPTURE METHOD E-fishing
FINAL SETTINGS (V, Hz, Pulse, Duty Cycle)_	100V, 20 Hz, Std pulse, 25 Duty EFFORT 2125 so

Steelhead Data

STATE OF THE PERSON NAMED IN	Fish #	Fork Length (mm)	Weight (g)	Mark / Tag / Comment (PIT = last 10 digits)
	1	137		Pic# 2629; Genetic
	* 2	122		Pic#2633; Genetic
	#3	111	grahus).	Prc#2636; Frenetic
-	4	128		Pic#2637; Genetics
1	5	105		No Picture; Genetic
	6	62		No Picture
	7	65		No Picture
	8	64		No Picture
	9	59		No Picture
	10	97		No Picture
-	11	74		No Picture
	12	87		No Picture
-	13	102		No Dicture
-	14	94		No Picture
-	15	109		No Picture; Genetics
	16	115		Pic#2640; Genetic
-	17	00% 16 × 11		
-	18			
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1	23			
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-	25		LJPMA SK	Manual VI III Manual Sanga

Fish #	Length (mm)	Weight (g)	Mark / Tag / Comment (PIT = last 10 digits)
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27			
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*indicates	scale	sample	e col	lected	trom	tish
HILLIOUTOD	Decer	Detrice 1				

= Page total scale samples

✓indicates DNA sample collected from fish

7	=	Page	total	DNA	sample
					SAME THE PROPERTY.



Steelhead Pre-Rescue Data Form

Fill in form to the maximum extent feasible. If information is not readily available, place 'NA' in the field. Additional data collection may be necessary prior to determining if a rescue is warranted. Please call Rick @ 562.980.3562 to relay this information, and email form to: Long_Beach_Steelhead_Team@noaa.gov.

1.	Date of First Steelhead Observation: 5 14 2014 TIME:
2.	Date of Follow Up Observation: 9 8 2014 TIME: 12:30
3.	Point of Contact (include both NMFS & CDFG staff person contacted):
	NAME: Thomas Van Meeuwen DATE/TIME: 9/9/2014, 10:00
	AFFILIATION: CDFW/PSMFC PHONE: (805) 636-0545
	NMFS CONTACT: Rick BUSh CDFG CONTACT: Dana Mc (anne
4.	Location of Proposed Rescue Site:
	WATERSHED: Santa Clara STREAM: Santa Paula
	ACCESS: Behind Thomas Aguinas College GPS: 34.42956°N, -119.09068°N
5.	Reason for Rescue Situation (i.e., loss of flow, anthropogenic cause, pool drying up, etc.):
	pool drying up
6.	Estimated time before fish rescue needs to occur:
	WEEKS: DAYS: HOURS:
7	Number of steelhead observed in each size class: (Guesstimate or Actual Count)
1.	
	>400 mm: <200 mm:
8.	Rescue Habitat (circle one): POOL / GLIDE / RIFFLE
	Maximum Depth: 0.52 m Average depth: 0.37 m
	Length: 12.5m Average Width: 2.1m
	Temperature (@ 0.3m above substrate): \\ \8 °(\) Time of Day: \\ \\ \2 \: 30 \rangle \gamma\)
	Can you install a temperature logger (@ 0.3m above substrate)? YES / NO When?
	Dissolved Oxygen: 11.04 mg/2 Conductivity: 0.813 mS/cm ²
	Cover Present (circle all that apply): <u>LWD / RIPARIAN / BOULDER / UNDERCUT / BRIDGE</u>
	Flow entering habitat? yes Inflow channel width: 0.15m Inflow depth: 0.03m
9.	Feasibility of Capture (circle one): (High) / Medium / Low
	Potential Problems for Capture: Excessive Depth / Boulder-Riprap / Large Area / Access
10.	Proposed relocation areas (Up/Downstream, GPS, length, width, max depth, temp, DO, inflow?):
	a.) 34.44571,-19.06346 4m length, 3m width 0.4m avg. depth, b.) 0.6m max. depth 20.5°C, 8.5 mg/e. DO, good inflow



STEELHEAD RELOCATION DATA FORM

Capture Site Information
Location: Santa Paula
Rescue Date: 9 11 2014 Time Period: 8:30 am - 1300
Personnel Present During Rescue (Affiliation):
Tim Hovey (CDFW) John O'Brian (CDFW) Sam Bankston (PSMFC)
Tom VanMeeuwen (PSMFC) Patrick Saldaña (PSMFC) Dana McCanne (CDF
Flow entering habitat? 405, trickle Inflow channel width: 0.4 ft Inflow depth: 0.1 ft
Max depth: 0.67m Length: 12.2m Width: 2.3 m
Temp: 59.4°F DO: 9.76 mg/L Cond: 0.831 mS/cmc
Capture: Seine V Dip Net / Electrofishing (Initial V: 100 Hz: 20 Pulse: Stel Duty Cycle: 20
Steelhead Transported in: Cooler w/ aerator / Buckets / Hatchery Truck
Number of Steelhead Rescued: >400 mm 200-400 mm 200-400 mm <200 mm 95
Observed Mortalities: >400 mm <200 mm
Tissue Samples Taken: YES / NO Description: Caudal Fin Clips for genetics
Relocation Site Information
Same Watershed: YES / NO Relocate (circle one): Upstream / Downstream / Estuary / Ocean
Location Description:
Access: Road off Thomas Aguinas College - 1.5 mi hike up trail
GPS Coordinates: 34.44572, -119.06354 (Site #1)
Relocation Habitat Type (circle one): POOL, / GLIDE / RIFFLE
Maximum Depth: 0.65 m Average depth: 0.3 m
Length: 3.9 m Average Width: 3.0 m
Temperature (@ 0.3m above substrate): 64.74° F Time of Day: 1030
Temperature Logger Installed: Y / N Description:
Dissolved Oxygen: 9.56 mall Time of Day: 1030
Cover Present (circle all that apply): <u>LWD / RIPARIAN / BOULDER / UNDERCUT / BRIDGE</u>
Will site monitoring occur: Y/N Who will monitor: CDFW
Description of monitoring activities: Measurements + water quality
Comments: Relocated fish to 3 different sites (each page of this
form represents each relocation site)
Took total lengths on fish

2475	9/11/	14	1000	annu Rai	1 040	de Dat	circle C	I dom' Tour
-	The state of the s		710.55	CREW SEV	1 F	SM, ragi	TUR SO	Idana Terro
		anta (The second secon	TEMP 41.1	1 6 1	9.50	mg/L C	US/0
rribut	TARY Sa	unta Po	ula					1.04354
REACH				CAPTURE MET	THOD E	fish, s	eine	
FINAL :	SETTINGS (V, Hz, Pulse,	Duty Cycle)	100,30	std, 31)	EFF	ORT 1880 5
								Minney McDode La Chaper
loco	ction S	ite #	1)	Steel	head Dat	a		
Fish #	Length (mm)	Weight (g)		/ Comment st 10 digits)	Fish	Length (mm)	Weight (g)	Mark / Tag / Comment (PIT = last 10 digits)
1	53		Thetes)	26		(3)	in the second
2	73				27	,		
3	74	11111			28			
4	74	THE RESERVE OF THE PERSON OF T	Albert Year	AURIT TO THE	29	- digital yar, v		n vernogaser i mani ez
5	83	inin 60/\$2		rom WALE	30	L. Biolis	en durante	on peoplowic to spani
6	72	13183-95		net	31		months	- troininnol/Libertur
7	62				32		1.8377	and a Professor Process
8	57				33			The second secon
9	74				34		NII KE DE	11 12 14 1 1 12 15 1 14 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
10	75	mus 3 / m	epilarwo0:	V proposed a	35	nesofolis.	ON 7	2377 shadasaaWesa
11	45				36			curion Descriptions
12	82				37	and the second second		
13	71				38			
14	73				39			
15	78		BURBIN		40			Suy i Tanta, ir timas ir i
16	77		***************************************		41			Tablet Gurak
17	64				42			and Table and adjusted
18	65		2780.3	o smiT	43		daths, sizer	k m£.0 (e) stoletsome
19	75				44		F toffs	ard catalant culting man
20	89			1	45			
22		1 1 1 1 1 1 1 1 1 1			46	A HOUSE TO SERVICE AND ADDRESS OF THE PARTY	in the second	
23					48		V Y TO	Z-6 30 LIGHTBOOK CB2 III
40					40		The state of the s	

*indicates scale sample collected from fish

24

25

= Page total scale samples

√indicates DNA sample collected from fish

= Page total DNA samples

49

50

DORR

STEELHEAD RELOCATION DATA FORM

Capture Site Information	
Location: Santa Paula	
Rescue Date: 9 11 14 Time Period:	DAR
Personnel Present During Rescue (Affiliation):	
	6/3-
Flow entering habitat? Inflow channel width: Inflow depth:	
Max depth: Length: Width:	2357 - 1
Temp:DO:Cond:	10
Capture: Seine / Dip Net / Electrofishing (Initial V: Hz: Pulse: Duty Cycle:)
Steelhead Transported in: Cooler w/ aerator / Buckets / Hatchery Truck	
Number of Steelhead Rescued: >400 mm 200-400 mm < 200 mm	
Observed Mortalities: >400 mm <200 mm <200 mm	
Tissue Samples Taken: YES / NO Description:	
Tissue Samples Taken: YES / NO Description: Relocation Site Information	8.
Relocation Site Information Same Watershed: YES / NO Relocate (circle one): Upstream / Downstream / Estuary / Ocean Location Description:	31
Relocation Site Information Same Watershed: YES / NO Relocate (circle one): Upstream / Downstream / Estuary / Ocean Location Description:	31
Relocation Site Information Same Watershed: YES / NO Relocate (circle one): Upstream / Downstream / Estuary / Ocean Location Description:	31
Relocation Site Information Same Watershed: YES / NO Relocate (circle one): Upstream) / Downstream / Estuary / Ocean Location Description: Access: Pool 1-5 mi up from road leading to trail from Thom GPS Coordinates: 34, 44494, -119.04476 (Site#2) Agui	31
Relocation Site Information Same Watershed: YES / NO Relocate (circle one): Upstream) / Downstream / Estuary / Ocean Location Description: Access: Pool 1-5 mi up from road leading to trail from Thom GPS Coordinates: 34, 44494, -119.04476 (Site#2) Agus	31
Relocation Site Information Same Watershed: YES / NO Relocate (circle one): Upstream) / Downstream / Estuary / Ocean Location Description: Access: Pool 1-5 mi up from road leading to trail from Thom GPS Coordinates: 34, 44494, -119.04474 (Site#2) Agus Relocation Habitat Type (circle one): POOL / GLIDE / RIFFLE Maximum Depth: 0.65 m Average depth: 0.24 m	31
Relocation Site Information Same Watershed: YES / NO Relocate (circle one): Upstream) / Downstream / Estuary / Ocean Location Description: Access: Pool 1.5 mi up from road leading to trail from Thom GPS Coordinates: 34, 44494, -119.04476 (Site#2) Agrange Relocation Habitat Type (circle one): POOL / GLIDE / RIFFLE Maximum Depth: 0.65 m Average depth: 0.24 m Length: 9.1 m Average Width: 3.6 m	31
Relocation Site Information Same Watershed: YES / NO Relocate (circle one): Upstream) / Downstream / Estuary / Ocean Location Description: Access: Pool -5 mi up from road leading + trail from Thom GPS Coordinates: 34, 44494, -19-04474 (Site#2) Agus Relocation Habitat Type (circle one): POOL / GLIDE / RIFFLE Maximum Depth: 0.65 m Average depth: 0.24 m Length: 9.1 m Average Width: 3.6 m Temperature (@ 0.3m above substrate): 68.8 F Time of Day: 1130	31
Relocation Site Information Same Watershed: YES / NO Relocate (circle one): Upstream) / Downstream / Estuary / Ocear Location Description: Access: Pool 5 mi up from road leading + trail from Thom GPS Coordinates: 34.44494, -119.04474 (Site#2) Agra Relocation Habitat Type (circle one): POOL / GLIDE / RIFFLE Maximum Depth: 0.65 m Average depth: 0.24 m Length: 9 M Average Width: 3.6 m Temperature (@ 0.3m above substrate): (8.8 F Time of Day: 1/30 Temperature Logger Installed: Y / N Description:	nas Col
Relocation Site Information Same Watershed: YES / NO Relocate (circle one): Upstream) / Downstream / Estuary / Ocean Location Description: Access: Pool 5 mi up from road leading to trail from Thom GPS Coordinates: 34, 44494, -119.04476 (Site#2) Agus Relocation Habitat Type (circle one): POOL / GLIDE / RIFFLE Maximum Depth: 0.65 m Average depth: 0.24 m Length: 9 m Average Width: 3.6 m Temperature (@ 0.3m above substrate): 68.8 F Time of Day: 1130 Temperature Logger Installed: Y / N Description: Dissolved Oxygen: 8.4 mg l Time of Day: 1130	nas Col
Relocation Site Information Same Watershed: YES / NO Relocate (circle one): Upstream) / Downstream / Estuary / Ocean Location Description: Access: Pool S mi up from road leading to trail from Thom GPS Coordinates: 34, 44494, -119.04476 (Site#2) Agra Relocation Habitat Type (circle one): POOL / GLIDE / RIFFLE Maximum Depth: 0.65 m Average depth: 0.24 m Length: 9.1 m Average Width: 3.6 m Temperature (@ 0.3m above substrate): 68.8 F Time of Day: 1130 Temperature Logger Installed: Y / N Description: Dissolved Oxygen: 8.4 mg L Time of Day: 1130 Cover Present (circle all that apply): LWD / RIPARIAN / BOULDER / UNDERCUT / BRIDGE	nas Col
Relocation Site Information Same Watershed: YES / NO Relocate (circle one): Upstream) / Downstream / Estuary / Ocear Location Description: Access: Pool -5 mi up from road leading + trail from Thom GPS Coordinates: 34, 44494, -119.04474 (Site#2) Agra Relocation Habitat Type (circle one): POOL / GLIDE / RIFFLE Maximum Depth: 0.65 m Average depth: 0.24 m Length: 9 - 1 m Average Width: 3.4 m Temperature (@ 0.3m above substrate): (8 8 F Time of Day: 1130 Temperature Logger Installed: Y / N Description: Dissolved Oxygen: 8.4 mg L Time of Day: 1130 Cover Present (circle all that apply): LWD / RIPARIAN / BOULDER / UNDERCUT / BRIDGE Will site monitoring occur: Y / N Who will monitor: CDFW	nas Col

Line A sun

STEELHEAD CAPTURE & MONITORING FORM

DATE 9 11 1 4	CREW BL, PS, TD, EM
WATERSHED Santa Clara	TEMP 68.8 5 DO 8.4 mg/L COND 0.675 uS/cm
TRIBUTARY Santa Paula	LAT 34.44496 LONG -119.06476
REACH	CAPTURE METHOD E-FISH Seining
FINAL SETTINGS (V, Hz, Pulse, Duty Cycle)_	100, 30, Std., 30 EFFORT 1880 sec

(Relocation Site # 2)

Steelhead Data

Fish #	Length (mm)	Weight (g)	Mark / Tag / Comment (PIT = last 10 digits)
21	71		Condu
22	132		1 Genetics
23	184		V Genetics
24	112		V Genetics
25	112	CORTE ENGLIS	
96	84	enur 80	
27	104		
28	106		
29	124		1 clevetics
30	117	on Banco	arranvad Testas
31	116		
32	114		
33	113		
34	121		V Crenetics
35	101		2-1
36	67		
37	97		
38	130		V Genetics
39	127		1 Grenetics
600	138		V Genetics
95	124		
20	115		
90	123	- 4- 71-10	
200	109		
25	93		

Fish #	Length (mm)	Weight (g)	Mark / Tag / Comment (PIT = last 10 digits)
46	69		harman de la companya
47	108		
48	106		The state of the s
49	110		nens-judenan i manunan
50	99		
51	129	rear of the	V Genetics
52	58	1 2117	Lande Faderno Person
53 🚳	70		
54	67	all state	
55	62	1314	222 Sheriston Wome
56 🕮	65		Shelaniwasa smrkeso
57	108	al la	
58	71		
51	55		
60	77		21/2 L 1/460337 (C)235007(C)
ы 🦚 .	67		ingst mumani
b2 40	83		2148gno.
V3 (1)	70	(ABBA SVE)	le m2.0 (a)) septenagno
64	72	7 -994()	conservation Lorent Eqs.
45			mone O Linder in
46			
47	*	E10 40 1220	
48			AN SERVICE OF DES
49		adit/iros).	monuomi jo andqirose
50			

*indicates	scale	sample	collected	from	fish

_____ = Page total scale samples

√indicates DNA sample collected from fish

= Page total DNA samples



STEELHEAD RELOCATION DATA FORM

Capture Site Information			
Location: Santa Pa	ula		YAATUSI
Rescue Date: 9 11 14	Time Perio	od:	September 1 of the second section (1997) A.
Personnel Present During Rescue	e (Affiliation):		
	ste@ bead	0072	
Flow entering habitat?	Inflow channel width:	Inflow	depth:
Max depth:	Length:	Width:	Magashi digash da
Temp:	DO:	Cond:	
Capture: Seine / Dip Net / Ele	ectrofishing (Initial V:	Hz: Pulse:	Duty Cycle:)
Steelhead Transported in: Coole			
Number of Steelhead Rescued:	>400 mm 20	00-400 mm	<200 mm
Observed Mortalities: >400 mm			
Tissue Samples Taken: YES	/ NO Description:_		
Relocation Site Information			
Same Watershed: YES Y NO Location Description:	98	(pstream) Downstream	100
Access: Pobl 18/4 mi	,	1/	1
GPS Coordinates: 34.44			3)
Relocation Habitat Type (circle o		GLIDE / RIFFLE	
Maximum Depth: 1.		ige depth: (), 54	
Length: (0-7m		ge Width: 2.4 m	
Temperature (@ 0.3m above sub	70	Time of Day:	00
Temperature Logger Installed:	Y / N Description:		63
Dissolved Oxygen: 9. 2	C 1.		7 .3.3
~	8 mg/L		300
Cover Present (circle all that app	oly): LWD / RIPARIA	AN / BOULDER / UNI	1
Will site monitoring occur: Y	bly): LWD / RIPARL	AN / BOULDER / UNI	1 2 3
	bly): LWD / RIPARIA	AN / BOULDER / UNI	1 2 3
Will site monitoring occur: Y	oly): LWD / RIPARL Oly) / N Who will more ties: Measurement	AN / BOULDER / UNI	1 2 3

STEELHEAD CAPTURE & MONITORING FORM

DATE 9/11/15	CREW BL, PS. TD, EM
WATERSHED Santa Clara	TEMP 65.19 F DO 9.28 mg/L COND 0.667 us/cm
TRIBUTARY Santa Paula	LAT 34,448 16 LONG -119.06059
REACH	CAPTURE METHOD e-fish Seine
FINAL SETTINGS (V, Hz, Pulse, Duty Cycle)_	100, 30, Std., 30 EFFORT 1880 sec

(Relocation Site #3)

Steelhead Data

Fish #	Length (mm)	Weight (g)	Mark / Tag / Comment (PIT = last 10 digits)
450	114		statofia
640	150		
670	150		
680	130		
690	72	then ext.2	THE COLO
700	120	_ toth 66	EW
710	130		
720	150		
73	180		
74	110	ustali v n	Арепеана — Орукантира
75	70		
76	95		
77	110		
78	80		
79 66	115		
80	70		Mugae
81	85		Same and State of the State of
82	225		el mal'io smit
83 D	155		
84	65		L. modificación
85	100	173.013	
86	95		
87	lib		
88	60		
89	98		

Fish #	Length (mm)	Weight (g)	Mark / Tag / Comment (PIT = last 10 digits)
90	70	material control of the	200200
91	135		A year of the second and a second as
9200	90		
93	65		
7460	155		
75	50	1140-000	Colores and Annabara
32	E - 01/	LXXX	Toole Fungles Taken
33			
34		W. W. W. A.	
35	ilicoloid	- Guilly	ame Verschändt XBS
36			coation Descriptions
37			
38	1		
39			The state of the s
40		eso providy	
41			Land of the second
42			inigno.
43	all r feats	asting page	is ratio wil sucrepand
44		V constan	ani rosena i omamome:
45			
46			
47	21.3	744	
48	KI.	Later III	and great animals are
49	Marine a	omianos d	nyanawa 10 nanyahao.
50			

*indicates	scale	sample	collected	from	fish

= Page total scale samples

√indicates DNA sample collected from fish

___ = Page total DNA samples

Date: 1/26/15	9	Weath	Weather: Over cast	cast	MANG	War M								Form #	# of]
Creek Name/Reach: 50	each: SP1	Air Ten	Air Temp (°C): 70°F Water Temp (°C): 54°F	70°F	Water	Temp (°	0: 52	7	Water	Water Visibility:	1900:1	Water Flow (cfs):	Flow (c	ifs):	2.5
Surveyor(s): TD EM LG	DEM LG	Camera	Camera: Botmoun	Nous		GPS Ur	GPS Unit: B\0850M	CMOSS		Age Code but visible	: 1= new; 2 3; 4= No re	= Previso dd only fla	uly ID'd 8 g; 5= Poc	measura r conditio	Age Code: $1 = \text{new}$; $2 = \text{Previsouly ID'd } \& \text{ measurable}$; $3 = \text{Can't measure but visible}$; $4 = \text{No redd only flag}$; $5 = \text{Poor conditions can't see substrate}$
Redd Record Number	GPS Coordinates	GPS Error (ft)	Bear- ing	Dis- tance (m)	Pot L (cm)	TS L (cm)	Pot D (cm)	Pot W (cm)	TS W 1 (cm)	THE RESERVE THE PARTY OF THE PA	Pot Sub- strate (cm)	TS Sub- strate (cm)	Age Code	Re- meas ured?	Comments (Picture File #, fish on?, etc)
												. (-			
77															
															*
				1											

COMMENTE CAPS (YSP) Studio Bod Hubburgharders

* Denotes data to record for a batch observation	for a batch observation								Form # \(\square \) of \(\square \)
Date: 1/24/15	Creek Name/Reach: SP\	Condition: 1= 4= Carcass, s	Condition: 1= Carcass, fresh eye; 2= Carcass, cloudy eye; 3= Carcass, no eye 4= Carcass, skin & bones w head; 5= Carcass, skin& bones no head; L= Live.	/e; 2= Carcass, ad; 5= Carcass	cloudy eye , skin& bon	; 3= Carcass, es no head; l	3= Carcass, no eye, heavy fungus; s no head; L= Live.		Surveyor(s): TO EM LG
Fish Record Number (Individual Fish only)	GPS*	GPS Error (ft)*	Condition? (live? Spawned?)	Species*	Sex (if fish on redd)	Length	Length type (FL, TL)	Fish on redd?	Comments* (for batch- length estimates, etc)
Section April 1	34.43954.119.07950 22	22	DAIL	O.mylins	1	2-411	7	\	
2	34,43963,-119,079610	019	live	Synfrw.0	-	2-411	H	1	* dead Fish Pool!
								NACO NACACAMENTO CONTRACTOR CONTR	
	V								
									32
									9
				And the Person of the Person o			and the second second second		

Gear	1	070	Notes	DO	Temp	1			,							Re	Surv	Cree	Date:	
Camera	0	155 2	SS	7/Eu 51-01	57.59 °F	-119.06483	pelocation									Redd Record Number	Surveyor(s): EM	Creek Name/Reach:	1/27	
GPS)	5	State - EE-O	Starte 3	10.46 mg/L	59.49°F	34.44570 -119.00350	Peol 2									GPS Coordinates	170	1: SP 2	18	
GoPro		-	1.43966	9.9.	57.58	34.44810	Pool 3	strader soun)								GPS Error (ft)	Camera:	Air Tem	Weather:	
ro	1	16× 0	66.	9.94 mg/L	T	1000	Mos	parts)								Bear- ing	Robin	Air Temp (°C): 58		
Stadia Rod	1	2 2	119.0													Dis- tance (m)	3	T	Cloudy	
Rod		5 500	7790													Pot L (cm)		Water Temp (°C):		
Compass		-	3					DRO								TS L (cm)	GPS Unit:	emp (°C):		REDD SURVEY FORM
			700					DROUGHT								Pot D (cm)		54		SURVE
Thermo-meters				-1				DATA								Pot W (cm)	Blossom	TI		Y FOR
neters			Punch bo													TS W 1 (cm)		Water Visibility:		Ŝ
(Nex)			W 34													TS W 2 (cm)	Age Code: No redd on	sibility:		
			4,44904									9				Pot Sub- strate strate (cm) (cm)	1= new; 2 = ly flag; 5= F	999		
			-													TS Sub- strate (cm)	Previsouly	Water Fl		
			-110													Age Code	Age Code: 1= new; 2 = Previsouly ID'd & measurable; 3= No redd only flag; 5= Poor conditions can't see substrate	Water Flow (cfs):		
			299501611													Re- measur ed?	asurable; 3 ee substra	Schs		
\$			N					r			4		- 12-	else kilos Fotos	Su	Comments (Picture File #, fish on?, etc)	Age Code: 1= new; 2 = Previsouly ID'd & measurable; 3= Can't measure but visible; 4= No redd only flag; 5= Poor conditions can't see substrate	25	Form # of 2	

general Park

Date: 1 27 15 * Denotes data to record for a batch observation (Individual Fish only) Fish Record Number 4 N 0 3 6 Creek Name/Reach: SP2 14. 4A470 34.445/5 -119.06802 34.44526 56890-611--119.06703 34.44494 119-06-184 34,44485 34.44877 34.44611 49.06767 119.05943 19,06623 GPS* Condition: 1= Carcass, fresh eye; 2= Carcass, cloudy eye; 3= Carcass, no eye, heavy fungus; 4= Carcass, skin & bones w head; 5= Carcass, skin& bones no head; L= Live. **GPS Error** 6 0 0 (ft)* 0 0 2 Spawned?) Condition? TIVE ZE 11Vie 20 INO INA 20 (live? DMYLLISS DMUKESS So-thwo OMY KISS Ornyluss STATITUMO Species* 0. 72 fish on Sex (if redd) 1 4-6 2-4 4-6 0 Length N 2-4 -2 4 A TI Length (FL, TL) type T TI P T 70 70 Fish on redd? 2 3 Z 20 20 Surveyor(s): EM TD 4 A BW 49.8M 1881 Comments* (for batch-length N から 2 45h Ash Ash estimates, etc) Form # 2 of Horseshoe D

Gea	ar	pro	Notes	DO	Temp	1 03	-7								Red	Surve	Creek	Date:	
Caméra		(D)	S	7/6w L8.8	55.13.4	34.42949	Watchpool								Redd Record Number	Surveyor(s): EM	Creek Name/Reach:	2/33	
(GPS	1	or & shoe pool 3	Starte	18.54	56.16	34.43003	watchpool			b.					GPS Coordinates	170	: SP	22	40.0
GoPro		34.446	34.42915												GPS Error (ft)	Camera:	Air Temp (°C):	Weather:	
6		2	15												Bear- ing	Bath			
Stadia Rod		119.	-119.												Dis- tance (m)	atman	96	Sunny /	
Rod		9.0680	0909												Pot L (cm)		Water T	Shnal	
Compass		3 (4					DRC							(cm)	GPS Unit:	Water Temp (°C):	Small clouds	REDD
pass	1	s puns	Deek					DROUGHT							Pot D (cm)		: 53	Spr	REDD SURVEY
Thermo-meters	X	Survey	prints					DATA							Pot W	Blosson			EY FORM
-meters	*	e de	(9)												TS W 1 (cm)		Water \		RM
-	and the same of th	ce to	Najo U												TS W 2 (cm)	Age Code No redd	Visibility:		
YSI	4	rain.	main wort dapool									1.			Pot Sub- strate (cm)	:: 1= new; : only flag; 5:	999		
Hann		Ţ.													TS Sub- strate (cm)	2 = Previsor = Poor con	Water		
Hannah DO			otos:												Age Code	ıly ID'd & r ditions can	Water Flow (cfs):		
			sec + Lee : saland												Re- measur ed?	Age Code: 1= new; 2 = Previsouly ID'd & measurable; 3= No redd only flag; 5= Poor conditions can't see substrate	D: 2.5		
			360								8				Comments (Picture File #, fish on?, etc)	Age Code: 1= new; 2 = Previsouly ID'd & measurable; 3= Can't measure but visible; 4= No redd only flag; 5= Poor conditions can't see substrate	S	Form # of	

									FOILIT 91
Date:	Creek Name/Reach:	Condition: 1: 4= Carcass, s	Condition: 1= Carcass, fresh eye; 2= Carcass, cloudy eye; 3= Carcass, no eye, heavy fungus; 4= Carcass, skin & bones w head; 5= Carcass, skin& bones no head; L= Live.	ye; 2= Carcass, ead; 5= Carcass	cloudy eye , skin& bon	; 3= Carcass, no eye es no head; L= Live	, no eye, he L= Live.	avy fungus;	Surveyor(s):
Fish Record Number (Individual Fish only)	GPS*	GPS Error (ft)*	Condition? (live? Spawned?)	Species*	Sex (if fish on redd)	Length	Length type (FL, TL)	Fish on redd?	Comments* (for batch- length estimates, etc)
	34.43574	2	JIVE	o-mulkiss	1	2-41	11	Z	78.4 I
90	-119.08073	2	anil	Donyluss	1	8-Ain	77	7	7541
S	-119.67967	_	onl	Omyliss	1	2-4m	7.4	70	45&E
A	100 LO 10 10 10 10 10 10 10 10 10 10 10 10 10	9	ine	Dwylass	3	4-600	J.	7	MS# 1
5	-119.07073	_0	This	omylass	1	2-45	FL	7	7542
6	34.44400	-9	live	Ornaluss	(2-410	FL	Z	3686
7	34.44531	-9	120	omylus	(2-4in		7	2 Ash
						F			

					3	REDD	SURV	REDD SURVEY FORM	Ĩ	1		CRI			
Date: 2/26/15		Weathe	Weather: partly		Cloudy	4						Na	S		Form # 1 of 2
Creek Name/Reach: SP2	ch:SPZ (x cond)	Air Temp (°C):	ıp (°C): E	.,	Water T	Water Temp (°C):	52	一一	Water V	Visibility:	999	Water Flow (cfs):	ow (cfs):	2	CF3
Surveyor(s):	HG Q	Camera:	place	r pentax	X	GPS Unit:		Blossom		Age Code: No redd or	1= new; 2 : ily flag; 5=	Age Code: 1= new; 2 = Previsouly ID'd & measurable; 3= No redd only flag; 5= Poor conditions can't see substrate	/ ID'd & me ions can't	easurable; see substra	Age Code: 1= new; 2 = Previsouly ID'd & measurable; 3= Can't measure but visible; 4= No redd only flag; 5= Poor conditions can't see substrate
Redd Record Number	GPS Coordinates	GPS Error (ft)	Bear- ing	Dis- tance (m)	Pot L (cm)	TS L (cm)	Pot D (cm)	Pot W (cm)	TS W 1 (cm)	TS W 2 (cm)	Pot Sub- strate (cm)	TS Sub- strate (cm)	Age Code	Re- measur ed?	Comments (Picture File #, fish on?, etc)
1009220	34.44850	9	7/0	8.0	36	34	13	29	46	28	(N)	N	-)	PIC#389H-3904
0226002	26	_0	270	0.65	32	31	0	30	0	-3	1	5.	_		DIC #3905-3007
															(~4 in)
		Ī					OTE -								
					120										
												1			
						DRC	DROUGHT	DATA							
relogation	relaction fool	Kelocation Pool	on Pool												
GP 39,44504,	14 34.44571	39.448/3,	119.06055												
Temp 57,47°F	to 44:45 7	57.11	7												
7.90	8.38 mg/2	9.60mg	0 mg/2												
Notes	Start @ 34	1.44530	1	119.0680	S	horseshoe	shoe	THE STATE OF THE S							
TT	END SULVEY	34.448	4872	1119	. 056	169									
Redd	1 #2 : shn all	redd	7	Mily.	SEEN	Mear	redd	2							
ear	GDE	3	8	£			1			Y6					
Ge		GOPTO	Pro	Stadia Rod	Kou	Compass	1	Inermo-meters	meters	191	1	Hannah DO	טטח		

SCAN SCAN

Form #___2_ of ___2

* Denotes data to record for a batch observation	for a batch observation						(10111#0
Date: 2/26/15	572	Condition: 1= 4= Carcass, s	Condition: 1= Carcass, fresh eye; 2= Carcass, cloudy eye; 3= Carcass, no eye 4= Carcass, skin & bones w head; 5= Carcass, skin& bones no head; L= Live.	ye; 2= Carcass, ad; 5= Carcass	, cloudy eye , skin& bon	; 3= Carcass es no head;	, no eye, he L= Live.	3= Carcass, no eye, heavy fungus; s no head; L= Live.	Surveyor(s): TD BH
Fish Record Number (Individual Fish only)		GPS Error (ft)*	Condition? (live? Spawned?)	Species*	Sex (if fish on redd)	Length	Length type (FL, TL)	Fish on redd?	Comments* (for batch-length estimates, etc)
-	34.44511, 34.44511,	_0	114	O.mykos	١	Vig-h	77	1	1 fish
2	(459)0.011-	_0_	live	o.my kis	1	2-410	カ	\	1 fish
W	24.49872	0	live	0. Mykiss	1	4-610	<u>†</u>	1	3 fish
4	70420.011-	0	live	O.mykas	1	Vi)	T	1	I fish, seen on the way
							No.		
					10000				

Date: 3/9/(Creek Name/Reach: Surveyor(s): EM Redd Record Number 0309001 0309002 3 0309003 3	15 17D 17D 17D 34.43887 -119.08469 -119.08432 34.43960 -119.08432	Weather: Sul Air Temp (°C): S Camera: Bath GPS Error (ft) Bear- ing (ft) (00	206 = 203	Sunny Sunny Sunny Solver Bear- Bear- tance ing (m) Solver	DROI Water T	DROUGHT R Water Temp (°C): GPS Unit: (cm) (cm) 27 27 29 29	REDD S Pot D (cm)	Pot W (cm)	Water V TS W 1 (cm) 2 4 4 4	In Scountisibility: 799 Water Flow (cfs): 2 Code: 1= new; 2 = Previsouly ID'd & measurable; 3= No redd only flag; 5= Poor conditions can't see substrate (cm)	799 1= new; 2: nly flag; 5= Pot Sub- strate (cm) 2	Water Flow (cfs): Previsouly ID'd & me Poor conditions can't s TS Sub- Strate (cm) 0.5 1	low (cfs): Age Code	easurable; see substr Remeasur ed?	Form #. CFS 3= Can't mea ate Comment fish # 299- # 311-	
	2 0	٥	150	2.5	29	29	6	26	24	16	2	-		3	#320	1 1 1
						DRC	DROUGHT	T DATA								
1/2011/2015 Worltchpool	U.S. (13005)															
Temp 53-15	54.33															
9.97	8-74															
Notes possible to	Start @ 34.4	39.43	119.	65890	9.0	9119 1119	S. 07	Horse	Bhare)	1?? C ?	5 4	43985		19.08	41030	(~0.25 m; U.S Redd #2
ar	GPS	Gopro	ro	Stadi	Stadia Rod	Com	pass	Thermo-meters	meters	YS		Hannah DO	h Do	Weds U		
	Gra	10 11.11	č	Stani	2000	Compass	pds5	Hermo	-Illeters	-		Maille	200	Service of the servic	4	

Form # 9

2

* Denotes data to record for a batch observation (Individual Fish only) Date: 3 9/15 Fish Record Number W N Creek Name/Reach: SP 34.43963 34.44538 34-43594 100.07907 -119.07964 19.08758 GPS* Condition: 1= Carcass, fresh eye; 2= Carcass, cloudy eye; 3= Carcass, no eye, heavy fungus; **GPS Error** 4= Carcass, skin & bones w head; 5= Carcass, skin & bones no head; L= Live. 3 (元)* 2 0 Spawned?) Condition? IND TVI THE (live? Drykiss O Muykuss omykiss Species* fish on Sex (if redd) 1 5-8-3 4-6-M Length 4-6 in Length (FL, TL) type T Fish on redd? Z Z Z Surveyor(s): Eng 7D Comments* (for batch-length 250 285 ASW. estimates, etc) WK 4-61X John Sugar

,	*	Scan	ŏ	Hannah DO		(KSI)	meters	Thermo-meters	Compass	Con	Stadia Rod	Stad	GoPro	6	GPS	Camera	Gear
- '			-				1				1						
1						6					190		-	1.		2	
nox+ time	05-955 (chark no	-119	34.44873	re & 34	possible r		took them	teams to	TONE TO CO	Horseshae)	7	20890	. 1	44532,-119	START 34.4	is.	Notes
Prohable								•			8		3 mg/2	7.53	6.25 mg/L	8.94mg/2	DO
													63°F	57.63	57°46°F	57.5°F	Temp
									à				119.06062	34,44816,	-119.0V343 -119.0V343	- 119.06493	
													Ztion	replocation	22	Relocation Pool	p.c
_ '			$\left \cdot \right $					I DATA	DROUGHT	DR(we.
									-							c	- 1
F 9	Redd #2 from 2/26/15	yes Red		2	1	7	22	22	4	.42	10	()	1	19	10430 1011-	002 5	022
			1	_	2	3	19	空	W	35	26	7		4	+	7511/207	031
Ū	Agricate looking Us	No.	1	_	2	7	8	27	7	46	20	2	1	7	34.44955,	0311006	0311
PIC#339 340	opchannel from #5 pic	\$ P.C.		0.5	2	O	20	22	4	30	24	4	1	4	+	0311/005	0311
15年3年一学	103		Yes	2 2	(y	37	50	46	6	25	33	2	1	16	119 SO 6010	0226001 BY	022
-	pic#337-338	pic		2		20 '	29	30	4	40	22	2.2	1	<u>o</u> s	34.44827,	110011 34	031
	prc#332-334	* pos		_	CV	19	27 1	29	W	33	15	8	17	20	34.44492,	0311003 30	031
Tight	#Pacing upstream, #1 is on the Left #2 on Prics #328-330	##	1	_	2	26	30 1	30	2	60	20	2.5	1-	12	4	2311002	031
	*2 redds right next	*21 +6 t	1	2	(n	28	38	36	8	100	31	2:3	1	12	39.49514,	0311001 34	031
	Comments (Picture File #, fish on?, etc)	Re- measur ed?	Age me Code e	TS Sub- A strate (cm)	Pot Sub- Ti strate s (cm)	TS W 2 S (cm)	TS W 1 1 (cm)	Pot W (cm)	Pot D (cm)	TS L	Pot L (cm)	Dis- tance (m)	Bear- ing	GPS Error (ft)	GPS Coordinates	Redd Record Number	Red
	Age Code: 1= new; 2 = Previsouly ID'd & measurable; 3= Can't measure but visible; 4= No redd only flag; 5= Poor conditions can't see substrate	rable; 3= Ca substrate	d & measu can't see s	Age Code: 1= new; 2 = Previsouly ID'd & measurable; 3= No redd only flag; 5= Poor conditions can't see substrate	new; 2 = F flag; 5= Po	ge Code: 1= o redd only		GPS Unit: BUHERCUP	Hug :i	GPS Un		Batman		Camera:	EM	Surveyor(s): TD	Surve
		2 cfs	(cfs):	Water Flow (cfs):	M be	Visibility: 999	Water Vis	T): 56°	Water Temp (°C):	Water	7.89	Air Temp (°C): (Air Ten	SPZ	Creek Name/Reach:	Creek
1	Form # of	T.										(COLST	Weather: ONLY COLST	Weath		3/11/15	Date:
		3	IN EM	(scan		V	Y FORM	SURVEY	REDD :	DROUGHT	DRO						
4				\													

GPS Error (live? Species* fish on Length type (ft)* Spawned?) 9 live 0.mykss - 2-9in FE - 29 live 0.mykss - 4-6in FC - 4-6in FC -	Date: 3/11/15	Creek Name/Reach: SP2	Total Control of the	Condition: 1= Carcass, fresh eye; 2= Carcass, cloudy eye; 3= Carcass, no eye 4= Carcass, skin & bones w head; 5= Carcass, skin& bones no head; L= Live	ye; 2= Carcass ad; 5= Carcass	, cloudy eye s, skin& bon	; 3= Carcass es no head;	3= Carcass, no eye, heavy fungus; s no head; L= Live.		Surveyor(s): TO EM
34.4478, 9 IVC 0.myks - 24in FE - 2 34.44831, 21 IVC 0.myks - 46in FC - 1 34.41865, 27 0.myks - 46in FC - 1	Fish Record Number (Individual Fish only)	GPS*	GPS Error (ft)*	Condition? (live? Spawned?)	Species*	Sex (if fish on redd)	Length	Length type (FL, TL)		Comments* (for batch- length estimates, etc)
34.49831, 21 IVE 0.1094KG - 4-bin FL - 1 34.19865, - 4-bin FL - 1 -119.057704 29 IVE 0.1094KG - 4-bin FL - 1		08990 1611-R	٥_	live	0.mykiss		1-4in	77	1	2 fish
34.44865, 704 29 live 0.myks - 46in Fl - 1		34.44831,	21		Sy Mars 0	-	uigh,	74	prep	1 fish
		34.44865,	29	1	0. mylicis	1	Migh	77	1	I fish (near redd)
						No. of Co.				
					l k					
									4	
				411						
				17			.8			

Gear	Notes	DO	Temp	GPS							031	03	03	030	R	Surv	Cree	Date:	
Camera	es	9,49	60.76	34. 42948	Resour fool #						030900%	0319001	0309002	(00100)	Redd Record Number	Surveyor(s):	Creek Name/Reach: ≤ P	3/19/	
GPS	56t: 34.42917	8.25	62.9	29080 b11-	Resur pool #2				~		-119.07961	34, 43922	34. 43907	34.43885	GPS Coordinates	(本	ch: 5P1	15	***
GoPro											394	12	12	م	GPS Error (ft)	Camera:	Air Temp (°¢):	Weather:	
Pro	-119, 09116										150	40	50	60	Bear- ing	Pentox	J:(2°) d	0	
Stadi										13	W.W	1,5	1.3	2.2	Dis- tance (m)	Š	68	Pear , Sommy	
Stadia Rod											23	23	20	21	Pot L (cm)		Water -	ha	DRO
Compass	Ender					DR(3	I A		26	33	26	22	TS L (cm)	GPS Unit:	Water Temp (°¢):		DROUGHT REDD SURVEY FOR
pass	34.44210					HBOC					4	W	6	4	Pot D (cm)		jf 57		REDD
Thermo						DROUGHT DATA	2				16	24	22	19	Pot W (cm)	Butterwo	7		SURV
Thermo-meters	119,07603					L	6				7	21	22	. 20	TS W 1 (cm)		Water V		EY FOI
_	803										13	12	14	.12	TS W 2 (cm)	Age Code No redd o	Visibility:		Ñ
YSI											2	W	2	2	Pot Sub- strate (cm)	: 1= new; 2 only flag; 5=	999		
Hann											-	-	-	_	strate (cm)	= Previsou = Poor cond	Water	4	
Hannah DO									,	H	2	_	N	2	Age Code	ily ID'd & m litions can'	Water Flow (cfs):		
Sc							2		1		×	N/A	~	~	Re- measur ed?	Age Code: 1= new; 2 = Previsouly ID'd & measurable; 3= No redd only flag; 5= Poor conditions can't see substrate); - -		100000
Scan									*		#	pic# 4097, 4100, 4101			Comments (Picture File #, fish on?, etc)	Age Code: 1= new; 2 = Previsouly ID'd & measurable; 3= Can't measure but visible; 4= No redd only flag; 5= Poor conditions can't see substrate		Form # of2	

Date: * Denotes data to record for a batch observation Fish Record Number (Individual Fish only) 9 N 4 Gi 4 w /19/15 Creek Name/Reach: 57 34.42948 34. 43344 34. 43386 39. 43269 34. 43537 -119. 09668 119,090b 119.09637 -119·08793 -119,0900 GPS* 4= Carcass, skin & bones w head; 5= Carcass, skin& bones no head; L= Live. Condition: 1= Carcass, fresh eye; 2= Carcass, cloudy eye; 3= Carcass, no eye, heavy fungus; **GPS Error** 0 (ft)* 0 J ō 3 0 7 7 Spawned?) Condition? (live? 1 1 1 5 1 1 O. Replier O. Mykers O. Myha O. Mykiss Species* O. Wyles a. White 7 fish on Sex (if NIA 2/4 redd) 2/2 TA 1/4 NA. -4 Length 7 7 7 7 Z X 1 ? 2-4 7-4 2-4 (FL, TL) Length 2-4 type 2-4 2-4 6-3 Fish on redd? > > 5 4 The 17 7 3 Surveyor(s): TD, KE XU メルで X4 fish Comments* (for batch- length 43 estimates, etc) Form # 2 of

Notes:

) Fish own in Course pool #2, possibly Sucker

Creek Name/Reach: SP2 Surveyor(s): EM TD Redd Record Number 0323001 34.44856 0323003 34.44556 0323000 34.44551				DRO	DROUGHT REDD	REDD	SURVEY FO	Y FOR	RM			I	7	
Vame/Reach: Vame/Reach: Vame/Reach: Vame/Reach: Vamber or(s): EW o	Wea	Weather: 8	Phylmg										1	Form # of 3
1 Record Imber 3001 30001 30001 30001 30001 30005 30005 30006 300006 30000006 30006 30006 30006 30006 30006 30006 30006 30006 30006 300000		Air Temp (°C): 58	38	Water	Water Temp (°C):	50		Water Vi	Visibility: 999		Water Flow (cfs):	w (cfs):	دو	
1 Record Imber 3001 3 3005 3006 3006 3006 3006		Camera: R	atma	5	GPS Unit:	1	Buldbles		Age Code: 1=	: new; 2 =	Previsouly	ID'd & mea	surable; 3	Age Code: 1= new; 2 = Previsouly ID'd & measurable; 3= Can't measure but visible; 4=
3001 3006 3005 3006 3006 3006 3006	2	ć	-			- 11	00000		No read only riag; 5= Poor conditions can usee substrate	ilag; o= Po	oor conditi	ons can t s	se substrat	ic.
3001 3001 3005 3005 3005 3006 3006	dinates Error	or Bear-	tance (m)	Pot L (cm)	TS L (cm)	Pot D (cm)	Pot W (cm)	TS W 1 (cm)	TS W 2 P	Pot Sub- strate strate (cm) (cm)	TS Sub- strate (cm)	Age Code	Re- measur ed?	Comments (Picture File #, fish on?, etc)
3003 3003 3005 3006 3006	5	2 85	1/1	37	3	V	36	\$	36	77	-	-	1	PIC:347-350
3003 3 3006 3006 3006 3006	1+	13 70	2.3	38	23	W	200	2	50	2	_	-	1	PIC: 361-352
3005 3005 3006 3006	1+	7 7	2.7	2	_0	4	23	Q 4	20	0			1	Pre: 353-354 SPI
3005 3005 3006 3006	1+	9 216	2.3	34	<u>0</u>	4	04	23	00	W		_	1	Dust Dis. of Redds 5-9
3005 3006 3006 3006		140		43	38	W	200	∞ ∞	5	w	_	R	イ	361-364 = Pictures of Pedds 5-8
3005 3006 3006 3006				1	١	1.	1	1)	.1	1	W	2	Redds are furniven
3006 3006 3007				9	コ	ير	14	<u>v</u>	=	W	_	_	1	Dight.
#6 not				19	21	2	23	00	28	W		-)	されないい
#16 not	_	+	-	CC	8	p	20	21	[7]	20	'n	_	1	٥
the not	1- 601	22 50	2.2	23	30	6	23	28	22	W	_	-	1	when facing U.S. (#11)
the not					DRC	DROUGHT	DATA.							DIC 36%
the not														
# 6 not														
#16 not														
# 6 not								-						
	- 1	12,-119.	0							7				
Camera	Mark all	oct was	1	COVERSON	by the	to	11/05	07	Legaci	1				
Camera)									
	PS/	GoPro	Stad	Stadia Rod	Compass		thermo-meters	meters	ISA		Hannah DO	8	Scan	ă

Form # 2 of 3

* Denotes data to record for a batch observation Date: 3 23 15 Creek Name/Reach: SP $\sqrt{2}$ Condition: 1= Carcass, fresh eye; 2= Carcass, cloudy eye; 3= Carcass, no eye, heavy fungus; Surveyor(s): Em 74= Carcass, skin & bones w head; 5= Carcass, skin& bones no head; L= Live.

Fish Record Number		GPS Error	Condition?) He	Sex (if		Length	Fish on	Comments* (for batch- length
(Individual Fish only)	GPS*	(ft)*	(live? Spawned?)	Species*	redd)	Length	type (FL, TL)	redd?	estimates, etc)
	-119-04937	8	Z.	Oppulpaiss		2-4	77	Z	afish near Radd # 3
P	-119.0688G	5	live	Omykiss	1	2-4	FL	7	375/
W	34.44530	4	live	Omyluss)	2-4	T.	Z	2=2-4 Horseshoe 1=4-6 Pool
4	34.41521	1 9	122	Omykess	1	2-4	77	7	1 A.S.V
5	34.44487	1+	live	Oprujuss	1	2-4	FL	Z	2556
6	34.44546	47	- IVA	ssryhmo	1	2-4	FL	7	1882
7	34.44628	122	170	Omillas	1	4-6	FL	Z	18:50
8	34.44785 -119.06232	1-10	live	Openiuss	Allena	2-4	7	Z	1 2-4
9	-119.06220	± 20	live	ss. malman a	1	4-4	FL	T	7841
0	34.41861	+12	INE	omykuss	1	2-4	FL	7	N3:41
							V		

ar	Notes	DO	Temp	GPS	Pu		0221	032	1180	0311	0323	5001150	0221	0311004	0372	0311	Redd Nu	Surveyo	Creek N	Date:	
		10.71mg/L	28-96	34.44498	Pullication		0226002	1108280	4.001180	0311006	0323010	200	0226001		0323009	0311003	Redd Record Number	Syrveyor(s): EM	Creek Name/Reach:	3 23	
	50a G 24.	10.68 mg/L	F 59.44 F	8 -119.06347	Pelocation Pool #2		-119.05702	34,44950	<	34.44954 -119.05867	-119.05943	+	34.44854	-119.06042	-119.00164	-119.06705	GPS Coordinates	ATD .	ch: SP2	115	
	4480	11.38	40.20	34.41810	Pelocation Pool 井る		7 2	1.35	+	17	121	4	± 20	1 21	+ 19	122	GPS Error (ft)	Camera:	Air Temp (°C):	Weather:	
		1/5m 88	0 1	448-10 06058	Tion		248	125	156	136	42	1		345	8	0	Bear- ing	Batrnan			
	17.0	9					1.2	n	2	2	2.6	p	P	2.9	+	છ	Dis- tance (m)	Man	760	Swnny	
	0261	- 22					29	3	19	j	28))	33	31	22	Pot L (cm)		Water T		DROU
						DRO	27	100	22	1	44	١	1	75	32	39	(cm)	GPS Unit:	Water Temp (°C):		DROUGHT REDD SURVEY FORM
						DROUGHT	8	6	S	1	W	1)	Þ	4	W	Pot D (cm)		20		EDD S
				Ť		DATA	22	29	80	١	38	1	١	23	23	27	Pot W (cm)	Bubbles	71		URVE
							20	28	コ)	27	١)	30	34	30	TS W 1 (cm)		Water Vi		Y FOR
							<u>e</u>	24	5)	Q 4	1	١	24	27	26	TS W 2 (cm)	Age Code: 1= new; 2 = Previsouly ID'd & measurable; 3= No redd only flag; 5= Poor conditions can't see substrate	isibility: 999		Z
							4	B	2)	R	١	١	W	-	4	Pot Sub- strate (cm)	1= new; 2 = ly flag; 5= I			
							2	_	_	J	-	ano.)	-	0.25	_	TS Sub- strate (cm)	= Previsoul Poor condi	Water Fl		
							2	_	2	w	_	Do	B	2	-	2	Age Code	/ ID'd & me ions can't :	Water Flow (cfs):		<u>~</u>
							-<	1	~	Z	1	Z	Z	4	1	~	Re- measur ed?	asurable; s see substra	2	1	Const
								Pics: 374-377			PICS: 371-373		7		Pic: 369-370	new record Eight of facing	Comments (Picture File #, fish on?, etc)	Age Code: 1= new; 2 = Previsouly ID'd & measurable; 3= Can't measure but visible; 4= No redd only flag; 5= Poor conditions can't see substrate		Form # 3 of 3	
						1					42				5.0	- Cacina	Pic: 368	(trape company) gaugh			

în l	Scan	Hannah DO	Hann	YSI		Thermo-meters	Therm	Compass	Con	Stadia Rod	Stad	GoPro	Go	GPS	Gear Camera
														And the second s	
												4			
							75								
					1		台书	out redd	END C		09119	-119.0°	34.42912,	START: 34.4	Notes
															DO
							3,-								Temp
															GPS
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Pic 4472-493	1.	-	2	2	12	22	一一	S	26	30	2.5	3420	2	111	04/02/00)
Comments (Picture File #, fish on?, etc)	Re- measur ed?	Age Code	TS Sub- strate (cm)	Pot Sub- strate (cm)	TS W 2 (cm)	TS W 1 (cm)	Pot W (cm)	Pot D (cm)	TS L	Pot L (cm)	Dis- tance (m)	Bear- ing	GPS Error (ft)	GPS Coordinates	Redd Record Number
Age Code: 1= new; 2 = Previsouly ID'd & measurable; 3= Can't measure but visible; 4= No redd only flag; 5= Poor conditions can't see substrate	Age Code: 1= new; 2 = Previsouly ID'd & measurable; 3= No redd only flag; 5= Poor conditions can't see substrate	ıly ID'd & m ditions can't	= Previsor	:: 1= new; 2 only flag; 5=	Age Code No redd o		Bubbles	it: But	GPS Unit:		Batman		Camera:	EV	Surveyor(s): TD
À	2 cfs	Water Flow (cfs):	Water	999	Water Visibility: 999	Water \	'n	77	Water Temp (°C):		7200	1p (°C):	Air Temp (°C):	h: 5P)	Creek Name/Reach:
Form # of		F	7		2	204				LUUNS	clear, si		Weather:		Date: 4/2/15
			S	A CHARLES AND A	Ñ	DROUGHT REDD SURVEY FORM	SURV	REDD	TH90	DRO					

Form # 2 of N

Date: * Denotes data to record for a batch observation Notes: Fish Record Number (Individual Fish only) 4/2/15 Creek Name/Reach: SP 34.4352 34.42957, GPS* 00880 Condition: 1= Carcass, fresh eye; 2= Carcass, cloudy eye; 3= Carcass, no eye, heavy fungus; 4= Carcass, skin & bones w head; 5= Carcass, skin& bones no head; L= Live. **GPS Error** T (ft)* TIVE Spawned?) Condition? (live? 8 sylves O. Muricis Species* fish on Sex (if redd) Length 4-6in しつり type Length (FL, TL) -4 Fish on redd? Surveyor(s): Comments* (for batch-length 00 MSA PIST *YOUR # estimates, etc) TOPA

	Scan	h DO	Hannah DO	YSI	Υ.	Thermo-meters	Thermo	Compass	Cor	Stadia Rod	Sta	GoPro	6	GPS	Gear Camera
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Comments (Picture File #, fish on?, etc)	Re- measur ed?	Age Code	TS Sub- strate (cm)	Pot Sub- strate (cm)	TS W 2 (cm)	TS W 1 (cm)	Pot W (cm)	Pot D (cm)	(cm)	Pot L (cm)	Dis- tance (m)	Bearing	GPS Error (it)	GPS Coordinates	Redd Record Number
Age Code: 1= new; 2 = Previsouly ID'd & measurable; 3= Can't measure but visible; 4= No redd only flag; 5= Poor conditions can't see substrate	Age Code: 1= new; 2 = Previsouly ID'd & measurable; 3= No redd only flag; 5= Poor conditions can't see substrate	y ID'd & me tions can't s	= Previsouh Poor condi	: 1= new; 2 nly flag; 5=	Age Code: No redd o		Blossow		GPS Unit:		Batman		Camera:	TD JT	Surveyor(s): EM
CR	200	Water Flow (cfs):	Water Fl	2	Visibility: 99	Water \	D°F	3): 56	Water Temp (র্ণির):		62.F	Air Temp (%):	Air Tei	:: SPI/SP2	Creek Name/Reach: SP1/
Form # of 3	-	7								1	Cloude		Weather:	5	Date: 4 6 15
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Date: 4/6/15		Weather:	Lynnos	F					7					1	Form # 2 of
Creek Name/Reach: 5	SP1/SPZ	Air Temp (°C): 65 ° F	(°C): 65		Water Temp (°C):	np (°C):	57°F		Water Visibility:	ibility: C	N 600	Water Flow (cfs):	ow (cfs):	2	
Surveyor(s): EM TD	D 31	Camera:	Batman	UNG	6	GPS Unit:	Blossom	OM	Z >	ge Code: 1= o redd only	new; 2 = flag: 5= P	Previsouly oor conditi	ID'd & me	Age Code: 1= new; 2 = Previsouly ID'd & measurable; 3= No redd only flag; 5= Poor conditions can't see substrate	Age Code: I= new; 2 = Previsouly ID'd & measurable; 3= Can't measure but visible; 4= No redd only flag; 5= Poor conditions can't see substrate
Redd Record GPS Number	GPS Coordinates	GPS Error (ft)	Bear- ing	Dis- tance	Pot L (cm)	TS 1 I	Pot D (cm)		TS W 1 (cm)	TS W 2 P. (cm)	Pot Sub- 1 strate (cm)	TS Substrate	Age Code	Re- measur	Comments (Picture File #, fish on?, etc)
0323002 37.44	4.44253,	+19		-		* .							N	2	
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	1/6/1	2	Weather:		RUMUS									Bire		Form # 3 of 4
Creek Na	Creek Name/Reach:	h: ,592	Air Temp (°C):	p (°C):	c	Water T	Water Temp (°C):			Water \	Visibility:		Water Flow (cfs):	ow (cfs)		
Surveyor(s):	(s): EM	A TD OT	Camera: 8 atmax	Bat	may		GPS Unit:	8	lossom	2	Age Code:	1= new; 2	= Previsoul	y ID'd & me	easurable; 3	Age Code: 1= new; 2 = Previsouly ID'd & measurable; 3= Can't measure but visible; 4= No redd only flae: 5= Poor conditions can't see substrate
Redd Record Number	ecord	GPS Coordinates	GPS Error (ft)	Bear- ing	Dis- tance (m)	Pot L (cm)	TS L	Pot D (cm)	Pot W (cm)	TS W 1 (cm)	TS W 2 (cm)	Pot Sub- strate	TS Sub- strate	Age Code	TS W 2 Pot Sub- TS Sub- Age Re- (cm) (cm) (cm) Code Cd2	Comments (Picture File #, fish on?, etc)
0323,069		34.44756,	+ 13											N	2	
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0311006	•	<u></u>	<											B	Z	2
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* Denotes data to record for a batch observation	or a batch observation	a t							Form # 4 of 4	
Date:	Creek Name/Reach:	Condition: 1= 4= Carcass, sl	Condition: 1= Carcass, fresh eye; 2= Carcass, cloudy eye; 3= Carcass, no eye, heavy fungus; 4= Carcass, skin & bones w head; 5= Carcass, skin& bones no head; L= Live.	ye; 2= Carcass, ad; 5= Carcass	cloudy eye , skin& bon	; 3= Carcass, no eye es no head; L= Live	no eye, he = Live.	The same of the sa	Surveyor(s):	
Fish Record Number (Individual Fish only)	GPS*	GPS Error (ft)*	Condition? (live? Spawned?)	Species*	Sex (if fish on redd)	Length	Length type (FL, TL)	Fish on redd?	Comments* (for batch- length estimates, etc)	7
_	54.447.52,082	15	live	0.myass	1	4-6m	エ	7	1 fish	
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Comments (Picture File #, fish on?, etc)	Re- measur Co	Age Code	TS Sub- strate (cm)	Pot Sub- strate (cm)	TS W 2 (cm)	TS W 1 (cm)	Pot W (cm)	Pot D (cm)	(cm) 1.S.1	Pot L (cm)	Dis- tance (m)	Bear- ing	GPS Error (ft)	GPS Coordinates	brd	Redd Record Number
Age Code: 1= new; 2 = Previsouly ID'd & measurable; 3= Can't measure but visible; 4= No redd only flag; 5= Poor conditions can't see substrate	Age Code: 1= new; 2 = Previsouly ID'd & measurable; 3= Co No redd only flag; 5= Poor conditions can't see substrate	y ID'd & me tions can't	= Previsoul Poor condi	: 1= new; 2 only flag; 5=	Age Code No redd c		obles	nit: by	GPS Unit:		COLIN		Camera:	3	16	Surveyor(s):
	1.0	Water Flow (cfs):	Water F	isibility: 999	/isibility:	Water V	0	c): 576	Water Temp (°C):	Wate	17	Air Temp (°C):	Air Ter	8	e/Reach: (Creek Name/Reach: Sp
Form # of (0											SUNNV		Weather:	2015	DOI D	Date: 4
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INDIVIDUAL & BATCH OBSERVATION FORM

Date: AL\pai\2015 Creek Name/Reach	Creek Name/Reach:		Condition: 1= Carcass, fresh eye; 2= Carcass, cloudy eye; 3= Carcass, no eye 4= Carcass, skin & bones w head; 5= Carcass, skin& bones no head; L= Live. Condition? Sex (if Leng	ead; 5= Carcass,	cloudy eye , skin& bon		3= Carcass, es no head; I	Condition: 1= Carcass, fresh eye; 2= Carcass, cloudy eye; 3= Carcass, no eye, heavy fungus; 4= Carcass, skin & bones w head; 5= Carcass, skin & bones no head; L= Live. Condition? Sex (if Length
Fish Record Number (Individual Fish only)	GPS*	GPS Error (ft)*	Condition? (live? Spawned?)	Species*	Sex (if fish on redd)		Length	
\frac{\pi}{-}	8£060.611 01060.148	4)		mukiss			2-4:7	2-4:7 4-6:1 FL
11-10	119.09028	11	1	mykliss		1	2-4	2-4 FL
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INDIVIDUAL & BATCH OBSERVATION FORM

Date: Creek Name/Reach	Creek Name/Reach:	Condition: 1:	Condition: 1= Carcass, fresh eye; 2= Carcass, cloudy eye; 3= Carcass, no eye, heavy fungus;	ye; 2= Carcass	cloudy eye	; 3= Carcass	, no eye, he	- Department of	Surveyor(s):
Fish Record Number (Individual Fish only)	GPS*	GPS Error (ft)*	Condition? (live? Spawned?)	Species*	Sex (if fish on redd)	Length	Length type (FL, TL)	Fish on redd?	Comments* (for batch-length estimates, etc)
IJ	11,040 15	19	7	Shows.	3	24	y.		
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INDIVIDUAL & BATCH OBSERVATION FORM

* Denotes data to record for a batch observation	for a batch observation								Form # 6 of 6
Date: 14 Appalus	Creek Name/Reach: Sp	Condition: 1= 4= Carcass, sl	Condition: 1= Carcass, fresh eye; 2= Carcass, cloudy eye; 3= Carcass, no eye, heavy fungus; 4= Carcass, skin & bones w head; 5= Carcass, skin& bones no head; L= Live.	ye; 2= Carcass, ad; 5= Carcass	cloudy eye; , skin& bone	3= Carcass, s no head; i	no eye, hea .= Live.	COLONES CONTRACTOR MINISTER CONTRACTOR CONTR	Surveyor(s): (5, T)
Fish Record Number (Individual Fish only)		GPS Error (ft)*	Condition? (live? Spawned?)	Species*	Sex (if fish on redd)	Length	Length type (FL, TL)	Fish on redd?	Comments* (for batch- length estimates, etc)
14	16 10/06/23	12		3 HUS		24	7		
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Comments (Picture File #, fish on?, etc)	Re- measur ed?	Age Code	TS Sub- strate (cm)	Pot Sub- strate (cm)	TS W 2 (cm)	TS W 1 (cm)	Pot W (cm)	Pot D (cm)	TS1 (cm)	Pot L (cm)	tance (m)	Bear- ing	Error (ft)	GPS Coordinates	Redd Record Number
Age Code: 1= new; 2 = Previsouly ID'd & measurable; 3= Can't measure but visible; 4= No redd only flag; 5= Poor conditions can't see substrate	Age Code: 1= new; 2 = Previsouly ID'd & measurable; 3= No redd only flag; 5= Poor conditions can't see substrate	ly ID'd & n itions can'i	= Previsou : Poor cond	:: 1= new; 2 only flag; 5=	Age Code No redd c	7	NOS SO	it: Blos	GPS Unit:		コュ	1801	Camera:	181	Surveyor(s): TD
CFS		Water Flow (cfs):	Water F	999	Visibility: 999	Water \	77	D: 54	Water Temp (°C):	1	10+0F	Air Temp (°C):	Air Ten	sp2	Creek Name/Reach:
Form # 1 of 4											Ruya	()	Weather:	5	Date: 4/15/1
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INDIVIDUAL & BATCH OBSERVATION FORM

Date:	Creek Name/Reach:	Condition: 1= 4= Carcass, s	Condition: 1= Carcass, fresh eye; 2= Carcass, cloudy eye; 3= Carcass, no eye, heavy fungus; 4= Carcass, skin & bones w head; 5= Carcass, skin& bones no head; L= Live.	ye; 2= Carcass, ad; 5= Carcass	cloudy eye , skin& bon	; 3= Carcass, es no head; I	no eye, he .= Live.		Surveyor(s):
Fish Record Number (Individual Fish only)	GPS*	GPS Error (ft)*	Condition? (live? Spawned?)	Species*	Sex (if fish on redd)	Length	Length type (FL, TL)	Fish on redd?	Comments* (for batch- lengthestimates, etc)
-	34.44481,	46	live	mykiss		2-410	77	2	1 fish
2	34.44534,	23	TV	O. O	1	ナーででき	77	Z	2 2-4in fish
W	34.446.45,	20	1118	30 o	1	21-616	7	Z	
4	34.44795,	961	live	My Kiss		4-6in	7	2	
ળ	34.44812,	15	live	O. Visi	1	4-6in	T	2	
6	-119.05964	12	live	mukiss	0 4 5	0-2in	T	Yes	* fry swimming.
7	34.44867, 128	27	TWY.	2 Striped	1			. 1	
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					REDD	REDD SURVEY FORM	FORM								
Date: 4/15/	15	Weather:		Kunns											Form# 3 of 96.5
Creek Name/Reach:	ach: 582	Air Tem	Air Temp (°C): 68°F	Oc TI	Water T	Water Temp (°C):	20	11	Water V	Water Visibility: 990	000	Water Flow (cfs):	ow (cfs):	۷	CPS
Surveyor(s):	D 31	Camera				GPS Unit:	30			Age Code	: 1= new; /	= Previsor	ıly ID'd &	measurab	Age Code: 1= new; 2 = Previsouly ID'd & measurable; 3= Can't measure but
Redd Record Number	GPS Coordinates	GPS Error (ft)	Bear-ing	Dis- tance (m)	Pot L (cm)	(cm)	Pot D (cm)	Pot W (cm)	TS W 1 (cm)	TS W 2 (cm)	Pot Sub- strate (cm)	TS Sub- strate (cm)	Age	Re- measure d?	TS W 2 Pot Sub- TS Sub- Age comments (Picture File #, Code d? fish on?, etc)
1009220	34.44826,	16		1	The state of the s)	1 -)) .		١		7		
0311005	←	*		-1		-	1	1.	1	1 -	1		7		
0415062	34.44822,		320	3	32	5	エ	29	22	24	4.0	100	_		
0415003			600	W	32	4	3.6	40	36	G	-	0.5	-	1	PiC#6515-0517
HO05170	-	*	400	Ç	25	19	5	21	19	7	1 . 1	0,0	-		*2 large rocks
0415005		18	360	1.6	21	26	2.6	26	25	6	8.0	4.0	-	1.	
0415006	-	P	150°	1.6	25	30	4	26	19	1.6	9.0	0.3	-	. 1	147
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Date: 4/27/15		Weathe	Weather: Windy		SERVE	325						1768			Form # 2 of ~(
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		A STATE OF THE PARTY OF THE PAR									Z	1	Re- measure d?	measurab	A		The same same same same same same same sam
													Comments (Picture File #, fish on?, etc)	Age to de: 1= tarr ? = Pt \ isoury ID'd & measurable; 3= Can't measure but \\ Visible; 4= No redd only flag; 5= Poor conditions can't see substrate	N	Form # of 4	The same of the sa

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INDIVIDUAL & BATCH OBSERVATION FORM

Date: 4/27/16	Creek Name/Reach: S₽	Condition: 1= 4= Carcass, s	Condition: 1= Carcass, fresh eye; 2= Carcass, cloudy eye; 3= Carcass, no eye, heavy fungus; 4= Carcass, skin & bones w head; 5= Carcass, skin & bones no head; L= Live.	ye; 2= Carcass ad; 5= Carcass	, cloudy eye s, skin& bon	; 3= Carcass es no head;	no eye, he L= Live.	avy fungus;	Surveyor(s): TD BH KE
Fish Record Number (Individual Fish only)		GPS Error (ft)*	Condition? (live? Spawned?)	Species*	Sex (if fish on redd)	Length	Length type (FL, TL)	Fish on redd?	Comments* (for batch-length estimates, etc)
	34.42947, -119.001068	٥	live	O.mykiss	All Property and the second	1-815, 1-610,	F	Z	10 Ash (54-6, 5 68)
2	34.42980,		live	0. MYKIS	ggreen.	2-4in	7	Z	1 ASN
(s	34.43649,	-0		0.mykiss		0-212	7	Z	1 fish (fry)
7	34.43879	و	live	S. MAKIS		0-210	T	2	- fish (Fry)
5	34.43962,	J	TIVE	O.Mykis		2-410	7	2	\$ D.S.
6	19940-511-	P	11VC	Sixtum.0	1	2-4:5	77	2	7 4:57
	34.44270,	و	Time	MA	3	12.5cm	1	1	Not copioned
+1	26690-611- SURHY: 178	_0	1146	O. mykik		2-410	I	2	2 85%
⊗	82890 - 641- 866 hr 46	9	live	d.mykiss	1	1-4in, (3)	FC	Z	4 Pish
_0	34,44577	٥	live	O.mykis	\	2-4 in; (3) 4-6 in; (4) 6-8 in; (1)	7	Z	& fish (Horseshor)
		militari da Carlo de							

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Weather: Weather: /Reach: Spl. Air Temp (* GPS Coordinates Error (ft)) **A: 445 13,	Robin tance (m)	Water Te	Water Temp (°C):	7.09	Water						Form # of 2
rd GPS Coordinates 34.44490, 24.44490, 21.9.06711	Sbin ar- tance	Water Te		GO . F	Water		- Annual	-	-		
7 D LG Camera: GPS Coordinates Error (ft) 34.4445 13, 24.44490,	John Distance (m)	1000			2000	Water Visibility: 499	666	Water F	Water Flow (cfs):	0 27	The offer
rd GPS Coordinates Error (ft) 34.44490, 34.44490,		Pott	GPS Unit:	Bubble	S	Age Code.	: 1= new; 2 nlv flag: 5=	= Previsou	y ID'd & me	asurable;	
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Gamera: Air Temp (°C): Water Temp (°C): Wat	Date:		Weathe	u l											The state of the s	2 of
GPS Coordinates GPS	Creek Name/Re	ach;	Air Tem	p (°C);		Water T	emp (°C):			Water Vi	isibility:		Water F	ow (cfs)		
GPS Coordinates First Part Table Tab	Surveyor(s):		Camera				GPS Unit				Age Code: No redd or	1= new; 2 ily flag; 5=	= Previsoul Poor condi	y ID'd & me tions can't	easurable;	3= Can't measure but visible; 4=
34. 44.75. 5 19. 05.77.4	Redd Record Number	GPS Coordinates	GPS Error (ft)	Bear- ing	Dis- tance (m)	Pot L (cm)	(cm)	Pot D (cm)	Pot W (cm)	The second second second	TS W 2 (cm)	Pot Sub- strate	TS Sub- strate	Age	Re- measur	Comments (Picture File #,
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Date:	Creek Name/Reach:	Condition: 1= 4= Carcass, s	Condition: 1= Carcass, fresh eye; 2= Carcass, cloudy eye; 3= Carcass, no eye, heavy fungus; 4= Carcass, skin & bones w head; 5= Carcass, skin& bones no head; L= Live.	ye; 2= Carcass ad; 5= Carcass	cloudy eye , skin& bon	; 3= Carcass es no head;	, no eye, he L= Live.		Surveyor(s);
Fish Record Number (Individual Fish only)	GpS*	GPS Error (ft)*	Condition? (live? Spawned?)	Species*	Sex (if fish on redd)	Length	Length type (FL, TL)	Fish on redd?	Comments* (for batch-length estimates, etc)
	34.44500,	5	TIVE	TdM		10cm	C. T. T. C.	CHANGE AND CONTRACTOR	Toron service and a condession of the property
	31.444 7-7, -119.0678	4	live	O.mrykiss	Î	0-2in	FL	Z	(207) ASF -
	3. 44515, -19.06461	25	live	Jam	T	Ilcm			
2-4	7.4458E,		II.Ve	O.mykig	1	0-2in	FL	Z	3 Fish (104)
5-6	34.47779	7	live	D.Mykell		0-7.m	1	2	2 Ash (404)
7+	34.44787,	+	1/1	O, mykin		4-6in	FL	Z	1 Fish
8	34.44850,	32	live	O.mykiss	-	0-2in	TH	Z	1 FISH (404)
	34,446 681	1	INC	O.mykin)	0-2m	FL	2	(FISH CYOY)
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Notes:

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1. 4. 2948 34. 43003 ±10 19. 81 (00, 25 14. 80/L 1. 25 mg/L 1. 1 mg/L 1. 25 mg/L	DROUGHT REDD SURVE							
R.P. 1 RPD 34,42008 116,090610 59.81 (00,25 119,090610 59.81 (00,25	DROUGHT REDD SURVER 200							otes
RP 1 RP2 34,42948 34,43009 ±10 -119,09068 -119,090610	DROUGHT REDD SURVE						7.25 mg/L	
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1 RP2	DROUGHT REDD SURVER AST LOD ST Air Temp (°C): 59° Water Temp (°C): 57° T, EH Camera: Roldin GPS Unit: TSI Pot D Fot Water Temp (°C): 57° Bear tance (rt) ing (m) (cm) (cm) (cm) (cm) (cm) (cm) (cm)				The state of the s		34.43003	- 119. H
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	DROUGHT REDD SURVERSE COOL SD Air Temp (°C): S9° Water Temp (°C): S7° T, EH Camera: Robin GPS Unit: \$\frac{1}{205564}\$ PS Coordinates Error ing (m) (cm) (cm) (cm) 3969 4181 9 11 9	F				+	326.90 617-	2015
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GPS Coordinates GPS Coordinates Error ing (m) At \$3769 -1(9,67967 -1(9,67	2015 Weather: Overcast, (Water Visibility: 999 Water Flow (cfs): (), 5	UI HO	Water Temp (°C	J	Air Temp (°C):	ach: SD	Lreek Name/Re
SD Air Temp (°C): S9 Water Temp (°C): S7 T, EH				1001	-	Weather: OV	ay 2015	M of Brane
SD	CONTRACTOR	ORM	REDD SURVEY F	DROUGHT				

	Proprior delle delegationale delle	INDIVIDUAL		& BATCH OBSERVATION FORM	TION FOR	M	Newspace Accelerated the Assessment Assessme	Capacidam a preparativos como presenta	AFFIRM FOR THE STATE OF THE STATE OF ST
* Denotes data to record for a batch observation	or a batch observation	AN LANGUAGE MARIES COMMENCED AND REPORTED AN	THE REAL PROPERTY AND ADDRESS OF THE PROPERTY ADDRESS OF THE PROPE				A Committee of the Comm	CONTROL OF THE PARTY OF THE PAR	Form # of
Date:	Creek Name/Reach:	Condition: 1= 4= Carcass, sl	Condition: 1= Carcass, fresh eye; 2= Carcass, cloudy eye; 3= Carcass, no eye, heavy fungus; 4= Carcass, skin & bones w head; 5= Carcass, skin& bones no head; L= Live.	/e; 2= Carcass, ad; 5= Carcass,	cloudy eye; , skin& bone	3= Carcass, ss no head;	no eye, he = Live.	avy fungus;	Surveyor(s):
Fish Record Number (Individual Fish only)	GpS*	GPS Error (ft)*	Condition? (live? Spawned?)	Species*	Sex (if fish on redd)	Length	Length type (FL, TL)	Fish on redd?	Comments* (for batch- length estimates, etc)
	34,42980 -119,09052	413	live	O my Kiss	The street of th	2in	1	2	SOME AND PROPERTY OF THE PROPE
4	34.43004	H 18	1100	O-Mykis		Zin	7.	2	(2) Santa Ara suckers
Ldw	34.44263	415		LCM	2	M7C1			*missing
MDT	34, 4429 4	413	7	LAM	Z	11cm		ern-choosessammer * h-c-c-g-mail installation of the comments	Oralive : Sall
(N)	34,44518 -14.06803	790		Omykiss					(3) Sin (4)3in
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Notes:

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And the second s															
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			To the state of th									S Com	9.18	J. 31 mg/2	9.20mJ/
												2°F	60.72	1, 185.65	7.098.65
	AND SECTION OF THE PARTY.											06060	34,44811,	- 119:06361	-119.06986
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and the second s	2	w		1	1	1	\	-\		1	1		14	119.08954	0412006 37
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CELEBRA MANAGEMENT CONTRACTOR OF THE CONTRACTOR	Z	3	The second secon	1	1	\	1)		12		1	4	34.44517	2 400 ELEO
Comments (Picture File #, fish on?, etc)	Re- measur ed?	Age Code	TS Sub- strate (cm)	Pot Sub- strate (cm)	TS W 2 (cm)	TS W 1 (cm)	Pot W	Pot D (cm)	TS L (cm)	Pot L (cm)	Dis- tance (m)	Bear-	GPS Error (ft)	GPS Coordinates	Redd Record Number
Age Code: 1= new; 2 = Previsouly ID'd & measurable; 3= Can't measure but visible; 4= No redd only flag; 5= Poor conditions can't see substrate	Age Code: 1= new; 2 = Previsouly ID'd & measurable; 3= No redd only flag; 5= Poor conditions can't see substrate	ly ID'd & m	= Previsou = Poor cond	: 1= new; 2 only flag; 5=	Age Code No redd c		Bubbles		GPS Unit:		Batman	i i	Camera:	型門	Surveyor(s): TD
F	0.5cts	Water Flow (cfs):	Water F	999	r Visibility:	Water '	5	S	Water Temp (°C):	Water	6101	Air Temp (°C):	Air Ten	" SP2	Creek Name/Reach:
Form # of											Cloudy		Weather:	5	Date: 7/26/
HANDAR HECHAFFE DE DE UNBERETE DE CHICATRON LES LICOTOS DA PARFOCA.	ATTENNETICENS SEPTEMBERS SON POST A	CORTO CANADA CONTRACTO CANADA CONTRACTO CONTRA	WILDSHIP DOCCOLORS OF THE STATE)RM	EY FOI	DROUGHT REDD SURVEY FO	REDD	HEU	DRC					

		INDIVIDUAL		& BATCH OBSERVATION FORM	TION FO	RM	CONTRIBUTE SCHOOL SCHOO	A SOCIAL CONTRACTOR OF THE CON	OFFINGER, WE WERE CONTROLLED TO THE PROPERTY OF THE PROPERTY O
* Denotes data to record for a batch observation	for a batch observation	BANDOLD BAND CHARLES THE PROPERTY OF	ALL THE PERSONNEL TO SERVE OF THE PERSONNEL						Form # of
Date:	Creek Name/Reach:	Condition: 1 4= Carcass, s	Condition: 1= Carcass, fresh eye; 2= Carcass, cloudy eye; 3= Carcass, no eye, heavy fungus; 4= Carcass, skin & bones w head; 5= Carcass, skin& bones no head; L= Live.	ye; 2= Carcass ad; 5= Carcas	, cloudy eye s, skin& bon	; 3= Carcass es no head;	, no eye, he L= Live.	avy fungus;	Surveyor(s):
Fish Record Number (Individual Fish only)	GPS*	GPS Error (ft)*	Condition? (live? Spawned?)	Species*	Sex (if fish on redd)	Length	Length type (FL, TL)	Fish on redd?	Comments* (for batch- length estimates, etc)
-	34.44511,	8	1 VC	a mykiss	TO COLUMN THE PROPERTY OF THE PARTY OF THE P	2-4 in	F.C.	SERVATA VINCENTIARED CEDICARCEAN	4 Fish
D4-6	39-4/190,97,	+	live	0-mylus	l	のといる		7	3 FIR (1704)
7-8.	34.41785	5-	1.46	0.myk153	1	0-2in	74	2	2 Fish (YOY)
9-10	34.44784,	8	live	O. majluin	1	87.8	FL	Z	2 FLA (YOY)
	34.44.756	+	1200	O. mykir	and the same of th	24.4	7	2	I FISH
2	34.44 811,	エ	live	O mykas)	0-2in	7	2	1 Fish (194) underpoints
13-17	34.44828,	7	live	o myhig		17 (2) 17 (2) 17 (2) 18 (2)	74	Z	
, 18-21	34 44855, -119 06003	2	INE	O. Imphilip		2-4(1)	7	Z	4 FIGH C2 HOM)
. 22	34.44865 bt. 65979	5	11/10	G. mykky		7.0	73	7	(25) (2S)
25-27	34.44368,	5	live	C. mykis	1	7-0	FC	Z	S fish (all yoy)
28-29	74. 449 17, -119.65798	7	live	O. myKici		20	7	2	2 FSK (404)
30	34.44865	20	live	O.mgkig.		9-9	7.1	2	16:35

		Form # of
Date: 6/17/15 Time: (0:00 Stream	am Name: Santa Paula	Reach:
Snorkelers: FM	Data Recorder: TD BY	4
Start Lat: 34,430,60	Start Long: -119.08184	GPS Error: 9 ft
Camera: Mr. Freeze GPS: Butter C	weather Desc: Sunny	
100	1000 100	1 200 0 0

Γ	Unit #	001	002	603	004	005	006	607	305	009	010
	Lat.	34.43960	34.439.56	34.45956	Control of the Contro		34.43959	34.43959	34 43981	39.43.988	34.43976
	Long.	-119.06184		119.08150	119-08130	119.08/25	119108091	119.08081	119.0804	119.08014	119.07973
	Mean Length	43	39	46	13	9	12:	42	9	15	24
	Mean Width	9	5.5	7	7.5	6	### T	705	10 mm 7 m m m m	7	子。
er	Mean Depth	0.7	0.6	0.10	0.5	0.5	0-7	0.9	0.7	0.6	0.8
cord	Max Depth	1.5	0-7-	1	0.7	0.7	1.0	1.7	. 1.2	1.0	LA.
Re	Inflow?	Y	No.	7	A THE	4	No.	Y	H	Y	- Sp
Data Recorder	Outflow?	Y	4	4	MANAGE AND	7	14.1	Y		4	A Transition
	Isolated Pool?	N	N.	N	N.	N	N	N	$\sim M_{\rm Post}$	N	N. N.
	Reloc. Pool?	N	. West	N	and the	N	N	N	N. N.	N	- N.
	Watch Pool?	N.		N	14	2		N	E-W-	N	IN NECES
	Photos	0007	2000 2000	0010	00 II	0012	0013	4100	6015	00/6	0017
ē	Shelter (0-3)	2	2	2	275	2	1.2	2	10.2 mars	2	Ω
Snorkeler	Visibiliy (1-3)	3	333	3	3	3	3	3	3	3	3.5
0)	0-1.99	1	4	2		2		4	6 1 The Control of th	Paraman	Space of
	2-3.99	1		2			11.47	3			3
(in)	4-5.99	4	and Edition of	1			自身大学的	2	151 A		1484
mykiss size (in)	6-7.99	-			464 4 24				. 1		
rkiss	8-9.99							2	nacidos estados de la como de la		
. my	10-11.99										是 19g AMP 100 1
0.	12-13.99		en e								
	14-15.99		e universal productive state. National productive state of the state o				Brain probablica		inelling in 1966 days and September 1967 and	The Real Property of	
es							September 3				rguistaas († 1
Species									Control of		The standard of the standard o
ier S	ar and a second										to growing
Other											
	Temp (F)	60 F			1						
alit	Conductivity (ms/cm²)	100 Hz	1 2 2 2 3 3 3 3						A 1		
Water	DO (mg/l)			100							
3	Air	710=	HOUSE CONTRACTOR								
-	1/11		10.45.144.149.19								
				Pools,	- 17 AP						
Other Comments			3	step p			1				
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			ST .	\$ 33		and the same of th					
			*Sents snorkeled	*Series o							
			S X	\$ ts					7		

Date: 6/17/15 Time: 11:00 Stream Name: Santa Paula Reach:

Snorkelers: FM Data Recorder: TD BH

Start Lat: Start Long: GPS: BUH-Prap Weather Desc: Survey

	Unit #	011	012	013	014	015	016	017	018	019	020
	Lat.	34.43959	31.43964	34.43966	39.45976	34.439.80	34.43917	34.43987	341.43998	34.44014	34,44022
	Long.	119:07954		119.07867	119.07775	119.07746	119.073	119.0774	119.07706	119.07696	119,0786
	Mean Length	25	19	7	8	8	10	5.5	7	35	16
• 7	Mean Width	7	5	5	5	4	4	3.5	4	4	140
er	Mean Depth	0.7	1.01	0.7	0.6	0.9	0.7	0.7	0.4	0.6	0.6
Recorder	Max Depth	1-0	2.1	1.1	0.7	1.1	0.7	1.1	0.8	0.9	1.0
Rec	Inflow?	Ч.	i yan	N	and Shares	7		4	Table 1	7	4
Data	Outflow?	Y	i Yu	4	SI SI SI	4		Y	4	7	4
	Isolated Pool?	N	- New	N	- 1 T 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	N	San All Control	N	we do	N.	N
- 1	Reloc. Pool?	N	o Mai	N	- Mari	N		N	M. M.	N	SANA
	Watch Pool?	TN.	· M	N	\sim \sim	N	- 4	N	No.	N	in place
- 1	Photos	0018	0019	0020-	0027	0023	0014	0025	0026	0027	0024
e.	Shelter (0-3)	2	91.	2	0.T.	2	1. 0.	2	2	2	1
22	Visibiliy (1-3)	3	31:	3	2	3	3.3	3	3 3	3 .	3
-	0-1.99						property and the		Sign of the sign o		m-2/11
-	2-3.99	2	21	1		2	2.7			1	Constant of the Section of the Secti
Ē.	4-5,99 ·	1					E-10" (3 to 25" (3 to	1	1742 (1921)		Control (Control
a)	6-7.99		Traj - 2mbili 1825. A		100						
diss s	8-9.99				1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -						
m Y	10-11.99						CONTRACTOR !				16. TEMPARENT
0 1	12-13.99										
-	14-15.99				torage to a section with				Andread Control of the Control of th		n mendeleggener (un) General Georgia
-	WPT			1 (Kath)	(数据 5-8的)		60.00000000000000000000000000000000000				12 15 BANDED
Species	VVI						ceptary and		CONTRACT O		and Barry
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Other							Assiltate of				
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alit	Temp (F) Conductivity (ms/cm²)	91 1							e selva i seleva i Normalista i seleva i Normalista i seleva		
0 1	DO (mg/l)	1 1									
× -	Air	78°F									
1		10 1	50	-			1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		The state of the s		
			*dead fish pool! (from last year)	Female Fic 0021					And Andrews		
ents			2 3	0.8 ft long Fernale							
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Other Comments			5.00	4 62							
the			4.3	w B							
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			J. 2	MA							

DROUGHT/SNORKEL SURVEY DATA FORM ver 09.29.14

_			I hadet			nd / Data	hi T		Form# 3	of A	
Da	ite: 6/17/15	Time: :	35	Stream Name		Poula	ver Larry	nakt grager	Reach:	979	
	orkelers: EM	1	Data Recorde	10		Camera: My	Freeze		GPS: BUH	ercup	name of the second
Sta	art Lat:		100 - 210 T		Start Long:	-	and heal		GPS Error:	IT fi	· Ji
										1 1	
PI	REVIOUS SUR	VEY DATA:								ATAK AV	1,12 PER 10
Da	te of Previous Sur	vey:									
Pre	ev. Max Depths										143 - 144 A
											Annual control of the
	Unit #	1021	022	023	024	025	026	027	028	029	030
	Lat.	34.44050	34.41043	34.44074	34.44074	34,44093	34.44113	34,4123	34.44137	34,44172	34,44123
	Long.	-119.07693	119.07677	19,07677		119.07689	19.0769	No. of Concession, Name of Street, or other Desires, Name of Street, Name of S	119,07693	The second name of the second na	119.67614
	Mean Length	19	\mathbb{N}	27	8	18	6	20	12	9	10
	Mean Width	4.5	4.5	5	5.5	4	7.5	6.5	3.5	5.5	7.5
Per	Mean Depth	0.5	0.5	0.6	0.6	0.7	0.9	0.6	0.7	0.7	0.7
Recorder	Max Depth	11	6.9	1.6	0.8	1.5	1.5	1.0	1-0	1.0	1.6
Rec	Depth Change?										
Data	Inflow?	4	Ч	Y	Ч	N	4	Ч	Y	4	4
	Outflow?	4	7	7	7	7	4	Ч	Ч	4	- Noting
	Isolated Pool?	N	N	N	N	N	N	N	2	N	N
	Reloc. Pool?	N	N	N	N	N	N	N.	N	N	TONE
	Watch Pool?	N	√	N	N	N	N	N	N	N	TOON SOL
	Photos	0031	0032	ANLI	G	6631	1111	mas	0039-	00/10	0000
_				0034	0635	0036	0037	0038	0047	0048	0050-
Snorkeler	Shelter (0-3)	2	2	2	2	2	2	2	2	2	2
	Visibiliy (1-3)	3	3	3	3	3	3	3	3	2	3
- 1	Rankeide Obs?										
- 1	0-1.99	4	2			4		1			4"
-	2-3.99	1		1	2	2				1	
10 1	4-5.99	2									
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Ja	8-9.99										
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	14-15.99										
cies											
Spe											
Other Species											
0											
ity	Temp (F)	60°F									10 (11)
Qual	Conductivity (ms/cm ^c)										
Water Quality											
Wa	DO (mg/l)	9-05									
-	AIV	75°F									
					7.0						
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nts											
Other Comments								A			
Com											
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										76 m	

DROUGHT/SNORKEL SURVEY DATA FORM ver 09.29.14 1st / 2nd / Data Form# 4 Time: 12:7 Stream Name: PULLO Reach: Snorkelers: EM Data Recorder: Camera: Mr. Freeze GPS: BUHPray Start Lat: Start Long: GPS Error: ft PREVIOUS SURVEY DATA: Date of Previous Survey: Prev. Max Depths Unit # 035 Lat. 34.44160 34,441 44185 34.44195 1,94733 Long. 119-07570 19.07529 07512 19.07510 119.07503 07479 119,074 19.07309 Mean Length 0 9 Mean Width 5 5.5 4.5 6 5.5 6 Mean Depth 0.9 0.6 0.8 0.7 0.8 0-7 0.7 Max Depth 0.9 1.6 0. 1.1 Depth Change? Inflow? Y V Outflow? Y 4 4 Y Isolated Pool? N N N N N N N N N Reloc. Pool? N N N N N N N N N Watch Pool? N N 1 N N N N N N N Photos 0056 0055 6058 0057 0062 0060 0063 006 0050 Shelter (0-3) 2 2 1 2 2 Visibiliy (1-3) 7 3 3 2 Bankside Obs? 0-1.99 <u>E</u> 2-3.99 2 mykiss size 4-5.99 6-7.99 8-9.99 ó 10-11.99 12-13.99 14-15.99 Species Other 9 (2°F Temp (F) Water Quality Conductivity (ms/cm^c) DO (mg/l) Air 78°F Other Comments

DROUGHT/SNORKEL SURVEY DATA FORM ver 09.29.14

	1st/ 2nd / Data	Form # 1 of 3
TUN 205 Time: 9	48 Stream Name: Santa Patla	Reach: 1
Snorkelers: KE	Data Recorder: LG Depth JT Camera: Bottom N	GPS: Buldhles
Start Lat: 34 . 42873	Start Long: -119, 09114	GPS Error: O ft

_	REVIOUS SUR te of Previous Sur										
Pr	ev. Max Depths										I
57-	Psemore		±8	±12	±13	± 10	±13	± 15	= 13	+ 12	
	Unit #	001	002	003	1004	005	1930	007			t
	Lat.	34.42865	34.428710	341.42882	34.42880	34. 42926	34. 12944	34.42948	003 34,42975	009	010
	Long.	-19.09113	-119.09190		-119.09117	719,09108	719. D9090	The state of the s		34.42.999	-
	Mean Length	1114	17.254	18 f+	10.0ft	19 ft	03: ft	19.09071 53.091	119.09045	-119.09041 19.51	Annual contraction of the last
	Mean Width	4.74	5,5ft	5.3ft	504	14.2 ft	9.01	The same of the sa	57.5 11	1111	31 ft
4	Mean Depth	0,7 ft	0.64	0.5 1	0.64	0.9 ft	D74	17.5 A	IN TO	10.5 f+	12-11
Recorder	Max Depth	11.2 ft	1 4	0.84	094	21 ft	1.14	-	1.7-41	0.6 ft	11.2+
Rec	Depth Change?			0.011	9.77	02.17	1,177	3.6 ft	2.841	1.1 ft	2.5+
Data	Inflow?	TY	Y	V	V	V		Y	V	1	
Ö	Outflow?	Y	1	V	Y	Y	Y		A 4	Y	
	Isolated Pool?	N	N	V-)	N	N.	Y	Y	Y	Y	
	Reloc. Pool?	IN	N	N	12	N	N	N	N	N	
	Watch Pool?	N	N	N		2	N	7	N	N	
	Photos		IV.	IV	N	17	N	N	N	N	
Snorkeler	Shelter (0-3)	1	1	2		2	2	2			position than 1965 in
Shork	Visibiliy (1-3)	3	3	3	3	3	- 3		2	1	2
	Bankside Obs?						- 0	3	3	3	3
	0-1.99		3		2	3			. /		1
6	2-3.99	4	2			2			4		3
() az	4-5.99				activities to the second	-	4	le	0		2
25 51	6-7.99		This is a second or					5	8		2
mykiss size (in)	8-9.99		Lancia Lancia						4		
	10-11.99								alle was not a		
	12-13.99	10					The second second second				
	14-15.99							Access of			
S	Stickelback					the street of the			the engineed a con-		Mercurial and
Other species	SHUBERE			1							
ir St									and the second		
Ĕ.										-	
	T (=)						-4.000000		L. Fridake State See		
HILLY	Temp (F) Conductivity				error engage		or pear years ago a		n ann shakara in the s		
water quality	(ms/cm ^c)										
arer	DO (mg/l)				-		and the second second				eriological department
VV	DO (Mg/I)								er en en en en		
-											2
		stact pool due to oil preesont from beidge	Ion geodient					pool pool			5000 de/ dta/ 4000 34.4500 47.05 47.05 47.4500 4.77

DROUGHT/SNORKEL SURVEY DATA FORM ver 09.29.14 1st / 2nd / Data Form # Date: (9/17 Time: 35 Stream Name: Reach: Snorkelers: Data Recorder: Death Camera: botomani GPS: Start Lat: 34, 43119 Start Long: GPS Error: ft PREVIOUS SURVEY DATA: Date of Previous Survey: Prev. Max Depths ± 8 GIPS CREDOD # + ナナ +7 49 + 士子 Unit# 01 011 013 015 010 013 019 Lat. 24.4311 34.43209 34.43288 34,43331 34.43351 43372 34.4337 Long. 119.09088 -119.09r50 -119. 19.0904 119,090 09037 19,09024 19,0900 Mean Length 64 ft Ct 8.0ft 110 ft Mean Width 11.7 4 7.84 8.5ft Mean Depth 1.5 ft 0.7.0 1.Q++ 0.75ft 0.7- 4 1.0f+ 0.8 ft Max Depth 2.69 1.4 A 2.2 A .Of+ 2.3 F4 1.641 2.6 Depth Change? Data Inflow? Outflow? Isolated Pool? NI N N N 1 N N Reloc. Pool? N N N N N N N N N Watch Pool? N N N N N N Photos Shelter (0-3) 2 2 1 2 Visibiliy (1-3) 3 3 2 3 3 Bankside Obs? 0-1.99 4 2-3.99 mykiss size (in) 4 4-5.99 6-7.99 8-9.99 o. 10-11.99 12-13.99 14-15.99 Other Species Wary! Temp (F) Water Quality warm Naviv Conductivity (ms/cm^c) DO (mg/l) Other Comments 34. 45 PA 108

DROUGHT/SNORKEL SURVEY DATA FORM ver 09.29.14

[st)2nd/Data Form # 3 of 3

Date: | 7 Jun70|| Time: | 3) 2 | Stream Name: Sn + 1 Paula Reach:

Snorkelers: | 6 / 3 | Data Recorder: | 6 / 3 | Camera: Balman GPS: Bubbler

Start Lat: 34, 43462 | Start Long: - | 19,09833 | GPS Error: + 7 | ft

PREVIOUS SURVEY DATA:

Date of Previous Survey:

Prev. Max Depths

_	te of Previous Surv	ey:							and a service of the		
re	w. Max Depths	士子					Control of				
	Unit#		±7	±7	± 12	1/2	19	-8	18	=10	12
	The state of the s	021	022	023	024	045	020	027	CA8	029	030
		34.43492	34.43501	34.43516	34,43729	34.45744	34.43774	34.43787	34.43817	34 .4382)	34,4389
	Long. Mean Length	-119.08833	14.088 6	119.08798	-119.1004	1-119,0864	119.06/4	119.01559	-119,0855	-119.08553	-119.08457
	Mean Width	8 ft	73 /	24	1841	12.5 +	175 14	22+	11) 07+	17. Off	324
_	Mean Depth	0761	9.6	8.5	11 ++	10 #	9.54	8-f+	7.0 H	30ft	94
Recorder	Max Depth V	1.3 ++	117	18	1+8.0	0.111	D-144	0.9 ++	0.7 #	0.84	0.74
eco	Depth Change?	1.777	117	LID	154	1.14	11.464	1.2-ft	009 A	1.2+	1.074
ta R	Inflow?	X	V	V	1/	V	V	1			
Data	Outflow?	Y	2	1	V	Y	1	Y	Y	Y	Y
	Isolated Pool?	N	A	A		Y	T.	Y	Y	1	Y
	Reloc. Pool?	N	N A	N	N	N	N	N	N	N	N
	Watch Pool?	N	N	N	N		N	N	N	12	N
	Photos	10	IV	IV	IV.	N	M	10	N	N	N.
er	Shelter (0-3)				1	2	7	0		The same of the	
Snorkeler	Visibiliy (1-3)	3	2		-3	3	3	2	3	2	2
	Bankside Obs?		_ C		(2)	3)	3	3	3	3
	0-1.99	0	0	0	1						
n n	2-3.99	1			7		4	. ,			
ze (i	4-5.99	10.7			i			1			2
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	14-15.99	V	V	V							
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Species		The second secon									
Other										Language and an an	
5				600 Park Street	ne Hila systematics	Salara radio		+18		a secretary 1	era Arika erasa
5	Temp (F)										
nam	Conductivity				e e in						
water Quality	(ms/cm ^c)										
wat	DO (mg/l)										
							a la constant			Terror Company	(44)(12)(4)(14)(14)(14)(14)(14)
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-				74 11	70,-119 08775 115 * Fellsmed Wing all Mingles	Met @34,43685,719.0865028	24,43635,75,08620114 CUSAND WINT!				= 32
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DROUGHT/SNORKEL SURVEY DATA FORM ver 09.29.14

		1.	£	•		nd / Data	Contract Contract		Form#	of	
	ite: 6/22/15	Time: ()			: Santo	- Paula	Title		Reach: \		
Sn	orkelers: TD	76/47	Data Recorde	r: BH MO		Camera: R	obin .		GPS: But-	tercup	
Sta	art Lat: 34.47	2864				19.09/03			GPS Error:	9 ft	
	W	eas memor	ts in ft							1000	
PF	REVIOUS SUR	VEY DATA:	4		1 -						
Da	te of Previous Sur	vey:	The same of the sa			1					
Pre	ev. Max Depths								Appella and a super-		110
(CW63	110						V .		V	IV
	Unit#	001	002	003	004	005	006	007	008	009*	010
	Lat.	34.42864	42870	.42875	.42888	.42897	Contract of the local division in which the local division in the local division in which the local division in th	. 42928	,42937		,42976
	Long.	119-09163	09166	.09114	.09113	.09114	+09116	.09109	+ 09087		-09045
	Mean Length	14 5+	8.5 A	414	8.0 51	6.04	12.04	14 ++	9.0 ft	42.8+	38 84
	Mean Width	8.0	4.5	6.0	2.10	3.0	75	13 ft	5.0 ft		9,084
<u>_</u>	Mean Depth	0.5	0.7	0.6	0.5	0.6	0.6	0.8	0.6	2.5	16
Data Recorder	Max Depth	0.8	0.14	1.0	1.0	0.8	6.8	1.8	1.0	3.3	2.4
Seco	Depth Change?	-									
ta	Inflow?	Y	×γ	4	Y	Y	· Y	Y	- V	4	Y
Da	Outflow?	Y	Ý	Y	Y	4	Ÿ	Y	Y	Y	Y
	Isolated Pool?	N	N	7		N	J.	N	N	N	N .
	Reloc. Pool?	12	- N	2	1 72	N	N	N	N	N	N. 14
	Watch Pool?	N	N	2	Ž	N	N	N	N	(1)	N
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eler	Shelter (0-3)	2	71414274	2	2	2 .	2.	2	2	2	2
×	Visibiliy (1-3)	3	3	3	3	3	2	2	7.	2	
	Bankside Obs?	٠, ۴				• 1					e de la compansión de l
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SS SI	6-7.99				and the result		e		NASCO CONTRACTO		
ykis	2-3.99 4-5.99 6-7.99 8-9.99 10-11.99										
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	14-15.99			.0							negovala se de la comi
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Other Species											
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ality	Temp (F) Conductivity	00/1									
	(ms/cm ^c)										
ater	DO (mg/l)				1						
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Other Comments	* 1										
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DROUGHT/SNORKEL SURVEY DATA FORM ver 09.29.14 1st / 2nd / Data Form # 2 Date: 6/22/15 Time: Stream Name: Santa Paula Reach: Snorkelers: 10 BH Data Recorder: BH Camera: GPS: Butterenp Start Lat: Start Long: GPS Error: MEGSVENENTS PREVIOUS SURVEY DATA: Date of Previous Survey: Prev. Max Depths CMP? Unit# 012 × 013 014 016 017 019 018 026 34.4300034, 4334034, 43377 34.43385 Lat. 34.43506 4. 4352034.43581 34.4372 34.43727 14.09063 119.09039117.0903/119.09003 Long. 119.09817 119.08801 119.08754 119-06/ST 19.08645 9.0804 Mean Length 20.0 FH 44.04 8.0 A 22.0ft 8.0 ft 180A 14.0 9 8.5 Mean Width 11.0 Ft 10.0H 5.0 10.0 9.0 9.0 94 7.0 \$ 4,5 4 8 1.2 Mean Depth 1.1 0.7 1.3 ++ 0.8 0.7 0.7 0.8 Max Depth 2.4 2.3 1.3 2.5 2.0 1.2 A .3 Depth Change? Y Inflow? Outflow? N Isolated Pool? N N N N N N N N Reloc. Pool? 2 N N N N N N Watch Pool? N N N N N Photos 610-612 Shelter (0-3) 2 2 2 2 7 2 2 Visibiliy (1-3) 3 2 2 3 2 2 3 Bankside Obs? 0-1.99 2 2-3.99 mykiss size (in) .3 4-5.99 6-7.99 8-9.99 10-11.99 12-13.99 14-15.99 Other Species Temp (F) 60°F Water Quality Conductivity (ms/cm^c) DO (mg/l) ANT 72° PDye 34.43008 119.09063 2 6 119.09061

DROUGHT/SNORKEL SURVEY DATA FORM ver 09.29.14

-	(1. n /1 m	101	. ~	T					Form #	ot	
-	ate: 6/22/15	Time: 12:	-	Stream Nan	ne: Santa			-102	Reach:		
-	orkelers: B	H	Data Record	er: TD		Camera:	ROWIN		GPS: BUH	ercup	
Sta	art Lat:				Start Long:		to a later to the same	and the second		0	t
										4.00	
PF	REVIOUS SUI	RVEY DATA:		(1) 4) 1 1 (1) (1) 1							
	ite of Previous Su										
	ev. Max Depths		Tanana a				- market and	2	T	F	T
	-cwh.		1	1	1-/-	+-/	1	1-/-	1	1	1
	Unit #	1021	1000	000	1 -011	100=	1001	1 -0-1		\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	1
		The same of the sa	022	023	024	025	026	027	028	029	030
	Lat.	34.43729	34.43745	34.4374	34.43171	34.43788	34.43790	34.43806		34.43822	34,4383
	Long.	-119.08646	6 119.08658	19-08622	119.08610		1119.08587		H119.08555	119.08549	19.085
	Mean Length	12	8.5	1.5	10.5	4	14	25	9	17	7
	Mean Width	10	9.5	5	5	5	5	6.5	5	65	9.5
ā	Mean Depth	0.9	0.7	0-6	0.8	0-9.	0-9	0.8	0.7	09	0.5
pic	Max Depth	1.5	1,1	0.9	1.4	0.7	12	1.7	0.9	1.3	1.2
Recorder	Depth Change?							1.0	0. 1.	1-2	Solid Control
	Inflow?	. 4	Y	4	N	V	33 XI 5 3 3 3 3	. 7	N	\/	
Data	Outflow?	4	V2.272	4	H	1	7		and the first of the	· 4	1 1 1 N 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
	Isolated Pool?	-1	7					Y		4	* 14
		N	N	N	N	N	И	N	7	N	N
t	Reloc. Pool?	N	N.	~	N	N	N -	N	N	N	*N
- 1	Watch Pool?	N	N	7	N	7	• N	N	N	N	N
	Photos										100.00
						1					
-	Shelter (0-3)	12	2	1	2	2	2	2	Section Section	2	2
	Visibiliy (1-3)	3	3-	3	2	3	3	3	3	3	2
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-	0-1.99		1				A CAMPAGARAGA A A A A A A A A A A A A A A A A				2
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-	L2-13,99								100		
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		£.		Y	Total Market 1	8	a Marine e	4		in the second se	
T	emp (F)	(4°F)							7. 27.42.2.88		
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	ns/cm²)							9			
D	O (mg/l)										
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DROUGHT/SNORKEL SURVEY DATA FORM ver 09.29.14 1st / 2nd / Data Form # Date: 6/22/15 Time: 13.20 Stream Name: Santa Prula Reach: Snorkelers: BH Data Recorder: Camera: Robin GPS: BUTTERWE Start Lat: Start Long: GPS Error: ft PREVIOUS SURVEY DATA: Date of Previous Survey: Prev. Max Depths CM Unit # 031 032 033 036 4586 Lat. 34.43891 34.42935 Long. 08503 08467 09454 08380 0833 0837 119 0836 Mean Length 10 4 2 10 Mean Width 6-5 3.5 9 Mean Depth 0.7 (),(, 0 () 0 -.0 4 Max Depth 0.9 0.9 1.1 1.7 1.6 Depth Change? Data Inflow? N SE 1 Outflow? 4 4 Isolated Pool? N N N N N M N N N Reloc. Pool? N N N N N N N N N 14 Watch Pool? N N N N N N N Photos Shelter (0-3) 2 Visibiliy (1-3) 2 2 Bankside Obs? 0-1.99 2-3.99 3 mykiss size (in) 4-5.99 2 6-7.99 8-9.99 10-11.99 12-13.99 14-15.99 Other Species Temp (F) Water Quality Conductivity (ms/cm^c) DO (mg/l) 19°F AIV Other Comments

DROUGHT/SNORKEL SURVEY DATA FORM ver 09.29.14

1st / 2nd / Data

Date	D-	te: 6/12/15	Time: 1/12	<u>^2</u>	Stroam Nam		Paul			Reach:	<u> </u>	
Start Late Start Long: GPS Error:	-					e. OUI ITO					OKCI IIO	
PREVIOUS SURVEY DATA: Date of Previous Survey: Prev. May Depths C.N. (2) Unit 8 O. (1) Unit 8 O. (1) Unit 9 O. (1) Unit 10 O. (1) Unit 10 O. (1) Unit 2 O. (1) Unit 2 O. (1) Unit 2 O. (1) Unit 3 O. (1) Unit 3 O. (1) Unit 4 O. (1) Unit 5 O. (1) Unit 6 Unit 7	*			Thata vectoring	. 11)	Start Long:	Carriera. K	201.1		GPS Error:		
Date of Previous Survey: Prev. Max Depths Lint: 31, 43912, 2413916 Str. 143573 Line: 117, 6827 143916 Str. 143573 Line: 117, 6827 143918 Str. 143573 Line: 117, 6827 143918 Str. 143573 Line: 117, 6827 143918 Str. 143573 Mean Length Mean Depth A			· A			1					13	per il suo
Date of Previous Survey: Prox. Nato Depths UN (₹) Unit 8 O (1) Lia: 31, 437(2, 34739, 16, 34, 43737) Lone:	PF	REVIOUS SURV	/EY DATA:			Manager Control of the Control of th						
Unit # 041 CH2 043 044 045 Lat. 31, 437(2, 21137 to 34,4373 to 34,4373 to 14,4373 to 14	-				75.5						7	Manager 1
Unit 8	-		1									
Lat. 31, 437(2) 54, 437(3) 54, 437(3) Lone 1/9, (85-7) 19, 5622 1 Mean Depth		CW65	V									G.
Long.		Unit #		042	043	044	045	h-10-12-13				
Long.		Lat.	34.43962	34.4396(34.43953			j				
Mean Width		Long.	119.08257	19.08238	119.08221							
Mean Pepth 0. 0. 0. 1. 2. 0. 7 1. 2. 1. 2. 2. 2. 2. 2.		Mean Length		100								
Max Depth		Mean Width										
	er	Mean Depth		And the second second second second						1. (1864)		
	ord	Max Depth	1.3	4	1.2							
	Rec	Depth Change?							-		propried in the party of the last of the l	
	ata	Inflow?		4	Y					14.42		
Reloc. Pool? N N N N N N N N N N N N N N N N N N N		Outilowr		Y						Conservation (Conservation)		
Watch Pool? Photos Shelter (0-3) Shelter (0-3) Deankide Obs? O-1.99 O-1.99 O-1.99 1 2-3.99 1 4-5.99 1 10-11.99 10-11		Isolated Pool?		and the second second second second			5					na sike odpane za sukra postani sike na sike o
Shelter (0-3)		Reloc. Pool?				(83)						
Shelter (0-3)			N -	N	N							
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12-13.99 14-15.99 Temp (F)	size		1	A STATE OF THE PARTY OF THE PAR	1							
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12-13.99 14-15.99 Temp (F)	E		4	W 2			-(- 12			
14-15.99 14-15.99						Name of the same						
Specific Conductivity (ms/cm°) DO (mg/l) A) Y 80°F				W - A								
Temp (F) (5°F) Conductivity (ms/cm²) DO (mg/l) Air 80°F	-	THE RESERVE OF THE PERSON NAMED IN		V		Carlos and the						
Temp (F) 65°F Conductivity (ms/cm°) DO (mg/l) Air 80°F	ecie	INKT				La company de la company d						
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DROUGHT/SNORKEL SURVEY DATA FORM ver 09.29.14 1st / 2nd / Data Form # Date: (64/15 Time: 10:00 Santa Paula Stream Name: Reach: Data Recorder: 814 Camera: Batman GPS: Bubbles Snorkelers: TD Start Lat: 34.44248 Start Long: GPS Error: 119.07270 ft PREVIOUS SURVEY DATA: Date of Previous Survey: Prev. Max Depths CWD 3 Unit# 00 007 006 008 34.44248 34.44252 34.44254 34.44262 34 44271 34.44270 34,44268 34.44259 Lat. 34.44269 34.44221 119.0712219.07117 119.07270/19.07260 Long. 119.07256 119.07250 119.07233 119.07212 119.07270 119.07188 9 0 ft 12.5 8 16 Mean Length oft Mean Width 6.5 11.5 7 4.5 7067 8.0 0.5 Mean Depth 0.9 0.8 Ft 0.7 0.7 0.7 1.0 0.9 0.5 0.6 0.6 0.8 Max Depth 1.0 84. 1.3 1.4 1.4 1.0 1.0 1.0 0.9 Depth Change? Inflow? Y Y V Outflow? Y 4 Isolated Pool? N N N Reloc. Pool? N N N N N N N Watch Pool? N N N N N Photos 5 Shelter (0-3) 2 2 2 2 2 2 2 2 3 Visibiliy (1-3) 2 Bankside Obs? 0-1.99 2 4 3 2 2 2-3.99 2 2 mykiss size (in) 2 4-5.99 6-7.99 8-9.99 10-11.99 12-13.99 14-15.99 Species Other 61 Temp (F) Quality Conductivity (ms/cm^c) Water DO (mg/l) Air Temp

Other Comments

DROUGHT/SNORKEL SURVEY DATA FORM ver 09.29.14

1st / 2nd / Data

		2507 25107 5510	1 Oll 11 17 months of the control of		
Date: 6/24/15 Time:	Stream Name:	Santa Paula	Reach:		
Snorkelers: TD	Data Recorder: 81+	Camera: Batmon	GPS: Bubbles		
Start Lat:	St	art Long:	GPS Error: 18 ft		

Dat	te of Previous Surv	ey:								108/11	Parenty in
-	ev. Max Depths										0.091,090
-	CMP?			V	V			1	/		
	Unit #	011	012	013	014	015	016	017	018	019	020
	Lat.	34.44265	THE RESIDENCE OF THE PARTY OF T	34 4427	CA CONTRACTOR AND ADDRESS OF THE PARTY OF TH	AND DESCRIPTION OF THE PARTY OF		THE RESERVE OF THE PERSON NAMED IN		34.44358	
	Long.		119.07056			119.07043	STREET, STREET			119.07009	
	Mean Length	18.0	7.0	10.0	5.0	15.0	13.0	4.5	14.5	9	8.0
	Mean Width	6.0	6.0	8.0	5.5	6.5	9.0	5.0	6.0	5.5	5.5
_	Mean Depth	0.6	0.5	0.8	0.8	06	1.3	08	0.9	0.9	0.6
rde	Max Depth	1.1	1.1	1.2	1.3	0.9	1.6	1.2	1.2	1.3	1.1
Recorder	Depth Change?				13			146		13	-
ra R	Inflow?	Y	У	Y	V	V	V	Y	Ч	Y	
Data	Outflow?	Υ	V	Y	V	V	V	V	M	V	
	Isolated Pool?	N	N	72	1	N	N	N	N	N	
	Reloc. Pool?	N	N	N	N	N	N	N			
	Watch Pool?	N	N	N	N	N	THE RESERVE WHEN PERSONS AND RESERVE AND R		N	N	
	Photos					2	N	N	10	N	
Snorkeler	Shelter (0-3)	2	2	2	2	2	2	2,	2	2	
Snor	Visibiliy (1-3)	2	2	2	3	3	3	3	3	2	
and a second	Bankside Obs?			2			1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1				
	0-1.99									4	
in)	2-3.99		1-1	2	1		2				
mykiss size (in)	4-5.99							1	1	2	1 6 .
55 5	6-7.99				1		10.00				
nyki	8-9.99										
0.	10-11.99	- September 1	V-12 - 13								
	12-13.99										
	14-15.99										Aug.
es	WPT	1	Alleria de la companya								
pecies					Carl Manager Live Comment		average less than				
Other Sp											
g.	-										
	Temp (F)	63°F									
Water Quality	Conductivity (ms/cm ^c)										VI IIV
ter ((ms/cm /		ra a post o hi sundanti he								W/0
Wa	DO (mg/l)										113
	AN Temp	Meas	went.	ts in	ft.						
Other Comments			1								
			-4				\$10 10				1

DROUGHT/SNORKEL SURVEY DATA FORM ver 09.29.14

Date: 6/24/15 Time: 11:20 Stream Name: Santa Payla Reach:

Snorkelers: TD Data Recorder: BH Camera: Bulman GPS: Bubbles

Start Lat: Start Long: GPS Error: 19 ft

Dat	e of Previous Sun	/ey:									
Pre	v. Max Depths	1071	وساسويوارين	023	024	-025-		4		7027	130,
7	CMP	1	IV	V	J	V	1	IV,	V	IV.	
	Unit #	021	022	023	024	ors	026	'0Z7	028	029	030
	Lat.	34.44406	34.44475	3444491	34.44504	34.44507	34.44518	34.44520	34.44534	34,44529	34.44513
	Long.	19.06981	119.06592	119.06885	119=06864	119.06854	119.06851		119.06826		117,0675
	Mean Length	8.0	12.0	13.5	13.0	100	9.5	20.5	8.0	32.0	125
	Mean Width	8.5	10-0	11.5	9.0	6.0	5.5	9.3	11.5	8.5	8.5
er	Mean Depth	09	1.7	1.4	1.3	1.0	1.1	1.7	0.9	1.7	1.9
ord	Max Depth	1-1	2,2	1.8	1.8	1.3	1.5	2.0	1.6	2.3	2.2
Recorder	Depth Change?		1	15-						Action production as present commencer commencers	
Data	Inflow?	Y	Y	Y	Y	Y	Y	Y	Y	Y	1
۵	Outflow?	Y	4	Y	Y	Y	4	Y	Y	Y	Y
	Isolated Pool?	N	N	N	N	- N	N -	N	N	~	N
	Reloc. Pool?	N	N	N	N	N	N	N	N	N	N
	Watch Pool?	N	N	N	N	N	N	N	N	N	N
	Photos						Marie de la companya				
keler	Shelter (0-3)	2	2	2	2	2	2	2	2	2	2
Snorkeler	Visibiliy (1-3)	3	3	3	3	3	3	3	2	2	3
-	Bankside Obs?			2							
	0-1.99				1		Z				1
(n)	2-3.99		2	2	5	4	2	5		8	2
mykiss size (in)	4-5.99	2	4			1				8	
SS S	6-7.99		2		22						1
myk	8-9.99			1	10 m - 10 m						
- 1	10-11.99										
	12-13.99		- construction are the								
	14-15.99			CONTRACTOR NA							Service Control of the service
cies	Sucker			1	3						
peci	WPT						and the second second				recommendation
Other Spe			and the second second					100000			
हें				2011		La real real real section of the least	C-120-1 (1980) (194				DECTOR STATE
>	Temp (F)	61°F									
Water Quality	Conductivity				1						7,44
rog	(ms/cm ^c)	A CONTRACTOR OF THE PARTY OF TH			on endouge state						and the second second
Vate	DO (mg/l)				Land Co.				45-45-5		10 3 (18 m) + 15 (18 m)
>	Air Temp	78°F	a selection				CONTROL CONTROL				- Leading Control
	会.										
										Sit of Sight	
suts				0						1 3 3	
Other Comments	Mea	sciveme	NAS	nt						many of post	
her Ca										70	
Ö										12 De	
			- 2				is.			Se le	

DROUGHT/SNORKEL SURVEY DATA FORM ver 09.29.14 1st / 2nd / Data Form # Time: 12:05 Stream Name: anta Reach: Batuar Snorkelers: Data Recorder: 5B Camera: GPS: Start Long: GPS Error: Start Lat: ft PREVIOUS SURVEY DATA: Date of Previous Survey: Prev. Max Depths 1. CMP 034 Unit # 33 036 Lat. 119.06741 Long. Mean Length 5.7 ,0 Mean Width 6.0 .0 1.3 .0 0. Mean Depth 4 Recorder Max Depth 1.6 Depth Change? Data Inflow? Outflow? Isolated Pool? N Reloc. Pool? Watch Pool? Photos Shelter (0-3) 2 2 2 3 2 Visibiliy (1-3) 12 N Bankside Obs? 0-1.99 9 2-3.99 mykiss size (in) 4-5.99 L 6-7.99 8-9.99 10-11.99 12-13.99 14-15.99 Other Species (04°F Temp (F) Quality Conductivity (ms/cm^c) DO (mg/l) 82°F AIR TEMP Other Comments

1				1st / 2r	nd / Data			Form # 5	of	_
Date: 0/24/15	Time: \3: 4	1>	Stream Name	: Sant	a Pau	9		Reach:		
Snorkelers:)	Data Recorde			The state of the s	atmar	1	GPS: Bul	obles	
Start Lat:		Total Necoluc	AND DESCRIPTION OF THE PERSON NAMED IN COLUMN 2 IS NOT THE PERSON	Start Long:				GPS Error:		
							5		-10	
PREVIOUS SUR	VEV DATA:									
				Marie Co.						
Date of Previous Sur	vey:				1					
Prev. Max Depths										
Unit #	1041	042	043	044	045	046	FPO	048	049	050
Lat.	34,44489	34 44498		34.44549	34. 4454C	34. 44567		34.44561	34,44561	3-1. 44576
Long.	119.06497	119.06485	34.44635		119 06383	11906226				119,06345
Mean Length	13	11		119.06415	17	9.0	7.5	15	11.5	11
Mean Width	5.1	12.5	28.5	8.5	7.0	6.0	5.5	6	9	7
NA David	0.8	1.4				0.7	0.9		1,4	,9
Max Depth Depth Change? Inflow?	1.0	1.9	0.6	2.6	0.8	1.3	1.3	0.6	2.1	1,4
O Death Change?		14.21	1,1	7.0	1.2	1. 0	1.0	1/1	2.1	LIT
Depth Change?	Y	4	.,		1	Y	Y	Y		>/
Inflow?	+ (Y	Y	Y	7	7	7	À	7
Outriow?	1 /	7			N		/		1	1
Isolated Pool?	N	N	N	~		~	N	N	N	N
Reloc. Pool?	N		N	N	N	N	N	N	Y	
Watch Pool?	N	N	N	~	N	N	N	N	N	N
Photos										
ਤੋਂ Shelter (0-3)	7									
Shelter (0-3) Visibiliy (1-3)	7 3									
Bankside Obs?	N									
0-1.99	14								-	
	2	1			-		 		2	
2-3.99 4-5.99 6-7.99 8-9.99		4	2	3	5			7		Ø
S 6-7.99	Ø	2	Ø	3	-	1	2	Ø	8	O.
8-9.99	1 80	-	1 8		0	Ø	1		Ø	- 0
E 0-9.99	-									
20 22:00					-					
12-13.99					-					
14-15.99										
SG.										
Spe							-		-	
Other Species							-			
0										
≥ Temp (F)	45°F									
Conductivity (ms/cmc) DO (mg/l)								2		
(ms/cm°)							-		-	
DO (mg/l)										
S AIR TEMP	84°F									

Other Comments

		- Anna Samuel An State College							Form #	of	
Da	ate: 047/01/14	Time:		Stream Name	e: Scinter	Dala			Reach:		
_	orkelers: . \		Dr. 168 (218)		7,001,00	Data Recorde	er: PS				
_		414 5 89		Transfer L	Start Long:	114.06	336		GPS Error:	2/ f	t
-	mera: 15 admi		GPS: BUSI	Jac		Weather Des		verenst			
	17/21/20	n	17.00	21 6 5				7			
	Unit#	151	5.7	5%	54	55	56	57	58	59	40.
	Lat.		7.29.44594	34.44603	34,44612	34,44619	3444638	34, 44631	34.44638	34.44642	3444647
	Long.	-119,0633(PROPERTY AND INCIDENT AND INCIDENT		114.06317						11906294
	Mean Length	202	173	15	14	# 27	29	19	18	1/	-16-1-1
	Mean Width	1)	12	17	17		16	12	8	7	8
er		0.9	165	0,3	0.5	05	0.7	1,4	0.8	0.9	0.8
Data Recorder	Max Depth	1,4	0.8	0.7	0.9	0.9	1,4	2,4	1,17	0.6	1,4 = 4
Rec	Inflow?	Yes	1/1/2	-185	. /	Y	Y	Y	Ý	Y	7
ata	Outflow?	125	1/25	466	- Y	У		Y	- X	Y	· k
0	Isolated Pool?	No	- No	N	N	N		N	N	1	11
	Reloc. Pool?	No		N	<i>H</i> = 1	N	/ //	N	W	1	fyt Little
	Watch Pool?	No	14	N	N	N	<i>N</i>	N	1 M	N	Model
	Photos	100		JV					MINISTER WOLLS		
							- Carlotte Control				
ē	Shelter (0-3)	7	2)		1	Ca. 7.1.	2	. 2	2	2
norke	Visibiliy (1-3)	3		物7		3		2	3	3	2 1146.4
S	0-1.99									r minimum to mini	P. de State State St
	2-3.99	1	1775 - 1777 - 1775 - 17	1		1					3.
(in)	4-5.99	-	and Arms				45	1	at the second	7	1412
Size	6-7.99		1.2								A Marian
Kiss	8-9.99				and the second s	1	A Print Control of the Control of th			e in the second	
o. my	10-11.99										
o.	12-13.99			248.00		The state of the s		1			9.7
	14-15.99		or a see publicate of 144 or a district of 244		e produce a superior de la segui	No. of the last of	Comment Suprement	100	inggering der onger von	Ularing or one	
-		Control of the Contro				100	1000	1			
pecies			See			24.57			Control of the second		
2		1	11,000,000	3				A STATE OF THE STA			te salata (SE)
Other	200	77.7						Market Commencer		and the second	
	Temp (F)	64									
allty	Conductivity	10-1		1				94		1	
	(ms/cm ^c)	CENTRAL		, and the second			Charles Carlo				
are	DO (mg/l)										
3			72.705.0				Column Contract Column			1	
		D		7/1		Rim 1				-	
		A. I dem			370.00	17/2		2.5		*	
1		3	1.0	1					10 15 1 mg - 11 - 1		
2				1	100	- 1					
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5											
<u>ש</u>		12.7						i.			
5		3				. \ '		53			
						3	E SERVICE STATE	8			
									4"	,	
			14.0							1	

7 1 9 .				
Date: Moo7/01/15 Time: Stream Name: Secreta Caula	Reach:	Mayer		
Snorkelers: T		100		
Start Lat: 34,44656 Start Long: -114.66367	GPS Error:	7	ft	100
Camera: Batman GPS: Busses Weather Desc: Warn, over cast				

Cam	era: Batma	11	GPS: Dubly	es		Weather Des	c: Warn, 0	UCLAST			
-	Unit #	61	67	63	64 -	65	(6	67	6.8	69	70
-	Lat.		3441662	34.44681	34.44.716	34,44724	SHAMASK	31,44739	3444753	3444775	314477
-	Long.		119 06300		-114.0L308		The state of the s	119,06305	119,06302	119,06297	114.0629
-	Mean Length	12	- 10 m	27	1 × 1	17	13	6	16	12	12
-	Mean Width	8	i i	9	7,	8	16-	5.7		10	9
-	Mean Depth	0.3	0,5	.07	0.5	1,0	6,9	0.6	0.6	.11	34
	Max Depth	0.7	0.8	1.7	0.7	11.6	1.4	1,)	SITT -	, 8	. 1
2	nflow?	Y	V	Y	Y	. 4	Y	4	7	4	
0	Outflow?	4	1 Y 1 1 1 1	γ		Y	122	4	E.Y.	4	* Y = 2.
	solated Pool?	N	1 N 1	N	W	N	AN TO	N	- 1/	N	N
-	Reloc. Pool?	N	A.	N	No. 10	N	E M	N	\mathcal{A}	N	1/
-	Watch Pool?	N	Marie A	N	A Commission	N	$-\mathcal{M}$	N		N	N
F	Photos										
5	Shelter (0-3)	2				2	2.02	2		Z	and James
_	/isibiliy (1-3)	3	30.0		- J. S.	7	- L - 1	3	2-1	7	3.4
_)-1.99	and bear and	E SAME THE B				数を対する。		医 29 4 9		1
-	2-3.99		T.	R			3			1	
	1-5.99	1	surface in the	1		3)			
-	5-7.99								AND SUBSTITUTE		Contract Child
8	3-9.99					\ .			A A		
11	.0-11.99										建筑工程 型
1	2-13.99		The Property of the Control of the C	in the second							
1	4-15.99			Transition of the Parket	i transmitte tras		Breggia en en la sentiración de la companya de la c		Magazines de la		Roger School (1990) Conference
									verstering of		
Ī			Section 1				Karamatan da				aga Elas
							的分享[2]				
T	emp (F)	64			territoria.						garage Liber wasperspikker
C	conductivity ms/cm²)						1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		141 - 148 - 1 141 - 143 - 148		
D	O (mg/l)			100							
-				14 14 14			The state of the s				12706
		Vic Year JM						1			
Other Comments		6 (1) (1) (1) (1) (1) (1) (1) (1) (1) (1)						1			

		Form # OT	
Date: 07/01/15 Time: 1321	Stream Name: & Santa Vala	Reach:	
Snorkelers: 4 17	Data Recorder: P 5		
Start Lat: 34 44779	Start Long: -119, 06298	GPS Error: 19	ft
Camera: Bolman GPS:	Bulles Weather Desc: Juney,	wan, over st	

	nera: BMM			>16.2			/				Transfer and the San
1	Unit #	11	72	73	74	75	16	77	78	79	80
	Lat.	34,4479	34,44787	31,44785	34,44794	34,44789	3941740	34,44790	The state of the s	34.44787	744448
	Long.	-119,06298	20年からからは、大学の表示を含めていることがある。	-110.06290	-114,65283	-119.06274	119 06061	119.06249	-119,06239	119,06226	119,06219
	Mean Length	26	4	8	44	13	3	1+	M/.	11	4
	Mean Width	10	10-	7	10	7	6	9	.12	6	est Commu
der	Mean Depth	0,7	0.5	6,5	1,7 = 1	0.4	0.b	0,5	1.4	0,6	i del
COL	Max Depth	1,3	0.7	1.1	2.2	0.6	1.0	0,9	24	1.0	Z,6
Data Recorder	Inflow?	· Y	4	Y	Y	Y	The and pressure that I	1	Y.	T V	and the second
Date	Outflow?	Y.	z. Y.	Y	Y	<u> </u>	in Value	/	HK.	/	y
_	Isolated Pool?	N.	#	N	$-M^{-1}$	N		N	$M_{\rm c}$	N	N
	Reloc. Pool?	N	A. Maria	N,	A	N	<i>N</i> .	N	· N	N	5007-9915-6013-32-9915-991-5-7
	Watch Pool?	N	A	N	\mathcal{M}	N	A. A.	N	* A/***	N	W. 11.
	Photos										
ē	Shelter (0-3)	Z.	1000	2	2/27	7		7	46. Z	2	2
Snorkeler	Visibiliy (1-3)	3	7	Z	3 = 1	3	2	3	3-11-1	3	3
vā.	0-1.99	2	6 100 1 10 ± 10		7		16	. 5	U		AFRICAL SERVICE
	2-3.99	6		1	13		c	5	4	2	7
(ii)	4-5.99	4	and the second		减少性			1-	17		
mykiss size (in)	6-7.99	1	**************************************		2.00				Щ		(4)
ciss s	8-9.99	1			7.5						
	10-11.99										Sept.
Ö	12-13.99		Charles Considered								
	14-15.99		For the second s				Savetario de Salario de la composición del composición de la composición de la composición de la composición del composición de la composición de la composición de la composición del composición de la composición de la composición de la composición del composi		STATE SHARE HAVE A STATE OF THE		Luggy veryal ugas
S			with the second			4					
Species							1 STREET, 125-1		o Statement d		THE THIRTY
er Sp							(1) (1) (1) (1) (1) (1) (1) (1) (1) (1)				
Other			a di Mana								
_	Temp (F)	64	20,000							8	e designations
Quality	Conductivity (ms/cm ^c)	0 1								*-	and the only of
Water											
Š	DO (mg/l)						production of the second secon				
							The second liverage of				
		F. JIN									
							•			100	
S		7									
Other Comments						× 1		9.00			
				157				5	H 101		
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						2	Marian Parasi				
						9					
			1				A range of				144

Measuring and that is sour kelable are hole unit?

If whole unit this poling head under rocks milhol doesn't make sense units

Form # Reach: Date: 07/01/15 Time: 1406 Stream Name: Data Recorder: Snorkelers: IT GPS Error: 10 Start Long: 119, 66213 ft Start Lat: 34,44787 Weather Desc: William Osciast Betman GPS: Camera:

_	Unit #	61	82	83	84	85	9%	87	68	89	90
	Lat.	34,4478		3444770	Total and the second second second second	34,44759	7141736 ·	3444751	Control of the last of the las	34,44752	34,49760
	Long.	14.06213	119.06209	119.06191	114.06.82	-119,06180		119,06147	119.06143	119,06138	The second secon
	Mean Length	10	35	15	- 127	13	16	13	distr.	7	15
	Mean Width	13	8	7	7	12	12	18	18	547	11:
er	Mean Depth	0.7	6.8	0.8	05	0.6	1.1	6.8	0,1	6.7	1,2
Recorder	Max Depth	1.3	1.0	1.3	7.4	1,0	1.7	1.3	174	1,4	1.9
Rec	Inflow?	V	y.	V	V	Y	Y 100 101	Y	4	Y	7-20-20
Data	Outflow?	V	1	V	V 1	Y	TV:	Y	Y-7	Y	4
	Isolated Pool?	* N		N	4/	N	MN.	N	M.	N	N
	Reloc. Pool?	AN	\mathcal{N}_{i}	W	N .	N	\mathcal{M}	N	N	N	4
	Watch Pool?	1		W.	Alexander	N	N	N	W	N	1/2
	Photos						T.				
-a	Shelter (0-3)	2	and the second	2	2	12	Z	2	10-10-2 may 1	2	- Zw.
Snorkele	Visibiliy (1-3)	3	To Built	7		3	11.3	3	111 3 1 1	3	
2000	0-1.99		7			1		Ry	被一人 种 40%		The Marketter
	2-3.99	1		1			172	4	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	5	
(in)	4-5.99		id.	1	4 4 5		5	A	1.5.	1	1. 以图图 122000
o. mykiss size (in)	6-7.99							2		- 1	
kiss	8-9.99				100 A						2.11 (A)
. my	10-11.99		ar (more)						4		
0	12-13.99						100 may (2000)			The second supplies	
	14-15.99						Magazin e de causyone, e e 4 Se e e 4		entroperation of the second of	Ner been delinated	
es					e Transpire de la Company				(表现数21%)		
Species			1.5				Harry Carl		100000000000000000000000000000000000000		
er S	* 4, 1000		行业方法法	M S	Special L	-1		00000	Control of the Contro		Sacillar .
Other		7	1/35/15/20 6-1	i and	12 12 12 11 15 11 11 11 11 11 11 11 11 11 11 11					Market San Control	
_	Temp (F)	611						and the second			
alit	Conductivity (ms/cm²)	15.00				The state of the s		State Personal		Dept.	
E 1	DO (mg/l)							- 14			
3	DO (IIIg/I)	The second secon	S41.77.305-4.274.17	Topic Control			er or a statement to			Mark Superior Control	
-		Z									1771
		X17.76				1.00		2 dr. pla			12-
mment		6						5			1 New (128)
Other Comments									2.3		
								E.			
					n, ik androma, soliti Lib promotivi soliti						

Form # Reach: Date: 07/01/15 Time: Stream Name: Sontu Paula Data Recorder: Snorkelers: LG 45 GPS Error: Start Long: ft -119.06013 Start Lat: 34.44829 GPS: Butterry Weather Desc: Owcost Camera: Mr. Freeze 10 7 9 4 3 8 2 Unit # 34.49849 34.44864 34. 44868 34.44 886 34.44889 34.4489 4 34.48 49 34.44853 34.44829 34.44840 Lat. -119,05934 -119,05991 119.05978 -119.05966 -119.05984 119.05956 119.05930 19.05907 -119.05996 -119.06013 Long. 13 12 17 Mean Length 11 10 2 5 33 1 Tons 9 13 Mean Width 0.4 1,2 0.6 1.8 6.7 0.5 0.5 0.3 0.6 0.7 Mean Depth 1.7 0.4 2 0.9 0,5 0.7 0.9 1.2 Max Depth × ... Inflow? Y Outflow? N. N N N fil. N N. N Isolated Pool? N N M ...N N N Reloc. Pool? week Alexander N 11 MN Watch Pool? Photos 7 Z . 2 2 2 2 Shelter (0-3) to the Zalanta 3 33 3 3 2 3 Visibiliy (1-3) 3 **国际的现在** AND DESCRIPTION 2 3 **加州海岭之前** 0-1.99 3 4 2-3.99 2 and the second 4-5.99 1 to a state of 6-7.99 N. and Aligh 8-9.99 Walter Co. 10-11.99 A ARTHUR 12-13.99 14-15.99 Species A STATE OF THE STA · 查明的 . 好心 Ger Kur. Other orchests of **建** Temp (F) 1467 - 14**5**7 A Conductivity (ms/cm^c) DO (mg/l) Comments Other

/ = Lower Hobo = SN = 10584741 => 905 = 34.44495, -19.06477 ± 9 = Swopped with <math>SN = 10605824# 2 = Middle Hobo = $N^{10}SN = 10605836$ = 905 = 34.44574, -19.06343 ± 18 = Swopped ald <math>SN = 10605828# 3 = Upper Hobo = N SN = 10605838 = 905 = 34.44814, -19.06052 ± 44 = Swopped ald <math>SN = 10605832

Pic 964 Bodron Pic* 965 ME FIELE 0072

With _ 63 DROUGHT SURVEY DATA FORM ver 08.13.14 of Form # Ain 76 Reach: Paulo Stream Name: 11:44 /15 Time: Date: 07 KE Data Recorder: GPS Error: ft 17 Snorkelers: -119.05909 Start Long: 34. 44891 Start Lat: Guerciat Weather Desc: Buttercup GPS: Freeze MR. Camera: 20 18 19 15 17 16 12 13 34, 44955 34.44954 34.44944 Unit # 38, 44942 24. 94933 34.44926 24.44895 34.44901 34,44916 119.05886 34.44896 119.05920 119.05897 -119.659/6 Lat. 119.05915 119.05920 -119.05905 119.05918 8 119.05904 16 21 Long. 12 9 8 15 14 Mean Length 4 15 9 9 0,5 Mean Width 0.3 0,5 0.3 0.7 0.5 0.6 0.6 0.5 0.8 0.7 Recorder Mean Depth 0.8 015 0.9 0.8 1.4 Max Depth Inflow? 4 -> Data Y 1 Outflow? N N Isolated Pool? N N N N 1 N Reloc. Pool? N a personal N N N N Watch Pool? Photos 2 2 2 2 Shelter (0-3) 3 2, ٠. 3 3 3 3 Visibiliy (1-3) 0-1.99 4 2 2 2-3.99 764 t25 (ii) 4-5.99 278 6-7.99 8-9.99 10-11.1 10-11.99 12-13.99 地上地位 14-15.99 -565 Species Other: Temp (F) Water Quality Conductivity (ms/cm^c) DO (mg/l)

DROUGHT SURVEY DATA FORM ver 08.13.14 Form # Water = 64 Stream Name: Sonta Bula Reach: late: 07/01/15 Time: 1218 Data Recorder: norkelers: Start Long: -1/9 . 05875 GPS Error: ft tart Lat: 34.44954 Butter Cup Weather Desc: GPS: Freeze Camera: MR 28 30 77 77 25 Unit # 21 22 23 24 26 34, 44923 34.44914 34,4489 7 34.44951 34.44954 34.4952 34, 44949 34.44954 34.44298 Lat. 119,02807 119.05875 -119.05835 119.05798 119.05866 -119.05857-119.05849 119,05812 Long. 山 5 13 27 3 16 Mean Length 13 2 10 11 13 7 13 7 Mean Width 10 2 0.5 0.7 0.5 Data Recorder 0.4 64 0. 0.7 Mean Depth 31 2.1 1.4 Max Depth 2.5 0.9 1.4 0.7 Inflow? y Y Outflow? N 10 Isolated Pool? N N A. N 1 N N 1/ 100 H N N N Reloc. Pool? N N N N N 11 Watch Pool? Photos 2 2 2 2 2 Shelter (0-3) 3 3 3 3 Visibiliy (1-3) 3 3 3 3 2 5 3 0-1.99 10 25 2-3.99 8 2 -8 4-5.99 mykiss size 3 6-7.99 7. 增换成元 8-9.99 Significant 10-11.99 12-13.99 resolutione mattallitatione teametri (mattallitaendo A STANDARD 14-15.99 1771年1875年18 2 steps garter Other Species CONTRACTOR OF THE PARTY OF THE 5-45 TA SEPTEMBER STATE 15年 in the second Temp (F) Quality Conductivity (ms/cm^c) Water DO (mg/l) Other Comments

DROUGHT SURVEY DATA FORM ver 08.13.14 4 of 4 water = 64 Form # Ain = 77 Jule Reach: Stream Name: Time: 12:50 Date: 7/1/15 Data Recorder: Snorkelers: 16 GPS Error: -119,05784 Start Long: Start Lat: 34, 44878 11 ft Weather Desc: GPS: Camera: MR Freeze 36 34 35 37 40 32 33 Unit# 3/ 34.44862 34.44869 34.44872 34.44870 34. 44864 Lat. 34.49878 119,05784 -119.05780 -119,05768 -119,05755 119,056.82 119.05676 Long. 13 Mean Length 32 8 8 11 10 Mean Width 10 0.9 Recorder 6.9 116 0.7 0.1 Mean Depth 0.9 0.9 Max Depth 2.3 44 V Inflow? Outflow? N villa Significació Isolated Pool? N N 11 N plan. N Reloc. Pool? ALCOHOLD BELLEVIOLE San Tribbles Watch Pool? N Photos. Z 2 2 Shelter (0-3) 2 Visibiliy (1-3) 3 3 344 3 3 20年 经基础 Man this 经 多种相关 See Miller Are 0-1.99 5 2-3.99 mykiss size (in) 4 at Miller Ma 2 THE TANK 4-5.99 how a large 6-7.99 4 3 C. Pidaje 8-9.99 - C. INC. 10-11.99 12-13.99 14-15.99 Z strip garter Other Species 13年/教学文团 District Reserv Christian N Temp (F) Quality Conductivity (ms/cm^c) DO (mg/l)

Other Comments

SNORKEL SURVEY DATA FORM ver 06.19.15

			ヤ(かりりナ			Form #	of
Date: () チ/	10/15	Time:	Stream Name: Sa	nter Peula		GPS Blosson	
Snorkelers:	\$ BL		Data Recorder: P3	Camera: hobin		GPS Coordinate 5	System:
Start Lat:	34.	4762	Start I	ong: - (19,0 6) 0 6		GPS Error:	ft
Weather:	Jumy		Air Temp: 70	Water Temp:	60		

-	Unit#		2	7	ч	5		7	8	9	178
	Latitude	7144767	34,44771	349447	34 614781	34414785	78 114 44		34,44804	3-1,44 806	3444806
	Longitude	114.06170	-119.0610	-11906106	-119.06103	-14.06095			119,060 72		144806
	Type (P,P,E)	0010	1 (10)110	11 100		174,000 13		174,000	111111111111111111111111111111111111111	117.0606	111,06001
	Mean Length	35	22	30	6	21	11	53	7	6	31
er	Mean Width		6	115	2	10	8	10	6	10	12
ord	Mean Depth	0.5	0.6	0,4	0,5	0,9	6.7	0.6	6.4	0.6	1,9
Data Recorder	Max Depth	0.9	1,0	1),9	0,7	1.8	1.7	11	0,7	11	3.2
ta	LWD Count Inflow	Y	Y	Ÿ	7	V	Y	Y	Y	V	V
Da	Cover Rating (0-5)0	V	V	4	У	У	Y	4	4	Y	Y
	Cover Area (sq ft)	'N	N.	N	N	N	GUARAGEM SUPPLIES SERVICE	N	1	N	N
	% Cover Count on	N.	70	N	N	N	N	N	N	N	# 1
	100% Unit Y/N Noteh	N	N	N	N	N	N	N	N	N	N
	Photos	1									585 (mil)
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Flag	To be Snorkeled					7 1				/ /	1
프	Electrofishable?		1/								
	To be E-fished										
j.	Cover Rating (0=5)	2	7	2	2	2)		2.	2	3
Snorkeler	Cover Area (sq ft) √, ς	-3	2	3	3	3	7		3	3	3
JOL	%€ever										
Ϋ́	Visibility (1-3)										
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O. mykiss observed	2-3.99	3		L		7	夏	3	Z)	10
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Other Comments	ond of finishing of until where let 4 66 started 10013 - Sout souff.	4					Brile Leater Pool			8	

SNORKEL SURVEY DATA FORM ver 06 19 15

	. 7								Form # of			
Date: 07/10/15 Time: 1/24				Stream Name			rda Poula		GPS Blosson			
	celers: BL		Data Recorde						GPS Coordinate System:			
Start		<u> </u>			Start Long:	119.06		4-0	GPS Error:	7 t	t	
Weat	ther: Sland			Air Temp: 6	7		Water Temp:	59				
-	111-7-14	11		17	(t)	. /-	16	17_	18	19	20	
	Unit #		12	13		71111/21	Name and Address of the Owner, where the Owner, which is the Ow	17			-0	
	Latitude		-119,06057		119 11		3444837					
	Longitude	111,06050	1M,0605C	114,06048	1/1.00043	119,06044	-119,06031	119,06069				
	Type (P,R,F)	111	7 n	19	13	72	Pa .	27				
_	Mean Length	14	20	17	1)	14	8 7		5.00			
Data Recorder	Mean Width		35		0 9		0.7	13				
SCO	Mean Depth	1,0		0.5		1,5		119				
3 Re	Max Depth	1,7 Y	1.1	100	1.2 V	2.8	0,9	2.6				
Jati	EWB Count of las	1	Ĭ	V		Y	4	Y				
J	Cover Area (sq ft)			N	N	- V	Y,	11		-		
	% Cover Relication	N	N	N	W	N	N	V				
	100% Unit Y/N Ward		W	N	N	N	11	1)				
	100/00/11/1/ 0/01	70					70	70				
	Photos											
	Snorkelable?		1									
5.0	To be Snorkeled											
Flag	Electrofishable?	/					1/	1	7 6			
	To be E-fished											
-	Cover Rating (0-5)		۲	2	7	2	Λ	2				
kele	Cover Area (sq ft) 1/, 5	3	- 3	3	3	3	3	3				
Snorkeler	%€ ever											
S	Visibiliy (1-3)											
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vec	2-3.99	1 9	7		1	Ž		10	1000			
observed	4-5.99					1		3				
do s	6-7.99											
O. mykiss	8-9.99											
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