

Scott River Fall Chinook Spawning Ground Surveys 2019 Season



A female Chinook salmon resting in the Scott River mainstem. Photo courtesy of Jim Morris (2019).

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Contents

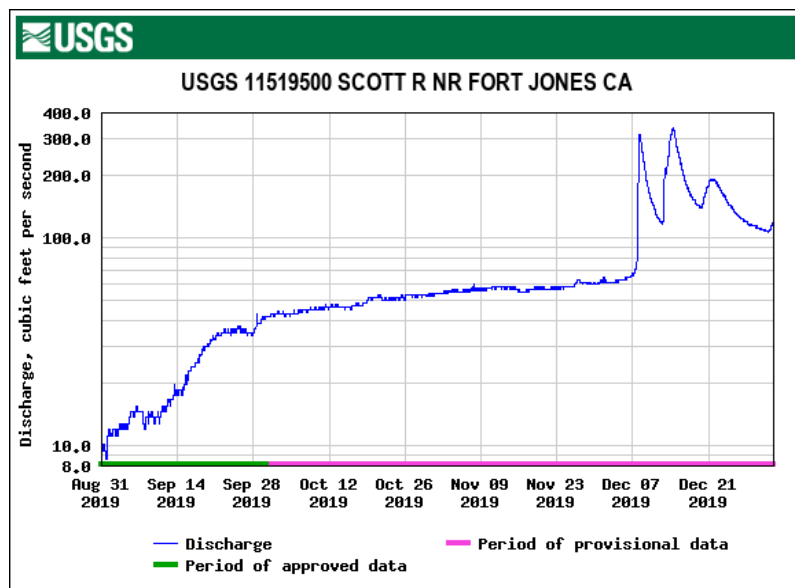
Introduction	2
Fall 2019 Flow Conditions	2
Surveys	3
Lives	5
Biological Samples	5
Redds	6
Conclusions	8

Introduction

The Scott River is an important spawning tributary for natural fall-run Chinook salmon in the Klamath Basin. Since 1992, escapement estimates have been compiled for the Scott River through cooperative spawning ground surveys organized by the California Department of Fish and Wildlife (CDFW) and the United States Forest Service (USFS). The objective of these surveys is to collect information on run parameters including the timing, duration, age composition, hatchery contribution, and redd distribution. The monitoring of this independent Chinook salmon population provides valuable trend data, including escapement estimates which are utilized by the Pacific Fisheries Management Council for the allocation of Klamath Basin fall run fish.

Fall 2019 Flow Conditions

Following a wet/average 2018-2019 water year in the Scott Valley sub-basin of the Klamath River, streams throughout the watershed began swelling out of base flow conditions in the latter half of September as the result of periodic light rain events and seasonably cool temperatures. In September, the Scott river discharge increased from about 10 cfs to 50 cfs and stayed around 50 cfs for most of October and November due to minimal precipitation in the fall. Weather stations in Callahan and Fort Jones both recorded less than 1 inch of precipitation in the form of rain during those months. The Scott River remained fully connected through Scott Valley except for a section in the historic mining tailings of reach 16 (river mile 55.0) south of Callahan. This area usually requires a flow of greater than 100 cfs to maintain surface water through the tailings.



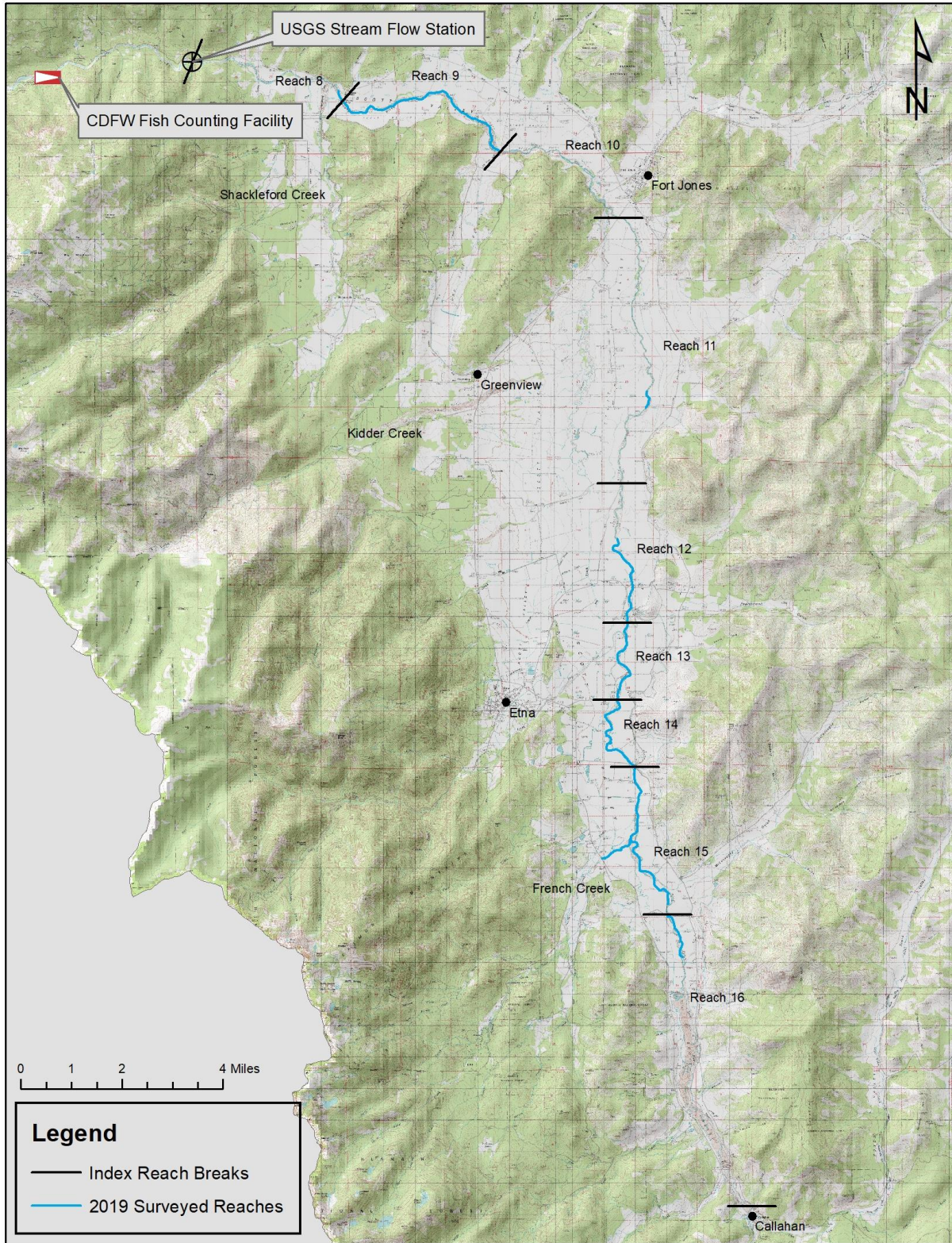
Surveys

The Annual Scott River Spawning Ground Survey Training was held at Indian Scotty Campground on October 8, 2019. All individuals who participated in the survey season attended the 2019 training or a previous year's training. RCD crew leaders were Chris Voigt and Jim Morris. Jim Morris, a former high school teacher, involved Etna High School students in the surveys. All surveys were carried out following protocols and procedures detailed in the Klamath Basin Cooperative Spawning Ground Survey 2019 Training Manual. Weather conditions over the fall of 2019 were ideal for the observation of spawning—low precipitation and stable flows.

The RCD initiated spawning ground surveys through the Index Reaches of the Scott River Valley on October 16, 2019 (Table 1, Map 1). Scheduling involved a minimum of bi-weekly surveys of Index Reaches 12 through 15 and weekly surveys of reach 9 as stream conditions permitted. Surveys were also regularly completed through portions of Index Reaches 8, 11, and 16 as the run progressed. A very limited extent of Reach 11 was surveyed in order to monitor a planned bank stabilization site. Only the lower portion of Reach 16 was surveyed because of a lack of connectivity through the mining tailings. The first 0.2 miles of reach 8 was surveyed as landowner access was granted. Surveys were also completed through 0.8 miles of lower French Creek (independent of Index Reach 15). Based on their observations of live fish numbers and redd construction, crews determined Chinook spawning had subsided and ended surveys on December 4, 2019. Map 1 indicates the index reach breaks and the tributary reaches surveyed.

Table 1. Scott River Mainstem Index Reaches					
Index Reach	Reach Description	Upstream River Mile	Downstream River Mile	Total Length	Length Surveyed
8	Meamber Bridge to USGS Stream Gauge	24.4	21	3.4	0.2
9	Oro Fino to Quartz Valley Bridge	28.6	24.4	4.2	4.2
10	Highway 3 to Oro Fino	35.6	28.6	7	0
11	Eller Lane to Highway 3	41.1	35.6	5.5	0.4
12	Etna Creek to Eller Lane	44.7	41.1	3.6	2.0
13	Horn Lane to Etna Creek	46.5	44.7	1.8	1.9
14	Young's Dam to Horn Lane	48.6	46.5	2.1	2.1
15	Fay Lane to Young's Dam	52.2	48.6	3.6	3.7
16	Callahan to Fay Lane	59.1	52.2	6.9	1.0
Total				34.7	15.5

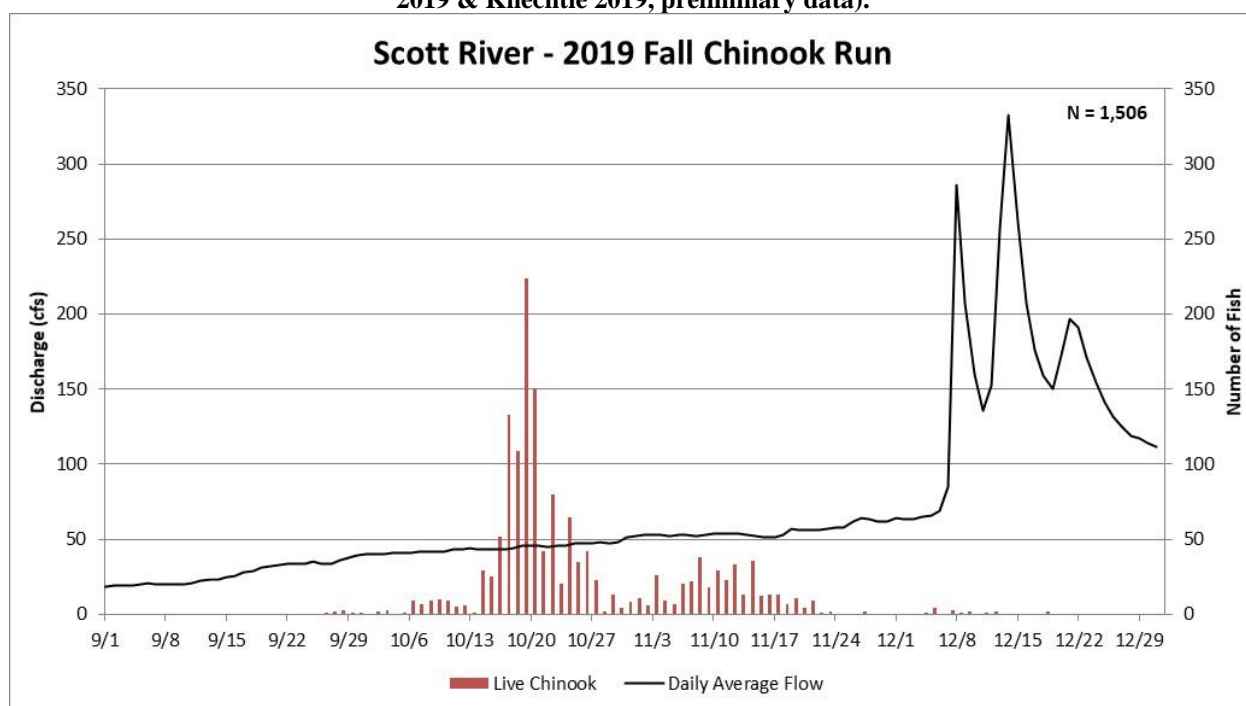
Map 1. Stream reaches surveyed by the Siskiyou RCD during the 2019 fall-Chinook run.



Lives

CDFW operates a Fish Counting Facility on the Scott River, which is situated at river mile 18.2 near the transition between the canyon and the low-gradient valley. A total of 1,506 Chinook were recorded passing upstream through the video weir from September 26 through December 18, 2019 (Knechtle and Giudice 2019, preliminary data, Figure 1). Although the Scott River remained connected through the valley over the summer of 2019 (excluding the historic mining tailings), a persistent lack of fall precipitation resulted in low but stable flows through the fall of 2019. The USGS streamflow gage at river mile 21 remained around 40-60 cfs through most of the migration period (USGS 2019, preliminary data). As such there was concern over fish passage through problem areas such as Oro Fino, Youngs Dam and the tailings. Crews periodically checked these sites and it was determined that neither the shallow riffles through Oro Fino or the channels through Young's Dam presented actual fish passage barriers because fish were documented on Reach 15 as early as October 17, 2019. Although, the historic mining tailings didn't connect until the first week of December, which was too late for the Chinook run, so spawning did not occur through the southern headwaters of the Scott River. Pairs of Chinook salmon were consistently encountered by RCD crews through the valley reaches of the mainstem from October 16 to December 4, 2019 (Appendix A).

Figure 1. Scott River streamflow and Chinook migration through the CDFW Fish Counting Facility (USGS 2019 & Knechtle 2019, preliminary data).



Biological Samples

All carcasses found by field crews (excluding those that were inaccessible) were inventoried and chopped to indicate that they had been handled. Surveyors recorded the fork length, sex, and presence of hatchery markings on each carcass. They also checked females for evidence of pre-spawn mortality. A total of 220 Chinook carcasses were handled and inventoried by field crews over the season (Appendix B). Of these, 41% were females and 58% were males; the remaining

1% of the carcasses were too deteriorated to determine the sex. No evidence of pre-spawn mortality was found. There were not any recovered carcasses with hatchery markings.

Of the 220 recovered carcasses, 218 were in suitable condition to collect scale samples (Appendix B). Gill plate and otolith samples were also gathered from selected carcasses —generally the first fish per reach on each survey day and every tenth fish thereafter. All samples were submitted to CDFW – Yreka Fisheries Office for further distribution and analysis.

Redds

Due to mild stream conditions, surveyors were typically able to find the pair of fish responsible for constructing a redd and observe the development of the spawning site from week to week. Redds identified on each survey were inventoried and flagged to indicate that they had been documented. Surveyors recorded habitat type, dimensions, superimposition and presence of fish in the vicinity of the site. GPS coordinates were collected for every redd where permitted by landowners.

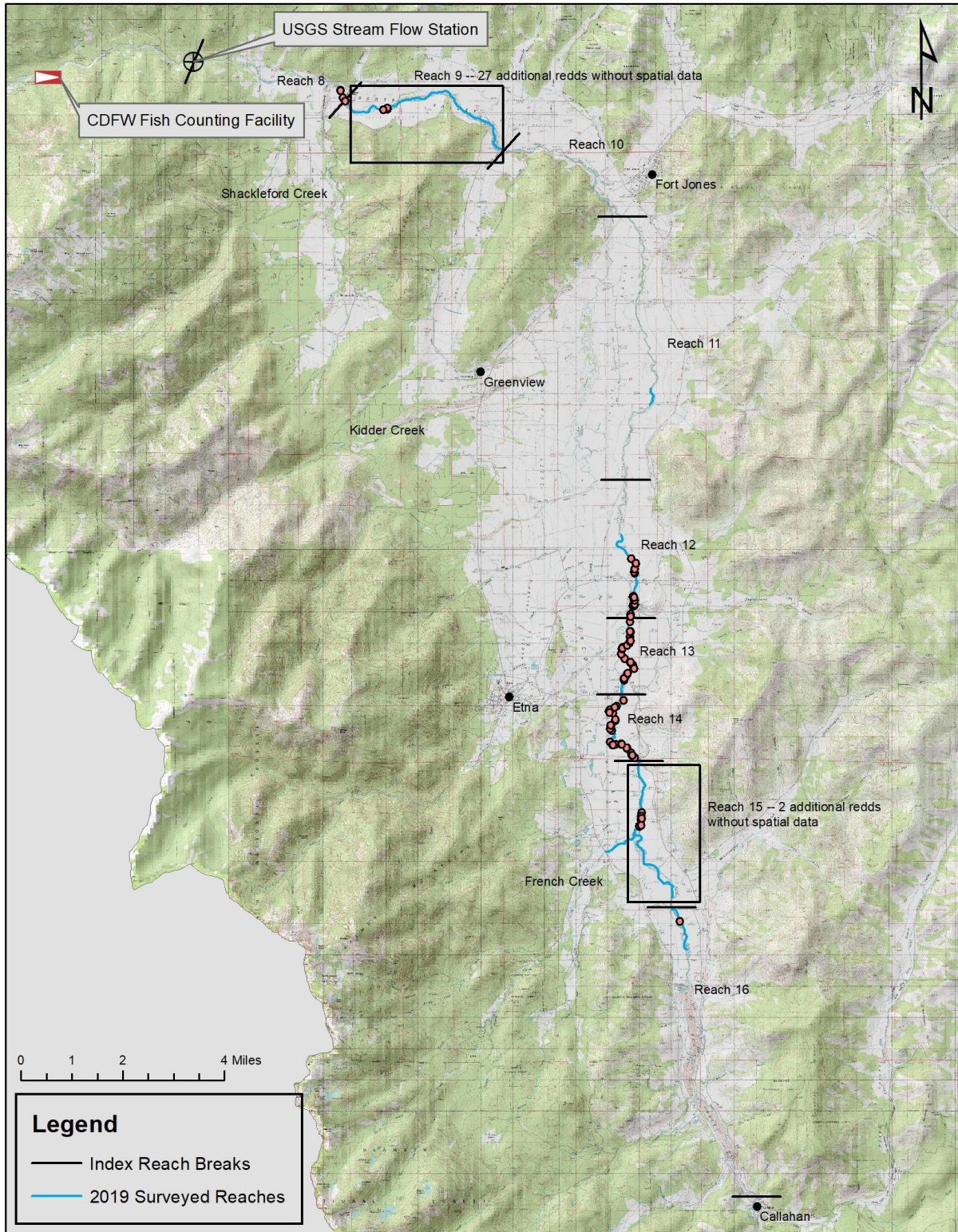
Surveys were conducted on 15.5 miles of the Scott River mainstem covering the Index Reaches 8-9 and 11-16. Surveys were not conducted through or above the historic mining tailings due to insufficient connectivity during the run. There was a decent amount of spawning observed on the mainstem with the distribution spanning most of the surveyed length (Table 2, Map 2). Relative spawning densities were highest on reaches 13, 14 and 8.

Valley Reach	Total Number of Redds Identified
8 (partial access)	4
9	34
10	Not Surveyed
11 (partial access)	0
12 (partial access)	35
13	70
14	43
15	13
16 (partial access)	1
Total	200

Except for French Creek, connectivity prevented fish from entering western tributaries to the Scott River during the Chinook run. Shackleford Creek, Etna Creek, and Kidder Creek did not connect to the mainstem Scott River until early December, which was too late for the Chinook run. Similarly, the historic mining tailings prevented fish access to Sugar Creek and the Forks which were therefore not surveyed for spawning this season (Table 3). Multiple surveys were carried out though the lower 0.8 miles of French Creek, however, they did not identify any redds or other evidence of spawning (Table 3, Map 2).

Tributary	Total Number of Redds Identified
Shackleford Creek	Not Surveyed
Kidder Creek	Not Surveyed
Etna Creek	Not Surveyed
French Creek	0
Sugar Creek	Not Surveyed
Total	0

Map 2. Chinook redds identified by the Siskiyou RCD during the 2019 fall run.



Conclusions

Since 1978, the natural Chinook escapement into the Scott River has ranged from 14,477 fish (1995) to 467 fish (2004) (Knechtle and Giudice 2019). The total escapement in 2019 was estimated at 2,090 fish, which is significantly lower than the average of 5,148 fish.

The fall of 2019 was characterized by little precipitation and therefore very moderate and stable flows. Although Chinook migration typically coincides with pulse flow events, in the absence of these environmental cues, the timing of the run remained relatively normal.

However, due to low flows there was concern over fish passage through problem areas such as Oro Fino, Youngs Dam and the historic mining tailings. Crews periodically checked these sites and it was determined that neither the shallow riffles through Oro Fino or the channels through Young's Dam presented fish passage barriers. In fact, a Chinook carcass was recovered on Reach 15 (above Young's Dam) on October 17 and then several pairs of live fish were observed on the next survey on October 21, 2019. Although fish successfully made it beyond the Dam, the spawning densities were much lower on Reach 15 and 16 and it is unknown whether low-flow passage challenges contributed to this occurrence. The historic mining tailings didn't connect until December 7, 2019, which was too late for the Chinook run, so spawning did not occur through the southern headwaters of the Scott River. This is no longer uncommon, so the spawning distribution and habitat utilization of the mainstem Scott River in 2019 can be considered typical of the species. Due to the timing of connectivity of the western tributaries to the Scott River, only French Creek was considered to be potentially utilized by spawning Chinook. However, surveys did not identify any Chinook redds in French Creek throughout the season.

Knechtle, M. and Giudice, D. 2019. 2018 Scott River Salmon Studies Final Report. California Department of Fish and Wildlife, Northern Region. <file:///C:/Users/User/Downloads/Scott%202018%20Final%20Annual%20Report.pdf>

U.S. Geological Survey (USGS). 2019. Discharge records for Scott River Gage 11519500 near Fort Jones. (data was identified as preliminary at time of retrieval) http://waterdata.usgs.gov/usa/nwis/inventory/?site_no=11519500&agency_cd=USGS

National Weather Service (NWS) 2019 Monthly Precipitation Callahan station (CAL). California Data Exchange Center (CDEC). http://cdec.water.ca.gov/dynamicapp/selectQuery?Stations=CAL&SensorNums=2&dur_code=M&Start=2018-03-18&End=2020-03-18

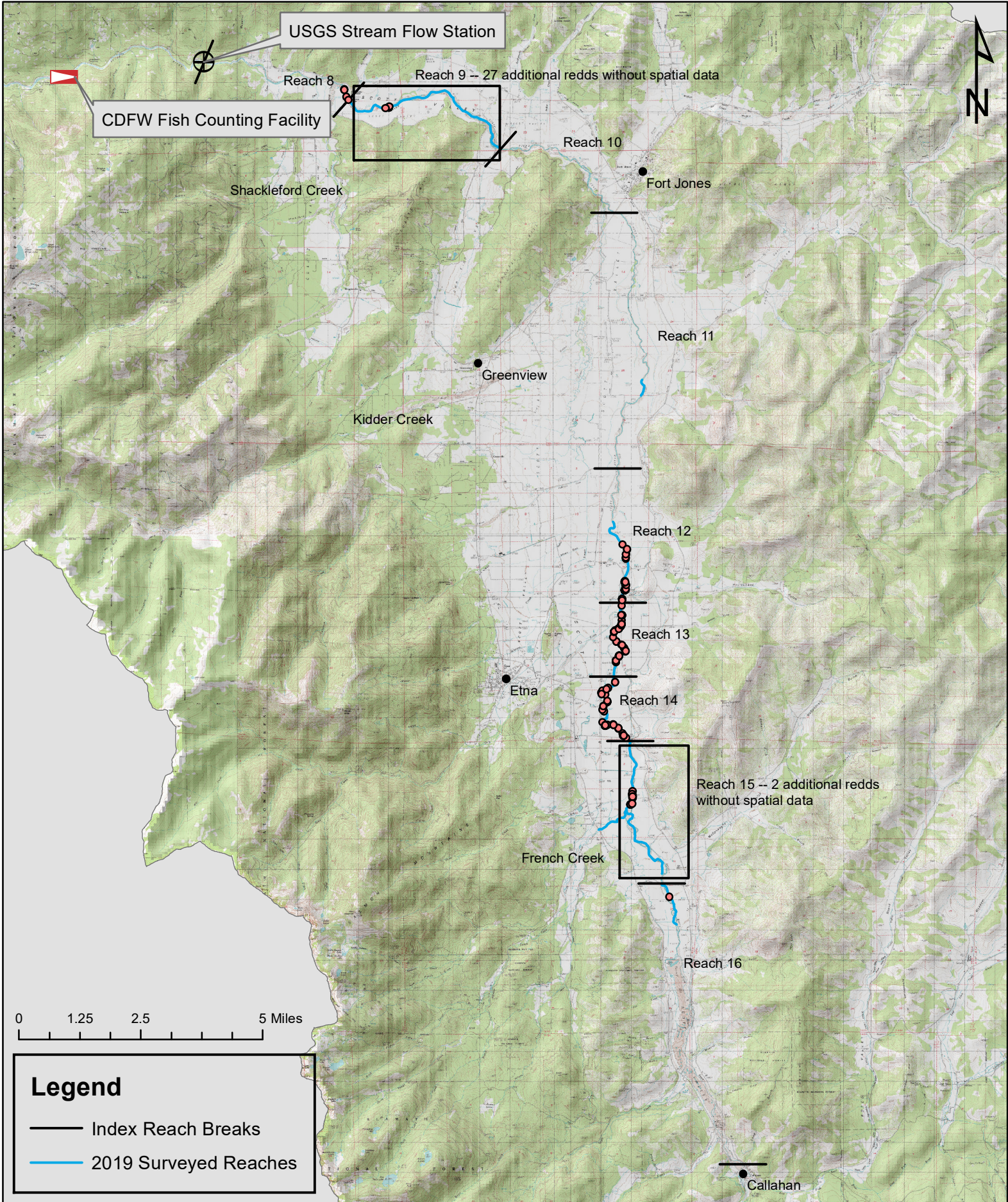
United States Forest Service (USFS). 2019 WY Monthly Precipitation: Scott River Basin: Fort Jones RS (FJN) stations.

California Data Exchange Center (CDEC).

http://cdec.water.ca.gov/dynamicapp/selectQuery?Stations=FJN&SensorNums=2&dur_code=M&Start=2018-03-18&End=2020-03-18

Western Regional Climate Center 2019 Northern California RAWS Daily Precipitation Callahan station <https://raws.dri.edu/cgi-bin/rawMAIN.pl?caCCAL>

2019 Scott River Chinook Salmon Spawning Ground Surveys



USGS Stream Flow Station

CDFW Fish Counting Facility

Reach 8

Reach 9 -- 27 additional redds without spatial data

Reach 10

Fort Jones

Shackleford Creek

Reach 11

Greenview

Kidder Creek

Reach 12

Reach 13

Etna

Reach 14

Reach 15 -- 2 additional redds without spatial data

French Creek

Reach 16

Callahan

0 1.25 2.5 5 Miles

Legend

- Index Reach Breaks
- 2019 Surveyed Reaches