

Scott River Adult Coho Spawning Ground Surveys 2011 Season

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Scott River Adult Coho Spawning Ground Surveys 2011-2012

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Abstract

In 2011, adult coho spawning ground surveys were completed in the Scott River Watershed in order to continue to further existing knowledge of the distribution and timing of coho salmon. A total of 21.4 miles were surveyed (3.10 miles on the mainstem and 18.3 miles on tributaries). Surveys consisted of trained crews walking established reaches either instream or on the bank in order to collect information on lives, carcasses, and redds. Most reaches were surveyed weekly; however, some reaches were surveyed only once. Streams that were surveyed include: East Fork Scott River, South Fork Scott River, Sugar Creek, French-Miners Creek, Etna Creek, Patterson Creek, Kidder Creek, Shackleford-Mill Creek, Kelsey Creek, Canyon Creek, and Tompkins Creek. The survey season lasted from November 23rd 2011– December 19th 2011. During this period a total of 26 redds, and 16 carcasses were identified.

Cooperators

The following entities cooperated in the survey effort this year:

California Dept. of Fish and Game
National Oceanic Atmospheric Administration
Quartz Valley Indian Reservation
United States Fish and Wildlife Service
United States Forest Service
Scott Valley Landowners

Introduction

Coho salmon (*Oncorhynchus kisutch*) in the Klamath River Basin, the Southern Oregon-Northern California Coast ESU, were listed as threatened by the National Marine Fisheries Service in 1997. In 2001, the State of California began considering a listing of the species as threatened, and in August of 2004, the California Fish and Game Commission acted to add the coho to the list of endangered and threatened species. The listing became effective March 30th, 2005.

Adult coho spawning ground surveys have been performed annually in the Scott River Watershed since the winter of 2001. These surveys began as a cooperative effort between local landowners, agencies, and concerned volunteers. At that time it was recognized that baseline population and distribution data were needed in order to implement and assess effective restoration efforts.

Project Objectives

- 1.) Document the presence of coho salmon within the historic range of distribution.
- 2.) Survey “Index Reaches”, as delineated in the 2001-2002 survey, once per week, or as survey conditions (e.g. flow) allow.
- 3.) Document distribution of adult coho spawning by brood year. Document the upper extent of spawning in each tributary where coho salmon are observed.
- 4.) Determine the run timing and duration of adult coho spawning in the Scott River system.

- 5.) Collect one set of tissue samples for DNA analysis to understand the genetic relationship of the Scott River coho salmon to other stocks and collect a sets of scale samples to understand the life history of the Scott River coho salmon. The tissue and scale samples will be submitted to CDFG. In addition, otoliths are to be collected for life history analysis, and submitted to CDFG.

Project Location

The 2011 survey effort took place in the Scott River Watershed, a sub-basin of the Klamath River Basin. The Scott River is located in Siskiyou County, CA. The legal description of the mouth of the Scott River is T45N R10W Sec 6.

Survey Locations

Adult coho spawning ground surveys were completed in the Tributaries: South Fork Scott, Sugar Creek, French-Miners Creek, Etna Creek, Patterson Creek, Kidder Creek, Shackleford-Mill Creek, Kelsey Creek, Canyon Creek, and Thompkins Creek. Some reaches of these streams were not surveyed during the season due to flow conditions, or a lack of access: Lower South Fork, Lower French, Lower and Upper Etna, Middle Kidder, Upper Shackleford, Mill Creek. Streams not surveyed in 2011 include: East Fork Scott River, Moffet Creek, Indian Creek, Patterson Creek (Fort Jones), Rattlesnake Creek, Scott Bar-Mill, Boulder Creek, Middle Creek, Wildcat Creek, Rail Creek and Kangaroo Creek. **Table 1. Survey Reach Descriptions** depicts all stream reaches surveyed since 2001, and indicates the reaches surveyed in 2011. Reaches were surveyed a minimum of once, and reaches designated as index reaches in 2001 were attempted to be surveyed weekly, when flow conditions allowed. Reaches designated in the past as index reaches are: Upper South Fork, Lower Shackleford/Mill, Lower Mill, Middle Patterson, Lower and Middle French, Miners, Lower and Upper Sugar, and the Mainstem Tailings. See **Map 1** for a depiction of reaches surveyed in 2011.

Table I. Survey Reach Descriptions						
Watershed	Reach Description	Survey Crew	Begin Mile	End Mile	# of Surveys	Total Miles

Scott River Adult Coho Spawning Ground Surveys 2011-2012

Mill Cr. (Scott Bar)		NS	0.40	0	NS	0
Tompkins Creek						
Lower.	Lowest 1.25 miles of Thompkins Creek	CDFG	1.8	0	3	1.6
Upper	From USFS road # 46N64 crossing to Potato Patch	CDFG	2	1	3	1.0
Middle Creek	Lowest .4 miles of Middle Creek	NS	.40	0	NS	0
Kelsey Creek	Lower Kelsey from barrier to mouth	CDFG	0.6	0	3	0.6
Kelsey Spawning Channel	Spawning channel	CDFG	0.2	0	3	0.2
Canyon Creek	mouth up	CDFG	1.1	0	3	1.1
Boulder Creek	County bridge to mouth	NS	.20	0	NS	0
Shackleford-Mill Creek						
Lower Shackleford-Mill(Index)	From Milepost 2 on Dangel lane to Bridge at Quartz Valley Dr	RCD	2.17	0	2	1.6
Upper Shackleford	Below the falls		5	4.5	NS	0
Lower Mill(Index)	From the QV road bridge to road crossing ~ 300 meters below conf of Shack	RCD	1.6	0	2	1.4
Middle Mill	From the Quartz Valley Rd bridge to above Emigrant Cr.	RCD/Menke	3.2	1.5	NS	1.7
Emmigrant Creek(trib to Mill)	Confluence with Mill Creek to County Road	RCD/Menke	0.1	0	NS	0.1
Upper Mill Creek	From county road crossing to 1/2 mile above	RCD	3.7	3.3	1	0.4
Kidder Creek						
Lower	Below Hwy 3 bridge	RCD			NS	1.3

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Middle	Above Hwy 3 bridge outside of Greenview	NS	5.8	5.0	NS	0
Upper	Upper Timber Vest property	spot survey			1	0.1
Patterson(Etna)						
Mid (FGS) (Index)	From Upper Youngs Diversion to Hwy 3	RCD	6.2	4.6	1	1.70
Lower Mid	Hwy 3 down	RCD	4.60	3.90	1	0.7
Upper (FGS)	From the Falls down	RCD	7.9	7.6	NS	0.3
Etna Creek						
Lower	200 yards below Highway 3 to mouth	RCD	2.25	0	NS	0
Middle	From Etna City Diversion to End of FGS	RCD	5.2	4.6	1	0.6
Upper	From Mill Creek to Alder Creek	RCD	8	6.35	NS	0
Ruffy Gap (Trib to Etna)	area above mouth	RCD	0.2	0	NS	0
French Creek						
Lower (Index)	Hwy 3 to mouth (New Reach 2003)	NO Access	0.7	0	NS	0
Middle 1 (Index)	Confluence w/Miners to bottom of Krum. Reduced from 2001 due to lack of access	RCD	2.43	1.83	2	0.6
Middle 2	Miner Cr. Rd to bottom of Tobias	RCD	1.60	.80	2	0.8
North Fork Area	From below North Fork to confluence of French and Miners	RCD	3.43	2.43	1	1
Paynes Creek Area	French Creek from 1/4 mile us Paynes Creek to 1/4 mile ds	RCD	5.35	4.65	NS	0.70

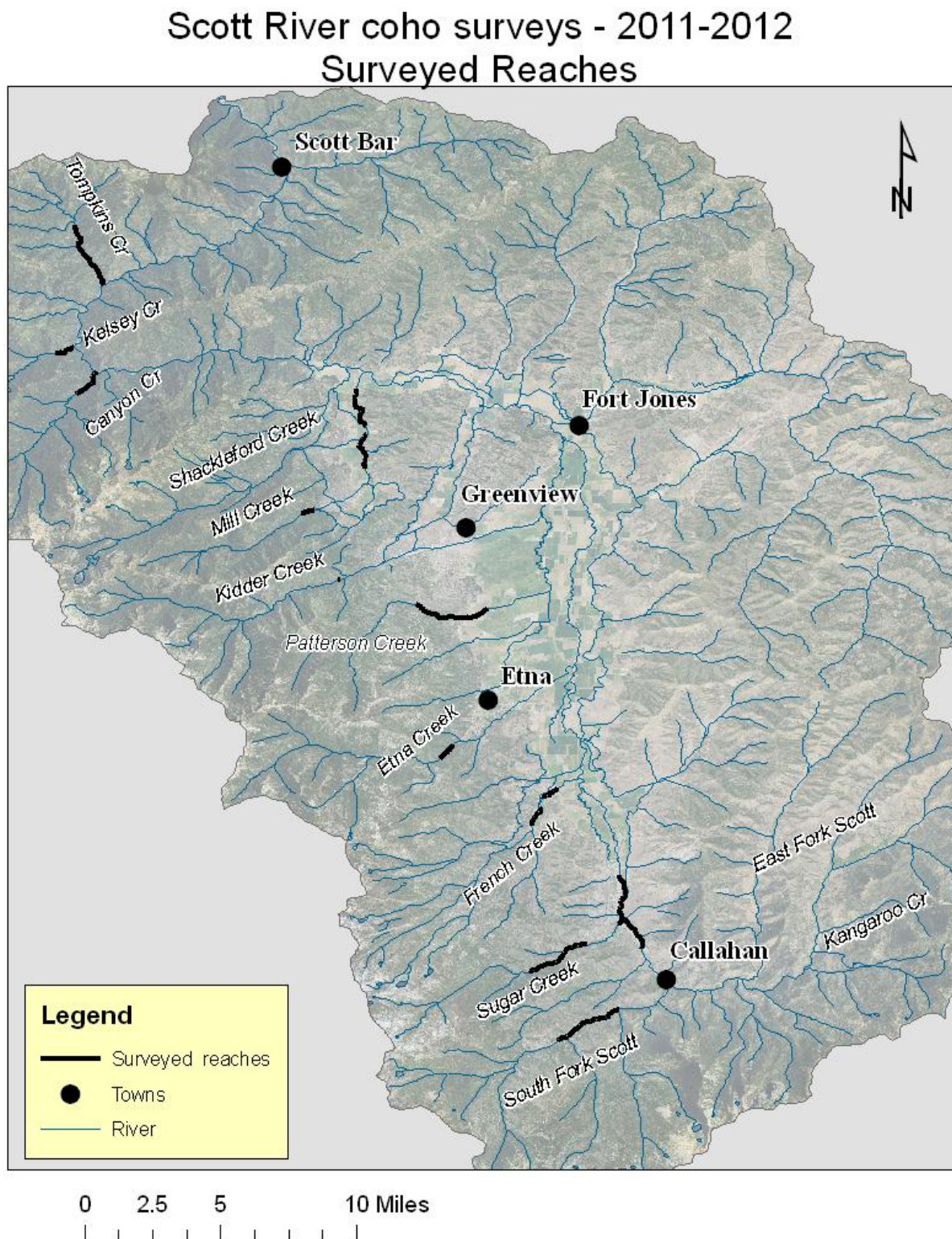
Scott River Adult Coho Spawning Ground Surveys 2011-2012

Duck Lake Area	Above and below mouth of Duck Lake	RCD	6.3	5.8	NS	0
Miners Creek	Confluence with French Creek to upper Phelps Property	RCD	0.9	0	NS	0.9
Paynes Cr.	Lowest .2 miles	RCD	0.2	0	NS	0
North Fork French Cr.	Timber Products	TP	0.7	0	NS	0
Tailings (INDEX)	From .30 miles below Wildcat Cr. To 1/2 mile upstream from Messner gulch.	RCD	55.35	52.25	1	3.10
Sugar Creek						
Lower (Index)	From Hwy 3 mouth	CDFG	0.3	0	1	0.3
mid	From Hwy 3 to Jeffy Bridge		0.3	0.60	NS	0.3
Upper (Index)	From bridge crossing on Rd # 40N23 to cattle guard on Sugar Cr. Rd.	RCD	4	1.9	1	2.1
Wildcat	Mouth up 2 mile	RCD	2.0	0	NS	0
South Fork						
Lower S. Fork	USFS piece	RCD/NOAA	0.7	0.3	NS	0
Upper S. Fork	800 meters above Fox Cr. to Boulder Cr.	RCD/NOAA	4	1.8	1	2.2
Boulder Creek	Mouth area	RCD/NOAA			NS	0
Fox Creek	Mouth Area	RCD/NOAA			NS	0
East Fork						
E. Fork-Lower Masterson	Beginning 1.4 miles above mouth of Grouse Cr.	RCD	6.3	5.8	NS	1.1
E. Fork-Lower Masterson	Grouse Creek downstream.	RCD	5.8	4.9	NS	0.5
East Fork-Upper Masterson	AP Cattle Ranch	RCD	11.8	7	NS	4.8
Upper East Fork	Confluence of Crater and Houston Creek downstream	RCD	13.8	12.8	NS	1.0

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Grouse Cr.	lower .6mile	RCD	0.6	0	NS	0
Kangaroo Cr. - Lower	Lower 1 mile of creek	RCD	1.1	0.1	NS	0.8
Kangaroo Cr. - Upper	USFS piece	RCD	2.1	1.4	NS	0.5
Rail Creek	Rd 41N39 to end of USFS land	RCD	1.25	1.45	NS	0.2
					Total	21.4

Map 1. 2011-2012 Survey Reaches



Crew training

Crew training was organized by California Dept. of Fish and Game (CDFG) and the Siskiyou RCD. Training was held on December 6th, 2011 at the Siskiyou RCD office. Training included: Fish ID, tissue and scale sampling techniques, identification of marks and tags that have been applied throughout the Klamath Basin, GPS use and naming conventions, data sheets, and redd identification. See **Appendix A. Training Materials**.

All Siskiyou RCD field crew members participated in the Annual Adult Chinook Spawning Ground Surveys & training provided by CDFG, so they were already familiar with the basics of fish ID and Redd surveys. A landowner volunteer was also present for the training and walked several surveys with the RCD.

Spawning Ground and Carcass Surveys

Stream surveys were completed by a two person field crew. A stream survey is completed by walking instream, or on the bank (to avoid disturbing redds) beginning upstream and moving downstream. Crew members walk on opposite sides of the stream, looking for redds and fish. The location of any fish, redd, or carcasses was recorded by GPS, and noted on the data sheet. In addition, flagging was hung at redds to mark for the next survey crew, preventing double counting of redds. Carcasses are processed and then chopped to prevent double counting. Tissue and scale samples were taken from a subset of carcasses, and the species, sex, fork length, and any marking recorded on the data sheet. Additionally, otoliths were collected from a subset of carcasses sampled. One member of each crew had a State of California Scientific Collection Permit.

During redd surveys, the following data was collected from redds, if it did not disturb the spawning fish: redd length, width, pott depth, and substrate composition. Substrate composition categories are: Sand (<.2 cm), small gravel (.2-5 cm), large gravel (6-9 cm), small cobble (10-13 cm), and large cobble (> 13 cm).

See **Appendix A** for sample datasheets.

Biological Sample Collection

Tissue samples were collected by clipping a one cm² piece of operculum tissue, using a hole punch. Samples were placed in absorptive paper, and placed into labeled envelopes. Scale samples were collected below the dorsal fin, but above the lateral line. Samples were collected by scraping with a knife blade in the direction from head to tail. Scale samples were placed in a labeled scale envelope. When possible, both left and right otoliths were collected using a pocket knife. The otoliths were then cleaned, dried, and placed in a labeled envelope. All samples were then provided to the California Department of Fish and Game, Yreka.

GPS data collection

Hand-held Global Positioning System (GPS) units were used to record the location of the beginning and end of each survey reach, and location of each carcass, redd, and live fish identified. However, large concentrations of redds within ten meters of each other received only one GPS point. Only carcasses which were sampled were marked, and live fish sightings were grouped. The exception to this was if the fish or carcass was found in a unique location, or beyond the upper extent previously observed. In that case a GPS point was taken.

GPS waypoints were assigned an ID based on a stream code, sequential number, and a letter code denoting carcass (C), redd (R), or live fish (F).

Ex.) F C 0 4 C = French Creek # 4 Carcass

In addition, the GPS coordinates in Lat/Long were recorded on the field data sheet, along with the ID code assigned to that datapoint. See **Appendix A** for further detail on naming conventions.

Fish ID and Mark Identification

Fish ID

Positive identification of coho salmon was a crucial step in conducting the spawning ground surveys, and the collection of the tissue and scale samples. Morgan Knechtle, CDFG, provided

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hatchery carcasses of all three species (coho, chinook, steelhead) present in the Scott River Watershed, to ensure that the crew was fully aware of key identifying features.

The following characteristics are used to identify coho salmon:

Gums: Coho salmon have white gums at the base of the teeth only, typically the rest of the gum is gray.

Spots: These spots are black in color and can vary from circular to irregularly shaped spots. Both sexes have spots on the back, dorsal fin, and upper lobe of the caudal fin, with no spots on the lower lobe.

Color: Many coho salmon, both male and female, can exhibit extremely brilliant pink to red coloration of the lower 2/3 of the body.

Kype: Both males and females can have a fairly pronounced kype

Nares: Nares are enlarged and white in coloration. This characteristic is useful in identification of live fish due to the visibility.

Caudal Peduncle: the caudal peduncle is thicker than that of a Chinook. This is most noticeable when picking up a carcass, making it difficult to hold in one hand.

Anal Fin: The anal fin of coho salmon have 12-17 rays, and the outermost rays are longer than the inner rays, which is not the case with Chinook or steelhead.

Sex: Males generally are larger, have larger hooked kypes, and brilliant pink to red coloration. To verify the sex the anal opening was squeezed to determine the presence of milt (male) or eggs (female).

Origin: Hatchery fish are identified by either the lack of an adipose fin, or by a maxillary clip. (Right maxillary clip = Trinity River Hatchery, Left maxillary clip = Iron Gate Hatchery) Adipose clipped fish have the snout removed and submitted to CDFG for coded-wire tag recovery.

Results

Run timing and duration of coho spawning.

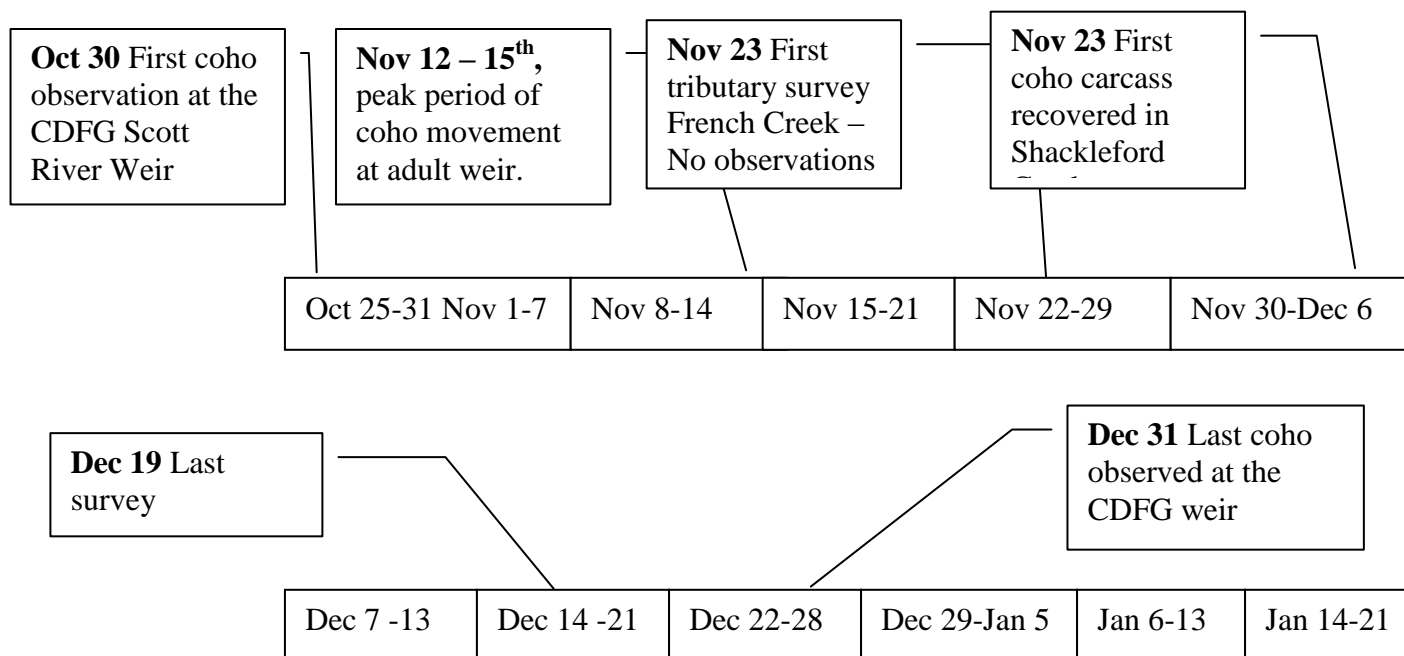


Figure I. Adult coho run timing in the Scott River – 2011-2012

Initial coho sightings

The first sighting of live coho adults in the Scott River was on October 30th, 2011, at the Scott River Weir, just upstream of Indian Scotty Campground (CDFG). By November 23rd, RCD crews had identified a coho carcass in Shackleford Creek.. The last live coho observation at the CDFG weir was on December 31st 2011. The last carcass collected was in French Creek on December 19th, 2011. The peak coho movement through the CDFG weir was observed from November 12th – 25th, with 309 of the 360 observed coho passing during this time period.

Summary

Redd Survey Results

Table II. Results by Reach, documents the redds, and carcasses identified during the survey season.

Table II. Results by Reach 2011-2012

Stream	Reach	Total Redds(a)	Total Carcasses (b)
Canyon Cr	Mouth up	1	0
Etna	Middle	0	0
French Creek	Middle	5	8
Kelsey Creek	Lower	2	0
Kidder Creek	Upper	0	0
Mill Creek	Lower	9	0
Mill Creek	Upper	0	0
Patterson	Lower	0	0
Patterson	upper/middle (index)	0	0
Scott	Tailings	1	0
Shackleford-Mill	Lower	7	2
South Fork Scott River	Upper	1	0
Sugar	Upper	0	0
Sugar Creek	Lower	0	0
Tompkins Creek	Lower	0	0
Main stem Scott River (b)	13	0	4
Main stem Scott River(b)	12	0	1
	Redd Total	26	15

a- some of the 7 redds in Shackleford-Mill were possibly Chinook redds.

b- Coho carcasses observed in main stem of Scott River during Chinook targeted surveys.

A total of 26 redds were observed during the survey season, and 15 carcasses were sampled. Very few live fish were observed during the surveys. It should be noted that some of the redds observed in Shackleford-Mill were likely Chinook. It is difficult based on timing and redd size to definitively determine which redds were which species. This reach typically has Chinook and coho overlap in spawning in years when flows are sufficient to reconnect Shackleford Creek to the Scott River during coho spawning. See **Map 2** for redds observed during the 2011 survey season.

Table II and **Map 3** show the redds per mile for each survey reach where coho were observed. Similar to previous years, the highest spawning density was observed in lower Shackleford and Lower Mill Creek (See **Appendix B** for 2008 data). After that the highest spawning density was observed in lower and French Creek.

Map 2. 2011-2012 Coho Redd Observations

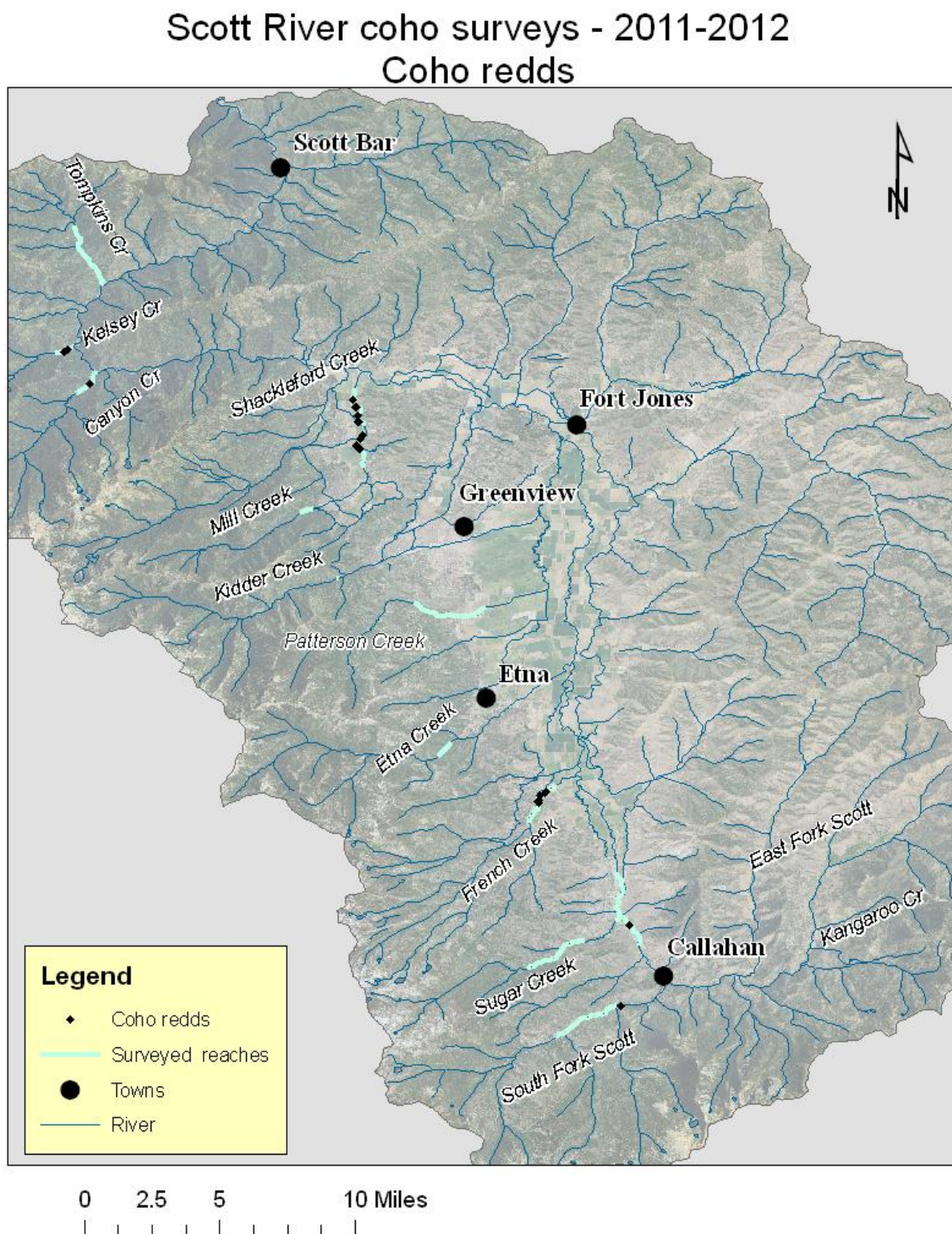
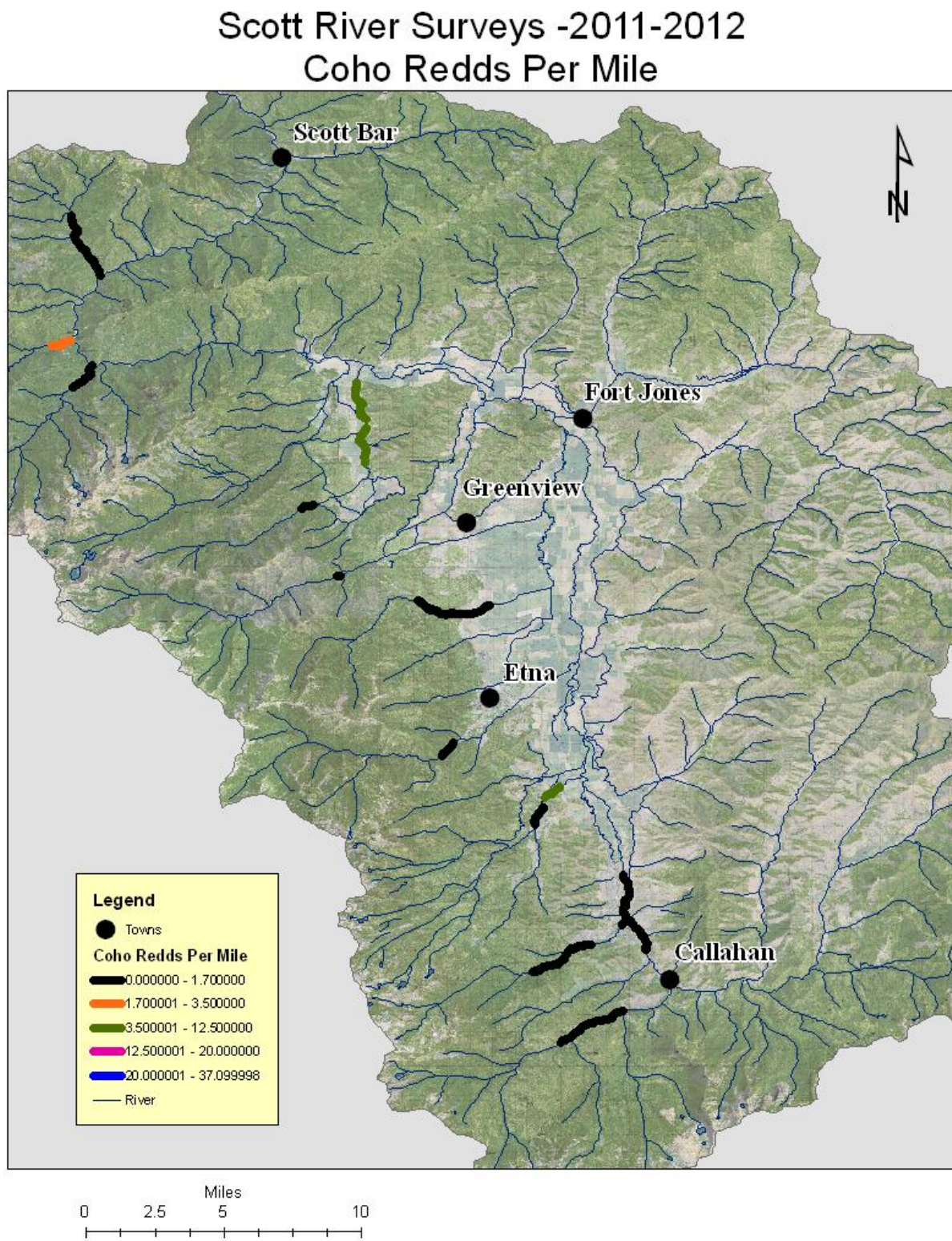


Table III. Redds by Mile for Each Reach.

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Map 3. Redds Per Mile



Flow Conditions

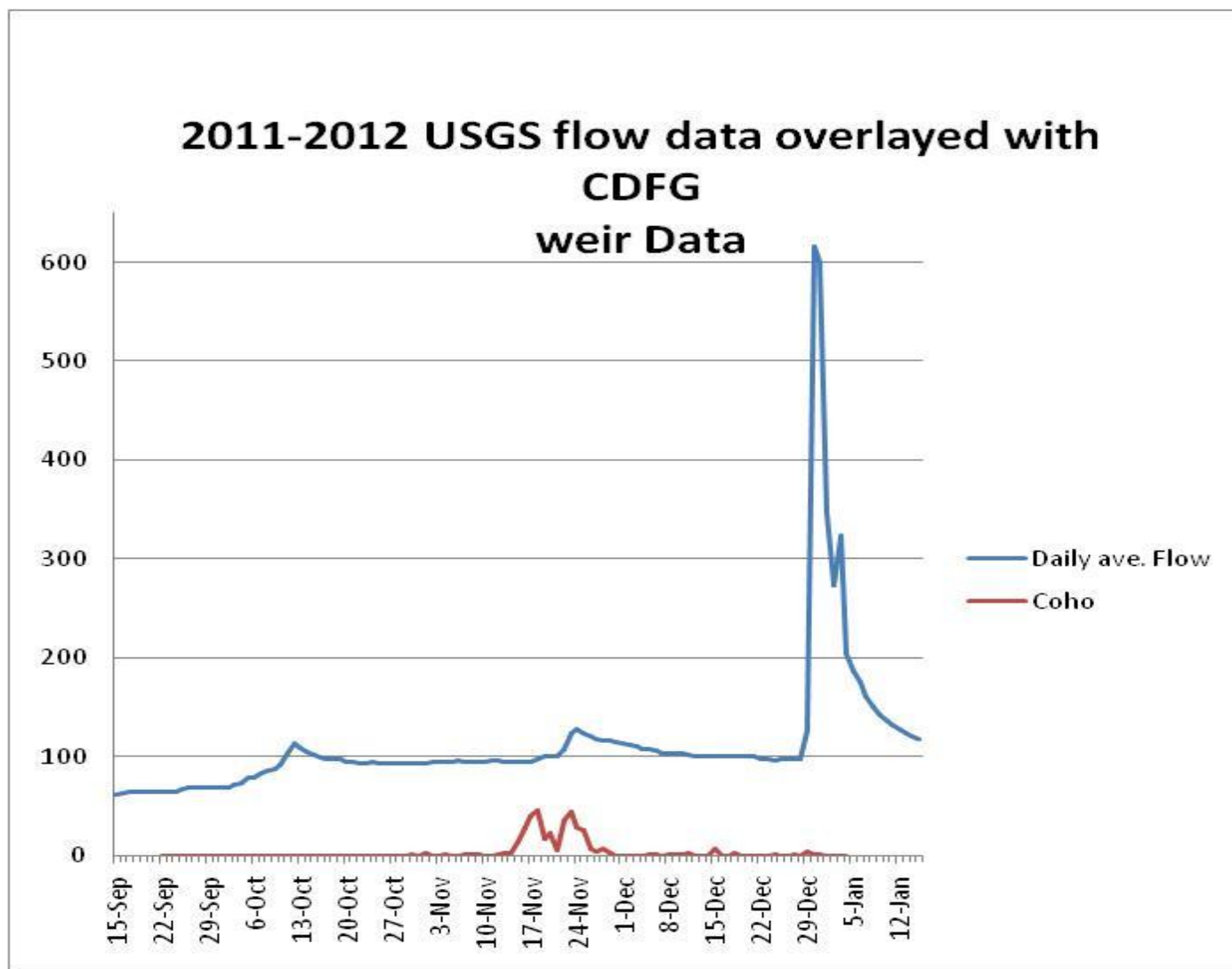


Figure II. Streamflow at USGS gauge during survey period, and coho migration at the CDFG weir. (Note: USGS data is preliminary only.)

Figure II. Shows the relationship between flow events and coho migrations. Coho clearly migrated upstream when there are “pulses” of water movement. This migration pattern was observed in 2009-2010 as well (M Knechtle, CDFG). The largest migration of coho was observed in mid to late November.

Biological Sample Collection

A total of 15 coho carcasses were recovered in the Scott River Watershed. Of those identified, six (6) were male and nine (9) were female. Tissue, scale and otolith samples were taken from each carcass recovered. All samples were submitted to Morgan Knechtle (CDFG- Yreka).

Table IV. Carcass Details contains data for each carcass sampled by the RCD 2011-2012.

Date	Stream	Reach	Lat	Long	species	Sex	forklength	clips	Scale	Tissue	otolith	collector
11/30/2011	Shackleford-mill	Lower	41.6097	122.96354	coho	F	62	n	y	y	y	Tom Franklin
11/30/2011	Shackleford-mill	Lower	41.6141	122.96504	coho	M	81	n	y	y	y	Tom Franklin
11/30/2011	Mill	Lower	41.594	122.96377	Chinook	M	38	n	y	y	y	Tom Franklin
12/8/2011	Scott	14	41.443	122.85493	coho	F	69	n	y	y	y	Tom Franklin
12/1/2011	Scott	Reach 13	41 28.631	122 50.736	coho	M	78	n	y	y	y	Tom Franklin
12/8/2011	Scott	Reach 13	41 27.926	122 50.863	coho	m	85	n	y	y	y	Tom Franklin
12/8/2011	Scott	Reach 13	41 28.420	122 50.933	coho	f	71	n	y	y	y	Tom Franklin
12/15/2011	French	Mid	41.409	122.86236	coho	M	76	n	y	y	y	Tom Franklin
12/15/2011	French	Mid	41.4066	122.86598	coho	M	68	n	y	y	y	Tom Franklin
12/15/2011	French	Mid	41.4077	122.86416	coho	F	71	n	y	y	y	Tom Franklin
12/15/2011	French	Mid	41.409	122.86236	coho	F	68	n	y	y	y	Tom Franklin
12/15/2011	French	Mid	41.4033	122.86717	coho	F	70	n	y	y	y	Tom Franklin
12/15/2011	French	Mid	41.4033	122.86717	coho	F	66	n	y	y	y	Tom Franklin
12/15/2011	French	Mid	41.4041	122.86655	coho	F	70	n	y	y	y	Tom Franklin
12/19/2011	French	Mid	41.4008	122.86735	coho	f	67	n	y	y	y	Tom Franklin

CDFG Scott River Weir

Since the fall of 2007, the California Department of Fish and Game (CDFG) has operated a weir and camera flume just upstream of Indian Scotty campground. Recording began on 09/23/2011 and the first coho was recorded on 10/30/2011. The last coho was recorded migrating past the weir on 12/31/2011. The weir was removed on 01/01/2012. The preliminary total count of coho observed at the weir stands at 360 (Pers. Comm. Morgan Knechtle, CDFG). The peak movement through the weir was observed from November 12th – 25th, with 309 of the 360 (85.6%) coho passing through at this time.

Discussion

Run Timing and Duration

Data collected from spawning ground surveys and the CDFG weir during this period indicates that the run timing is very similar from year to year. Coho appear to enter the Scott River system as early as flows will allow. Flows were low throughout the spawning season, and coho distributed throughout the watershed where there was access. Migration and spawning appears to be mostly completed by the last week of December

Coho Spawning Distribution

During the 2011 spawning season, coho were observed only in tributaries where they have previously been documented. Key tributaries (ie Patterson & Kidder) did not appear to have spawning, due to low flows throughout the season preventing access. No effort was made during this survey season to identify new spawning reaches. Based on this year and previous year's information, coho appear to distribute throughout the watershed based upon flow conditions.

The highest spawning densities were observed in Lower Mill, Lower Shackleford, Kelsey Creek, and Lower French. These locations all provide both quality spawning habitat and quality rearing habitat. (Quigley 2003, Yokel 2006)

References

California Data Exchange Center – Flow data for Shackleford and French Cr.

<http://cdec.water.ca.gov/cgi-progs/queryF?s=FCC>

<http://cdec.water.ca.gov/cgi-progs/queryF?s=SCK>

United States Geological Survey – Flow data for Fort Jones Gauge

http://waterdata.usgs.gov/ca/nwis/uv/?site_no=11519500

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Appendix B

Coho redds per mile - 2004 - 05

Reach	Length (mi.)	# Redds	Redds/mile
Upper Mill Creek (Scott Bar Mill)	0.7	0	0.0
Upper Thompkins Creek	1.0	0	0.0
Middle Creek	0.4	0	0.0
Boulder Creek	0.2	0	0.0
Middle Etna (above Etna Diversion)	1.6	0	0.0
East Fork - below Grouse Creek	0.6	0	0.0
Upper Kidder Creek	0.5	0	0.0
Grouse Creek	0.6	0	0.0
East Fork - below Rail	5.1	1	0.2
Wildcat Creek	2.0	1	0.5
Upper French Creek - N. Fork to Miners	1.0	1	1.0
Kelsey Creek	0.6	1	1.7
Canyon Creek	1.1	2	1.8
Upper French Creek - Horse Range Cr	0.5	2	4.0
Lower Thompkins Creek	1.8	8	4.4
Middle Etna	1.0	7	7.0
Scott River - Tailings	2.8	21	7.6
South Fork	1.9	15	7.9
Upper Mill Creek (Shackleford)	0.5	5	10.0
Middle Patterson	1.6	19	11.9
Mid Sugar Creek	2.1	26	12.4
Upper Patterson	0.3	6	20.0
East Fork - above Grouse Creek	1.1	23	20.0
Lower Etna Creek	2.3	50	22.2
Lower French Creek	0.6	20	28.6
Mid French Creek	1.6	49	30.1
Shackleford Creek	2.2	76	34.5
Lower Mill Creek (Scott Bar Mill)	0.4	15	37.5
Miners Creek	0.9	43	47.8
Lower Kidder Creek	1.1	56	50.9
Lower Sugar Creek	0.3	26	86.7
Lower Mill Creek (Shackleford)	1.4	127	90.7
Lower Patterson	1.3	232	178.5

Coho redds per mile - 2007 - 08

Reach	Length (mi.)	# Redds	Redds/mile
Upper Mill Creek (Scott Bar Mill)	0.6	0	0.0
Upper Thompkins Creek	1.3	0	0.0
Lower Thompkins Creek	0.5	0	0.0
Middle Creek	0.3	0	0.0
Boulder Creek	0.2	0	0.0
Middle Etna (above Etna Diversion)	2.2	0	0.0
Middle Miners Creek	1.1	0	0.0
Middle Sugar Creek	2.1	0	0.0
Grouse Creek	0.9	0	0.0
East Fork below Rail Cr.	2.6	2	0.8
Upper French Cr. - Horse Range Cr.	0.7	1	1.5
East Fork below Grouse Cr.	0.6	1	1.6
Canyon Creek	0.9	2	2.3
Lower South Fork Scott River	0.4	1	2.6
Scott River - Tailings	3.1	8	2.6
Upper French Creek - N. Fork to Miners	1.0	3	2.9
Lower Mill Creek (Scott Bar Mill)	0.3	1	3.1
Kelsey Creek	0.6	2	3.2
Lower Kidder Creek	1.3	5	3.7
Wildcat Creek	0.8	3	4.0
Upper Mill Creek (Shackleford)	0.9	4	4.6
Lower Patterson	1.1	5	4.7
South Fork Scott River	2.5	16	6.3
Middle Etna (below Etna Diversion)	0.7	5	7.5
Lower Miners Creek	0.9	7	7.8
Shackleford Creek	0.3	3	10.0
Upper Kidder Creek	0.2	2	10.3
Mid French Creek	1.0	10	10.4
Lower Sugar Creek	0.3	3	11.3
Lower Patterson Creek	0.4	5	12.3
Lower French Creek	0.6	9	13.8
East Fork above Grouse Creek	1.1	16	14.2
Mid French Creek	0.6	10	15.6
Middle Patterson Creek	1.7	27	15.7
Shackleford Creek	2.3	39	16.6
Upper Patterson Creek	0.3	9	30.2
Lower Mill Creek (Shackleford)	1.4	57	40.7

Scott River Adult Coho Spawning Ground Surveys 2011-2012

Redds per mile 2008-2009

Name	Length (miles)	No_Redds	Redds_per_mile
Upper Scott Bar Mill Creek	0.60	0	0.00
Lower Scott Bar Mill Creek	0.35	1	2.90
Upper Thompkins Creek	1.35	0	0.00
Lower Thompkins Creek	0.46	0	0.00
Middle Creek	0.31	0	0.00
Kelsey Creek	0.62	2	3.23
Canyon Creek	0.88	2	2.27
Boulder Creek	0.16	0	0.00
Upper Mill Creek	0.87	4	4.60
Lower Mill Creek	1.40	57	40.71
Shackleford Creek	2.35	39	16.60
Upper Kidder Creek	0.19	2	10.50
Lower Kidder Creek	1.34	5	3.73
Upper Patterson	0.30	9	30.00
Middle Patterson - above HWY3	1.72	27	15.70
Lower Patterson - below HWY3	0.41	5	12.30
Lower Patterson	1.06	5	4.72
Middle Etna - above Etna Diversion	2.22	0	0.00
Middle Etna - below Etna Diversion	0.67	5	7.46
Upper French Cr. - Paynes Creek Area	0.69	1	1.45
Upper French Cr. - Below North Fork	1.04	3	2.88
Mid French Creek	0.96	10	10.40
Mid French Creek	0.64	10	15.63
Lower French Creek	0.65	9	13.85
Miners Creek	1.06	0	0.00
Miners Creek	0.90	7	7.78
Mid Sugar Creek	2.08	0	0.00
Lower Sugar Creek	0.27	3	11.10
Wildcat Creek	0.75	3	4.00
Scott River - Tailings	3.07	8	2.61
South Fork Scott River	2.54	16	6.30
Lower South Fork Scott River	0.38	1	2.63
East Fork - Above Kangaroo Cr.	2.62	2	0.76
East Fork - Above Grouse Cr.	1.15	16	13.90
East Fork - Below Grouse Cr.	0.63	1	1.59
Grouse Creek	0.88	0	0.00

Scott River Adult Coho Spawning Ground Surveys 2011-2012

Redds per mile 2010-2011

Stream	Reach	Distance (miles)	Number Redds	Redds per Mile
East Fork Scott River	Below Grouse	0.5	0	0
French Creek	Horse Range	0.7	0	0.0
Kidder Creek	Gage Site	Spot	1	NA
Sugar Creek	Upper	2.1	1	0.5
South Fork Scott River	Middle	2.2	1	0.5
Canyon Creek	Mouth to Mauer	1.1	1	0.9
Scott River	Tailings	3.1	3	1.0
Tompkins Creek	Mouth to Potato Flat	2.6	3	1.2
East Fork Scott River	Newton	4.8	8	1.7
Mill Creek	Middle	1.7	4	2.4
Patterson Creek	Hayden	0.8	2	2.5
Kangaroo Creek	Newton	0.8	2	2.5
Mill Creek	Upper	0.4	1	2.5
Patterson	Middle	0.7	2	2.9
Kidder Creek	Below HWY3	1.3	4	3.1
Patterson Creek	Upper	0.3	1	3.3
Patterson	Middle	1.7	6	3.5
East Fork	Above Grouse	1.1	7	6.4
Etna Creek	Diversion Dam Down	0.6	4	6.7
Kelsey	Mouth to falls	0.6	5	8.3
French Creek	Middle	0.6	6	10.0
Sugar Creek	Lower	0.3	3	10.0
Rail Creek	Newton	0.2	2	10.0
French Creek	Middle	0.8	10	12.5
Sugar Creek	Gozzarino	0.3	5	16.7
Shackleford Creek	Mill Creek Down	1.6	32	20.0
Mill Creek	Lower	1.4	52	37.1