

Scott River Fall Chinook Spawning Ground Surveys



Female Chinook carcass recovered on November 14th 2016 (Siskiyou RCD)

Work Completed by the
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Introduction

The Scott River is an important spawning tributary for natural fall-run Chinook in the Klamath Basin. Since 1992, escapement estimates have been completed in the Scott River through cooperative adult Chinook 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 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 Chinook.

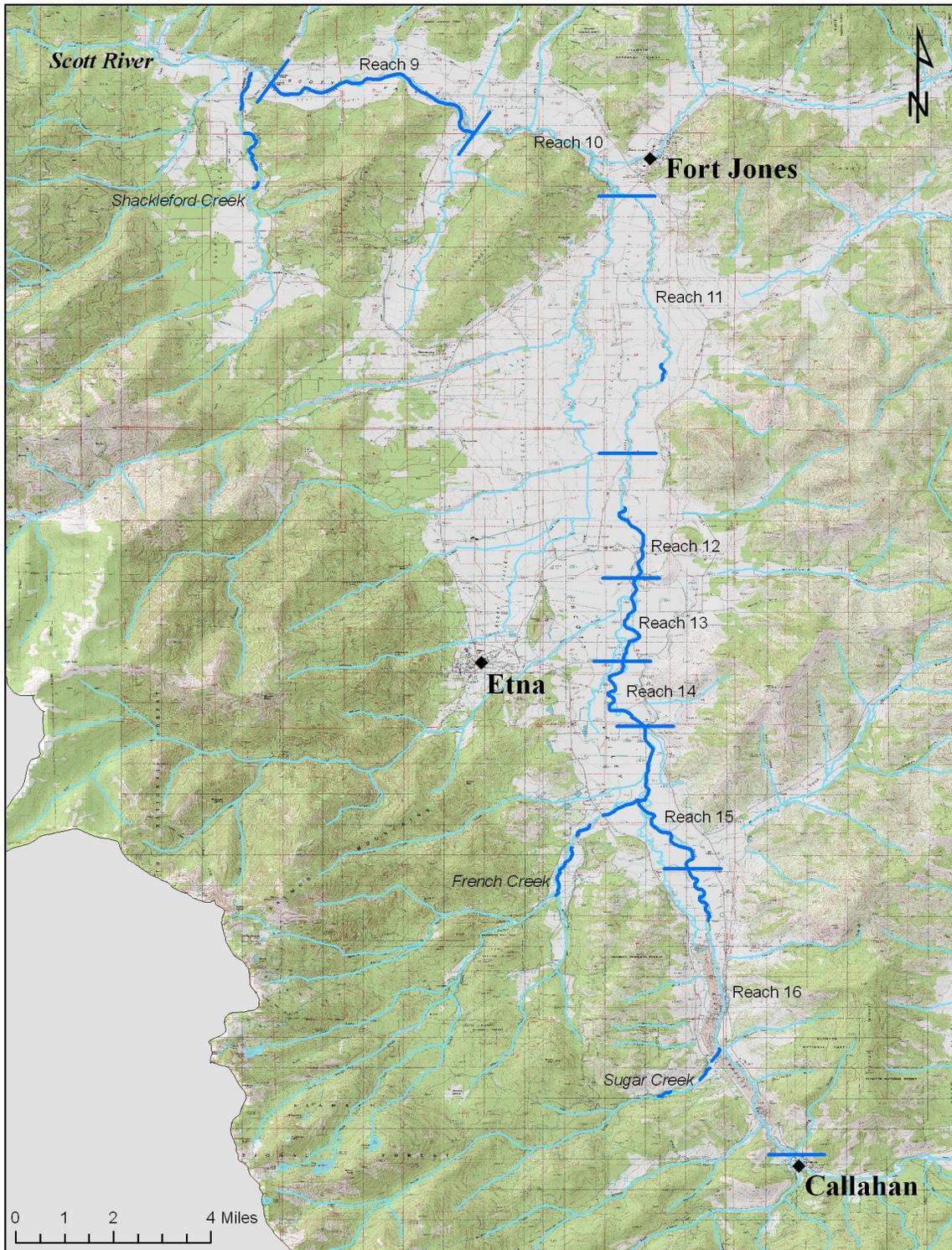
Surveys

The Annual Scott River Spawning Ground Survey Training was held at Indian Scott Campground on October 4th 2016. All individuals who participated in the surveys attended the training event this year or in a previous year. RCD crews initiated spawning ground surveys in the Scott River Valley on October 12th 2016 (Appendix A). Scheduling involved a minimum of bi-weekly surveys of Index Reaches 12 through 15 as stream conditions permitted. Surveys were also completed on sections of Reach 9, 11 and 16 as landowner access was granted (Table 1). At least one surveyed covered the full length of Reach 9, after which efforts were focused on the upper 2.8 miles where there was more suitable spawning substrate. A very limited extent of Reach 11 was surveyed in order to monitor a planned bank stabilization site. Unfortunately due to scheduling only the lower portion of reach 16 was surveyed. Surveys were also completed on French Creek, Sugar Creek and Shackleford Creek beginning in mid-November after coho salmon were identified in the system. Map 1 indicates the index reach breaks and the tributary reaches surveyed. Jim Morris, a former high school teacher, led a crew of 2-4 Etna High School students on several occasions. All surveys were carried out following protocols and procedures detailed in the Klamath Basin Cooperative Spawning Ground Survey 2016 Training Manual.

Index Reach	Reach Description	Upstream River Mile	Downstream River Mile	Total Length	Length Surveyed 2016
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	2.1
13	Horn Lane to Etna Creek	46.5	44.7	1.8	1.8
14	Young's Point to Horn Lane	48.6	46.5	2.1	2.1
15	Fay Lane to Young's Point	52.2	48.6	3.6	3.6

16	Callahan to Fay Lane	59.1	52.2	6.9	1.3
			Total	34.7	15.5

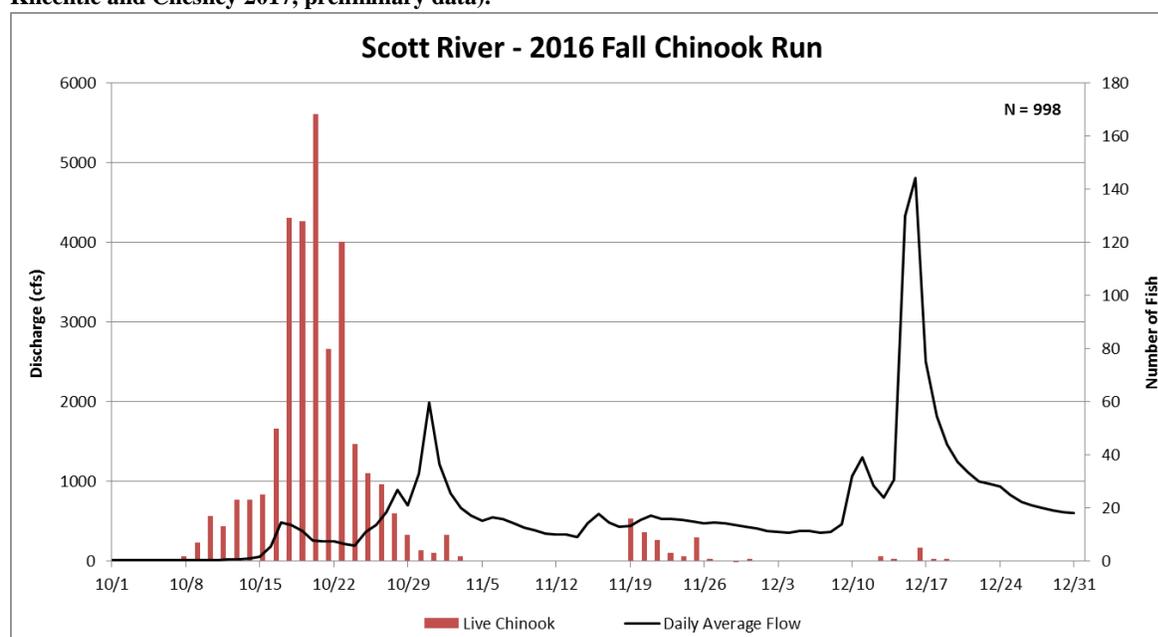
Map 1. Stream reaches surveyed by the Siskiyou RCD during the 2016 fall-Chinook run.



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 998 Chinook were recorded passing upstream through the video weir from October 6th through December 3rd 2016 (Knechtle and Chesney 2017, preliminary data, Figure 1). The Scott River was confirmed to be connected through Oro Fino on October 12th 2016, after which rains insured that fish passage was no longer a concern. The first Chinook encountered in the valley was a pair migrating through Reach 11 on October 19th 2016 (Appendix A). Chinook were consistently documented between Eller Lane (Blacks Bridge) and Fay Lane on surveys completed through November 14th 2016. November 18th 2016 was the last day a live fish was positively identified as a Chinook (Appendix A).

Figure 1. Scott River streamflow and Chinook migration through the CDFW Fish Counting Facility (USGS 2016 & Knechtle and Chesney 2017, preliminary data).



Biological Samples

All carcasses encountered (with the exception of those that were inaccessible) were inventoried and then chopped to indicate that they had been handled. Surveyors recorded the fork length, sex, and presence of hatchery markings (if any). They also checked females for evidence of pre-spawn mortality. A total of 91 Chinook carcasses were handled and inventoried by RCD field technicians over the season (Appendix B). Of these, 57% were females and 33% were males; the remaining 10% of the carcasses were too deteriorated to determine the sex. No evidence of pre-spawn mortality was found. The last two Chinook carcasses recovered by crews were found on Shackleford Creek on December 12th and December 19th 2016. The collection of fresh female carcasses this late in the season corroborates the small pulse of fish identified passing through the Fish Counting Facility in mid-December.

There were 80 recovered carcasses that were of suitable condition to allow for scale samples to be collected (Appendix B). Gill plate and otolith samples were also gathered from selected carcasses, generally the first fish encountered per reach on each survey day. All samples were submitted to CDFW – Yreka Fisheries Office for further distribution and analysis. On November 21st 2016, a male carcass with

a fork length of 76 cm was found on Reach 14 with a clipped adipose fin. The head was taken to CDFW – Yreka for recovery of the coded wire tag, which confirmed the origin of the fish to be the Trinity River Hatchery.

For the purpose of this report, the upper extent of Chinook presence in the tributaries has been defined by the documentation of carcasses rather than redds because the species can be reliably determined. However, in 2016, the upper extent of spawning could not be determined on any of the surveyed tributaries because either no carcasses were recovered (French Creek and Sugar Creek) or a carcass was recovered at the upper boundary of the reach (Shackleford Creek river mile 2.9, just below the confluence with Mill Creek).

Redds

The 2016 season was a difficult one for the documentation of redds. Surveys on the mainstem Index Reaches 9 through 16 do not involve marking redds with flagging due to landowner preference. As a result all visible redds are counted on each survey and positional information, in the form of GPS coordinates, is collected once (sometimes twice) during the season at the peak of spawning. This year there was a sufficient amount of spawning documented on October 24th 2016 that GPS coordinates were scheduled to be collected the following week. However, a storm event increased flows to the extent that surveys had to be postponed until November 4th 2016 after which previously constructed redds were no longer visible for documentation. From that point on, coordinates were taken for all redds on each survey however, spawning had noticeably subsided. Therefore, the Siskiyou RCD is able to provide counts of new redds encountered each survey day but positional information is not inclusive enough to allow for mapping (Appendix A).

Surveys were conducted on 15.5 miles of the Scott River mainstem covering the Index Reaches 9 and 11 – 16. There was a moderate amount of spawning observed within index reaches 13-15 (Eller Lane to Fay Lane) with spawning densities increasing upstream (Table 2).

Surveys conducted on tributaries to the Scott River are handled differently; GPS coordinates are collected on every survey where permitted by landowners to alleviate double counting and interference between species.

The first survey conducted on Shackleford Creek occurred on November 18th 2016 and was complicated by evidence of spawning from both Chinook and coho salmon. Surveyors considered dimensions,

gravel size and habitat characteristics to differentiate redds by species but some could not be allocated with certainty. Of the 13 redds identified that day, 8 were attributed to Chinook salmon (Table 3), the

Valley Reach	Total Number of Redds Surveyed
9	1
10	Not Surveyed
11 (partial access)	0
12 (partial access)	0
13	11
14	16
15	61
16 (partial access)	2
Total	91

*number reported is the maximum redds recorded on a single survey day (10-24-16)

Tributary	Total Number of Redds Surveyed
Shackleford Creek	8
French Creek	2
Sugar Creek	0
Total	10

most upstream of which was located at river mile 2.4. There were no subsequent Chinook redds encountered on the tributary during the season.

A total of two redds on French Creek were attributed to Chinook salmon, one at river mile 0.1 and the other at river mile 1.9 (Table 3). A live fish was encountered in the vicinity of the redd near Wolford Slough.

No evidence of Chinook spawning was documented on Sugar Creek (Table 3).

Conclusions

Since 1978, the natural Chinook escapement into the Scott River has ranged from 14,477 fish (1995) to 467 fish (2004) (Knechtle and Chesney 2017, preliminary data). The 2016 run ranks third lowest on record. Chinook spawning throughout the valley reaches of the Scott River was noticeably low during season; surveyors walking reaches 12 through 14 reported very few habitat units being utilized compared with past years.

Unfortunately, this small brood year was further disadvantaged by consistent high water from October through March, which was punctuated by several substantial peaks. The first of these occurred on October 31st after the majority of the seasons redds had been identified and although flows only reached 2,360 cfs that was sufficient to completely destroy any evidence of previously utilized spawning sites (USGS 2016, preliminary data). There were some additional redds that were observed by surveyors up through the first week of December (and it is possible that others were constructed even later into the season and went undocumented) but spawning was not nearly to the extent that was found in mid-October. Subsequent peak flows such as those on December 15th (6,930 cfs), January 9th (4,770 cfs), and February 10th (16,100 cfs) further redistributed the streambed (USGS 2016, preliminary data).

It is likely that the low adult returns coupled with repeated high water events adversely impacted the abundance of the 2016 brood year of fall-Chinook salmon on the Scott River.

References

- Knechtle, M. and Chesney, D. 2017. 2016 Scott River Salmon Studies Final Report. California Department of Fish and Wildlife, Northern Region. Available at 1625 South Main Street Yreka Ca. 96097
- U.S. Geological Survey (USGS). 2016. Discharge records for Scott River Gage 11519500 near Fort Jones. (data was identified to be preliminary at time of retrieval)
http://waterdata.usgs.gov/usa/nwis/inventory/?site_no=11519500&agency_cd=USGS