

Scott River Adult Coho Spawning Ground Surveys 2013-2014 Season



Dec 11, 2013 looking north from the Fay Lane Bridge.

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Abstract

Adult coho salmon spawning ground surveys were conducted between November 20th, 2013 and January 27th 2014. However, low flow conditions in the Scott River throughout the spawning season created temporal and spatial overlap of Chinook and coho spawning. Coho were observed spawning in the Scott River at various locations between November 21st 2013 and February 7th 2014 (pers. Comm Morgan Knechtle, landowner observations).

Heavy rains and run-off, beginning February 11th 2014, temporarily raised the river conditions to levels unsafe to survey, and likely washed any remaining carcasses out of the system. It appears that the redds were not destroyed, as dives completed by CDFW staff on April 10th, 2014 observed coho fry emerging in the vicinity of French Creek.

The 2013 Water Year was classified as a Dry Water Year, following a similar Dry Water Year in 2012. Similar to what was observed in 2009, low flow conditions confined coho spawning primarily to the Scott River Mainstem, with the exception of documented spawning in Shackleford and French Creek. Spawning was documented in Chinook Spawning Ground Survey reaches 8, and 12-15. The Scott River was dry upstream of reach 15, and no surveys were completed between Reach 8 and 12 (Etna Creek to Shackleford Creek). Based on total adult observations at the weir it is expected that some spawning must have occurred in reaches 9-11. . Of the 454 documented redds, 97% of the spawning occurred in the mainstem Scott river, although this accounts for only approximately 27% of the live coho observations through counting weir. Superimposition of redds was observed in most locations, so the actual count of spawning adults is likely higher. Spawning was observed in a total of two tributary locations: French Creek and Shackleford Creek. These locations are the same reaches where coho salmon have been observed spawning annually since 2001. French Creek and Shackleford Creek were the only tributary locations accessible to salmonids during much of the spawning season.

Preliminary data from the California Department of Fish and Game (CDFG) video weir showed a total of 2731 adult coho passing through the video weir. A total of 231 carcasses were sampled by RCD and CDFW staff.

Acknowledgements

The following entities cooperated in the survey effort this year:

California Dept. of Fish & Wildlife

Siskiyou Resource Conservation District

United States Fish and Wildlife Service

United States Forest Service

Scott Valley Landowners

Northern California Resource Center

The following individuals provided assistance in the spawning ground survey effort:

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Adam Robinson-Northern California Resource Center

Jim Morris

Introduction

The Southern Oregon Northern California Coastal (SONCC) coho salmon (*Oncorhynchus kisutch*) are endemic to the Scott River system. In the Klamath River Basin, the Southern Oregon-Northern California Coast coho salmon evolutionarily significant unit (ESU) was federally 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 when the Klamath National Forest triggered the initial project in anticipation of an exceptional coho run (Maurer 2002). These surveys began as a cooperative effort among 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.

In addition to spawning ground surveys, the California Department of Fish and Wildlife installed an adult video weir at River Mile 18 in 2007. The video weir provides escapement numbers for the Scott Valley. The escapement estimates provided by the video weir are an important informational complement to the distribution data collected during the spawning ground surveys.

The past twelve years of population and distribution data have shown that adult returns to the Scott River have ranged from 62 to 2,731 (2013) adults and 7 to 728 redds documented. However, the Spawning Ground Surveys do not cover all potential spawning habitat and it is likely that actual redd numbers are higher. Similar to the rest of the SONCC, the Scott River has one stronger brood year and two weaker brood years. The coho returns documented in this report represent the stronger brood year.

Information on spawning distribution collected during the annual surveys has been utilized to plan and prioritize restoration and protection activities (eg fish screens, fencing, instream projects, and surface water management). In addition, information collected during these

surveys can help identify potential habitat restoration projects for the Siskiyou Resource Conservation District (RCD), private and public landowners and cooperators. This data is also used by the Scott River Water Trust to prioritize water lease transactions.

The Scott River Water Trust (Water Trust) is a nonprofit organization that seeks to voluntarily increase stream flow in critical stream reaches to improve conditions for rearing salmonids including SONCC coho salmon. Information gathered during this effort helps to inform the Water Trust on the locations where SONCC coho salmon spawn and are therefore likely to rear during the summer. The Water Trust can then target those locations that are likely to be negatively affected by low flow conditions through voluntary leases of water from current water right holders to improve rearing conditions for salmonids

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 set of scale samples to better 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.
- 6.) Through the identification of 2013-2014 coho spawning areas, inform the Scott River Water Trust of the potential locations where coho juveniles may be found to help prioritize water lease locations for the 2014summer.
- 7.) Identify Key reaches utilized annually by coho salmon for restoration and enhancement activities.

BACKGROUND

Coho Population Expectations:

Coho Salmon Populations in the SONCC show a trend of two “weak” brood years and one relatively stronger brood year. Coho salmon populations in the Scott River Watershed show this trend as well (NOAA 2012). Redd counts collected during spawning ground surveys since 2001 show this trend. The brood year documented in 2001, and every third year thereafter, is considered the “stronger” brood year. The 2013-2014 coho brood year represents the return of the “strong” brood years in the Scott River, this brood year has the longest datasets in the Scott River for both spawning ground survey and the migrant weir. Table I. shows redd counts for all years since they were implemented in 2001 and live counts through the video weir operated by the California Department of Fish and Wildlife.

Table I. Coho observations for the all Brood Years.

Year	Total Redds	Total Live through Video Weir.
2001*	211	ND
2002*	17	ND
2003	7	ND
2004	728	ND
2005	30	ND
2006	12	ND
2007	250	1622
2008	24	62
2009	6	81
2010	160	911
2011	26	344
2012	24	201
2013	354 ^a	2731

*Survey reaches were expanded (more distance added) in 2003 so 2001 and 2002 data are not directly comparable.

a-superimposition of coho redds was observed in all locations, along with some superimposition of coho redds on chinook redds..

Streamflow and coho salmon migration

In previous years, coho salmon have been observed spawning in the Scott River watershed directly following the first significant rainfall event. During the fall of 2013 there was significant rainfall and runoff that occurred on Sept 30 –Oct 1st. The first live coho observation was

October 21st at the CDFW counting weir. The next significant change in flows occurred around November 22nd, after which no rainfall occurred until the end of January.

Coho migration was observed following the increase in flows on November 22nd, and migration followed a steady pattern until dropping to zero observed from 1/16/2014 until the weir was discontinued on 1/26/2014. See Figure II (page 17) for documented migration through the counting weir compared to flows.

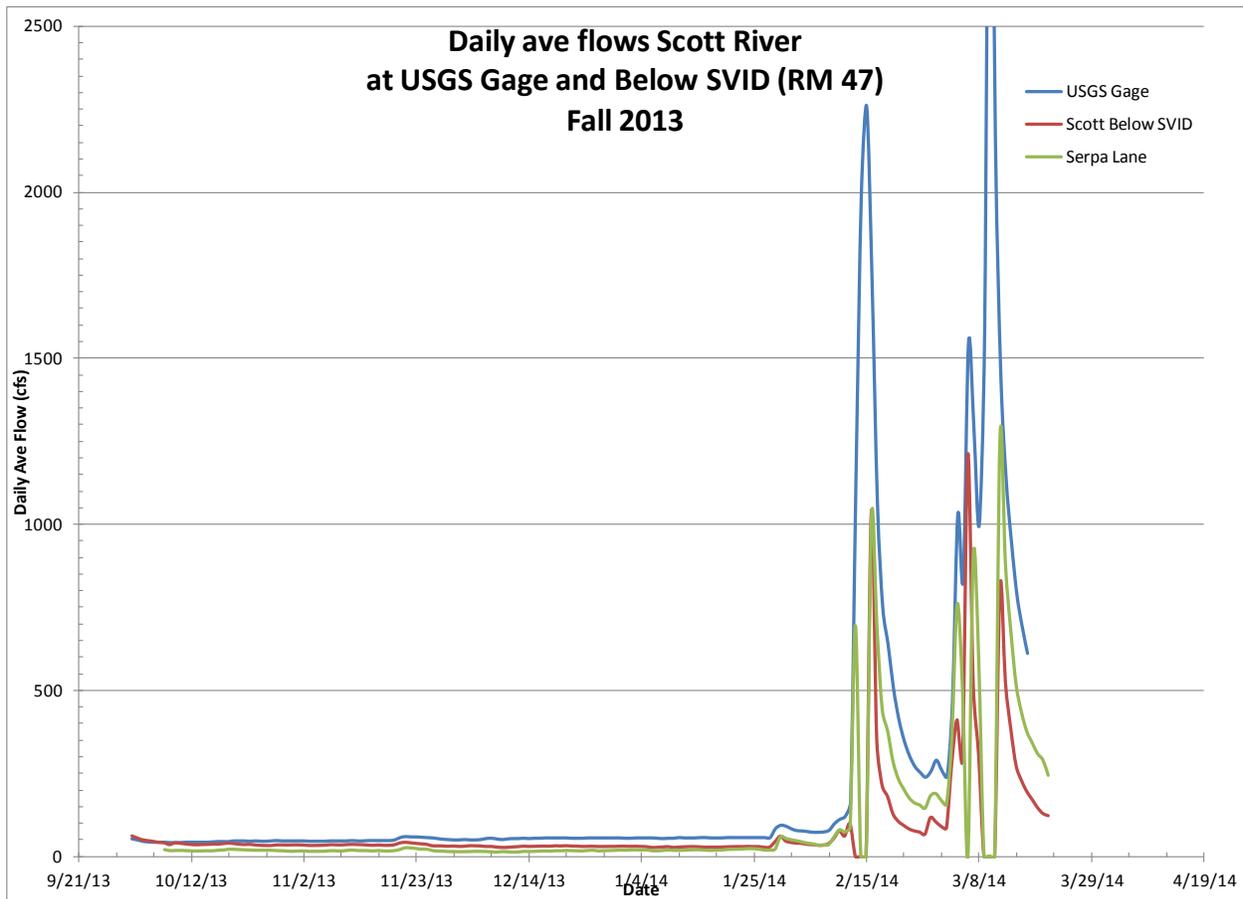


Figure I. Fall Flows in the Scott River and tributaries prior to and during the survey period.

http://waterdata.usgs.gov/nwis/uv/?site_no=11519500&agency_cd=USGS all data preliminary.

METHODS

Project Location

The 2013-2014 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.

Crew training

Crew training was organized by California Dept. of Fish and Game (CDFG) and the Siskiyou RCD. Training was held on November 6th, 2013 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.

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 marked with the date was hung at each redd encountered, to inform subsequent survey crews that this redd location had already been sampled. This strategy reduced the potential for double counting redds over the duration of the survey.

Tissue, otolith and scale samples were taken from all carcasses, and the species, sex, fork length, and any marking recorded on the data sheet.

During redd surveys, the following data was collected from redds, if it did not disturb the spawning fish: redd length, width, pot 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.

Survey Locations

Adult coho spawning ground surveys were completed in the following tributaries to the Scott River: French-Miners Creek, Shackleford-Mill Creek, Kelsey Creek, Canyon Creek, and Tompkins Creek. Adult coho spawning ground surveys were completed in the mainstem Scott River on reaches 8, and 12 -15. Streams not surveyed in 2013-2014, due to lack of flows sufficient to provide connectivity, include: South Fork Scott River, Etna, Kidder, Upper Shackleford, East Fork Scott River, Moffett Creek, Indian Creek, Patterson Creek (Fort Jones), Rattlesnake Creek, Wildcat Creek, Rail Creek, and Kangaroo Creek. Scott Bar-Mill was not surveyed due to lack of permission to access the property.

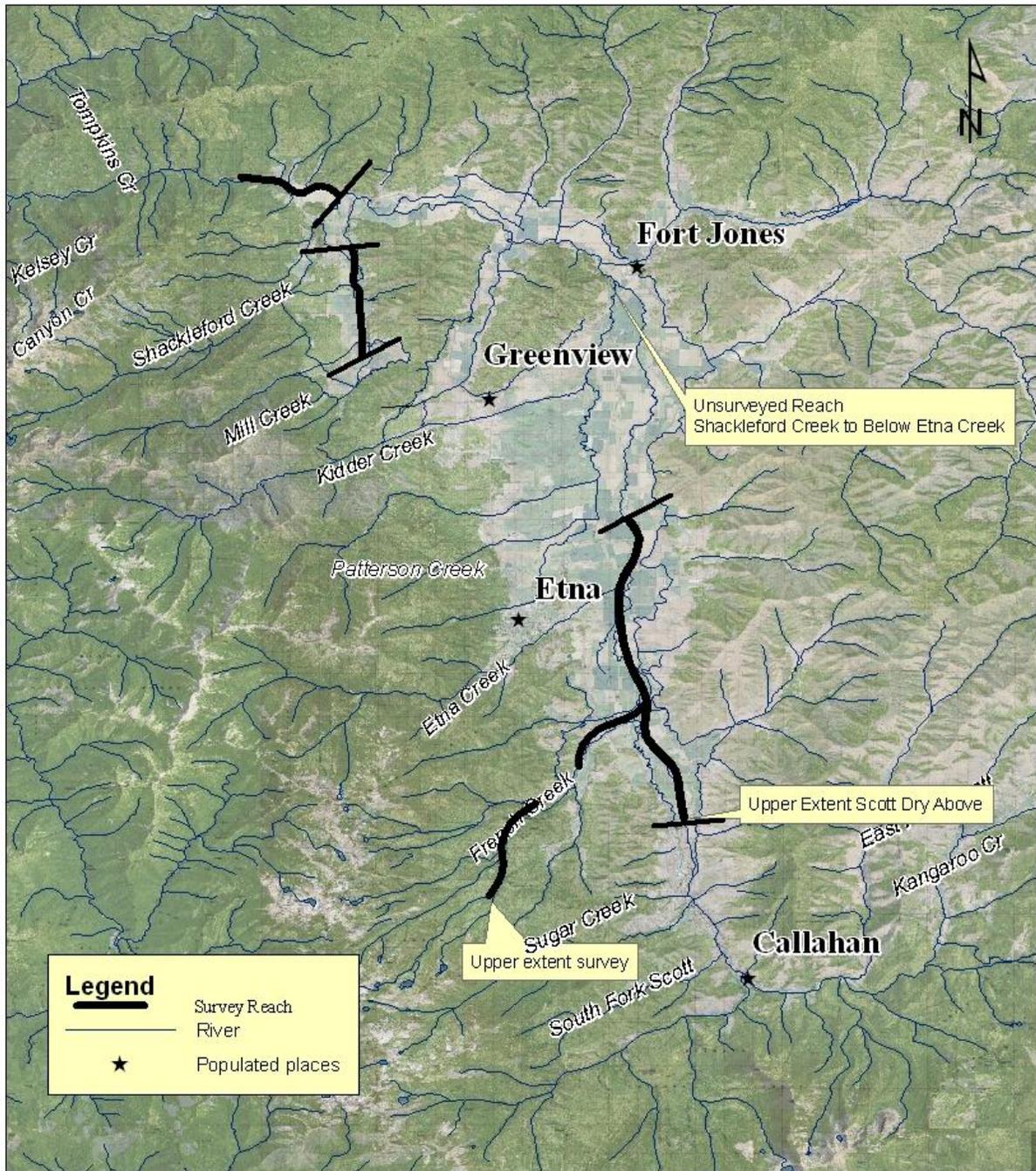
The East Fork, South Fork and Sugar Creek connected after a significant rain event on February 14th, 2014. It is possible that a few coho at the tail end of the run could have moved into those locations after the rain event.

Table II. Survey Reach Descriptions depicts all stream reaches surveyed since 2001, and indicates which reaches were surveyed in 2013-2014 by whom, the number of surveys, and the total miles surveyed. 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 2013-2014.

Table II. Survey Reaches

Reach	Description	Total Surveys
Canyon Creek	Mouth to Maurer	5
Duck Lake Creek		Once
Kelsey Creek		5
Lower French Creek	Mouth to Miners Creek	9
Upper French	North Fork to Duck Lake	Once
Scott 2		Once
Scott 3		Once
Scott 8		5
Scott 12	Bottom of Morris to Etna Creek	7
Scott 13	Horn Lane to Etna Creek	7
Scott 14	SVID to Horn	5
Scott 15	Fay Lane to SVID	5
Scott Above Fay	Above Fay lane to top of Barnes	3
Shackleford Creek	Mill Confluence to Bridge.	Once
Tompkins Creek		Once

Scott River coho surveys - 2013 Survey Reaches



0 2 4 8 Miles

Cartography Siskiyou RCD

Map 1. Spawning Ground Survey Reaches 2013-2014

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 clean with a knife blade in the direction from head to tail, then removing scales by scraping tail to head.. 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, in 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.

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.

Boulder Cr. (South Fork)	BO	Mill Cr. (Scott Bar)	SB
Boulder Cr.(Scott)	BS	Mill Creek	ML
Canyon Cr.	CA	Miners Cr.	MI
Clark Cr.	CL	Moffet Creek	MO
East Fork Scott	EF	North Fork French	NF
Emigrant Creek	EM	Patterson Creek (Scott)	PS
Etna Cr.	ET	Patterson Creek(Etna)	PA
French Cr.	FR	Rattlesnake Cr.	RA
Grouse Creek	GR	Ruffy Gap Trib	RU
Horse Range Cr.	HR	Shackleford	SH
Indian Creek	IN	Shackleford-Mill	SM
Johnson Creek	JO	South Fork Scott	SF
Kangaroo Cr.	KA	Sugar Creek	SU
Kelsey Channel	KC	Tompkins Creek	TO
Kelsey Creek	KE	Wildcat Cr.	WI
Kidder Creek	KI	Wooliver	WO
McAdams Cr.	MC	Scott River Tailings	TA
Meamber Gulch	ME	Scott River Chinook Reach	S## (Example – S08 =
Middle Creek	MI	Scott Reach 8)	

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 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

Survey Timing

Mainstem Spawning

Adult coho salmon spawning ground surveys were conducted between November 20th, 2013 and January 27th, 2014. The first live coho were observed passing through the CDFW counting weir on October 21st, 2013, and the first redd observation was November 21st, 2013 in the mainstem Scott River (during Fall Chinook Surveys). Fall Chinook Surveys were conducted in the mainstem Scott River from October until December 16th, 2013. At this point it was observed that chinook were no longer spawning and coho were starting to be observed, with the first coho redd documented on December 5th, 2013. The Scott River was connected up to RM 53 but dry through the tailings reach January 2014. This disconnection prevented coho access to Sugar Creek, the South Fork, and the East Fork Scott River, until after February 14th, 2014.

Water Year Conditions

Tributary connectivity and access for coho spawning.

The extended drought conditions during the fall of 2013 prevented access into most Valley tributaries to the Scott River. The canyon tributaries: Canyon Creek, Kelsey Creek, and Tompkins Creek do not typically experience connectivity problems, however flows were extremely low during the fall of 2013 and no coho were observed in those tributaries during spawning ground surveys. French Creek was connected to the Scott River throughout the spawning season. However the extreme low flows, and low flow barriers appear to have prevented salmon from spawning anywhere other than the lower ¼ mile of the Creek. The only other tributary to connect prior to the rainfall in February was Shackleford Creek. Flow conditions did not allow coho to access Shackleford-Mill Creek until November 22, 2013, after which Shackleford Creek was connected for approximately two days. This allowed for a few fish to access Shackleford Creek for spawning, but was prior to most of the observed migration through the video weir (Figure II.)

Run timing and duration of coho spawning.

Initial coho sightings

The first sighting of live coho adults in the Scott River occurred on October 21st, 2013, at the Scott River CDFG Video Weir, just upstream of Indian Scotty Campground at river mile 18 (Knechtle 2013). The Video Weir was first installed in 2007 to provide escapement estimates for chinook and coho spawners returning to the Scott River Valley. The weir complements the spawning ground surveys by providing escapement estimates for the Scott River above River Mile 18. However, the weir does not capture the escapement for the entire Scott River, as it is located upstream of potential coho habitat in Canyon Creek, Kelsey Creek, Tompkins Creek and Lower Mill Creek.

The first redd was observed on November 21st, 2013 during the Fall Chinook Surveys. RCD crews identified the first coho redd in Shackleford-Mill Creek on November 26th, 2013, and the first coho redd observation in French-Miners Creek on December 4th, 2013. Coho were observed spawning in the mainstem Scott River on December 5th, 2013

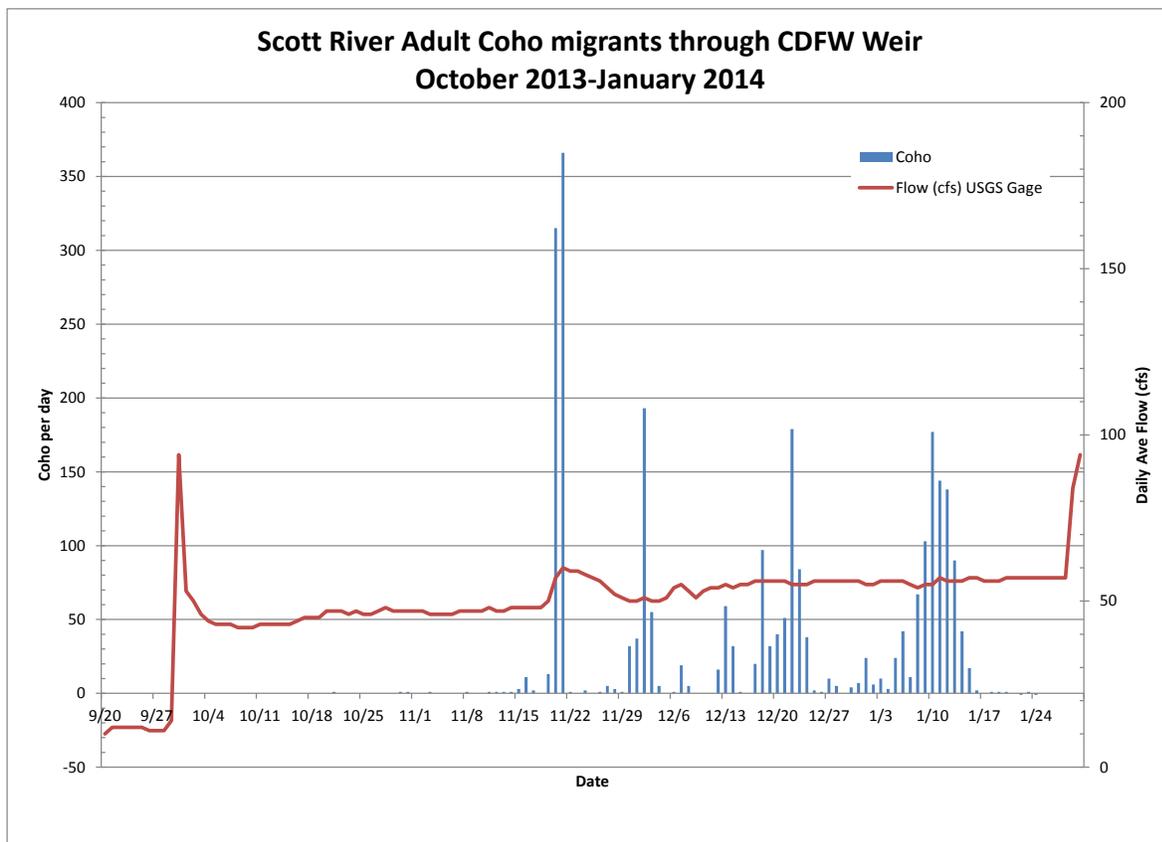


Figure II. Streamflow at USGS gauge during survey period, and coho migration at the CDFG weir. (Note: USGS data is preliminary only.)

Figure II. Shows the relationship between flow events and coho migrations. Observations from past coho survey efforts have shown that coho clearly migrate upstream when there are “pulses” of water movement. This migration pattern was observed in 2009-2010, and 2011-2012 (M. Knechtle, personal communication, CDFG). This migration pattern was partially observed in 2013. The largest pulse of coho movement was directly following the increased flows on November 22nd, 2013. Figure II also shows coho were migrating through the CDFW adult counting weir in the absence of a pulse flow events during the remainder of the season.

Upper Extent Surveys

The lack of connectivity in the Scott River Watershed prevented the opportunity to complete upper extent surveys in the various tributaries to the Scott River. French Creek was the only location connected through-out the spawning season. On December 20th, 2013 effort was made to identify the upper extent of coho spawning. Surveys were completed in upper French Creek and upper Duck Lake. No fish or redds were observed.

Redd Survey Results:

Mainstem Scott River

Adult Chinook surveys were completed from October 15th until early December 2013, during which multiple live coho observation and redds were documented. Live coho and coho redds were documented in reaches 6 (below the counting weir) , 8, and 12-15 of the Fall Chinook surveys. The first coho spawning was observed on November 21st, 2013 and continued through mid-February 2014. The majority of the coho spawning occurred in reaches 12-15 of the Scott River (Etna Creek to Fay Lane).

Tributary Observations

During the 2013 survey season, coho salmon redds were observed in two tributaries of the Scott River: French Creek, and Shackleford Creek. Spawning observed in French Creek was much lower than anticipated, based on the strong brood year. This is potentially due in part to a series of beaver dams along the lower mile, which may have been partial barriers during the low flow events. In addition, the extreme low flows in French Creek without significant pulse flow events may not have attracted coho into French Creek. In addition, French Creek was significantly frozen over until late December, at which point the majority of the spawner had migrated into the system. In contrast, the Scott River was not frozen over during this time period. During extreme low flows groundwater and hyporeic flow can have a greater impact on mainstem temperatures.. See Figure III. for Scott River water temperature data.

During the Spawning season there was insufficient rainfall to reconnect the Scott River through the tailings. It unlikely that spawning occurred in the East Fork, South Fork or Sugar Creek as they were not connected to the Scott River until after February 14th, 2014.

Scott River Adult Coho Spawning Ground Surveys 2013-2014



Scott River at Horn Lane, Dec 11, 2013



French Creek at Hwy 3 Dec 11, 2013



French Creek near the North Fork French Creek, Dec 11, 2013

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

Table III. Results by Reach 2013-2014-

Reach	Redds	% total
8	46	13%
12 & 13 combined	92	27%
14	98	29%
15	100	29%
Above 15	7	2%
Mainstem Total	343	
Shackleford-Mill	2	
French	9	
Total Redds	354	

Scott River Adult Coho Spawning Ground Surveys 2013-2014

A total of 354 redds were observed during the survey season, and 239 carcasses were sampled. However, it is likely the actual number of redds was higher than the count for two reasons; 1.) Significant superimposition was observed in reaches 12-15; and 2.) The ~15 miles of unsurveyed river between reaches 8 and 12 likely received some spawning. However, as the image below shows, this reach of the Scott River is sand dominated and does not have the substrate and habitat complexity suitable for spawning and rearing.

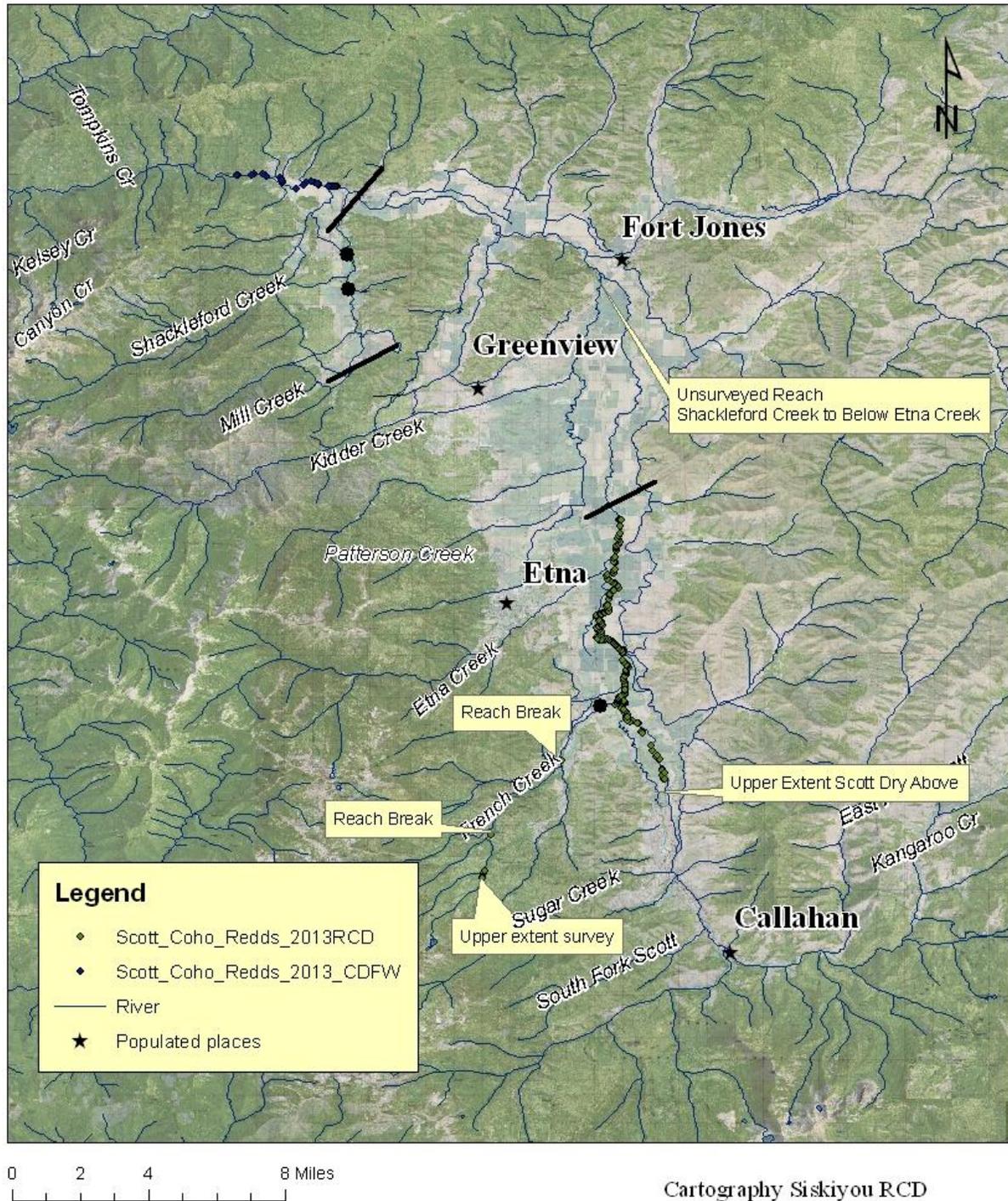
California Department of Fish and Wildlife staff began juvenile fish dives in the Scott River, near French Creek on April 10, 2014. These dives have observed both young of the year coho and Chinook in the Scott River near French Creek. The emergence for coho is slightly earlier than previously anticipated. This is due to the Scott River being warmer than the tributaries during winter conditions. See Figure III. below for water temperature data.



Image by Mel Fletcher

See **Map II.** for redds observed during the 2013-2014 survey season.

Scott River coho surveys - 2013 Coho redds



Map II. Coho Redd observations 2013-2014.

Water temperature data and thermal unit calculations

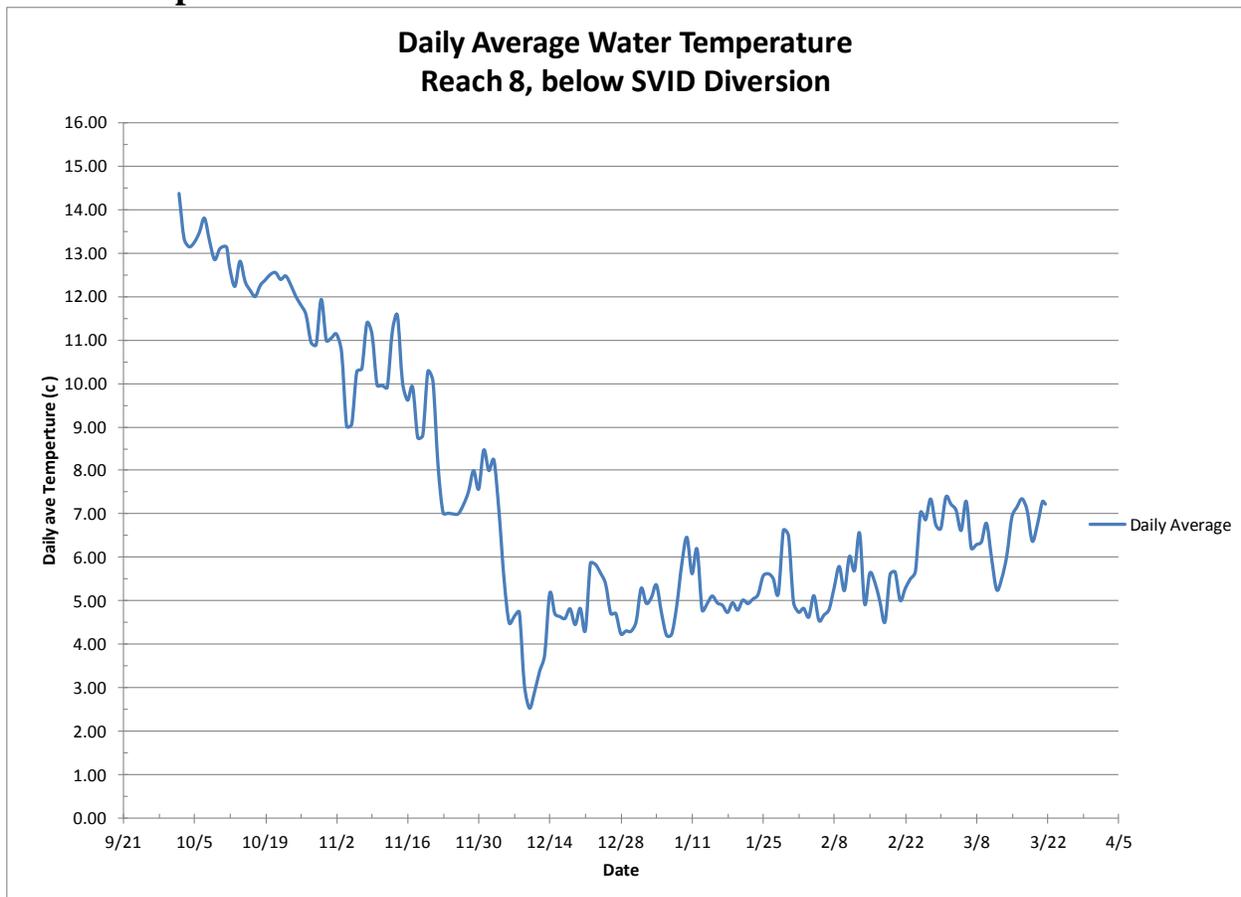


Figure III. Water Temperature data in the Scott River at Rive Mile 47, downstream of SVID.

In order to determine when coho fry might begin emerging, thermal unit (TU) calculations were completed using the data collected at RM 47.

Stage of development	Coho (TU)	Chinook (TU)
eyed eggs	220	250
Hatch to alevin	400-500	500
Fry	700-829	800-1000

<http://www.salmonidsinthe classroom.ca/atu.html>
ne

First observed coho spawners 12/9/13		
As of 2/15/14	345.27	ATU
as of 3/21/14	562	ATU

Scott River Adult Coho Spawning Ground Surveys 2013-2014

First observed chinook spawners 10/17/13		
As of 2/15/14	839.75	ATU
as of 3/21/14	1064	ATU

Based on these calculation, by the beginning of April 2014 chinook from the earliest redds would be at the fry stage and coho beginning to hatch to alevin.

Carcass Samples

A total of 239 coho carcasses were sampled, throughout the coho run, with the last sample collected on January 27th, 2014. Carcasses ranged from 44-80 cm, but the majority of those sampled ranged from 68-70 cm.

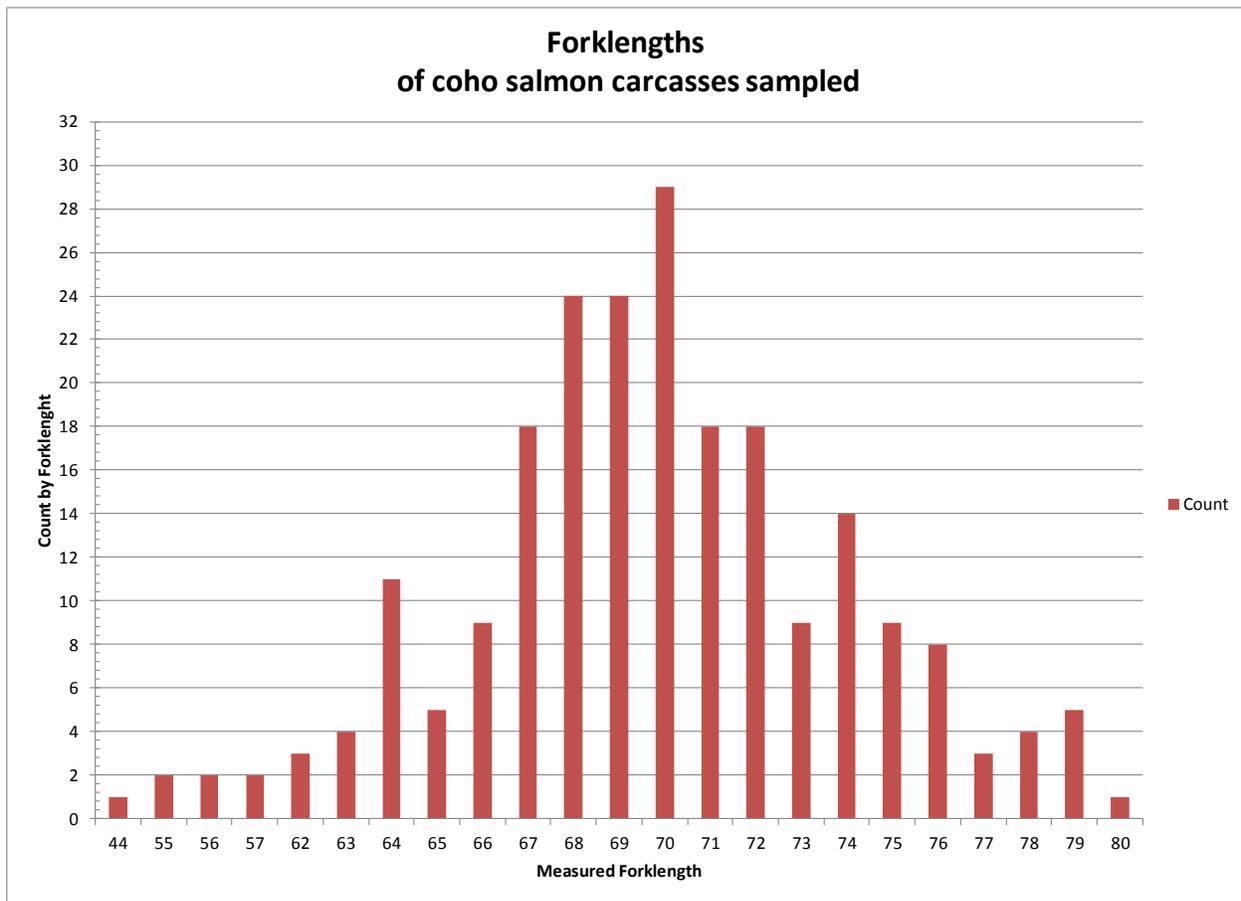


Figure IV. Forklengths of coho salmon carcasses sampled.

Discussion

Run Timing and Duration

The first coho observations in the watershed were within the timeframe of previous observations. As has been observed in the past, coho did not actively begin to move into the spawning grounds in the Scott Valley until the first pulse of fall rains. The key difference observed this year was the run extending until into February. This extended run may have been caused by the lack of attractive flows during the spawning season. In addition, the flows

Coho Spawning Distribution

Extended drought conditions limited coho spawning distribution to the mainstem Scott River and French and Shackleford Creek. It is possible that a few fish migrated into the South Fork, Sugar Creek and the East Fork following the reconnection of the Scott River Tailings on February 14th, 2014. This is the most limited distribution of coho spawning documented since surveys began in 2001. This limited distribution, combined with lack of snowpack in the watershed, prompted discussions with the California Dept of Fish and Wildlife to begin to develop an emergency fish relocation plan.

Recommendations

Emergency juvenile salmon relocation

The high density of chinook and coho spawning which occurred in the mainstem Scott River, combined with the extreme drought conditions in the Scott River watershed has led to the development of an emergency salmon relocation plan for the Scott River Watershed. The April 1 snow surveys completed by Klamath National Forest show 9% of average snowpack for the Scott River Watershed. It is anticipated that flows in the Scott River will be extremely low to dry at some locations by June. Depending on the ability of the coho and chinook to migrate to other locations, this can potentially lead to high densities of fish trapped in the mainstem Scott River. The California Department of Fish and Wildlife, Siskiyou RCD, Scott River Water Trust, NOAA Fisheries, and Klamath National Forest have been working together to develop a plan for emergency fish relocation, in the event it is needed. See **Appendix C**

2014 summer juvenile monitoring and assessment.

The summer of 2014 offers a unique opportunity to assess the extent of juvenile coho migration. Klamath National Forest, the Siskiyou RCD and the Scott River Water Trust will be working together to complete juvenile dives in tributaries to the Scott River, including those which did not have documented spawning. These dives will be completed early in the spring, when coho fry are just emerging, and again in late summer or fall to determine if coho juveniles migrated into those tributary habitats. However, it is anticipated that in some locations fish will be relocated during emergency fish rescue operations (described below). Any fish relocation will be closely monitored.

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KNF snow survey data