

South Fork San Joaquin River 2011 summary report

September 7-10, 2011

Natural Resources Agency

California Department of Fish and Game

Heritage and Wild Trout Program



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Introduction

The South Fork San Joaquin River (South Fork) is located approximately 60 miles northeast of Fresno, CA (Fresno County; Figure 1). It originates at an elevation of 3500 meters in Kings Canyon National Park and flows in a north-northwest direction for 20 miles before emptying into Florence Lake. The California Department of Fish and Game (DFG) Heritage and Wild Trout Program (HWTP) has evaluated the South Fork watershed for candidacy as a designated Wild Trout Water. On an annual basis, the HWTP is responsible for recommending to the California Fish and Game Commission (Commission) 25 miles of stream and one lake that fit the criteria for designation as Wild Trout Waters. Wild Trout Waters are those that support self-sustaining wild trout populations, are aesthetically pleasing and environmentally productive, provide adequate catch rates in terms of numbers or size of trout, and are open to public angling (Bloom and Weaver 2008). Wild Trout Waters may not be stocked with catchable-sized hatchery trout. The HWTP evaluates candidate waters using a phased approach to systematically collect data and evaluate whether or not a stream or lake meets designation criteria.

Since 2007, the HWTP has been conducting Phase 1 (initial resource) and Phase 2 (candidate water) assessments of waters in the South Fork watershed, including Piute Creek and numerous high-elevation lakes that feed into this system (Weaver and Mehalick 2007, 2009, and 2010). The majority of this drainage is located in the John Muir Wilderness of the Sierra National Forest; due to the popularity of backcountry recreation in California and associated angling, the HWTP is interested in identifying and designating high-elevation waters in the Sierra Nevada Mountains and other remote locations throughout the state as “wilderness” Wild Trout Waters. Royce Lake #2 and Lower Honeymoon Lake, both headwater lakes in the Piute Creek drainage, are designated by the Commission as Wild Trout Waters. In 2011, the HWTP conducted direct observation snorkel, habitat, and angling assessments in the South Fork, Sallie Keyes Lakes, and Sallie Keyes Creek as a continuation of Phase 2 candidate water assessments in this watershed.

Historically, portions of this watershed were fishless, particularly in the higher elevation lakes and streams that were glaciated as recently as 10,000 years ago. The 2011 HWTP surveys occurred outside of national park boundaries in the portion of the South Fork downstream of Piute Creek and upstream of Florence Lake (Figure 2). Sallie Keyes Lakes consist of two lakes directly south of Seldon Pass, with access via the Pacific Crest and John Muir trails. The outflow, Sallie Keyes Creek, flows due south for approximately two miles before entering the South Fork in the vicinity of Blayne Meadows.

Methods

Direct observation

The HWTP conducted direct observation surveys at 17 locations on the South Fork between September 7-9, 2011 using snorkeling methods, an effective survey technique in many small streams and creeks in California and the Pacific Northwest (Hankin and Reeves 1988). Sections were spaced approximately every one-half mile and the start of each section was selected at random. Specific section boundaries were located at distinct breaks in habitat type and/or stream gradient. Individual sections were surveyed with either two or three divers; the number of divers per section was determined based on wetted width, water visibility, and habitat complexity. The majority of surveys were conducted in an upstream direction; however, in Section 1011 water velocity was such that a downstream dive was required.

Divers maintained an evenly-spaced line perpendicular to the current and counted fish by species. All observed trout were further separated and counted by size class. Size classes were divided into the following categories: young of year (YOY); small (< 6 inches); medium (6-11.9 inches); large (12-17.9 inches); and extra-large (\geq 18 inches). YOY are defined by the HWTP as age 0+ fish, emerged from the gravel in the same year as the survey effort. Depending on species, date of emergence, relative growth rates, and habitat conditions, the size of YOY varies greatly, but are generally between zero and three inches in total length. If a trout was observed to be less than six inches in total length but it was difficult to determine whether it was an age 0+ or 1+ fish, by default it was classified in the small size class.

Divers were instructed in both visual size class estimation and proper snorkel survey techniques prior to starting the survey (establishing a dominant side, determining the extent of their visual survey area, how and when to count (or not count) fish observed, safety considerations, etc.). For each section, surveyors measured section length along the thalweg (ft), water and air temperature ($^{\circ}$ C), and average wetted width, water depth, and water visibility (ft). Habitat type (flatwater, riffle, or pool) was identified following Level 2 protocol as defined in the California Salmonid Stream Habitat Restoration Manual (Flosi et al. 1988). Representative photographs were taken and coordinates were recorded for the section boundaries using Global Positioning System (GPS) hand-held units (North American Datum 1983).

Angling

An angling effort was conducted on the South Fork, Sallie Keyes Lakes, and Sallie Keyes Creek between September 7-10, 2011 to better understand recreational angling potential, catch rates, species composition, and size class distribution. Anglers used fly fishing gear and recorded total fishing effort (hours) and the number of fish captured by species and size class using the size classes

defined above for direct observation. In addition, voluntary angler survey box (ASB) forms were available to the public at the John Muir Ranch during their open season, from July through September, 2011 (Figure 3). Data from these forms were examined to better understand angler use, catch rates, catch sizes, and satisfaction. Forms missing pertinent information (date, number of hours fished, and/or fish size classes) were not included in the analysis. A total of 21 completed forms were examined in 2011 and included angling efforts on the South Fork, Piute Creek, Sallie Keyes Lake, and Senger Creek.

Results

Direct observation

The South Fork between Florence Lake and the confluence with Piute Creek is a low to medium gradient stream, with substrate consisting mostly of boulder and cobble with some bedrock and gravel (Figure 4). Among the 17 sections, a total of 3405.0 feet of stream habitat was surveyed with an average wetted width of 58.3 feet and an average water depth of 2.6 feet. The surveyed sections consisted of 82% flatwater and 18% pool habitat. Water temperature ranged from 10 °C to 14 °C and air temperature was between 13 °C and 26 °C, depending on the time of day. A total of 255 rainbow trout (*Oncorhynchus mykiss*), 341 brown trout (*Salmo trutta*), two brook trout (*Salvelinus fontinalis*), and eight unknown trout were observed (Tables 1 and 2). Observed trout ranged from YOY to extra-large with the majority in the small- and medium-size classes (Figure 5). Estimated mean fish densities across all sections were 425 rainbow trout/mi, 478 brown trout/mi, two brook trout/mi, and 14 unknown trout/mi.

Angling

Seven anglers participated in the hook and line assessment on the South Fork with a cumulative effort of 27.35 hours (Table 3). Anglers captured 92 rainbow trout and 33 brown trout, with the majority falling in the medium-size class (Figures 6 and 7). Catch rates on the South Fork ranged from zero to 11.5 fish/hr with a mean catch per unit effort (CPUE) of 2.8 fish/hr. Four anglers fished a total of 3.3 hours on Sallie Keyes Lakes and captured 20 medium-sized California golden trout (*Oncorhynchus mykiss aguabonita*). CPUE ranged from zero to 13 fish/hr with an average of 5.8 fish/hr. One angler fished Sallie Keyes Creek for 15 minutes and captured two medium-sized California golden trout with a CPUE of eight fish per hour. During the angling effort in the Sallie Keyes drainage, surveyors interacted with numerous individuals and groups who were utilizing the Pacific Crest and John Muir trails for backcountry recreation. During these interactions, HWTP staff informally interviewed those encountered to better understand angler use and intrinsic values of backcountry angling. Numerous people were angling as part of their wilderness recreation and stressed the value these angling opportunities provided.

A total of 21 voluntary ASB forms were analyzed for the South Fork watershed (provided to the public at the John Muir Ranch). Anglers reported fishing on the South Fork, Piute Creek, Sallie Keyes Lakes, and Senger Creek (Table 4). Anglers reported catching a total of 245 trout in 72 hours effort; the majority of trout reported caught were in the medium-size class (Figure 8). Mean CPUE ranged from 0.9 fish/hr on Piute Creek to 4.6 fish/hr on Sallie Keyes Lakes. An evaluation of angler responses regarding satisfaction of their angler experience (rated on a scale from least satisfied (-2) to most satisfied (+2) with neutral being 0) showed that on average anglers were satisfied (1) with their overall experience and neutral (0) about the size and numbers of fish caught.

Discussion

The South Fork from Florence Lake upstream to the confluence with Piute Creek contains wild rainbow, brown, and brook trouts in a remote and scenic wilderness setting. All trout captured during the 2011 angling assessment in the South Fork appeared to be of wild origin. Anglers can catch three trout species in the same water and it appears to be a relatively fast-action fishery with catch rates exceeding two fish/hr (catch rates from previous surveys farther upstream in the watershed were as high as 50 fish/hr; Weaver and Mehalick 2007, 2009, and 2010). The presence of brown trout larger than 18 inches provides the opportunity for a trophy trout fishery. Based on HWTP staff interactions with the public, as well as the voluntary ASB forms, it appears that angler use in the John Muir Wilderness is relatively high and those that engage in recreational fishing in this region highly value backcountry fishing opportunities.

Sierra District General fishing regulations allow for the take of five trout per day with a total of ten trout in possession. In addition to the daily bag and possession limits, up to ten brook trout per day, less than ten inches in total length, may be taken and possessed. The portion of the South Fork from the confluence with Piute Creek downstream to Florence Lake is located on both public (Sierra National Forest) and private land. This segment of river is approximately eight miles in length. The Piute Creek and South Fork watersheds meet numerous criteria for designation as Wild Trout Waters. The HWTP recommends continued Phased 2 assessments in 2012 through the use of voluntarily ASB forms provided to anglers at the John Muir Ranch on the South Fork, as well as assessing feasibility of a creel census in the John Muir Wilderness. The HWTP further recommends continued collaboration with the U.S. Forest Service, private landowners, recreational users, and other stakeholders as part of the phased approach to evaluating the South Fork and associated tributaries as a candidate for Wild Trout Water designation. Specifically, the HWTP should discuss public access issues with private landowners in the system to ensure the proposed designated reach is publicly accessible throughout. The proposed designation may warrant exclusion within private property boundaries if access issues are identified.

References

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

Flosi, G., S. Downie, J. Hopelain, M. Bird, R. Coey, and B. Collins. 1998. California Salmonid Stream Habitat Restoration Manual. 3rd Edition. Vol. 1. State of California Resources Agency. Department of Fish and Game. Inland Fisheries Division.

Hankin D.G., and G.H. Reeves. 1988. Estimating total fish abundance and total habitat area in small streams based on visual estimation methods. Canadian Journal of Fisheries and Aquatic Sciences. 45:834-844.

Weaver, J. and S. Mehalick. 2007. Phase 1 high mountain lake and stream resource assessment: John Muir Wilderness fishery and angler survey report-2007. State of California Natural Resources Agency. Department of Fish and Game. Heritage and Wild Trout Program.

Weaver, J. and S. Mehalick. 2009. Piute Creek watershed 2009 summary report. State of California Natural Resources Agency. Department of Fish and Game. Heritage and Wild Trout Program.

Weaver, J. and S. Mehalick. 2010. South Fork San Joaquin River 2010 summary report. State of California Natural Resources Agency. Department of Fish and Game. Heritage and Wild Trout Program.

Figure 1. Vicinity map of 2011 South Fork drainage survey locations



Figure 2. Map of South Fork drainage section locations

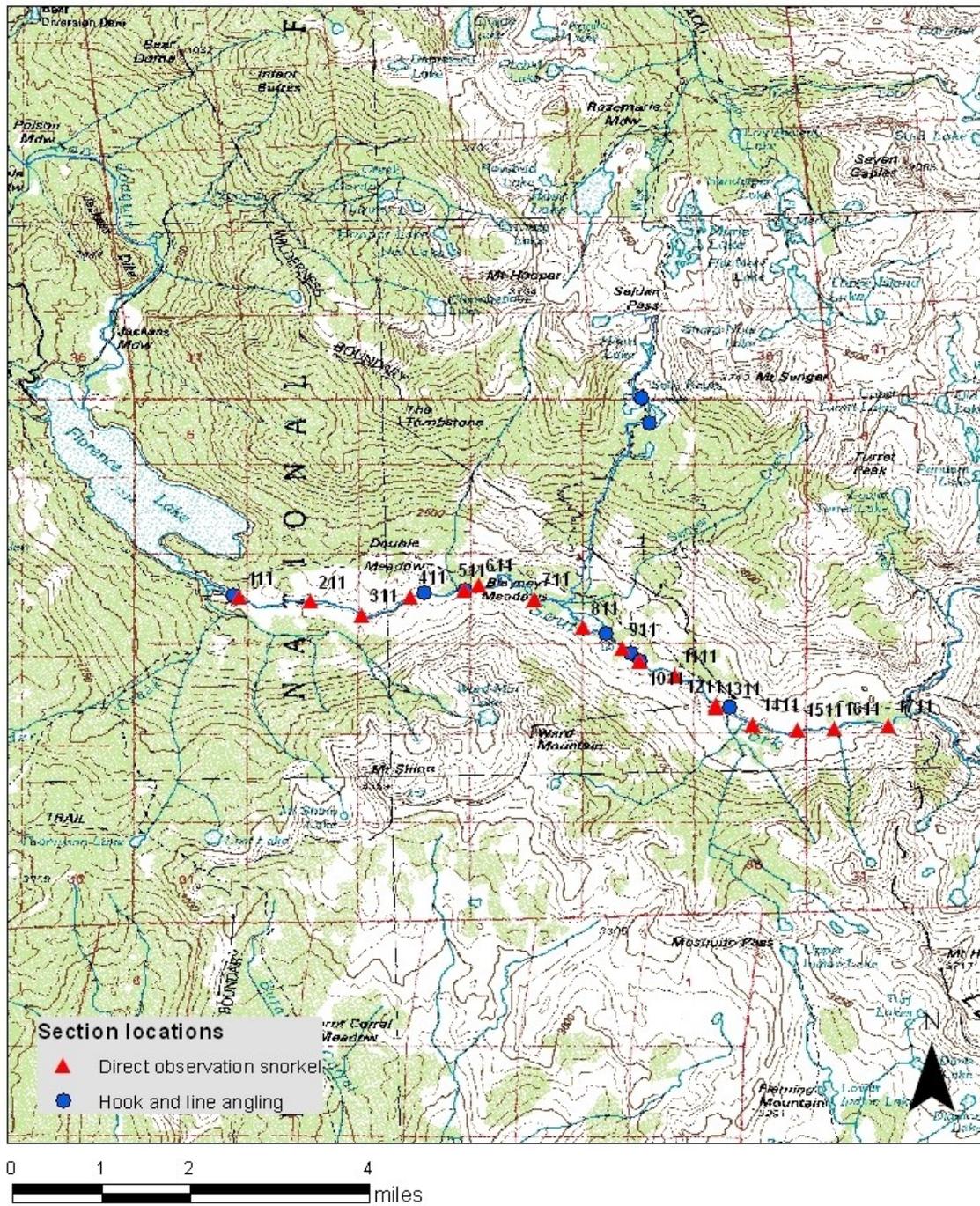


Figure 3. Example of voluntary ASB form provided at the John Muir Ranch

The California Department of Fish and Game is conducting an evaluation of the wild trout fishery in the South Fork San Joaquin watershed. We request your help in this evaluation by providing the following information in this survey. Please use this form for **one day** of fishing on **one stream or lake** by **one angler** only. Use a separate form for each body of water fished.

Water body fished (check one):

- South Fork San Joaquin River Sallie Keys Lake
 Piute Creek Other: _____

Date Fished: _____ # Hours Fished: _____
mm/dd/yyyy

Primary gear type used (check one):
 Bait Lure Fly

Total # of rainbow trout caught: _____
Total # of brown trout caught: _____
Total # of brook trout caught: _____
Total # of golden trout caught: _____

Enter the total number of fish caught by species and size class:

| Size | rainbow trout | | brown trout | | brook trout | | golden trout | |
|-----------------|---------------|----------|-------------|----------|-------------|----------|--------------|----------|
| | kept | released | kept | released | kept | released | kept | released |
| Less than 6" | | | | | | | | |
| 6"-7.9" | | | | | | | | |
| 8"-9.9" | | | | | | | | |
| 10"-11.9" | | | | | | | | |
| 12"-13.9" | | | | | | | | |
| 14"-15.9" | | | | | | | | |
| 16"-17.9" | | | | | | | | |
| 18" and greater | | | | | | | | |

Please indicate your level of satisfaction with the following statements regarding your fishing experience today:

| | Least satisfied | | Neutral | Most satisfied | |
|-----------------------------------|-----------------|----|---------|----------------|----|
| Overall angling experience today: | -2 | -1 | 0 | +1 | +2 |
| Size of fish: | -2 | -1 | 0 | +1 | +2 |
| Number of fish: | -2 | -1 | 0 | +1 | +2 |

Please use the back of this form for any additional comments. Thank you for helping us manage and protect California's wild trout resources.

Figure 4. Representative photographs of the South Fork drainage 2011 direct observation effort



Figure 5. 2011 summary of South Fork direct observation data: percent of fish observed by species and size class

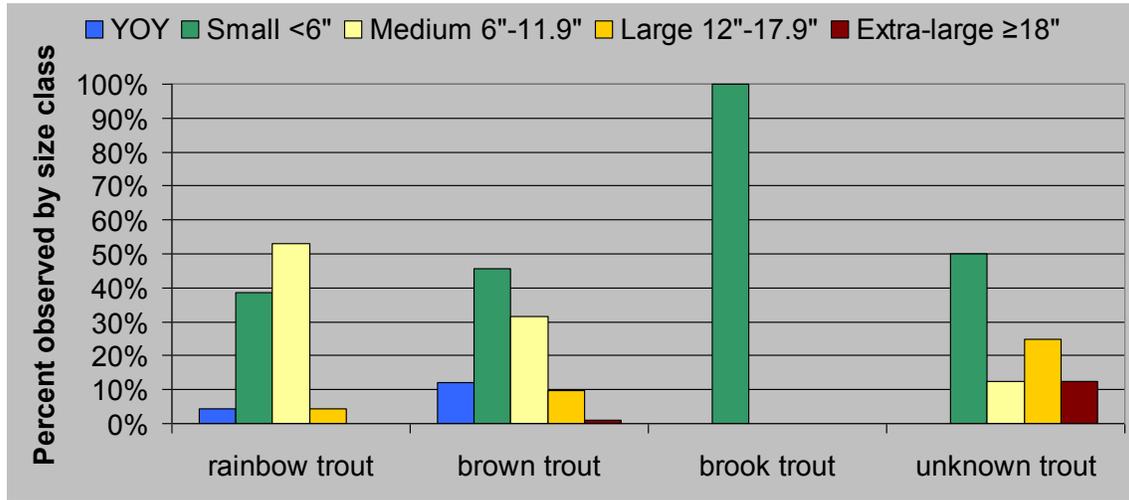


Figure 6. Representative photographs of the South Fork drainage 2011 angling effort



Figure 7. 2011 summary of South Fork drainage angling data: percent of fish observed by species and size class

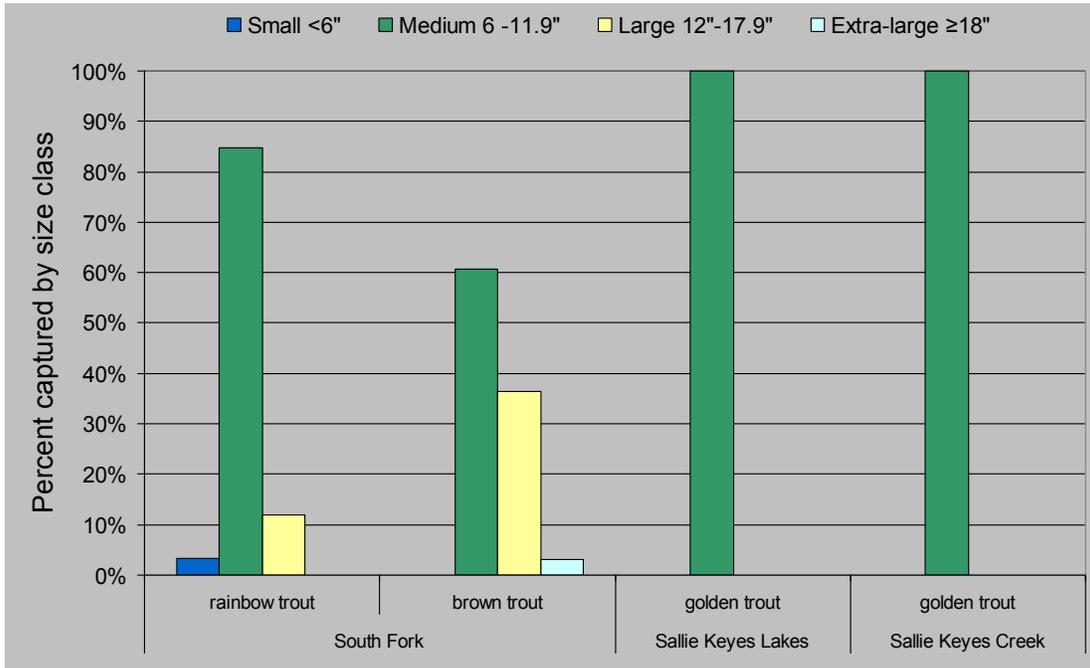


Figure 8. 2011 summary of South Fork drainage ASB data: percent of fish observed by species and size class

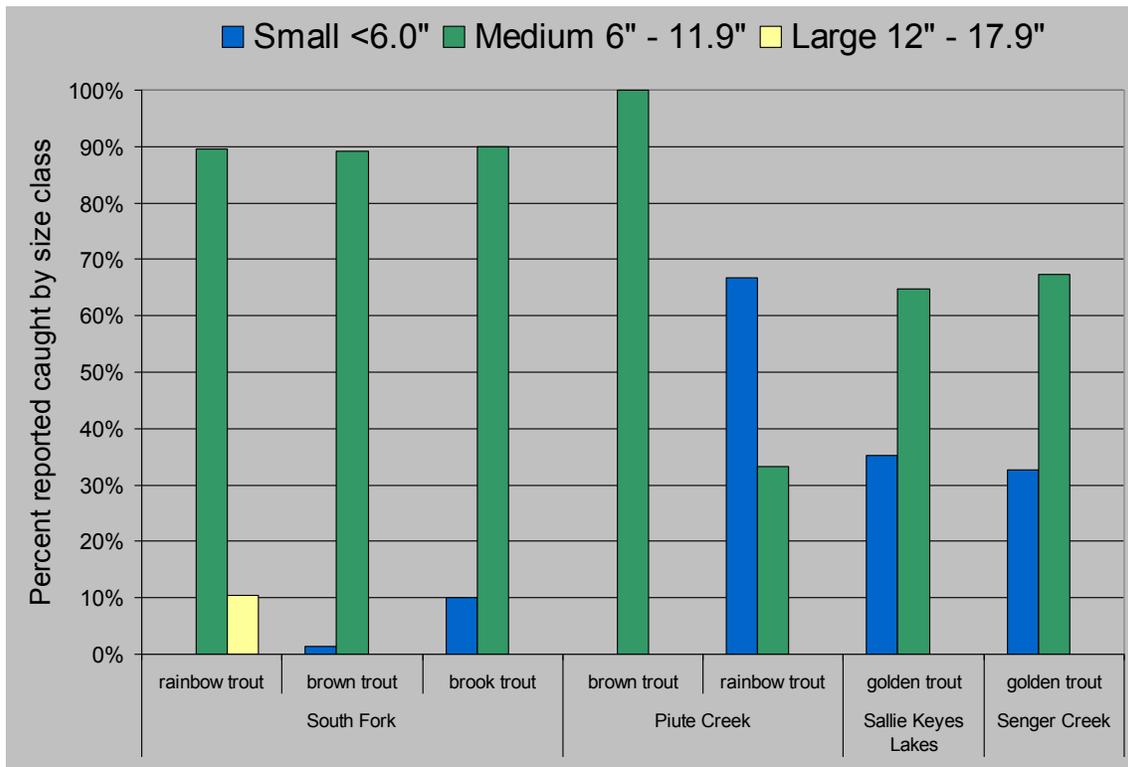


Table 1. 2011 summary of South Fork direct observation data: number of fish observed by species, section, and habitat

| Section number | Section length (ft) | Habitat type | Species | Total number observed | Estimated density (fish/mi) |
|----------------|---------------------|--------------|---------------|-----------------------|-----------------------------|
| 111 | 256.2 | Flatwater | rainbow trout | 4 | 82 |
| | | | brown trout | 11 | 227 |
| 211 | 132.0 | Flatwater | rainbow trout | 1 | 40 |
| | | | brown trout | 15 | 600 |
| | | | unknown trout | 1 | 40 |
| 311 | 93.0 | Flatwater | rainbow trout | 2 | 114 |
| | | | brown trout | 12 | 681 |
| | | | unknown trout | 2 | 114 |
| 411 | 204.0 | Flatwater | brown trout | 38 | 984 |
| 511 | 231.0 | Flatwater | rainbow trout | 2 | 46 |
| | | | brown trout | 41 | 937 |
| 611 | 360.0 | Flatwater | rainbow trout | 3 | 44 |
| | | | brown trout | 61 | 895 |
| | | | rainbow trout | 2 | 35 |
| 711 | 300.0 | Flatwater | brown trout | 29 | 510 |
| | | | brook trout | 1 | 18 |
| | | | unknown trout | 4 | 70 |
| | | | rainbow trout | 2 | 46 |
| 811 | 228.0 | Flatwater | brown trout | 73 | 1691 |
| | | | brook trout | 1 | 23 |
| | | | rainbow trout | 3 | 50 |
| 911 | 318.0 | Flatwater | brown trout | 33 | 548 |
| | | | unknown trout | 1 | 17 |
| | | | rainbow trout | 66 | 1636 |
| 1011 | 213.0 | Pool | brown trout | 11 | 273 |
| | | | rainbow trout | 51 | 860 |
| 1111 | 313.0 | Flatwater | brown trout | 1 | 17 |
| | | | rainbow trout | 7 | 313 |
| 1211 | 118.0 | Flatwater | rainbow trout | 72 | 1549 |
| | | | brown trout | 2 | 43 |
| 1311 | 245.5 | Pool | rainbow trout | 3 | 176 |
| | | | brown trout | 1 | 59 |
| 1411 | 90.0 | Pool | rainbow trout | 15 | 951 |
| | | | brown trout | 2 | 127 |
| 1511 | 83.3 | Flatwater | rainbow trout | 12 | 396 |
| | | | brown trout | 8 | 264 |
| 1611 | 160.0 | Flatwater | rainbow trout | 10 | 880 |
| | | | brown trout | 3 | 264 |
| 1711 | 60.0 | Pool | rainbow trout | 3 | 264 |
| | | | brown trout | | |

Table 2. 2011 South Fork direct observation data: total number of trout observed and mean estimated trout density among all sections

| Species | Total trout observed | Mean estimated density (fish/mi) |
|---------------|----------------------|----------------------------------|
| rainbow trout | 255 | 425 |
| brown trout | 341 | 478 |
| brook trout | 2 | 2 |
| unknown trout | 8 | 14 |

Table 3. 2011 summary of South Fork angling data

| Water | Angler | Effort date | Total effort (hrs) | Species | Number of fish captured | Total trout captured | Catch per unit effort (fish/hr) |
|--------------------|-----------|-------------|--------------------|---------------|-------------------------|----------------------|---------------------------------|
| South Fork | Bloom | 9/7/2011 | 3.00 | rainbow trout | 2 | 18 | 6.0 |
| | | | | brown trout | 16 | | |
| | Rizza | 9/7/2011 | 0.50 | ----- | 0 | 0 | 0.0 |
| | Bloom | 9/8/2011 | 5.50 | rainbow trout | 57 | 63 | 11.5 |
| | | | | brown trout | 6 | | |
| | Drummond | 9/8/2011 | 2.10 | rainbow trout | 4 | 7 | 3.3 |
| | | | | brown trout | 3 | | |
| | Mehalick | 9/8/2011 | 5.00 | rainbow trout | 17 | 20 | 4.0 |
| | | | | brown trout | 3 | | |
| | Rizza | 9/8/2011 | 3.00 | rainbow trout | 3 | 3 | 1.0 |
| | Silva | 9/8/2011 | 1.00 | rainbow trout | 1 | 4 | 4.0 |
| | | | | brown trout | 3 | | |
| | Wassmund | 9/8/2011 | 2.00 | rainbow trout | 2 | 3 | 1.5 |
| | | | | brown trout | 1 | | |
| | Zuber | 9/8/2011 | 0.75 | brown trout | 1 | 1 | 1.3 |
| | Drummond | 9/9/2011 | 1.50 | rainbow trout | 3 | 3 | 2.0 |
| Rizza | 9/9/2011 | 1.50 | rainbow trout | 3 | 3 | 2.0 | |
| Drummond | 9/10/2011 | 0.75 | ----- | 0 | 0 | 0.0 | |
| Rizza | 9/10/2011 | 0.75 | ----- | 0 | 0 | 0.0 | |
| Sallie Keyes Lakes | Bloom | 9/9/2011 | 1.00 | golden trout | 13 | 13 | 13.0 |
| | Mehalick | 9/9/2011 | 1.00 | ----- | 0 | 0 | 0.0 |
| | Silva | 9/9/2011 | 0.50 | golden trout | 2 | 2 | 4.0 |
| | Zuber | 9/9/2011 | 0.83 | golden trout | 5 | 5 | 6.0 |
| Sallie Keyes Creek | Bloom | 9/9/2011 | 0.25 | golden trout | 2 | 2 | 8.0 |

Table 4. 2011 summary of South Fork drainage ASB data

| Water | Total number of analyzed forms | Total effort reported (hrs) | Total trout reported caught | Mean CPUE (fish/hr) |
|------------------------|--------------------------------|-----------------------------|-----------------------------|---------------------|
| South Fork San Joaquin | 9 | 37.0 | 103 | 3.1 |
| Puite Creek | 2 | 6.0 | 5 | 0.9 |
| Sallie Keyes Lakes | 6 | 16.5 | 85 | 4.6 |
| Senger Creek | 4 | 12.5 | 52 | 0.7 |