Bishop Creek Progress Report 2:
APPENDIX F - BISHOP CREEK FISH DISTRIBUTION TECHNICAL MEMO

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TECHNICAL MEMORANDUM

DATE: 14 April 2020

TO: Southern California Edison

FROM: Stillwater Sciences and Kleinschmidt

SUBJECT: Bishop Creek Stream Fish Distribution Technical Memorandum

1 INTRODUCTION

Southern California Edison (SCE) has applied for a new license to continue operation and maintenance of the Bishop Creek Hydroelectric Project (Project), Federal Energy Regulatory Commission (FERC) Project No. 1394. The Project consists of five powerhouses on the Middle Fork of Bishop Creek, three primary storage reservoirs, and ten diversion dams. Bishop Creek is the largest tributary to the Owens River and enters the river near the community of Bishop in Inyo County, California. When the current license was issued in 1994, FERC established minimum flow requirements in Bishop Creek of 18 cubic feet per second (cfs) below Plant 4 (Intake 5) and 5 cfs below Plant 3 (Intake 4). Baseline fish population monitoring efforts in Bishop Creek began in 1991, and population monitoring efforts continued through 2010, following changes to minimum instream flow releases (Sada and Rosamond 2010, Sada 2006, Sada and Knapp 1993). This Fish Distribution Study (Study) focuses on identifying the presence and distribution of fish species within the Project area that may be affected by Project operations, as described in the Study Plan that was approved by FERC on November 4, 2019. This report includes the results of fish population sampling in the Bishop Creek watershed during September 2019.

2 STUDY GOALS AND OBJECTIVES

The primary goal of this study is to acquire information on the current distribution of game and non-game fish species of interest and the growth and density of wild brown trout (*Salmo trutta*) populations in the Project Area. To address this goal, this study was designed with the following objectives:

- Characterize fish populations and distribution in Project-influenced stream reaches;
  - Assess whether recruitment of Owens sucker (*Catostomus fumeiventris*) has occurred downstream of Lake Sabrina and South Lake in Bishop Creek;
  - Assess the distribution of other fish species in Project waters (streams and Project intakes);
  - Identify the extent to which naturally reproducing brown trout populations are consistent with levels documented from 1991 through 2010 at historical monitoring locations; and

  - Evaluate population, health, and condition of recreationally important trout species (e.g., brown trout, rainbow trout [*Oncorhynchus mykiss*], and brook trout [*Salvelinus fontinalis*]) in lotic habitat affected by Project operations.
- Evaluate select, localized water quality parameters that may affect the growth and distribution of fish species; and
- Determine whether future Project facilities and operations are consistent with the Desired Conditions described in the Land Management Plan for the Inyo National Forest (USDA 2018) as they relate to ecological sustainability and diversity of plant and animal communities.

3 STUDY AREA

The Study Area included the Bishop Creek watershed downstream of Project reservoirs (i.e., South Lake and Lake Sabrina) to Plant 5. This section of the watershed ranges in elevation from approximately 1,500 meters (m) to 2,600 m. Bishop Creek is separated into multiple segments by a series of powerplants and intakes.

Sample sites were selected in six locations within Project-affected reaches of Bishop Creek, Middle Fork Bishop Creek, and South Fork Bishop Creek (Figure 1). Of the six sample sites, two sample sites (Sada 3 and Sada 5) were selected for comparison with historical fish monitoring data from Bishop Creek (although not necessarily at the precise locations as the historical sites). The remaining four sample sites (South Fork, Cardinal, Intake 4 and Intake 5) were selected to assess fish species distribution. The locations of these sample sites specifically targeted suitable habitat for Owens sucker and Owens dace (*Rhinichthys osculus robustus*) primarily considering low channel gradients, smaller substrates (i.e., South Fork and Cardinal sites), or availability of large pool habitat (i.e., Intake 4 and Intake 5 sites) (Figure 1). Sample sites were selected based on habitat characteristics in consultation with California Department of Fish and Wildlife (CDFW) and USDA Forest Service.

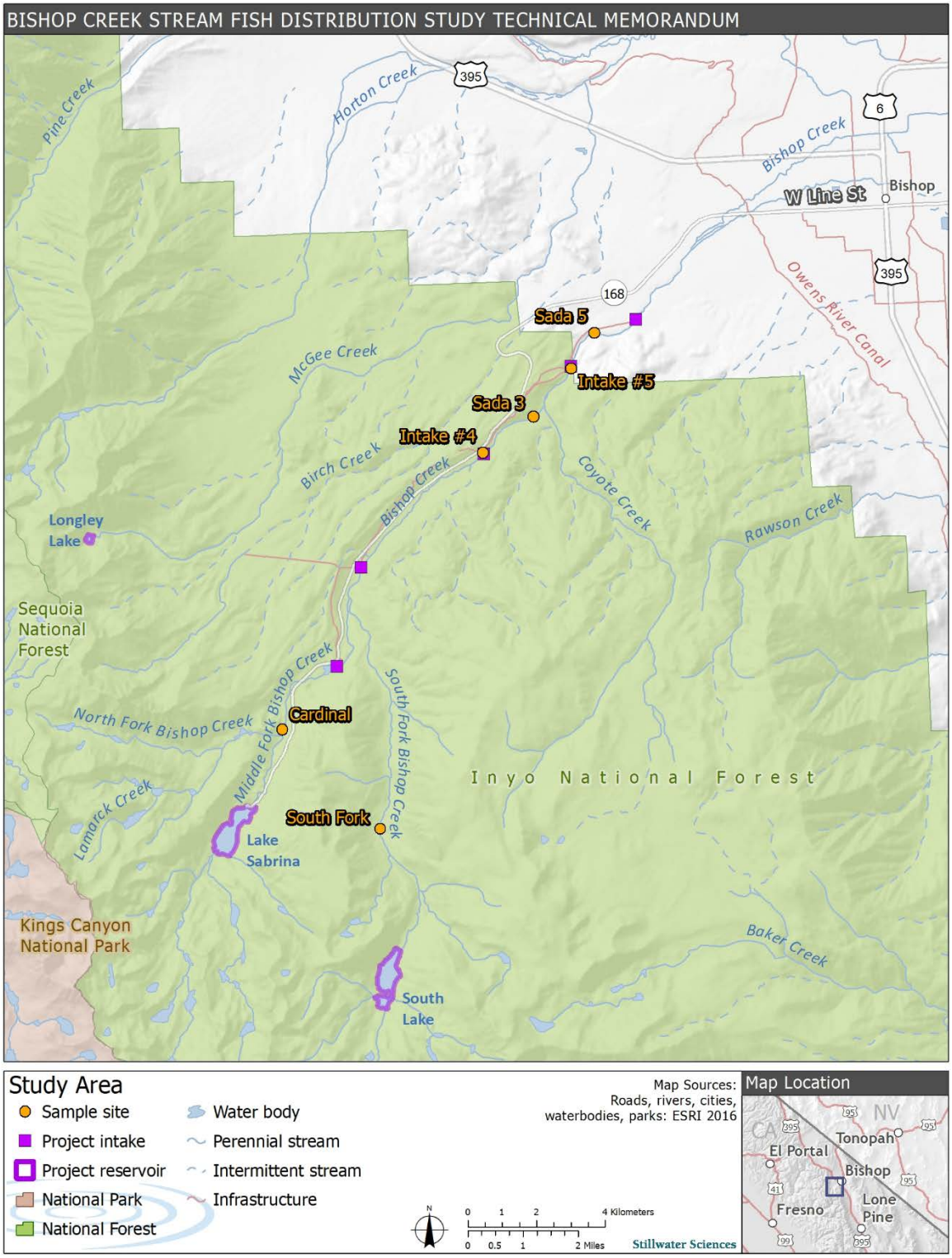

Figure 1. Stream fish distribution sample sites in the Bishop Creek Project Area, September 2019.

4 METHODS

4.1 Fish Sampling

Fish surveys were conducted from September 22–26, 2019. Stream sampling methods included multiple-pass depletion backpack electrofishing at the Sada 5 and Sada 3 sample sites, gill netting in Project intakes, and single-pass backpack electrofishing at the South Fork and Cardinal sample sites (Table 1). All sites were sampled to assess fish species composition, distribution, and fish condition. The Sada 5 and Sada 3 sample sites were also sampled to estimate abundance for comparison with historical monitoring data. Fish age class structure was assessed at stream sample sites sampled using backpack electrofishing. Sample methods are summarized by location in Table 1 and described in detail below. Photographs of habitat conditions and block net locations are provided in Appendix A.

4.1.1 Single-pass electrofishing

Single-pass electrofishing was conducted at Middle Fork (Cardinal) and South Fork Bishop Creek (South Fork) sample sites. One representative 60-meter long segment was sampled at South Fork due to uniform channel conditions, whereas four segments totaling 118 meters were sampled at Cardinal due to variable channel conditions, including pool, riffle, run, and side-channel habitats.

Block nets were used to section off sites and/or stream segments to prevent migration in and out of the sample site and to increase capture probabilities. Two biologists with Smith Root LR-24 backpack electrofishers and three netters began electrofishing at the downstream block net and proceeded upstream, working closely together. A single pass through each segment was made by the electrofishing crew. As fish were captured (netted), they were placed in buckets with aerated stream water and periodically transferred to a live-car until the completion of the pass. The captured fish were processed upon completion of each pass. Fish data recorded included species identification, total length (TL; millimeters [mm]), fork length (FL; mm), and weight (grams [g]). At each sample site, scale samples were collected from up to 20 brown trout across each 50 mm size bin greater than 100 mm. Scales were taken from the fish's left side below the dorsal fin and above the lateral line, and then placed in individually labeled envelopes. Using the same methods, scale samples were also collected opportunistically from other trout species captured including rainbow trout and brook trout. Scales were later analyzed by CDFW in their Bishop laboratory to characterize age/size class.

Table 1. Sample site locations and sampling dates during the Bishop Creek Stream Fish Distribution Study, September 2019.

Sample site name	Site description	Location (UTM NAD 83)		Sample method	Survey dates	Sampling rationale
		Easting	Northing			
Sada 5	Bishop Creek downstream of Intake 5	367749	4132748	Multiple-pass depletion backpack electrofishing	9/22–23/2019	Document species distribution, abundance, fish condition, and age class structure and compare with historical monitoring data
Sada 3[1]	Bishop Creek upstream of Coyote Creek	365839	4130446	Multiple-pass depletion backpack electrofishing	9/26/2019	Document species distribution, abundance, fish condition, and age class structure and compare with historical monitoring data
Intake 4	Margin and open water lentic habitat	364306	4129497	Gill netting	9/24/2019	Document species distribution and fish condition
Intake 5	Margin and open water lentic habitat	367006	4131759	Gill netting	9/25/2019	Document species distribution and fish condition
Cardinal	Middle Fork Bishop Creek downstream of Lake Sabrina	357978	4121838	Single-pass backpack electrofishing	9/24/2019	Document species distribution, fish condition, and age class structure
South Fork	South Fork Bishop Creek downstream of South Lake	360580	4118679	Single-pass backpack electrofishing	9/25/2019	Document species distribution, fish condition, and age class structure

[1] Sample site was relocated from the historical location

4.1.2 Gill netting

Gill netting was conducted at sample sites in Intake 4 and Intake 5. A single gill net approximately 80 feet (ft) long with variable mesh sizes ranging from 0.75 inch to 2.50 inch was deployed in each intake. The net was deployed perpendicular to the shoreline with one end attached to the shore and the other end anchored in deeper water. The gill net was deployed in Intake 4 for a single 13-hour period spanning from evening until morning. In Intake 5 the gill net was deployed for a 9-hour period from morning until evening; however, since no fish were captured during the initial set, the gill net was redeployed for a 14-hour period from evening through morning. All fish captured were processed as previously described in Section 4.1.1.

4.1.3 Multiple-pass electrofishing

Multiple-pass depletion backpack electrofishing following procedures described by Reynolds (1996) was conducted at two sample sites (Sada 5 and Sada 3) for comparison to historical fish monitoring data from Bishop Creek. Each site was approximately 120 m long; to repeat methods used during historical monitoring efforts, each sample site was divided into five segments. Block nets were installed at the upstream and downstream ends of each segment to prevent migration in and out of the sample site and to facilitate an accurate assessment of sample populations.

Two biologists with Smith Root LR-24 backpack electrofishers and three netters began at the downstream block net and proceeded upstream, working closely together. As fish were captured (netted), they were placed in buckets with aerated stream water and periodically transferred to a live-car until the completion of the pass. Upon completion of each pass, all captured fish were processed as previously described in Section 4.1.1. After processing, fish were held in a live-car outside the boundary of the segment until the completion of the final pass. Once the fish from the final pass were processed, all fish were returned to the segment. A minimum of three passes were conducted within each segment. If there was poor depletion after three passes, a fourth pass was performed, and the fish captured were assumed to be the total count of fish in the segment.

4.2 Habitat Conditions

Habitat descriptors and physical habitat measurements were recorded at each sample site. Each segment was characterized by habitat type (e.g., pool, run, or riffle). The length of each segment was measured along the thalweg to the nearest tenth of a meter, and the mean width of each sampling segment was calculated by measuring the width of the wetted channel to the nearest tenth of a meter at six or more evenly spaced transects. The area of each sampling segment was calculated by multiplying the site length by mean width. The approximate maximum depth and the estimated discharge of the sample site were recorded. Substrates and fish cover were visually estimated at each sample site. Water temperature, dissolved oxygen (DO), pH, electrical conductivity, and specific conductance were measured using a YSI Pro Plus multi-parameter meter at the time of sampling.

4.3 Analysis

4.3.1 Fish species composition and distribution

Fish species composition and distribution were assessed at all sample sites. Relative abundance was summarized as percent composition using the total count of fish observed at each sample site.

4.3.2 Abundance, density, and biomass

Trout abundance, density, and biomass were calculated for sites sampled using multiple-pass electrofishing. Abundance was calculated as the total number of fish captured at each site. Density and biomass estimates were calculated for each segment and then averaged over the

entire sample site for brown trout and for all trout species combined. Multiple-pass depletion values were analyzed using the MicroFish V. 3.0 software package (Van Deventer and Platts 2006) to generate maximum-likelihood population estimates. Biomass was calculated by multiplying the average fish weight per segment by the calculated segment density and then adding all the segment values to get the total site biomass.

4.3.3 Age class distribution

Length-frequency histograms were developed for all fish species captured at each sample site. Breaks or modalities within the histogram were evaluated for each trout species to determine approximate age classes. Fish scales were taken on-site from approximately 50 fish (rainbow trout and/or brown trout) of different age classes and were aged by CDFW staff. Historical fish age data collected from Bishop Creek (Walsh and Williams 1991)[2] were plotted along with length-frequency and scale ages from this study.

4.3.4 Trout condition

Trout condition was evaluated for all trout captured. The weight-to-length relationship of individual trout was assessed as a method of identifying the nutritional state or health of the fish related to size and growth. Fulton's condition factor (Ricker 1975), a measure of this nutritional state, was calculated for each trout. Individual condition factors (k) were calculated by the following formula:

$$k = \frac{\text{wet weight (g)} \times 10^5}{[\text{fork length (mm)}]^3}$$

The mean condition of trout was calculated by averaging individual condition factors for each trout species at each sample site.

4.3.5 Current and historical brown trout population data comparison

Brown trout population data collected from the Sada 5 and Sada 3 sample sites in 2019 were compared to population data from historical monitoring sites collected between 1991 and 2010 (Sada and Rosamond 2010, Sada 2006, Sada and Knapp 1993). Brown trout density estimates from 2019 were compared to previous monitoring results using a two-tailed t-test with unequal variance to determine if 2019 density is significantly different. Biomass values from previous studies are reported as the site mean biomass and upper and lower range of values which do not allow for comparison using t-tests.

5 RESULTS

5.1 Habitat Conditions

General habitat conditions at fish sample sites in the Bishop Creek watershed are summarized by sample site in Table 2. Habitat condition data and water chemistry are provided in Appendix B. Riffle was the dominant habitat type at most stream sample sites except for South Fork, which primarily contained run habitat. The Sada 5 and Sada 3 sample sites had larger substrates (boulder

[2] The age class system used in Walsh and Williams 1991 did not include young of the year (YOY) but considered brown trout ranging from 36 mm to 103 mm as age 1+ fish. In order to convert the age class system used in Walsh and Williams 1991 to match the age class system in this report the following updates were made: age 1+ fish are referred to as YOY, age 2+ fish are referred to as age 1+, and age 3+ fish are referred to as age 2+.

and cobble) than the South Fork and Cardinal sample sites (cobble, gravel, and sand).[3] Water temperatures were cold and within the preferred range of trout at all four stream sample sites. Estimated stream discharge was higher at the Sada 5 and Sada 3 sample sites than at the farther upstream South Fork and Cardinal sample sites.

Table 2. Summary of habitat conditions during the Bishop Creek Stream Fish Distribution Study, September 2019.

Sample site	Habitat type (%)			Substrate		Water temperature (°C)	Discharge (cfs)[a]
	Pool	Riffle	Run	Dominant	Subdominant		
Sada 5	5	90	5	Boulder	Cobble	10.0	22
Sada 3	28	58	14	Boulder	Cobble	13.8	20
South Fork	20	0	80	Sand	Gravel	8.5	14
Cardinal	16	61	23	Cobble	Gravel	11.0	10

[a] Discharge values provided by Southern California Edison

5.2 Composition and Distribution

Three fish species were observed in the Bishop Creek watershed: brown trout, rainbow trout, and brook trout. No Owens sucker were observed, indicating no recruitment of this species in Bishop Creek downstream of Lake Sabrina and South Lake (Table 3). Composition and distribution patterns appeared similar throughout the Bishop Creek watershed with brown trout being the dominant species at all locations and rainbow trout observed at all sample sites, although in low abundance (Figure 2). However, a single brook trout was captured in Intake 5. Rainbow trout represented a larger portion of the fish species captured within Project intakes compared to the proportion of rainbow trout at stream sample sites, but overall, fish capture numbers were relatively low in the intakes, which likely reflects the different sampling methods (i.e., gill net versus single-pass and multiple-pass electrofishing). During 2019, rainbow trout in the "catchable" size range (roughly 300 mm [12 inch]) were stocked throughout the Study Area including in Bishop Creek, Middle Fork Bishop Creek, and South Fork Bishop Creek (CDFW 2019).

Table 3. Fish species captured by sample site via single-pass electrofishing, multiple-pass electrofishing, and gill netting during the Stream Fish Distribution Study, September 2019.

Fish species (common name)	Sada 5	Sada 3	South Fork	Cardinal	Intake 4	Intake 5
Brown trout	186	103	45	145	2	7
Rainbow trout	8	10	3	1	1	4
Brook trout	0	0	0	0	0	1
Total	**194**	**113**	**48**	**146**	**3**	**12**

[3] The Sada 5, Cardinal, and South Fork sites are also IFIM study sites used in the Instream Flow Needs PHABSIM model

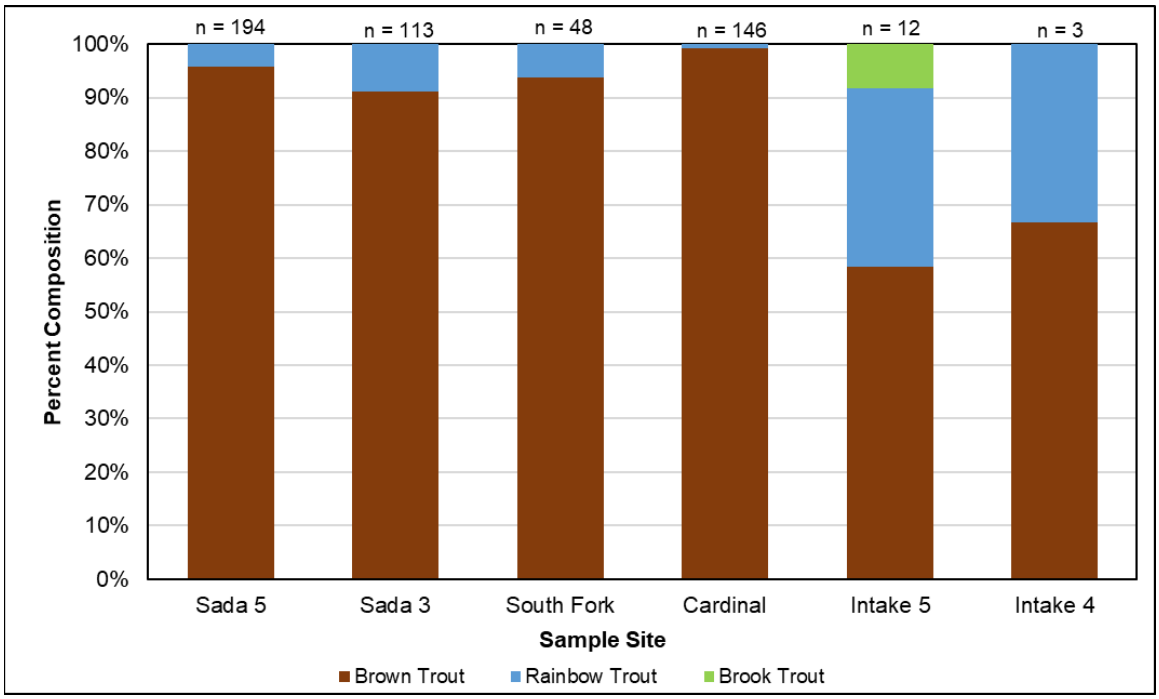

Figure 2. Fish species composition observed during the Stream Fish Distribution Study via single-pass electrofishing, multiple-pass electrofishing, and gill netting in the Bishop Creek watershed during September 2019.

5.3 Abundance, Density, and Biomass

Of the two sites sampled using multiple-pass electrofishing, trout abundance was higher at the Sada 5 sample site; however, biomass was greater at the Sada 3 sample site. Brown trout, being the dominant species at both sites, were the primary driver of the population estimates. Trout abundance, density, and biomass in Bishop Creek at the Sada 5 and Sada 3 sample sites are summarized by site in Table 4 and Figure 3. Trout abundance and biomass are presented by segment in Appendix C, and individual fish data are provided in Appendix D.

Table 4. Trout population abundance, estimated density, and estimated biomass at the Sada 5 and Sada 3 sample sites, September 2019.

Sample site	Site length (m)	Average width (m)	Trout species	Number captured	Biomass (g/m^2)			Density (Trout per mile)		
					Est.	Lower 95% C.I.	Upper 95% C.I.	Est.	Lower 95% C.I.	Upper 95% C.I.
Sada 5	122	6.3	Rainbow	8	0.13	--[a]	--[a]	--[a]	--[a]	--[a]
			Brown	186	5.72	3.89	7.55	2,889	2,032	3,745
			All Trout	194	5.85	5.06	6.65	2,983	2,220	3,747
Sada 3	123	5.1	Rainbow	10	1.58	--[a]	--[a]	--[a]	--[a]	--[a]
			Brown	103	9.08	2.46	15.70	1,354	1,222	1,485
			All Trout	113	10.58	4.00	17.16	1,486	1,334	1,637

[a] Depletion pattern and low capture numbers for rainbow trout did not allow for density estimates.

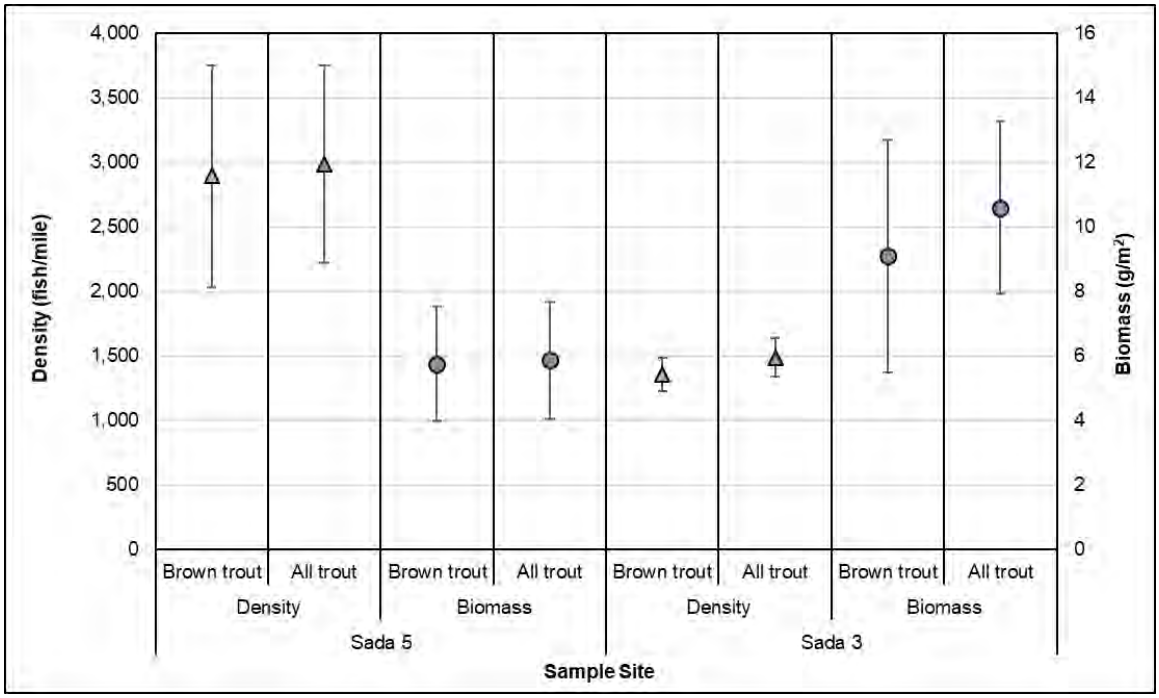

Figure 3. Estimated density and biomass (with 95% confidence intervals) for brown trout and all trout at the Sada 5 and Sada 3 sample sites, September 2019.

5.4 Age Class Distribution

During the 2019 sampling effort, brown trout were observed at each sampling location with most fish ranging from YOY up to age 3+ with a few older fish observed; both sites had fish as old as 4+, with the Sada 3 sample site having brown trout as old as 7+. Length-at-age size ranges based on scale analysis, length frequency distribution, and previously reported values are presented in

Table 5. Fish lengths during this study were narrower in range for each age class than the values provided in Walsh and Williams (1991) (Table 5 and figures 4–7).

Table 5. Trout age based on length frequency histograms and scale analysis.

Fish species	Age	Fork length range based on 2019 scale analysis (mm)[a]			Fork length range (mm) based on length-frequency nodes[b]	Fork length (mm) range reported in Walsh and Williams 1991[c]
		Sada 5	Sada 3	Cardinal		
Brown trout	YOY	--[d]	100	--[d]	< 120	36–103
	1+	100–112	97–100	107–149	90–170	87–219
	2+	178–248	140–172	137–236	130–220	136–327
	3+	250	150–204	167–182	180–250	--
	4+	240	199	--[d]	210–290	--
	5+	--[d]	198–270	--[d]	>290	--
	6+	--[d]	--[d]	--[d]	--	--
	7+	--[d]	289	--[d]	--	--
Rainbow trout	YOY	--[d]	--[d]	--[d]	--	--
	1+	--[d]	--[d]	--[d]	--	--
	2+	--[d]	170–176	--[d]	--	--
	3+	--[d]	147–174	--[d]	--	--
	4+	--[d]	--[d]	--[d]	--	--
	5+	--[d]	233	--[d]	--	--
	6+	--[d]	--[d]	--[d]	--	--
	7+	--[d]	--[d]	--[d]	--	--
	8+	--[d]	--[d]	285	--	--

[a] Fish were not aged from scales collected at the South Fork, Intake 5 or Intake 4 sample sites.
[b] Distinct nodes were not apparent on the length frequency distribution for brown trout longer than 290 mm FL or for rainbow trout of any size due to low numbers captured.
[c] Brown trout age class data in Walsh and Williams (1991) included YOY, age 1+ and age 2+; no rainbow trout ages were reported.
[d] scales were not aged from fish in this size class (*N. Buckmaster, CDFW, personal communication*).

Brown trout captured at the Sada 5 sample site were predominately smaller fish, less than 110 mm FL. Although no scales were aged from brown trout less than 100 mm FL at the Sada 5 sample site, brown trout less than 100 mm FL are expected to fall within the YOY age-class based on the length frequency distribution and scale age data reported in Walsh and Williams (1991). Brown trout within the age 1+ and age 2+ age-classes were also common but in lower numbers. A few brown trout longer than 220 mm FL were captured and likely fall within the age 2+ through age 4+ range. The overlap in fish lengths at specific age-classes is typically due to variability in individual fish growth rates and the overlap in age-class lengths is fairly common especially for older age-classes. The larger fish length assigned to age 3+ brown trout compared to age 4+ brown trout is likely due to age-class size overlap and the small sample size of scales analyzed from fish in both age classes (n = 1). The largest brown trout captured at the Sada 5 sample site was 299 mm FL and was likely age 5+ or older. The gap in sizes of brown trout observed between 120 mm and 180 mm at the Sada 5 sample site (Figure 4) may indicate unfavorable environmental conditions that limited fish survival or growth during 2018 or delayed the spawning season. Multiple age classes of brown trout and a high abundance of young fish

suggest that brown trout are successfully reproducing within this segment of Bishop Creek. The low number of rainbow trout captured at the Sada 5 sample site did not allow for identification of specific age-classes; however, the large range in sizes observed suggest at least two age groups were observed (Figure 4). Rainbow trout less than 100 mm FL observed at the Sada 5 sample site suggest that a small population of rainbow trout is reproducing in this section of Bishop Creek.

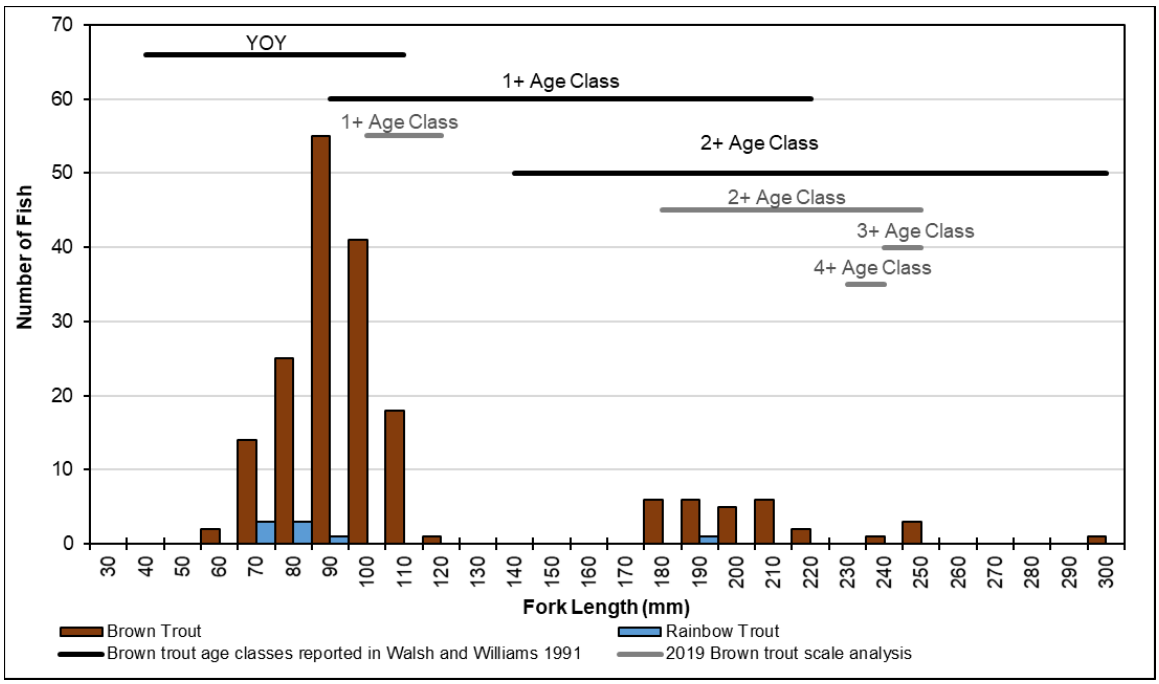

Figure 4. Length-frequency and age class structure of trout species captured by electrofishing at the Sada 5 sample site in September 2019 compared to brown trout age classes identified in 1991 by Walsh and Williams (1991).

At the Sada 3 sample site, brown trout were fairly evenly distributed within the YOY through age 3+ age classes with lower abundance of larger fish from age 4+ and 5+. A single fish was estimated to be age 7+ based on scale analysis suggesting that brown trout older than age 5+ are rare within this section of Bishop Creek (Figure 5). As previously discussed, the overlap in fish lengths at specific age-classes is typically due to variability in individual fish growth rates and becomes more apparent for older age-classes. Rainbow trout captured at the Sada 3 sample site were between the 2+ and 6+ (or older) age classes (Figure 5).

Scales collected from fish at the South Fork sample site showed signs of scale regeneration and/or damage and were therefore considered unreliable for aging. That said, the length frequency distribution for the South Fork sample site shows very few brown trout in the presumptive YOY and 1+ age classes relative to older age classes, which is atypical for trout populations (Figure 6). The skewed age-class distribution is likely an artifact of the unique habitat conditions (e.g., slow, deep water with sand and gravel substrate) that are less favored by YOY brown trout, which prefer shallow water and rocky substrate (Raleigh et al. 1986). Based on scale analyses from the Cardinal sample site, most trout at the South Fork sample site were likely within the age 2+ to age 3+ range. The narrow range of lengths assigned to age 3+ brown trout that falls within the length range for age 2+ brown trout is likely due to the small sample size of scales analyzed from age 3+ brown trout (n = 2) and the potential for variable growth between age-classes.

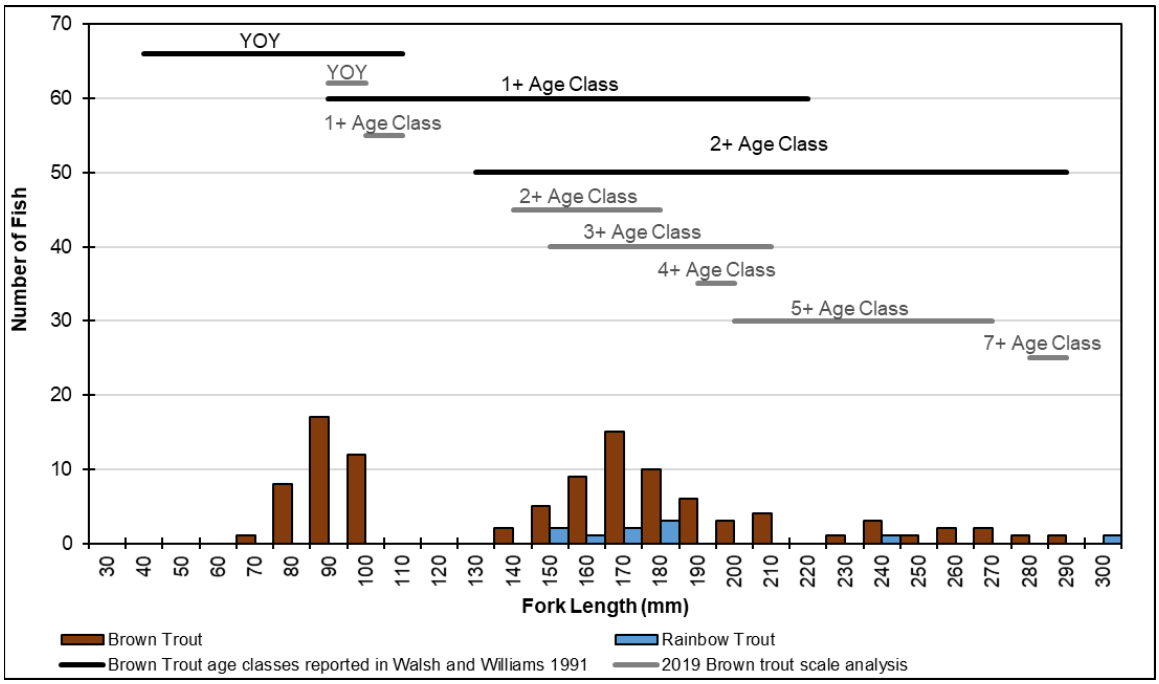

Figure 5. Length-frequency and age class structure of trout species captured by electrofishing at the Sada 3 sample site in September 2019 compared to brown trout age classes identified in 1991 by Walsh and Williams (1991).

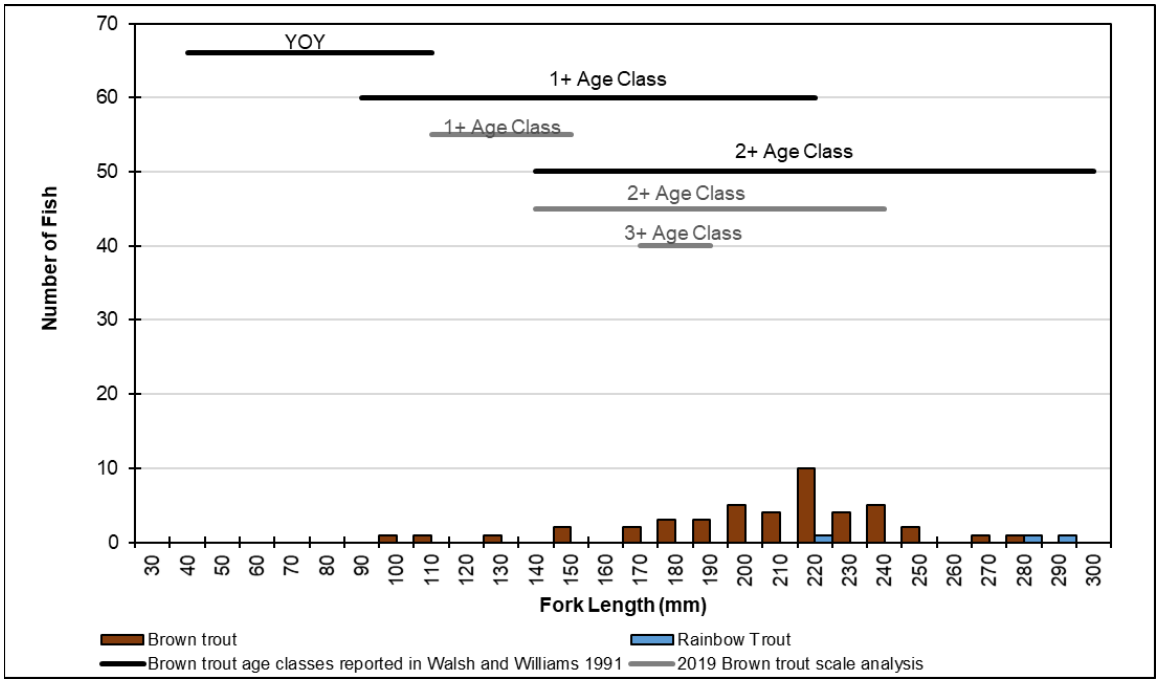

Figure 6. Length-frequency and age-class structure of trout species captured by electrofishing at the South Fork sample site in September 2019 compared to brown trout age classes identified in 1991 by Walsh and Williams (1991). Scales were not aged from fish at the South Fork sample site; scale analyses shown are based on ages from fish captured at the Cardinal sample site.

At the Cardinal sample site, brown trout estimated to fall within the YOY were observed in relatively high numbers, with lower numbers of brown trout through age 4+ (Figure 7). A single rainbow trout was captured at the Cardinal sample site and estimated to be age 8+. Overall, length distribution for brown trout at the Cardinal sample site suggests multiple age classes indicative of a self-supporting population of brown trout.

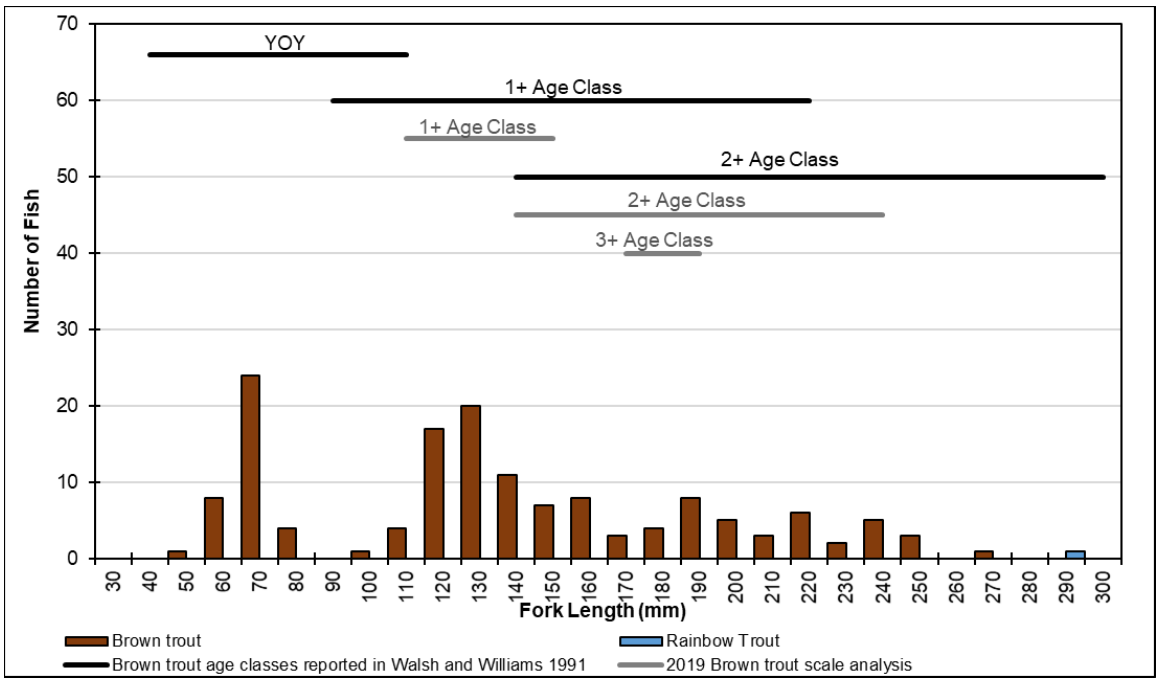

Figure 7. Length-frequency and age-class structure of trout species captured by electrofishing at the Cardinal sample site in September 2019 compared to brown trout age classes identified in 1991 by Walsh and Williams (1991).

Trout captured in Project intakes had lengths ranging from approximately 160 mm FL to 400 mm FL. Scales collected from fish in Intake 4 and Intake 5 showed signs of scale regeneration and/or damage and were therefore considered unreliable for aging. Based on ages observed from other locations in the Bishop Creek watershed, fish captured in Project intakes likely ranged from age 1+ up to age 5+ or older (Figure 8). Gill netting was selective for fish longer than approximately 100 mm, therefore the fish lengths observed may not be representative of the true fish size and age distribution in these locations.

Figure 8. Length-frequency and age-class structure of fish species captured by gill netting in Intake 5 and Intake 4 in September 2019, compared to brown trout age classes identified in 1991 by Walsh and Williams (1991).

5.5 Fish Condition

Site-specific mean condition factors (k-values) of trout sampled at all sites in 2019 ranged from 0.92 to 1.21[4], indicating that trout were generally in good condition (Table 6). Mean brown trout condition factors ranged from 0.92 to 1.12.

[4] Condition factors in western Sierra Nevada streams typically range from 0.8 to 2.0, with a mean condition factor generally 1.2 or below (Beak 1991, EA 1986, Ebasco Environmental 1993, Wilcox 1994, Hanson Environmental 2005). Rabe (1967) reported the condition factor to be between 0.9 and 1.1 for rainbow trout in Alpine lakes. Arismendi et al. (2011) cites broader ranges (0.5 to 2.0); however, condition is dependent on the sampling season, the species, the strain of trout, state of sexual maturity, and the way fish length is defined (e.g., fork length [FL], total length [TL], or standard length [SL]), which is not often documented with the results.

Table 6. Trout condition (k-value) calculated for fish captured during the Bishop Creek Stream Fish Distribution Study, September 2019.

Stream	Sample site	Trout species	(n)	Mean k-value	k-value range
Bishop Creek	Sada 5	Rainbow	8	1.10	0.83–1.30
		Brown	186	1.08	0.78–1.31
	Sada 3	Rainbow	10	1.03	0.93–1.10
		Brown	103	0.97	0.79–1.13
	Intake 5	Brook	1	0.95	0.95
		Rainbow	4	0.98	0.92–1.05
		Brown	7	1.00	0.92–1.08
	Intake 4	Rainbow	1	1.21	1.21
		Brown	2	1.12	1.09–1.16
Middle Fork Bishop Creek	Cardinal	Rainbow	1	0.94	0.94
		Brown	145	0.92	0.65–1.14
South Fork Bishop Creek	South Fork	Rainbow	3	1.09	1.01–1.21
		Brown	45	0.96	0.75–1.70

5.6 Current and Historical Brown Trout Population Data Comparison

5.6.1 Abundance and biomass

The estimated density for brown trout in Bishop Creek at the Sada 5 sample site during 2019 was significantly higher (P=0.045) than in all previous years, while biomass was within the range of prior years (Table 7, Figure 9). The Sada 5 site was dry during 1991 and 1992 monitoring efforts, and subsequently, no fish were captured (Sada 2006). At the Sada 3 sample site, the estimated density and biomass for brown trout during 2019 were higher than in 2010 but lower than in previous years (Figure 10); however, no significant difference was detected between any of the estimated densities at this site during these sample years (Table 7).

Table 7. Results from two-tailed t-tests with unequal variances comparing density estimates at Sada 3 and Sada 5 for 2019 and previous monitoring efforts. Light grey highlight indicates significant differences at $\alpha = 0.05$.

Sample years	P-values	
	Sada 5	Sada 3
2019 and 2010	0.015	0.221
2019 and 2004	0.045	0.504
2019 and 1992	na [a]	0.265
2019 and 1991	na [a]	0.275

[a] This location was dry during 1991 and 1992, so no fish were captured during those years.

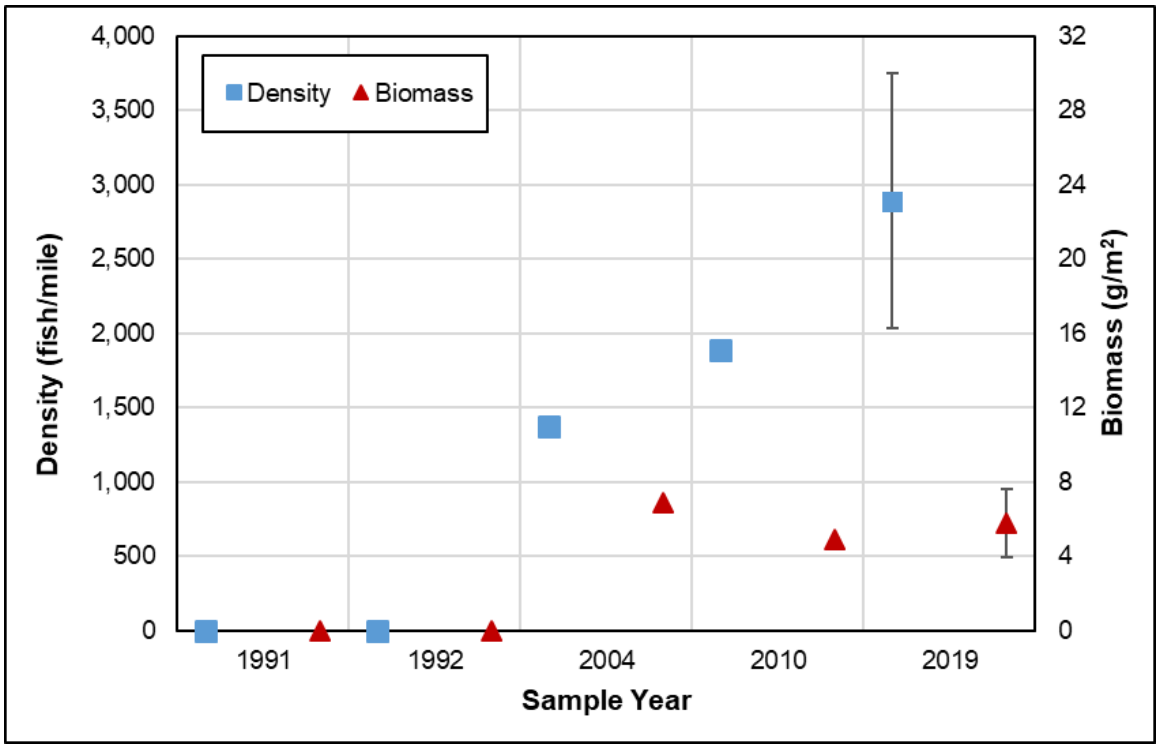

Figure 9. Brown trout estimated density and biomass at the Sada 5 sample site during 2019 (with 95% confidence intervals) and previous studies. (Note, this location was dry during 1991 and 1992, so no fish were captured during those years).

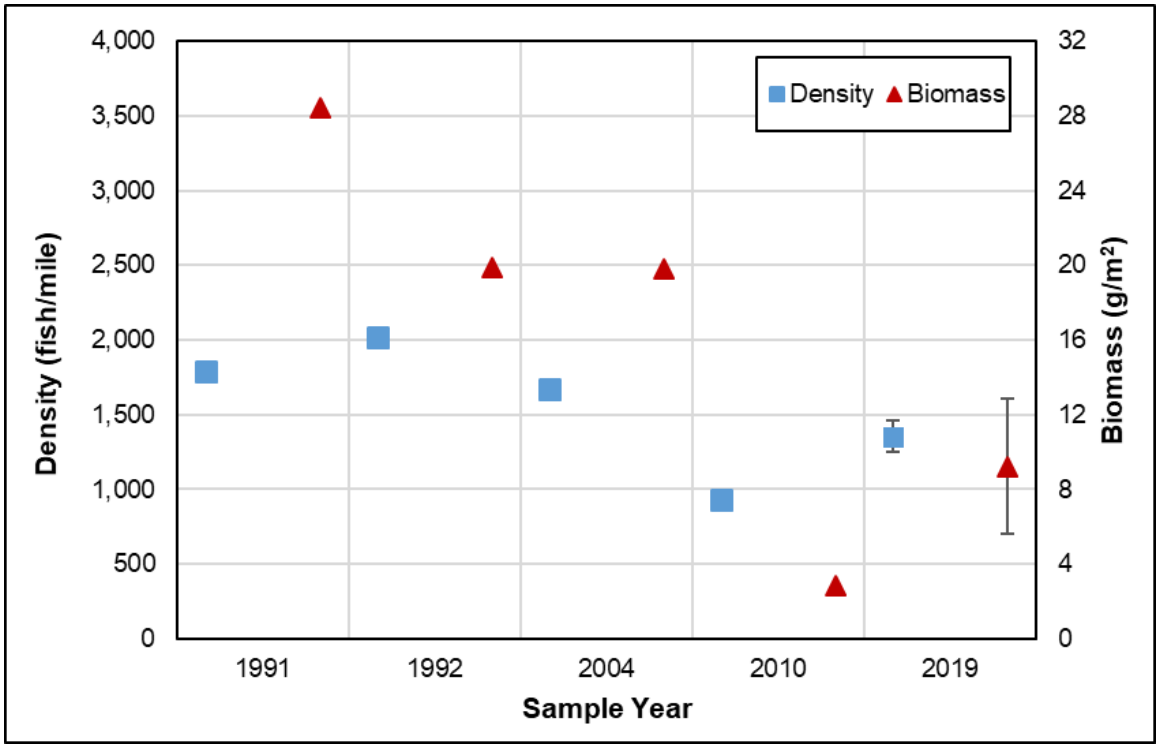

Figure 10. Brown trout estimated density and biomass in Bishop Creek at the Sada 3 sample site during 2019 (with 95% confidence intervals) and previous studies.

5.6.2 Age-class distribution and fish condition

On average, brown trout captured at the Sada 5 sample site during 2019 were slightly smaller than fish captured during the two previous survey years, whereas brown trout captured at the Sada 3 sample site during 2019 were slightly larger than fish captured during previous years (Table 8). The age class distribution of brown trout in Bishop Creek at the Sada 5 sample site appeared similar across all sample years, showing a typical length-frequency distribution where YOY have the highest abundance followed by fewer numbers of each subsequent age class (Figure 11). Length-frequency histograms for the Sada 3 sample site show a more typical distribution for brown trout in 2019, whereas populations in previous monitoring years indicated lower recruitment, demonstrated by a higher proportion of older age classes (Figure 12).

Table 8. Average brown trout length and weight for the Sada 5 and Sada 3 sample sites during 2019 and previous studies in Bishop Creek.

Sample year (season)	n	Mean fork length (mm)	Range (mm)	Average weight (g)	Range (g)
Sada 5					
2019 (fall)	186	106.2	53–299	23.3	1.8–326.8
2010 (fall)	117	121.4	67–259	29.3	3.2–165.6
2004 (summer)[a]	103	130.6	54–263	24.4	1.2–127.1
1991 and 1992[b]	--	--	--	--	--
Sada 3					
2019 (fall)	103	147.9	66–289	51.8	3.6–235.4
2010 (fall)	57	127.8	70–287	29.8	4.1–179.0
2004 (summer)[a]	130	132.0	77–205	49.6	7.5–152.5
1991 (fall)	120	147.5	73–250	38.5	4.7–100.5
1992 (fall)	143	135.4	69–213	32.5	3.7–101.9

[a] The Sada 5 and Sada 3 sample sites were not sampled during the fall of 2004 due to high flows.
[b] The Sada 5 sample site was dry during the 1991 and 1992 monitoring efforts.

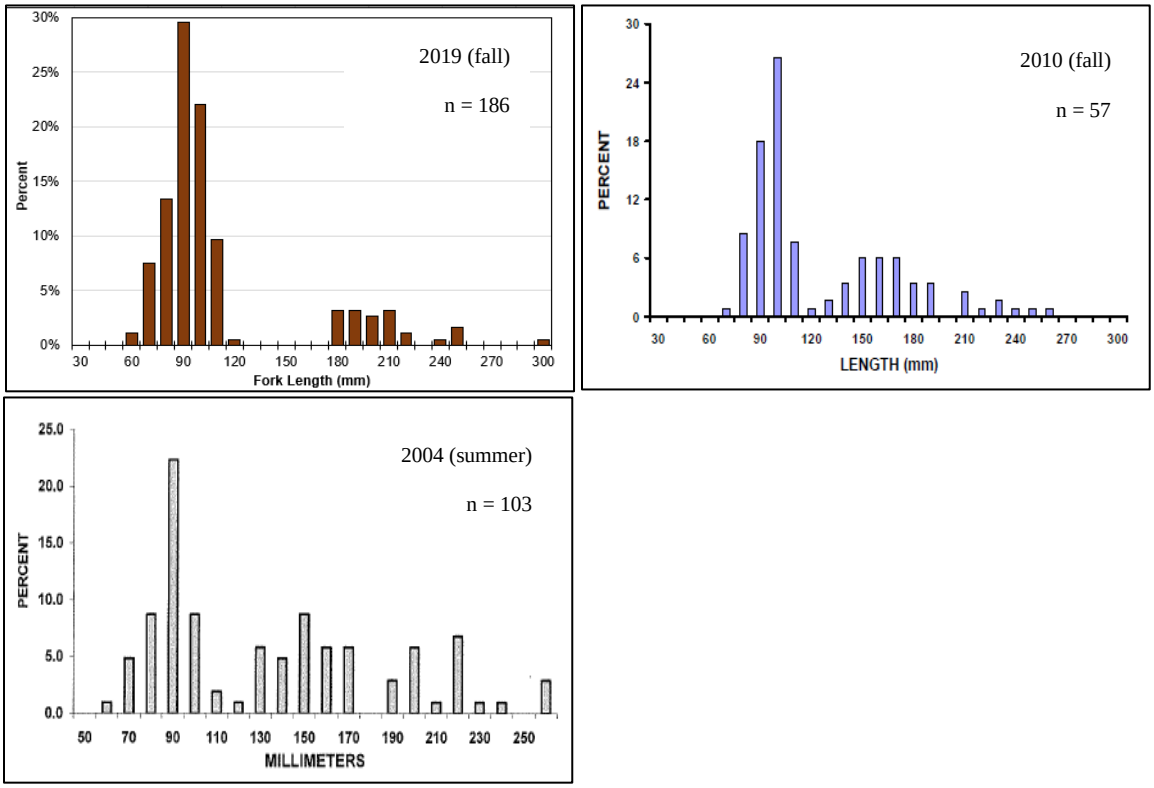

Figure 11. Brown trout length-frequency distribution at the Sada 5 sample site during 2019 (top left), 2010 (top right), 2004 (bottom). Brown trout were not observed at the Sada 5 sample site during 1991 and 1992 when the stream channel was dry.

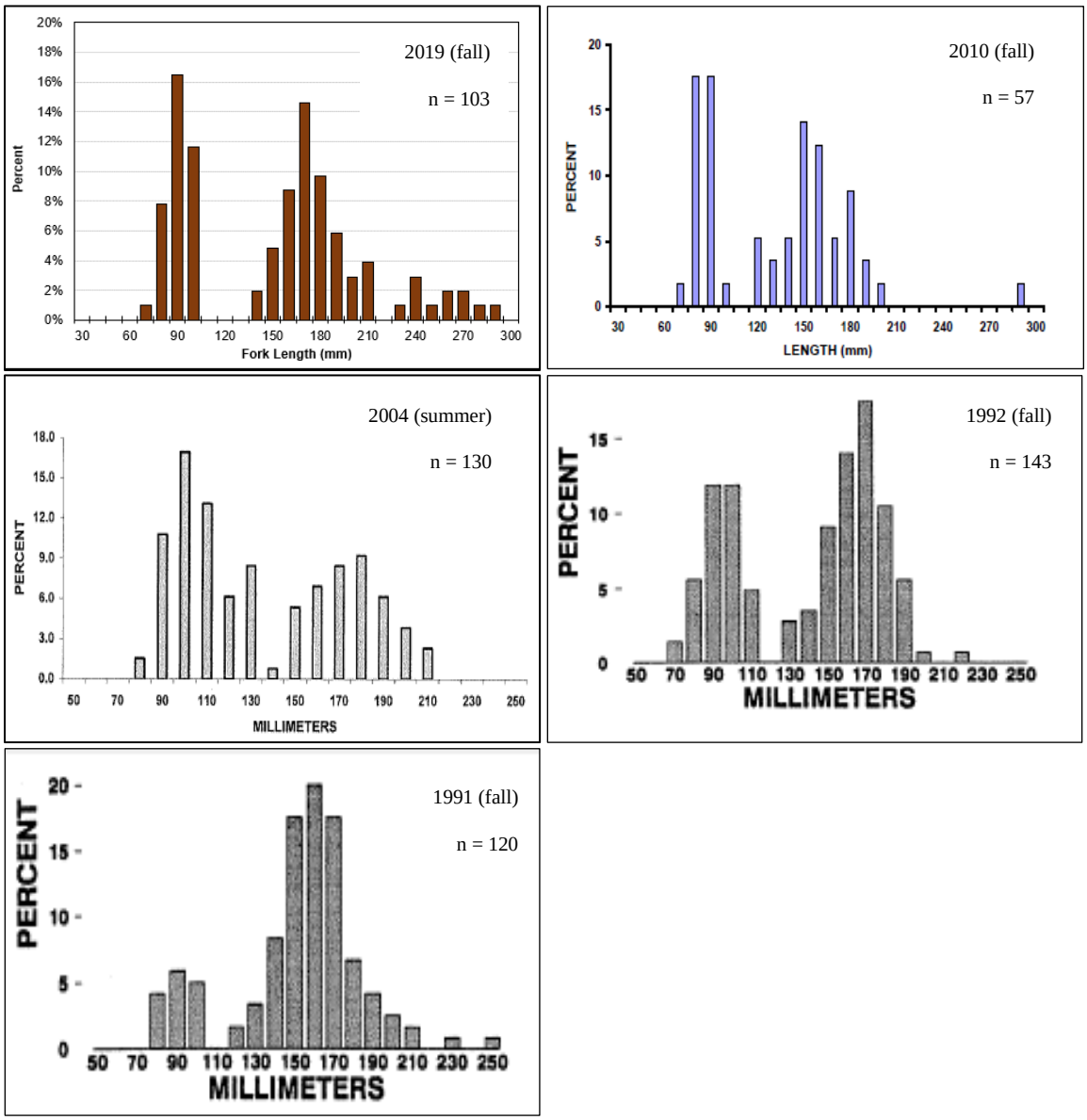

Figure 12. Brown trout length-frequency distribution at the Sada 3 sample site during 2019 (top left), 2010 (top right), 2004 (middle left), 1992 (middle right), and 1991 (bottom).

The average fish condition was similar across years at both the Sada 5 and Sada 3 sample sites (Table 9).

Table 9. Brown trout condition at the Sada 5 and Sada 3 sample sites during 2019 compared to historic values

Sample period	(n)	Mean condition
Sada 5		
September 2019	186	1.090
Fall 2010	117	0.990
Summer 2004	130	0.999
Fall 1991–1992[a]	0	--
Sada 3		
September 2019	103	0.970
Fall 2010	57	0.980
Fall 2004	103	0.998
Fall 1991	120	0.98
Fall 1992	143	0.99

[a] The Sada 5 sample site was dry during 1991 and 1992 sampling efforts.

6 DISCUSSION

The 2019 sampling found no evidence of Owens sucker recruitment in the reaches of Bishop Creek below Lake Sabrina and South Lake. Brown trout are the most abundant fish species in the Project Area, and the population appears healthy based on individual fish size and condition, age class distribution, and fish density. Stocking of rainbow trout is ongoing throughout the Study Area and occurred near the time of sampling (CDFW 2019); however, rainbow trout only made up a small proportion of the total catch at each survey site. Brook trout are rare in the Project Area with only a single individual captured during this study.

The average brown trout fish size has generally increased in the Sada sites since sampling began in 1991. Fish condition factors are within the range considered healthy for trout populations in Sierra Nevada mountain streams (Ebasco Environmental 1993, Wilcox 1994, EA 1986, Beak 1991).

The age class distribution for brown trout at most sample sites suggests the population is self-sustaining, based on the high abundance of YOY fish, multiple age classes, and numbers of older age classes (4+ or older) present. The South Fork Bishop Creek sample site was the only site where YOY fish were not observed. The lack of smaller brown trout at the South Fork sample site may be due to the site location which was selected to target a low gradient section with small substrate sizes that is not ideal habitat for smaller brown trout. Therefore, the size range of fish observed at this sample site may only be representative of conditions in that type of mesohabitat which is limited in the Project Area.

Brown trout density at the Sada 5 sample site also appears to have increased, whereas the brown trout density at the Sada 3 sample site has declined slightly (Figures 9–10). The higher proportion of larger fish captured at the Sada 3 sample site may be due to lower angling pressure at this location while the high numbers of YOY brown trout captured suggest that recruitment is occurring at this location at a similar rate compared to earlier monitoring results (Figure 12).

Before minimum flow requirements were established in Bishop Creek, stream flow below Intake 5 occasionally experienced extensive periods with no flow, and therefore did not historically support an aquatic community (SCE 1986). Results from this study and previous studies have not

documented native fish species within the Project Area; however, Bishop Creek is a popular destination for recreational angling where nonnative trout are targeted. As a popular sport fish, brown trout are considered a desirable nonnative fish.

The results from this study suggest that trout populations within the Bishop Creek sample sites are in line with the Desired Conditions described in the Land Management Plan for the Inyo National Forest (USDA 2018) as they relate to ecological sustainability and diversity of plant and animal communities.

Specific Desired Conditions that are being met at the sample sites include:

- **(SPEC-FW-DC) 01:** Sustainable populations of native and desirable nonnative, plant and animal species are supported by healthy ecosystems, essential ecological processes, and land stewardship activities, and reflect the diversity, quantity, quality, and capability of natural habitats on the Inyo National Forest.
- **(SPEC-FW-DC) 05:** The Inyo National Forest provides high quality hunting and fishing opportunities. Habitat for nonnative fish and game species is managed in locations and ways that do not pose substantial risk to native species, while still contributing to economies of local communities.
- **(RCA-RIV-DC) 01:** Stream ecosystems, riparian corridors, and associated stream courses sustain ecosystem structure; are resilient to natural disturbances (such as flooding) and climate change; promote the natural movement of water, sediment and woody debris; and provide habitat for native aquatic species or desirable nonnative species.

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Appendices

Appendix A

Site Photos

Appendix B

Bishop Creek Stream Fish Distribution Study Sample Site Habitat and Water Quality Data

September 2019

Appendix C

Trout Abundance, Density, and Biomass at the Sada 5 and Sada 3 Sample Sites

September 2019

Appendix D

Fish Capture Data for the Bishop Creek Stream Fish Distribution Study

September 2019

Figure A-1. Sada 5 segment 1, lower block net looking upstream. September 22, 2019.

Figure A-2. Sada 5 segment 1, lower block net and segment 2 lower block net looking downstream. September 22, 2019.

Figure A-3. Sada 5 segment 2, upper block net looking downstream. September 22, 2019.

Figure A-4. Sada 5 segment 3, lower block net looking downstream. September 23, 2019.

Figure A-5. Sada 5 segment 3, lower block net looking upstream. September 23, 2019.

Figure A-6. Sada 5 segment 3, upper block net and segment 4, lower block net looking upstream. September 23, 2019.

Figure A-7. Sada 5 segment 3, upper block net and segment 4, lower block net looking downstream. September 23, 2019.

Figure A-8. Sada 5 segment 4, upper block net and Segment 5, lower block net looking downstream. September 23, 2019.

Figure A-9. Sada 5 segment 4, upper block net and segment 5, lower block net looking upstream. September 23, 2019.

Figure A-10. Sada 5 segment 5, upper block net looking upstream. September 23, 2019.

Figure A-11. Sada 5 segment 5, upper block net looking downstream. September 23, 2019.

Figure A-12. Sada 3 segment 1, lower block net looking downstream. September 26, 2019.

Figure A-13. Sada 3 segment 1, lower block net looking upstream. September 26, 2019.

Figure A-14. Sada 3 segment 1, upper block net and segment 2 lower block net looking upstream. September 26, 2019.

Figure A-15. Sada 3 segment 1, upper block net and segment 2, lower block net looking downstream. September 26, 2019.

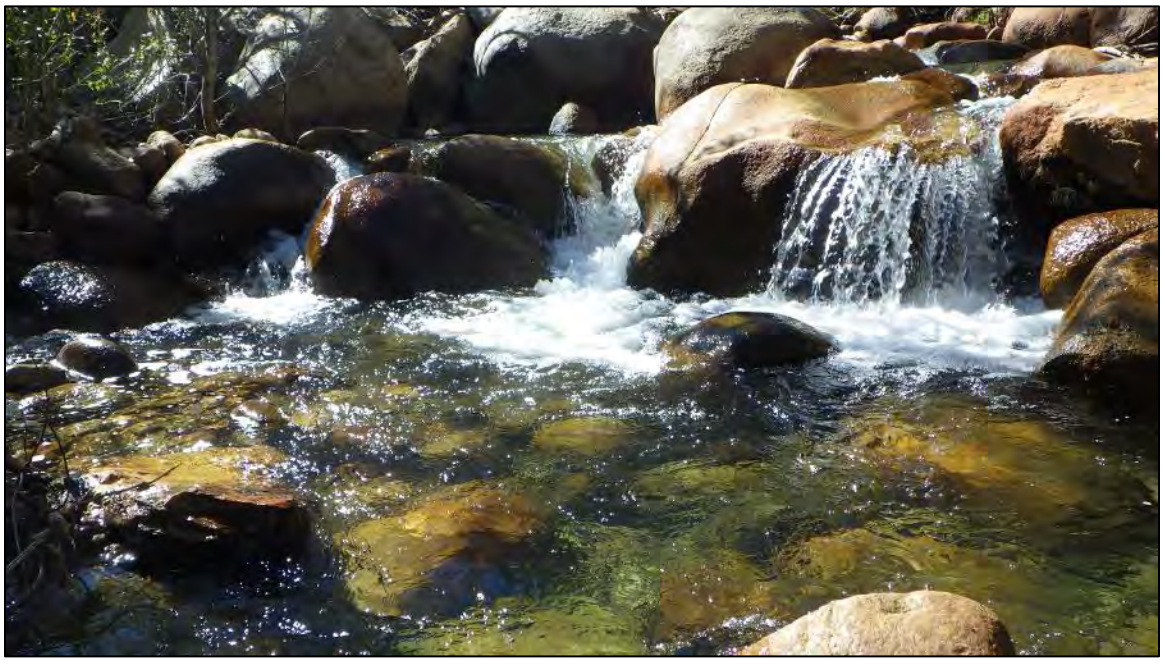

Figure A-16. Sada 3 segment 2, upstream end at natural break. September 26, 2019.

Figure A-17. Sada 3 step pool habitat in segment 1 (left) and segment 2 (right), September 26, 2019.

Figure A-18. Sada 3 segment 3, lower block net looking downstream. September 26, 2019.

Figure A-19. Sada 3 segment 3, lower block net looking upstream. September 26, 2019.

Figure A-20. Sada 3 upper natural barrier and overall site condition. September 26, 2019.

Figure A-21. Sada 3 segment 4, lower block net looking upstream. September 26, 2019.

Figure A-22. Sada 3 segment 4, lower block net looking downstream. September 26, 2019.

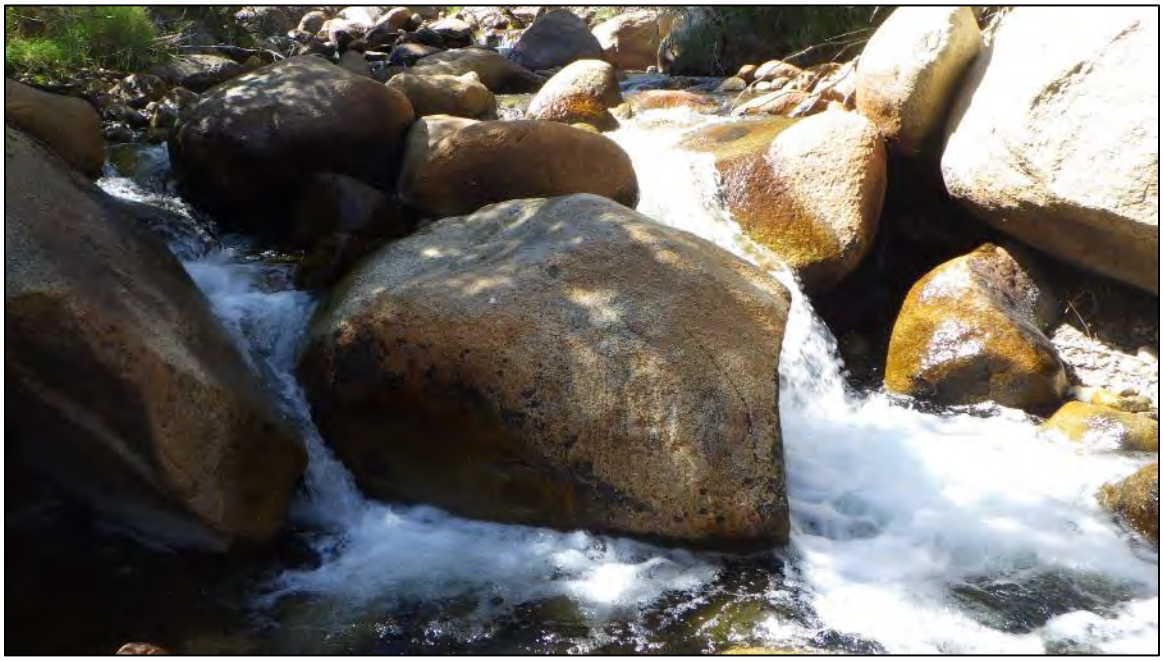

Figure A-23. Sada 3 segment 4, upper natural barrier. September 26, 2019.

Figure A-24. Sada 3 segment 5, lower block net looking upstream. September 26, 2019.

Figure A-25. Sada 3 segment 5, lower block net looking downstream. September 26, 2019.

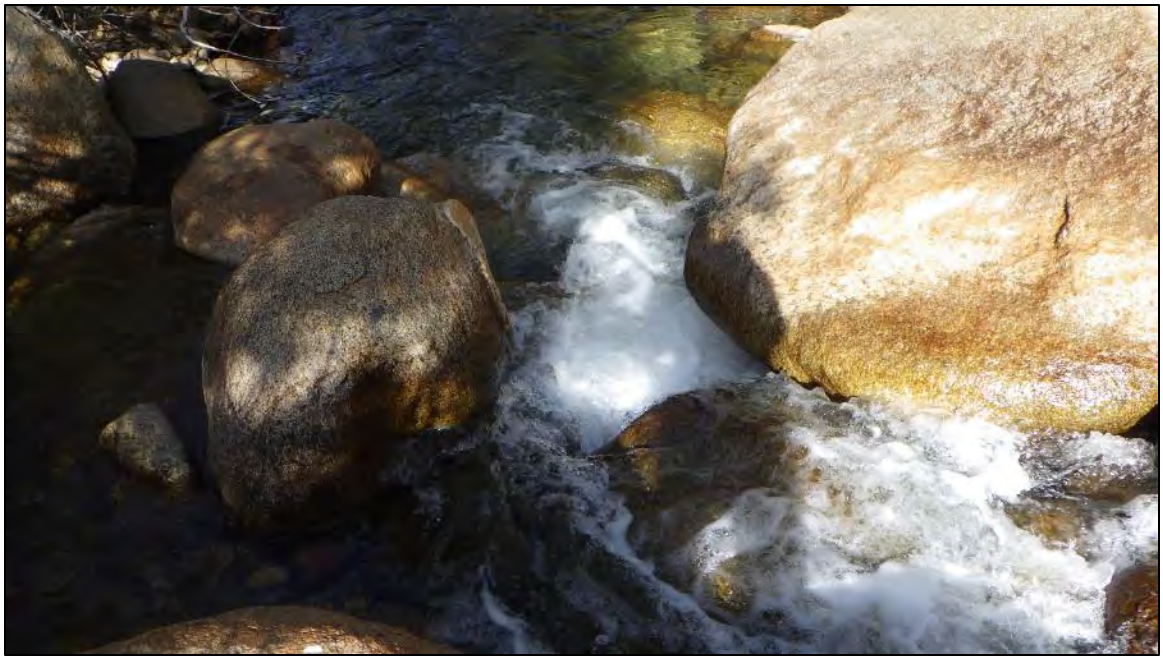

Figure A-26. Sada 3 segment 5, upper natural barrier. September 26, 2019.

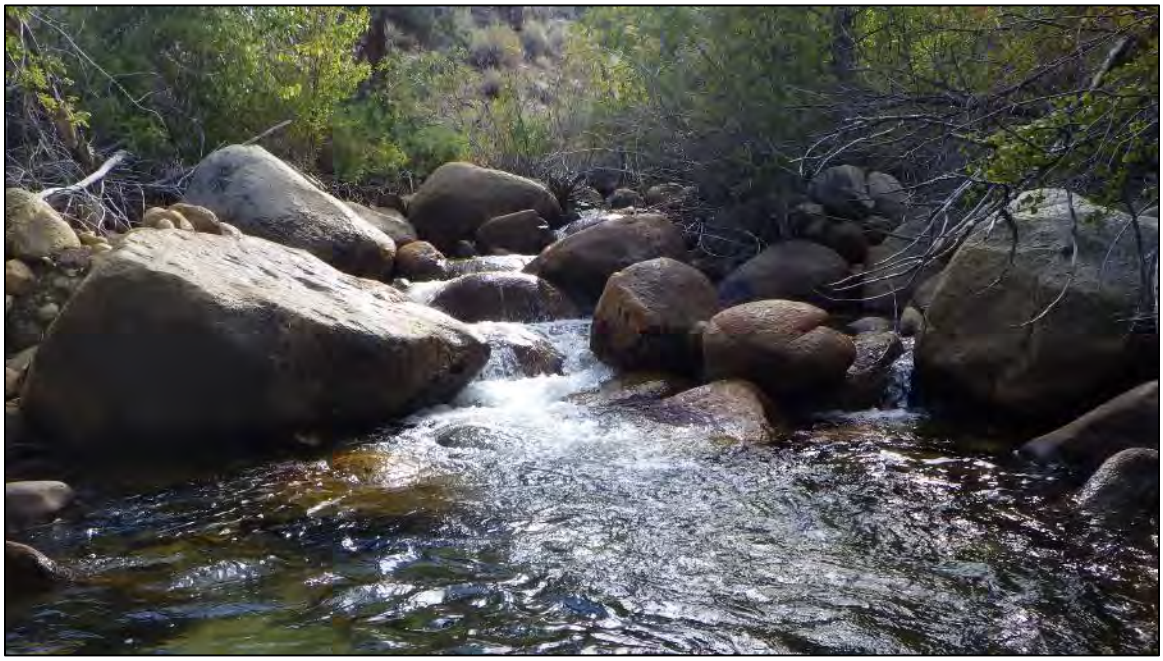

Figure A-27. Sada 3 segment 5, upper natural barrier looking upstream. September 26, 2019.

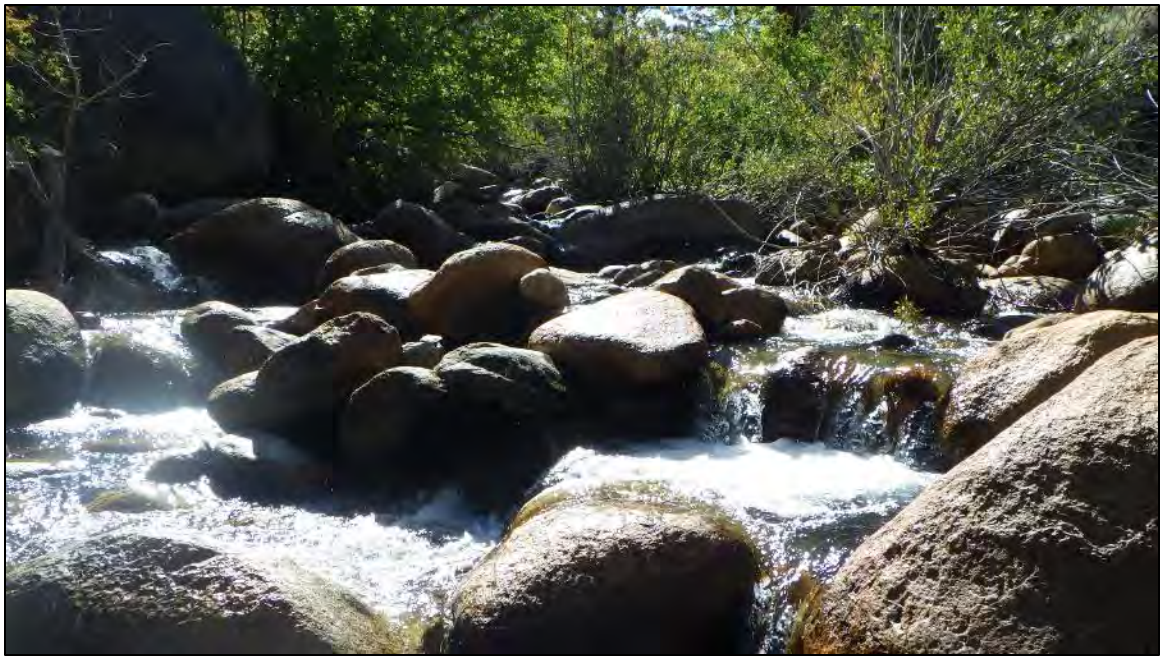

Figure A-28. Sada 3 segment 5, high gradient riffle habitat. September 26, 2019.

Figure A-29. South Fork Bishop Creek lower block net looking downstream. September 25, 2019.

Figure A-30. South Fork Bishop Creek lower block net looking upstream. September 25, 2019.

Figure A-31. South Fork Bishop Creek deep pool habitat. September 25, 2019.

Figure A-32. South Fork Bishop Creek boulder cover and undercut bank habitat. September 25, 2019.

Figure A-33. Cardinal side channel habitat conditions. September 24, 2019.

Figure A-34. Cardinal lower segment large woody debris cover habitat. September 24, 2019.

Figure A-35. Cardinal upper segment riffle habitat. September 24, 2019.

Figure A-36. Cardinal lower segment B undercut bank and run habitat. September 24, 2019.

Figure A-37. Intake 4 overview photo. September 24, 2019.

Figure A-38. Intake 5 overview photo and gillnet placement. September 25, 2019.

Figure A-39. Brook trout captured by gillnet in Intake 5 September 25, 2019.

Figure A-40. Brown trout captured by electrofishing at Sada 5. September 23, 2019.

Figure A-41. Rainbow trout captured by electrofishing at Sada 3. September 26, 2019.

Figure A-42. Brown Trout captured by electrofishing at South Fork Bishop Creek. September 26, 2019.

Figure A-43. Suspected hatchery rainbow trout captured by electrofishing at South Fork Bishop Creek. September 26, 2019.

Table B-1. Summary of physical habitat measurements at sample sites, September 2019.

Sample site	Segment	Habitat type (%)			Segment width (m)					Avg. width (m)	Length (m)	Max depth (ft)	Substrate composition (%)						Cover %						
		Pool	Low gradient riffle	Run	1	2	3	4	5				Bedrock	Boulder	Cobble	Gravel	Sand	Silt	Undercut bank	Bubble	Instream veg.	Over-hanging veg.	No cover	Lg. woody material	Lg. boulder
Sada 5	1	10	90		8.4	7.7	4.8	6.6	4.6	6.4	29.1	3.0		90	10				10	5		10	25		50
	2		100		5.1	6.0	5.5	5.7	5.5	5.6	25.0	2.5		75		25				20		10	20		50
	3		90	10	11.5	7.2	6.3	6.1	6.3	7.5	19.8	2.5		60	30	10			10	5		15			20
	4		100		8.3	8.1	6.8	4.0	5.3	6.5	23.5	2.5		50	40	10				10		30	40		20
	5	10	80	10	6.0	4.2	6.2	5.0	5.2	5.3	25.0	4.0		50	50				5	10	5	10	60		10
Sada 3	1		100		4.4	4.9	3.6	5.2	4.0	4.4	25.0	3.0		60	40				25			50			25
	2	45	5	50	4.5	5.6	3.2	5.9	5.9	5.0	29.9	2.0		33	33	33			10	10		10	30		40
	3	30	60	10	4.4	3.9	4.1	5.9	4.3	4.5	21.0	3.0		70	30				5	15		5	5		70
	4	35	65		5.2	4.6	4.2	2.6	4.0	4.1	21.5	3.5		85	10		5		5	10			15		70
	5	30	70		5.7	8.1	9.6	7.3	7.7	7.7	25.7	3.0		65	30		5		10	5		10			75
South Fork	1	20		80	8.1	6.0	12.4	7.0	8.7	8.4	60.0	4.0		10	5	15	70		15			15	45		25
Cardinal	Side Channel	15	5	80	3.5	3.3	3.4	3.4	3.7	3.4	24.7	1.0				75	20	5	5			40	50	5	
	Lower Segment	20	80		5.0	6.5	8.0	6.8	7.5	6.8	19.7	2.0			90	10			10	5		20	20	45	
	Upper Segment		100		7.8	9.5	7.2	5.7	7.7	7.6	51.0	2.5		50	50				5	10			80	5	
	Lower Segment B	50	20	30	5.3	2.4	8.3	7.0	10.2	6.6	23.0	3.5			75	25			40		5	30	20	5	

Table B-2. Summary of water chemistry measurements at Project sites in Bishop Creek.

Site	Date	Dissolved oxygen		Conductivity (uS/cm)		Temp (°C)	Discharge (cfs)	pH	Visibility (ft)
		%	mg/l	to 25°C	to °C				
Sada 5	9/22/2019	84.6	9.70	46.8	33	9.2	22	7.73	clear
Sada 3	9/26/2019	83.8	8.62	44.7	35	13.8	14	6.98	clear
South Fork	9/25/2019	68.6	7.99	36.4	25	8.5	15	7.28	clear
Cardinal	9/24/2019	73.5	8.07	26.7	20	11.0	20	6.77	clear
Intake 4	9/24/2019	87.4	10.18	41.8	29	8.6	n/a	6.84	>10
Intake 5	9/25/2019	75.1	8.52	82.9	59	9.8	n/a	7.60	>10

Table C-1. Trout abundance, density, and biomass at the Sada 5 and Sada 3 sample sites, September 2019.

Segment number	Length (ft)	Average width (m)	Trout species	Fish removal pattern	Total no. observed	Biomass (g/m^2)	Density					
							Trout per m^2			Trout per mile		
							Estimate	Lower 95% C.I.	Upper 95% C.I.	Estimate	Lower 95% C.I.	Upper 95% C.I.
Sada 5												
1	29.1	6.4	Rainbow	2, 0, 0	2	0.03	--[a]	--[a]	--[a]	--[a]	--[a]	--[a]
			Brown	21, 7, 5	33	6.31	0.19	0.16	0.21	1,936	1,659	2,212
			All Trout	23, 7, 5	35	6.34	0.20	0.17	0.23	2046	1770	2323
2	25.0	5.6	Rainbow	1, 0, 0, 0	1	0.46	--[a]	--[a]	--[a]	--[a]	--[a]	--[a]
			Brown	11, 6, 11, 4	32	6.59	0.36	0.08	0.64	3,219	708	5,729
			All Trout	12, 6, 11, 4	33	7.05	0.35	0.12	0.57	3,090	1,094	5,086
3	19.8	7.5	Rainbow	2, 0, 0	2	0.05	--[a]	--[a]	--[a]	--[a]	--[a]	--[a]
			Brown	28, 10, 4	42	4.43	0.29	0.26	0.32	3,488	3,164	3,812
			All Trout	30, 10, 4	44	4.48	0.30	0.28	0.32	3,650	3,407	3,894
4	23.5	6.5	Rainbow	1, 0, 0	1	0.04	--[a]	--[a]	--[a]	--[a]	--[a]	--[a]
			Brown	19, 12, 2	33	3.18	0.22	0.20	0.25	2,328	2,054	2,602
			All Trout	20, 12, 2	34	3.22	0.23	0.20	0.26	2,397	2,123	2,671
5	25.0	5.3	Rainbow	1, 0, 1	2	0.07	--[a]	--[a]	--[a]	--[a]	--[a]	--[a]
			Brown	25, 12, 9	46	8.45	0.41	0.30	0.51	3,476	2,575	4,377
			All Trout	26, 12, 10	50	8.52	0.44	0.32	0.56	3734	2704	4764
Site	122.4	6.3	Rainbow	7, 0, 3	8	0.13	--[a]	--[a]	--[a]	--[a]	--[a]	--[a]
			Brown	104, 47, 31	186	5.80	0.29	0.20	0.39	2,889	2,032	3,745
			All Trout	111, 47, 32	194	5.92	0.30	0.22	0.39	2983	2,220	3,747

Segment number	Length (ft)	Average width (m)	Trout species	Fish removal pattern	Total no. observed	Biomass (g/m^2)	Density					
							Trout per m^2			Trout per mile		
							Estimate	Lower 95% C.I.	Upper 95% C.I.	Estimate	Lower 95% C.I.	Upper 95% C.I.
Sada 3												
1	25.0	4.39	Rainbow	2, 0, 0	2	1.06	--[a]	--[a]	--[a]	--[a]	--[a]	--[a]
			Brown	16, 3, 2	21	12.59	0.19	0.18	0.20	1,352	1,287	1,416
			All Trout	18, 3, 2	23	13.66	0.21	0.20	0.22	1481	1416	1545
2	29.9	4.99	Rainbow	2, 0, 0	2	0.38	--[a]	--[a]	--[a]	--[a]	--[a]	--[a]
			Brown	25, 6, 4	35	11.53	0.24	0.22	0.26	1,938	1,776	2,099
			All Trout	27, 6, 4	37	11.91	0.25	0.23	0.26	1991	1884	2099
3	21.0	4.52	Rainbow	0, 0, 1	1	4.18	--[a]	--[a]	--[a]	--[a]	--[a]	--[a]
			Brown	14, 8, 2	24	12.03	0.26	0.22	0.31	1,916	1,609	2,222
			All Trout	14, 8, 3	25	16.21	0.28	0.22	0.35	2069	1609	2529
4	21.5	4.12	Rainbow	0, 1, 0	1	0.77	--[a]	--[a]	--[a]	--[a]	--[a]	--[a]
			Brown	9, 1, 0	10	7.37	0.11	0.11	0.11	749	749	749
			All Trout	9, 2, 0	11	8.14	0.12	0.12	0.12	823	823	823
5	25.7	7.68	Rainbow	3, 1, 0	4	1.52	--[a]	--[a]	--[a]	--[a]	--[a]	--[a]
			Brown	9, 2, 2	13	2.67	0.07	0.06	0.08	814	689	939
			All Trout	12, 3, 2	17	4.19	0.09	0.08	0.10	1065	939	1190
Site	123.1	5.1	Rainbow	7, 2, 1	10	1.58	--[a]	--[a]	--[a]	--[a]	--[a]	--[a]
			Brown	73, 20, 10	103	9.24	0.17	0.16	0.19	1354	1222	1485
			All Trout	80, 22, 11	113	10.82	0.19	0.17	0.21	1486	1334	1637

[a] Density estimates could not be calculated due to low capture numbers or poor fish removal pattern.

Table D-1. Stream fish distribution monitoring data for Bishop Creek, September 2019.

Date	Stream	Site	Segment	Pass	Species	Scale sample ID	Fork length (mm)	Total length (mm)	Weight (g)	k-value
9/22/2019	Bishop Creek	Sada 5	1	1	Brown trout		69	66	2.9	1.01
9/22/2019	Bishop Creek	Sada 5	1	1	Brown trout	S5-1	95	90	7.8	1.07
9/22/2019	Bishop Creek	Sada 5	1	1	Brown trout	S5-2	99	95	9.3	1.08
9/22/2019	Bishop Creek	Sada 5	1	1	Rainbow trout		82	79	5.3	1.10
9/22/2019	Bishop Creek	Sada 5	1	1	Rainbow trout		69	66	2.4	1.10
9/22/2019	Bishop Creek	Sada 5	1	1	Brown trout	S5-3	93	90	8.0	1.18
9/22/2019	Bishop Creek	Sada 5	1	1	Brown trout	S5-4	99	95	9.4	1.07
9/22/2019	Bishop Creek	Sada 5	1	1	Brown trout	S5-5	95	92	9.2	1.28
9/22/2019	Bishop Creek	Sada 5	1	1	Brown trout	S5-6	104	100	10.7	1.08
9/22/2019	Bishop Creek	Sada 5	1	1	Brown trout		82	79	6.3	1.05
9/22/2019	Bishop Creek	Sada 5	1	1	Brown trout		99	94	9.0	0.98
9/22/2019	Bishop Creek	Sada 5	1	1	Brown trout		85	81	5.6	1.11
9/22/2019	Bishop Creek	Sada 5	1	1	Brown trout		92	89	6.9	1.13
9/22/2019	Bishop Creek	Sada 5	1	1	Brown trout		83	80	5.7	1.12
9/22/2019	Bishop Creek	Sada 5	1	1	Brown trout	S5-7	198	186	72.4	1.13
9/22/2019	Bishop Creek	Sada 5	1	1	Brown trout	S5-8	102	98	10.5	1.25
9/22/2019	Bishop Creek	Sada 5	1	1	Brown trout	S5-9	215	208	102.0	0.95
9/22/2019	Bishop Creek	Sada 5	1	1	Brown trout	S5-10	101	97	11.4	1.13
9/22/2019	Bishop Creek	Sada 5	1	1	Brown trout		93	90	6.9	1.02
9/22/2019	Bishop Creek	Sada 5	1	1	Brown trout	S5-11	202	193	81.4	1.29
9/22/2019	Bishop Creek	Sada 5	1	1	Brown trout	S5-12	228	218	105.6	1.24
9/22/2019	Bishop Creek	Sada 5	1	1	Brown trout	S5-13	258	250	202.0	1.07
9/22/2019	Bishop Creek	Sada 5	1	1	Brown trout	S5-14	255	245	182.3	0.83
9/22/2019	Bishop Creek	Sada 5	1	2	Brown trout		77	74	4.3	1.06
9/22/2019	Bishop Creek	Sada 5	1	2	Brown trout	S5-15	106	102	12.0	1.13
9/22/2019	Bishop Creek	Sada 5	1	2	Brown trout	S5-16	115	110	14.6	1.10

Date	Stream	Site	Segment	Pass	Species	Scale sample ID	Fork length (mm)	Total length (mm)	Weight (g)	k-value
9/22/2019	Bishop Creek	Sada 5	1	2	Brown trout	S5-17	110	108	12.3	0.98
9/22/2019	Bishop Creek	Sada 5	1	2	Brown trout	S5-18	114	109	13.1	1.01
9/22/2019	Bishop Creek	Sada 5	1	2	Brown trout	S5-19	112	109	14.0	1.08
9/22/2019	Bishop Creek	Sada 5	1	2	Brown trout		98	93	9.6	1.19
9/22/2019	Bishop Creek	Sada 5	1	3	Brown trout		93	89	7.2	1.02
9/22/2019	Bishop Creek	Sada 5	1	3	Brown trout		91	86	7.3	1.15
9/22/2019	Bishop Creek	Sada 5	1	3	Brown trout	S5-20	184	178	59.6	1.06
9/22/2019	Bishop Creek	Sada 5	1	3	Brown trout	S5-21	105	100	10.9	1.09
9/22/2019	Bishop Creek	Sada 5	1	3	Brown trout	S5-22	198	189	78.3	1.16
9/22/2019	Bishop Creek	Sada 5	2	1	Brown trout	S5-23	107	104	11.3	1.00
9/22/2019	Bishop Creek	Sada 5	2	1	Brown trout	S5-24	115	112	13.3	0.95
9/22/2019	Bishop Creek	Sada 5	2	1	Brown trout	S5-25	186	179	56.5	0.99
9/22/2019	Bishop Creek	Sada 5	2	1	Brown trout		91	88	6.4	0.94
9/22/2019	Bishop Creek	Sada 5	2	1	Brown trout		89	85	6.6	1.07
9/22/2019	Bishop Creek	Sada 5	2	1	Brown trout	S5-26	255	245	174.6	1.19
9/22/2019	Bishop Creek	Sada 5	2	1	Brown trout	S5-27	199	185	69.0	1.09
9/22/2019	Bishop Creek	Sada 5	2	1	Brown trout	S5-28	249	240	163.3	1.18
9/22/2019	Bishop Creek	Sada 5	2	1	Brown trout		78	75	4.3	1.02
9/22/2019	Bishop Creek	Sada 5	2	1	Brown trout	S5-29	112	105	13.1	1.13
9/22/2019	Bishop Creek	Sada 5	2	1	Rainbow trout		191	182	64.5	1.17
9/22/2019	Bishop Creek	Sada 5	2	1	Brown trout	S5-30	211	200	93.2	1.07
9/22/2019	Bishop Creek	Sada 5	2	2	Brown trout	S5-31	184	175	60.7	1.13
9/22/2019	Bishop Creek	Sada 5	2	2	Brown trout		78	75	4.0	0.95
9/22/2019	Bishop Creek	Sada 5	2	2	Brown trout		91	86	6.7	1.05
9/22/2019	Bishop Creek	Sada 5	2	2	Brown trout		87	81	5.9	1.11
9/22/2019	Bishop Creek	Sada 5	2	2	Brown trout		90	86	6.8	1.07
9/22/2019	Bishop Creek	Sada 5	2	2	Brown trout	S5-32	216	204	93.3	1.10

Date	Stream	Site	Segment	Pass	Species	Scale sample ID	Fork length (mm)	Total length (mm)	Weight (g)	k-value
9/22/2019	Bishop Creek	Sada 5	2	3	Brown trout		94	90	8.4	1.15
9/22/2019	Bishop Creek	Sada 5	2	3	Brown trout		99	95	8.9	1.04
9/22/2019	Bishop Creek	Sada 5	2	3	Brown trout	S5-33	105	100	11.5	1.15
9/22/2019	Bishop Creek	Sada 5	2	3	Brown trout	S5-34	102	99	10.3	1.06
9/22/2019	Bishop Creek	Sada 5	2	3	Brown trout		92	89	8.3	1.18
9/22/2019	Bishop Creek	Sada 5	2	3	Brown trout		93	90	8.2	1.12
9/22/2019	Bishop Creek	Sada 5	2	3	Brown trout		79	75	4.4	1.04
9/22/2019	Bishop Creek	Sada 5	2	3	Brown trout		77	75	4.7	1.11
9/22/2019	Bishop Creek	Sada 5	2	3	Brown trout		86	84	6.2	1.05
9/22/2019	Bishop Creek	Sada 5	2	3	Brown trout	S5-35	105	101	11.0	1.07
9/22/2019	Bishop Creek	Sada 5	2	3	Brown trout		92	89	7.6	1.08
9/22/2019	Bishop Creek	Sada 5	2	4	Brown trout		90	86	7.2	1.13
9/22/2019	Bishop Creek	Sada 5	2	4	Brown trout	S5-36	104	100	10.3	1.03
9/22/2019	Bishop Creek	Sada 5	2	4	Brown trout	S5-37	116	110	16.0	1.20
9/22/2019	Bishop Creek	Sada 5	2	4	Brown trout		73	71	3.5	0.98
9/23/2019	Bishop Creek	Sada 5	3	1	Brown trout	S5-38	107	100	11.2	1.12
9/23/2019	Bishop Creek	Sada 5	3	1	Brown trout		73	68	3.3	1.05
9/23/2019	Bishop Creek	Sada 5	3	1	Brown trout		60	56	2.1	1.20
9/23/2019	Bishop Creek	Sada 5	3	1	Brown trout	S5-39	202	191	78.4	1.13
9/23/2019	Bishop Creek	Sada 5	3	1	Brown trout		73	68	3.5	1.11
9/23/2019	Bishop Creek	Sada 5	3	1	Brown trout		81	76	5.1	1.16
9/23/2019	Bishop Creek	Sada 5	3	1	Brown trout		90	84	6.3	1.06
9/23/2019	Bishop Creek	Sada 5	3	1	Brown trout		81	76	4.9	1.12
9/23/2019	Bishop Creek	Sada 5	3	1	Brown trout	S5-40	217	210	108.7	1.17
9/23/2019	Bishop Creek	Sada 5	3	1	Brown trout		93	88	8.2	1.20
9/23/2019	Bishop Creek	Sada 5	3	1	Brown trout	S5-41	181	173	57.0	1.10
9/23/2019	Bishop Creek	Sada 5	3	1	Brown trout		76	73	4.3	1.11

Date	Stream	Site	Segment	Pass	Species	Scale sample ID	Fork length (mm)	Total length (mm)	Weight (g)	k-value
9/23/2019	Bishop Creek	Sada 5	3	1	Brown trout		98	93	8.9	1.11
9/23/2019	Bishop Creek	Sada 5	3	1	Brown trout		72	68	3.6	1.14
9/23/2019	Bishop Creek	Sada 5	3	1	Brown trout		96	90	7.6	1.04
9/23/2019	Bishop Creek	Sada 5	3	1	Brown trout	S5-42	111	105	11.8	1.02
9/23/2019	Bishop Creek	Sada 5	3	1	Brown trout	S5-43	105	100	10.7	1.07
9/23/2019	Bishop Creek	Sada 5	3	1	Brown trout	S5-44	196	186	71.1	1.10
9/23/2019	Bishop Creek	Sada 5	3	1	Brown trout		106	100	11.9	1.19
9/23/2019	Bishop Creek	Sada 5	3	1	Brown trout		94	90	8.1	1.11
9/23/2019	Bishop Creek	Sada 5	3	1	Brown trout		87	83	6.4	1.12
9/23/2019	Bishop Creek	Sada 5	3	1	Brown trout		113	106	13.4	1.13
9/23/2019	Bishop Creek	Sada 5	3	1	Brown trout		88	84	6.7	1.13
9/23/2019	Bishop Creek	Sada 5	3	1	Brown trout		86	81	5.8	1.09
9/23/2019	Bishop Creek	Sada 5	3	1	Brown trout		90	85	6.9	1.12
9/23/2019	Bishop Creek	Sada 5	3	1	Brown trout		91	85	6.7	1.09
9/23/2019	Bishop Creek	Sada 5	3	1	Brown trout		75	71	3.3	0.92
9/23/2019	Bishop Creek	Sada 5	3	1	Brown trout		74	70	3.5	1.02
9/23/2019	Bishop Creek	Sada 5	3	2	Rainbow trout		76	71	3.9	0.95
9/23/2019	Bishop Creek	Sada 5	3	2	Brown trout		68	64	2.5	0.97
9/23/2019	Bishop Creek	Sada 5	3	2	Brown trout		70	66	2.8	1.11
9/23/2019	Bishop Creek	Sada 5	3	2	Brown trout		77	73	4.3	1.08
9/23/2019	Bishop Creek	Sada 5	3	2	Brown trout		106	100	10.8	1.15
9/23/2019	Bishop Creek	Sada 5	3	2	Brown trout		95	90	8.4	1.05
9/23/2019	Bishop Creek	Sada 5	3	2	Rainbow trout		69	64	3.4	0.99
9/23/2019	Bishop Creek	Sada 5	3	2	Brown trout		100	95	9.0	1.08
9/23/2019	Bishop Creek	Sada 5	3	2	Brown trout		71	68	3.1	1.01
9/23/2019	Bishop Creek	Sada 5	3	2	Brown trout	S5-45	221	208	96.8	1.00
9/23/2019	Bishop Creek	Sada 5	3	2	Brown trout		99	94	8.4	1.09

Date	Stream	Site	Segment	Pass	Species	Scale sample ID	Fork length (mm)	Total length (mm)	Weight (g)	k-value
9/23/2019	Bishop Creek	Sada 5	3	2	Brown trout		66	63	2.5	1.30
9/23/2019	Bishop Creek	Sada 5	3	3	Brown trout		82	77	5.2	1.14
9/23/2019	Bishop Creek	Sada 5	3	3	Brown trout		116	110	14.9	1.12
9/23/2019	Bishop Creek	Sada 5	3	3	Brown trout		74	70	3.5	1.02
9/23/2019	Bishop Creek	Sada 5	3	3	Brown trout		88	82	5.8	1.05
9/23/2019	Bishop Creek	Sada 5	4	1	Brown trout		102	97	9.1	1.00
9/23/2019	Bishop Creek	Sada 5	4	1	Brown trout	S5-46	219	210	107.6	1.16
9/23/2019	Bishop Creek	Sada 5	4	1	Brown trout	S5-47	206	197	95.0	1.24
9/23/2019	Bishop Creek	Sada 5	4	1	Brown trout	S5-48	193	184	72.2	1.16
9/23/2019	Bishop Creek	Sada 5	4	1	Brown trout		94	89	7.8	1.11
9/23/2019	Bishop Creek	Sada 5	4	1	Brown trout		86	82	6.6	1.20
9/23/2019	Bishop Creek	Sada 5	4	1	Brown trout		83	79	5.4	1.10
9/23/2019	Bishop Creek	Sada 5	4	1	Brown trout		82	78	5.3	1.12
9/23/2019	Bishop Creek	Sada 5	4	1	Brown trout		95	90	7.8	1.07
9/23/2019	Bishop Creek	Sada 5	4	1	Brown trout		100	95	9.5	1.11
9/23/2019	Bishop Creek	Sada 5	4	1	Brown trout		100	95	9.7	1.13
9/23/2019	Bishop Creek	Sada 5	4	1	Brown trout		111	109	12.6	0.97
9/23/2019	Bishop Creek	Sada 5	4	1	Brown trout		103	98	9.4	1.00
9/23/2019	Bishop Creek	Sada 5	4	1	Brown trout		100	94	8.9	1.07
9/23/2019	Bishop Creek	Sada 5	4	1	Brown trout		103	98	10.9	1.16
9/23/2019	Bishop Creek	Sada 5	4	1	Brown trout		105	100	10.5	1.05
9/23/2019	Bishop Creek	Sada 5	4	1	Brown trout		81	76	5.4	1.23
9/23/2019	Bishop Creek	Sada 5	4	1	Brown trout		74	70	3.6	1.05
9/23/2019	Bishop Creek	Sada 5	4	1	Brown trout		85	81	5.8	1.09
9/23/2019	Bishop Creek	Sada 5	4	1	Rainbow trout		82	77	5.6	1.23
9/23/2019	Bishop Creek	Sada 5	4	2	Brown trout		87	83	5.0	0.87
9/23/2019	Bishop Creek	Sada 5	4	2	Brown trout		88	82	-- [a]	-- [a]

Date	Stream	Site	Segment	Pass	Species	Scale sample ID	Fork length (mm)	Total length (mm)	Weight (g)	k-value
9/23/2019	Bishop Creek	Sada 5	4	2	Brown trout		77	73	4.4	1.13
9/23/2019	Bishop Creek	Sada 5	4	2	Brown trout		80	76	5.0	1.14
9/23/2019	Bishop Creek	Sada 5	4	2	Brown trout		80	75	4.3	1.02
9/23/2019	Bishop Creek	Sada 5	4	2	Brown trout		91	85	--[a]	--[a]
9/23/2019	Bishop Creek	Sada 5	4	2	Brown trout		101	96	9.6	1.09
9/23/2019	Bishop Creek	Sada 5	4	2	Brown trout		97	91	7.8	1.04
9/23/2019	Bishop Creek	Sada 5	4	2	Brown trout		95	100	9.1	0.91
9/23/2019	Bishop Creek	Sada 5	4	2	Brown trout		86	91	7.3	0.97
9/23/2019	Bishop Creek	Sada 5	4	2	Brown trout		101	107	12.2	1.00
9/23/2019	Bishop Creek	Sada 5	4	2	Brown trout		68	72	3.2	0.86
9/23/2019	Bishop Creek	Sada 5	4	3	Brown trout		77	82	4.6	0.83
9/23/2019	Bishop Creek	Sada 5	4	3	Brown trout		85	89	5.8	0.82
9/23/2019	Bishop Creek	Sada 5	5	1	Brown trout		93	88	8.0	1.17
9/23/2019	Bishop Creek	Sada 5	5	1	Brown trout		88	83	6.3	1.10
9/23/2019	Bishop Creek	Sada 5	5	1	Brown trout	S5-49	226	218	120.1	1.16
9/23/2019	Bishop Creek	Sada 5	5	1	Brown trout		74	71	2.8	0.78
9/23/2019	Bishop Creek	Sada 5	5	1	Rainbow trout		70	66	3.2	1.08
9/23/2019	Bishop Creek	Sada 5	5	1	Brown trout		87	84	6.4	1.13
9/23/2019	Bishop Creek	Sada 5	5	1	Brown trout		95	91	8.5	1.19
9/23/2019	Bishop Creek	Sada 5	5	1	Brown trout		93	88	8.1	1.18
9/23/2019	Bishop Creek	Sada 5	5	1	Brown trout	S5-50	198	190	80.8	1.26
9/23/2019	Bishop Creek	Sada 5	5	1	Brown trout		71	67	3.8	1.15
9/23/2019	Bishop Creek	Sada 5	5	1	Brown trout		89	86	7.3	1.17
9/23/2019	Bishop Creek	Sada 5	5	1	Brown trout		97	92	9.1	1.26
9/23/2019	Bishop Creek	Sada 5	5	1	Brown trout		96	92	9.8	1.13
9/23/2019	Bishop Creek	Sada 5	5	1	Brown trout		90	86	7.2	1.16
9/23/2019	Bishop Creek	Sada 5	5	1	Brown trout		108	103	12.7	1.09

Date	Stream	Site	Segment	Pass	Species	Scale sample ID	Fork length (mm)	Total length (mm)	Weight (g)	k-value
9/23/2019	Bishop Creek	Sada 5	5	1	Brown trout		94	91	8.2	1.17
9/23/2019	Bishop Creek	Sada 5	5	1	Brown trout		93	88	8.0	0.99
9/23/2019	Bishop Creek	Sada 5	5	1	Brown trout	S5-51	183	177	55.1	1.10
9/23/2019	Bishop Creek	Sada 5	5	1	Brown trout	S5-52	221	210	102.3	1.07
9/23/2019	Bishop Creek	Sada 5	5	1	Brown trout		93	88	7.3	1.16
9/23/2019	Bishop Creek	Sada 5	5	1	Brown trout		102	96	10.3	1.18
9/23/2019	Bishop Creek	Sada 5	5	1	Brown trout		102	97	10.8	1.12
9/23/2019	Bishop Creek	Sada 5	5	1	Brown trout		104	98	10.5	1.31
9/23/2019	Bishop Creek	Sada 5	5	1	Brown trout	S5-53	180	172	66.6	1.02
9/23/2019	Bishop Creek	Sada 5	5	1	Brown trout	S5-54	202	191	71.3	1.22
9/23/2019	Bishop Creek	Sada 5	5	1	Brown trout	S5-55	310	299	326.8	1.11
9/23/2019	Bishop Creek	Sada 5	5	2	Brown trout		99	94	8.9	1.07
9/23/2019	Bishop Creek	Sada 5	5	2	Brown trout		114	108	14.0	1.11
9/23/2019	Bishop Creek	Sada 5	5	2	Brown trout		95	90	7.9	1.08
9/23/2019	Bishop Creek	Sada 5	5	2	Brown trout		74	71	3.7	1.03
9/23/2019	Bishop Creek	Sada 5	5	2	Brown trout		67	64	2.7	1.03
9/23/2019	Bishop Creek	Sada 5	5	2	Brown trout		90	86	7.6	1.19
9/23/2019	Bishop Creek	Sada 5	5	2	Brown trout		114	107	13.2	1.08
9/23/2019	Bishop Creek	Sada 5	5	2	Brown trout		94	90	7.8	1.07
9/23/2019	Bishop Creek	Sada 5	5	2	Brown trout		80	76	4.3	0.98
9/23/2019	Bishop Creek	Sada 5	5	2	Brown trout		95	90	6.9	0.95
9/23/2019	Bishop Creek	Sada 5	5	2	Brown trout		94	89	7.9	1.12
9/23/2019	Bishop Creek	Sada 5	5	2	Brown trout		93	90	8.1	1.11
9/23/2019	Bishop Creek	Sada 5	5	3	Brown trout		110	105	13.2	1.14
9/23/2019	Bishop Creek	Sada 5	5	3	Brown trout		91	87	7.3	1.11
9/23/2019	Bishop Creek	Sada 5	5	3	Brown trout		90	86	7.1	1.12
9/23/2019	Bishop Creek	Sada 5	5	3	Brown trout		56	53	1.8	1.21

Date	Stream	Site	Segment	Pass	Species	Scale sample ID	Fork length (mm)	Total length (mm)	Weight (g)	k-value
9/23/2019	Bishop Creek	Sada 5	5	3	Brown trout		72	68	3.5	1.11
9/23/2019	Bishop Creek	Sada 5	5	3	Brown trout		96	91	8.7	1.15
9/23/2019	Bishop Creek	Sada 5	5	3	Brown trout		83	80	5.8	1.13
9/23/2019	Bishop Creek	Sada 5	5	3	Brown trout		100	95	8.9	1.04
9/23/2019	Bishop Creek	Sada 5	5	3	Brown trout		88	84	6.8	1.15
9/23/2019	Bishop Creek	Sada 5	5	3	Rainbow trout		87	83	6.3	1.10
9/26/2019	Bishop Creek	Sada 3	1	1	Brown trout		94	89	8.0	1.13
9/26/2019	Bishop Creek	Sada 3	1	1	Brown trout	S-3-1	159	150	37.5	0.93
9/26/2019	Bishop Creek	Sada 3	1	1	Brown trout		95	90	7.4	0.86
9/26/2019	Bishop Creek	Sada 3	1	1	Rainbow trout	S5-2	170	160	55.4	0.92
9/26/2019	Bishop Creek	Sada 3	1	1	Brown trout		96	90	8.1	1.04
9/26/2019	Bishop Creek	Sada 3	1	1	Brown trout	S3-3	270	261	204.7	1.03
9/26/2019	Bishop Creek	Sada 3	1	1	Brown trout	S3-4	174	164	54.1	0.98
9/26/2019	Bishop Creek	Sada 3	1	1	Brown trout	S3-5	188	177	65.3	1.13
9/26/2019	Bishop Creek	Sada 3	1	1	Brown trout	S3-6	219	210	118.7	1.00
9/26/2019	Bishop Creek	Sada 3	1	1	Brown trout		87	83	6.6	1.03
9/26/2019	Bishop Creek	Sada 3	1	1	Brown trout	S3-7	195	184	76.3	1.06
9/26/2019	Bishop Creek	Sada 3	1	1	Brown trout	S3-8	187	182	69.0	0.90
9/26/2019	Bishop Creek	Sada 3	1	1	Brown trout	S3-9	283	270	204.0	0.96
9/26/2019	Bishop Creek	Sada 3	1	1	Rainbow trout	S3-10	180	170	61.4	1.07
9/26/2019	Bishop Creek	Sada 3	1	1	Brown trout	S3-11	169	161	46.1	1.04
9/26/2019	Bishop Creek	Sada 3	1	1	Brown trout	S3-12	244	235	156.0	0.98
9/26/2019	Bishop Creek	Sada 3	1	1	Brown trout	S3-13	208	198	93.6	1.13
9/26/2019	Bishop Creek	Sada 3	1	1	Brown trout	S3-14	196	184	73.7	1.05
9/26/2019	Bishop Creek	Sada 3	1	2	Brown trout	S3-15	194	185	80.0	1.10
9/26/2019	Bishop Creek	Sada 3	1	2	Brown trout	S3-16	105	99	11.2	0.97
9/26/2019	Bishop Creek	Sada 3	1	2	Brown trout	S3-17	105	100	10.2	0.88

Date	Stream	Site	Segment	Pass	Species	Scale sample ID	Fork length (mm)	Total length (mm)	Weight (g)	k-value
9/26/2019	Bishop Creek	Sada 3	1	3	Brown trout		96	92	9.1	1.03
9/26/2019	Bishop Creek	Sada 3	1	3	Brown trout	S3-18	170	162	42.6	0.87
9/26/2019	Bishop Creek	Sada 3	2	1	Brown trout		82	78	5.4	0.98
9/26/2019	Bishop Creek	Sada 3	2	1	Rainbow trout	S3-19	158	148	39.5	0.84
9/26/2019	Bishop Creek	Sada 3	2	1	Brown trout		96	85	7.4	0.91
9/26/2019	Bishop Creek	Sada 3	2	1	Brown trout		88	84	6.2	0.89
9/26/2019	Bishop Creek	Sada 3	2	1	Brown trout	S3-20	165	157	40.0	0.93
9/26/2019	Bishop Creek	Sada 3	2	1	Brown trout	S3-21	168	159	44.3	0.99
9/26/2019	Bishop Creek	Sada 3	2	1	Brown trout		95	92	8.5	0.88
9/26/2019	Bishop Creek	Sada 3	2	1	Brown trout		89	85	6.2	0.83
9/26/2019	Bishop Creek	Sada 3	2	1	Brown trout	S3-22	305	289	235.4	0.99
9/26/2019	Bishop Creek	Sada 3	2	1	Brown trout	S3-23	166	158	45.3	0.88
9/26/2019	Bishop Creek	Sada 3	2	1	Brown trout		86	83	5.6	1.05
9/26/2019	Bishop Creek	Sada 3	2	1	Rainbow trout	S3-24	188	176	64.8	0.91
9/26/2019	Bishop Creek	Sada 3	2	1	Brown trout	S3-25	183	176	64.4	0.96
9/26/2019	Bishop Creek	Sada 3	2	1	Brown trout	S3-26	182	173	54.8	0.99
9/26/2019	Bishop Creek	Sada 3	2	1	Brown trout	S3-27	204	196	81.8	0.97
9/26/2019	Bishop Creek	Sada 3	2	1	Brown trout	S3-28	172	165	50.3	0.82
9/26/2019	Bishop Creek	Sada 3	2	1	Brown trout	S3-29	176	167	52.9	0.89
9/26/2019	Bishop Creek	Sada 3	2	1	Brown trout	S3-30	291	278	201.1	1.06
9/26/2019	Bishop Creek	Sada 3	2	1	Brown trout		89	85	6.3	0.98
9/26/2019	Bishop Creek	Sada 3	2	1	Brown trout	S3-31	236	234	138.7	1.03
9/26/2019	Bishop Creek	Sada 3	2	1	Brown trout	S3-32	181	172	58.3	0.97
9/26/2019	Bishop Creek	Sada 3	2	1	Brown trout	S3-33	185	176	65.5	0.90
9/26/2019	Bishop Creek	Sada 3	2	1	Brown trout	S3-34	211	199	91.0	0.95
9/26/2019	Bishop Creek	Sada 3	2	1	Brown trout	S3-35	164	156	39.8	0.97
9/26/2019	Bishop Creek	Sada 3	2	1	Brown trout	S3-36	199	190	75.0	0.98

Date	Stream	Site	Segment	Pass	Species	Scale sample ID	Fork length (mm)	Total length (mm)	Weight (g)	k-value
9/26/2019	Bishop Creek	Sada 3	2	1	Brown trout	S3-37	181	171	57.4	1.00
9/26/2019	Bishop Creek	Sada 3	2	1	Brown trout	S3-38	170	162	48.2	0.98
9/26/2019	Bishop Creek	Sada 3	2	2	Brown trout		87	83	6.4	0.97
9/26/2019	Bishop Creek	Sada 3	2	2	Brown trout		79	75	4.8	0.97
9/26/2019	Bishop Creek	Sada 3	2	2	Brown trout		86	82	6.1	0.96
9/26/2019	Bishop Creek	Sada 3	2	2	Brown trout		94	90	8.7	1.05
9/26/2019	Bishop Creek	Sada 3	2	2	Brown trout	S3-39	168	160	45.7	0.96
9/26/2019	Bishop Creek	Sada 3	2	2	Brown trout	S3-40	100	96	9.8	0.98
9/26/2019	Bishop Creek	Sada 3	2	3	Brown trout		81	77	5.0	0.94
9/26/2019	Bishop Creek	Sada 3	2	3	Brown trout		175	167	49.5	0.92
9/26/2019	Bishop Creek	Sada 3	2	3	Brown trout		94	90	7.2	0.87
9/26/2019	Bishop Creek	Sada 3	2	3	Brown trout		159	150	39.8	0.99
9/26/2019	Bishop Creek	Sada 3	3	1	Brown trout	S3-41	160	151	37.7	0.92
9/26/2019	Bishop Creek	Sada 3	3	1	Brown trout		171	163	49.6	0.99
9/26/2019	Bishop Creek	Sada 3	3	1	Brown trout	S3-42	261	251	174.8	0.98
9/26/2019	Bishop Creek	Sada 3	3	1	Brown trout		152	146	33.8	0.96
9/26/2019	Bishop Creek	Sada 3	3	1	Brown trout		95	91	7.8	0.91
9/26/2019	Bishop Creek	Sada 3	3	1	Brown trout		79	76	5.0	1.01
9/26/2019	Bishop Creek	Sada 3	3	1	Brown trout		69	66	3.6	1.10
9/26/2019	Bishop Creek	Sada 3	3	1	Brown trout	S3-43	259	245	161.0	0.93
9/26/2019	Bishop Creek	Sada 3	3	1	Brown trout		91	87	7.9	1.05
9/26/2019	Bishop Creek	Sada 3	3	1	Brown trout		164	158	45.8	1.04
9/26/2019	Bishop Creek	Sada 3	3	1	Brown trout		79	76	5.3	1.07
9/26/2019	Bishop Creek	Sada 3	3	1	Brown trout		179	170	56.3	0.98
9/26/2019	Bishop Creek	Sada 3	3	1	Brown trout		181	174	61.2	1.03
9/26/2019	Bishop Creek	Sada 3	3	1	Brown trout	S3-44	234	225	131.0	1.02
9/26/2019	Bishop Creek	Sada 3	3	2	Brown trout		76	73	4.6	1.05

Date	Stream	Site	Segment	Pass	Species	Scale sample ID	Fork length (mm)	Total length (mm)	Weight (g)	k-value
9/26/2019	Bishop Creek	Sada 3	3	2	Brown trout		177	171	51.2	0.92
9/26/2019	Bishop Creek	Sada 3	3	2	Brown trout		77	74	3.6	0.79
9/26/2019	Bishop Creek	Sada 3	3	2	Brown trout		162	155	38.6	0.91
9/26/2019	Bishop Creek	Sada 3	3	2	Brown trout		169	161	45.6	0.94
9/26/2019	Bishop Creek	Sada 3	3	2	Brown trout		97	93	9.5	1.04
9/26/2019	Bishop Creek	Sada 3	3	2	Brown trout		171	163	42.7	0.85
9/26/2019	Bishop Creek	Sada 3	3	2	Brown trout	S3-45	219	210	107.2	1.02
9/26/2019	Bishop Creek	Sada 3	3	3	Brown trout		95	91	8.4	0.98
9/26/2019	Bishop Creek	Sada 3	3	3	Brown trout		75	72	4.4	1.04
9/26/2019	Bishop Creek	Sada 3	3	3	Rainbow trout	S3-46	310	295	328.1	1.10
9/26/2019	Bishop Creek	Sada 3	4	1	Brown trout		92	88	7.8	1.00
9/26/2019	Bishop Creek	Sada 3	4	1	Brown trout		182	173	56.0	0.93
9/26/2019	Bishop Creek	Sada 3	4	1	Brown trout		164	157	44.1	1.00
9/26/2019	Bishop Creek	Sada 3	4	1	Brown trout		155	149	34.0	0.91
9/26/2019	Bishop Creek	Sada 3	4	1	Brown trout	S3-47	147	140	30.0	0.94
9/26/2019	Bishop Creek	Sada 3	4	1	Brown trout	S3-48	214	204	95.1	0.97
9/26/2019	Bishop Creek	Sada 3	4	1	Brown trout		174	166	55.3	1.05
9/26/2019	Bishop Creek	Sada 3	4	1	Brown trout		180	170	56.8	0.97
9/26/2019	Bishop Creek	Sada 3	4	1	Brown trout		195	184	75.7	1.02
9/26/2019	Bishop Creek	Sada 3	4	2	Brown trout	S3-49	270	260	197.9	1.01
9/26/2019	Bishop Creek	Sada 3	4	2	Rainbow trout	S3-50	185	175	67.9	1.07
9/26/2019	Bishop Creek	Sada 3	5	1	Brown trout		88	84	7.0	1.03
9/26/2019	Bishop Creek	Sada 3	5	1	Brown trout		91	87	7.4	0.98
9/26/2019	Bishop Creek	Sada 3	5	1	Brown trout	S3-51	105	100	11.5	0.99
9/26/2019	Bishop Creek	Sada 3	5	1	Brown trout	S3-52	102	97	9.6	0.90
9/26/2019	Bishop Creek	Sada 3	5	1	Rainbow trout	S3-53	185	174	59.2	0.89
9/26/2019	Bishop Creek	Sada 3	5	1	Brown trout	S3-54	249	237	136.9	0.99

Date	Stream	Site	Segment	Pass	Species	Scale sample ID	Fork length (mm)	Total length (mm)	Weight (g)	k-value
9/26/2019	Bishop Creek	Sada 3	5	1	Brown trout		170	162	48.6	0.99
9/26/2019	Bishop Creek	Sada 3	5	1	Brown trout		151	144	34.0	0.93
9/26/2019	Bishop Creek	Sada 3	5	1	Brown trout		147	140	29.7	0.91
9/26/2019	Bishop Creek	Sada 3	5	1	Brown trout		99	94	8.8	0.93
9/26/2019	Bishop Creek	Sada 3	5	1	Rainbow trout	S3-55	157	147	38.2	0.99
9/26/2019	Bishop Creek	Sada 3	5	1	Rainbow trout	S3-56	170	161	48.5	0.99
9/26/2019	Bishop Creek	Sada 3	5	2	Brown trout		186	176	63.8	0.99
9/26/2019	Bishop Creek	Sada 3	5	2	Brown trout		99	96	9.1	0.94
9/26/2019	Bishop Creek	Sada 3	5	2	Rainbow trout	S3-57	244	233	154.9	1.07
9/26/2019	Bishop Creek	Sada 3	5	3	Brown trout		178	170	51.8	0.92
9/26/2019	Bishop Creek	Sada 3	5	3	Brown trout	S3-58	223	210	108.4	0.98
9/25/2019	South Fork Bishop Creek	South Fork	1	1	Brown trout	SF1	231	219	120.0	1.14
9/25/2019	South Fork Bishop Creek	South Fork	1	1	Brown trout	SF2	274	265	211.5	1.03
9/25/2019	South Fork Bishop Creek	South Fork	1	1	Rainbow trout		291	280	249.2	1.01
9/25/2019	South Fork Bishop Creek	South Fork	1	1	Rainbow trout		220	220	128.9	1.21
9/25/2019	South Fork Bishop Creek	South Fork	1	1	Brown trout	SF3	237	226	226.7	1.70
9/25/2019	South Fork Bishop Creek	South Fork	1	1	Brown trout	SF4	257	242	145.9	0.86
9/25/2019	South Fork Bishop Creek	South Fork	1	1	Brown trout	SF5	226	215	101.5	0.88
9/25/2019	South Fork Bishop Creek	South Fork	1	1	Brown trout	SF6	220	212	104.8	0.98
9/25/2019	South Fork Bishop Creek	South Fork	1	1	Brown trout	SF7	228	216	112.3	0.95
9/25/2019	South Fork Bishop Creek	South Fork	1	1	Brown trout	SF8	229	218	106.3	0.89
9/25/2019	South Fork Bishop Creek	South Fork	1	1	Brown trout	SF9	202	193	77.0	0.93
9/25/2019	South Fork Bishop Creek	South Fork	1	1	Brown trout	SF10	185	173	56.5	0.89
9/25/2019	South Fork Bishop Creek	South Fork	1	1	Brown trout	SF11	228	220	114.8	0.97
9/25/2019	South Fork Bishop Creek	South Fork	1	1	Brown trout	SF12	114	108	14.0	0.94
9/25/2019	South Fork Bishop Creek	South Fork	1	1	Brown trout	SF13	172	162	43.7	0.86
9/25/2019	South Fork Bishop Creek	South Fork	1	1	Brown trout	SF14	197	185	74.5	0.97

Date	Stream	Site	Segment	Pass	Species	Scale sample ID	Fork length (mm)	Total length (mm)	Weight (g)	k-value
9/25/2019	South Fork Bishop Creek	South Fork	1	1	Brown trout	SF15	212	202	85.0	0.89
9/25/2019	South Fork Bishop Creek	South Fork	1	1	Brown trout	SF16	230	272	113.3	0.93
9/25/2019	South Fork Bishop Creek	South Fork	1	1	Brown trout	SF17	179	169	56.7	0.99
9/25/2019	South Fork Bishop Creek	South Fork	1	1	Rainbow trout		297	285	277.4	1.06
9/25/2019	South Fork Bishop Creek	South Fork	1	1	Brown trout	SF18	241	232	132.7	0.95
9/25/2019	South Fork Bishop Creek	South Fork	1	1	Brown trout	SF19	182	172	53.6	0.89
9/25/2019	South Fork Bishop Creek	South Fork	1	1	Brown trout	SF20	218	210	96.1	0.93
9/25/2019	South Fork Bishop Creek	South Fork	1	1	Brown trout	SF21	230	220	117.8	0.97
9/25/2019	South Fork Bishop Creek	South Fork	1	1	Brown trout	SF22	190	179	61.7	0.90
9/25/2019	South Fork Bishop Creek	South Fork	1	1	Brown trout	SF23	156	147	32.0	0.84
9/25/2019	South Fork Bishop Creek	South Fork	1	1	Brown trout	SF24	133	125	22.8	0.97
9/25/2019	South Fork Bishop Creek	South Fork	1	1	Brown trout	SF25	210	202	87.1	0.94
9/25/2019	South Fork Bishop Creek	South Fork	1	1	Brown trout		99	95	9.2	0.95
9/25/2019	South Fork Bishop Creek	South Fork	1	1	Brown trout	SF26	242	233	137.4	0.97
9/25/2019	South Fork Bishop Creek	South Fork	1	1	Brown trout	SF27	223	212	83.5	0.75
9/25/2019	South Fork Bishop Creek	South Fork	1	1	Brown trout	SF28	263	250	162.0	0.89
9/25/2019	South Fork Bishop Creek	South Fork	1	1	Brown trout	SF29	229	221	126.9	1.06
9/25/2019	South Fork Bishop Creek	South Fork	1	1	Brown trout	SF30	197	187	77.7	1.02
9/25/2019	South Fork Bishop Creek	South Fork	1	1	Brown trout		227	215	116.3	0.99
9/25/2019	South Fork Bishop Creek	South Fork	1	1	Brown trout		252	240	142.1	0.89
9/25/2019	South Fork Bishop Creek	South Fork	1	1	Brown trout		249	240	159.5	1.03
9/25/2019	South Fork Bishop Creek	South Fork	1	1	Brown trout		229	221	110.5	0.92
9/25/2019	South Fork Bishop Creek	South Fork	1	1	Brown trout		211	200	81.1	0.86
9/25/2019	South Fork Bishop Creek	South Fork	1	1	Brown trout	SF31	151	142	28.5	0.83
9/25/2019	South Fork Bishop Creek	South Fork	1	1	Brown trout		211	200	84.0	0.89
9/25/2019	South Fork Bishop Creek	South Fork	1	1	Brown trout		205	193	77.6	0.90
9/25/2019	South Fork Bishop Creek	South Fork	1	1	Brown trout		204	192	77.6	0.91

Date	Stream	Site	Segment	Pass	Species	Scale sample ID	Fork length (mm)	Total length (mm)	Weight (g)	k-value
9/25/2019	South Fork Bishop Creek	South Fork	1	1	Brown trout		239	229	146.5	1.07
9/25/2019	South Fork Bishop Creek	South Fork	1	1	Brown trout		243	234	142.0	0.99
9/25/2019	South Fork Bishop Creek	South Fork	1	1	Brown trout		225	217	100.4	0.88
9/25/2019	South Fork Bishop Creek	South Fork	1	1	Brown trout	SF32	192	181	69.0	0.97
9/25/2019	South Fork Bishop Creek	South Fork	1	1	Brown trout		211	204	98.0	1.04
9/24/2019	Middle Fork Bishop Creek	Cardinal	Side Channel	1	Brown trout	C-1	221	212	103.9	0.96
9/24/2019	Middle Fork Bishop Creek	Cardinal	Side Channel	1	Brown trout		56	59	1.8	1.02
9/24/2019	Middle Fork Bishop Creek	Cardinal	Side Channel	1	Brown trout		55	53	1.1	0.66
9/24/2019	Middle Fork Bishop Creek	Cardinal	Side Channel	1	Brown trout	C-2	194	185	75.4	1.03
9/24/2019	Middle Fork Bishop Creek	Cardinal	Side Channel	1	Brown trout	C-3	152	143	30.8	0.88
9/24/2019	Middle Fork Bishop Creek	Cardinal	Side Channel	1	Brown trout		66	62	2.5	0.87
9/24/2019	Middle Fork Bishop Creek	Cardinal	Side Channel	1	Brown trout	C-4	141	133	24.2	0.86
9/24/2019	Middle Fork Bishop Creek	Cardinal	Side Channel	1	Brown trout		70	66	3.3	0.96
9/24/2019	Middle Fork Bishop Creek	Cardinal	Side Channel	1	Brown trout		70	66	3.0	0.87
9/24/2019	Middle Fork Bishop Creek	Cardinal	Side Channel	1	Brown trout		52	50	1.6	1.14
9/24/2019	Middle Fork Bishop Creek	Cardinal	Side Channel	1	Brown trout		57	54	1.7	0.92
9/24/2019	Middle Fork Bishop Creek	Cardinal	Side Channel	1	Brown trout		103	98	10.4	0.95
9/24/2019	Middle Fork Bishop Creek	Cardinal	Side Channel	1	Brown trout	C-5	122	116	16.1	0.89
9/24/2019	Middle Fork Bishop Creek	Cardinal	Side Channel	1	Brown trout		67	64	2.6	0.86
9/24/2019	Middle Fork Bishop Creek	Cardinal	Side Channel	1	Brown trout		69	65	2.4	0.73
9/24/2019	Middle Fork Bishop Creek	Cardinal	Side Channel	1	Brown trout	C-6	184	175	58.2	0.93
9/24/2019	Middle Fork Bishop Creek	Cardinal	Side Channel	1	Brown trout	C-7	113	108	13.4	0.93
9/24/2019	Middle Fork Bishop Creek	Cardinal	Side Channel	1	Brown trout	C-8	132	126	21.2	0.92
9/24/2019	Middle Fork Bishop Creek	Cardinal	Side Channel	1	Brown trout	C-9	138	130	21.3	0.81
9/24/2019	Middle Fork Bishop Creek	Cardinal	Side Channel	1	Brown trout	C-10	125	118	17.7	0.91
9/24/2019	Middle Fork Bishop Creek	Cardinal	Side Channel	1	Brown trout	C-11	191	187	72.2	1.04
9/24/2019	Middle Fork Bishop Creek	Cardinal	Side Channel	1	Brown trout	C-12	158	148	36.9	0.94

Date	Stream	Site	Segment	Pass	Species	Scale sample ID	Fork length (mm)	Total length (mm)	Weight (g)	k-value
9/24/2019	Middle Fork Bishop Creek	Cardinal	Side Channel	1	Brown trout	C-13	135	127	22.4	0.91
9/24/2019	Middle Fork Bishop Creek	Cardinal	Side Channel	1	Brown trout		64	61	2.3	0.88
9/24/2019	Middle Fork Bishop Creek	Cardinal	Side Channel	1	Brown trout	C-14	112	107	13.4	0.95
9/24/2019	Middle Fork Bishop Creek	Cardinal	Side Channel	1	Brown trout	C-15	190	181	65.1	0.95
9/24/2019	Middle Fork Bishop Creek	Cardinal	Side Channel	1	Brown trout	C-16	182	175	59.3	0.98
9/24/2019	Middle Fork Bishop Creek	Cardinal	Side Channel	1	Brown trout	C-17	246	236	148.0	0.99
9/24/2019	Middle Fork Bishop Creek	Cardinal	Side Channel	1	Brown trout	C-18	120	112	15.0	0.87
9/24/2019	Middle Fork Bishop Creek	Cardinal	Side Channel	1	Brown trout	C-19	123	116	16.0	0.86
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower Segment	1	Brown trout	C-20	122	116	16.0	0.88
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower Segment	1	Brown trout		67	64	2.8	0.93
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower Segment	1	Brown trout	C-21	145	137	26.8	0.88
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower Segment	1	Brown trout	C-22	126	119	19.2	0.96
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower Segment	1	Brown trout	C-23	234	226	128.8	1.01
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower Segment	1	Brown trout	C-24	244	238	150.3	1.03
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower Segment	1	Brown trout	C-25	118	112	15.0	0.91
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower Segment	1	Brown trout	C-26	255	246	158.6	0.96
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower Segment	1	Brown trout	C-27	135	127	22.6	0.92
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower Segment	1	Brown trout	C-28	234	225	124.7	0.97
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower Segment	1	Brown trout	C-29	121	115	16.5	0.93
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower Segment	1	Brown trout		69	65	2.8	0.85
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower Segment	1	Brown trout	C-30	260	250	183.7	1.05
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower Segment	1	Brown trout	C-31	135	127	20.7	0.84
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower Segment	1	Brown trout	C-32	246	235	142.4	0.96
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower Segment	1	Brown trout	C-33	189	179	61.5	0.91
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower Segment	1	Brown trout	C-34	150	142	29.8	0.88
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower Segment	1	Brown trout	C-35	176	167	49.0	0.90
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower Segment	1	Brown trout	C-36	134	128	23.4	0.97

Date	Stream	Site	Segment	Pass	Species	Scale sample ID	Fork length (mm)	Total length (mm)	Weight (g)	k-value
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower Segment	1	Brown trout	C-37	190	182	70.1	1.02
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower Segment	1	Brown trout	C-38	118	112	15.9	0.97
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout		66	63	6.2	0.90
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout	C-39	207	200	86.3	0.97
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout	C-40	225	214	107.4	0.94
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout	C-41	141	132	24.2	0.86
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout	C-42	137	129	23.9	0.93
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout		62	59	2.0	0.84
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout	C-43	133	127	22.9	0.97
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout		61	58	2.1	0.93
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout		138	130	22.2	0.84
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout		125	118	17.0	0.87
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout		134	126	22.3	0.93
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout	C-44	221	212	111.5	1.03
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout		139	131	25.2	0.94
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout	C-45	175	156	42.2	0.79
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout		131	125	19.8	0.88
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout		64	60	2.2	0.84
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout	C-46	212	204	91.2	0.96
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout	C-47	252	242	154.1	0.96
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout		124	118	17.7	0.93
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout	C-48	219	209	104.0	0.99
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout		137	130	21.5	0.84
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout		133	127	22.1	0.94
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout	C-49	163	156	37.5	0.87
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout	C-50	205	195	78.5	0.91
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout		68	65	2.8	0.89

Date	Stream	Site	Segment	Pass	Species	Scale sample ID	Fork length (mm)	Total length (mm)	Weight (g)	k-value
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout	C-51	213	204	90.2	0.93
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout		120	113	15.6	0.90
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout	C-52	240	239	149.0	1.08
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout		71	67	3.2	0.89
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout	C-53	192	182	64.2	0.91
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout		66	63	2.5	0.87
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout	C-54	187	176	56.6	0.87
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout	C-55	153	145	32.1	0.90
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout		149	140	29.8	0.90
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout	C-56	227	218	114.8	0.98
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout	C-57	163	155	38.2	0.88
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout		68	64	3.0	0.95
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout		141	132	24.1	0.86
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout		110	104	11.3	0.85
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout	C-58	196	189	49.3	0.65
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout		142	134	26.0	0.91
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout	C-59	171	160	44.9	0.90
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout		143	135	27.4	0.94
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout		79	75	5.3	1.07
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout	C-60	225	214	106.4	0.93
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout		71	68	3.4	0.95
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout		137	129	24.0	0.93
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout	C-61	158	149	34.6	0.88
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout		165	157	41.0	0.91
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout		167	159	42.9	0.92
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout	C-62	201	191	74.9	0.92
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout	C-63	203	194	78.5	0.94

Date	Stream	Site	Segment	Pass	Species	Scale sample ID	Fork length (mm)	Total length (mm)	Weight (g)	k-value
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout		70	66	3.1	0.90
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout		137	130	22.6	0.88
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout		152	144	31.2	0.89
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout		127	121	19.8	0.97
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout		140	133	25.1	0.91
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout		142	134	28.7	1.00
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout	C-64	204	195	84.5	1.00
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout		165	157	44.6	0.99
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout		65	63	2.4	0.87
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout		136	128	22.7	0.90
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout		71	67	3.0	0.84
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout		168	161	44.9	0.95
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower B	1	Brown trout		66	62	2.4	1.01
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower B	1	Brown trout		121	114	16.2	0.91
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower B	1	Brown trout		129	121	20.1	0.94
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower B	1	Brown trout		241	232	147.9	1.06
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower B	1	Rainbow trout	C-65	299	285	252.2	0.94
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower B	1	Brown trout		228	214	109.8	0.93
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower B	1	Brown trout		275	265	215.0	1.03
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower B	1	Brown trout		65	61	2.6	0.95
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower B	1	Brown trout		113	106	13.5	0.94
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower B	1	Brown trout		64	60	2.2	0.84
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower B	1	Brown trout		197	189	69.2	0.91
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower B	1	Brown trout		147	138	28.1	0.88
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower B	1	Brown trout		73	69	3.6	0.93
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower B	1	Brown trout		70	65	3.0	0.87
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower B	1	Brown trout		79	75	4.0	0.81

Date	Stream	Site	Segment	Pass	Species	Scale sample ID	Fork length (mm)	Total length (mm)	Weight (g)	k-value
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower B	1	Brown trout		178	170	52.0	0.92
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower B	1	Brown trout		127	120	20.5	1.00
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower B	1	Brown trout		131	124	22.0	0.98
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower B	1	Brown trout		78	74	4.3	0.91
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower B	1	Brown trout		75	71	3.8	0.90
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower B	1	Brown trout		57	54	1.9	1.03
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower B	1	Brown trout		120	114	15.8	0.91
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower B	1	Brown trout		198	187	73.2	0.94
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower B	1	Brown trout		161	152	41.3	0.99
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower B	1	Brown trout		68	64	2.8	0.89
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower B	1	Brown trout		65	62	2.3	0.84
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower B	1	Brown trout		137	130	24.5	0.95
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower B	1	Brown trout		118	111	15.0	0.91
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower B	1	Brown trout		69	65	3.2	0.97
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower B	1	Brown trout		151	143	31.8	0.92
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower B	1	Brown trout		118	112	15.3	0.93
9/24/2019	Bishop Creek	Intake 4	--	F4-1	Rainbow trout	F4-1	385	400	690.0	1.21
9/24/2019	Bishop Creek	Intake 4	--	F4-1	Brown trout	F4-2	276	262	243.1	1.16
9/24/2019	Bishop Creek	Intake 4	--	F4-1	Brown trout	F4-3	253	240	176.9	1.09
9/25/2019	Bishop Creek	Intake 5	--	F5-1	Brook trout	F5-2	177	168	52.8	0.95
9/25/2019	Bishop Creek	Intake 5	--	F5-1	Brown trout	F5-1	245	238	158.3	1.08
9/25/2019	Bishop Creek	Intake 5	--	F5-1	Brown trout	F5-4	218	205	103.3	1.00
9/25/2019	Bishop Creek	Intake 5	--	F5-1	Brown trout	F5-8	249	239	167.1	1.08
9/25/2019	Bishop Creek	Intake 5	--	F5-1	Brown trout	F5-9	227	217	123.0	1.05
9/25/2019	Bishop Creek	Intake 5	--	F5-1	Brown trout	F5-10	230	216	111.8	0.92
9/25/2019	Bishop Creek	Intake 5	--	F5-1	Brown trout	F5-11	223	209	102.5	0.92
9/25/2019	Bishop Creek	Intake 5	--	F5-1	Brown trout	F5-12	218	205	98.4	0.95

Date	Stream	Site	Segment	Pass	Species	Scale sample ID	Fork length (mm)	Total length (mm)	Weight (g)	k-value
9/25/2019	Bishop Creek	Intake 5	--	F5-1	Rainbow trout	F5-3	221	208	101.8	0.94
9/25/2019	Bishop Creek	Intake 5	--	F5-1	Rainbow trout	F5-6	269	254	204.1	1.05
9/25/2019	Bishop Creek	Intake 5	--	F5-1	Rainbow trout	F5-7	239	223	125.7	0.92
9/25/2019	Bishop Creek	Intake 5	--	F5-1	Rainbow trout	F5-8	218	205	104.2	1.01

[a] Weight not recorded, therefore condition (k-value) could not be determined for these fish.