

Scott River Coho Salmon Spawning Ground Surveys 2022-2023 Season



Report Prepared by
Siskiyou Resource Conservation District

United States Fish and Wildlife Service – Fisheries Program
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ABSTRACT

2022 was the third consecutive dry water year in the Scott Valley sub-basin of the Klamath River, though less dry than the preceding two years. The Scott River stayed flowing and connected throughout the valley during the base flow period of mid-July thru September 2022. On December 26, 2022, the day with the highest number of observed coho salmon migration, the California Department of Fish and Wildlife (CDFW) removed the Scott River Fish Counting Facility (SRFCF). Prior to removal CDFW reported “a net total of 238” documented coho salmon during its period of operation. The SRFCF was not operational during time coho salmon most likely entered the system according to the CDFW report. Due to lack of funding, few spawner surveys were conducted in the Scott River watershed during this season, and precipitation events in late December and mid-January caused large spikes in streamflow, decreasing visibility. In general, information from the spawning ground surveys helps predict where juvenile rearing is expected within the watershed. Although spawning ground surveys for 2022-2023 were very limited due to budget constraints, they were conducted as possible by the Siskiyou Resource Conservation District from the period of November 20th, 2022, to January 22nd, 2023 to determine the distribution of coho salmon spawning in the watershed and inform related management decisions over the following year. A total of 20.5 river miles were surveyed (12.5 river miles on the mainstem and 8.0 river miles on western tributaries). Surveys were conducted as conditions allowed through the active period of the run and consisted of trained two-person field crews hiking established reaches either in-stream or along the bank in waders. Field technicians counted the number of live fish by species, documented the location and dimensions of redds, and collected biological samples (scale, tissue, and otolith) from recovered carcasses. A total of zero coho redds were recorded by surveyors on the Scott River mainstem and the following tributaries (from north to south): Shackleford Creek and its tributary Mill Creek, Etna Creek, French Creek and its tributary Miners Creek. A total of six coho carcasses were recovered, sexed, measured, and sampled.

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Siskiyou Resource Conservation District
California Department of Fish and Wildlife
Scott River Watershed Council
Quartz Valley Indian Tribe

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The Siskiyou RCD would like to extend a specific acknowledgement to all the participating Scott Valley landowners that gave permission for field technicians to conduct surveys on their property. This work would not have been completed without their cooperation.

INTRODUCTION

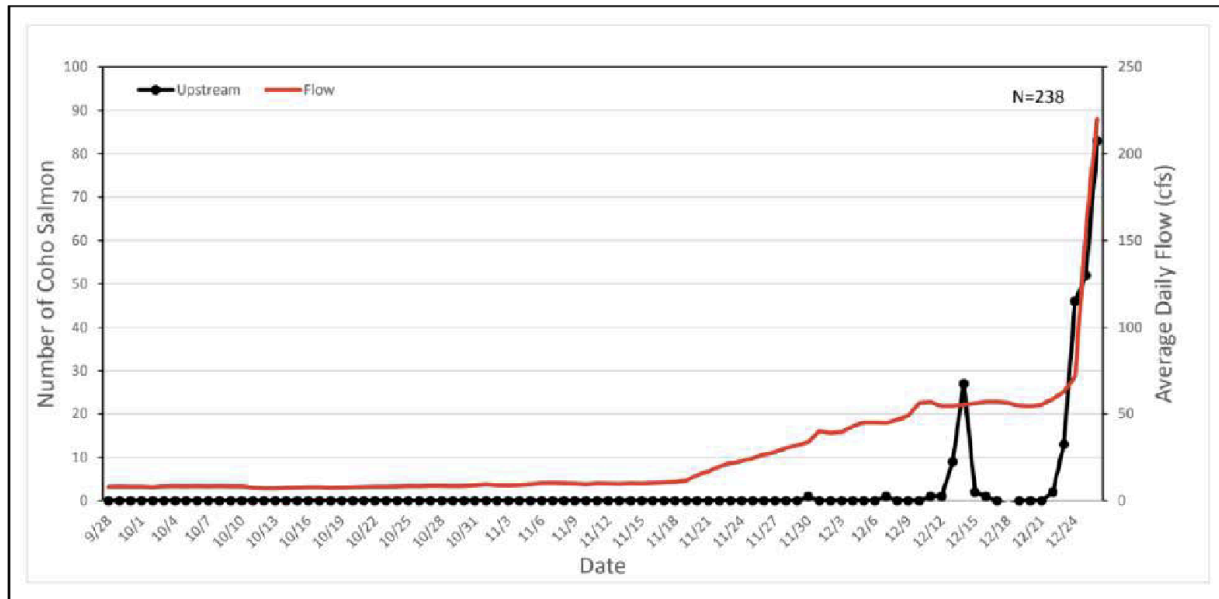


Figure 1. Run timing of Coho Salmon observed passing through the Scott River Fish County Facility during the 2022 season (N=238), and average daily flows observed at USGS Gage No. 11519500. California Department of Fish and Wildlife, 2022 Scott River Salmon Studies, Final Report July 17, 2023, prepared by Morgan Knechtle and Domenic Giudice.

Coho salmon (*oncorhynchus kisutch*) are endemic to the Scott River system and belong to the Southern Oregon Northern California Coast (SONCC) Evolutionarily Significant Unit, which was listed as threatened under the Federal Endangered Species Act (by the National Marine Fisheries Service) in 1997. In 2001, the State of California began considering listing coho salmon as threatened and, with the expectation of an abundant run on the Scott River, the Klamath National Forest spearheaded the first spawning ground survey effort (Maurer, 2002). The spawning ground 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 was needed in order to implement and assess effective restoration plans and efforts. In 2004, the California Fish and Game Commission acted to add coho salmon to the state endangered and threatened species list and the threatened listing became effective March 5th, 2005. The collection of coho spawning distribution data has continued annually on the Scott River since the initiation of the surveys in 2001.

In addition to the spawning ground surveys, coho population data (run size and timing) was gathered starting in 2007 at the Scott River Fish Counting Facility (SRFCF) run by the California Department of Fish and Wildlife (CDFW). The counting station was operated during the chinook and coho salmon migration period and consisted of a temporary weir constructed at river mile 18.2 that directed fish through a video flume where they were counted by species. This video weir data was coupled with downstream mark and recapture population estimates completed during the spawning ground surveys to make an escapement determination for the Scott River.

On December 26, 2022 the Scott River Fish Counting Facility (SRFCF) was removed. For the 2022 spawning season, the California Department of Fish and Wildlife (CDFW) documented the first adult coho salmon on November 20, 2022, and the last documented animal on December 26, 2022. That same day, the Scott River Fish Counting Facility (SRFCF) was removed. CDFW reported “a net total of 238” documented coho salmon during the period of operation and states: "The counting station was removed during the day with the highest observed daily coho salmon migration. If the counting station was not removed additional coho salmon would have been counted.” (Figure 1). Due to high flows and lack of funding, the SRFCF was not operational during times coho salmon most likely entered the system(SRFCF), and very few spawner surveys were conducted in the Scott River for the 2022-2023 survey season. In general, information from the spawning ground surveys help predict areas where juvenile rearing is expected within the watershed.

The monitoring of coho spawning parameters (abundance, range, distribution, and timing) through annual surveys (and formerly the operation of the SRFCF) is valuable on both an annual basis and for long-term trend analysis. By locating known coho spawning sites, stream reaches can be identified where juvenile coho salmon may be rearing the following summer when low-flow conditions may impact growth and survival. The Scott River Water Trust, a nonprofit that seeks to voluntarily improve stream flow in critical stream reaches, relies on this information each year to prioritize water leases. Over the long-term, this distribution data has allowed for the development of strategic recovery plans as well as the design, implementation, and assessment of informed restoration projects across the Scott River watershed.

PROJECT PURPOSE AND OBJECTIVES

The purpose of the annual report and survey is to gather data on run parameters including the abundance, timing, duration, age composition, hatchery contribution and redd distribution of coho salmon in the Scott River and tributaries. The 2022-2023 effort marks the twenty-second year of data collection (although there was no valley wide data collection during 2017-18 and 2018-19 runs).

Specific project objectives:

1. Conduct cooperative coho salmon spawning ground surveys on the Scott River and tributaries during the 2022-2023 survey season to document the distribution of coho salmon spawning within the historic range.
2. Document the upper extent of spawning in each tributary where coho are found.
3. Collect biological samples from carcasses to build upon our understanding of the life history of the evolutionarily significant SONCC coho salmon and for comparison of the genetic relationship between Scott River fish and other stocks.
4. Inform local non-governmental organizations and community members of potential locations where juvenile coho may be rearing for the purpose of informed management over the following summer.

STUDY LOCATION AND RUN TIMING

The 2022-2023 survey effort took place in the Scott River Watershed, a sub-basin of the Klamath River Basin. The Scott River is a major tributary and enters the Klamath River at river mile 143 in Siskiyou County, California. Coho salmon (*O. kisutch*) generally return to the Scott River to spawn from mid-November to early January with Chinook salmon (*O. tshawytscha*) (mid-October through late November) and steelhead trout (*O. mykiss*) (November through April) runs overlapping.

Water Year Conditions

April 1, 2022, snow survey results for Scott River sub-basin

Snow Course	Height of Snow			Snow Water Equivalent		
	Measured	Historic Average for Apr 1	% of Historic Average	Measured	Historic Average for Apr 1	% of Historic Average
Middle Boulder 1 (Established 1946 / Elevation 6600')	1.5"	69.8"	2%	0.6"	30.0"	2%
Middle Boulder 3 (Established 1948 / Elevation 6200')	6.6"	62.4"	11%	2.6"	26.6"	10%
Dynamite Meadow (Established 1955 / Elevation 5700')	0.0"	43.4"	0%	0.0"	18.1"	0%
Swampy John (Established 1951 / Elevation 5500')	25.0"	77.6"	32%	10.4"	31.1"	33%
Scott Mountain (Established 1986 / Elevation 5900')	0.0"	47.2"	0%	0.0"	21.8"	0%
Box Camp (Established 1978 / Elevation 6440')	43.1"	83.2"	52%	20.9"	33.7"	62%
Etna Mountain (Established 1951 / Elevation 5900')	18.7"	68.0"	28%	8.8"	26.9"	33%
Wolford Cabin (Established 1949 / Elevation 6150')	0.5"	80.6"	0.6%	0.2"	33.5"	0.6%
Total Average		16%			18%	

Water Year 2022 (October 1, 2021, to September 30, 2022) was a third dry year, although it was not as extreme in terms of temperature or precipitation as was the preceding Water Year 2021 (76% of average statewide precipitation and 50% of the average respectively in a 41-year dataset). Precipitation events in late December and early January caused large spikes in streamflows. The Water Year 2022 peak Sierra-Cascades snowpack occurred well before the April 1st date that is historically considered to be the time of maximum accumulation, providing another example of the need to reframe expectations in an era of climate change. Dry conditions followed the wet end to the calendar year and California experienced its driest January through April on record, with only 25 percent of average statewide precipitation based on records dating back to 1895. In April 2022 the Klamath National Forest reported the snowpack at 16% of the historic average snow height (snow depth) and at 18% of the historic Snow Water Equivalent (“SWE”, measure of water content) across all survey points (see results table). The water year wrapped up with an early September heatwave that was notable for both its duration (especially in Northern California) and its intensity.

Coho Population Trends in the Scott River Watershed

Year	Total Redds Documented	Estimated Coho Spawner Escapement
2001*	211	ND
2002*	17	ND
2003	6	ND
2004	960	ND
2005	30	ND
2006	9	ND
2007	259	1,622
2008	24	63
2009	6	81
2010	162	927
2011	26	355
2012	24	201 ^a
2013	354 ^b	2,752
2014	103	485
2015	60	212 ^a
2016	95	226 ^a
2017	ND	382
2018	ND	739
2019	79	346
2020	280	1766
2021	ND	852
2022	ND	238

Table 1. Coho redds and abundance in the Scott River across all Brood Years (Magranet 2017, Knechtle and Giudice, 2021).

*Survey reaches expanded in 2003, therefore data collected in 2001 and 2002 are not directly comparable.

^aAbundance underestimated, high flows prematurely ended the survey season.

^bSuperimposition of coho redds observed in all locations including with Chinook redds (shaded).

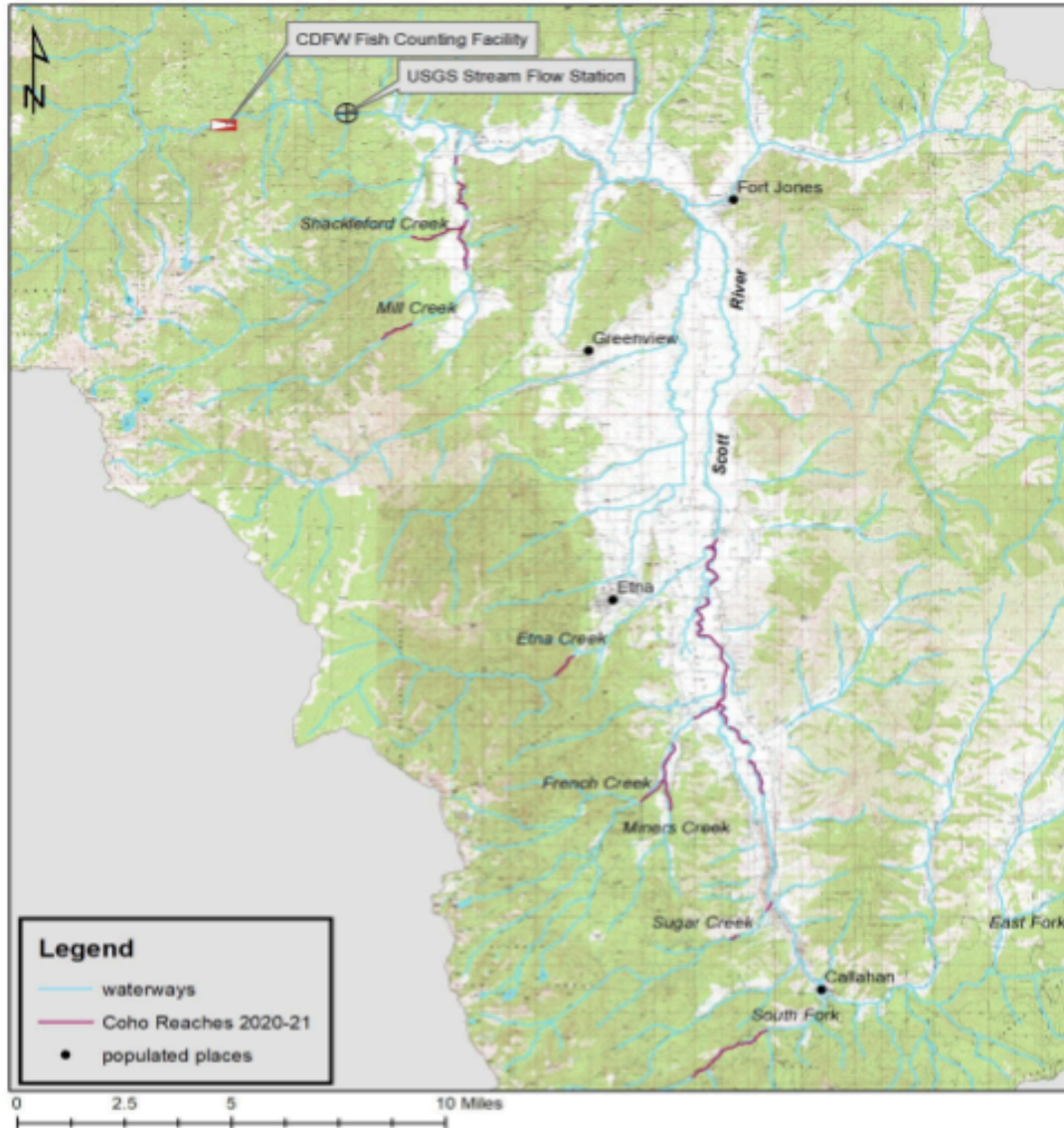
Annual monitoring of the quantity and distribution of Scott River coho salmon spawning began in 2001 and since then has enumerated between 6 and 960 redds per year (*Table 1*). It is important to note that surveys do not cover all potential spawning habitats and it is understood that these figures do not represent a total count of coho redds in the watershed. The survey effort has attempted to maintain coverage of consistent index reaches over the years thus ensuring that the relative number of redds observed each year is comparable. This data, in combination with the yearling juvenile smolt emigration abundance collected since 2000, had indicated a significant variation in brood year strength, with one of the three brood years being notably stronger (Jetter et al., 2016). Adult coho spawner escapement (by return year) has been estimated since 2007 and is predominantly derived from the SRFCF recordings with adjustments made to account for spawning below the migrant weir. This data shows that adult returns to the Scott River have ranged from 63 to 2,752 fish, with an average of 680 adults (*Table 1*, Knechtle and Giudice, 2023). The brood year discussed in this report was made up of the progeny of a return of 346 adult fish in 2019, which was a below average year.

The Siskiyou RCD follows the protocol employed since 1992 to assess chinook populations in the Klamath River Basin. This protocol has been used in the Scott River watershed for adult coho spawning ground surveys since they were initiated in 2001 (Maurer, 2002). Stream reaches were surveyed by hiking the stream channel during the coho spawning season (mid-November through January). Surveyors worked in teams of two (sometimes accompanied by the landowner), traversing the stream in neoprene waders and felt soled boots, walking in a downstream direction. The number of live fish, redds and carcasses observed were counted by species, recorded on data sheets and mapped for each stream surveyed. Redd dimensions and substrate composition information was collected from redds only if it did not disturb spawning fish. Flagging was hung adjacent to all new redds on each survey to prevent double counting. GPS points were collected at redd sites, carcass sites, and sites of unusual fish observation (i.e. beyond previously documented extent of rearing). Tissue, scale, and otolith samples were taken from each recovered coho carcass for age and DNA analysis. All carcasses that had been sampled were chopped in half with a machete to signify that they had been handled and were promptly returned to the stream.

REACHES SURVEYED

Coho spawning ground surveys were completed on 12.6 miles of the Scott River mainstem and 11.0 miles of tributaries (*Appendix I. Length of Stream Reaches Surveyed*). Tributaries surveyed (from North to South) include: Mill & Shackelford Creeks, French & Miners Creeks, Etna Creek, Sugar Creek, and South Fork Scott River (*Map 1*).

Winter 2020-2021 Scott River Coho Salmon Spawning Ground Surveys - Reaches Surveyed



Map 1. Scott River Index Reach Boundaries and tributary reaches surveyed (Siskiyou RCD)

CREW TRAINING

Crew training was organized by CDFW and the Siskiyou RCD. The Scott River chinook

Training was held in October 2022 at the Indian Scotty Campground outside of Fort Jones. Training items that were covered included fish species identification, sampling techniques, redd identification, GPS protocol and completing data sheets. All Siskiyou RCD crew members participated in the training offered this year or had been to one in past years. All new field technicians were accompanied by experienced surveyors.

SURVEY TIMING

Following a second dry water year in 2021-2022, October-November 2022 brought very little precipitation. In early December the Scott River remained fully disconnected through the valley for the entire base flow period, limiting adult salmon access to the upper reaches of valley spawning grounds. The first observation of adult coho by the Shasta River Fish Counting Facility (SRFCF) occurred on November 20th, 2022 and the last coho passed through December 26th, 2022. The first observation of adult coho in the valley reaches of the system by SRCD employees occurred on January 11, 2023, with the identification of a single individual on the middle portion of East Fork and the last observation was made on January 24th, 2023. The first notable precipitation/flow event occurred on November 1st but all precipitation in November did not remedy the disconnections. Surveys continued beyond the third week of January until no live fish were observed for the previous week.

GPS DATA COLLECTION

Hand-held Global Positioning System (GPS) units were used to record the location of each redd observed and carcass recovered. Each documented redd and carcass was assigned a unique identifier code based on the stream and reach, date, and sequential number. The unique identifier code was used to label GPS coordinates in the hand-held unit so that this information could be tied back to the data sheet. GPS coordinates were taken in NAD 83 datum and recorded on data sheets in decimal degrees.

Example: SU 112020 L R07 = Sugar Creek, November 20th 2020, Lower Reach, Redd Site #7

EXAMPLE

2019-2020 Scott River Adult Coho Salmon Spawning Survey Field Data Form
 Stream French Creek Reach Lower (HWY 3 → confluence)
 Date 12-8-16 Weather cloudy GPS# 120816 Datum: NAD 83
 Crew L. Magraret Start Time 11:02 Air Temp °C -1°
End Time 16:10 Air Temp °C 2°
 H₂O Temp °C 2°
 H₂O Temp °C 2°

ALL Site #	Habitat Type*	# Fish	LIVE FISH/REDDS			Fott Depth m	SUB* D/S	FL cm	Sex M/F Unk	CARCASSES		PIT Y/N	AS APPLICABLE		Notes (superimposed, sample code, PIT #)
			Redd Length m	Redd Width m	Clip* Y/N Specify					Prespaw mortality Y/N	Lat		Long		
L01	P	2										41.54832	-122.910423	pair	
R01	PT	0	2.0	1.3	0.18	2/3						.56496	.96495	superimposed	
R02/03	R	1	2.3	1.1	0.1	2/3						.552132	.96843	superimposed	
R-PT		0				2/1						#	#	incomplete, not flagged	
C01							69	F	N	N	N	#	#	FR 120816 L 01 STO	
C02							UNK	M	N	N	N			predation, no samples	
/							BEAVER DAM		/	/	/	/	/	/	

Habitat Type: P=Pool R=Riffle F=Flatwater PT=Pool tail crest
 S=Side Channel (i.e. S/R)
 Substrate: 1 = <0.2cm SAND 2=0.2-5cm SM. GRAVEL 3=6-9cm LG. GRAVEL 4=10-13cm SM COBBLE 5=>13cm LG. COBBLE
 Clip: LM - left max, RM = right max, Ad = adipose, O=other, describe in notes.
 Total Redds 3 Total Live 3 Total Carcasses 2

Sample Codes

Example: SC 120119 R16 07 STO =

Scott River Mainstem, December 1st 2019, Index Reach 16, Carcass #7, Scales, Tissue, Otolith samples

Example: SU 120119 L 07 STO =

Sugar Creek, December 1st 2019, Lower Reach, Carcass #7, Scales, Tissue, Otolith samples

Boulder Cr. (South Fork)	BO
Boulder Cr.(Scott)	BS
Canyon Cr.	CA
Clark Cr.	CL
East Fork Scott	EF
Emigrant Creek	EM
Etna Cr.	ET
French Cr.	FR
Grouse Creek	GR
Horse Range Cr.	HR
Indian Creek	IN
Johnson Creek	JO
Kangaroo Cr.	KA
Kelsey Channel	KC
Kelsey Creek	KE
Kidder Creek	KI
McAdams Cr.	MC
Meamber Gulch	ME
Middle Creek	MI
Mill Cr. (Scott Bar)	SB
Mill Creek	ML
Miners Cr.	MI
Moffet Creek	MO
North Fork French	NF
Patterson Creek (Scott)	PS
Patterson Creek(Etna)	PA
Rattlesnake Cr.	RA
Ruffy Gap Trib	RU
Shackleford	SH
Shackleford-Mill	SM
South Fork Scott	SF
Sugar Creek	SU
Thompkins Creek	TO
Wildcat Cr.	WI
Wooliver	WO
Scott River Mainstem	SC, use index # for reach entry

SAMPLE COLLECTION

A Federal Endangered Species Act Section 4(d) collection permit from the National Marine Fisheries Service (NMFS) was held by the Siskiyou RCD for biological sample collection from salvaged coho carcasses. The Siskiyou RCD also maintained a current California Endangered Species Act Memorandum of Understanding with CDFW for this effort.

Three sets of scale samples were taken from each carcass. The preferred location for scale collection is above the lateral line between the posterior insertion of the dorsal fin and the anterior insertion of the anal fin. Scales were collected after cleaning the area with a knife. Each set of scales was placed between absorptive paper and into a separate sample envelope and labeled with the unique identifier code that matches the GPS coordinates of its recovery. Sample envelopes and data sheets also record specific information about the carcass including species identification, fork length measurement (cm), sex determination, and a check for hatchery markings.

Tissue sampling protocol for coho salmon carcasses followed the direction provided by the NMFS, Southwest Fisheries Science Center, Santa Cruz Laboratory. A pair of tissue samples was taken from each carcass by clipping, with a hole-puncher, two disks from the operculum tissue (gill plate). The tissue samples were placed between absorptive paper and placed in one of the sample envelopes, which also contained scales. The envelope was labeled with information about the carcass, as described above, as well as the sample contents: Tissue + Scales.

At least one otolith was collected from each coho carcass with an intact head. A sharp knife was used to section the cranium by making a transverse cut from the dorsal side of the head to roughly above the posterior edge of the preopercular margin, revealing the otic capsule. Otoliths were carefully withdrawn using forceps, placed between absorptive paper and placed in one of the sample envelopes, which also contained scales. The envelope was labeled with information about the carcass, as described above, as well as the sample contents: Otolith + Scales.

Therefore, there were three sample envelopes assembled for each carcass: one with only scales, a second with tissue and scale samples, and a third with otolith and scale samples. All tissue, scale and otolith samples were submitted to CDFW – Yreka Fisheries Office for distribution to individuals performing further analysis. This included staff of the NMFS, Southwest Fisheries Science Center, Santa Cruz Laboratory. All coho carcasses were scanned for passive integrated transponder tags before being returned to the stream.

SPECIES, GENDER AND ORIGIN IDENTIFICATION

Positive identification of coho salmon is a crucial step in the collection of reliable data from the spawning ground surveys. All field technicians who participated in the surveys this season were experienced at distinguishing between anadromous salmonid species. Several characteristics were used to identify salmonid species in the field including size, body morphology, markings, coloration, behavior, run timing and geographic location. Suspected coho redds encountered in the absence of spawning fish were distinguished from other species' redds by a combination of the dimensions, gravel size and habitat characteristics.

The sex of carcasses was verified by squeezing the anal opening to check for the release of milt (male) or eggs (female) or by slitting the abdomen to examine the reproductive organs.

Prespawn mortality in females was determined by the visual presence of approximately 100 or more eggs.

Hatchery markings are distinct for both species of salmon present in the Klamath River system. Hatchery Chinook lack an adipose fin while hatchery coho have a maxillary clip (right maxillary clip = Trinity River Hatchery, left maxillary clip = Iron Gate Hatchery). Any hatchery marked carcasses encountered have the snout removed and submitted to the CDFW - Yreka Fisheries Office for recovery of the coded-wire tag.

RESULTS

In the 2022-2023 spawning season, the California Department of Fish and Wildlife (CDFW)

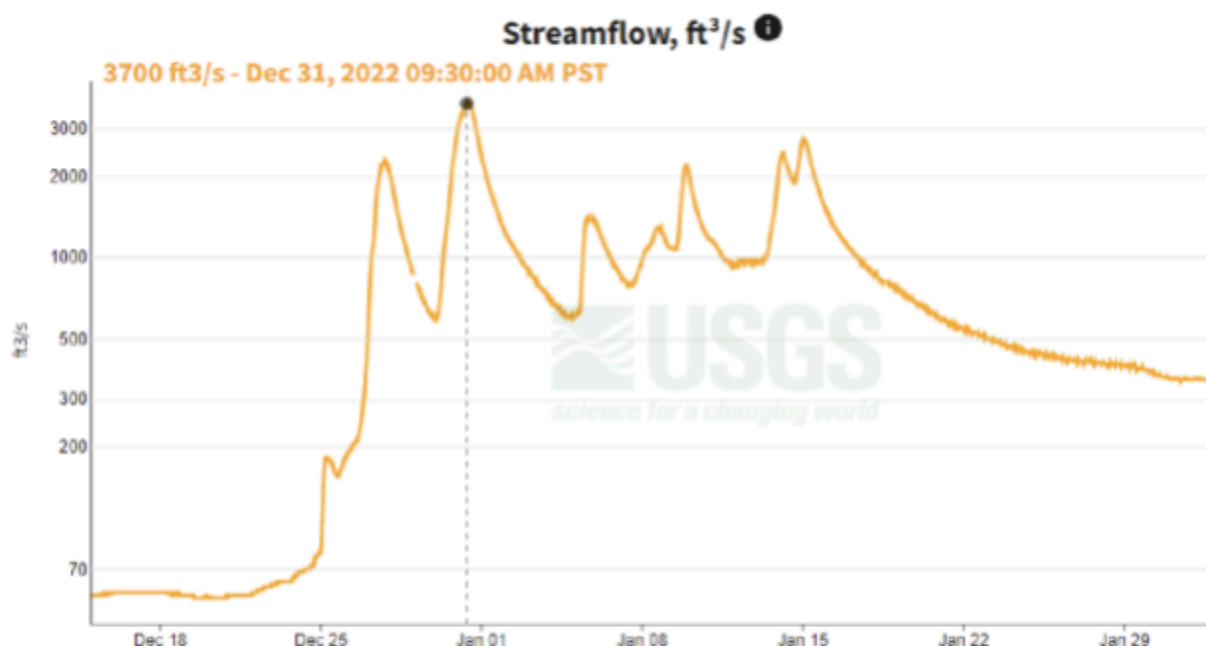


Figure 2. Streamflow (cfs) at the USGS Scott River Station (11519500) - December – January 2023

documented the first adult coho salmon on November 20, 2022, and the last documented animal on December 26, 2022, the same day the Scott River Fish Counting Facility (SRFCF) was removed. CDFW reported “a net total of 238” documented coho salmon during the period of operation and states: "The counting station was removed during the day with the highest observed daily coho salmon migration. If the counting station was not removed additional coho salmon would have been counted." (Figure 1) . Due to high flows and lack of funding, not only was the SRFCF not operational during times coho salmon most likely entered the system, very few spawner surveys were conducted in the Scott River for the 2022-2023 season. In general, information from the spawning ground surveys help predict areas where juvenile rearing is expected within the watershed.

The Scott River Fish Counting Facility (SRFCF) was installed and began operation on November 20, 2022 and remained operational through December 26th, 2022. Despite low flow,

the Scott River remained connected from the mouth through the valley reaches over the fall of 2022 with the exception of reach 9 and the historic mine tailings within reach 16 at river mile 55.0. The Reach 9 section of the river didn't become connected until November 18th, 2022, but the connection through the tailing was somewhat intermittent throughout at least the third week of December. This intermittent connection may have potentially limited spawners access to the upper reaches of the watershed such as Sugar Creek and the East and South Forks of the Scott River. Precipitation events in late December and mid-January caused large spikes in streamflow. From December 27 to January 17, flows at the USGS Fort Jones Gage on the mainstem Scott River did not dip below 500 cubic feet per second (cfs) and were greater than 1,000 cfs for much of that time (Figure 2). This period of sustained flows would have allowed Coho spawners to access a wide range of habitat throughout the watershed. This contrasts to recent years in which lower winter flows limited the accessible stream area for returning adults. These spikes of flow were accompanied by increased turbidity and sediment movement that may have also contributed to low visibility. (USGS, 2023) (Figure 2). Despite this initial pulse that provided connectivity through the tailings reach, connectivity to some western tributary spawning grounds remained limited throughout the remainder of the run.

This late-December rain event appears to have prompted the coho run into the valley reaches of the Scott River. The SRFCF recorded upstream movement of adult coho from November 20th through December 26th, with the majority of fish passing through for three days in late December (Knechtle and Giudice, 2023). Consistent with this timeframe, tributary surveys were initiated on January 10th and on January 11th on East Fork SRCD surveyors encountered the first coho salmon documented in the valley (*Appendix II*). It is hypothesized that fish had already entered lower valley tributaries such as Shackelford Creek by this time. From late-December through late January, streamflow remained relatively stable (Figure 2) and coho spawning was regularly documented across the watershed.

The migrant weir was operated through December 26th, 2022, after which it was dismantled due to a lack of migratory action and in anticipation of high flows. A preliminary total of 238 coho had been recorded passing through the SRFCF over the season, with the bulk of the returning coho passing through the video weir December 21st through December 26th until it was removed. (Knechtle and Giudice, 2023), immediately following the flow event. The first coho to be observed by surveyors was on November 20th, the bulk of the live coho observed were seen in the valley tributaries between January 10th and January 24th, 2023. The live coho that was observed by crews was documented on January 12th, 2023 on Lower French Creek of the Scott River (*Appendix II*). Surveys continued to be completed for two more weeks to collect carcasses, minimal observations were made, and the last flags were pulled February 2nd, 2023.

Stream	Redds		Carcasses	
	Number	Percentage	Number	Percentage
<i>Scott River mainstem</i>				
Reach 16	0	0	0	0
Reach 15	0	0	0	0
Reach 14	0	0	1	16.6%
Reach 13	0	0	0	0
Reach 9	0	0	0	0
Reach 8	0	0	0	0
Scott River mainstem Total	0	0	1	16.6%
<i>Tributaries (North to South)</i>				
Mill Creek	0	0	0	0
Shackleford Creek	0	0	0	0
Miners Creek	0	0	0	0
French Creek	0	0	2	33.3%
Sugar Creek	0	0	0	50%
South Fork	0	0	0	0
East Fork	0	0	3	

Table 2. Summary of Survey Observations by Stream.

Total Redds= 0

Total Carcasses= 6

Total Live Fish= 1

CARCASSES

Scott River Coho Salmon Surveys - Biological Sample Inventory - Winter 2022-23 Run										
Date	Stream - Reach	Species	Fork	Sex	Clips	Prespawm Mortality	Collector	Biological Samples (scale,	Sample ID #	PIT Tag #
1/11/23	East Fork-Middle	SS	65	M	N	n/a	C. Voigt	STO	EF-011123-M-01	N
1/16/23	French Creek - Lower	SS	72	M	N	n/a	C. Voigt	STO	FR-011623-L-01	N
1/23/23	East Fork-Middle	SS	68	M	N	n/a	C. Voigt	STO	EF-012323-L-01	N
1/23/23	East Fork-Middle	SS	73	M	N	n/a	C. Voigt	STO	EF-012323-L-02	N
1/24/23	Scott River- Reach 14	SS	58	M	N	n/a	C. Voigt	STO	SC-012423-R14-01	N

Table 3. Inventory of all recorded coho carcasses.

A total of 6 coho carcasses were recovered from January 10th, 2023, through February 2nd, 2023 (Tables 2&3, Appendix II). Six carcasses were observed and recovered for sampling (Table 3). The majority of carcasses (6) were found on the middle reach of East Fork. The recovered carcasses had fork lengths that measured between 58 and 73 cm (Table 3). Applying the maximum grilse fork length cutoff of 56 cm (Knechtle and Giudice, 2020) none of the carcasses were considered to be grilse (single sea winter salmon as opposed to multi sea winter salmon). No evidence of prespawm mortality was identified in any of the female carcasses. Scale, tissue and otolith samples were taken from all coho carcasses with the exception of two that could not be sampled due to predation. All coho carcasses were scanned for passive integrated transponder tags, and one was found on the lower reach of Miners Creek by our cooperators at Scott River Watershed Council. None of the recovered carcasses displayed hatchery markings. Following active spawning and carcass recovery from mid-December through mid-January, no new carcasses were found thereafter.

REDDS

A brief explanation of the coho spawning observations on the mainstem is presented here followed by each of the tributaries ordered from North to South. Positional information is gathered for all of coho redds observed by surveyors. Due to lack of funding for surveys and high flows/ water turbidity, zero redds were documented for the survey season 2022-2023.

Mainstem Scott River

No coho spawning was observed on the mainstem of the Scott River.

Shackleford Creek and its tributary Mill Creek

Shackleford Creek and its main tributary Mill Creek are known to be well utilized by anadromous salmon. Due to lack of funding for surveys Shackleford Creek and Mill Creek were not surveyed this season.

Etna Creek

Surveys on Etna Creek did not occur for the 2022-2023 season due to budget constraints.

French Creek and its tributary Miners Creek

No redds observed.

East Fork of the Scott River and its tributary Grouse Creek

The East Fork is one of the largest drainages that enters the Scott River and is known to have high volume flow events; therefore, it is important to carefully time winter surveys in order to catch the stream under wadable conditions with good visibility. No surveys were conducted during the 2022-2023 season due to budget limitations.

South Fork of the Scott River

No surveys were completed on the South Fork Scott River this season due to budget limitations.

DISCUSSION AND CONCLUSIONS

Since the coho spawning ground surveys were initiated in the Scott River watershed over the winter of 2001-02, the documented population trends have indicated varying strength of the three cohorts of coho salmon in the Scott River. Between the three cohort cycles, there existed one stronger and two weaker generations. The stronger cohort of 2013-2014 was roughly an order of magnitude larger than the two smaller cohorts (*Table 1*). The strong cohort has been equalized over time due to a combination of drought and unfavorable oceanic conditions. The fish returning in 2022-2023 were the progeny of the 2018-2019 brood year. This brood year was not particularly strong and well below historical averages.

Data collection over the winter of 2022-2023 coho spawning ground surveys went smoothly though budget limitations significantly narrowed their scope. Weather and stream conditions were generally favorable with some connectivity issues on Reaches 9 and 16, which may have limited some access to Sugar Creek and the East and North Forks. High flows may have hindered visibility and affected redd observations.

With weather conditions creating low visibility and few opportunities to survey, no redds were observed for the 2022-2023 coho spawning ground season in Scott Valley. As mentioned, the previous progeny year of 2017-2018 was not particularly strong and there was no expectation of a strong year of returning salmon. As a result, the success of the 2020-2021 progeny can largely be attributed to ocean conditions.

The spatial spawning distribution documented in the Scott River Valley was relatively consistent with previous years. Shackleford Creek and its tributary Mill Creek had the highest density of both redds and carcasses, followed by French Creek and its tributary, Miners Creek (*Table 2 & Figure 2*). The upstream extent of spawning was observed on French Creek/Miners Creek, Shackleford Creek/Mill Creek, and on the mainstem and was consistent with previous year's observations.

RECOMMENDATIONS

Continue working to maintain positive relationships with landowners and expand access for surveys. Areas of interest might include middle Kidder Creek, middle Patterson Creek, lower Etna Creek, middle Sugar Creek, middle South Fork and all of East Fork.

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STREAM	REACH	REACH DESCRIPTION	BEGINNING MILE (UPSTREAM)	END MILE (DOWNSTREAM)	TOTAL LENGTH	LENGTH SURVEYED 2022-2023
East Fork Scott River	Lower	East Highway 3 Bridge to mouth	2.3	0	2.3	NS
	Middle	China Cove to East Highway 3 Bridge	4.6	2.3	2.3	NS
	Middle	Lower Masterson to China Cove	6.2	4.6	1.6	NS
	Middle	Upper Masterson to Lower Masterson	7.2	6.2	1	NS
	Upper	Rail Creek Rd Bridge to Upper Masterson	12	7.2	4.8	NS
French Creek	Lower	HWY 3 to mouth	0.8	0	0.8	NS
	Middle	Confluence w/Miners to HWY 3	2.8	0.8	2	NS
	North Fork Area	North Fork to Miners Creek	3.9	2.8	1.1	NS
	Paynes Creek Area	Above and below mouth of Paynes Creek	6	5.5	0.5	NS
Miners Creek	Duck Lake Area	Above and below mouth of Duck Lake	7.3	6.8	0.5	NS
		From mouth upstream	2	0	2	NS

	Paynes Creek		From mouth upstream	0.2	0	0.2	NS
	North Fork French Creek		From mouth upstream	0.7	0	0.7	NS
		Upper	Upper Youngs Diversion to Highway 3	9.1	7.3	1.8	NS
Scott River Mainstem		Reach 9	Dunlop to Meamber Bridge	29.5	24.4	5.1	NS
		Reach 10	Highway 3 to Dunlop	35.6	29.5	6.1	NS
		Reach 11	Eller Lane to Highway 3	41.1	35.6	5.5	NS
Scott River Mainstem		Reach 12	Etna Creek to Eller Lane	44.7	41.1	3.6	NS
		Reach 13	Horn Lane to Etna Creek	46.5	44.7	1.8	NS
		Reach 14	SVID to Horn Lane	48.6	46.5	2.1	NS
		Reach 15	Fay Lane to SVID	52.2	48.6	3.6	NS
		Reach 16	Fay Lane to Callahan	59.1	52.2	6.9	NS
Shackleford Creek		Lower	From North Quartz Valley Rd bridge to mouth	0.8	0	0.8	NS
		Middle	From confluence with Mill Creek to North Quartz Valley Rd. bridge	3.1	0.8	2.3	2.0

	Upper	From the falls to the confluence with Mill Creek	5.2	3.1	2.1	1.4
Mill Creek	Lower	From the South Quartz Valley Rd. bridge to confluence with Shackleford Cr.	1.4	0	1.4	1.4
	Middle	From the South Quartz Valley Rd to Mill Creek Rd crossing	3.8	1.4	2.4	NS
	Upper	Above Mill Creek Rd crossing	4.8	3.8	1	0.9
			TOTAL	109.4	23.55	

Appendix I. Length of Stream Reaches Surveyed

Appendix II

2022 Siskiyou RCD Coho Spawning Ground Survey						
Date	Stream	Reach	Lives	Redds	Carcasses Inve	Carcasses Sampled
1/10/23	Kidder Creek	Orchard Camp & Johnson's	0	0	0	0
1/11/23	East Fork Scot	Lower Pasture @ BVHP	0	0	1	1
1/12/23	French Creek	Lower; D48 to confluence	1	0	0	0
1/16/23	French Creek	Lower; D48 to confluence	0	0	2	1
1/23/23	East Fork Scot	China Cove Fish Screen to Hwy 3 bridge	0	0	2	2
1/24/23	Scott River	14 -Young's Dam to Horn Lane	0	0	1	1
1/26/24	South Fork Sc	Fox Creek to Boulder Creek	0	0	0	0
1/27/23	Noyes Valley C	Masterson Rd to Confluence	0	0	0	0
1/29/23	East Fork Scot	China Cove Fish Screen to Hwy 3 bridge	0	0	0	0
2/2/23	French Creek	Lower; D48 to confluence	0	0	0	0
2/2/23	Scott River	14 & 15 (lower) French Confluence to Horn Lane	0	0	0	0