Scott River Fisheries Monitoring Project - Field Tech Note

Direct Observation for Juvenile Salmonids - July 18, 2023, through September 19, 2023

Project Overview

The ***Scott River Fisheries Monitoring Project*** is a collaborative effort between the Scott River Watershed Council and the Quartz Valley Indian Reservation to support and expand ongoing annual work to document both juvenile and adult Chinook Salmon (*Oncorhynchus tshawytscha*) and Coho Salmon (*Oncorhynchus kisutch*) within the Scott River and its tributaries. This work will integrate into other efforts throughout the basin to help inform fisheries and water management along with future restoration activities. Funding for this project was provided by the California Department of Fish and Wildlife Service's Climate Change Impacts on Wildlife (#Q2296027) fund. This project specifically provides resources to monitor Chinook and Coho Salmon, both juvenile distribution throughout the basin, and the number and spatial distribution of returning spawning adults.

Coho Spawning Season 2022

In 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, 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)[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. In general, information from the spawning ground surveys help predict areas where juvenile rearing is expected within the watershed. Due to funding and safety concerns, SRWC conducted limited surveys in Sugar Creek, Miners Creek and French Creek in 2022/2023, see report: *SRWC 2022-2023 Spawning Ground Survey Report.* There are no other reports for spawning ground surveys known at this time for the 2022/2023 season.

[1] California Department of Fish and Wildlife. 2023. 2022 SCOTT RIVER SALMON STUDIES FINAL REPORT. 1625 South Main Street, Yreka, CA 96097

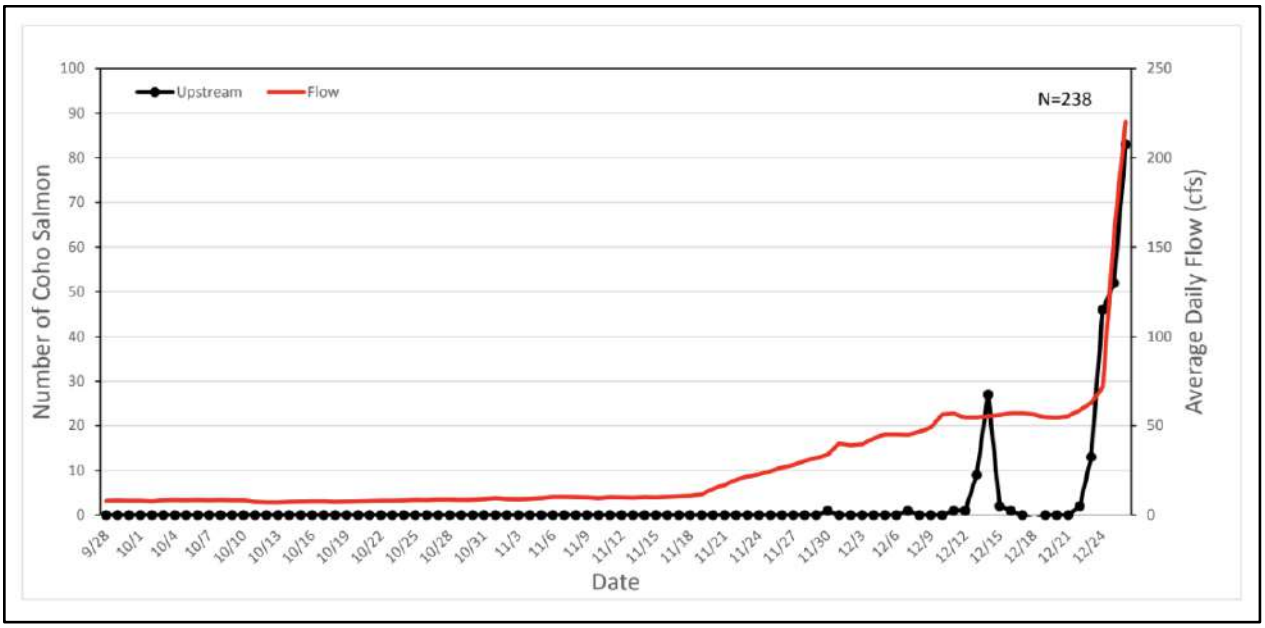


Figure 1. Run timing of Coho Salmon observed passing through the Scott River Fish County Facility during the 2022 season (N=238), and average daily flows observed at USGS Gage No. 11519500. California Department of Fish and Wildlife, 2022 Scott River Salmon Studies, Final Report July 17, 2023, prepared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

The number of observations of adult Coho Salmon spawning made by SRWC staff were fewer than expected given historical survey data and the number of fish seen at the CDFW counting facility. Precipitation events in late December and mid-January caused large spikes in streamflow that may provide an explanation for this. 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. A wider distribution of spawners throughout the Scott River and its tributaries would explain the perceived lack of density in the reaches that SRWC was able to survey. In addition, these spikes of flow were accompanied by increased turbidity and sediment movement that may have obscured live fish, redds, and carcasses.

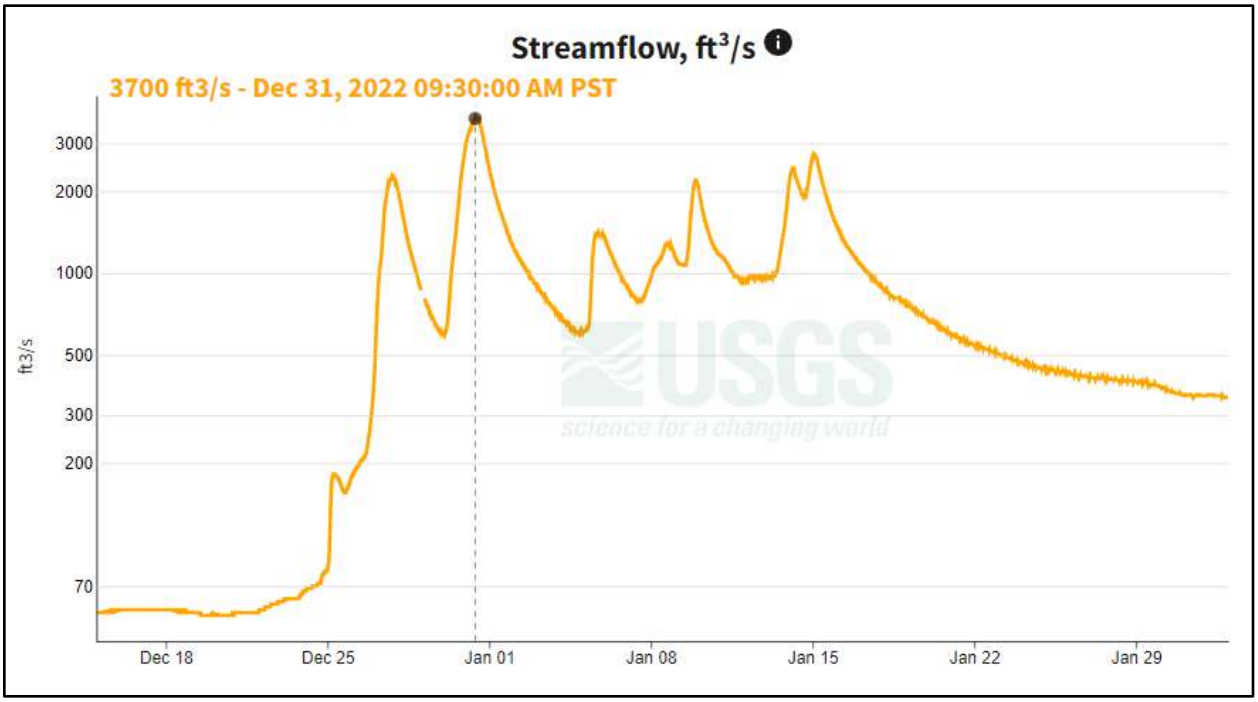


Figure 2. Streamflow (cfs) at the USGS Scott River Station (11519500) - December – January 2023.

It is well known that the Scott River supports a core, functionally independent population of Southern Oregon Northern California Coast (SONCC) Coho Salmon, one of the most productive natural stocks in the Klamath River basin[2]. In 2014, National Marine Fisheries Service identified the depensation threshold was 242 adult Coho Salmon which can cause less successful reproduction due to low population densities caused by factors such as difficulty in finding mates or other impacts based on less desirable spawning conditions. There are concerns about the viability of this cohort of spawning adult Coho Salmon. This is due to both the potential lower numbers of returning fish and the environmental conditions they experienced from very low flows to and immediately followed by higher flushing flows. To attain viability, 6,500 spawners have been identified as the federal recovery target[3].

Methodology for Juvenile Salmonid Direct Observations

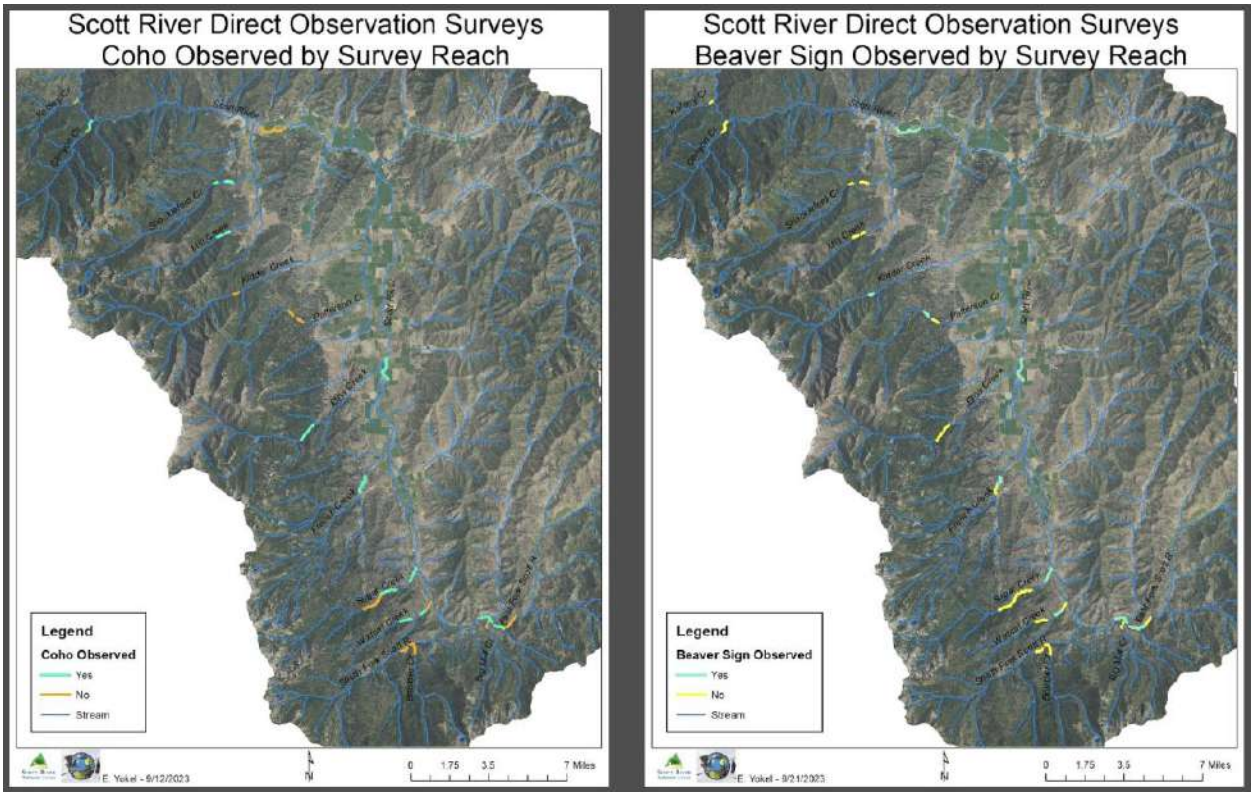
This report summarizes juvenile salmonid monitoring utilizing direct observation during the period of July 18, 2023, through September 19, 2023. Field crews snorkeled all slow-water habitats they encountered, and occasionally surveyed riffle units. Crews documented the presence or absence

[2] National Marine Fisheries Service. 2014. Final Recovery Plan for the Southern Oregon/Northern California Coast Evolutionarily Significant Unit of Coho Salmon (Oncorhynchus kisutch). National Marine Fisheries Service. Arcata, CA.

[3] National Marine Fisheries Service. 2014. Final Recovery Plan for the Southern Oregon/Northern California Coast Evolutionarily Significant Unit of Coho Salmon (Oncorhynchus kisutch). National Marine Fisheries Service. Arcata, CA.

of Chinook Salmon, Coho Salmon (Map 1) and rainbow trout/steelhead (*Oncorhynchus mykiss*), with estimates of the number of juveniles in each surveyed habitat. It is worth noting that various factors such as turbidity and salmonid's predilection for habitats with lots of cover make it difficult to observe, identify by species and count all individuals in an area during a survey. The numbers reported in this field tech note are the best estimates of the number of target species encountered.

The presence of beaver activity was also documented in the reaches surveyed (Map 1). Crews documented signs of beaver such as chew sticks, bank dens, scat, and dams. This information is being collected for another project, *Developing a Beaver-Based Restoration Plan for Drought and Wildfire Resilience in the Scott River Watershed*, and is being supported by the Resource Legacy Fund. This project supports Dr. Emily Fairfax and Molly Alves, a current master's student at Utah State University and Beaver Restoration lead with the Tulalip Tribe in Washington State to develop an evidence-based beaver management plan that prioritizes increased landscape drought and fire resilience and minimizes human-beaver conflict in the Scott Watershed.



Map 1. Direct observation surveys of both juvenile Coho observed and locations where beaver signs were observed.

Additional data collected includes habitat types (e.g., pool, flat water, riffle, etc.), basic characteristics of those habitats such as volume, maximum depth of water, temperature, dissolved oxygen, and the dominant substrate. Also noted were other aquatic species observed during the dive. ESRI's ArcGIS Survey123 was used to spatially and temporally document the data collected. Most reaches were surveyed one time with a crew of two people for a total 14.3

miles surveyed. With a few expectations, the crews surveyed the reaches in an upstream direction. The reaches surveyed were approximately 93% on private lands.

Summary

French Creek and Lower Sugar Creek exceeded all other survey reaches not only in total Coho Salmon observations but also Coho observed per mile and Coho observed by habitat unit surveyed (Table 1). Both tributaries are identified key watersheds with documented strong Coho Salmon rearing areas, and each has been the site of significant restoration activities.

Traditionally it is thought that the most important Coho Salmon tributaries in the Scott watershed are those that have confluences with the mainstem in the valley section of the river. Despite that, in Canyon Creek, which has its mouth in the Scott River canyon reach, the fourth-highest number of Coho observations were made. On the other hand, in Kelsey Creek, a significant Scott River canyon reach tributary in terms of watershed area and stream discharge, no Coho were observed (although Coho were present in the mainstem Scott River immediately downstream of the Kelsey Creek mouth, also known as the mixing zone). Differences in Coho Salmon density between these two creeks can perhaps be explained by variance in wood accumulation and degree of channel braiding at the confluence. Near its mouth, Canyon Creek splits into at least three meandering channels that all feed into the Scott River separately. Several pools formed by naturally occurring wood jams were observed in this reach. Conversely, the reach surveyed on Kelsey Creek was characterized by very little meandering, no braiding, and a scarcity of instream wood. The features observed in Kelsey Creek can lead to extremely high-water velocities, which make it difficult for juvenile Coho Salmon to rear successfully.

During surveys of Etna Creek and Wildcat Creek, observations of Coho Salmon were made above sites where there have been questions about possible passage barriers at certain flows. It is uncertain whether the juvenile Coho seen in these reaches were seeded by adult spawners or moved upstream at some point after emergence. This uncertainty underlies the importance of coupling spawning ground surveys with these juvenile surveys in order to understand the complex interplay of adult spawning and juvenile redistribution.

A potentially surprising finding from this direct observation effort is the relative scarcity of Coho observations made in the East Fork Scott River. Direct observation surveys in 2022 identified hundreds of Coho at several locations in the East Fork and Big Mill Creek[4]. This is in stark contrast to the 18 Coho observed over 2.1 miles of survey effort in 2023. In 2021, 858 Coho spawners were identified passing through the Department of Fish and Wildlife weir on the Scott River. In 2022, 238 spawners were identified[5]. As such, the relative lack of juvenile observations made in the East Fork watershed may be explained by a relative lack of spawners, although it should be

[4] Doose, S. 2022. Field Note: Snorkeling Big Mill Creek for Signs of Salmon.

[5] California Department of Fish and Wildlife. 2023. 2022 SCOTT RIVER SALMON STUDIES FINAL REPORT. 1625 South Main Street, Yreka, CA 96097.

noted that the early removal of the CDFW weir in 2022 resulted in an underestimate of the number of Coho spawners returning to the system. Other possible explanations include stresses from the high flow events in December 2022/January 2023, which may have caused difficulty with nest building in suitable locations and/or possible redd scour. A documented stressor within French Creek which may have occurred at other locations, was the dewatering of a redd that was built in a location that dewatered after the recession of the high flows[6].

Chinook Salmon were only observed in the mainstem and tributaries in the Scott River canyon reach. Low flows during the Chinook escapement in fall 2022 impeded the migration of Chinook spawners to the spawning grounds upstream of the canyon reach, resulting in the lack of observations made in valley reaches. 74 Chinook Salmon (7.4% of the estimated total escapement of 994 adults) were observed migrating upstream of the CDFW weir in 2022.

Rainbow trout/steelhead juveniles were observed in all survey reaches. *O. mykiss* observations were made consistently in all habitat types. Due to the methodology of mostly snorkeling deep, slow-water habitats, it is likely that the *O. mykiss* counts are vast underestimates of the actual abundance of these fish, as they were often present in shallow water and riffles.

Reach	**Survey Distance (Miles)**	**Habitat Units Surveyed**	**Coho Count**	***O. mykiss* Count**	**Chinook Count**
Kelsey Creek	0.2	10	20 (mixing zone only)	484	3 (mixing zone only)
Canyon Creek	0.6	27	286	556	37
Shackleford Creek	0.6	16	154	817	0
Mill Creek – (Canyon Reach)	0.5	12	211	157	0
Scott River RKM 40.7-42.8	1.3	16	0	42	0
Kidder Creek	0.3	9	0	537	0
Patterson Creek	1.0	20	0	268	0
Scott River RKM 68.6-70.6	1.2	19	15	155	0

(*Continued*)

[6] Stapleton, B. 2023. Personnel communication.

Reach	Survey Distance (Miles)	Habitat Units Surveyed	Coho Count	*O. mykiss* Count	Chinook Count
Etna Creek	0.8	26	653	1,291	0
French Creek	0.7	23	843	515	0
Lower Sugar Creek	0.7	35	1,750	454	0
Upper Sugar Creek	2.1	45	64	438	0
Wildcat Creek	1.2	41	200	1,018	0
South Fork Scott & Boulder Creek	1.0	22	0	435	0
East Fork Scott & Big Mill Creek	2.1	38	18	1,943	0
Totals	**14.3**	**359**	**4,214**	**9,110**	**40**

Table 1. Comparison of area surveyed and fish counts from all reaches.

The following pages summarizes some of the information collected during the direct observation surveys for each of the 15 reaches. Scott River Watershed Council and Quartz Valley Indian Reservation sincerely appreciates the ability to work on the private lands of Scott Valley. This report and the information contained within would not be available if not for the willingness of private landowners to grant such access.

Kelsey Creek

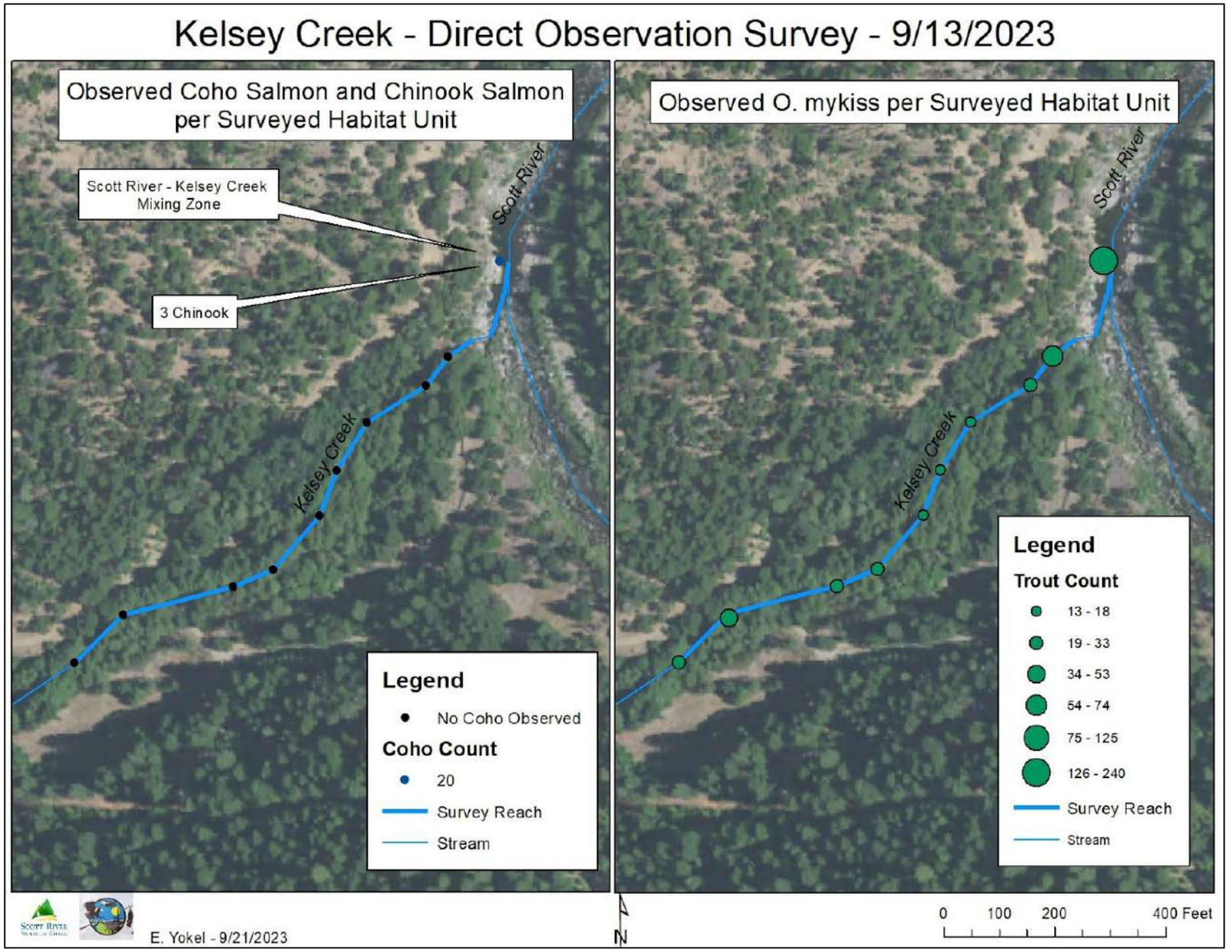
On September 13, 2023, 10 habitat units were surveyed in the Kelsey Creek area: 1 in the mixing zone at the confluence of Kelsey Creek with the Scott River, and 9 in Kelsey Creek above the confluence (Map 1). In this reach covering 0.2 miles, 20 Coho Salmon, 3 Chinook Salmon and 484 *O. mykiss* were observed (Table 1). All of the salmon and 240 of the *O. mykiss* were observed in the mixing zone pool (Photo 1 & 2).

Water temperatures ranged from 12.9 to 14.4 °C in Kelsey Creek on September 13th, with an average of 13.7 °C (Table 2).

No additional species were observed, including any sign of beaver.

Photo 1. Confluence of Scott River and Kelsey Creek and what is considered the mixing zone and where Coho Salmon were documented. 9-13-23

Photo 2. Mixing zone pool with Coho Salmon, Chinook and steelhead documented. 9-13-23



Map 1. Salmonid observations made in Kelsey Creek on September 13, 2023.

Survey Distance (Miles)	Habitat Units Surveyed	Coho Count	*O. mykiss* Count	Chinook Count
0.2	10	20	484	3

Table 1. Area covered and number of fish observed during the Kelsey Creek survey.

Date	Minimum Water Temperature (°C)	Maximum Water Temperature (°C)	Average Water Temperature (°C)
9/13/2023	12.9	14.4	13.7

Table 2. Minimum, maximum and average water temperatures in Kelsey Creek on the date of survey.

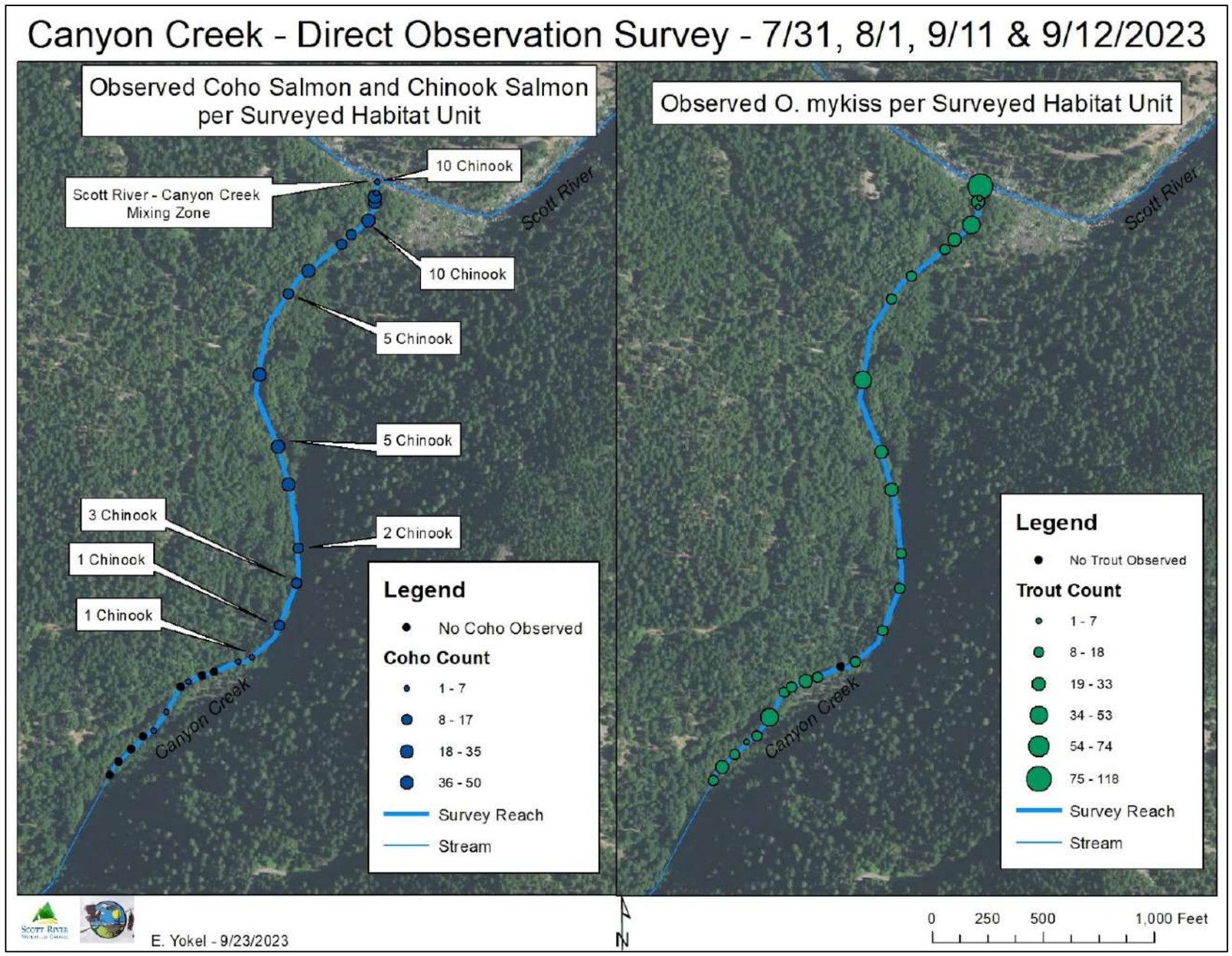
Canyon Creek

Direct observation surveys took place in the Canyon Creek area on four dates: July 31, August 1, September 11 and September 12, 2023. 27 habitat units were surveyed, including 1 in the mixing zone at the confluence with the Scott River (Map 1). In this reach covering 0.6 miles, 296 Coho Salmon, 37 Chinook Salmon and 556 *O. mykiss* were observed (Table 1). 5 of the Coho Salmon, 10 of the Chinook Salmon and 118 of the *O. mykiss* were observed in the mixing zone pool (Photo 1). A notable amount of instream woody debris was documented in Canyon Creek; several pools in which Coho Salmon were observed were formed by naturally occurring wood jams.

Periodic water temperatures were recorded during the Canyon Creek between July 31 and August 1, ranging from 13.1 to 14.5 °C with an average of 13.9 °C. A continuous water temperature logger was deployed in Lower Canyon Creek on August 2, 2023. Water temperature for August 3rd in Canyon Creek range from 13.5 to 14.6 °C with an average of 14.1 °C. Between September 11 and September 12, water temperatures ranged from 12.6 to 14.0 °C, with an average of 13.3 °C (Table 2).

Additional species observed were coastal giant salamander (*Dicamptodon tenebrosus*). No beaver sign was observed in Canyon Creek.

Photo 1. Coho Salmon, Chinook and steelhead documented in pool habitat such as this. 9-11-2023



Map 1. Salmonid observations made in Canyon Creek on July 31, August 1, September 11 and September 12, 2023.

Survey Distance (Miles)	Habitat Units Surveyed	Coho Count	*O. mykiss* Count	Chinook Count
0.6	27	286	556	37

Table 1. Area covered and number of fish observed during the Canyon Creek survey.

Date	Minimum Water Temperature (°C)	Maximum Water Temperature (°C)	Average Water Temperature (°C)
8/3	13.5	14.6	14.1
9/11-9/12	12.6	14.0	13.3

Table 2. Minimum, maximum and average water temperatures in Canyon Creek on the date of survey.

Shackleford Creek

Between August 22 and August 23, 2023, 16 habitat units were surveyed in Shackleford Creek. Shackleford Falls, which acts as a barrier to anadromous fish, served as the upstream extent of the survey reach (Map 1). In this reach covering 0.6 miles, 154 Coho Salmon and 817 *O. mykiss* were observed (Table 1).

Between August 22 and August 23, water temperatures in Shackleford Creek ranged from 14.1°C to 16.1 °C, with an average of 15.0 °C (Table 2).

No additional species were observed, including any sign of beaver.

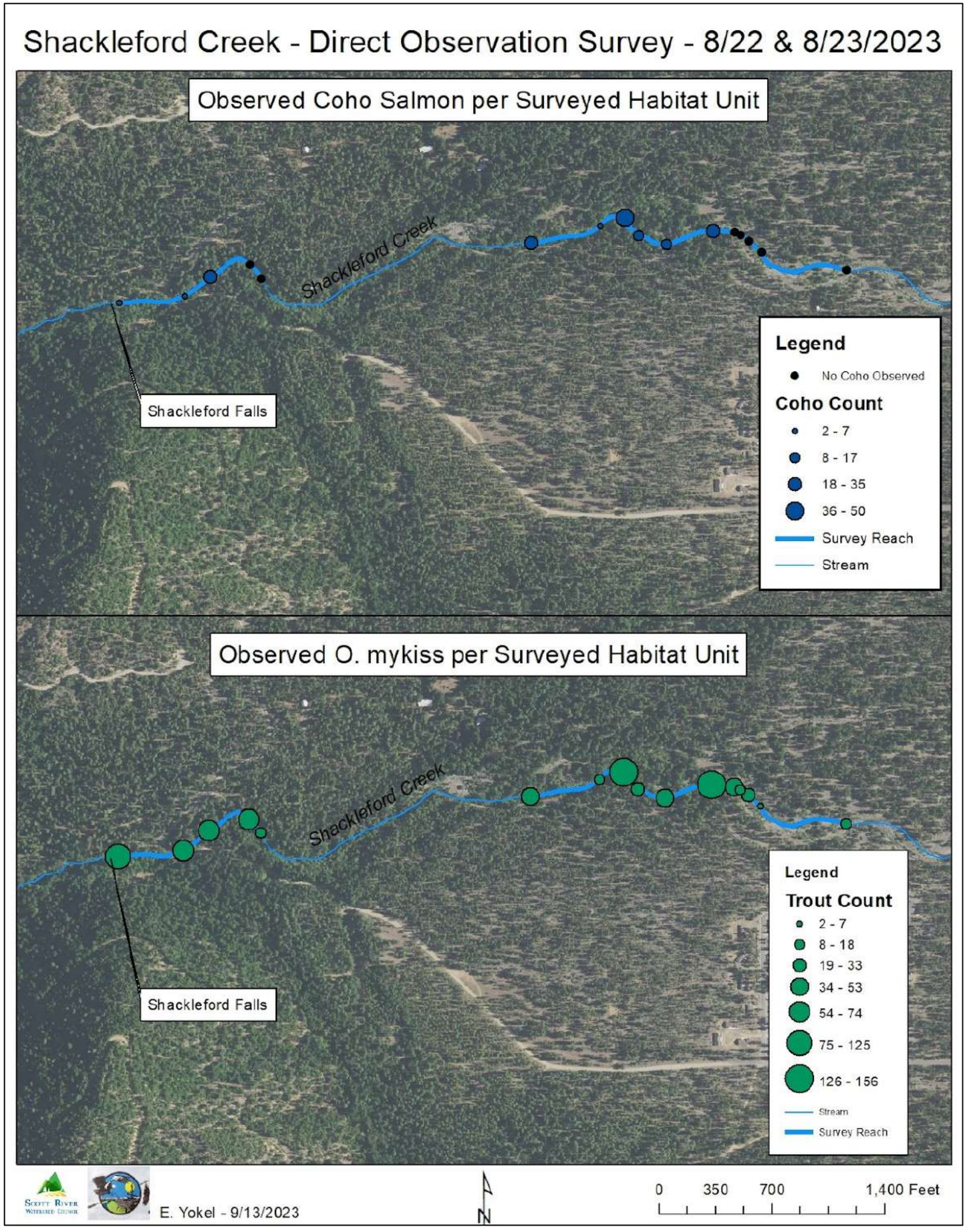
Survey Distance (Miles)	Habitat Units Surveyed	Coho Count	*O. mykiss* Count	Chinook Count
0.6	16	154	817	0

Table 1. Area covered and number of fish observed during the Shackleford Creek survey.

Date	Minimum Water Temperature (°C)	Maximum Water Temperature (°C)	Average Water Temperature (°C)
8/22-8/23	14.1	16.1	15.0

Table 2. Minimum, maximum and average water temperatures in Shackleford Creek on the date of survey.

Map 1. QVIR crew in Shackleford Creek preforming direct observation dives. August 22, 2023



Map 1. Salmonid observations made in Shackleford Creek on August 22 and August 23, 2023.

Mill Creek

Between August 23 and August 24, 2023, 12 habitat units were surveyed on Mill Creek (Map 1). In this reach covering 0.5 miles, 211 Coho Salmon and 157 *O. mykiss* were observed (Table 1).

Between August 23 and August 24, water temperatures in Mill Creek ranged from 13.7 to 15.2 °C, with an average of 14.4 °C (Table 2).

Additional species observed were coastal giant salamander (*Dicamptodon tenebrosus*). No beaver sign was observed in Mill Creek.

Survey Distance (Miles)	Habitat Units Surveyed	Coho Count	*O. mykiss* Count	Chinook Count
0.5	12	211	157	0

Table 7. Area covered and number of fish observed during the Mill Creek survey.

Date	Minimum Water Temperature (°C)	Maximum Water Temperature (°C)	Average Water Temperature (°C)
8/23-8/24	13.7	15.2	14.4

Table 8. Minimum, maximum and average water temperatures in Mill Creek on the date of survey.

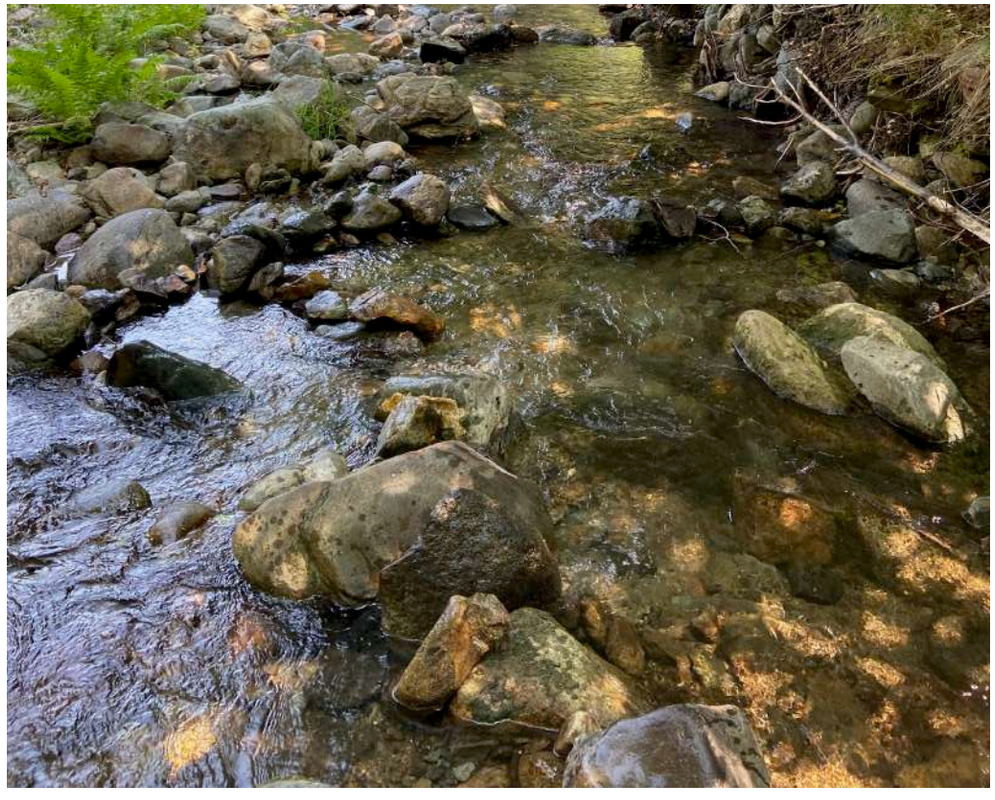
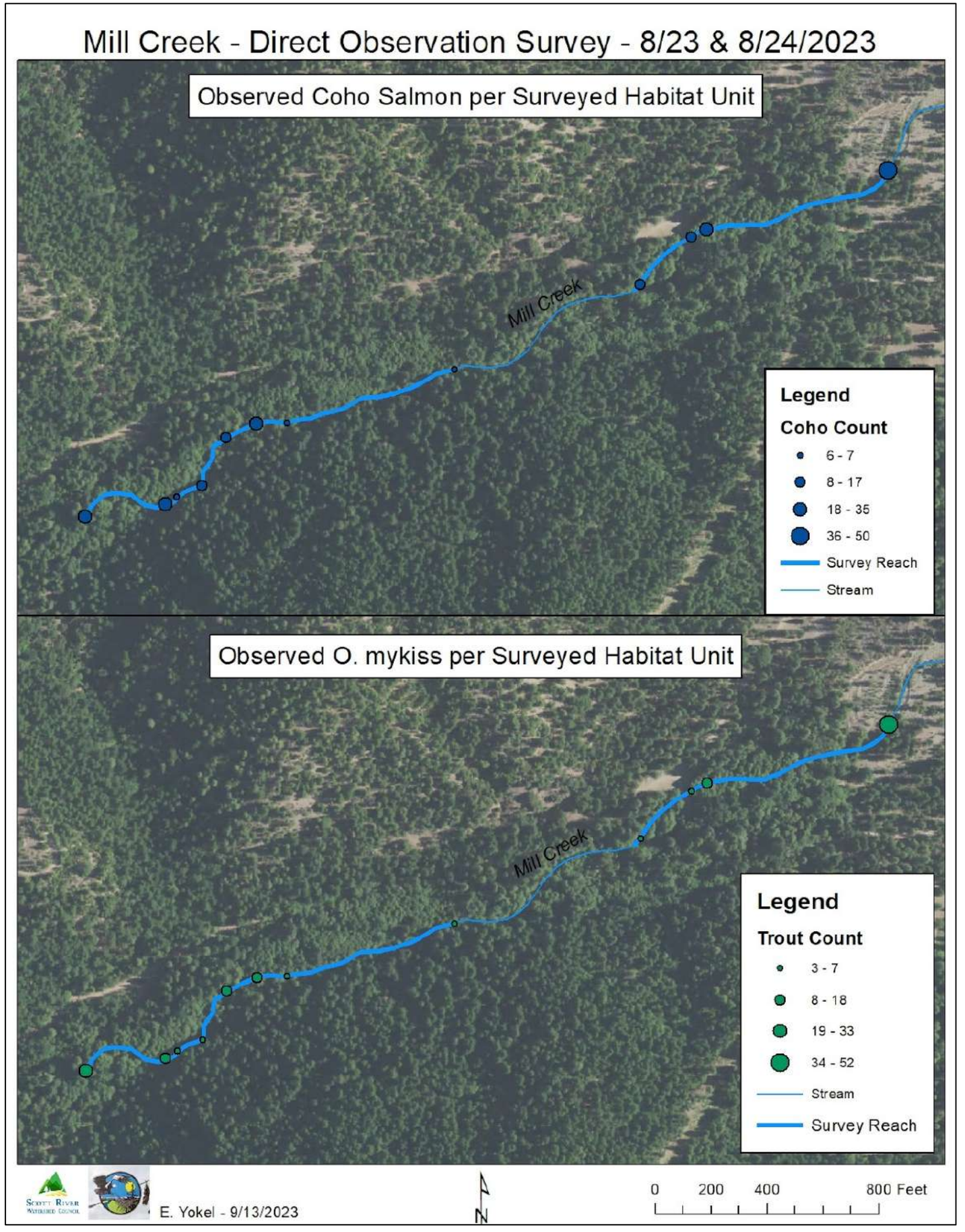


Photo 1. Boulder and cobble dominated subsurface. August 24, 2023.



Map 1. Salmonid observations made in Mill Creek on August 23 and August 24, 2023.

Scott River RKM 40.7 to 42.8

On September 19, 2023, 16 habitat units in the Scott River, upstream of the Meamber Bridge, were surveyed (Map 1). In this reach covering 1.3 miles, 42 *O. mykiss* were observed (Table 1).

Table 1. Area covered and number of fish observed during the Scott River survey.

Survey Distance (Miles)	Habitat Units Surveyed	Coho Count	*O. mykiss* Count	Chinook Count
1.3	16	0	42	0

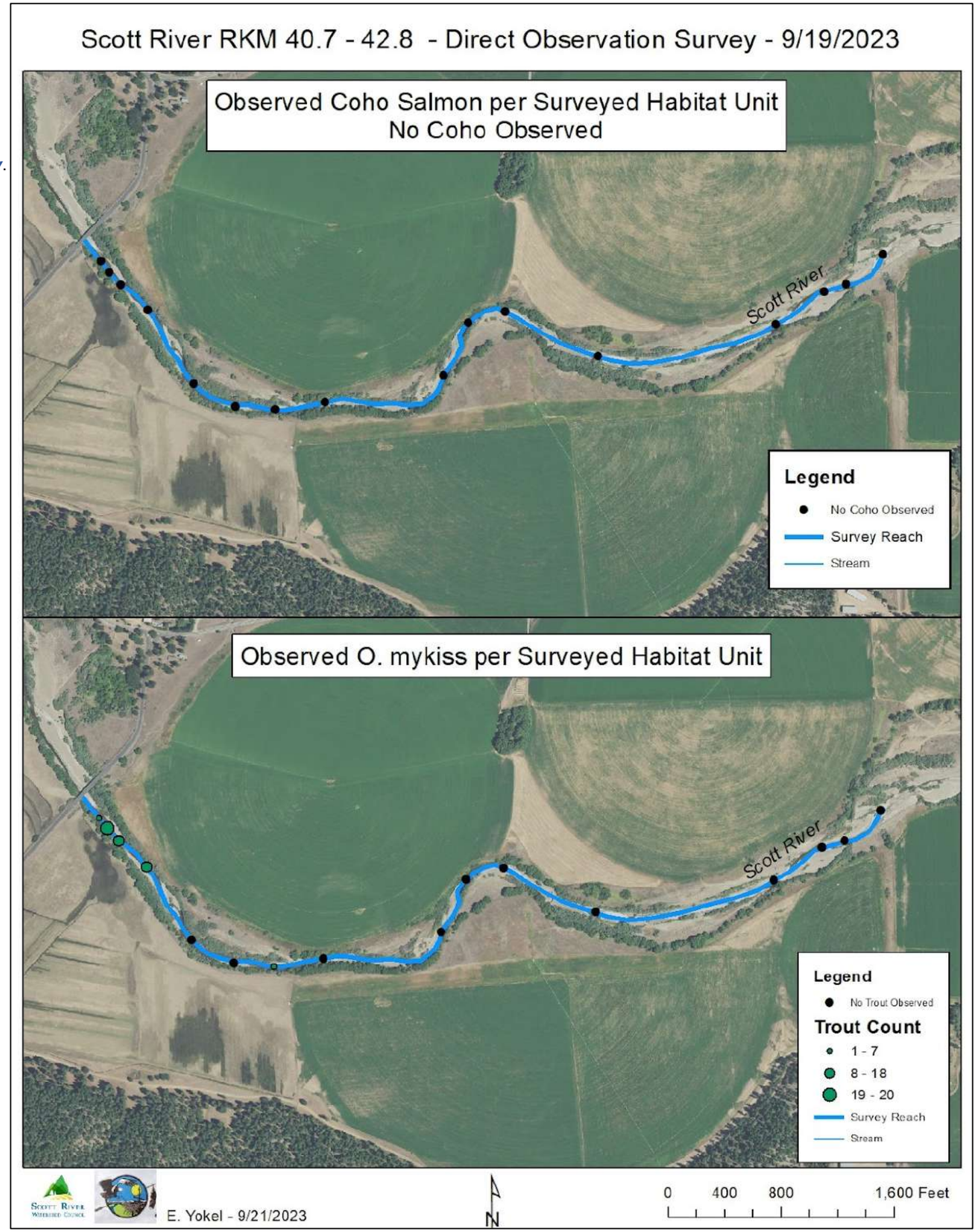
No continuous temperature data was recorded for the Scott River RKM 40.7 - 42.8 reach. Periodic temperature measurements were performed on September 19, documenting water temperatures in the Scott River ranging from 16.7 to 20.5 °C, with an average of 19.3 °C.

Additional species observed were speckled dace *(Rhinichthys osculus*) and Klamath smallscale sucker (*Catostomus rimiculus*).

Beaver sign was observed in the majority of units surveyed in this reach. Bank dens, scat, fresh chew sticks and a partially built beaver dam were observed (Picture 1-2).

Picture 1. Beaver dam site observed on Scott River survey, September 19, 2023.

Picture 2. Beaver bank den entrance observed on Scott River survey, September 19, 2023.



Map 1. Salmonid observations made in the Scott River on September 19, 2023.

Kidder Creek

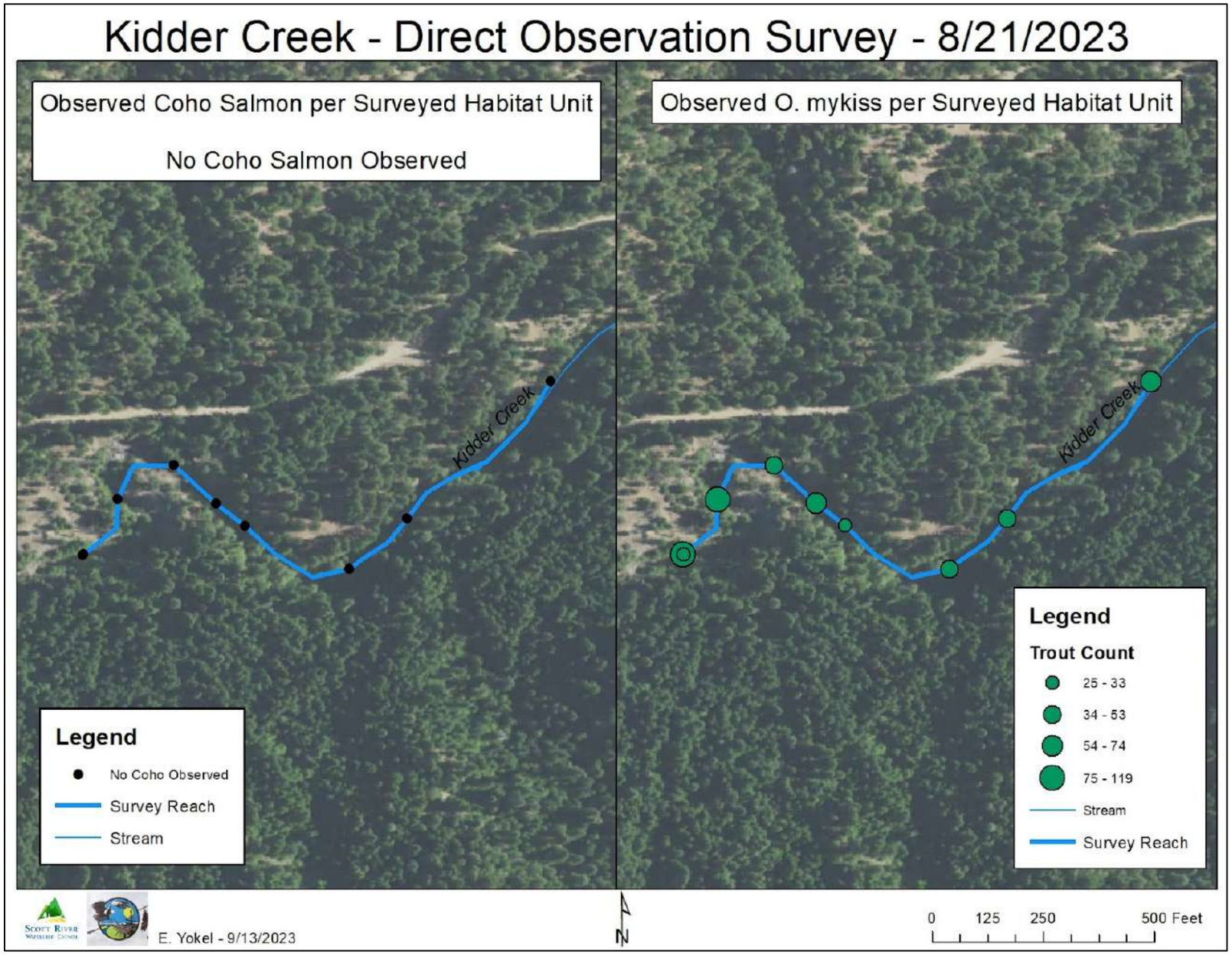
On August 21, 2023, 9 habitat units in Kidder Creek were surveyed (Map 1). In this reach covering 0.3 miles, 537 *O. mykiss* were observed (Table 1). This reach included several deep pool habitats.

On August 21, water temperatures in Kidder Creek ranged from 16.5 to 17.1° C, with an average of 17.8° C (Table 2).

Additional species observed were coastal giant salamander (*Dicamptodon tenebrosus*).

Beaver signs were observed at one site in this reach, although no signs of fresh activity were observed.

Photo 1. QVIR crew surveying pool habitat. 8-21-2023



Map 1. Salmonid observations made in Kidder Creek on August 21, 2023.

Survey Distance (Miles)	Habitat Units Surveyed	Coho Count	*O. mykiss* Count	Chinook Count
0.3	9	0	537	0

Table 1. Area covered and number of fish observed during the Kidder Creek survey.

Date	Minimum Water Temperature (°C)	Maximum Water Temperature (°C)	Average Water Temperature (°C)
8/21	16.5	17.1	17.8

Table 2. Minimum, maximum and average water temperatures in Kidder Creek on the date of survey.

Patterson Creek

On August 4 and August 23, 2023, 20 habitat units were surveyed on Patterson Creek (Map 1). In this reach covering 1.0 miles, 268 *O. mykiss* were observed (Table 1).

August 4, water temperatures in Patterson Creek ranged from 15.1 to 17.5 °C, with an average of 16.2 °C. On August 23, water temperatures in Patterson Creek ranged from 15.0 to 17.0 °C, with an average of 16.0 °C (Table 2).

No additional species observed, limited old signs of beaver were observed – fresh beaver sign was observed in 2021.

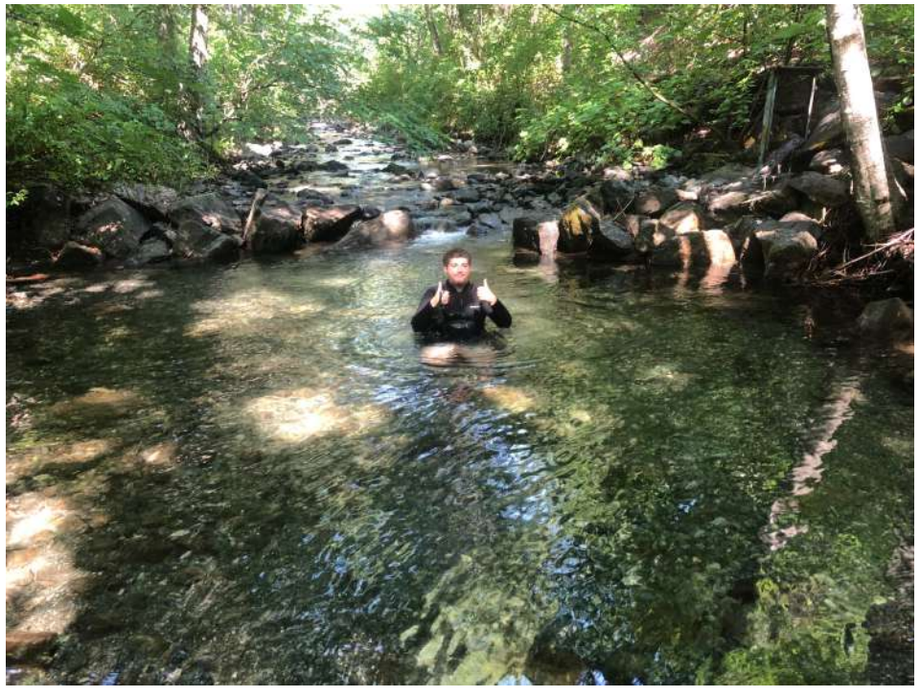
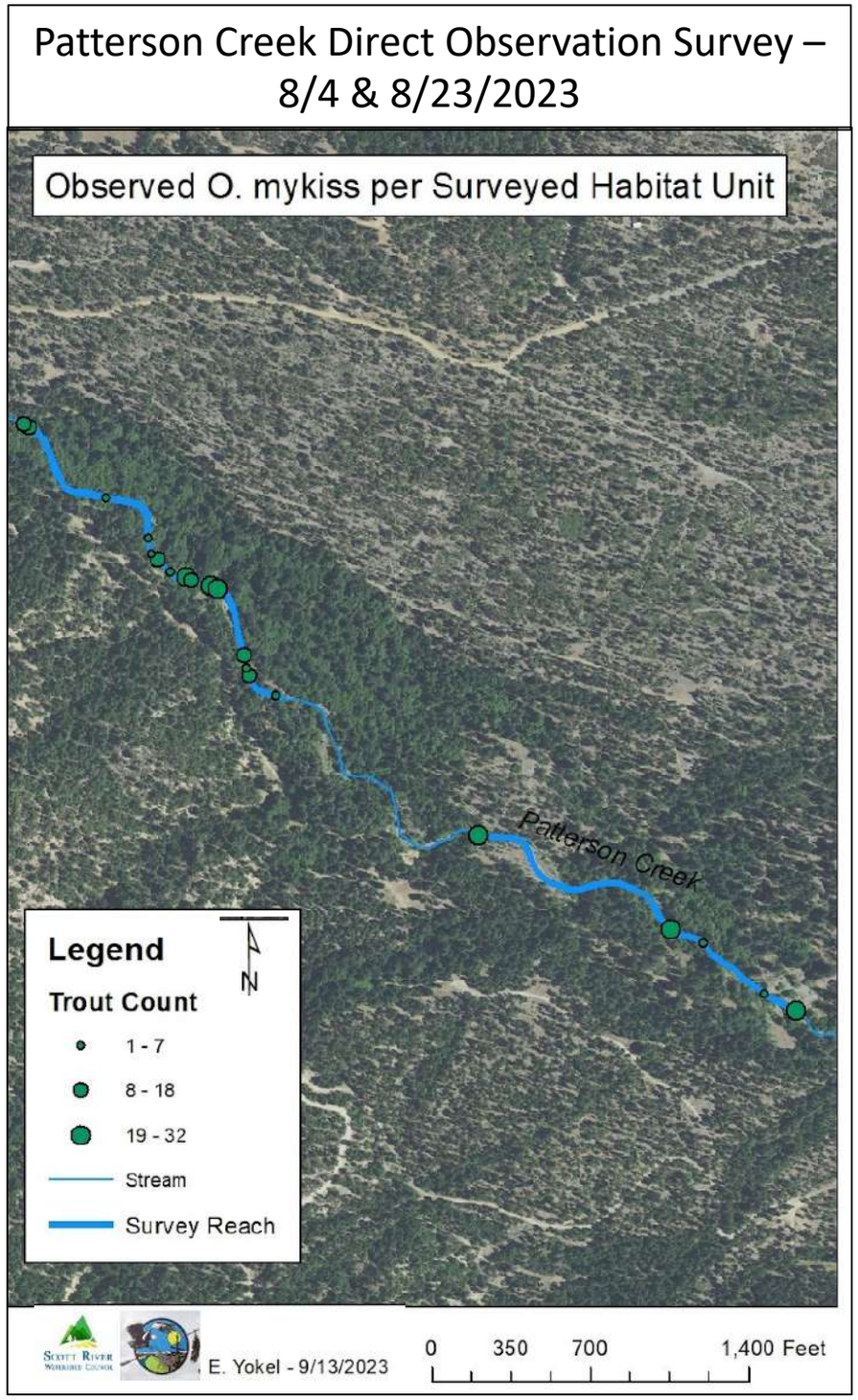


Photo 2. QVIR happy with the habitat. 8-4-2023

Photo 1. There is a lot of wood in the system as shown in this wood jam resulting in increased pool depth and volume, cover and a lot of spawning gravels. 8-23-2023

Photo 3. Patterson Creek wood jams with a lot of riparian shading. 8-4-2023



Map 1. Salmonid observations made in Patterson Creek on August 4 and August 23, 2023.

Survey Distance (Miles)	Habitat Units Surveyed	Coho Count	*O. mykiss* Count	Chinook Count
1.0	20	0	268	0

Table 1. Area covered and number of fish observed during the Patterson Creek survey.

Date	Minimum Water Temperature (°C)	Maximum Water Temperature (°C)	Average Water Temperature (°C)
8/4	15.1	17.5	16.2
8/23	15.0	17.0	16.0

Table 2. Minimum, maximum and average water temperatures in Patterson Creek on the date of survey.

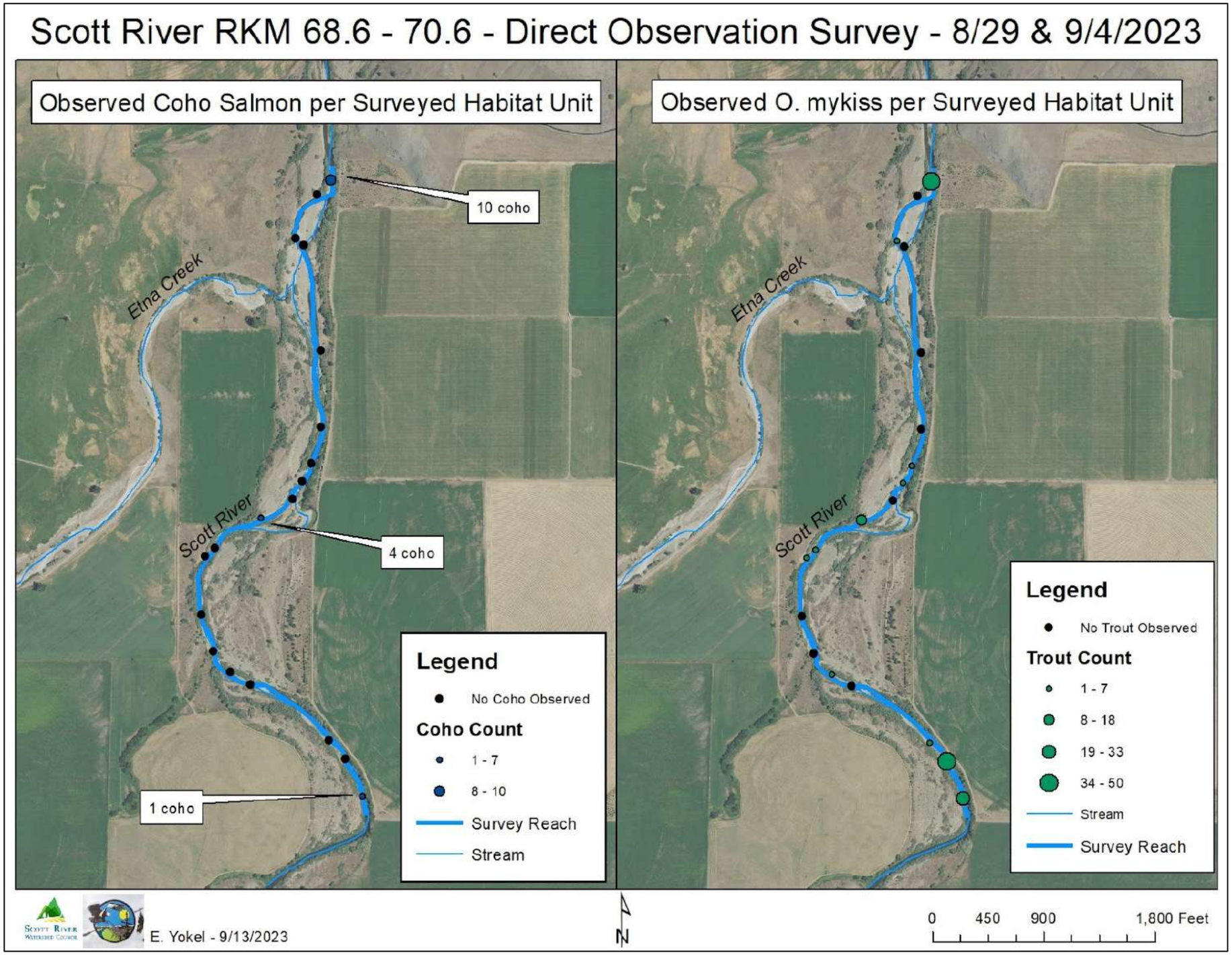
Scott River RKM 68.6 to 70.6

On August 29 and September 4, 2023, 19 habitat units were surveyed on the mainstem Scott River, near the mouth of Etna Creek (Map 1). In this reach covering 1.2 miles, 15 Coho Salmon and 155 *O. mykiss* were observed (Table 1).

No continuous temperature data was recorded for the Scott River RKM 68.6 - 70.6 reach. Periodic temperature measurements were performed on August 29, documenting water temperatures in the Scott River ranging from 16.7 to 17.1 °C, with an average of 16.9 °C.

Additional species observed were speckled dace *(Rhinichthys osculus*), Pacific lamprey (*Entosphenus tridentatus*) (Photo 1), and Klamath smallscale sucker (*Catostomus rimiculus*). Several turtles were also noted.

Beaver sign was observed at 13 of the 19 habitat units surveyed. Fresh chew sticks, scat, and a beaver dam were observed in this reach (Photo 2).



Map 1. Salmonid observations made in the Scott River near the mouth of Etna Creek on August 29 and September 4, 2023.

Photo 1. Adult lamprey seen swimming in pool. 8-29-2023

Photo 2. Beaver dam on the Scott River mainstem. 8-29-23

Survey Distance (Miles)	Habitat Units Surveyed	Coho Count	*O. mykiss* Count	Chinook Count
1.2	19	15	155	0

Table 1. Area covered and number of fish observed during the Scott River survey.

Etna Creek

Between August 21 and August 23, 2023, 26 habitat units were surveyed in Etna Creek. 9 of these units were above the diversion dam and fish ladder at the Etna City Water Works (Map 1). In this reach covering 0.8 miles, 653 Coho Salmon and 1,291 *O. mykiss* were observed (Table 1). 71 of the Coho Salmon were observed above the dam and fish ladder. It is worth noting that juvenile salmonids were observed in the bays of the fish ladder, so it is possible that the Coho Salmon observed above the dam used the ladder for migration in a redistribution period.

Between August 21 and August 23, water temperatures in Etna Creek ranged from 14.4 to 15.9° C, with an average of 15.2° C (Table 2).

Additional species observed were coastal giant salamander (*Dicamptodon tenebrosus*). and marbled sculpin (*Cottus klamathensis*). No beaver sign was observed in Etna Creek.

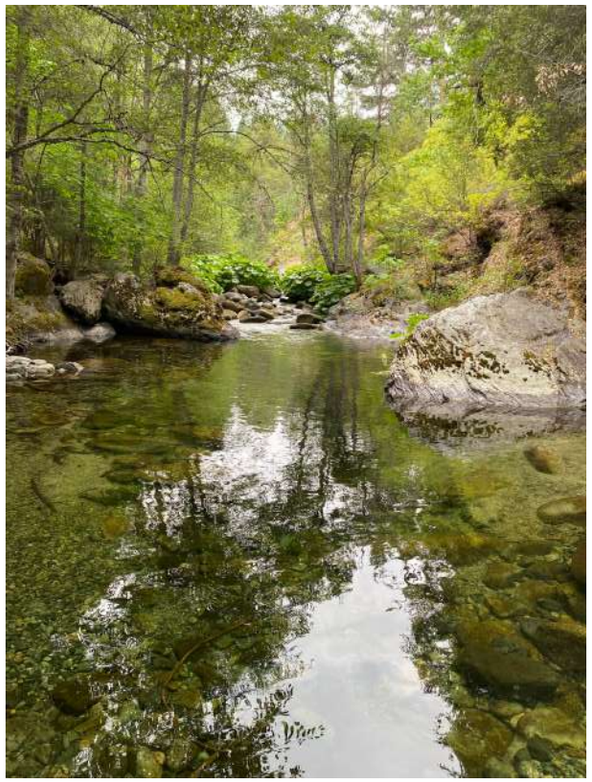
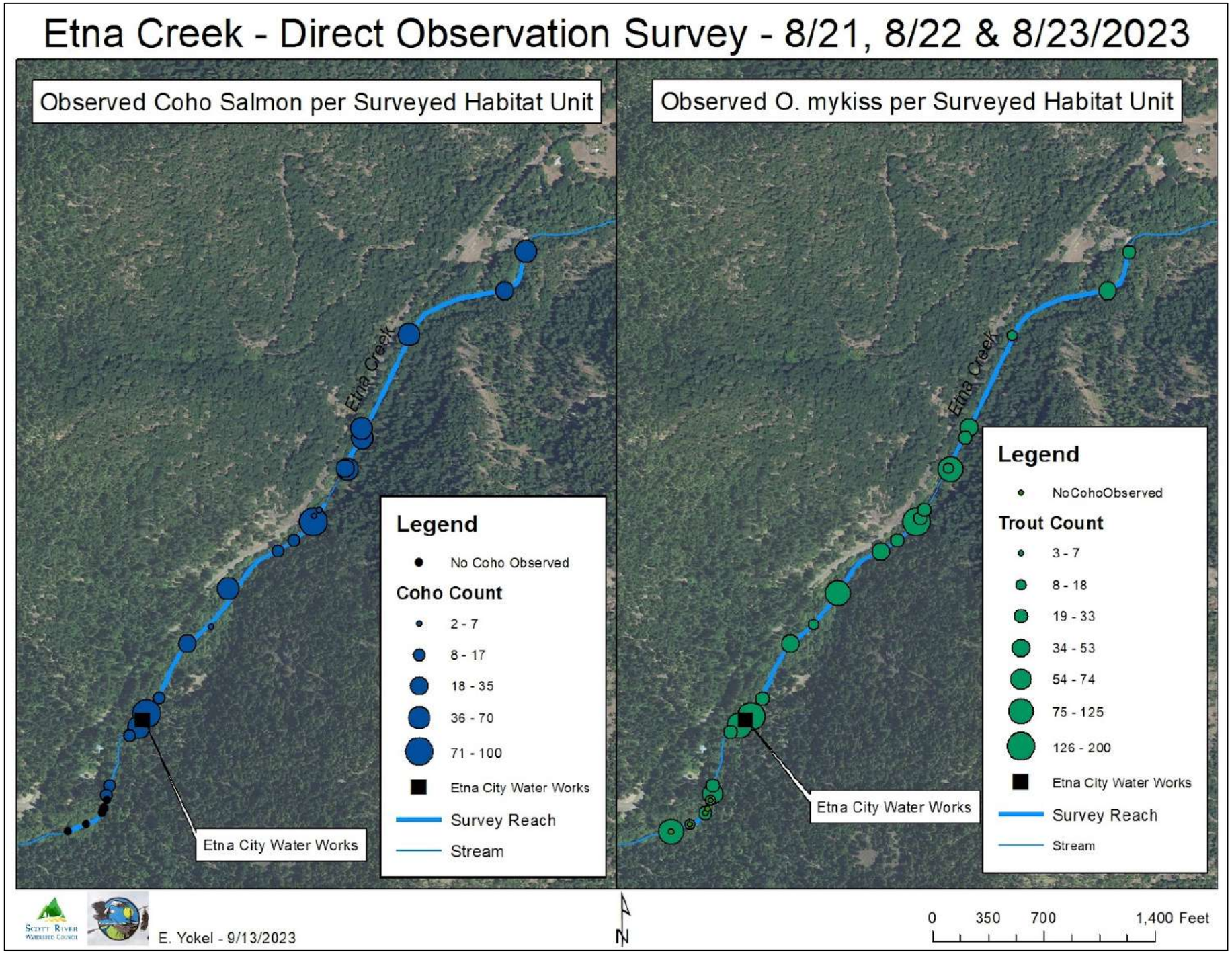


Photo 1. Typical pool habitat in Etna Creek. 8-21-23



Map 1. Salmonid observations made in Etna Creek between August 21 and August 23, 2023.

Photo 2. Typical pool habitat in Etna Creek. 8-21-23

Survey Distance (Miles)	Habitat Units Surveyed	Coho Count	*O. mykiss* Count	Chinook Count
0.8	26	653	1,291	0

Table 1. Area covered and number of fish observed during the Etna Creek survey.

Date	Minimum Water Temperature (°C)	Maximum Water Temperature (°C)	Average Water Temperature (°C)
8/21-23	14.4	15.9	15.2

Table 2. Minimum, maximum and average water temperatures in Etna Creek on the date of survey.

French Creek

Between July 28 and August 2, 2023, 23 habitat units were surveyed in Mid French Creek (Map 1). In this reach covering 0.70 miles, 843 Coho Salmon and 515 *O. mykiss* were observed (Table 1).

Between July 28 and August 2, water temperatures in French Creek ranged from 13.6 to 18.1° C, with an average of 15.7° C (Table 2).

Additional species observed were speckled dace *(Rhinichthys osculus*), and marbled sculpin (*Cottus klamathensis*).

Beaver sign was observed in 7 of the units surveyed in French Creek, including a dam at the downstream end of the reach.

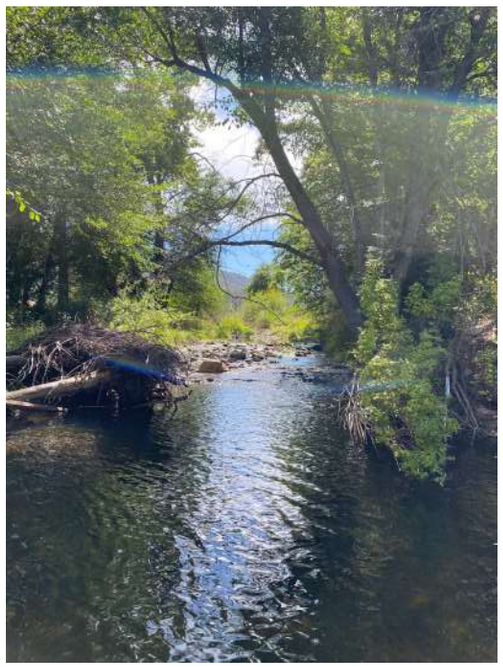
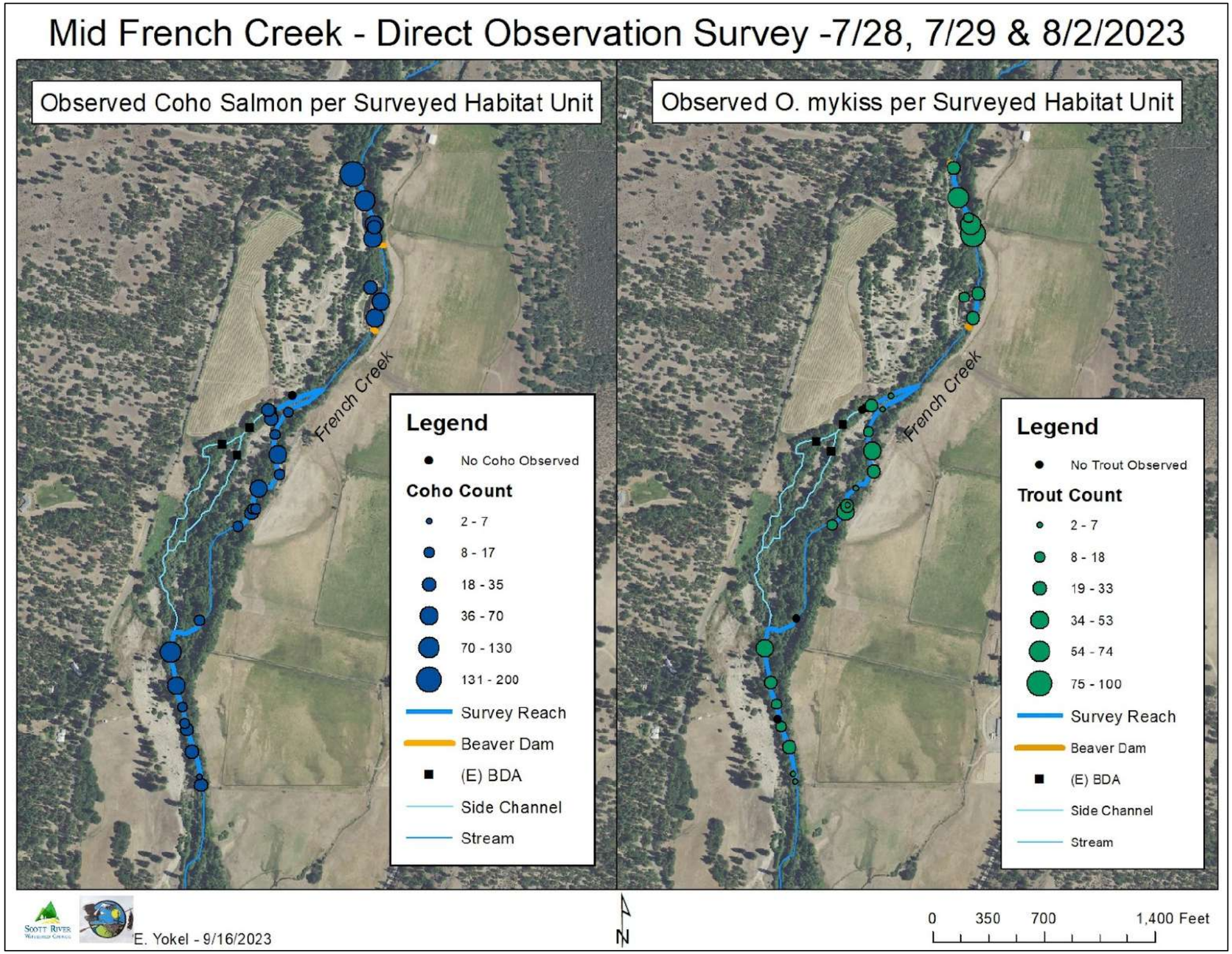


Photo 1. Large wood, good riparian cover, and pool habitat. July 28, 2023



Map 1. Salmonid observations made in French Creek between July 28 and August 2, 2023.

Survey Distance (Miles)	Habitat Units Surveyed	Coho Count	*O. mykiss* Count	Chinook Count
0.7	23	843	515	0

Table 1. Area covered and number of fish observed during the French Creek survey.

Date	Minimum Water Temperature (°C)	Maximum Water Temperature (°C)	Average Water Temperature (°C)
7/28-8/2	13.6	18.1	15.7

Table 2. Minimum, maximum and average water temperatures in French Creek on the date of survey.

Sugar Creek - Lower

Between July 18 and July 19, 2023, 35 habitat units in the Lower Sugar Creek area were surveyed, including 2 units in the mainstem Scott River at the confluence (Map 1). In this reach covering 0.7 miles, 1,750 Coho Salmon and 454 *O. mykiss* were observed (Table 1). 250 of the Coho Salmon were observed in mainstem Scott River pools near the confluence.

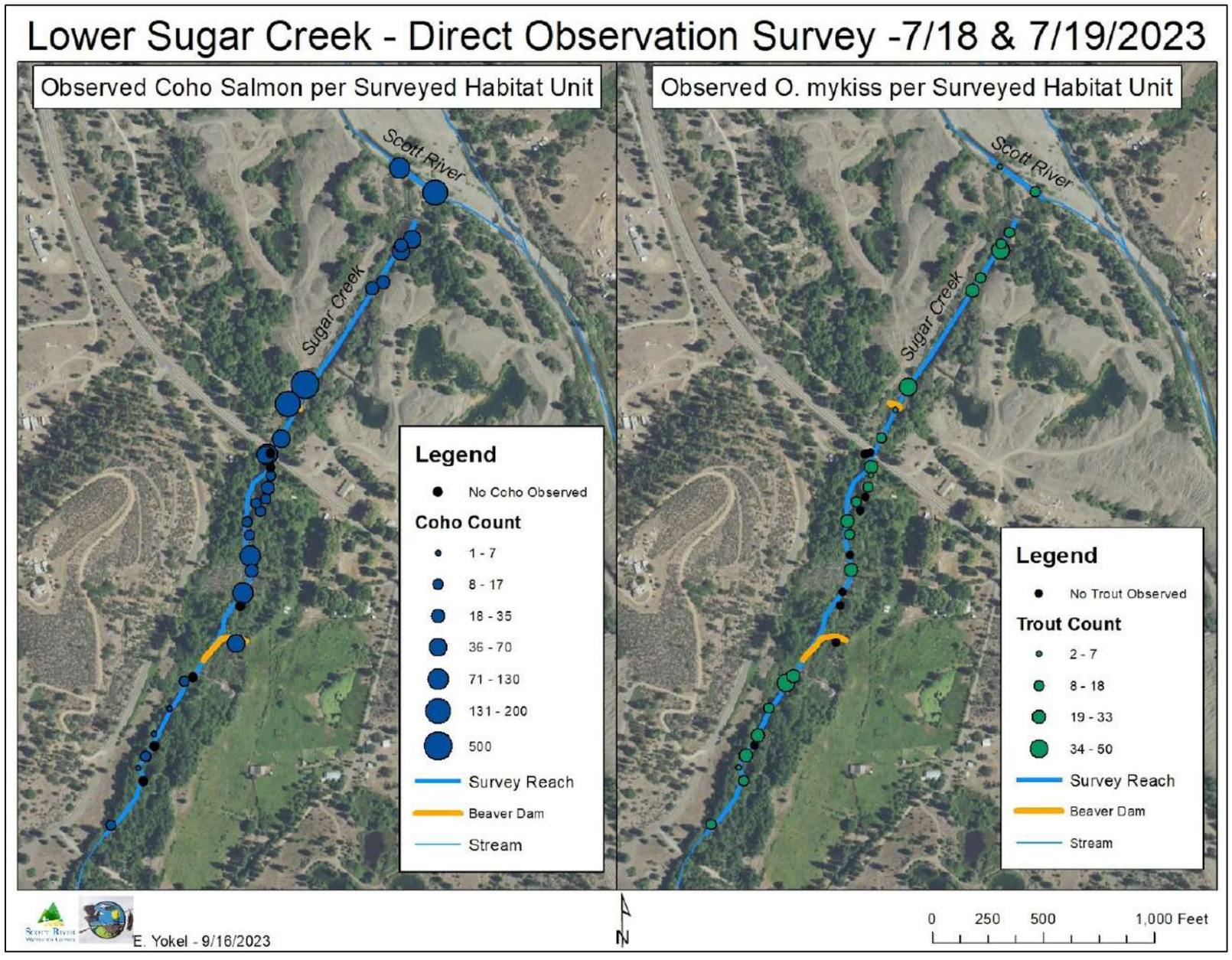
Between July 18 and July 19, water temperatures in Lower Sugar Creek ranged from 16.3 to 19.8, with an average of 18.0 °C (Table 2).

Additional species observed were speckled dace *(Rhinichthys osculus*) and crawfish.

Beaver sign was observed in both the mainstem Scott River and Sugar Creek in this reach. Bank dens, chew sticks, scat and an active dam were all observed.

Photo 1. Slow water habitat behind beaver dam, a lot of aquatic vegetation. 7-19-2023

Photo 2. Coho Salmon in pool habitat behind a beaver dam analogue (BDA) structure. 7-18-2023



Map 1. Salmonid observations made in Lower Sugar Creek between July 18 and July 19, 2023.

Survey Distance (Miles)	Habitat Units Surveyed	Coho Count	*O. mykiss* Count	Chinook Count
0.7	35	1,750	454	0

Table 1. Area covered and number of fish observed during the Lower Sugar Creek survey.

Date	Minimum Water Temperature (°C)	Maximum Water Temperature (°C)	Average Water Temperature (°C)
7/18-19	16.3	19.8	18.0

Table 2. Minimum, maximum and average water temperatures in Lower Sugar Creek on the date of survey.

Sugar Creek - Upper

A total of 45 habitat units were surveyed in Upper Sugar Creek on July 20, July 24 and September 11, 2023 (Map 1). In this reach covering 2.1 miles, 64 Coho Salmon and 438 *O. mykiss* were observed (Table 1).

No continuous temperature data was recorded for the Upper Sugar Creek reach. Periodic temperature measurements were performed on July 20, documenting water temperatures in the Scott River ranging from 14.6 to 17.0 °C, with an average of 15.8 °C. Periodic temperature measurements were performed on September 11, documenting water temperatures in the Scott River ranging from 11.7 to 13.1 °C, with an average of 12.6 °C.

Additional species observed were coastal giant salamander (*Dicamptodon tenebrosus*). No beaver sign was observed in Upper Sugar Creek.

Survey Distance (Miles)	Habitat Units Surveyed	Coho Count	*O. mykiss* Count	Chinook Count
2.1	35	64	438	0

Table 1. Area covered and number of fish observed during the Upper Sugar Creek survey.

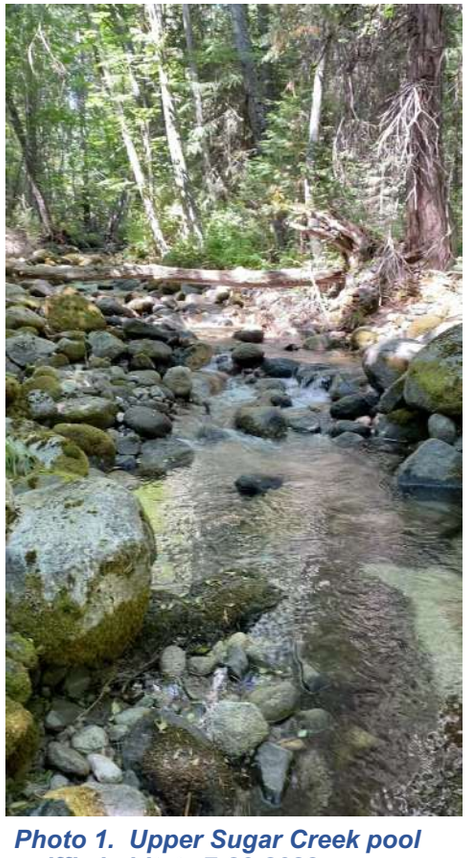
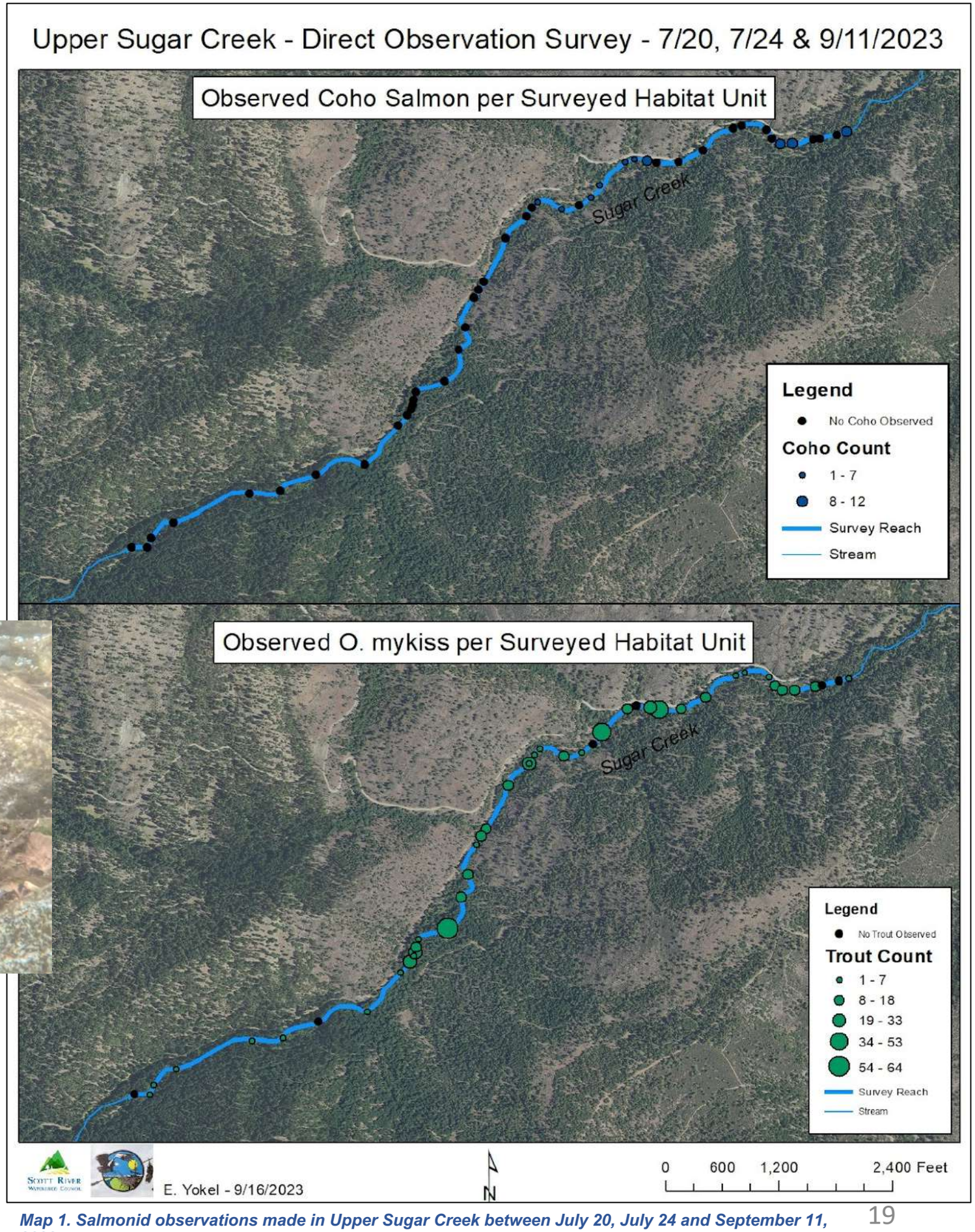


Photo 1. Upper Sugar Creek pool – riffle habitat. 7-20-2023

Photo 1. Coast giant salamander. 7-20-2023



Map 1. Salmonid observations made in Upper Sugar Creek between July 20, July 24 and September 11, 2023.

Wildcat Creek

On August 24 and August 28, 2023, 41 habitat units were sampled in Wildcat Creek (Map 1). In this reach covering 1.2 miles, 200 Coho Salmon and 1,018 *O. mykiss* were observed (Table 1).

Between August 24 and August 28, water temperatures in Wildcat Creek ranged from 12.5 to 16.9 °C, with an average of 14.7 °C (Table 2).

Additional species observed was marbled sculpin (*Cottus klamathensis*). Beaver chew sticks were observed at two sites in Wildcat Creek. It was not able to be determined whether these sticks were recently handled by beaver.

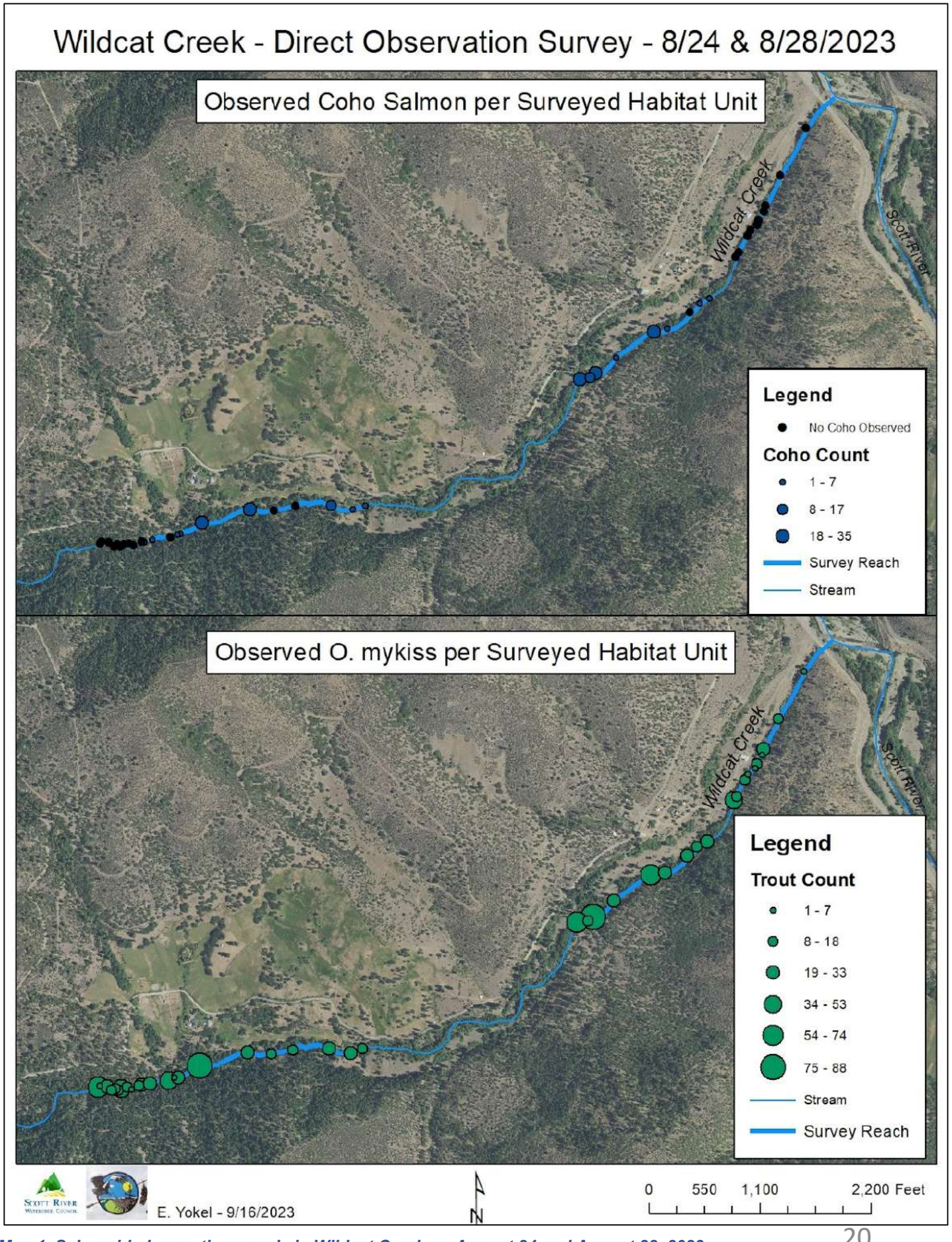
Survey Distance (Miles)	Habitat Units Surveyed	Coho Count	*O. mykiss* Count	Chinook Count
1.2	41	200	1,018	0

Table 1. Area covered and number of fish observed during the Wildcat Creek survey.

Date	Minimum Water Temperature (°C)	Maximum Water Temperature (°C)	Average Water Temperature (°C)
8/24-8/28	12.5	16.9	14.7

Table 2. Minimum, maximum and average water temperatures in Wildcat Creek on the date of survey.

Photo 1. O. mykiss in pool habitat. August 28, 2023.



Map 1. Salmonid observations made in Wildcat Creek on August 24 and August 28, 2023.

South Fork Scott River & Boulder Creek

Between August 16 and August 17, 2023, 12 habitat units were surveyed in the South Fork Scott River and 10 units were surveyed in Boulder Creek (Map 1). In this reach covering 1.0 miles, 435 *O. mykiss* were observed: 336 in the South Fork and 99 in Boulder Creek. (Table 1).

No continuous temperature data was recorded for the South Fork or Boulder Creek reaches. Periodic temperature measurements performed on August 16 and August 17, documented water temperatures in the South Fork Scott River from 15.5 °C to 16.8 °C, with an average of 16.1 °C (Table 2).

Periodic temperature measurements in Boulder Creek on August 17 ranged from 16.3 °C to 16.9 °C, with an average of 16.6 °C (Table 3).

Additional species observed were speckled dace *(Rhinichthys osculus*). No beaver sign was observed in the South Fork Scott River or Boulder Creek.

Survey Distance (Miles)	Habitat Units Surveyed	Coho Count	*O. mykiss* Count	Chinook Count
1.0	22	0	435	0

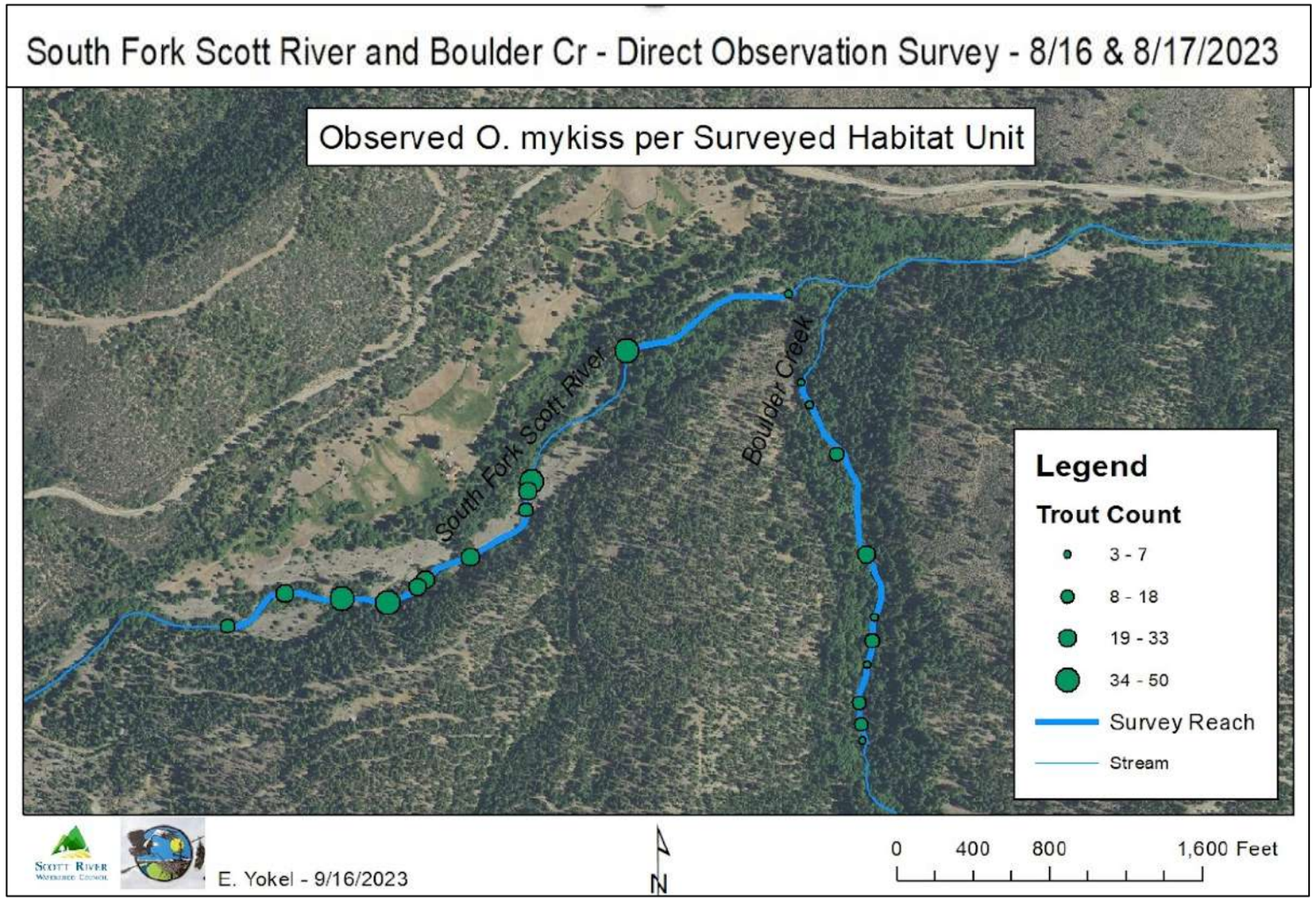
Table 1. Area covered and number of fish observed during the South Fork Scott and Boulder Creek survey.

Date	Minimum Water Temperature (°C)	Maximum Water Temperature (°C)	Average Water Temperature (°C)
8/16 -17	15.5	16.8	16.1

Table 2. Minimum, maximum and average water temperatures in the South Fork Scott River on the date of survey.

Date	Minimum Water Temperature (°C)	Maximum Water Temperature (°C)	Average Water Temperature (°C)
8/17	16.3	16.9	16.6

Table 3. Minimum, maximum and average water temperatures in Boulder Creek on the date of survey.



Map 1. Salmonid observations made in the South Fork Scott River and Boulder Creek between August 16 and August 17, 2023.

Photo 1. South Fork pool habitat. 8-17-2023

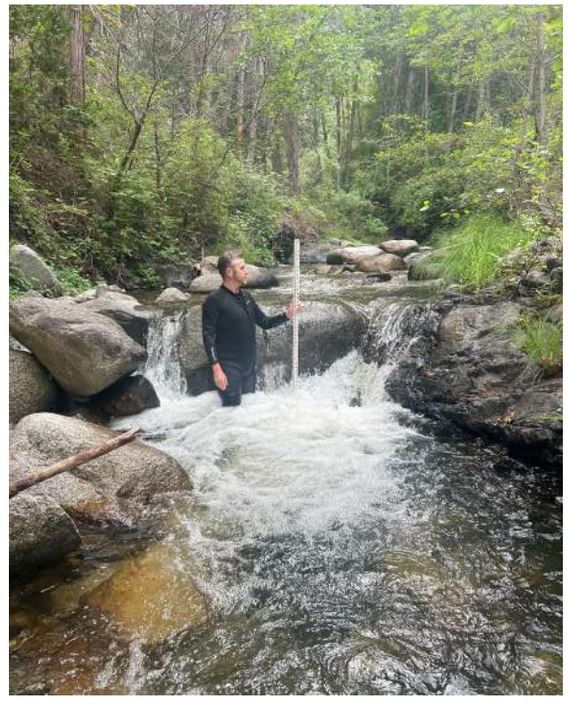


Photo 2. SRWC crew in Boulder Creek plunge pool. 8-17-2023

East Fork –Scott River
Big Mill Creek

On July 25, July 27, August 30 and September 1, 2023, 33 habitat units were surveyed in the East Fork Scott River and 4 units were surveyed in Big Mill Creek (Map 1). In this reach covering 2.1 miles, 18 Coho Salmon and 1,943 *O. mykiss* were observed (Table 1). 84 of these *O. mykiss* were observed in Big Mill Creek.

Between July 25 and July 27, water temperatures in the East Fork Scott River ranged from 22°C to 16°C, with an average of 18.8°C. Between August 30 and September 1, water temperatures in the East Fork Scott River ranged from 14.2°C to 20.2°C, with an average of 16.3°C (Table 2). Between July 25 and July 27, water temperatures in Big Mill Creek ranged from 13.9°C to 18.7°C, with an average of 16.2°C (Table 3).

Additional species observed were coastal giant salamander (*Dicamptodon tenebrosus*). speckled dace *(Rhinichthys osculus*), marbled sculpin (*Cottus klamathensis*) and crawfish. Sign of beaver was documented throughout the reach.

Survey Distance (Miles)	Habitat Units Surveyed	Coho Count	*O. mykiss* Count	Chinook Count
2.1	38	18	1,943	0

Table 1. Area covered and number of fish observed during the East Fork Scott and Big Mill Creek survey.

Date	Minimum Water Temperature (°C)	Maximum Water Temperature (°C)	Average Water Temperature (°C)
7/25-27	16.0	22.0	18.8
8/30-9/1	14.2	20.2	16.3

Table 2. Minimum, maximum and average water temperatures in the East Fork Scott River on the date of survey.

Date	Minimum Water Temperature (°C)	Maximum Water Temperature (°C)	Average Water Temperature (°C)
7/25-27	13.9	18.7	16.2

Table 3. Minimum, maximum and average water temperatures in Big Mill Creek on the date of survey.

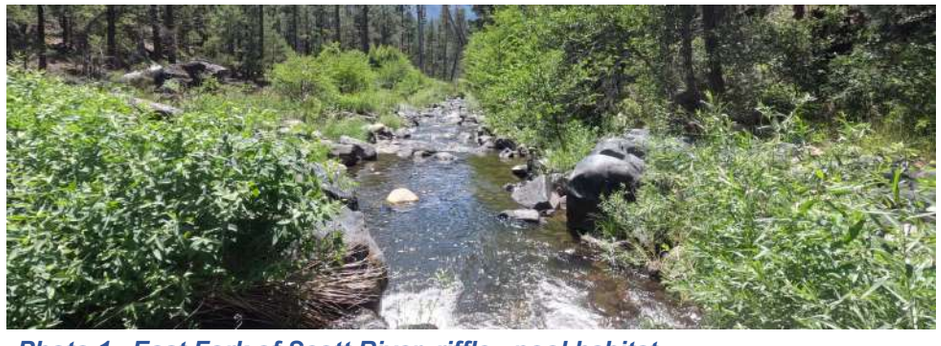
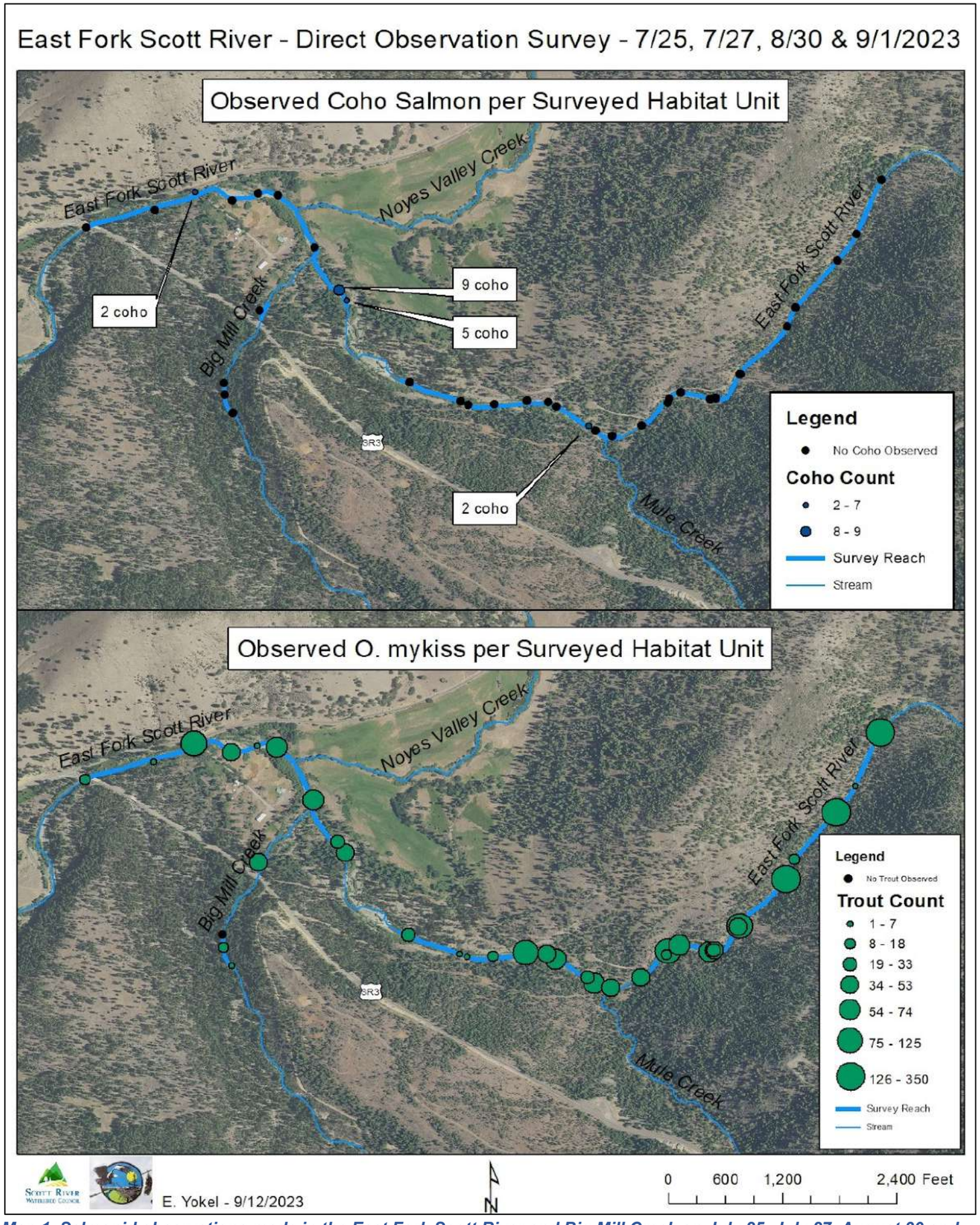


Photo 1. East Fork of Scott River, riffle - pool habitat.



Map 1. Salmonid observations made in the East Fork Scott River and Big Mill Creek on July 25, July 27, August 30 and September 1, 2023.