2023-24 Spawner Survey Report

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Forward to Skagit Fisheries Enhancement Group's Volunteers

On behalf of SFEG staff, I would like to thank you all for another incredible spawner survey season that was waded through with enthusiasm, lots of new faces, and sincere appreciation for the Skagit and Samish watersheds. You all donated an amazing amount of time and persevered despite having a less than fishy season. Your dedication to walking creeks and reporting to Skagit Fisheries what you see (and some fun stories to boot) are what make the Spawner Survey program not only possible but thrive.

First off, it was a pink year which means the creeks in the Skagit had an extra opportunity to see a ton of fish. Being that our Spawner Survey program does not start until the first week of October, surveyors only hit the tail end of the pink season. Despite this, Cumberland Creek survey volunteers were delighted on their first walk of the season with an incredible number of pinks, shoulder to shoulder and competing for spawning gravel, along the side channel reestablished in 2014. Across the county in the Samish watershed, volunteers were diligently counting huge numbers of kokanee on Finnegan Creek. Some creeks continued seeing fish through the end of January and our remarkable volunteers were committed to walking streams until the last coho was counted. Throughout the season, volunteers counted a large number of salmon and informed SFEG on the impacts of past restoration projects, water and survey conditions, and contributed to state-wide knowledge about the state of Salmon in the Skagit and Samish watersheds.

With all this, SFEG extends our deepest gratitude to the volunteers that withstood all that the magic Skagit and Samish had to offer during the 2023-2024 fall and winter salmon runs. The time that you all took out of your days, once a week for three plus months, is admirable. It is inspiring to see so many new faces, as well as those of you that have continued to return year after year to count the salmon. The restoration work that is completed by SFEG is complemented by the commitment our volunteers, YOU, continued to show up for. We hope that you enjoyed all that the season had to offer. We look forward to seeing you out on the creeks and walking with the salmon this coming year. Thank you so much!

Sincerely,

Myrriah Crowley

Habitat Restoration Coordinator

Skagit Fisheries Enhancement Group

Introduction

Skagit Fisheries Enhancement Group's (SFEG) volunteer Spawner Survey Program is a long-term salmon monitoring project that began in 1998. Monitoring data has been collected across 30+ creeks within the Samish and Skagit Watersheds over the last 25 years. These streams are surveyed to help quantify the success of restoration projects that have been completed. Some of these streams are part of the Washington Department of Fish and Wildlife (WDFW) index stream system, which means that this stream has been chosen to have data collected on it for many years and is used as a basis for the surrounding areas.

SFEG's Spawner Survey Program plays an integral part in collecting watershed-wide salmon spawner data. Our data is utilized by the WDFW as part of their annual counts and to provide insight on future salmon returns, abundance, distribution, escapement. Occasionally we are able to provide them with data which updates their current distribution database, Statewide Washington Integrated Fish Distribution (SWIFD). SWIFD is an excellent educational tool, available to the public, to view salmon streams and understand what species are present on what streams. It also indicates population run timing (i.e., Spring Chinook and Winter Chinook), and if a salmon species' presence was documented, presumed, or is determined "gradient accessible" (different species have varying levels of ability to migrate upstream based on stream slope, jumping pools and barriers). We also use these data internally at SFEG to assess past or future restoration projects and the data is made public to landowners and our community.

That said, these surveys only cover a fraction of the tributaries to the Samish and Skagit Rivers, and within the creek themselves only a small portion is surveyed. Currently, we do not have the capacity to wholly understand salmon population and abundance in these streams, as many factors are attributed to the health of salmon populations outside of the creeks they spawn in. This season, the data from the creeks in the Samish River was difficult to comprehend as it did not follow any pattern or trend seen previously. Many factors impact the data and overall success of salmon runs, including rainfall, other weather patterns, ocean conditions, and ocean fishing. Salmon populations return cyclically, and due to an array of limiting factors and environmental conditions, understanding their populations takes years of data and monitoring. We do, however, contribute to the story of fish in each creek and on each survey reach.

The SFEG Spawner Survey Program also plays an important role in connecting our community (volunteers and others) to the watersheds and the fish that are a critical part of our mission. The SFEG Vision Statement includes the hope that the community will be involved, supportive and develop an understanding of the importance of ecosystems. Getting boots on the ground in the streams and sharing data is a valuable outreach tool.

In March of 2023, WDFW release their predictions for returning salmon for the 2023-2024 season. These numbers were developed alongside tribal co-managers during many meetings to decide on timing and length of fishing seasons. We can use these numbers to compare with the trends in the data collected during the 2023-24 spawner survey season at SFEG. WDFW predicted that coho would return in higher numbers than the previous seasons across the state of Washington, except in the Skagit River. Chum, pinks, and kokanee were three other species that were seen on surveys this year. According to WDFW forecasts, chum and pink salmon were predicted to return in

lower numbers than their respective seasons. SFEG works closely with the Skagit River System Cooperative (SRSC), Skagit County, WDFW, local cities, and other local and state-wide entities to better inform and make decisions on how to best improve salmon habitat. This season's data builds on the importance of our Spawner Survey Program by providing SFEG, WDFW, and our community with data to educate, engage and emphasize the importance of keeping the Skagit watershed ecosystem healthy. Through this program and beyond, our goal is to ensure the Skagit has abundant and self-sustaining, wild salmonid populations that can be enjoyed by present and future generations.

Methods

Training volunteers to collect spawning data is a cost-effective way for SFEG to monitor a large suite of sites each year. Volunteers are recruited via outreach to the community on social media, newsletters, college listservs and through SFEG membership. This program requires a large time commitment and dedication across a long period of winter months. The program kicks off each season with a full day of training on the first Saturday of October. At this training, volunteers are taught the basics of salmon ecology, protocols for data collection & recording, and safety procedures. The first part of the day consists of classroom presentations, and the second half of the day is in the field doing salmon dissections and learning to identify fish and salmon redds. At the end of the training, volunteers are paired up with a survey partner for the season and assigned one stream they will walk every week throughout the season. Each person can borrow any survey gear needed, such as waders, boots, walking sticks, gloves and data notebooks. This training is mandatory for all surveyors and helps ensure consistency in data collection across streams and seasons.

SFEG spawner survey volunteers follow protocol set by WDFW. These methods have been used since the beginning of the spawner survey program so that data can be compared through each following year. Each stream that SFEG surveys has a set length with GPS coordinates for consistency and navigation.

Spawner surveys begin at the end of October, with the end of the season differing from stream to stream based on fish presence. Surveys must be completed every 7-10 days to record a broad understanding of what the returning runs look like throughout the season. If volunteers are unable to complete surveys within this time frame, substitutes can survey for the team. If surveys are canceled due to weather or unforeseen circumstances, this is noted in the data archives. A season is complete when fish, either live or dead, have not been seen for two consecutive weeks. This usually coincides with late January into early February.

During a spawner survey, volunteers start at the downstream end of their reach and take data on fish only while walking to the upstream point (see data sheet in Appendix A). Spawner survey volunteers are taught ways of distinguishing the characteristics of the five Pacific salmon species at a workshop before the season begins. Data collected on spawning salmon fall into three categories: live fish, carcasses, and redds. For live fish, the only data collected is species. If distinguishing characteristics of the species are unclear, it is marked as 'unknown'. Carcass data collection is a

longer process. When a salmon carcass is found, data points collected are species, sex, pre-spawn mortality, fork length, and presence or absence of the adipose fin. Sex can be determined from outward appearance but should be confirmed through an anatomy check. The fish must be cut open to determine which reproductive organs are present, which then goes together with determining pre-spawn mortality. We are looking for an abundance of eggs and milt inside the carcass. Fork length is measured from the snout of the fish to the middle of the fork in the tail. The presence of an adipose fin indicates that the fish comes from a wild population, whereas absence of an adipose fin indicates that it was raised in a hatchery. On a survey, these data points are taken for the first 30 carcasses of each species and the tail is clipped off at the peduncle to indicate that it has already been analyzed. These fish will not be counted again if present in the stream in the following weeks. After 30 fish have been processed, carcasses seen are just part of the tally. If they are present on the stream the following week, data can be collected if they are within the first 30 or counted as an additional tally. Salmon nests, which are called redds, are counted and flagged. Bright flagging marked with organization name, date, presumed species, and team initials is hung from objects nearby to show the presence of a redd. Existing redds are not counted in the following weeks. Along with specific data on the fish, survey conditions are also recorded. These include flow type, water visibility, water conditions, and viewing conditions. Additional notes are encouraged. Data sheets are sent to SFEG AmeriCorps members and interns to be entered into ongoing databases for each creek.

The 2023-2024 Season

During the 2023-2024 season, 19 creeks were surveyed throughout the Skagit and Samish watersheds (Figure 1). Each time the complete survey reach is walked, this is tallied as a survey. Total number of surveys, number of volunteer hours, and fish data are presented in Table 1. In total, 4 staff members, 40 volunteers, 2 Washington Service Corp members, 5 Washington Conservation Corps members, and 3 paid interns counted over 1,900 live fish this season (Table 2). This total includes 762 coho (*Oncorhynchus kisutch*), 5 chum (*O. keta*), 123 pinks (*O. gorbusha*), 1,077 kokanee (*O. nerka*), and 8 cutthroat trout (*O. clarkii*) (Table 3). This total is about 1,000 less than the previous season where they saw a total of 2,954 live spawning salmon.

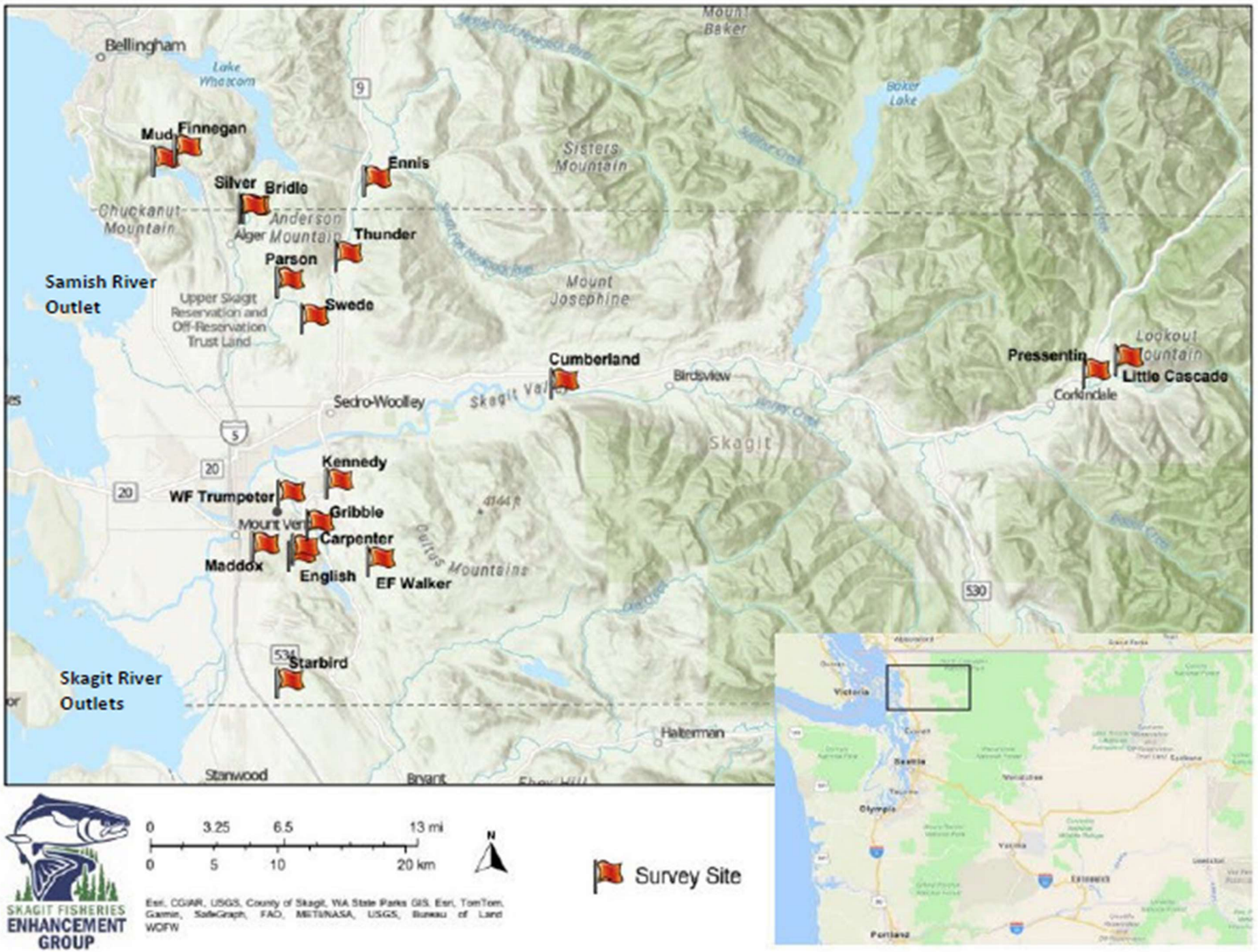

Figure 1: A map of all 19 creeks surveyed by SFEG volunteers in the Skagit and Samish watersheds during the 2023-2024 season.

Table 1: Survey Season Summary

2023-2024 Spawner Survey Summary	
# of Active Sites	19
Total Surveys Complete	208
# of sites where fish were observed	16
# of survey hours completed	1,266

Table 2. Detailed Survey Season Summary (*Surveys Completed represents the number of full surveys physically surveyed from start of reach to end, not surveys interrupted due to hazardous safety conditions)

Creek Name	Watershed	Length (miles)	*Surveys Completed	Total Season Mileage	Consistent Volunteers
Ennis	Samish	0.7	12	8.4	Connor Garrod & Adam Martinez
Parson	Samish	1.65	9	14.85	Ryan Mielke & Dominic Fotes
Thunder	Samish	0.3	12	3.6	John McKenzie & Adam Romine
Swede	Samish	0.5	12	6	Brianna Mafrici & Dimitri Katsiouleris
Silver	Samish	0.6	9	5.4	Jim & Shirley Wilkinson
Bridle	Samish	0.2	8	1.6	John Leighton
Mud	Samish	0.5	9	4.5	Erin Matthews & Felipe Muñoz Felix
Finnegan	Samish	0.3	11	3.3	Erin Matthews & Felipe Muñoz Felix
Maddox	Skagit	0.8	12	9.6	Hal Lee & John Yaeger
Carpenter	Skagit	0.1	10	1	Dean Tilles & Elizabeth Drozda
English	Skagit	0.4	10	4	Dean Tilles & Elizabeth Drozda
East Fork Walker	Skagit	0.5	14	7	Chad Verbitsky & Lindsey Juen
West Fork Trumpeter	Skagit	0.57	7	3.99	Connor Garrod & volunteers
Starbird	Skagit	0.5	14	7	Loren Fuell & Dean Tilles
Gribble	Skagit	0.3	12	3.6	Karin Gribble & Chris Farrow
Kennedy	Skagit	0.18	12	2.16	Catherine Houck & Doug Davidson
Cumberland	Skagit	0.15	10	1.5	Mike Oras & Maddie Player
Little Cascade (Lyric)	Skagit	0.25	16	4	Hal Lee
Pressentin	Skagit	0.5	9	4.5	Karen Schwenk & Don Daschuk

Table 3. Creek summary of 2023-2024 season including total of live fish, carcasses and redds by species.

Creek Name	Species	Live	Carcass	Redd
Ennis	Coho	101	10	18
Parson	Coho	47	74	52
Thunder	Coho	245	45	10
	Chum	5	3	0
Swede	Coho	5	4	0
Silver	Coho	3	5	8
Bridle	Coho	27	1	0
Mud	Kokanee	460	76	95
Finnegan	Kokanee	565	205	54
Maddox	Coho	10	6	4
Carpenter	No Fish Seen			
English	No Fish Seen			
East Fork Walker	Coho	222	186	6
	Cutthroat	8	0	0
West Fork Trumpeter	Coho	4	1	0
Starbird	No Fish Seen			
Gribble	Coho	62	16	9
Kennedy	Coho	10	16	5
Cumberland	Coho	15	11	0
	Chum	0	1	0
	Pink (*O. gorbuscha*)	123	76	14
Little Cascade (Lyric)	Coho	13	2	1
Pressentin	Coho	1	5	2

Samish Watershed

The Samish Watershed is located just north of the Skagit Watershed. It begins in Whatcom County and drains from tributaries in both Whatcom and Skagit County into Samish Bay. It is approximately 139 square miles and extends 25 miles before draining into Samish Bay, just south of the Whatcom-Skagit County Border (Figure 1). The primary salmon species that use this watershed for spawning and rearing include Chinook (*Oncorhynchus tshawytscha*), coho, chum, kokanee and steelhead trout (*O. mykiss*). Other species documented in the Samish River system but not seen during the SFEG Spawner Survey season include bull trout (*Salvelinus confluentus*), dolly varden (*S. malma*), resident coastal cutthroat and rainbow trout (*O. mykiss*).

Agriculture and forestry are major land uses of the watershed and have contributed to widespread degradation of streams in the last century, though practices have improved in recent decades. Pacific salmonid populations in the Samish watershed are posed with a variety of limiting factors such as loss of habitat, increasing water temperatures and sedimentation, and fecal matter contamination. In 2009, the Department of Ecology, Washington State's departments of Agriculture and Health, Skagit County's departments of Health, Planning, and Public Works, Skagit Conservation District, tribal governments, and non-profit organizations such as SFEG, began working together to combat pollution levels in the Samish River and improve riparian health, under the Clean Samish Initiative (Public Works 2009). Since 2009, the streams surveyed by SFEG have seen fluctuations in population numbers with no clear trend. Many surveyed streams within the Samish saw an exponential increase in the number of live fish counted in 2013, followed by a significant decrease, with some creeks seeing little to no fish in 2019 and 2020. Total live fish counts declined this season from last year, which sync with trends put forth by WDFW.

According to the United States Geological Survey (USGS) Samish River at Burlington gage, the highest river level for the 2023-2024 spawner survey season was recorded December 9, 2023 at 8.10 feet (Figure 2). This high river level may correlate to a week of elevated counts of coho on most tributaries of the Samish River as seen in Figure 3. Prior to the uptick in river height, the river was on average 6 feet. Salmon needs sufficient water flow to make it up the mainstem of rivers as well as tributaries (Warkentin 2022). We can speculate that the river height at the beginning of December provided enough water after large rains for salmon to receive an environmental cue and swim upstream to spawn. Notable higher river levels occurred at the end of January when most of the creeks in the Samish watershed had wrapped up surveying for the season. These events occurred on January 23, 2024, with a river height of 8.20 feet and January 28, 2024, with a river height of 9.20 feet.

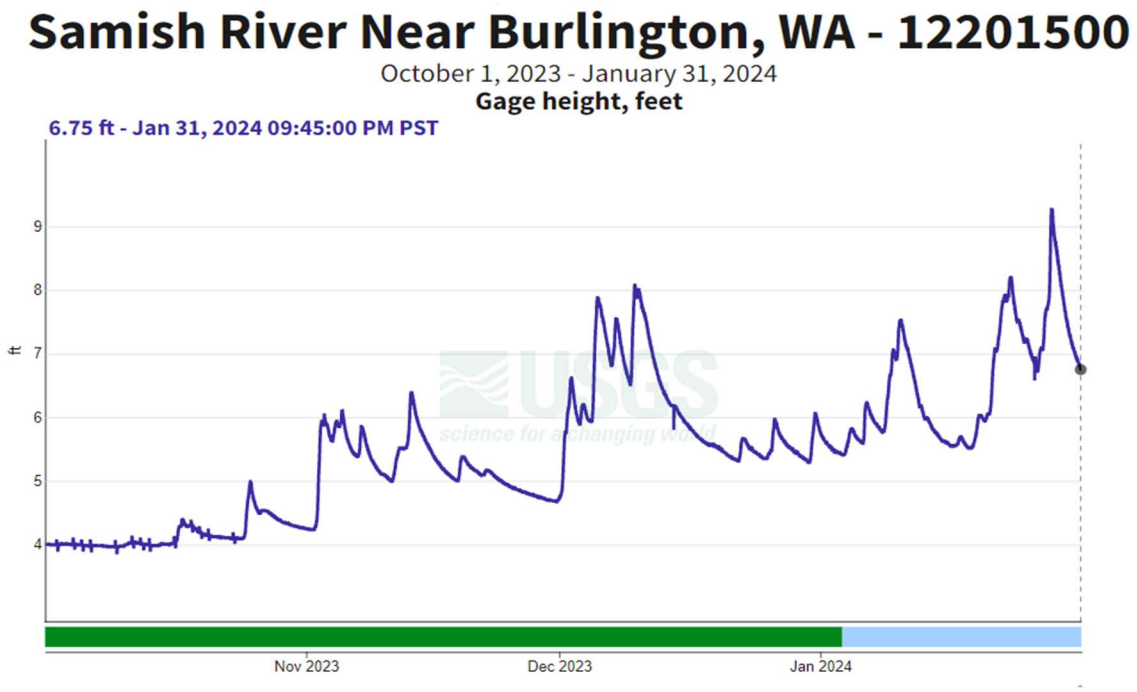

Figure 2: Height of the Samish River from October 1, 2023, to January 31, 2024 at the station near Burlington, WA (USGS 2024).

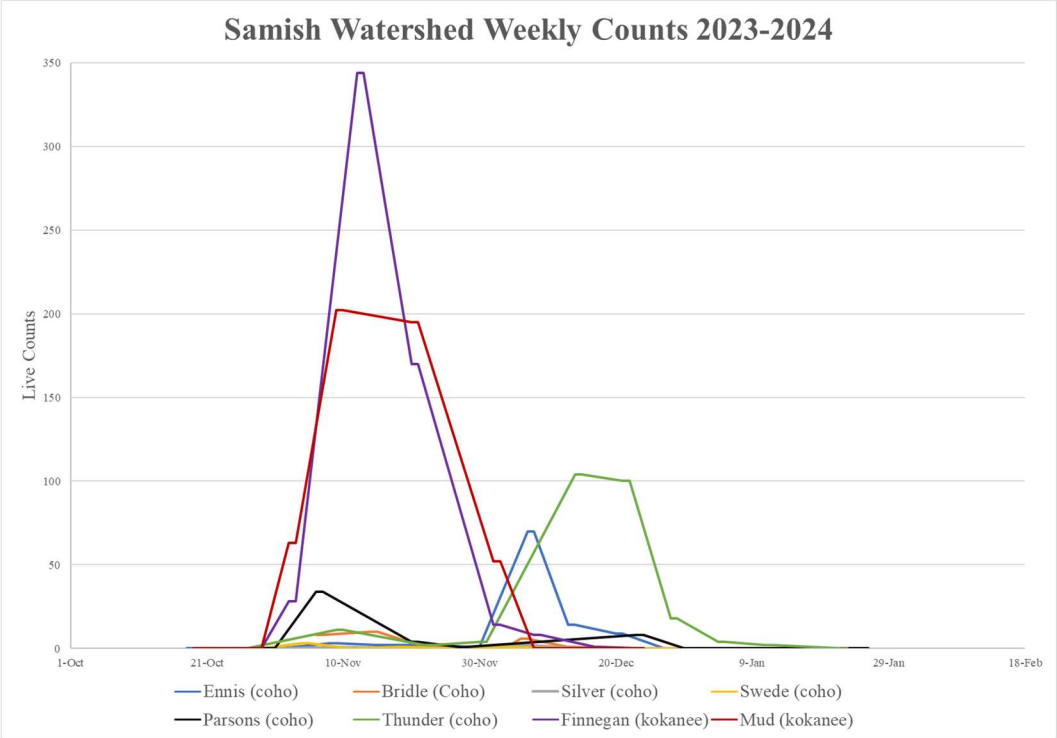

Figure 3: Seasonal coho and kokanee runs on eight creeks in the Samish Watershed. This graph compares live fish totals over the course of the 2023-2024 spawner survey season and can be compared to USGS River Gages (Figure 2).

Skagit Watershed

The Skagit River begins in E.C. Manning Provincial Park in British Columbia, Canada and flows south/southwest as into Washington state, converging with the Cascade River in Marblemount, Sauk River in Rockport and further downstream with Nookachamps Creek in North Mount Vernon before draining into the Skagit Bay southwest of Mount Vernon (Figure 1). The Skagit Watershed is approximately 150 miles long and 90 miles wide, covering over 2,650 square miles and is fed by over 10,000 streams and creeks. The Skagit River system in Washington state is home to all five species of Pacific salmon: Chinook, coho, chum, pink, and sockeye (*O. nerka*), and five species of trout/charr: steelhead, bull trout, dolly varden, coastal cutthroat and rainbow trout. The Skagit River is particularly important to Puget Sound Chinook which were listed as threatened in 1999 by the Endangered Species Act (ESA) (EPA 2023). In 2005, SRSC produced the Skagit Chinook Recovery Plan, identifying restoration actions to improve Chinook and other salmonid species production (SRSC and WDFW, 2005). The plan includes improvements to areas of spawning habitat and egg-incubation, freshwater rearing habitat in large river floodplains, tributaries, and non-tidal delta, tidal delta rearing habitat, and nearshore rearing habitat (primarily pocket-estuary restoration).

The Nookachamps Watershed is a subsection of the Lower Skagit Watershed and according to the Skagit Chinook Recovery Plan has significant Chinook production potential. Chinook, coho, chum, pink, steelhead, resident coastal cutthroat and rainbow trout, as well as Pacific lamprey (*Entosphenus tridentatus*) and western river lamprey (*Lampetra ayresii*) have all been documented in this watershed. Unfortunately, the Nookachamps watershed spawning habitat is considered "impaired" due to the lack of proper sediment size required for spawning and egg incubation, and warming water temperatures (Skagit Watershed Council, 2022). SFEG has worked and is continuing to work with landowners in the Nookachamps to improve riparian habitat and fish passage. East Fork Walker, Gribble and Kennedy Creeks are tributaries of Nookachamps Creek, all of which have seen a general positive trend in live fish counts since the streams first season of survey.

According to the USGS Skagit River at Mount Vernon gauge, the first peak of the season was on November 5, 2023, and was followed by the greatest amount of live fish counted on a survey in the Skagit watershed during the 2023-2024 season, with two consecutive weeks of high amounts of returning coho on East Fork Walker Creek (Figure 4). The highest river level for the 2023- 2024 spawner survey season was recorded December 6, 2023, at 29.55 feet, which is when the river is considered very close to moderate flood stage. This high river level appears to coincide with a slight increase in live fish counts from a few creeks, including Little Cascade, East Fork Walker, Kennedy, and Cumberland Creeks (Figure 5). Two days after this high river level was when Little Cascade Creek saw their first fish of the season. On November 5, 2023, the Skagit River peaked in Mount Vernon at 20.35 feet.

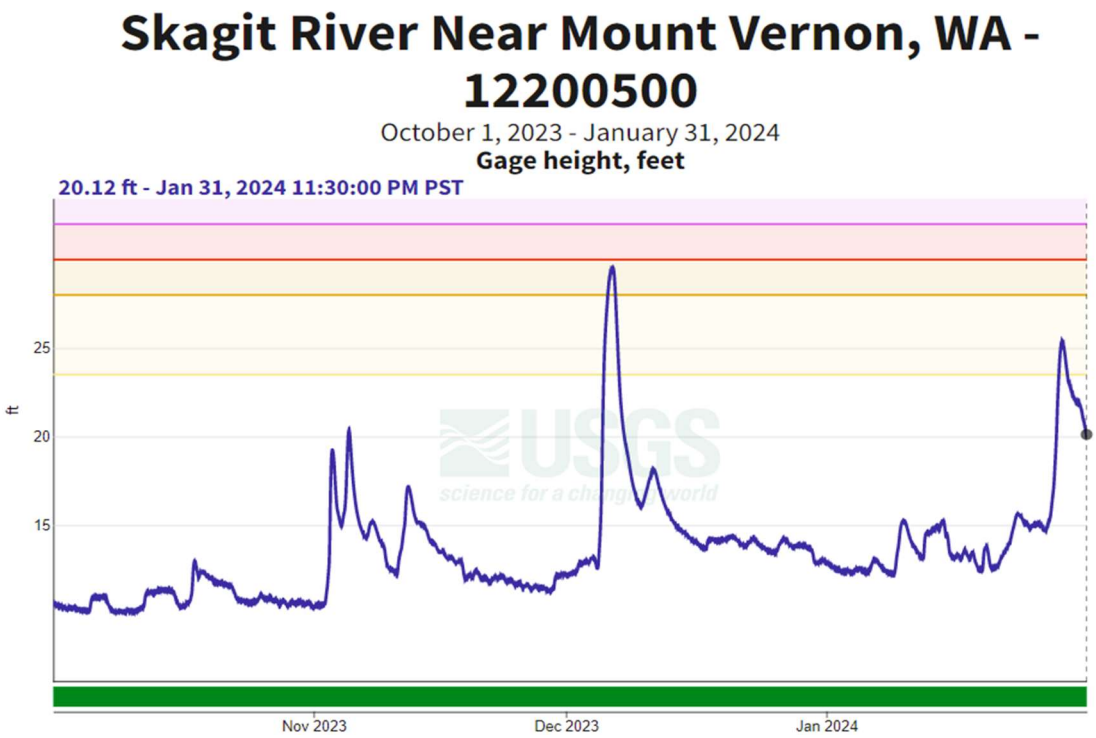

Figure 4: Height of the Skagit River from October 1, 2023, to January 31, 2024 at the station near Mount Vernon, WA (USGS 2024).

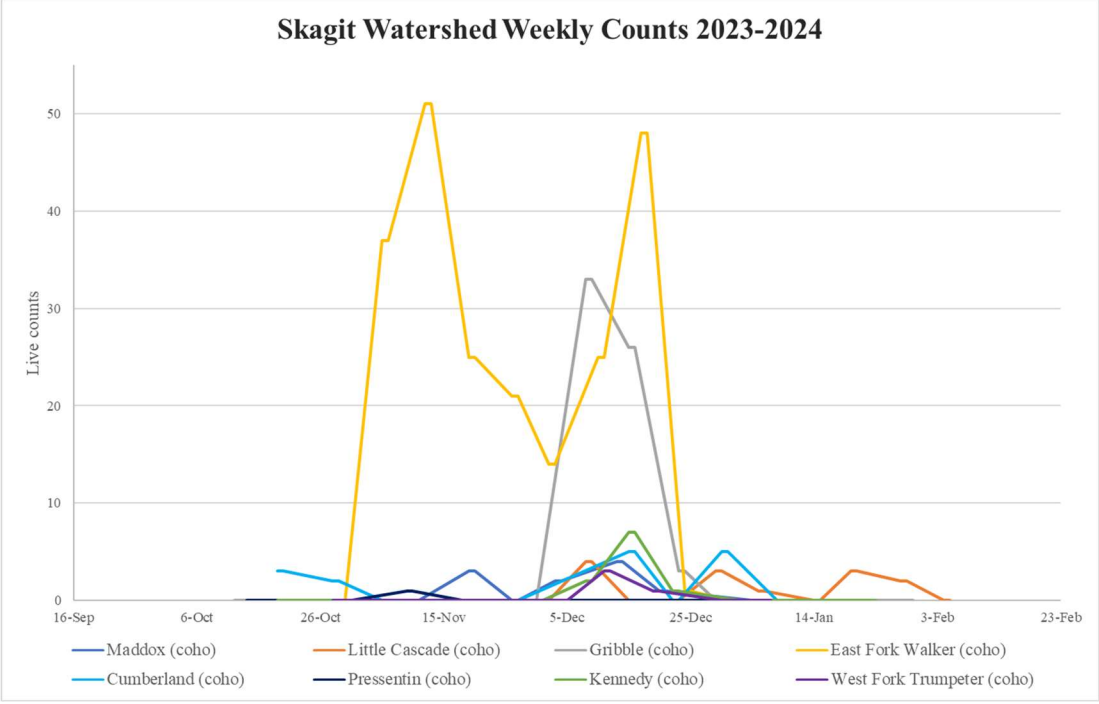

Figure 5: Seasonal coho runs on eight creeks in the Skagit Watershed. This graph compares live fish totals over the course of the 2023-2024 spawner survey season and can be compared to USGS River Gages (Figure 4). Cumberland Creek counted 119 live pink salmon on October 19, 2023, and 4 live pink salmon on October 28, 2023. Data from Carpenter, English, and Starbird Creeks was omitted as these creeks did not have any fish return.

Individual Survey Site Summaries

Ennis Creek

Ennis Creek is a tributary within the Samish Watershed and flows into a large wetland portion of the Samish River (Figure 6). It is historically a productive stream for coho, steelhead and cutthroat trout. This creek is a WDFW index stream that informs salmon population returns, escapement and distribution. Prior to the SFEG, Skagit Conservation District and Whatcom Land Trust Fish passage and Riparian Restoration project completed in 2007, Ennis Creek ran along Innis Creek Rd in an undersized channel. Now, it flows into 50 acres of protected wetlands owned by Whatcom Land Trust. Due to past logging practices and the previously routed channel along the road, Ennis Creek was not able to effectively transport sediment so large amounts of sediment were deposited at the mouth of Ennis Creek and the undersized road crossing flooded annually. Large woody debris (LWD) and native plants were installed in 2006 to enhance habitat, increase pool riffle and flow complexity. These actions aimed to improve rest and safety areas for both spawning adults swimming upstream and juvenile salmonids going out to sea. Since reconnecting the creek to its historic channel, there has been reduced flooding at the confluence of Ennis Creek and the Samish River wetland, however the Samish River continues to flood Wickersham Rd. The survey reach for Ennis Creek is 0.7 miles and includes about 300 feet of stream below the fish passage project completed in 2007 (Figure 6).

During the 2023-2024 season, Ennis Creek was surveyed by Connor Garrod (WSC AmeriCorps member) and Adam Martinez (Spawner Survey Intern) with help from Washington Conservation Corps (WCC) Crew members and interns. From October 18th, 2023, to January 3, 2024, 12 surveys were completed. The spawner survey season was significantly shorter than previous years, with a substantial decrease in the number of spawners observed. The first live fish were seen on November 8th, 2023, with only 3 live coho. Significantly low numbers of coho were seen over the following weeks (Figure 7). Water levels in the stream stayed consistently low to medium due to a lack of rainfall. The first major rain event occurred late into the season on December 5th, 2023, so unfortunately the following survey on December 6th, 2023 was canceled due to safety concerns and lack of visibility caused by significant flooding. Fortunately, water levels dropped to a safe level the next day and a survey was conducted in which the highest number of fish in the 2023 season were observed. This season's peak was significantly lower than previous years at only 70 live fish, compared to 181 in 2022 and 192 in 2021 (Figure 8). On January 3rd, only one coho carcass was found. The three surveys following were all canceled due to flooding and snow events, which led to the decision on January 23rd that another survey was not advantageous as no live fish had been seen since December 20, 2023. This decline in coho abundance follows the trends laid out in the WDFW forecasts for this year. Although the abundance in fish presence at Ennis has declined, it still boasts one of the most intact habitats in the Samish Watershed and provides great rearing and spawning habitat for salmon.

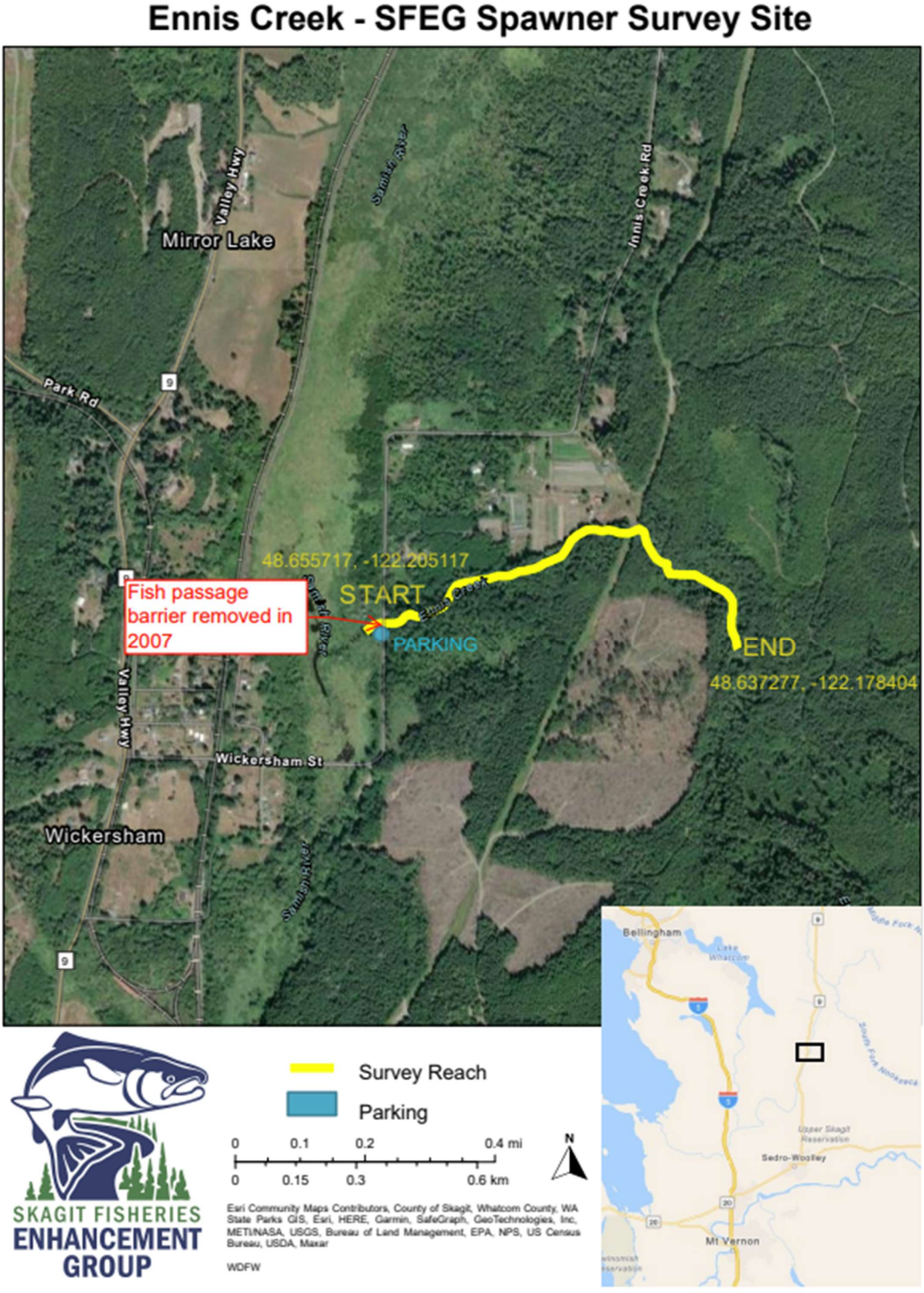

Figure 6: Map of the Ennis Creek reach and parking area in the Samish Watershed near Wickersham, Washington.

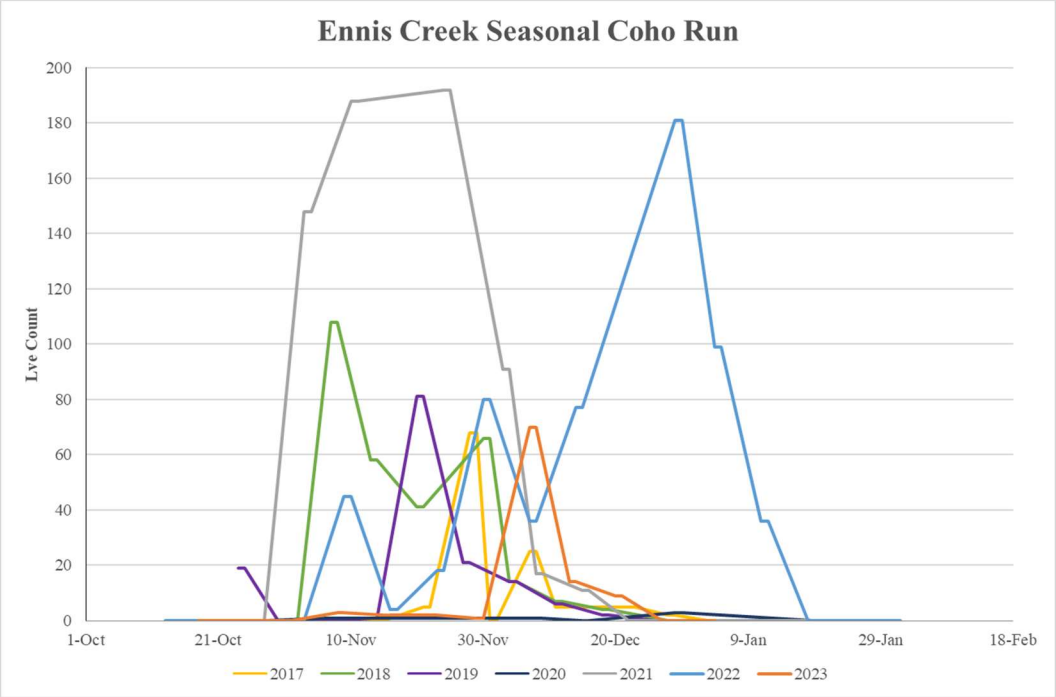

Figure 7: The peak of the 2023-2024 season came after a significant rainfall event on December 7th, 2023, with 70 live coho seen. To compare, last season's peak came on December 29th, 2022, with 181 coho seen. The second highest peak last season (2022) was 99 coho, which is ~30 more live fish than this seasons highest count on December 7, 2023.

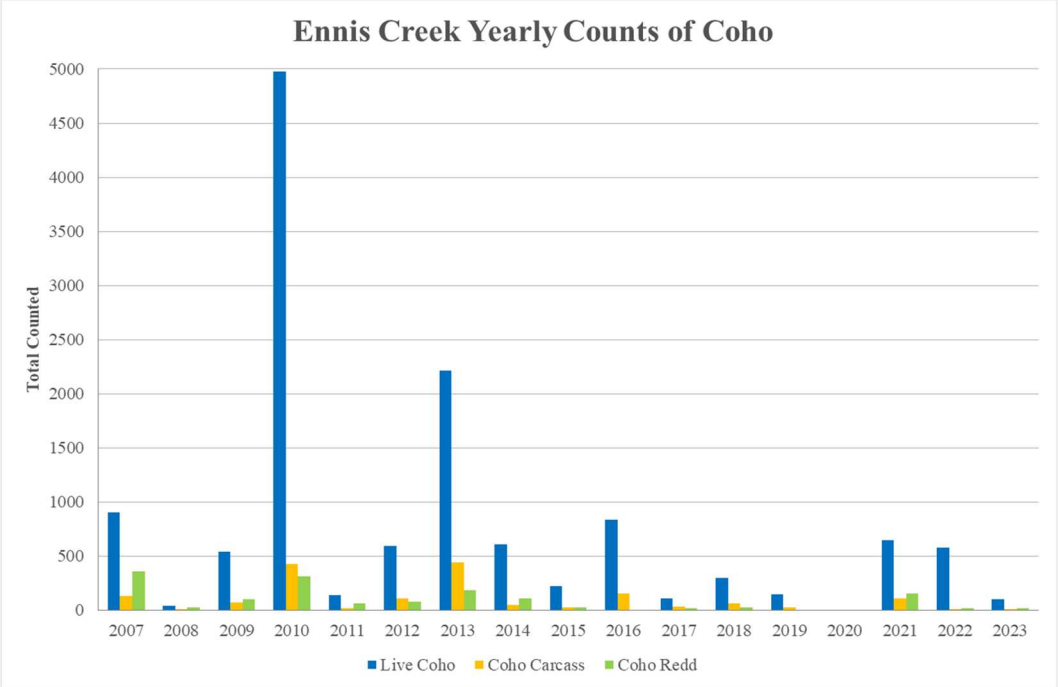

Figure 8: A total of 101 live coho were seen this season, along with 10 carcasses and 18 redds. This is a significant drop from the previous two seasons. The highest numbers seen on Ennis Creek were in 2010 when 4,979 live coho were observed and 2013 seeing 2,217 coho.

Parson Creek

Parson Creek enters the Samish River about five miles downstream of the Thunder Creek - Samish confluence (Figure 9). In 2006, about a mile upstream of the Parson Creek - Samish River confluence, a fish passage barrier removal project done by SFEG funded by the Family Fish Forest Passage Project (FFFPP) removed an undersized corrugated steel culvert and replaced it with an 18-foot-wide pipe arch made of structure plate steel. The survey reach is 1.65 miles downstream of the replaced culvert. The replacement of this culvert made accessible a half-mile of high-quality spawning and rearing habitat upstream of the current reach for coho, steelhead and cutthroat trout. The upper watershed habitat consists of a stable step-pool habitat with substantial large woody debris and a well-developed forest canopy. Coho, steelhead, and cutthroat trout have all been observed upstream of the replaced culvert. Within the lower section of Parsons Creek, Chinook and chum salmon have also been observed, however in much lower numbers. Similar to other creeks within the Samish and Skagit watersheds, Parson Creek is not seeing the high population numbers it saw a decade ago.

During the 2023-2024 season, Parson Creek was surveyed by volunteers Ryan Mielke and Dominic Fotes, as well as occasional help from PJ Huested and Dean Tilles. They completed 9 surveys from October 21, 2023, to January 26, 2024. The first live coho of the season was seen on November 6, 2023, which happened to be the same exact day the first coho were seen last season (Figure 10). When observing the data for Parson Creek for this season, many factors need to be taken into consideration. Due to several different circumstances, there were longer periods of time between surveys, so this low count cannot be seen as representative of a typical season on Parson Creek. Over the course of the season, nine surveys were completed where volunteers saw a total of 47 live coho and 73 carcasses were observed, compared to 698 live coho and 642 carcasses from the previous season (Figure 11). Last season Parson Creek boasted the highest number of coho recorded of any of the streams surveyed by SFEG in 2022. Chinook and chum have been observed sporadically over the past 15 years with four live Chinook and three live chum last observed in 2022 (Figure 12 and 13). Neither species were observed this year on Parson Creek.

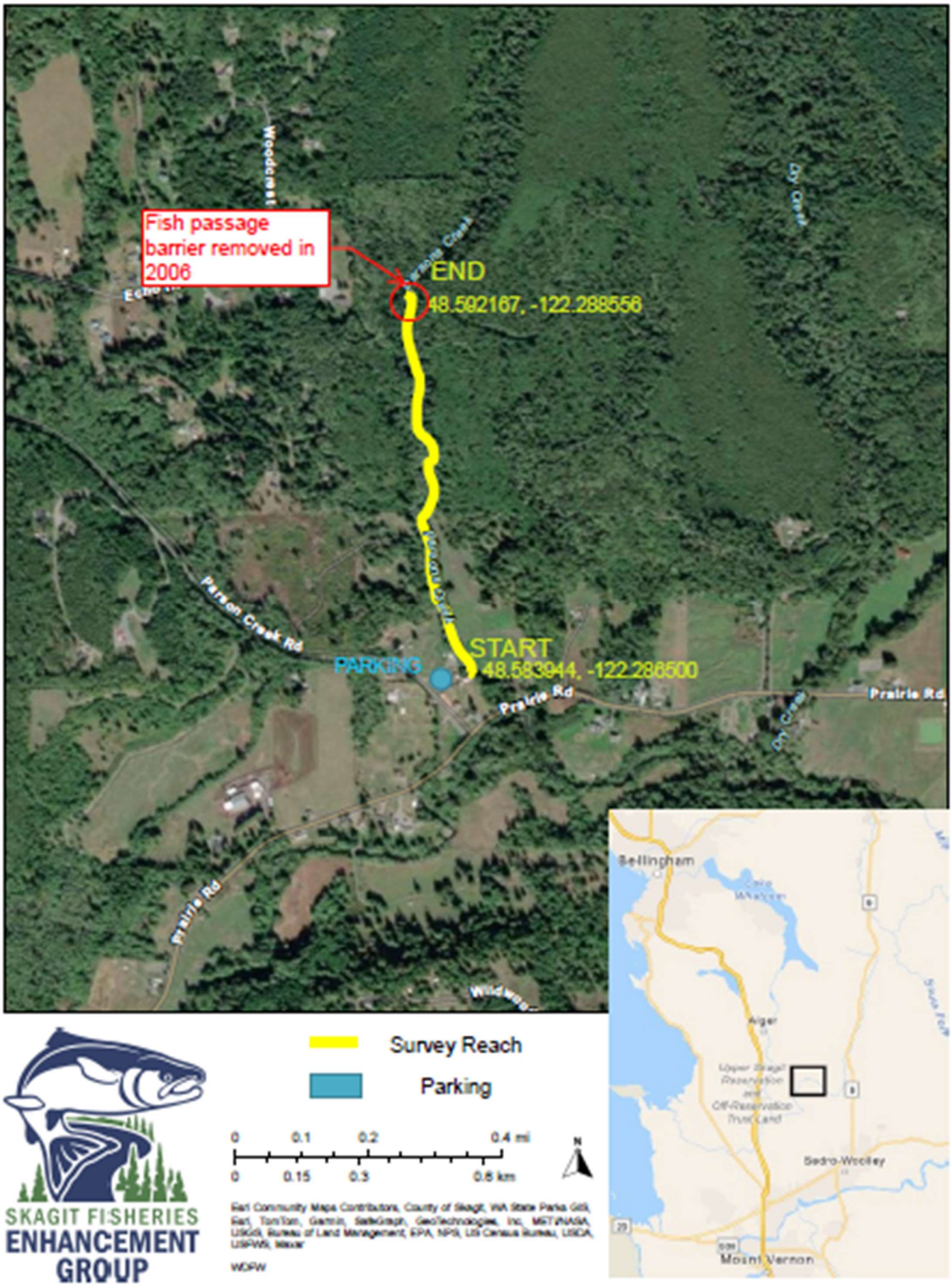

Figure 9: A map of the Parson Creek reach and parking area in the Samish Watershed near Sedro-Woolley, Washington.

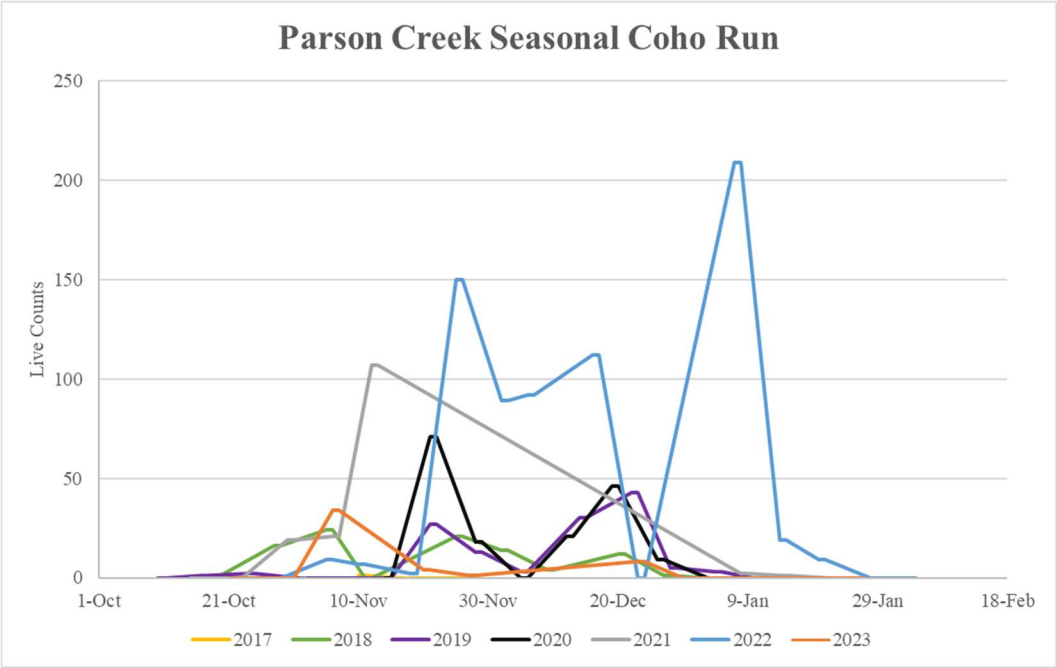

Figure 10: The observed peak of the season occurred November 6th, 2023, however this number should not be considered the time that there were the most fish in the creek; it is the time that the most fish were *observed* in the creek.

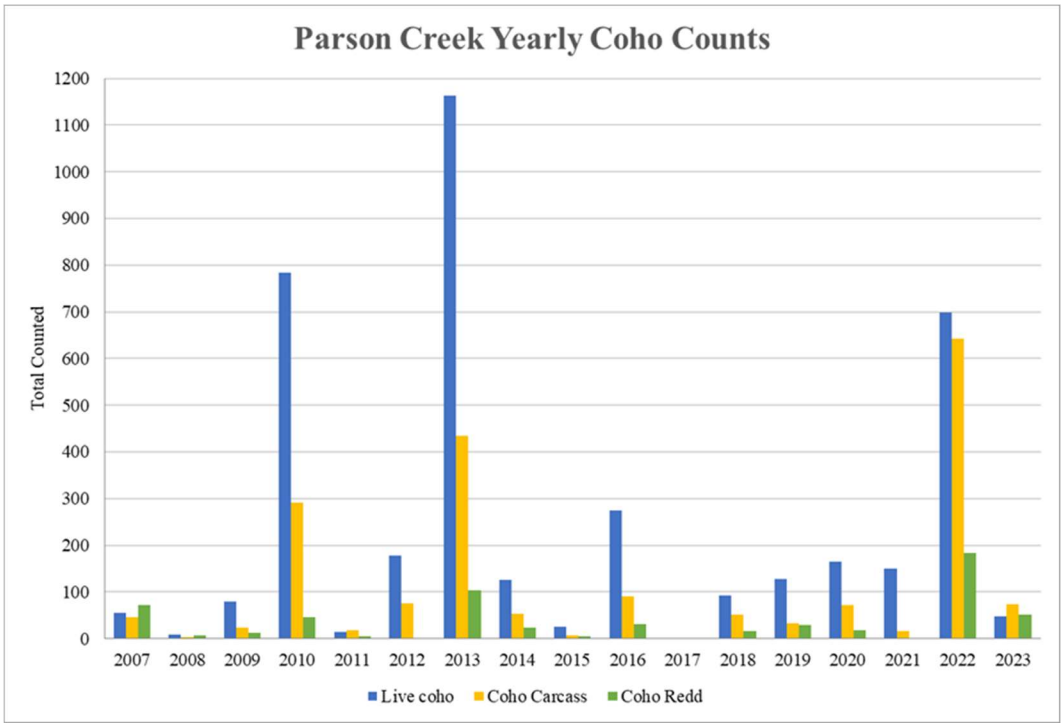

Figure 11: A total of 47 live coho were seen this season, along with 74 carcasses and 52 redds. This stream saw almost 700 coho last season, which is the 3rd largest count ever observed on this creek in a season. Total counts differ from previous seasons because of the irregularity in survey dates.

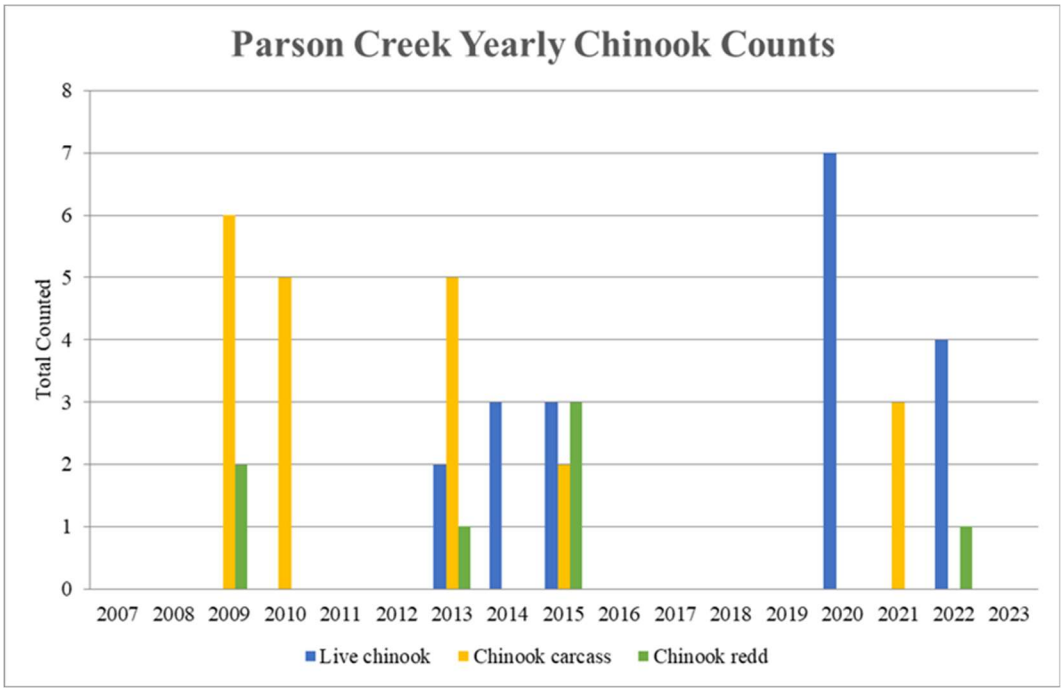

Figure 12: A total of zero live Chinook, zero carcasses and zero redds were seen this season. This is down from previous seasons when seven live Chinook were observed in 2020, and six Chinook carcasses were observed in 2009.

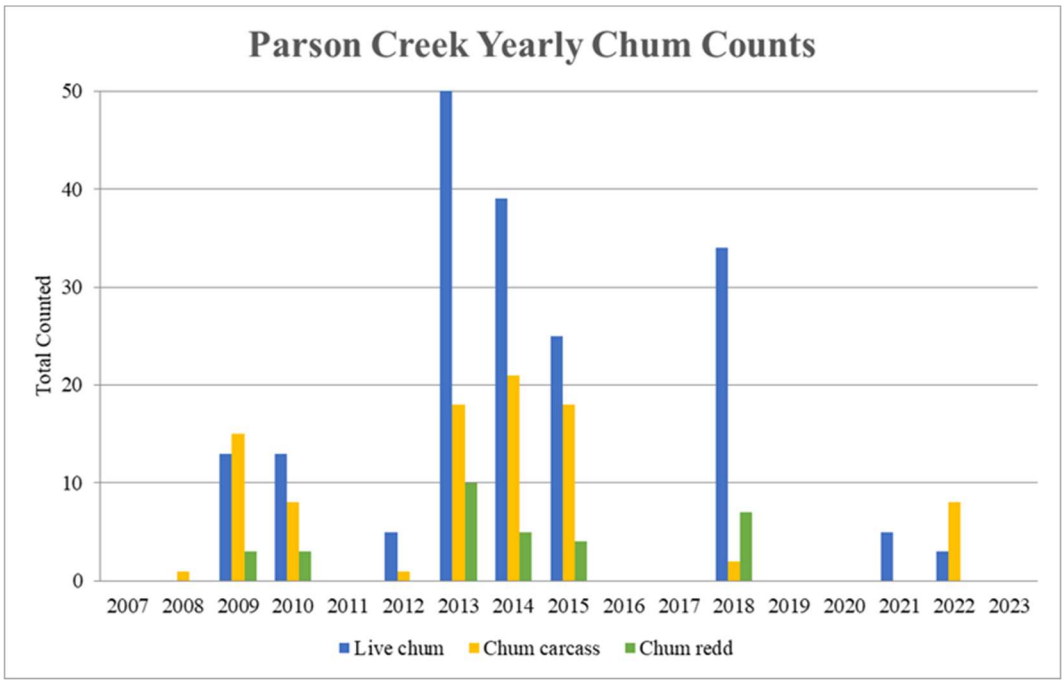

Figure 13: A total of zero live chum, zero carcasses and zero redds were seen this season. The most live chum observed in a single season was in 2013 when volunteers saw 50 spawning adults.

Thunder Creek

Thunder Creek is a major tributary of the Samish River that drains from Lyman Hill and discharges into it about 4 miles downstream from where Ennis Creek flows into the Samish (Figure 14). Thunder Creek provides critical spawning and rearing habitat for Chinook, chum, coho and steelhead, all of which have been documented in this system. Additionally, WDFW states that the creek is gradient accessible to pink salmon however none have been observed by SFEG. SFEG began surveying this creek in 2007, taking a small hiatus until 2010, and has been surveying yearly since. Thunder Creek is about 3.5-miles in length, however WDFW states Chinook and coho only travel about 2.1-miles upstream. Presence of Chinook on Thunder Creek is likely due to the WDFW Samish Hatchery on Friday Creek; during high flows, and for other various reasons SFEG surveys a reach of 0.3 miles that is 1000 feet from the confluence with the Samish River, then upstream to the railroad crossing. This creek is important to salmon as well as other wildlife. Birds of prey are frequently observed during surveys, as are other animal tracks. Between 2010 and 2015, SFEG worked with local landowners to remove invasive plant species and install native plants to enhance the riparian edge. The lower half of the creek is bordered by private residents; engaging landowners with restoration projects and providing education on salmon life history can provide neighbors with encouragement to carry on stewarding their lands.

During the 2023-2024 season, Thunder Creek was surveyed by volunteers Jon McKenzie and Adam Romine. They completed 12 surveys from October 19, 2023, to February 1, 2024. For the second season in a row, Thunder Creek had many notable records. Volunteers saw the most live fish of any of the 19 creeks surveyed by SFEG this season, with 245 live coho observed, as well as 5 chum (Figure 15 and 17). The first fish of the season for all the creeks was seen on their very first survey; it was a coho carcass found fresh in the water. The highest number of coho seen on a single survey was also on Thunder Creek, with two consecutive weeks seeing over 100 live coho in mid-December. Compared to the other streams surveyed in both the Samish and Skagit Watershed, Thunder Creek didn't have a drastic decrease in the amount of coho observed. The difference from last year is 22 less live fish, and 15 more carcasses this year (Figure 16). The seasons were relatively the same, with the 2022-2023 season seeing fish about two weeks earlier on their surveys. However, the survey scheduled for November 2, 2023, was canceled due to flooding, so it's hard to know if the season started earlier or not. Chum salmon are also important in this system but were not observed as frequently as they were last season. In the 2022-2023 season, 41 chum were observed, whereas only 5 were seen by our volunteers this season (Figure 17). Live Chinook salmon have not been observed on Thunder Creek since 2021 (Figure 18).

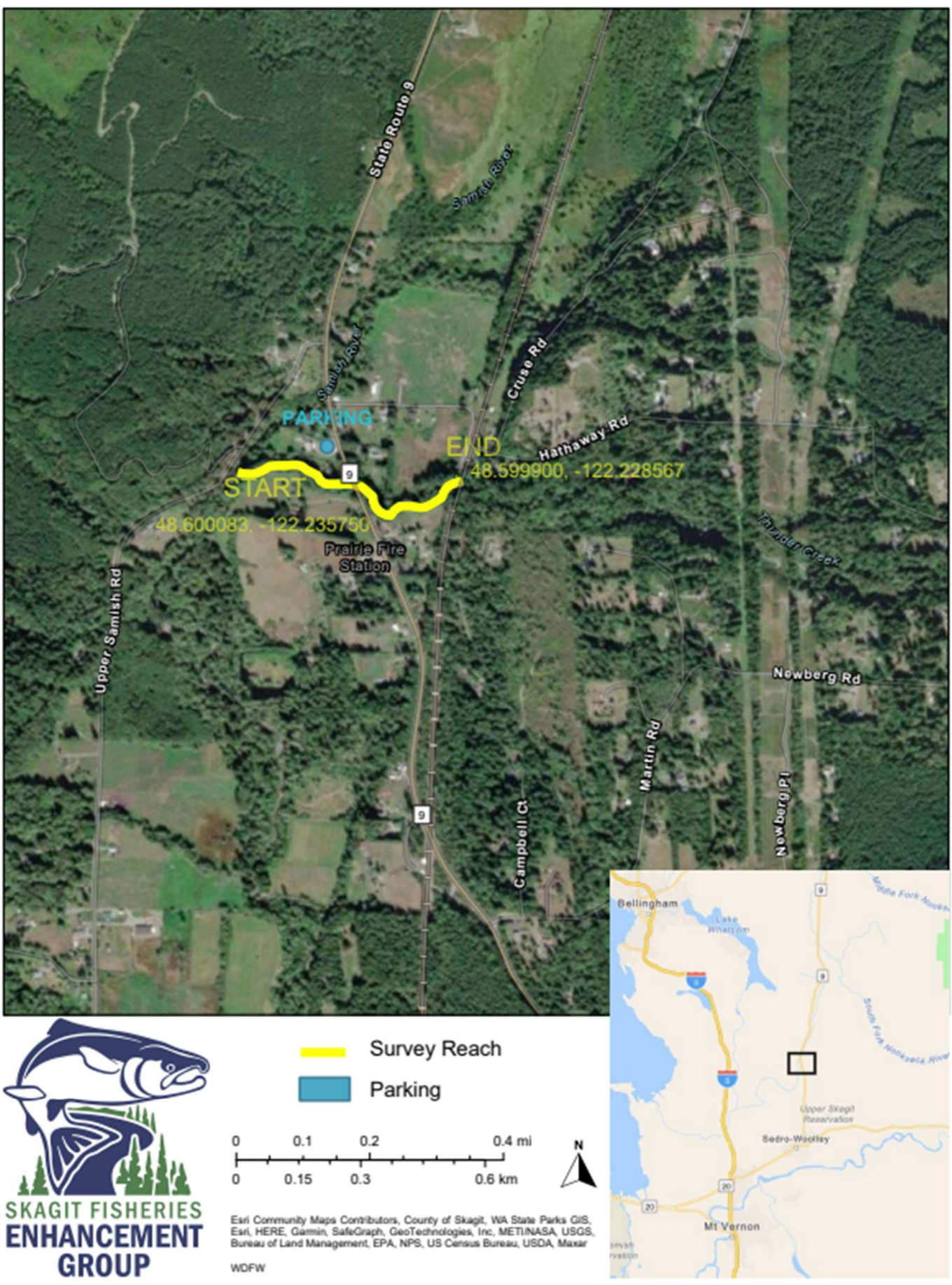

Figure 14: A map of the Thunder Creek reach and parking area in the Samish Watershed near Sedro-Woolley, Washington.

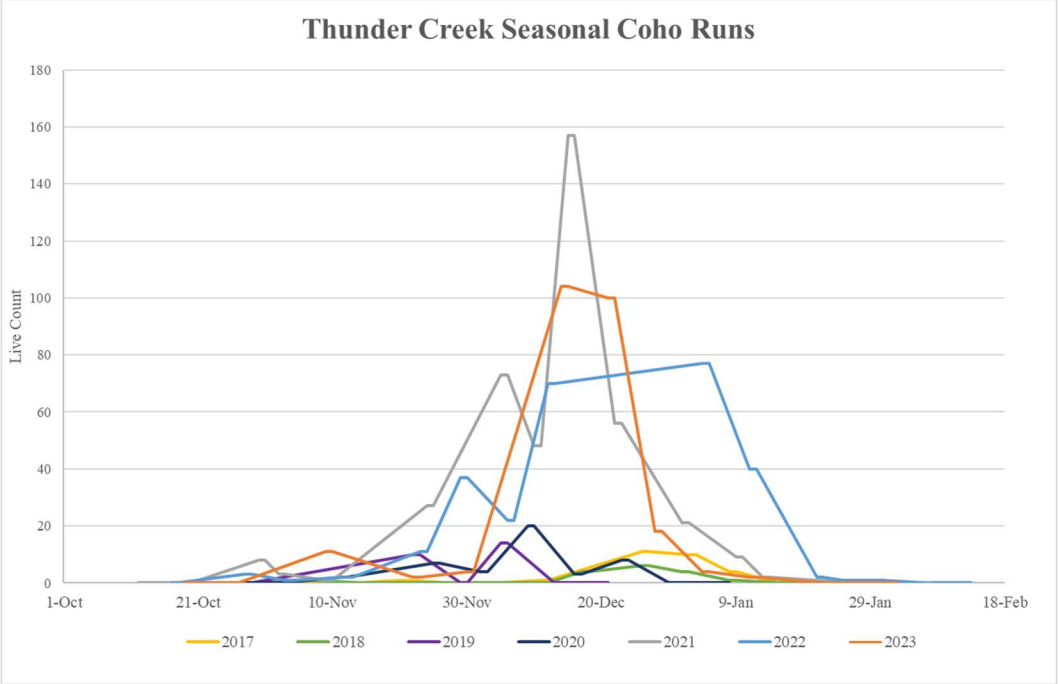

Figure 15: The 2023-2024 season peak came on December 14th, 2023, with 104 coho seen. The second largest peak of the season came the week after on December 21st with 100 coho seen. To compare, last year's peak saw 70 coho and the 2021 peak was 157 coho.

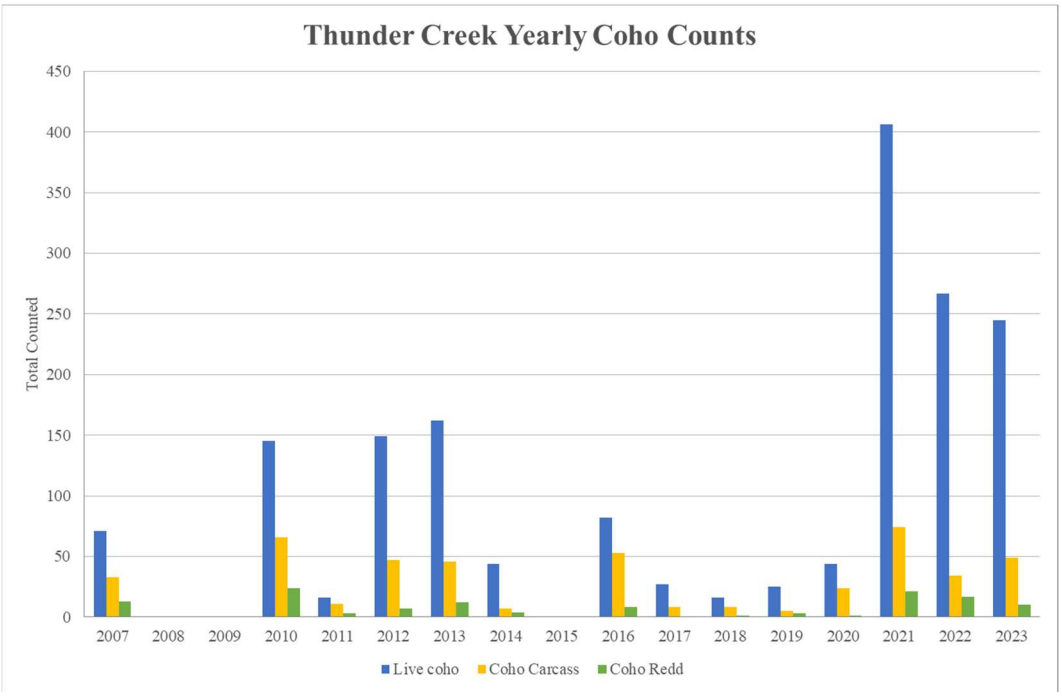

Figure 16: A total of 245 live coho were seen this season, along with 49 carcasses and 10 redds. This is lower than last year's total of 267 live coho and 406 seen in 2021.

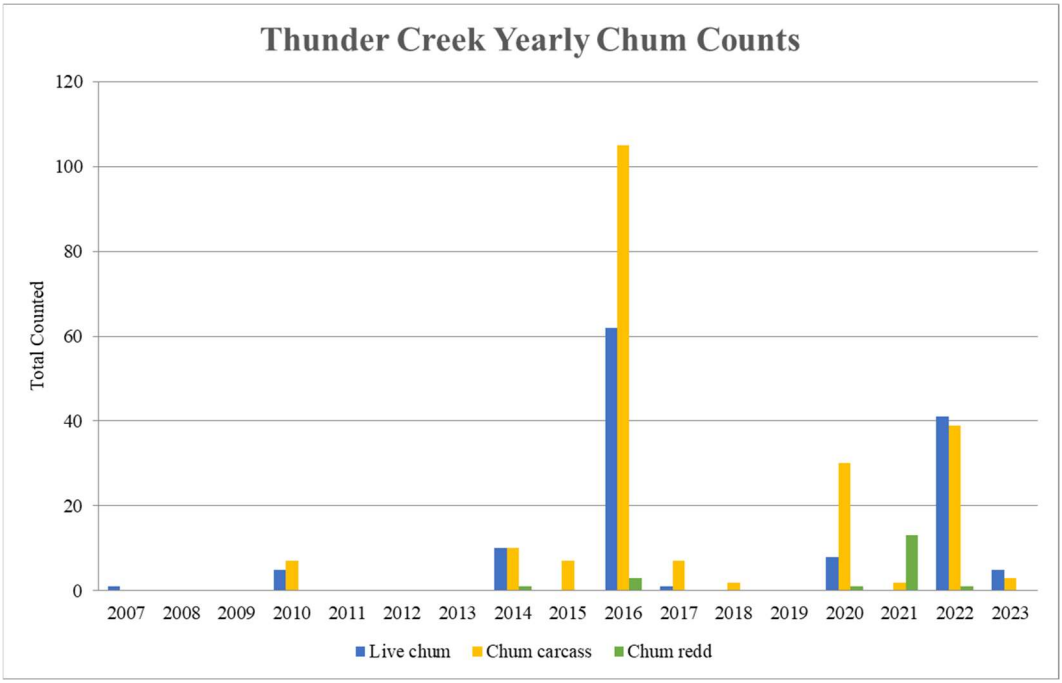

Figure 17: A total of five live chum were seen this season, along with three carcasses. Last year, 41 live chum were seen, along with 39 carcasses. Back in 2016, 62 chum were documented, along with 105 carcasses. Again, this suggests that more fish we're occupying the stream than surveyors observed.

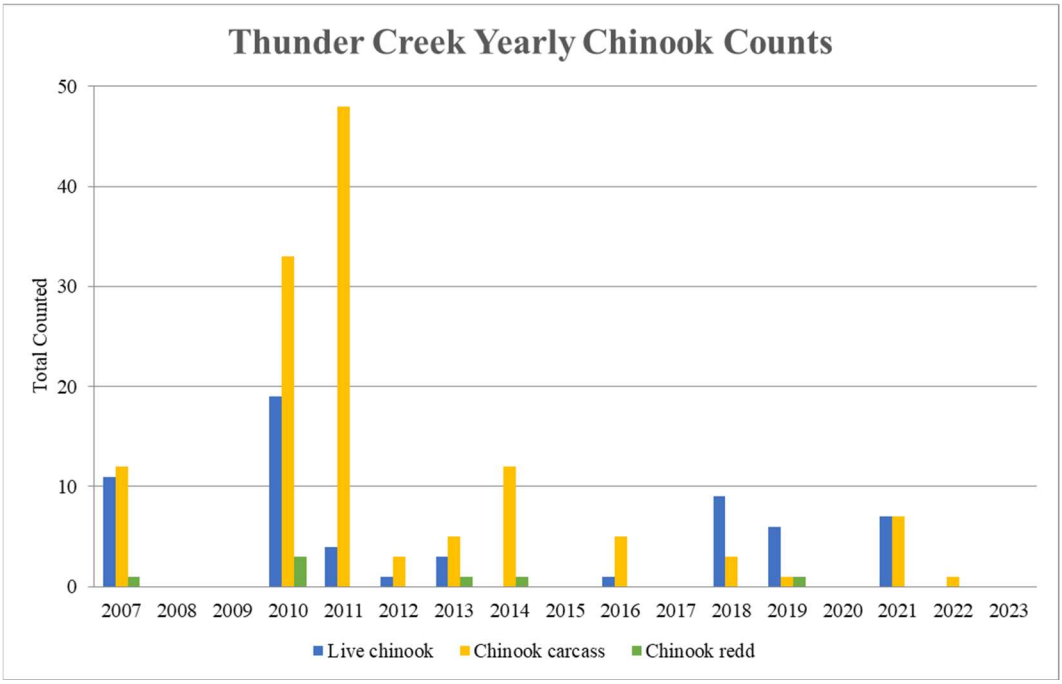

Figure 18: No live chinook, carcasses or redds were seen this season. In 2021 there were seven live Chinook and seven carcasses documented. In 2010, 19 live Chinook were seen on this creek, however a total of 33 carcasses we're counted, indicating that more live Chinook were in the stream than were observed.

Swede Creek

Swede Creek travels for about four miles from its main headwaters at Cranberry Lake, adjacent to Highway 9, to its confluence with the Samish River, just three miles downstream of Parson Creek (Figure 19). Swede Creek is also fed by upstream wetlands, so the water is dark with tannins making visibility difficult at times. While tannins do not harm salmon, they can make surveys difficult because of the lack of clarity and dark shade in the water. Rainfall can cause extra turbidity in the water and while salmon often utilize these higher flow events to travel upstream, being able to see the fish, live or dead, is variable and is sometimes not possible. This factor adds a level of assumed error in the precise number of fish counted on Swede Creek year to year. Swede Creek is known to have populations of coho, steelhead, sea-run and resident coastal cutthroat trout, both residents and WDFW's SalmonScape have noted this. One of the landowners on Swede Creek also claims to have seen lamprey alongside a steelhead in the creek under his newly finished bridge. SFEG began surveying Swede Creek in 2019 after completing the first of two large fish passage barrier removal projects funded by the Family Forest Fish Passage Program (FFFPP). In two separate sections of the creek, undersized culverts were removed and replaced with 40-foot steel bridges that granted instant access to upstream habitat for spawning and rearing salmonids. The first project on Swede Creek was completed in 2019 and the second in 2021. It was not until the second, more upstream project was completed that survey volunteers saw spawning coho salmon. The survey reach is 0.5 miles long and is located about 1.7 miles upstream from the confluence with the Samish River, starting at the first project site and ending below the second.

During the 2023-2024 season, Swede Creek was surveyed by volunteers Brianna Mafrici and Dimitri Katsiouleris, as well as occasional help from Myrriah Crowley, Zoe Ellis, and Claudia Basso. From October 21, 2023, to January 20, 2024, they completed 12 surveys. This season saw the lowest number of returning coho since before the bridge was completed in 2021. The presence of fish throughout the 12 surveys was sporadic, so there is no clear way to tell when the peak of the season was (Figure 20). This year volunteers only observed 5 live coho and 4 carcasses, whereas last season volunteers observed a total of 53 live coho and 14 carcasses (Figure 21). Swede Creek experienced the highest flow on December 2, 2023, but only one live fish was observed after that. However, on many surveys juvenile fish were spotted in both reaches of the creek, which does give hope for the following seasons that salmon are returning to Swede Creek.

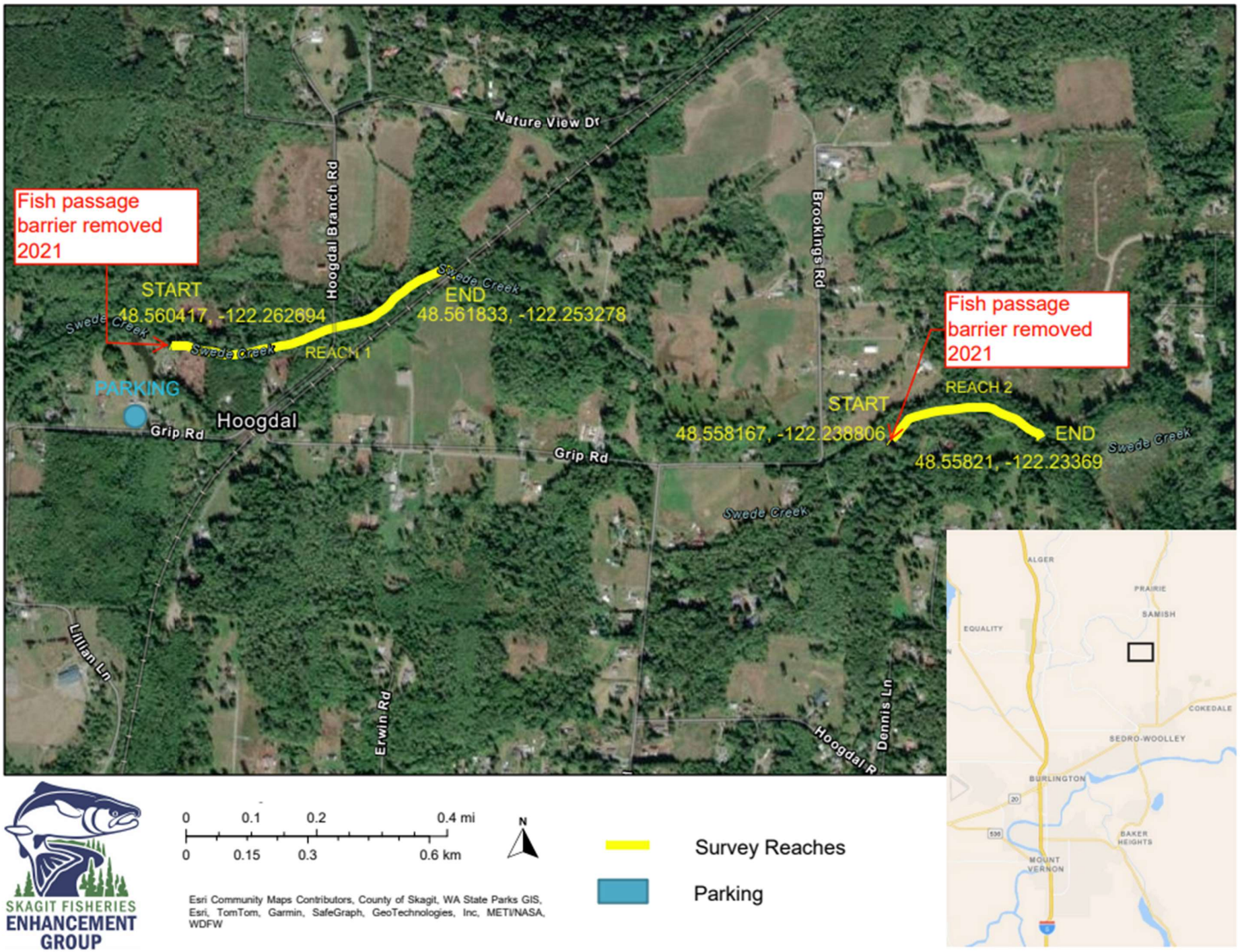

Figure 19: A map of the Swede Creek reaches and parking area in the Samish Watershed near Sedro-Woolley, Washington.

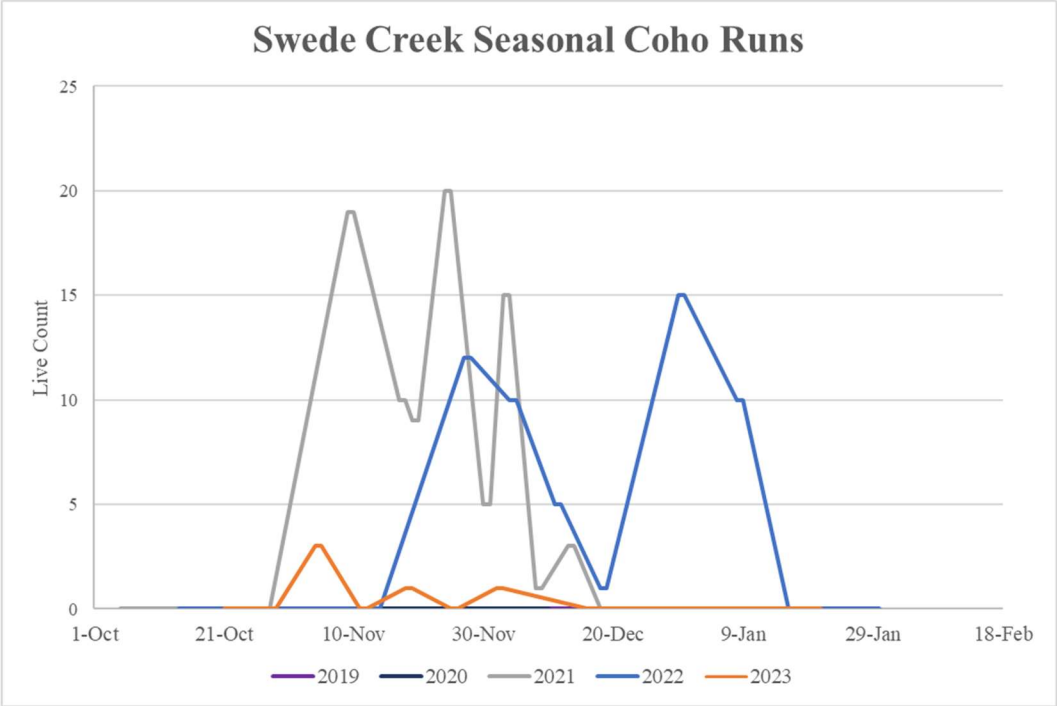

Figure 20: The peak of this season came on November 4th, 2023, with only 3 live coho. Two other surveys saw only a single coho, per survey. Last year's peak was 15 live coho and in 2021 surveyors saw 20 coho during a survey on November 24th, 2021.

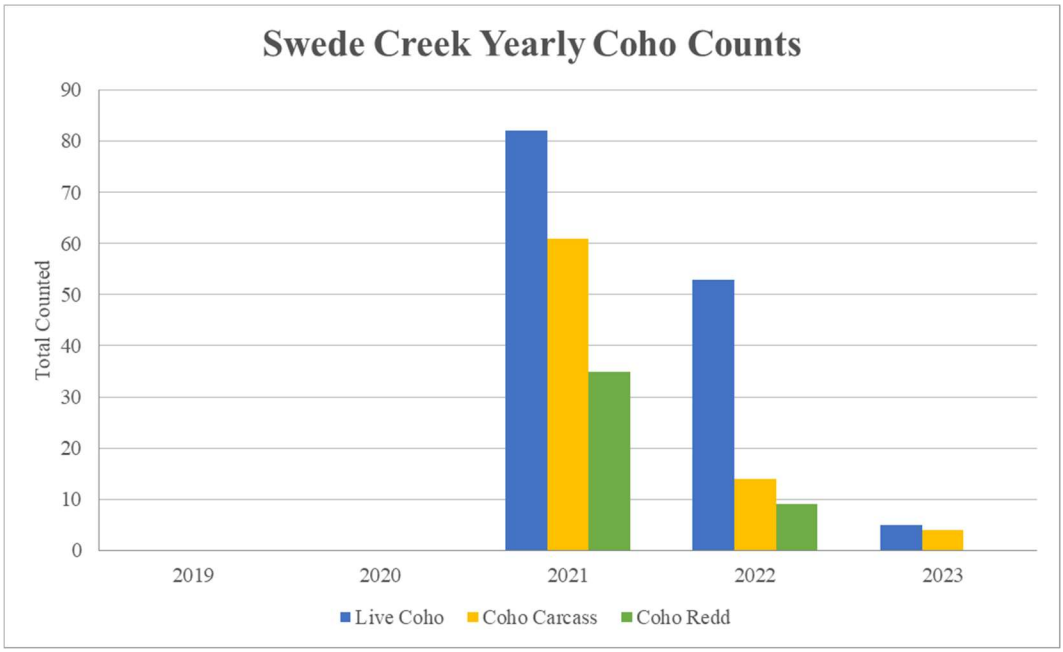

Figure 21: A total of five live coho were seen on this creek this season, along with 4 carcasses and zero redds. Observed fish abundance in Swede creek has declined since the spike in 2021, when 82 live coho were seen.

Silver Creek

Silver Creek is a large tributary of the upper Samish Watershed. Its headwaters are on Lookout Mountain, at the southeast end of Lake Whatcom in Whatcom County, flowing into Cain Lake (Figure 22). It is fed by several small tributaries before entering Friday Creek about 6.5-miles upstream of the Samish River confluence. Due to its length and diversity of creek characteristics, Silver Creek has documented all 5 species of Pacific salmon (specifically kokanee, not sockeye), however seeing Chinook and pink on this tributary of the Samish is an anomaly and may only ever occur during high flow years. The presence of Chinook on Silver Creek is likely due to the WDFW Samish Hatchery on Friday Creek; during high flows, and for other various reasons, Chinook may get past the hatchery, at which point they have the chance to spawn in the wild. The portion that SFEG monitors often only sees coho, and sometimes steelhead later in the season. SFEG started monitoring this 0.6-mile section of Silver Creek at the downstream end of Cain Lake in 2013 after completing a fish passage barrier removal project on a private neighborhood road. With funding from FFFPP, SFEG removed an undersized culvert and replaced it with a 50-foot steel bridge. In 2013, 129 live coho were recorded followed by 221 live coho in 2016. The initial increase in fish gave promise that the culvert removal was benefiting salmon spawning and rearing, however the coho population on Silver Creek has fluctuated over the last 5 years, trending downward with a soft uptick of live coho counted in 2020 (Figure 21). Since 2020, coho levels have declined heavily.

During the 2023-2024 season, survey volunteers Jim and Shirley Wilkinson observed only three live coho between October 21, 2023, and January 1, 2024, over the course of 9 surveys. The previous season saw 23 live coho throughout 11 surveys. The first coho of the season was seen in early November and the last coho of the season was seen in early-mid December (Figure 23). The most fish seen on one survey was December 6, 2023, with two fish, corresponding to the day with the highest flow observed. This was the last day fish were observed on Silver Creek for the season. The carcass count for the season was higher than the live count with 5 carcasses observed (Figure 24). The last date live fish were seen was December 6, 2023, and the last two of the five carcasses seen during the season were the last fish seen on Silver Creek on December 15, 2023. This data is helpful because it helps show that more fish are using the creek than just the small amount our volunteers observed. At this time, it is unclear why there has been a significant drop in the number of coho returning to Silver Creek each year. Silver Creek has previously seen Chinook as well, but they have not been observed since 2020 (Figure 25).

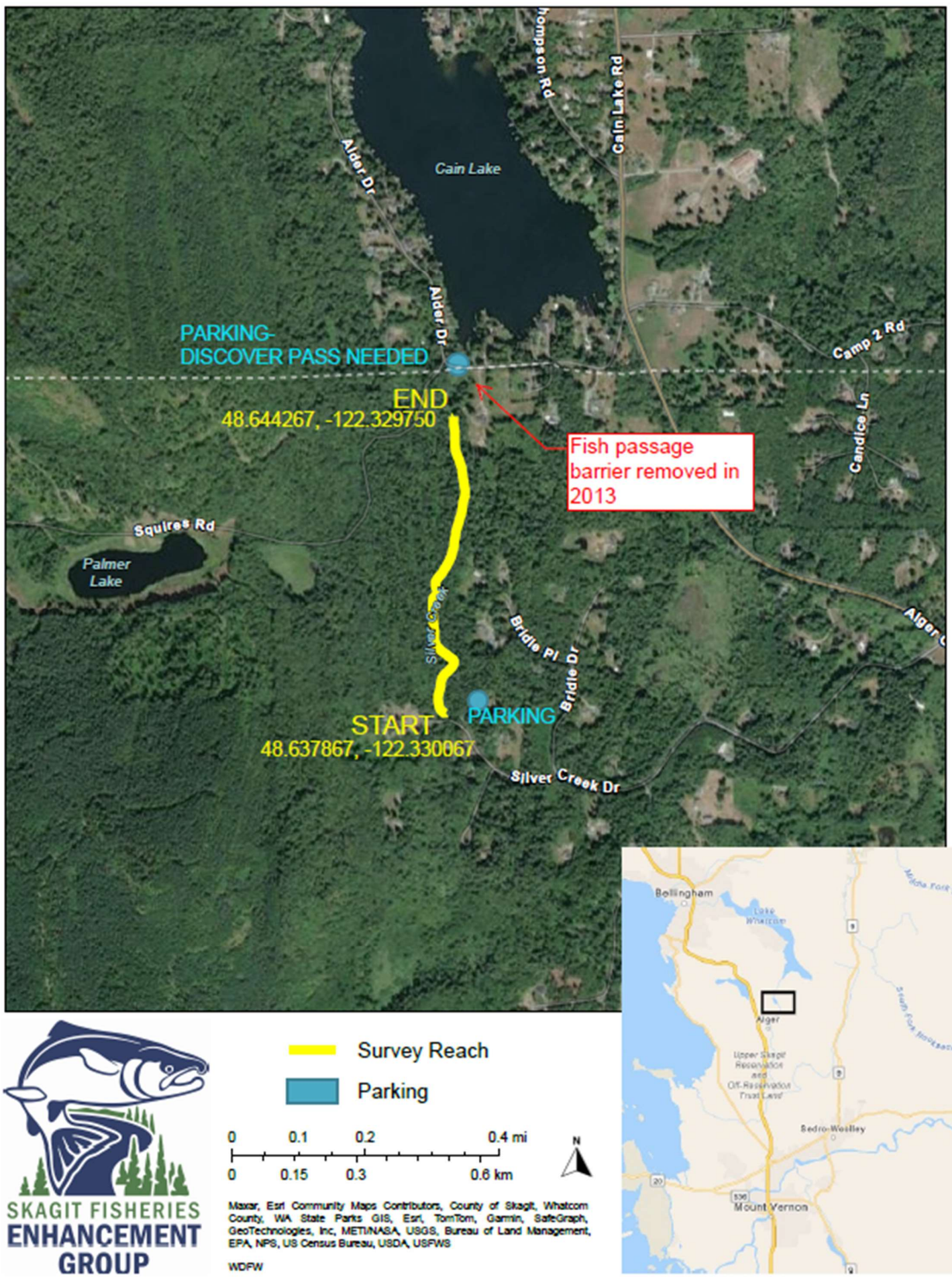

Figure 22: A map of the Silver Creek reach and parking areas in the Samish Watershed near Alger, Washington.

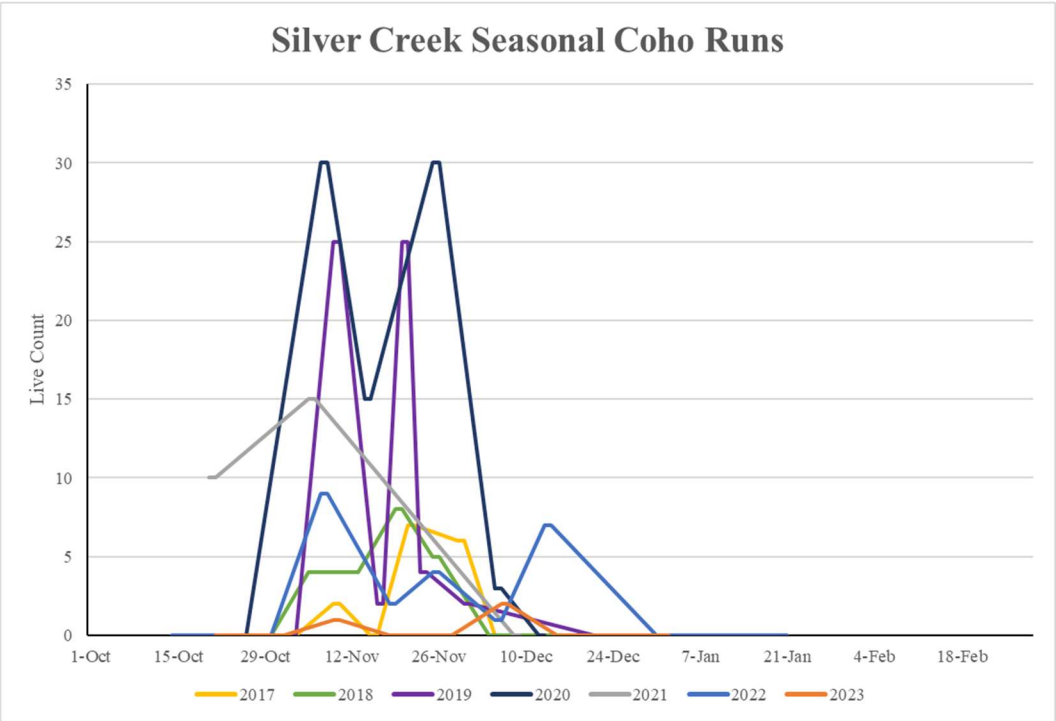

Figure 23: Coho were only seen on two surveys this season, with one on November 9th, 2023, and two more on December 6th, 2023. In 2022, the season's peak was 9 coho and in 2021 it was 15 coho.

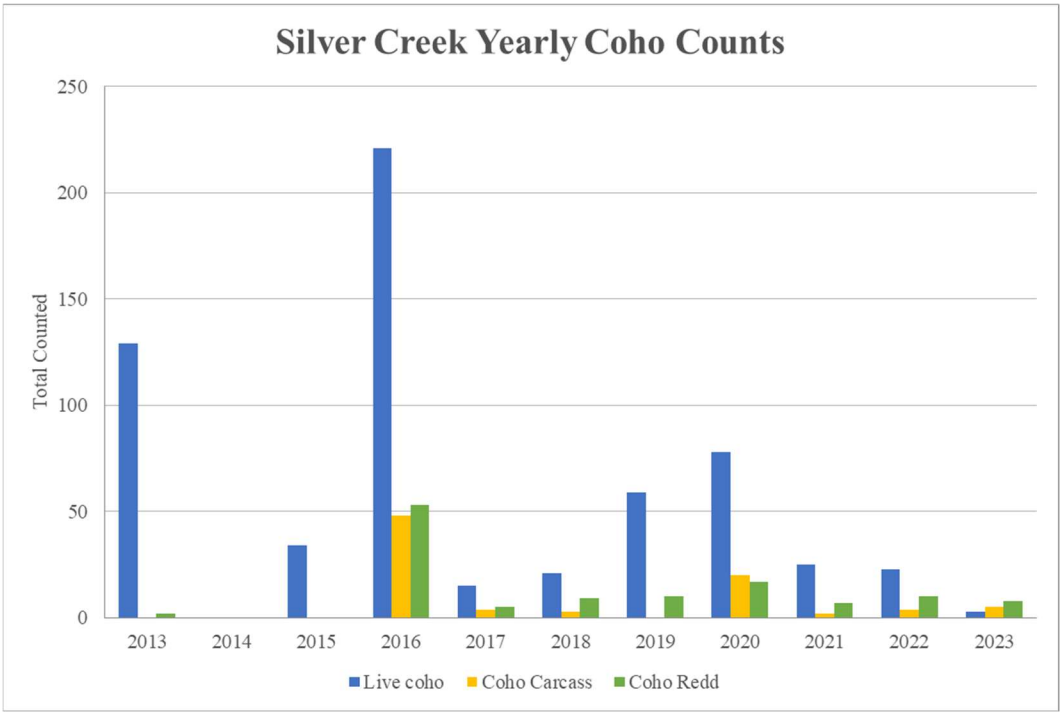

Figure 24: A total of three live coho were seen this season on Silver Creek, along with five carcasses and eight redds. This is the lowest fish seen on this creek in the past decade. The most fish seen on Silver Creek was in 2016 when volunteers observed 221 live coho.

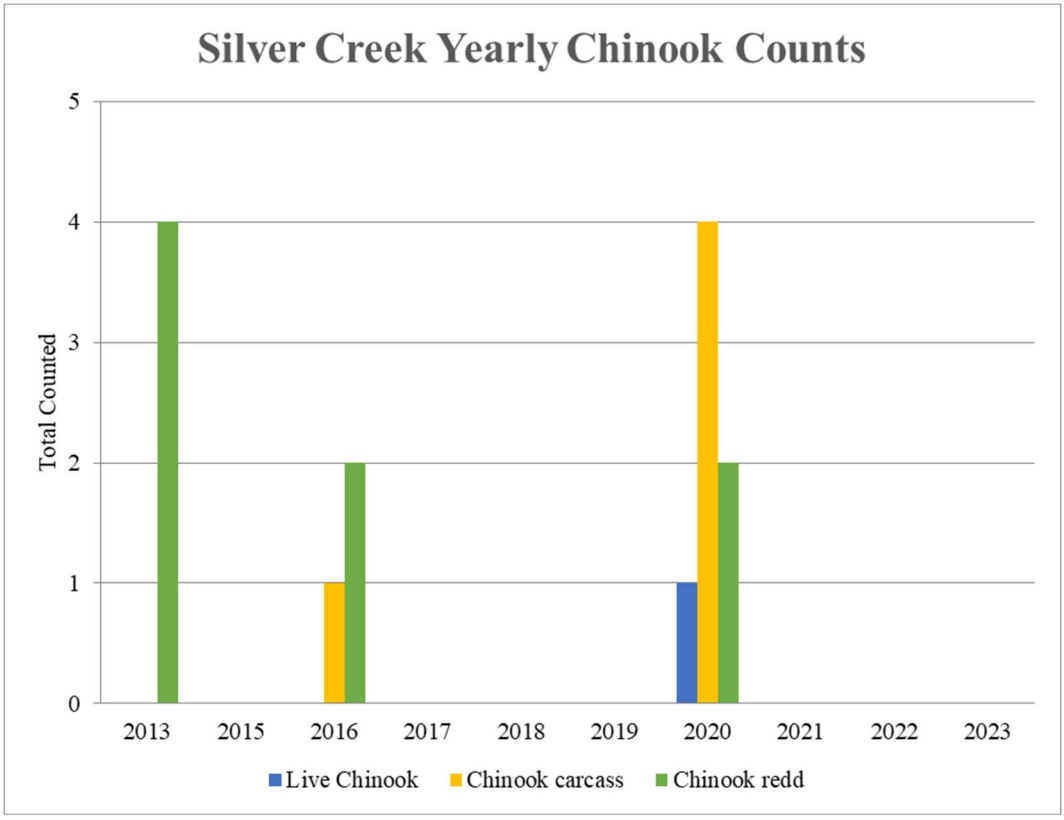

Figure 25: No Chinook were seen this season on Silver Creek, but in 2020, one was spotted along with four carcasses and two redds.

Bridle Creek

Bridle Creek is a small tributary to Silver Creek in the Samish Watershed (Figure 26). In 2014, SFEG removed a fish passage barrier under Silver Creek Rd. that improved access to 1.23 miles of spawning habitat for coho, steelhead, and sea run cutthroat on Bridle Creek. The survey reach completed on this creek is 0.2 miles long and includes sections of the stream that are both upstream and downstream of the 2014 project site. Although there has been a fish barrier replaced and spawner surveys occurring on this creek for over a decade, Bridle Creek is not an officially named stream on Salmonscape (WDFW) and is only recognizable to a keen eye with an active Lidar_Hillshde layer on Washington State Fish Passage database (WDFW). Bridle Creek is a very healthy and productive stream; residents have seen coho, lamprey, freshwater mussels and even a river otter. Bridle Creek has a large amount of tannins in the water, making it harder to see into deeper pools during shaded conditions. It also has lots of naturally recruited large woody debris in the channel, creating great places for spawners and juveniles to take refuge. At the upper end of the reach surveyed by SFEG volunteers there are beaver ponds, and fish have not been sighted near them. Bridle Creek is one of the smaller streams surveyed, and yet it has consistently seen coho returns that are on a similar scale as larger creeks in the watershed. It also boasts great spawning habitat.

During the 2023-2024 season, John Leighton surveyed Bridle Creek from November 6, 2023, to December 27, 2023, with help from Sue Madsen early in the season. John Leighton has been surveying this creek, which flows through his backyard, for over a decade. Bridle Creek's season was relatively short but was surveyed 8 times. Without survey data from the beginning of October, it is hard to say exactly when the coho started running up Bridle Creek. Leighton noted that the November 6, 2023, survey was the earliest date that he'd seen fish, 8 live coho observed (Figure 27). The highest number of fish occurred the following week with 10 live coho. Observations of fish and water levels fluctuated throughout the rest of the survey season. In 2021, 42 live coho and 9 carcasses were surveyed, compared to the 27 live coho and 1 carcass observed this season (Figure 28).

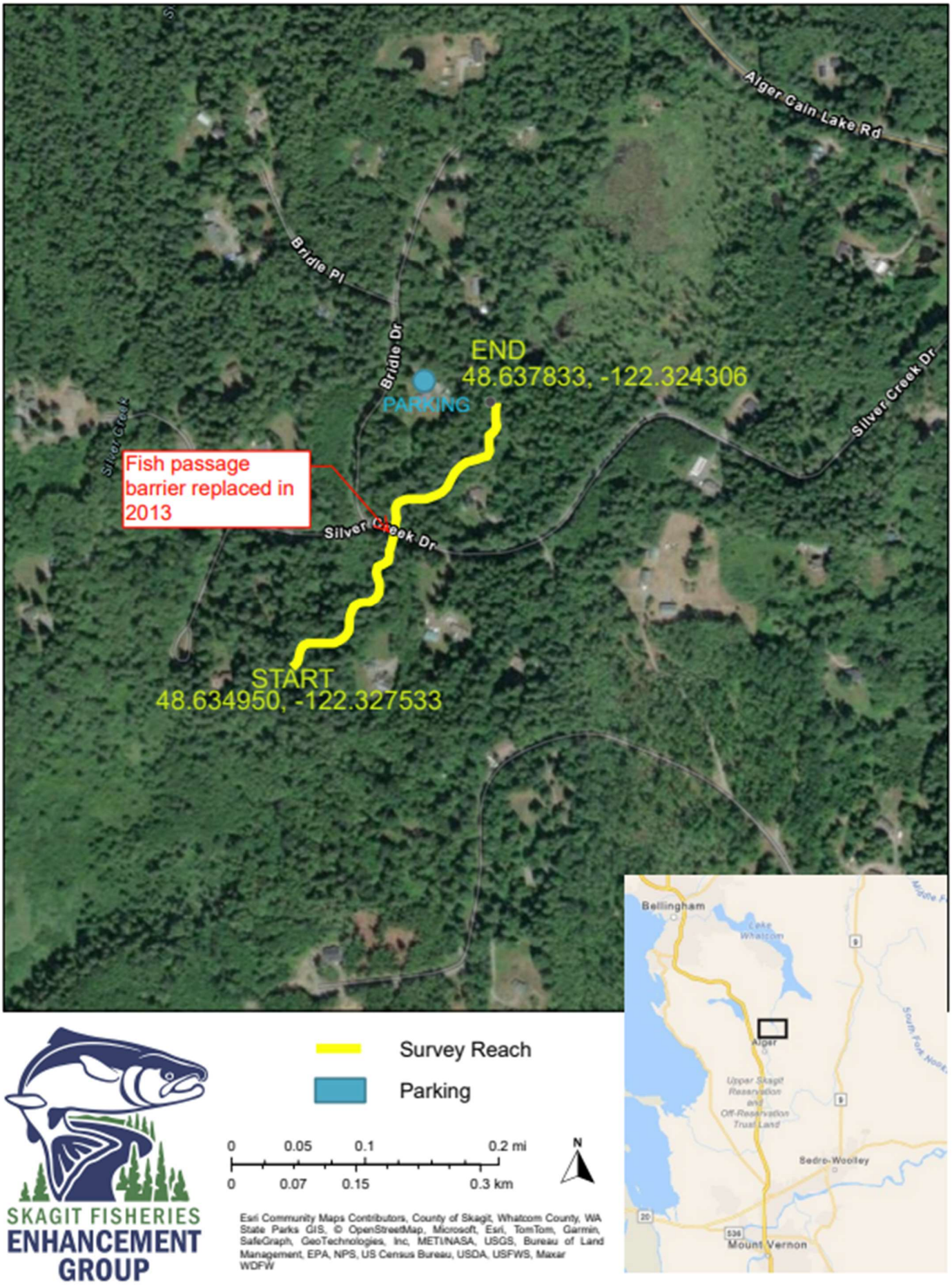

Figure 26: Map of the Bridle Creek reach and parking area in the Samish Watershed near Alger, Washington.

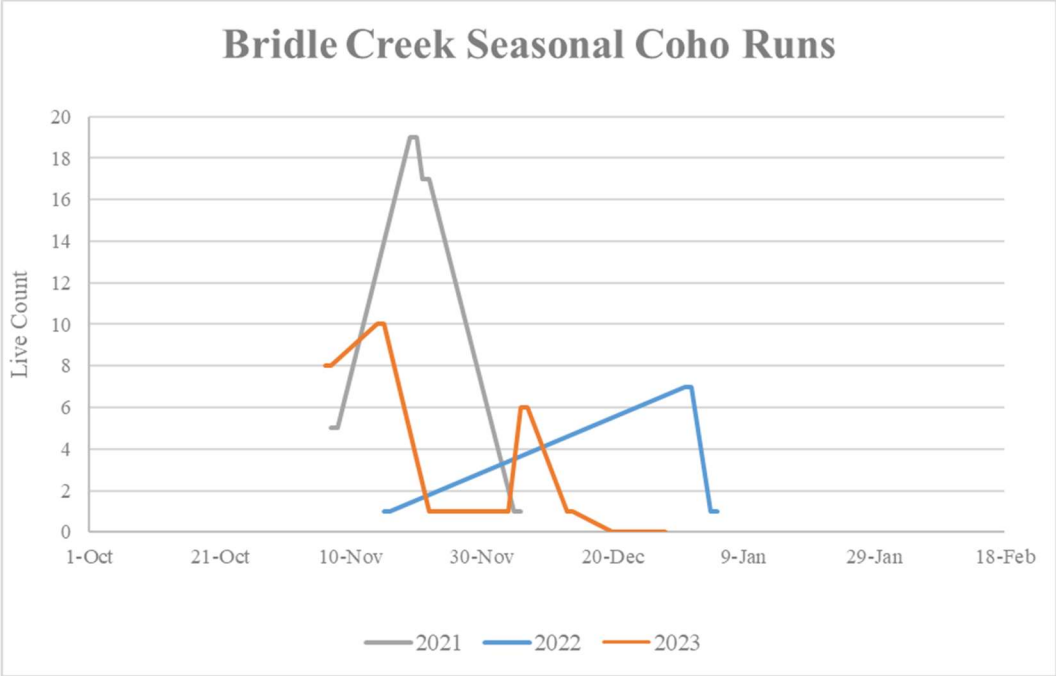

Figure 27: This season's peak occurred on November 14th, 2023, with 10 live coho. The second highest peak of the season came a week earlier which was the first survey of the season, with 8 live coho. Last year, the peak was 7 live coho and in 2021 19 live coho were observed in a single survey. Unfortunately, seasonal data prior to 2021 was not retained in the SFEG Spawner Survey database.

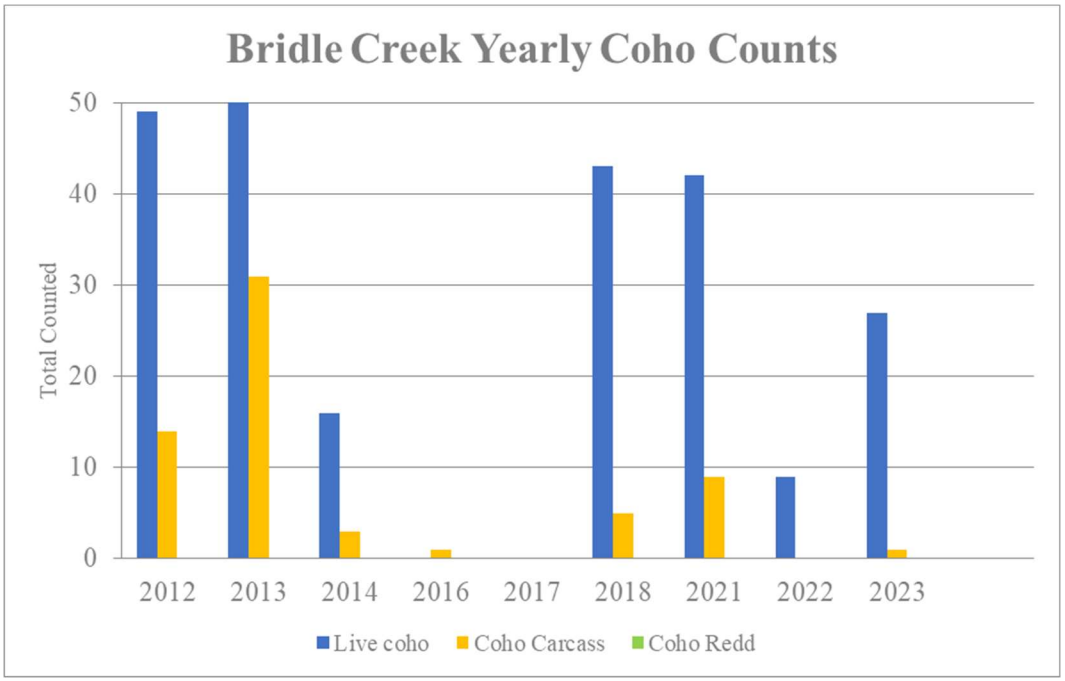

Figure 28: A total of 27 live coho, 1 coho carcass and zero redds were seen this season. This is an increase from last year when only 9 live coho were observed. The most live coho observed on this creek was in 2013 when 50 live coho were observed.

Mud Creek & Finnegan Creek

Mud Creek drains from Chuckanut Mountain and flows into the north end of Lake Samish (Figure 29). Coho and WFDW stocked-kokanee are the two most observed salmon in this stream, however steelhead, rainbow and cutthroat trout are classified as 'documented' via SalmonScape. The portion of the creek surveyed by SFEG is 0.5 miles long and meanders through Camp Lutherwood, a privately owned summer camp. SFEG has been monitoring Mud Creek since the early 2000's. In 2017, the Nooksack Salmon Enhancement Association (NSEA) completed a fish passage barrier removal project where a culvert was replaced with a bridge. The kokanee run is the most prolific population of salmon observed on this tributary of Lake Samish, however in the last 4 years total seasonal counts have decreased drastically. The most ever observed in a survey season was in 2009 when 1,799 live kokanee were counted. All but 5 years within the last 15, surveyors have observed more than 300 kokanee each season with numbers averaging around 500 per season (Figure 29). Since 2019 when 1,271 live kokanee were observed, kokanee populations have decreased. Since SFEG began monitoring Mud Creek no more than 11 coho have ever been counted in an individual season.

Finnegan Creek drains from Lookout Mountain into the middle section of Lake Samish and supports many spawning kokanee each year, however less than Mud Creek, and a lesser number of spawning coho (Figure 29). Steelhead, rainbow, and cutthroat trout have also been documented on this tributary, however seeing them is less common. In 1999, a fish passage barrier removal project corrected a culvert on residential road going over Finnegan Creek about 300-feet upstream of Lake Samish, however there is currently a partial barrier at the upstream end of the SFEG survey reach about 0.3 miles upstream from the mouth of the creek. Plans to remove this culvert are not known at this time, however SFEG completed a riparian restoration project in 2023, planting 1500 native trees and shrubs on 1.2 acres.

During the 2023-2024 season, Mud and Finnegan Creeks were surveyed by Erin Matthews and Felipe Muñoz Felix, as well as Connor Garrod, Adam Martinez, Clare Spain, Zack Matthews, and Lane Eide from October 19, 2023, to January 8, 2024. The return for kokanee on Mud Creek was relatively short, with the first kokanee recorded on November 2, 2023, and the last recorded was on December 2, 2023 (Figure 30). This season was notable for Mud Creek, as it had its highest count of kokanee since 2019 with 512 live and 80 carcasses (Figure 31). Furthermore, Finnegan creek saw the highest count of fish on a single survey of any of SFEG's streams this season with 344 kokanee counted on November 12th, 2023 (Figure 32). Finnegan Creek saw its highest number of kokanee since at least 2006 with 565 live and 205 carcasses (Figure 33). The highest count of kokanee prior to this season happened in 2015 with 314 kokanee. Before this year, population trends for kokanee in these streams appeared to be declining, especially for Mud Creek. More data in the upcoming years will need to be collected to determine if the trend is shifting back in the upward direction, since populations can vary from year to year. Coho were not observed on either creek this year (Figure 34 and 35).

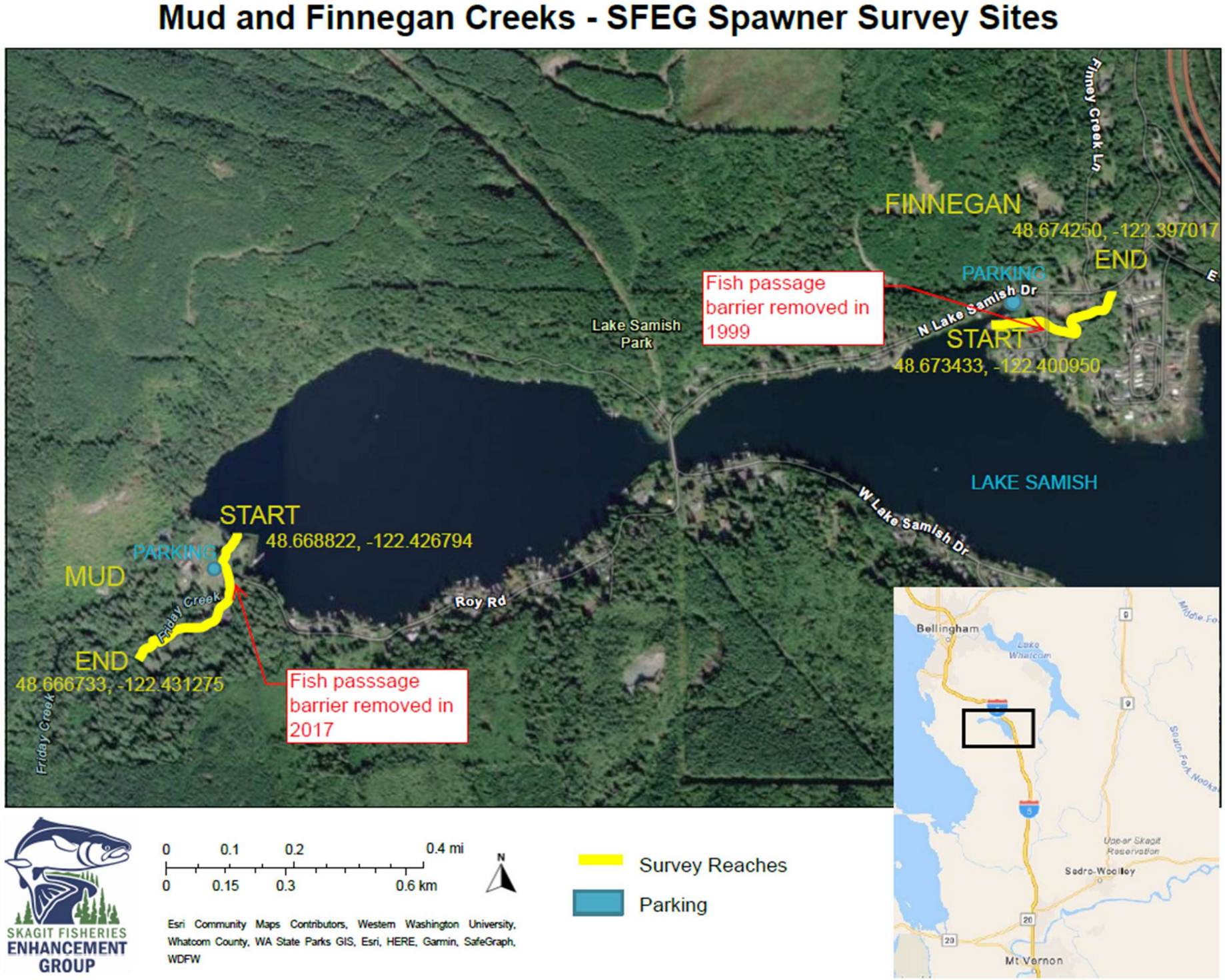

Figure 29: A map of the Mud and Finnegan Creeks reaches and parking areas in the Samish Watershed near Bellingham, Washington.

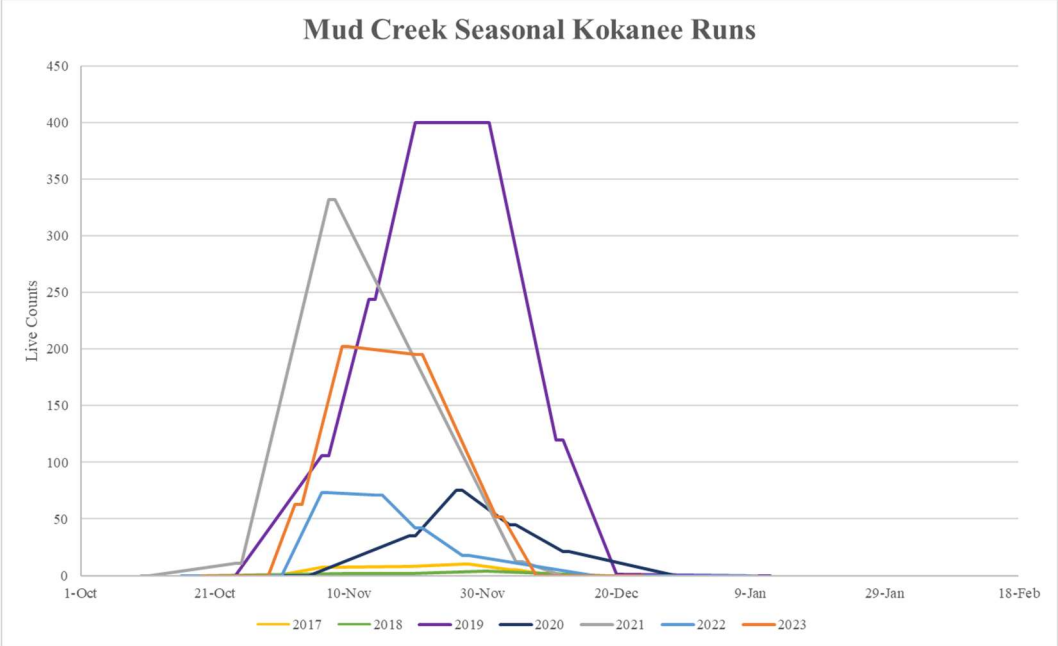

Figure 30: This season's peak occurred on November 9th, 2023, with 202 live kokanee. The following week surveyors saw 195 kokanee. In comparison, the two seasons with the most live kokanee seen on a single survey on Mud Creek occurred in 2019 with two consecutive surveys in 400 live kokanee and then in 2021 with a lone survey with 332 live kokanee.

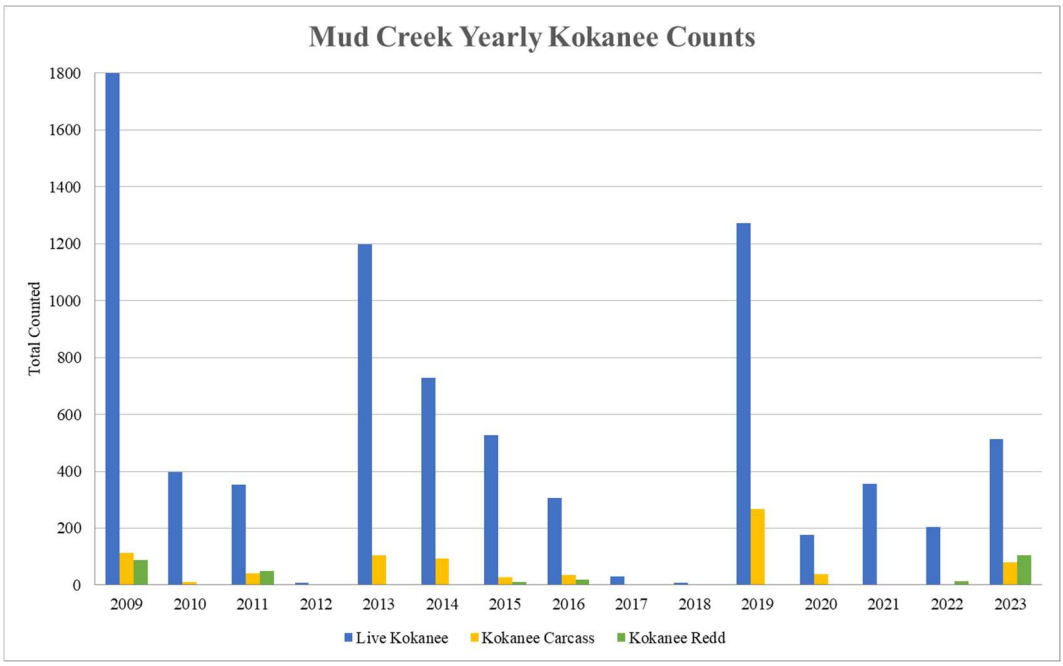

Figure 31: A total of 512 live kokanee were seen on Mud Creek this season, along with 80 carcasses and 106 redds. This is up from 204 live kokanee seen last year and 355 in 2021.In the last decade the most observed were 1,271 live kokanee in 2019.

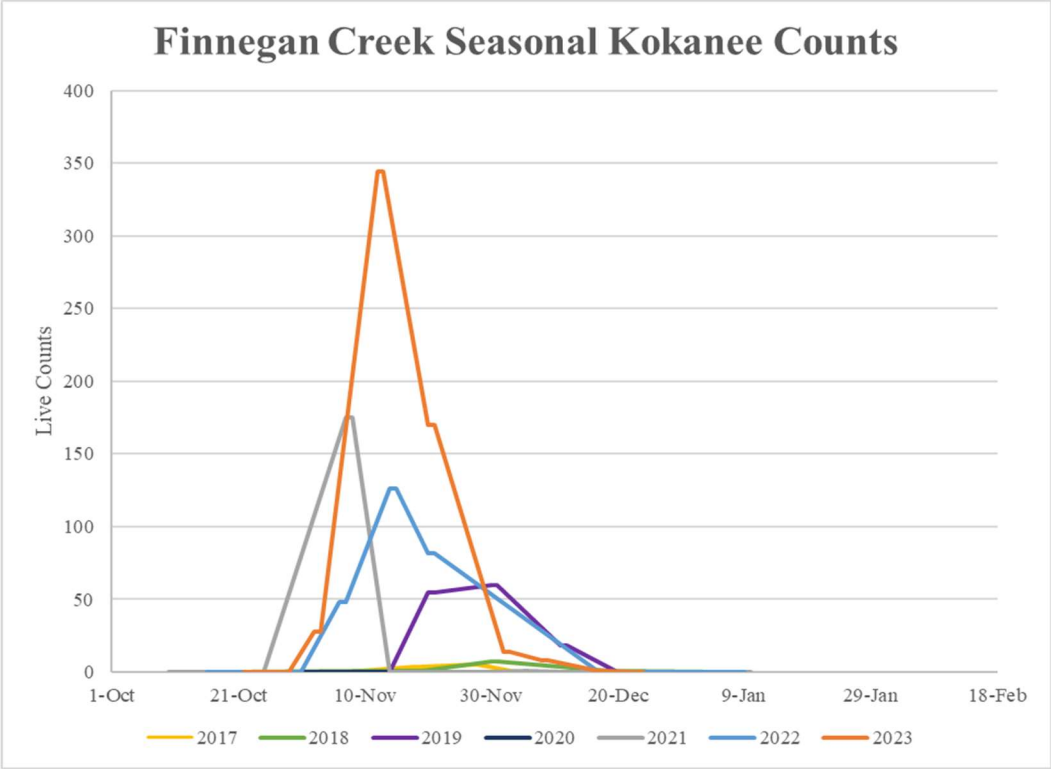

Figure 32: This year's peak occurred on November 12th, 2023, with 344 live kokanee. This is much higher than last season's peak of 126 live kokanee and 175 seen in 2021.

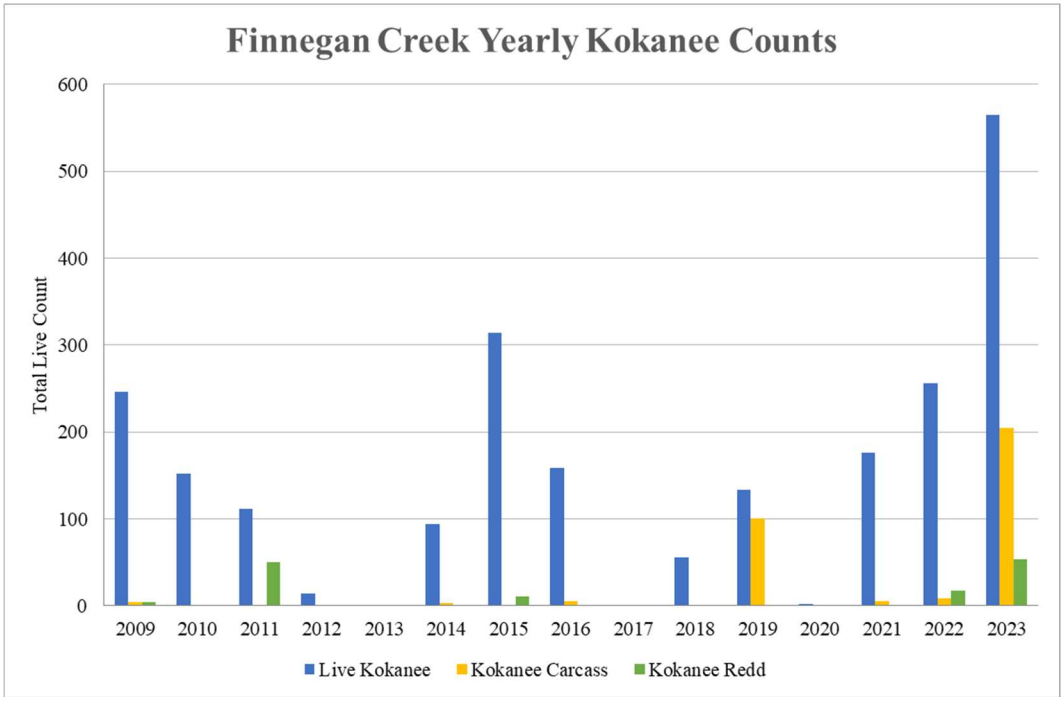

Figure 33: A total of 344 live kokanee were seen on Finnegan Creek this season. This is the most fish seen on this creek since surveying began in 2009. Last year, 265 live kokanee were counted and in 2021 there were 176 kokanee.

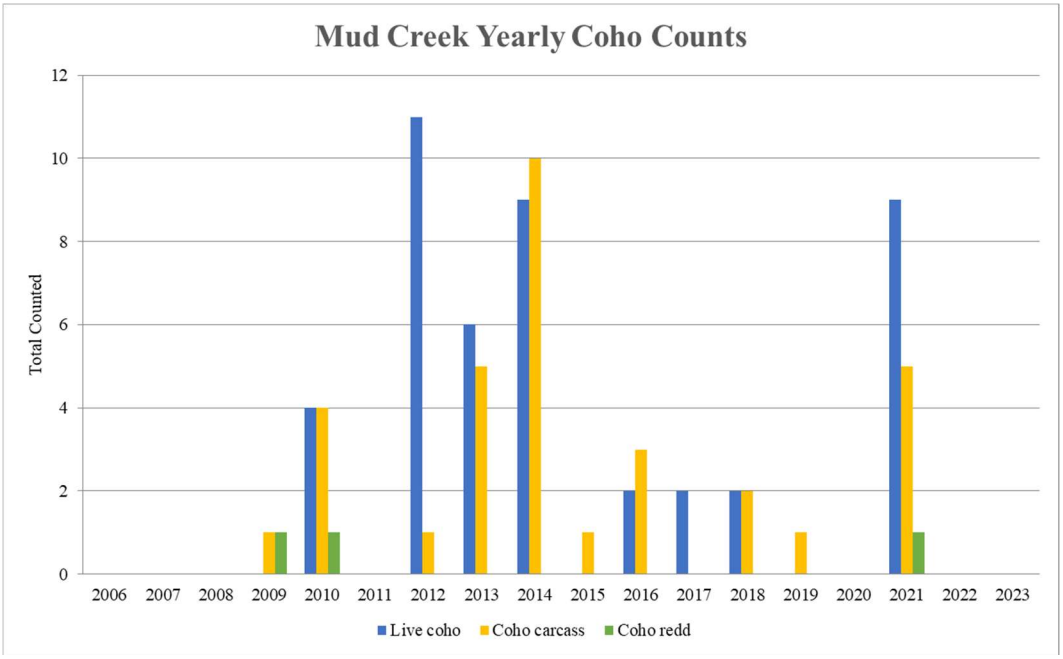

Figure 34: No coho were seen on Mud Creek this season, but 9 were seen 2 seasons ago, in 2021. The most live coho seen was 11 documented in 2012.

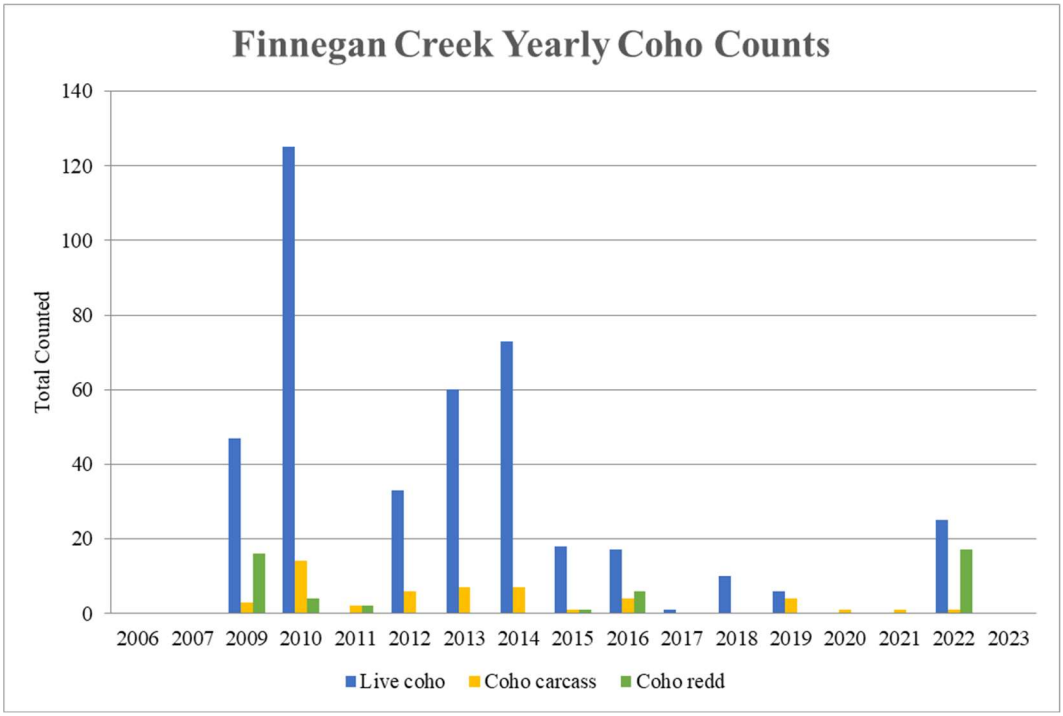

Figure 35: No live coho, nor carcasses or redds were spotted this season on Finnegan Creek, however 25 were seen last year. In 2010 surveyors observed 125 coho in the creek.

Maddox Creek

Maddox Creek is located in the Skagit Watershed and does flow into Skagit Bay; however, it does not flow directly into the Skagit River. It flows south parallelling the Skagit River and Interstate-5 and is hemmed in on either side by a dike until it empties out into estuarine marshlands adjacent to Conway. Maddox Creek is one of the most urbanized creek survey reaches SFEG has in the Spawner Survey Program (Figure 36). It begins within Mount Vernon city limits and flows through suburban neighborhoods and agricultural fields; so much of the riparian habitat that once existed along this creek is no longer intact. It has known populations of wild coho and resident cutthroat trout, and according to SalmonScape (WDFW) is gradient accessible to Chinook, pink, and steelhead, but they have not been physically observed in recent years. WDFW has records of coho spawning in this creek from the mid-1950's. In 2013, two impassible culverts were removed and replaced by large cement bridges allowing fish to regain access to a well-treed section of Bonnie Rae Park and an additional 3 miles of upstream habitat. Large woody debris was added to the stream, along with many willows to help create stabilization of the banks as well as refuge spots for juvenile and spawning fish. In 2017, SFEG began monitoring Maddox Creek and saw very few coho, just two live and zero carcasses or redds. Yearly counts of live fish have increased since the first year of surveying began. The survey reach in which SFEG volunteers survey could be considered ideal spawning habitat. The 0.7-mile reach is within a small ravine, cut off from the noise of urban life above. In 2020, an abandoned crossing with an impassable culvert was removed by Washington State Department of Transportation (WSDOT). The crossing was not replaced with a bridge, but instead lots of large woody debris and riparian planting now take up the space where the long culvert used to be. Now there are many places for spawning coho to take refuge. Many long stretches boast good-sized gravel and flowing water for them to make their redds as well. However, to get to this ideal habitat, about 9 miles of urbanized and agricultural land stand in their way. Changes in land use between the seasons may be the limiting factor for coho trying to reach the upper parts of Maddox Creek

During the 2023-2024 season, Maddox Creek was surveyed by volunteers Hal Lee and John Yaeger over 12 surveys from October 20, 2023, to January 11, 2024. The most coho seen on a survey was December 13, 2023, with 4 live coho, but the previous weeks had been 2, 0, and 3, making it hard to say if December 13th would be a significant peak or not. Last season, the peak occurred around November 30, 2022, with 19 fish observed in one survey (Figure 37). During this season, only 10 live coho and 6 coho carcasses were observed, compared to last year's counts of 35 live coho and 16 carcasses (Figure 38). This season fish were observed almost two weeks later than the previous year, with the first three live coho observed on November 19, 2023. There is not a clear peak of the season this year. The last coho seen this season on Maddox Creek this season was December 20, 2023, whereas the previous season saw their last two coho on December 31, 2022.

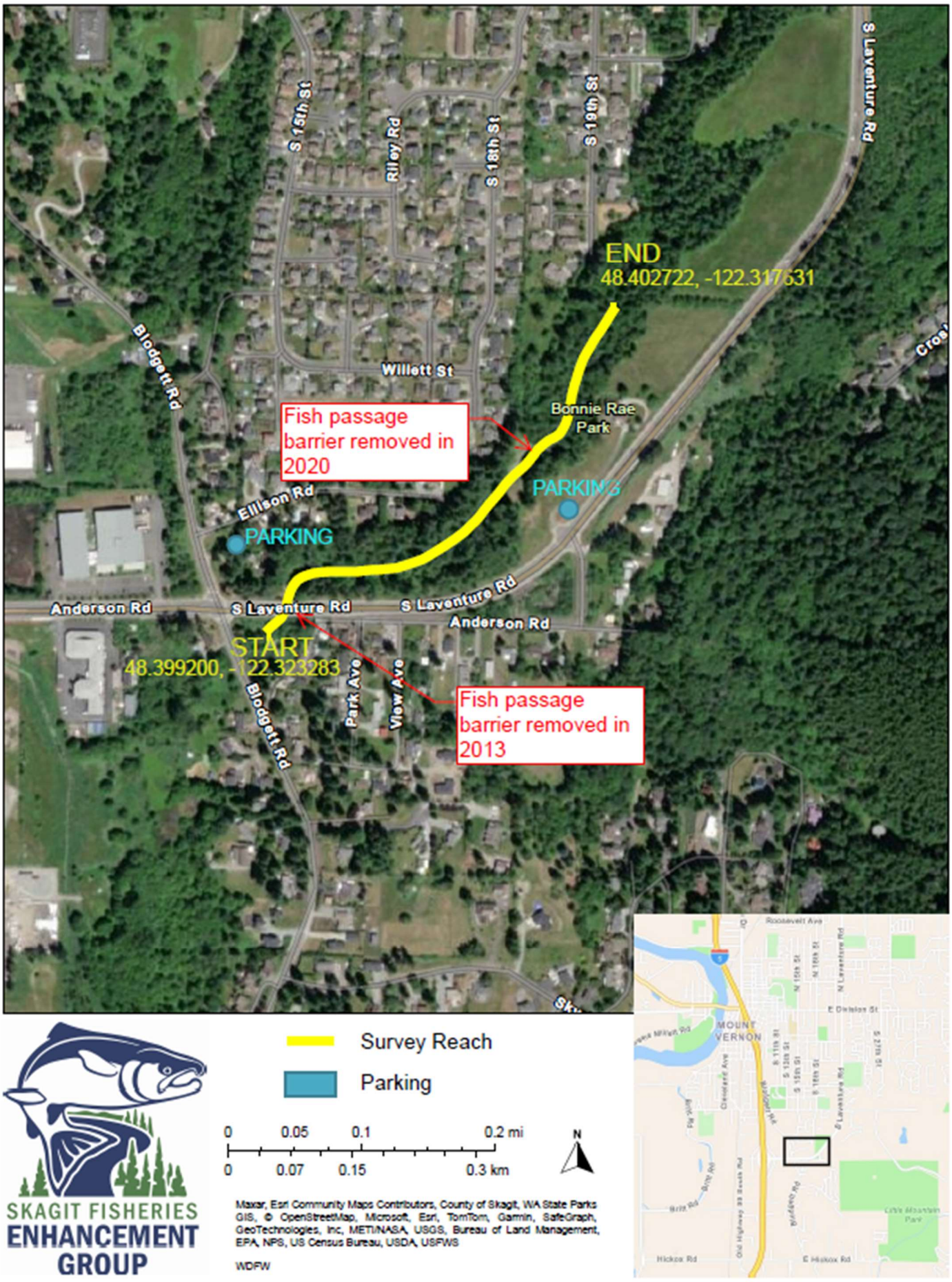

Figure 36: A map of the Maddox Creek reach and parking area in the Skagit Watershed in Mount Vernon, Washington.

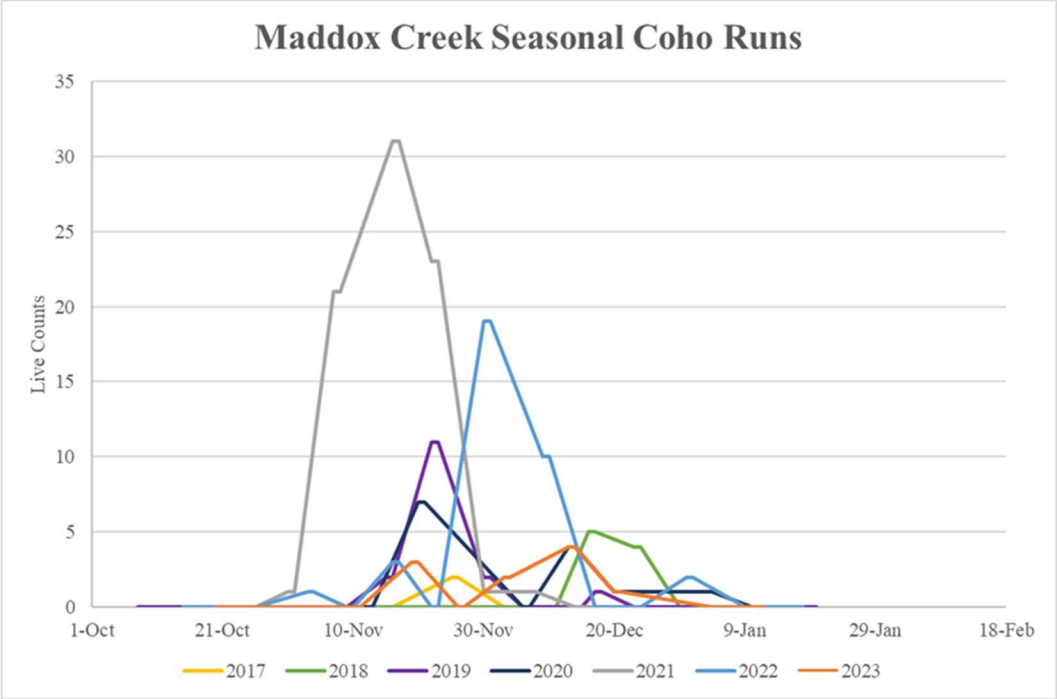

Figure 37: The peak of this season occurred on December 13th, 2023, with four coho. This is lower than 2022's peak of 19 live coho and 31 seen on a survey in 2021.

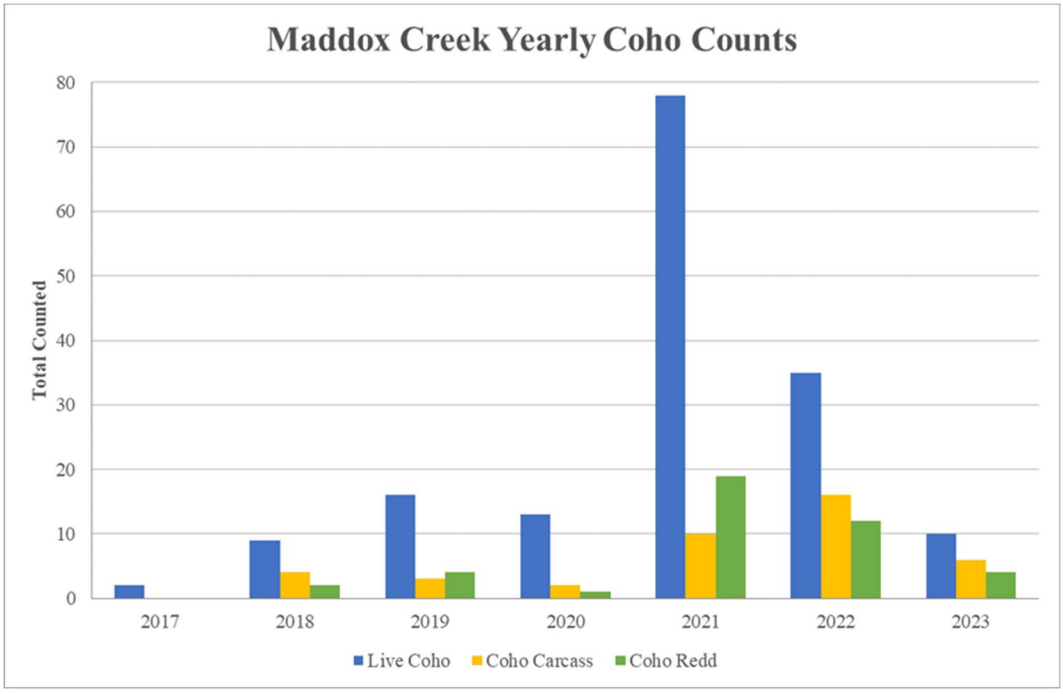

Figure 38: A total of 10 live coho were seen this season, along with 6 carcasses and 4 redds. This is a lower count of live coho in comparison to the past couple of years, as 35 coho were seen last year and 78 were seen in 2021. This seasons' numbers have a similar trend in live coho to 2018-2020 seasons.

Carpenter & English Creeks

Carpenter Creek is a tributary of the Skagit River, joining with the Fisher Creek system just south of Conway before dumping into the Skagit River estuarine floodplain and then Skagit Bay just a mile further downstream (Figure 39). Carpenter Creek is unique, like Maddox Creek, in that it is a more rural stream with improved habitat on its upper portion. The lower six-mile stretch flows through Hill Ditch, hemmed in on either side by agricultural land before entering Skagit Bay. Carpenter Creek has been monitored since 2019 after SFEG completed the first of two fish passage barrier removal projects with FFFPP funding. The second barrier culvert was removed in 2020 and in both cases, large bridges were installed, opening habitat upstream for spawning and rearing. Unfortunately, there is still a problematic culvert about 0.3 miles downstream that restricts nearly all fish passage. This problematic culvert received funding in July 2023 to design and construction a fish passage structure; SFEG staff are currently working to restore fish passage at this location and plan to have it complete by 2025. The survey reach for this creek is 0.1 miles long. Coho, residential cutthroat trout, and spring and winter steelhead have been documented on Carpenter Creek as recently as 2021.

English Creek is a tributary to Carpenter Creek and enters about 0.3 miles downstream of the Carpenter Creek survey reach (Figure 39). English Creek is a well-forested reach that drains from a large wetland complex on Devil's Mountain and Lake Creek to the southeast. In past years, coho and residential cutthroat trout have been documented in English Creek. English Creek is mapped incorrectly on most map layers and enters Carpenter immediately downstream of the fish passage barrier that has plans of removal. The 0.4-mile survey reach focuses on two undersized culverts that represent partial barriers that SFEG plans to improve in 2025 with funding from the Fish Barrier Removal Board (FBRB). Additionally, in fall 2023, SFEG staff applied for funding from several grant funding agencies. We are hopeful that we will be able to continue restoring fish passage throughout Carpenter Creek and eventually aid in completely opening the Carpenter system from its' headwaters to the Skagit Bay.

Unfortunately, Carpenter and English Creeks had an unfruitful season again in 2023-2024. These adjacent reaches were surveyed by volunteers Dean Tilles and Elizabeth Drozda. They surveyed 10 times from October 27, 2023, to January 5, 2024. Neither creek saw any spawning salmon throughout the whole season (Figure 40). The last time fish were seen on Carpenter Creek was in 2021 with 36 live coho recorded, as well as 1 Chinook and 4 sockeye (Figure 41). On Carpenter Creek, our volunteers tagged an unknown redd, but it is hard to say if it is indeed a redd or just the hydrology of the creek since there weren't any fish observed in the area. On December 11, 2023, spawner survey volunteers noticed higher flow and the culvert on Carpenter Creek was almost full, leading to further confirmation that this culvert is a barrier to fish wanting to access our reach of stream. On most of the surveys of English Creek, juvenile salmonids were observed on the upper section of the reach, which gives hope that in the following years spawning salmon return to these two systems. No graph was included for English Creek because no adult salmon have been documented on it during SFEG surveys.

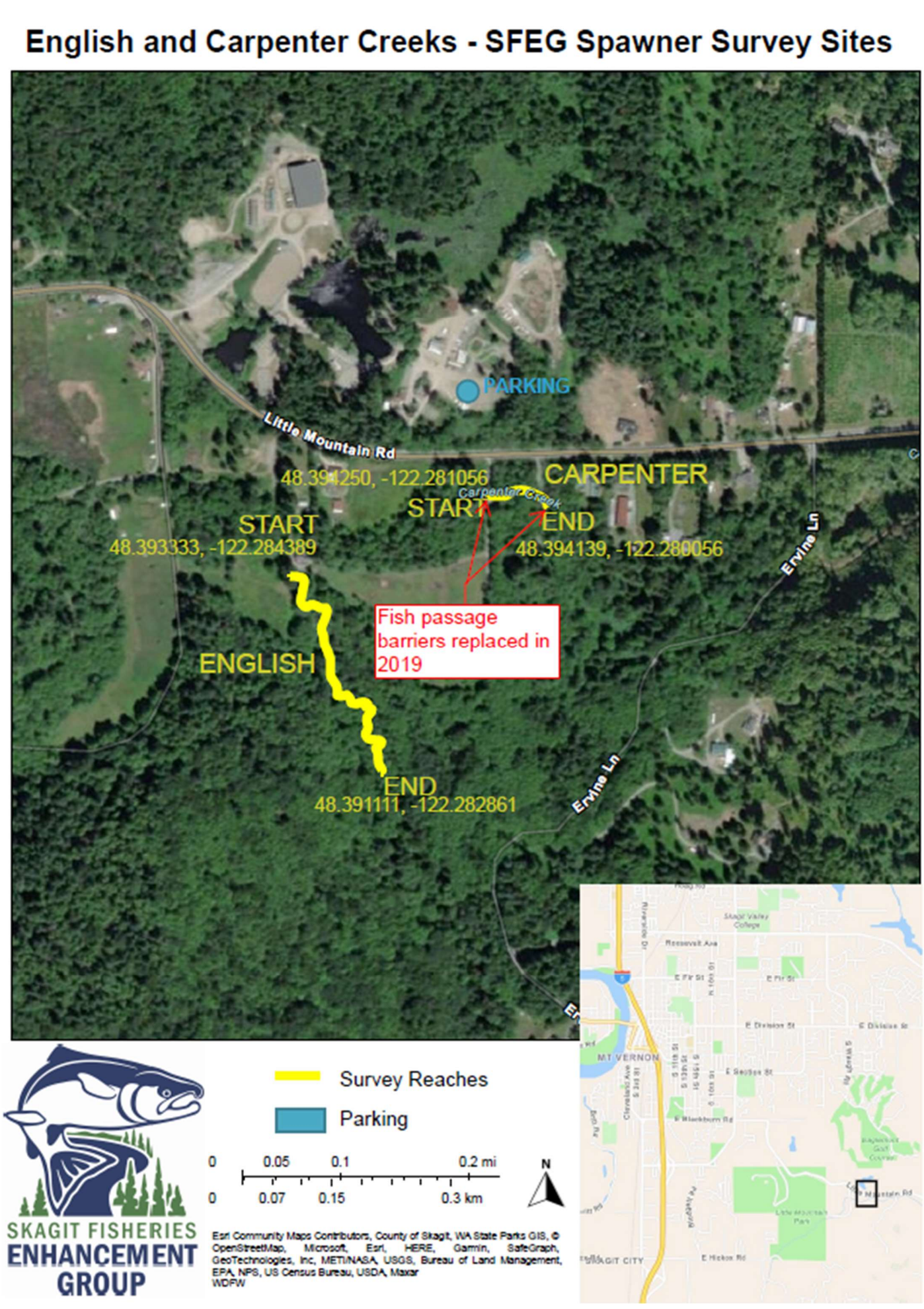

Figure 39: Map of the English and Carpenter Creek reaches and parking area in the Skagit Watershed near Mount Vernon, Washington

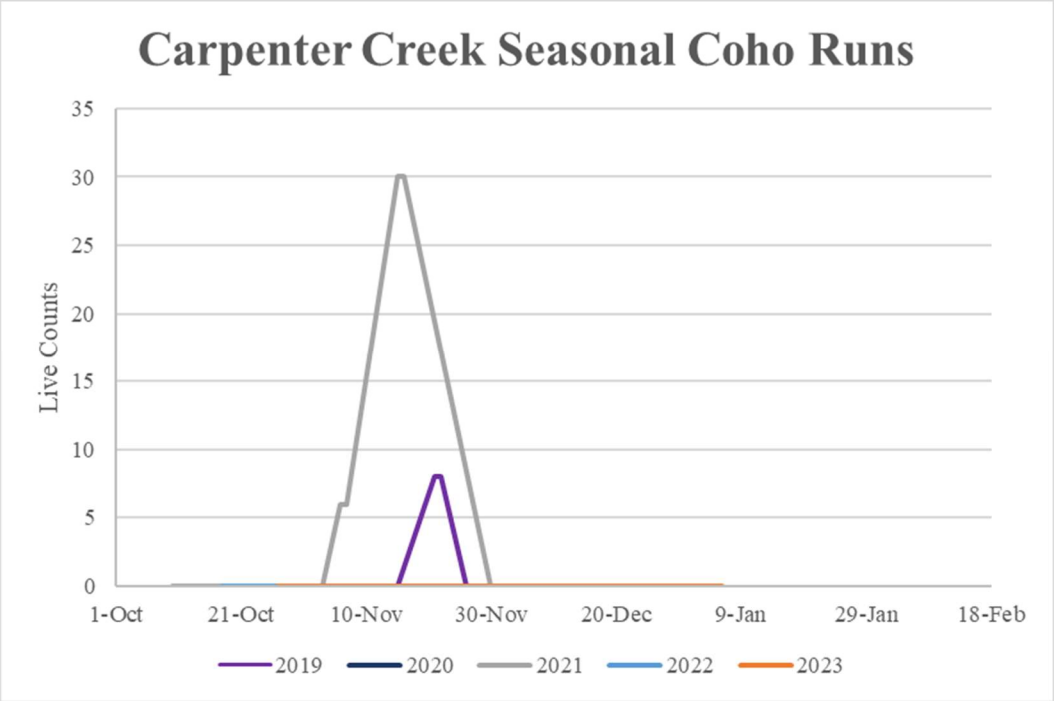

Figure 40: The greatest # of fish on a survey was 30 live coho on November 15th, 2021. The location of the system being lower in the watershed may lend to the peak counts being earlier in the season, although many factors are at play so this cannot be confirmed.

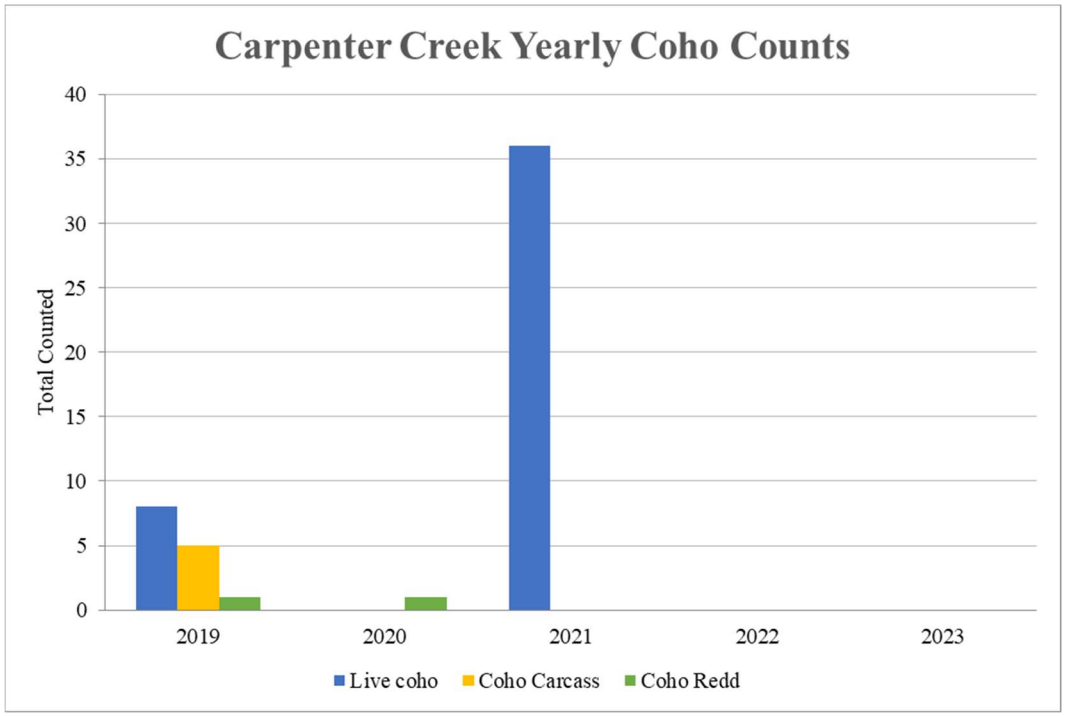

Figure 41: No fish were seen on this creek this season. The last time fish were documented on this stream was 2021 when 36 live coho were spotted. In 2019, 8 live coho, five carcasses and 1 redd were documented.

East Fork Walker Creek

East Fork Walker is a tributary of East Fork Nookachamps Creek and flows down from the Cultus Mountains between Big Lake and Lake Challenge (Figure 42). The survey reach of East Fork Walker is 0.5 miles long and encompasses a portion of the stream that underwent construction and restoration in 2016. With funding from the Family Forest Fish Passage Program (FFFPP), SFEG removed a culvert barrier that restricted fish passage and installed a 60-foot steel bridge restoring access to over a mile of upstream spawning and rearing habitat. With funding from the Washington Department of Ecology, SFEG and volunteers, including middle schoolers, Skagit Valley College Environmental Club, and local community members, planted 2.5 acres with native conifers and deciduous trees and shrubs. SFEG's Washington Conservation Crew also completed a new planting upstream of the survey reach in fall 2023. This year, SFEG staff are working to fix another fish passage barrier upstream of the current survey reach. When funds are secured to replace the undersized and perched culvert, SFEG hopes to extend the reach upstream and continue gathering information on how salmon populations are doing on East Fork Walker Creek. By completing fish passage projects and enhancing this riparian edge, the SFEG community is helping ensure that future salmon runs will have unimpeded access to well-forested, shaded streams, cleaner water through reduced erosion and increased water filtration by native plant root systems. All these aspects are critical to healthy and abundant salmon populations. SalmonScape resources document Chinook, chum, coho, spring and winter steelhead, and resident cutthroat trout in this stream. Since the first year of surveying the observed population of coho has had a very positive trend.

During the 2023-2024 season, East Fork Walker Creek was surveyed by volunteer Lindsey Juen and Chad Verbitsky, as well occasional help from Austin Werts, Audrey Verbitsky, Sarah Wheatley, Brianna Mafrici, and Pamela Verbitsky. They completed 14 surveys from October 15, 2023, to January 14, 2024. Volunteers saw their first fish of the season on November 5, 2023, with 37 live coho (Figure 43). Compared to the past five years, the appearance of these coho were right on schedule with the previous trends. The team consistently saw live coho each survey up until December 31, 2023, which was not the case for most other streams surveyed this season. Although the highest number of fish occurred on November 12, 2023, with 51 live coho and 1 carcass, it is not considered a definitive peak of the season (Figure 44). On December 17, 2023, 48 live coho were seen along with 60 carcasses. This date saw a larger fish presence overall and occurred after the week that saw the greatest rainfall and highest flow of the season. East Fork Walker had the second highest numbers of fish recorded out of all the SFEG streams and the most in the Skagit Watershed with 222 live coho, but unfortunately the total is almost half of what was recorded in the 2022-2023 season, where 404 live coho were documented (Figure 44). The surveyors' observations are consistent with the forecast from WDFW with lower numbers of coho in only the Skagit River. Along with coho, cutthroat trout have been spotted consistently since 2021, with 8 spotted this season. They were spotted sporadically throughout this survey season as well.

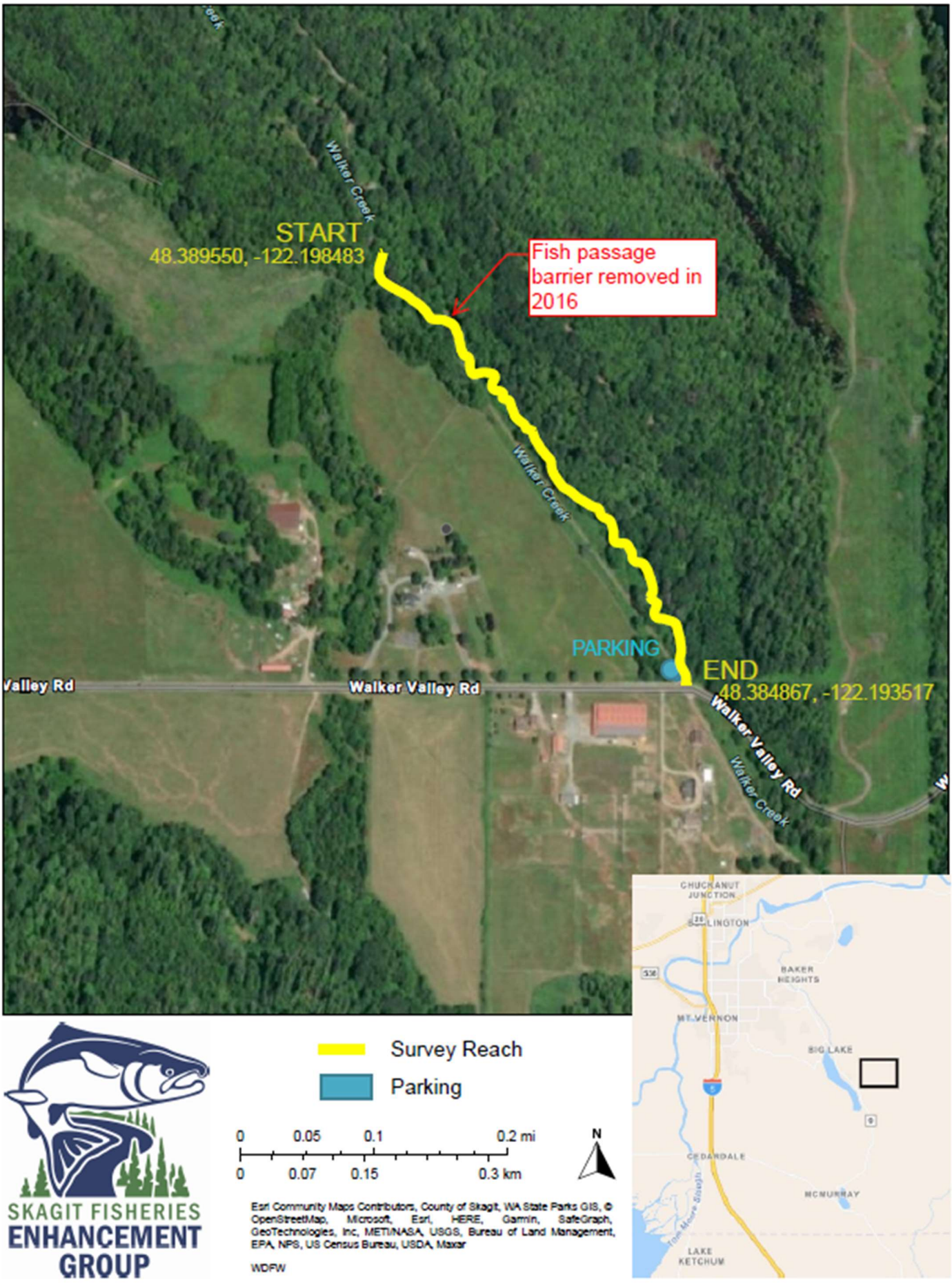

Figure 42: Map of the East Fork Walker reach and parking area in the Skagit Watershed near Mount Vernon, Washington.

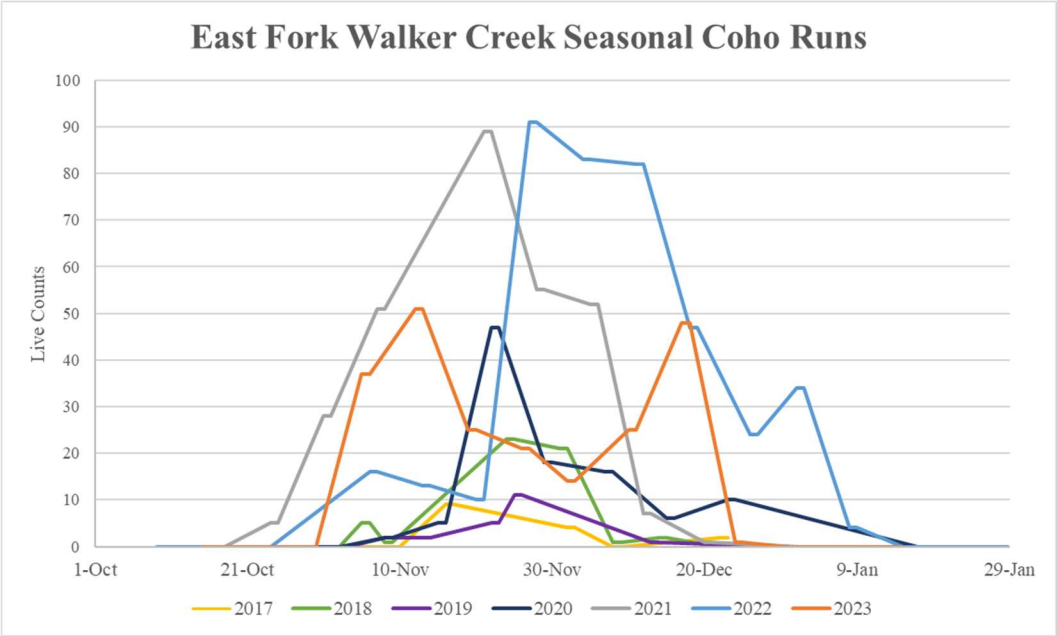

Figure 43: This season's peak was 51 live coho seen on November 12th, 2023. This year's peaks are consistent timing wise with previous years, but last year's peak survey saw almost double the amount of coho with 91.

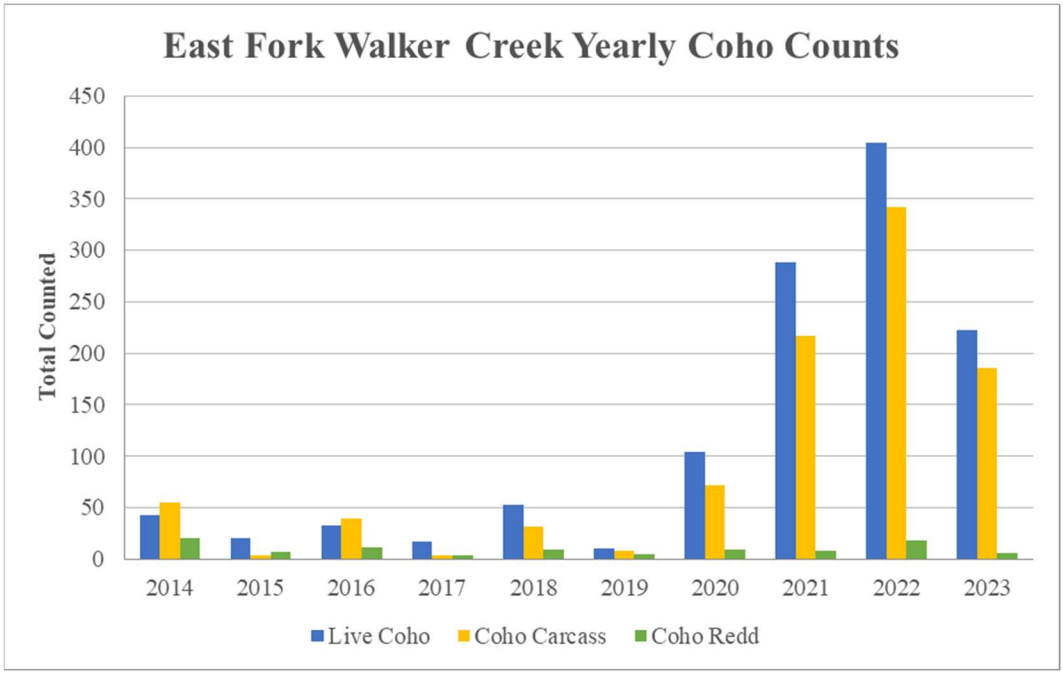

Figure 44: A total of 222 live coho were counted this season, along with 186 carcasses and 6 redds. This is much less than the 404 seen last year and 288 counted in 2021. East Fork Walker still ranks as the most productive stream in the Skagit Watershed that SFEG monitors.

West Fork Trumpeter

The West Fork of Trumpeter Creek originates in the City of Mount Vernon, flowing north into the West Fork of the Nookachamps Creek and then into the Lower Skagit River (Figure 45). Along with Maddox Creek, West Fork Trumpeter is one of the most urban streams SFEG surveys; walking paths, roads, and houses are within proximity to the stream itself. There is a SFEG restoration project located at Bakerview Park along West Fork Trumpeter Creek. The project, implemented from 1995 through 1997, involved recreating a stream channel through filled wetlands. The project was primarily funded by the Jobs for the Environment program. Ninety instream structures were placed along 3,000 feet of stream channel, including five rock weirs placed at the upper end of the project to provide fish access to 1,260 feet of upstream habitat. The survey reach is 0.57 miles, with the reach both upstream and downstream of these projects. To provide rearing habitat for juvenile salmon, large woody debris was installed along the stream channel, and an off-channel pond was created. Over 2,000 native trees and shrubs were planted by local community volunteers along 6,000 feet of the riparian zone on both stream banks. Community volunteers have been instrumental in monitoring and maintaining this project site over the past years. Signage was installed through cooperation with several grant programs. Coho are the main salmonids known to use this urban stream, although cutthroat trout are presumed present and it is gradient accessible to Chinook, chum, pink and steelhead. Since project completion, community volunteers have contributed thousands of hours toward planting, monitoring, and cleanup of this project site.

During the 2023-2024 season, West Fork Trumpeter was surveyed by Connor Garrod, Joe George, Clare Spain, Adam Martinez, and Claudia Basso. A total of seven surveys were completed between October 28, 2023, and January 6, 2024. The first and most fish seen of the season was on December 11, 2023, with 3 coho and 1 live, but unidentifiable fish species. The following week, on December 19, 2023, one coho was seen on West Fork Trumpeter, which ended up being the last live and identifiable fish seen this season. On January 6, 2024, an unknown live fish was seen. A single coho carcass was observed on December 30th, 2023, bringing the total to 4 live coho, 1 coho carcass, and 2 live unknown fish (Figure 46). While these numbers are low compared to other stream SFEG surveys, it is consistent with the data collected over the last two decades. (Figure 47). In 2013 surveyors saw a notable number of fish with 20 coho. They also documented 16 coho carcasses, the most carcasses seen during the span this stream has been surveyed. For this season, it is important to note that there was a gap between surveys during the early weeks of the season, therefore - the data from this season may not give a full picture of the number of fish that returned to West Fork Trumpeter this season.

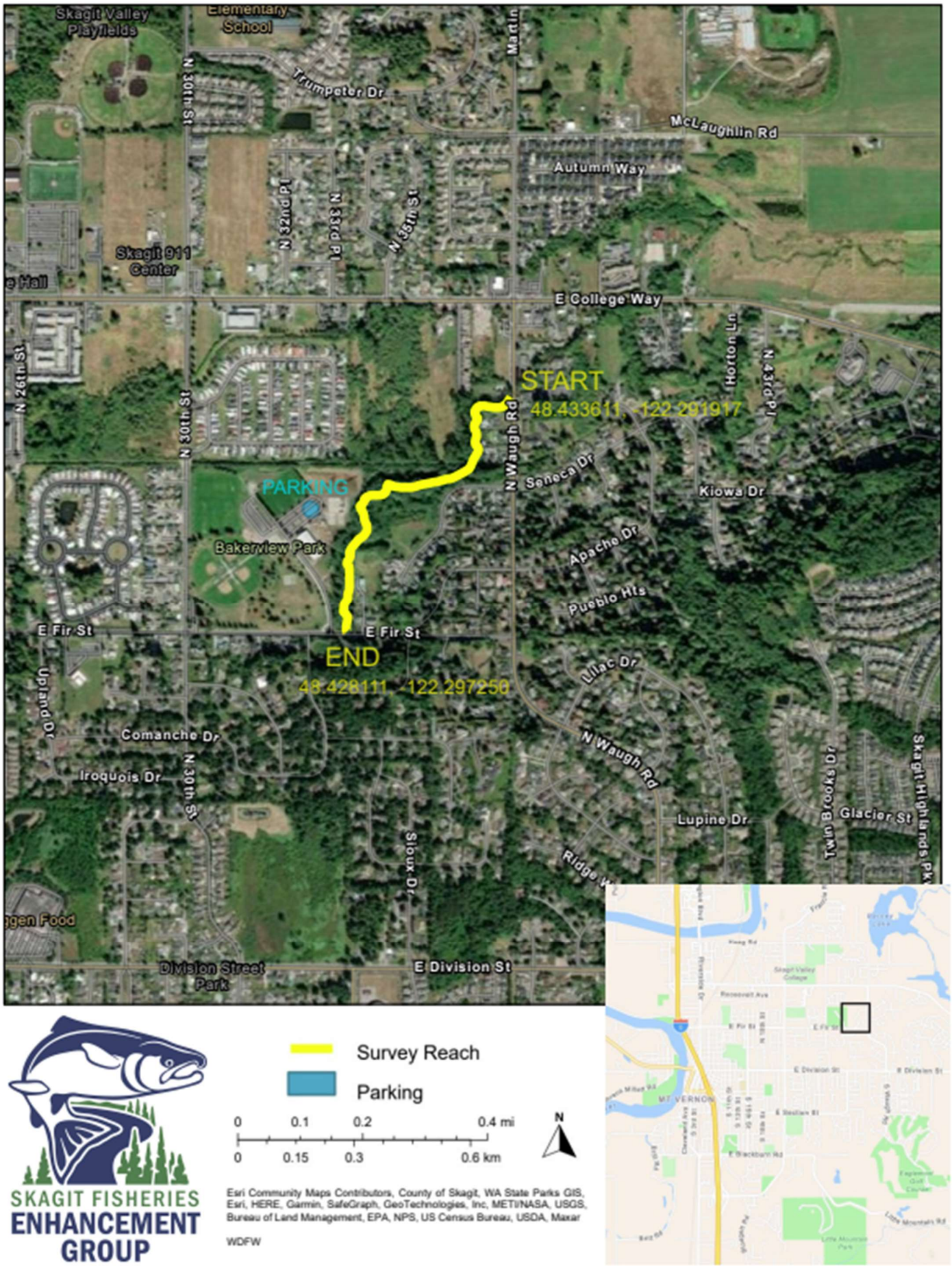

Figure 45: A map of the West Fork Trumpeter Creek reach and parking area in the Skagit Watershed in Mount Vernon, Washington.

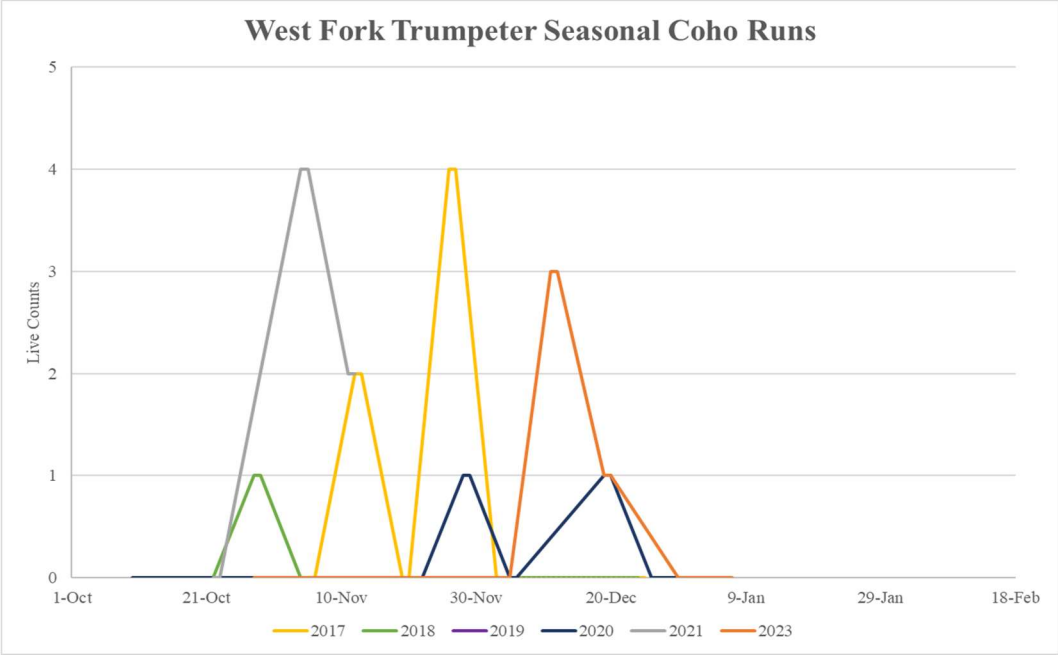

Figure 46: This season's peak occurred on December 11th, 2023, with 3 live coho but due to lack of consistent surveying this peak cannot be considered entirely accurate. The next week was the only other survey to see fish with just 1 live coho. The peak in 2021 was on November 4th, 2021, where surveyors saw 4 live coho.

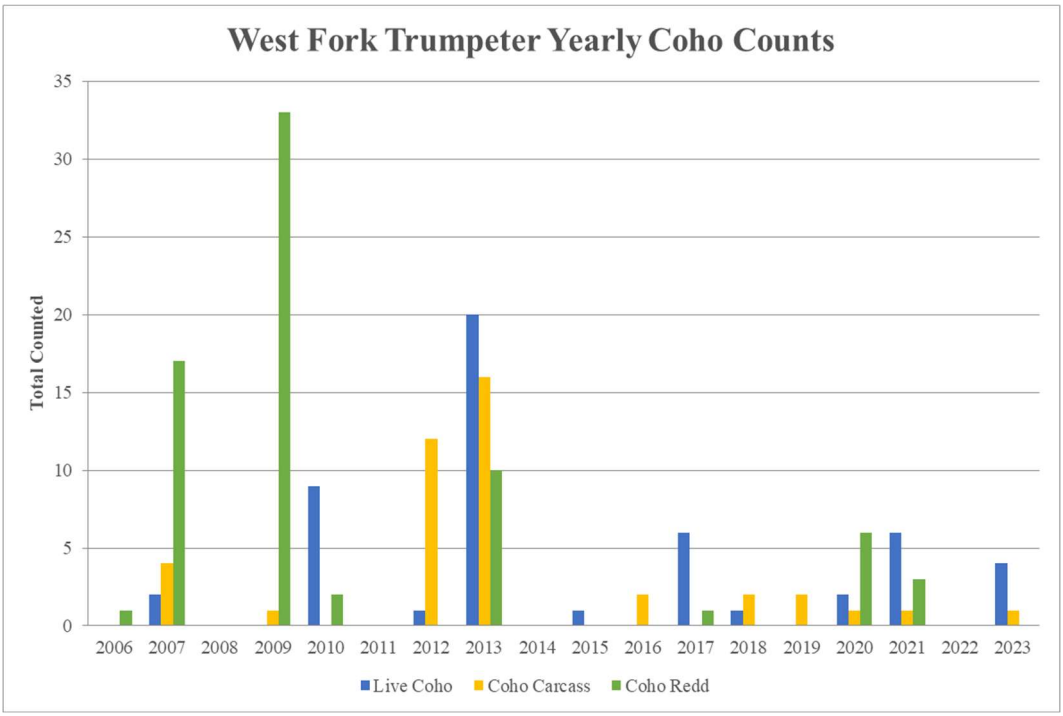

Figure 47: A total of four live coho were seen this season, along with just 1 carcass. No data was collected last year but in 2021 6 live coho were spotted. Back in 2013, 20 coho were seen on this creek and in 2009, no live coho were documented but 33 coho redds were seen, suggesting that they were there, just not seen during surveys.

Starbird Creek

Starbird Creek is a tributary of Fisher Creek and flows into the Skagit Bay estuary, very close to where Maddox Creek also enters the bay (Figure 48). While it does not flow directly into Skagit River, it is considered within the Skagit Watershed because it flows into the Skagit Bay. Starbird Creek has had two large fish barrier removal projects completed by SFEG. The first project completed in 2014 was a 60-foot steel bridge on Starbird Creek Lane, and the second project completed in 2021 was a 14-foot concrete bridge at the end of Fremali Lane on private property. Both projects were funded by the FFFPP. The 0.5-mile survey reach of Starbird Creek has some very large, old trees and good habitat for spawning and rearing salmonids. By removing the two fish passage barriers, SFEG and local landowners increased access to the pre-existing habitat and is hopeful there will be a parallel increase in the Starbird Creek salmon population. The creek is fed by boggy wetlands and is dark with tannins, like Swede Creek, making the creek tricky to survey due to low visibility. The healthy riparian edge with lots of shade and low light settings adds another level of difficulty to collecting data. According to SalmonScape (WDFW), Starbird Creek is gradient accessible to steelhead, chinook, chum, and pink salmon, and it is presumed that cutthroat trout live in the creek.

During the 2023-2024 season, Starbird Creek was surveyed by volunteers Loren Fuell and Dean Tilles. They completed 14 surveys from October 20, 2023, to January 31, 2024. No fish were seen on Starbird Creek this season, with returns fish being spotted only 3 times in the past five years, with 1 seen in 2017 and 5 seen last season (Figure 49). For the first three surveys of the season, the channel remained dry. On November 8, 2023, there was a change to low flow and a good indicator of a true start to the season on Starbird Creek. To our dismay no live coho were observed after this event, nor carcasses or redds (Figure 50). Some redds were marked tentatively, but without fish as an indicator it is hard to tell if they were indeed redds or simply due to the hydrology of the creek. The most fish seen on Starbird Creek was in 2016, with 89 fish live coho (Figure 50). Since then, numbers have continued to be at a small fraction of what it once was. Even though Starbird Creek once supported great abundance of salmon, boasts a healthy riparian edge, and has had several projects to help fish passage, there are many other factors at play that may be contributing to the lack of salmon observed in recent years. It may take time for two adventurous coho to navigate to this habitat, but we are hopeful that when they do, they will be supported by the projects SFEG has completed with the support of willing landowners. At this point in time, SFEG is unsure of why the number of coho documented in Starbird Creek have plummeted in the past decade.

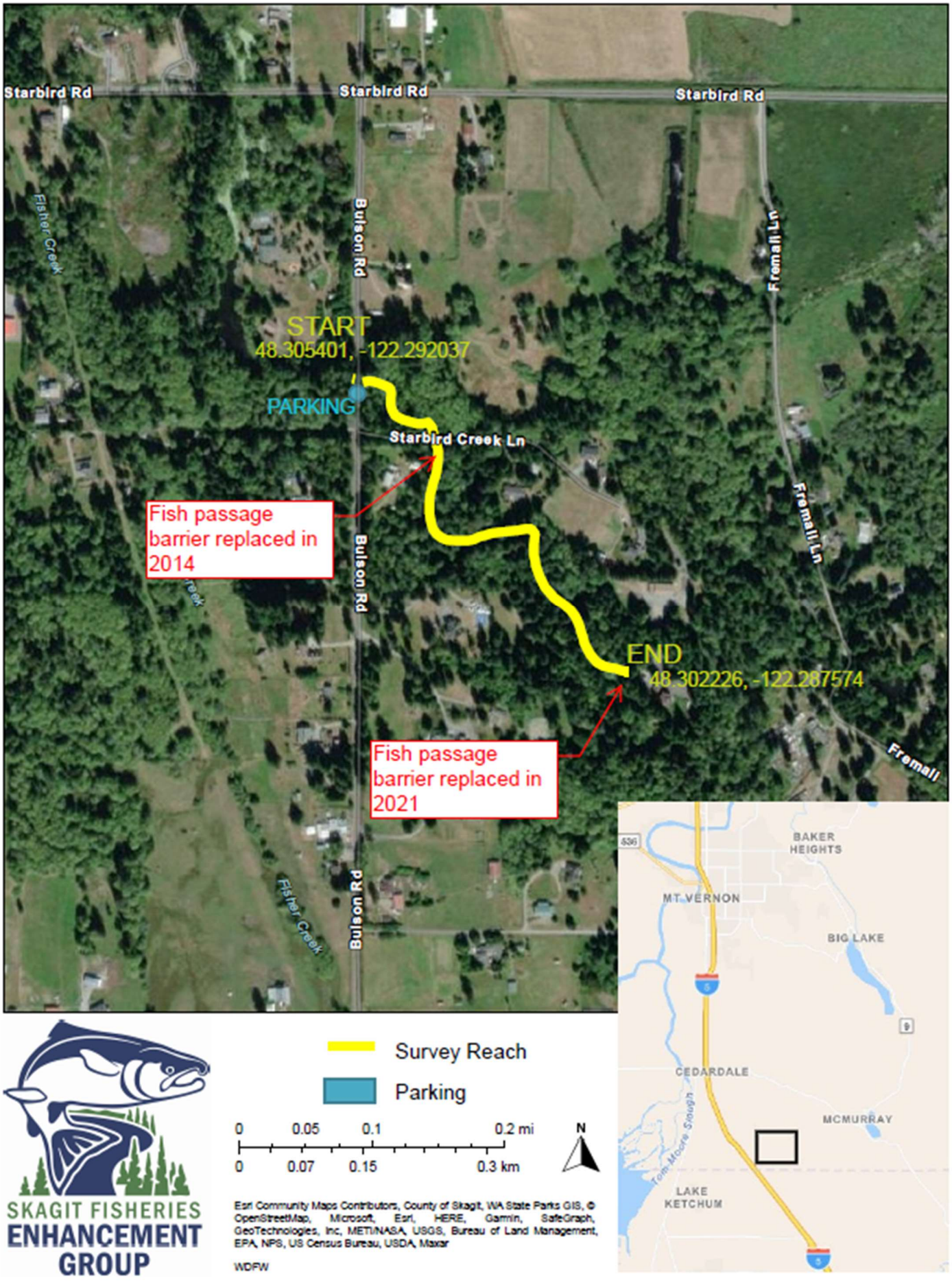

Figure 48: A map of the Starbird Creek reach and parking area in the Skagit Watershed near Conway, Washington.

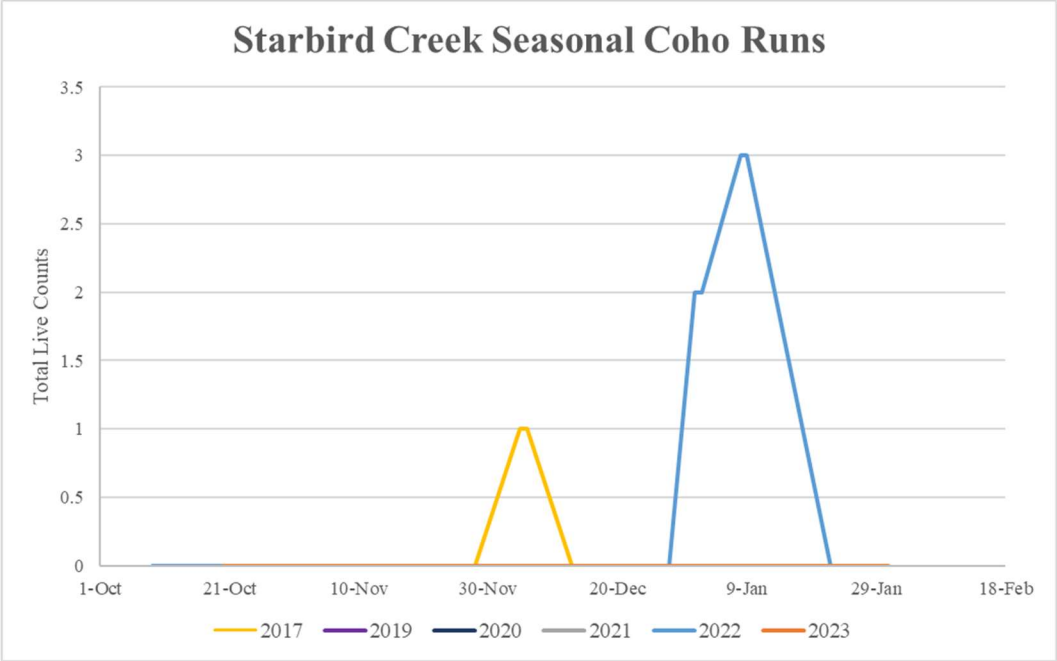

Figure 49: No fish were seen this season, but last year's peak was three live coho on January 8th, 2023. In 2017, only one live coho was spotted throughout the entire season. SFEG does not data on individual surveys dates before the 2017 season.

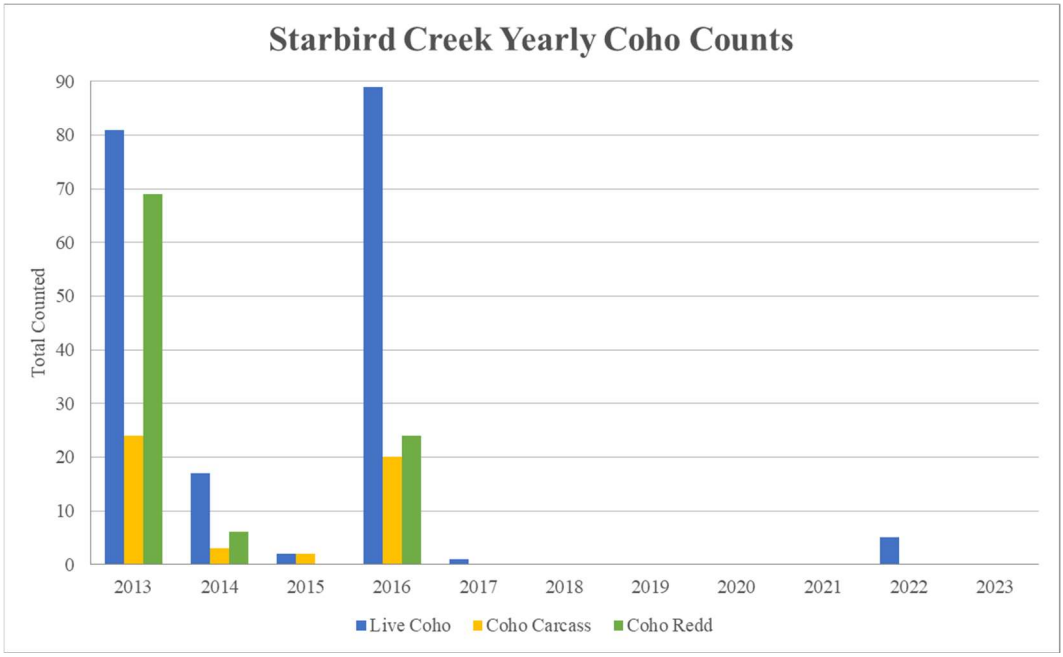

Figure 50: No fish were seen this season. Last year, 5 live coho were seen which marked the first time since 2017 that any fish were spotted. In 2016, 89 live coho were documented. The second most ever documented as in 2013 when 81 live coho were observed.

Gribble Creek

Gribble Creek is a tributary of West Fork Nookachamps Creek, a portion of the lower Skagit Watershed, and has been surveyed by SFEG volunteers since 2006 (Figure 51). This creek supports varying coho runs and has seen a nice upward trend in its coho population in the last several years. There have been several fish passage barriers replaced on Gribble Creek, most recently in 2013 with Natural Resource Conservation Service (NRCS) funding. The survey reach is 0.3 miles. Last season, Gribble Creek experienced the highest number of coho salmon recorded on the creek, with 285 live spawning coho observed.

During the 2023-2024 season, spawner survey volunteers Christine Farrow and Karin Gribble, one of the landowners along the creek, completed 12 surveys from October 12, 2023, to January 29, 2024. With the high rainfall and increased river levels seen throughout both watersheds, surveyors observed their first fish on December 8, 2023. In 2022, the first coho sightings were recorded on November 9th, almost a month before the current season (Figure 52). Spawner survey volunteers also noticed that the creek was choked with leaves for a few weeks, combined with low water could have made for less-than-ideal spawning conditions. Fish were only observed on three of the surveys this year, compared to 10 last year. It's hard to determine when the peak of the season could be for Gribble Creek, as the first fish were observed on December 8th which was also the most fish seen in a single survey. This coincides with the highest water seen in the creek. A total of 62 live coho and 16 coho carcasses were observed this season (Figure 53).

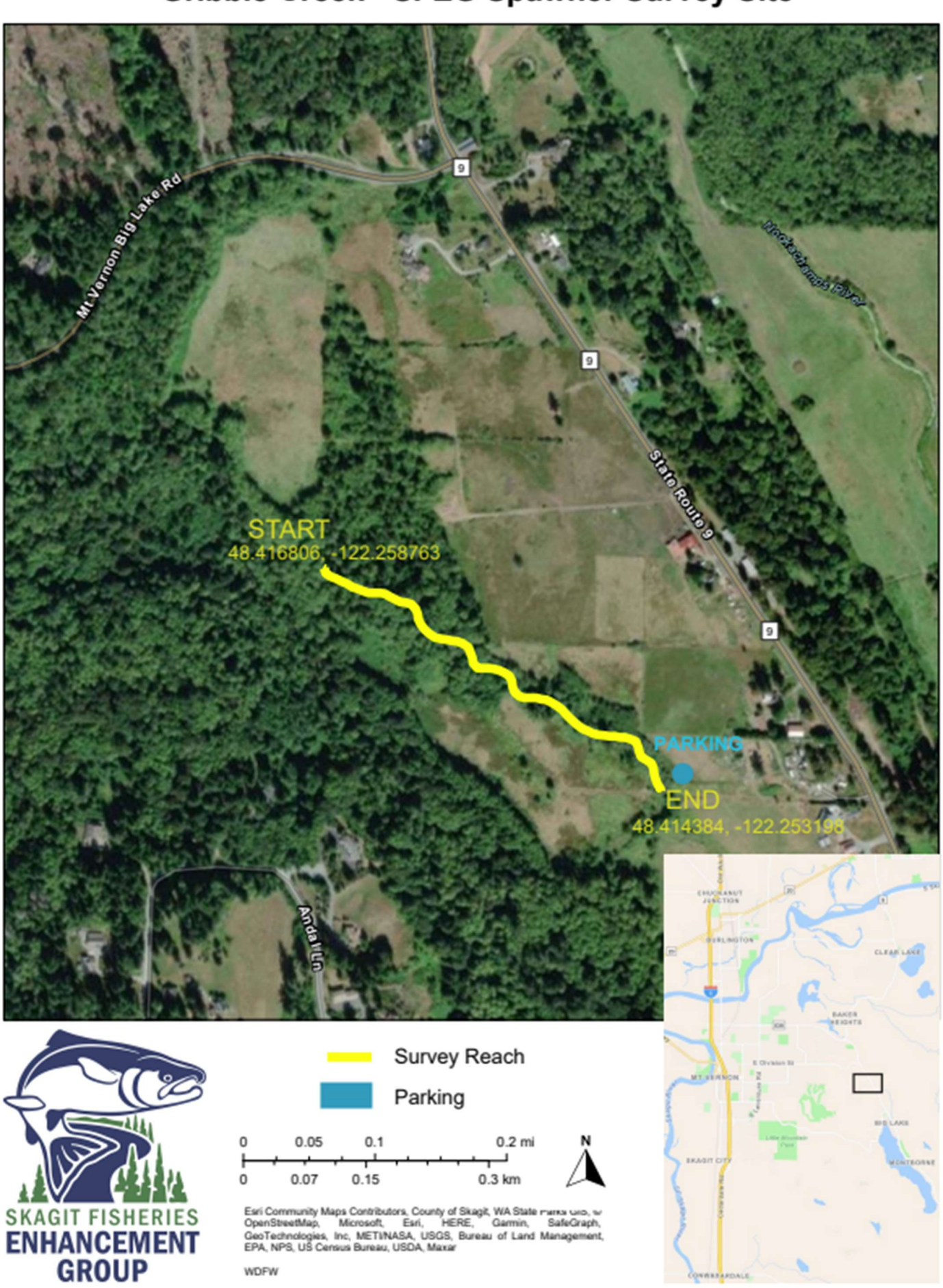

Figure 51: Map of the Gribble Creek reach and a parking area in the Skagit Watershed near Mount Vernon, Washington.

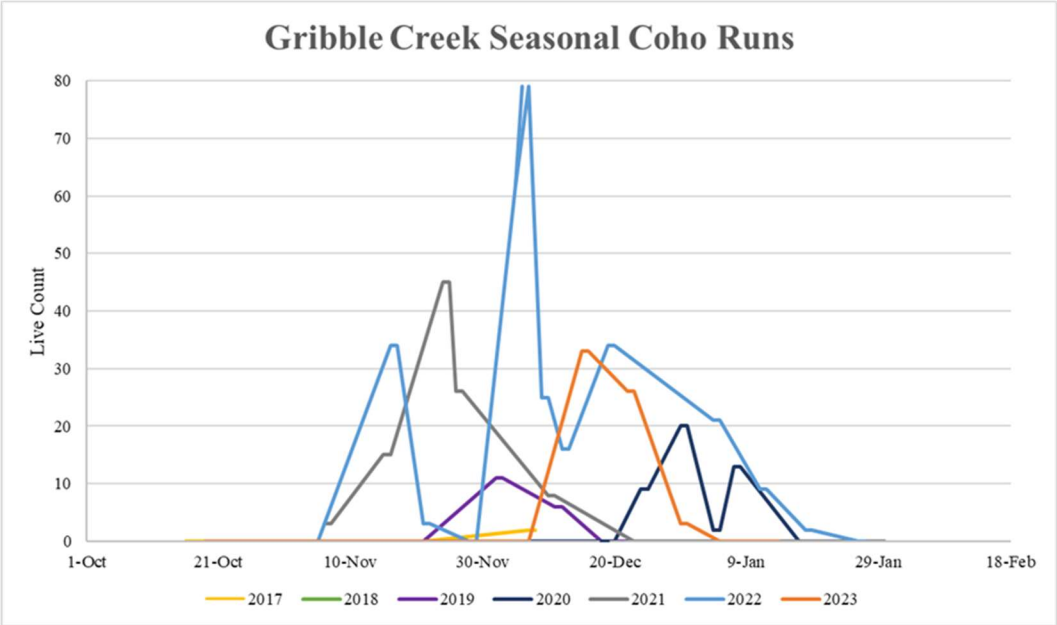

Figure 52: This year's peak count occurred on December 8th, 2023, after a large rainfall event; 33 live coho seen. The 2nd highest peak happened a week later on December 15th, 2023, with 26 live coho observed. Last year's peak saw 79 live coho on November 29th, 2022.

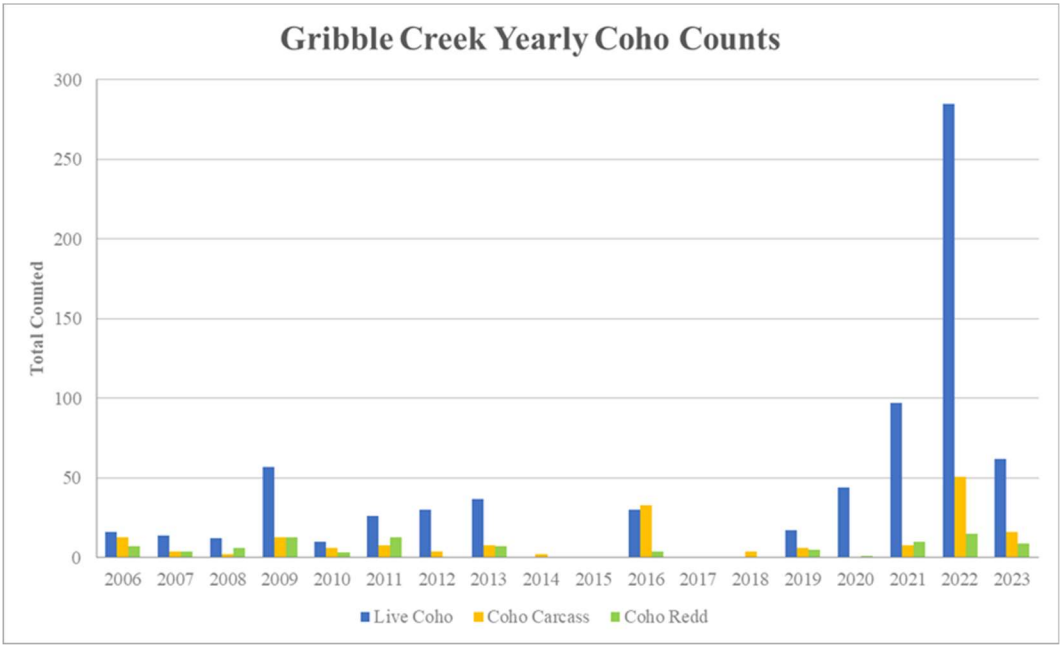

Figure 53: A total of 62 live coho, 16 carcasses and 9 redds were seen this season. This is a significant drop from last year when 285 live coho were seen which is the most every observed on this Gribble Creek.

Kennedy Creek

Kennedy Creek is a tributary of East Fork Nookachamps Creek, flowing in about a half mile before the East Fork Nookachamps-Turner Creek confluence (Figure 54). Kennedy Creek is the site of a 1999 SFEG restoration project in which 12 log weirs were installed to provide access to upstream habitat. Since this restoration project, the stream has down cut and the weirs now (25 years later) represent a barrier for juveniles. Upstream of the weirs is an undersized culvert with 67% passability by adult salmonids, however in 2021 the landowner said she has seen coho and pink try to burst swim through it. Juveniles have been observed in the pools between weirs. SFEG is currently working with an engineer and has design plans to remove the culvert and replace it with a box culvert that is 100% passable by adult spawning salmon. Native plants will also be installed in the area impacted by construction. This project will enhance salmon spawning and rearing habitat. Currently, the survey reach is 0.18 miles down to the confluence with the East Fork Nookachamps Creek. This was the second season that Kennedy Creek was monitored; the continued collection of pre-construction data is important in assessing the effects of the restoration project pre- and post-construction regarding trends on salmon abundance and populations. WDFW's SalmonScape only lists documented spawning coho as a salmonid species in Kennedy Creek. In the fall of 2023, SFEG staff observed both Pacific lamprey and *Lampetra* species of lamprey in the creek as well.

During the 2023-2024 season, Kennedy Creek was surveyed by volunteers Catherine Houck and Doug Davidson, with the help of Yuki Reiss and Connor Garrod on a few occasions. They completed 12 surveys from October 19, 2023, to January 23, 2024. The sighting of the first two live coho were seen at relatively the same time as the first fish in the previous season (Figure 55). These fish were not seen until December 8, 2023; however, 3 carcasses were observed three weeks prior, on November 3, 2023 (Figure 56). Many of this season' carcasses were found at the confluence of Kennedy Creek and a pond that is within the survey reach. Since this is only the second year of data, any details regarding population trends cannot be expanded on with confidence. This season, however, more live coho, carcasses, and redds were observed than last season, which makes for a hopeful outlook for the future.

Adjacent to the confluence of Kennedy Creek and East Fork Nookachamps is a large pasture field that is flooded when there is a larger volume of rainfall. Surveyors saw three mangled carcasses that were on the edge of the field on their third survey but noted that they were most likely dragged there by predators. For most of the season, surveyors found that there were high water levels within the pasture field for fish to swim into and then on to Kennedy Creek. This could potentially lead to stranding if water levels fluctuate throughout the coho season.

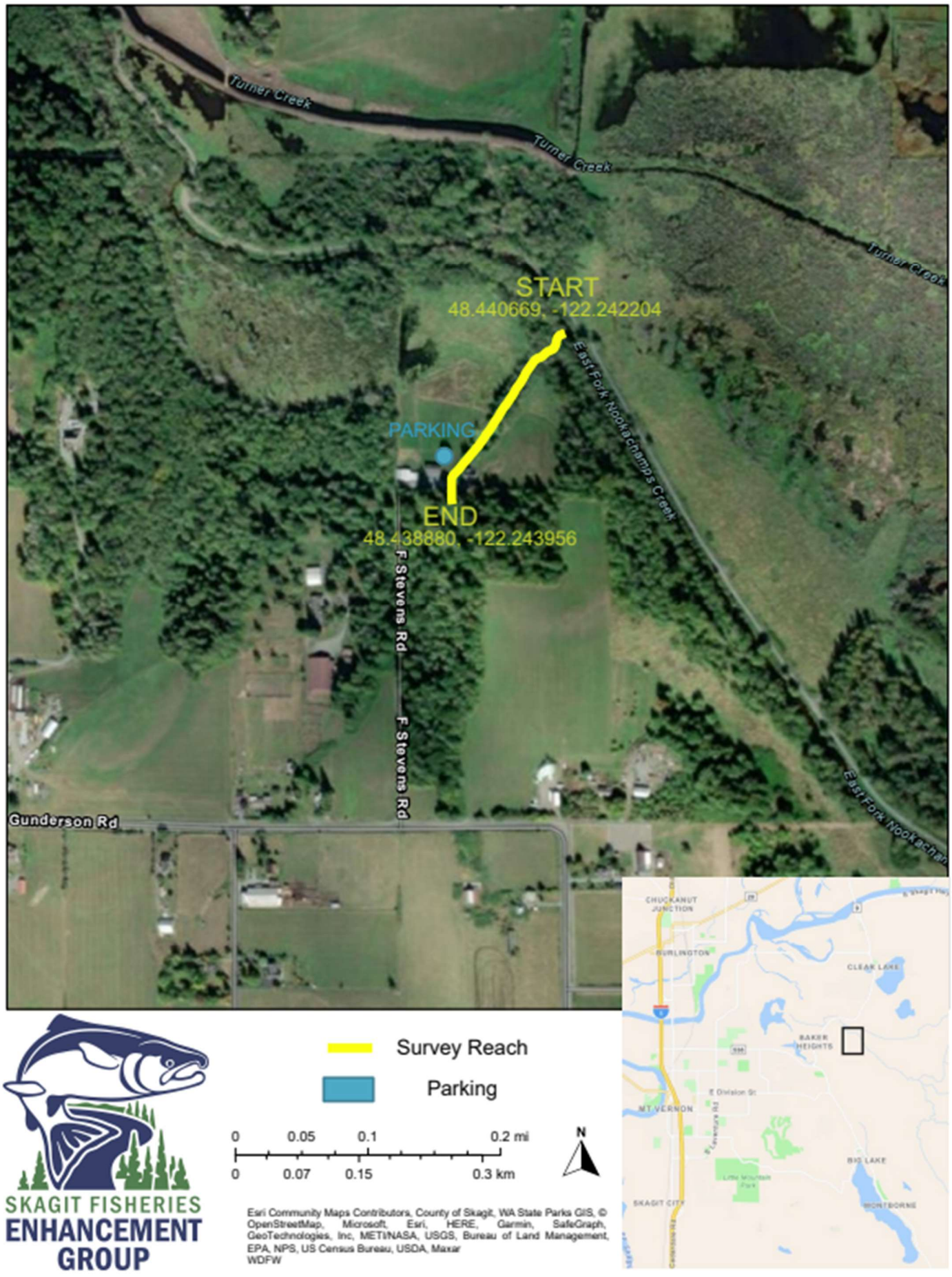

Figure 54: A map of the Kennedy Creek reach and parking area in the Skagit Watershed near Mount Vernon, Washington.

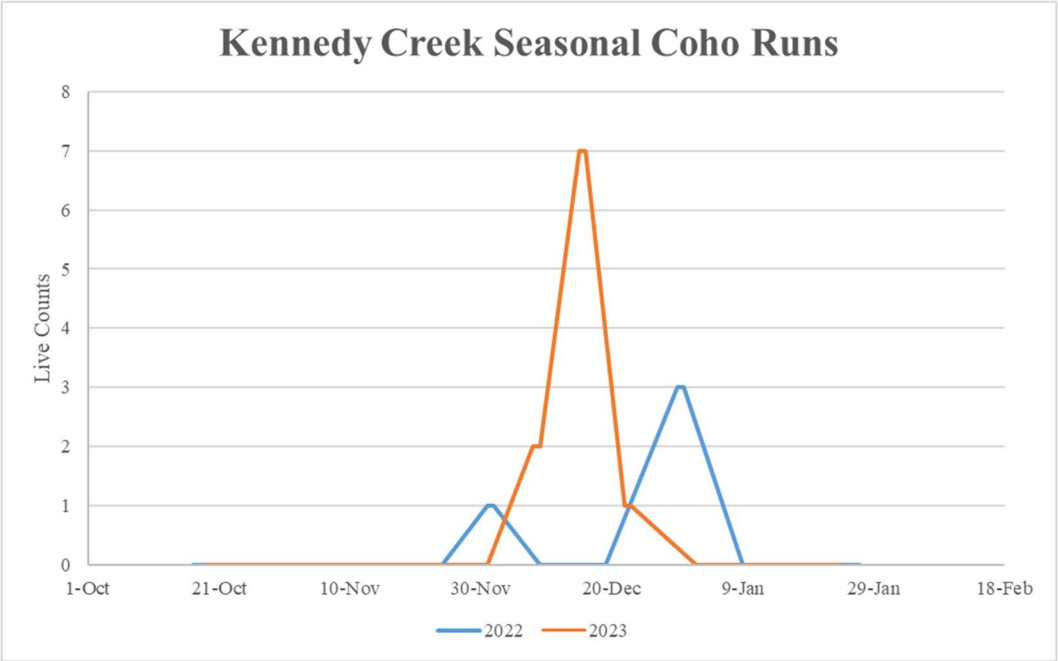

Figure 55: This year's peak live count occurred on December 15th, 2023, with seven live coho. Last year, the most seen on a single survey was 3 live coho on December 30th, 2022.

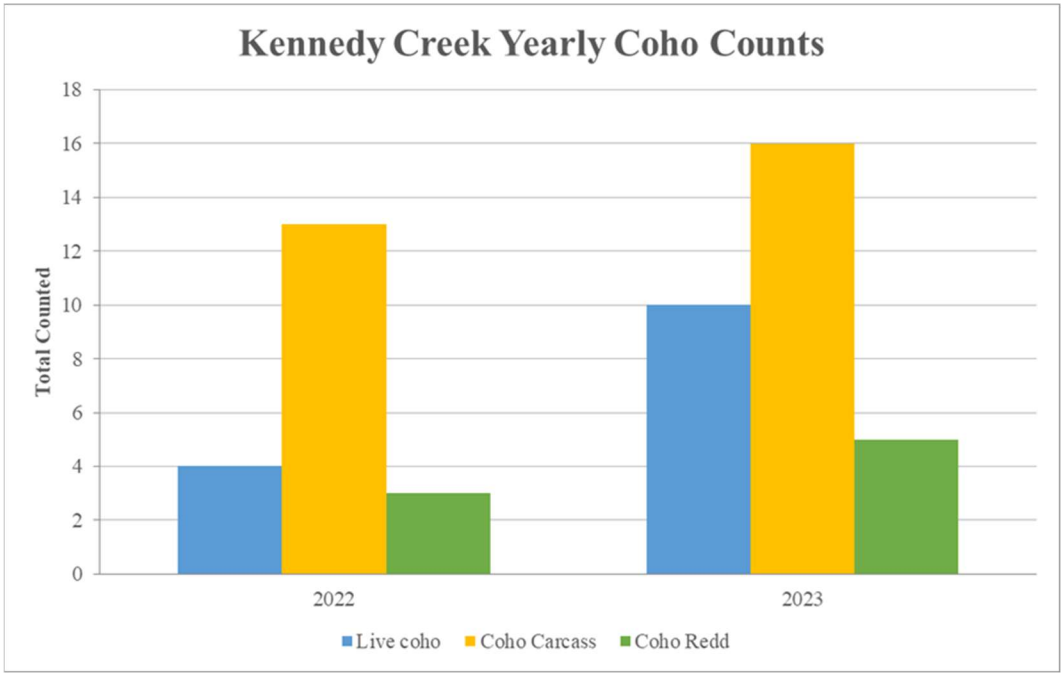

Figure 56: A total of 10 live coho, 16 carcasses and 5 redds were seen this season. Last year, 4 live coho were spotted along with 13 carcasses and 3 redds.

Cumberland Creek

Cumberland Creek drains from Coal and Iron Mountain, and is a tributary of the Skagit River, entering just south of Hamilton. Cumberland Creek flows through the Cumberland Conservation Area, a 211-acre property owned by the Skagit Land Trust (Figure 57). The conservation area is composed mostly of deciduous floodplain forest surrounded on three sides by the Skagit River. The predominant tree species are alder, cottonwood, and big leaf maple, and the area provides habitat for many species of mammals, birds, and amphibians. The creek flows through five acres of healthy riparian forest, paralleling the South Skagit Highway. In 2014, Cumberland Creek was rerouted and restored to its original channel opening over 4,000-feet of spawning habitat to a number of salmonids. This project was completed by a joint effort by the Skagit Land Trust, the Army Corps of Engineers, Skagit River System Cooperative (SRSC), Skagit County, and Seattle City Light. SFEG began monitoring this creek in 2014 after the bridge construction and channel restoration were completed. Since completion, there have been hundreds of pinks observed in the channel, as well as many chum, coho, Chinook, steelhead, and residential cutthroat trout. Currently, the survey site is broken up into three smaller reaches to accommodate large woody debris that is stacked within the stream and makes it difficult for volunteers to navigate. The three reaches total about 0.2 miles

During the 2023-2024 season, Cumberland Creek was monitored by spawner survey volunteers Mike Oras and Maddie Player, and occasionally Hal Lee, Connor Garrod, and Renee Woods. They surveyed 10 times from October 19, 2023, to January 16, 2024. Cumberland Creek is one of the only streams that SFEG monitors that regularly sees salmon other than coho. This season, both coho and pinks were observed since pink salmon are "odd year" spawners in the Skagit watershed. Contrary to most other creeks, coho were observed on the first survey day. Compared to last season, the total number of coho stayed relatively the same. Since total numbers of coho have been increasing relatively for two consecutive seasons, it is a hopeful testament to the work that has been done in this area in the last decade. Live pinks were only seen on the first two surveys of the season, but this isn't surprising as pinks normally spawning in late summer to early fall, so surveyors caught the tail end of their run. On the first survey of the season, volunteers counted 199 live pinks and 25 carcasses, along with 3 live coho (Figures 58, 59, 60, and 61). Last season was the first time coho had been observed since 2017 (Figure 59). Cumberland Creek is the only creek surveyed by SFEG that saw pinks this year, which is most-likely due to its proximity to the main channel of the Skagit River. Chinook have not been observed in this creek since 2016 and chum have been observed sporadically over the years Cumberland Creek has been monitored, with the last sightings in 2021 (Figure 62 and 63).

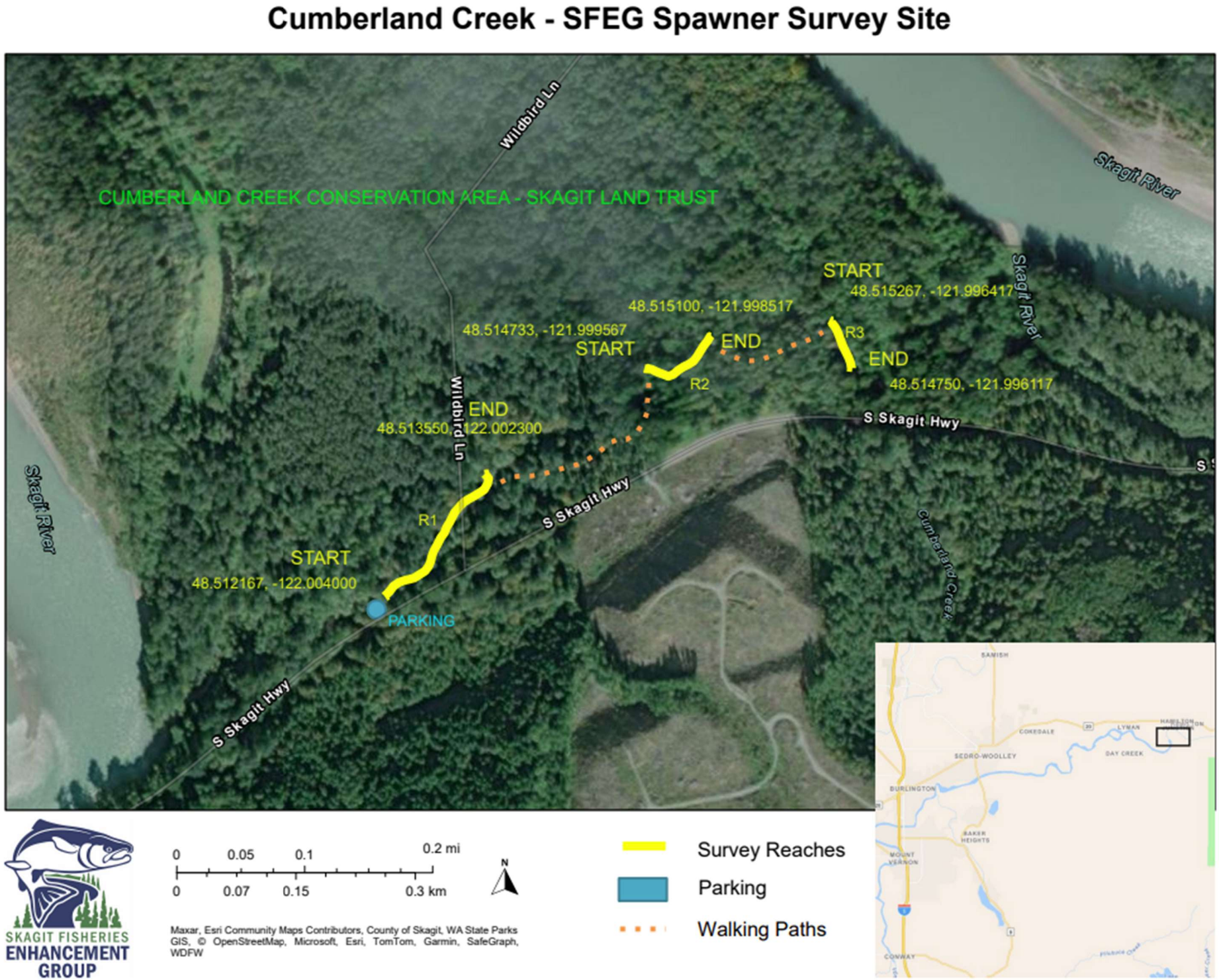

Figure 57: Map of the three Cumberland Creek reaches and parking area in the Skagit Watershed near Sedro-Woolley, Washington.

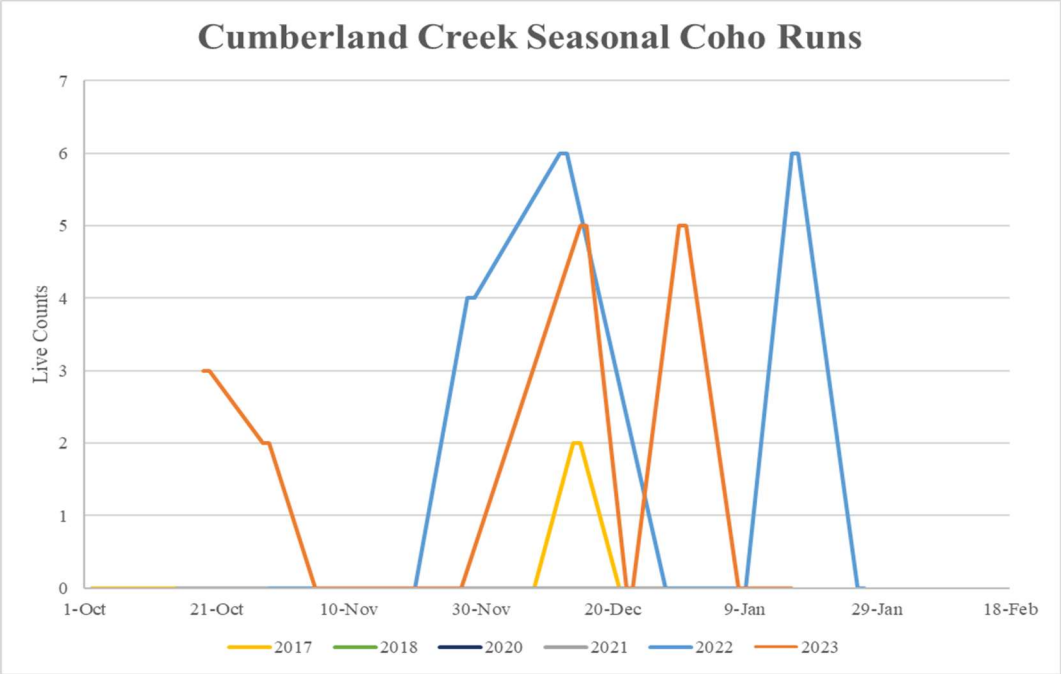

Figure 58: This season had multiple peaks of 5 live coho occurring on both December 15th and December 30th, 2023. These multiple peaks could be the result of greatly fluctuating water levels in this creek. This could affect when coho are able to swim upstream to better spawning grounds, possibly explaining why there was significant gaps where no fish were seen, but it is unclear at this time.

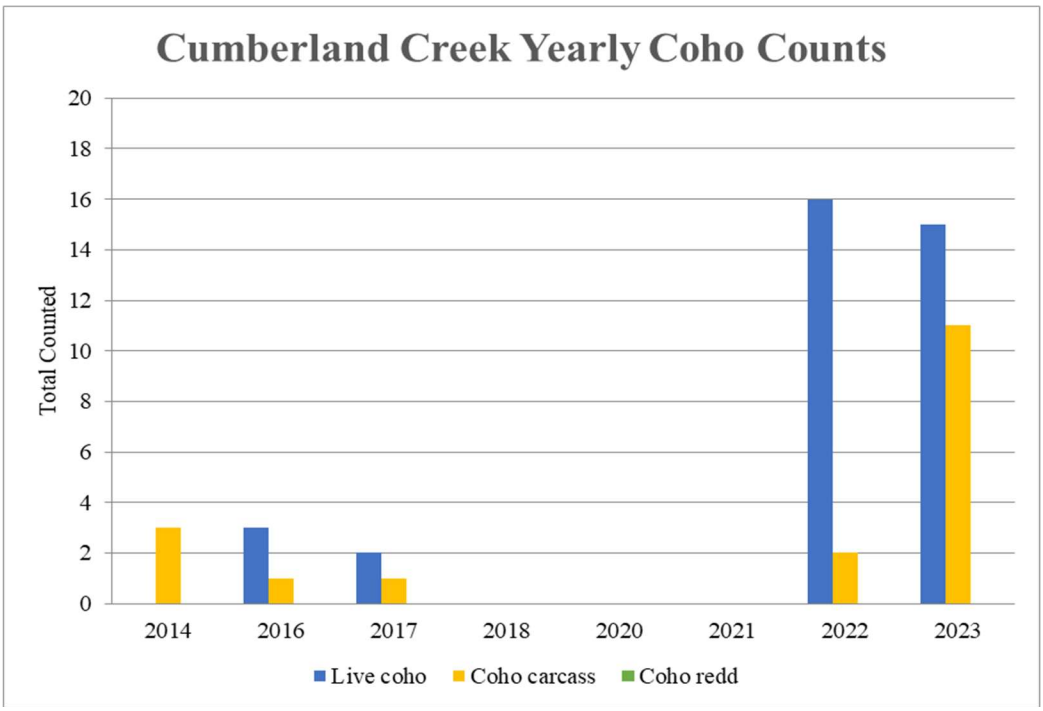

Figure 59: A total of 15 live coho were seen this season, along with 11 carcasses. This is the second most live coho observed in a season. Last year, 16 live coho were seen in the creek. No coho were spotted in the creek between 2018-2021. 2019 was omitted as surveys were not conducted that year.

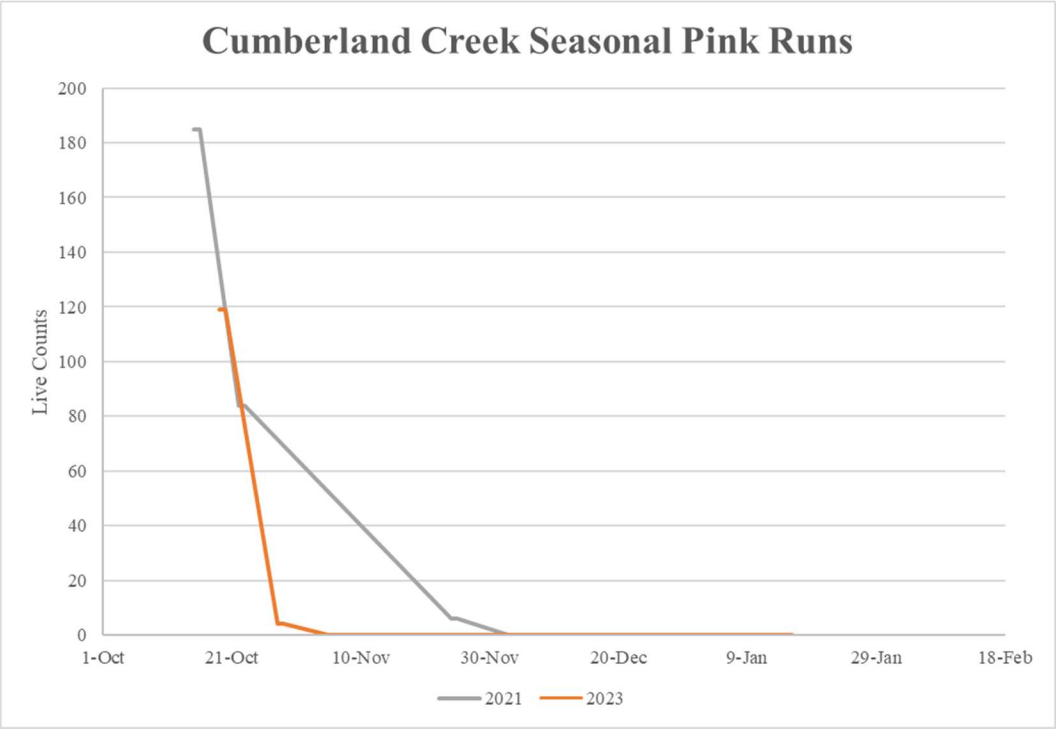

Figure 60: This season's peak was 119 live pinks seen on Oct 19th, 2023. Spawner surveys were conducted at the tail end of their run, which is why they were not seen past October.

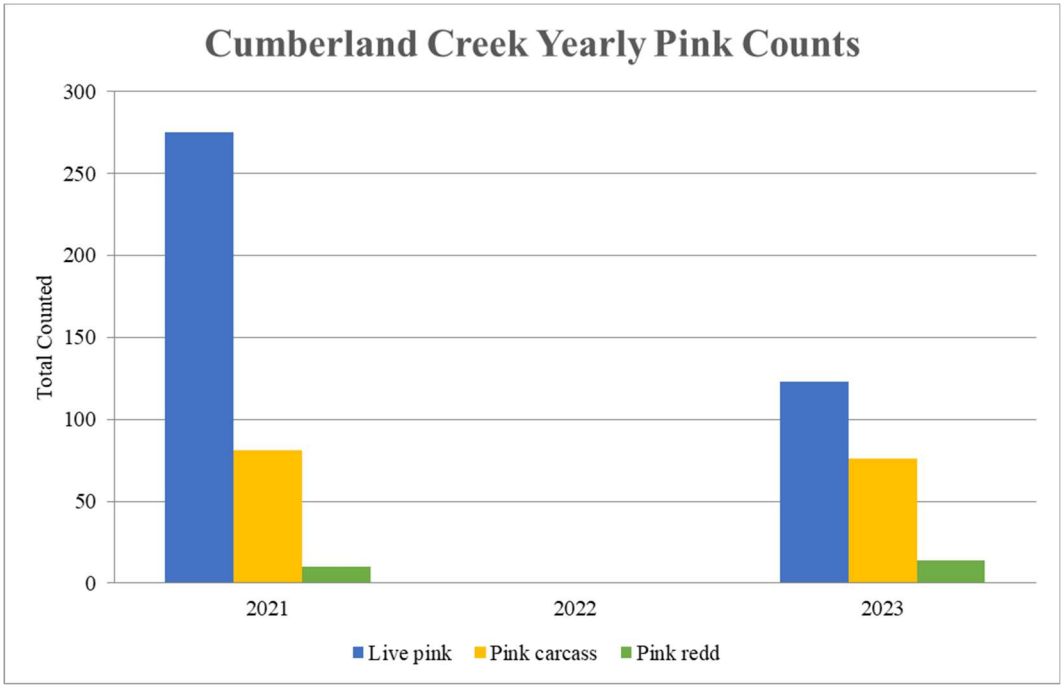

Figure 61: A total of 123 pinks were seen this season, less than the 275 seen in 2021. Pink's only return in odd years, which is why zero were seen last year.

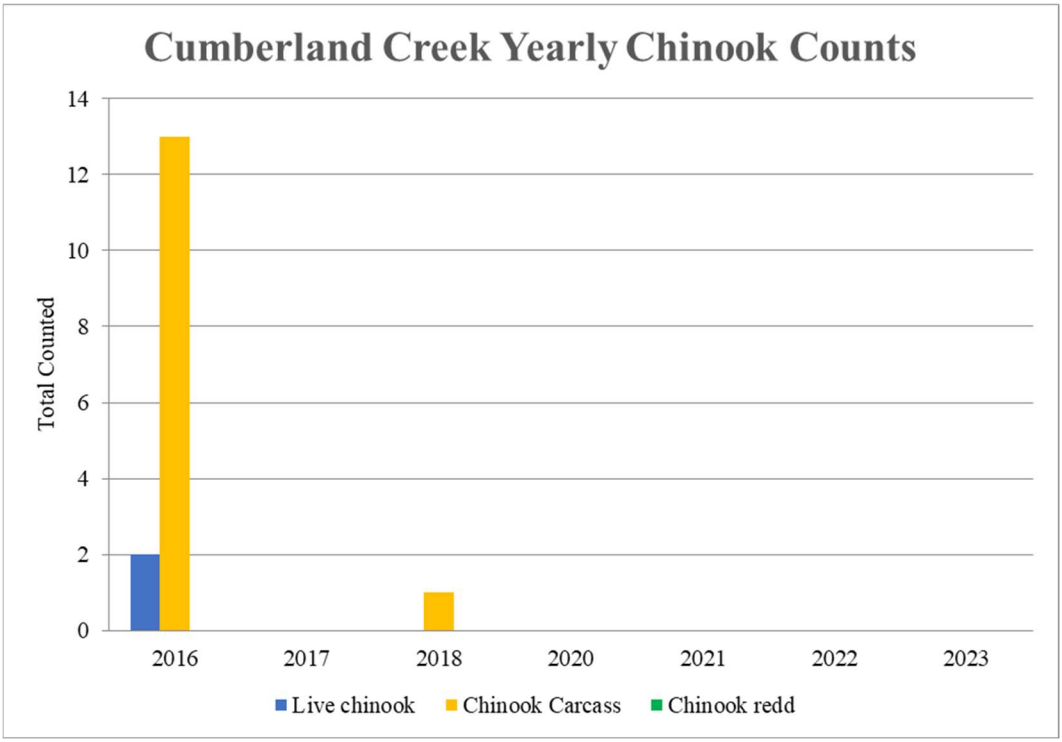

Figure 62: No Chinook were seen this season, but one was seen in 2016 along with 13 carcasses. 2019 was omitted as surveys were not conducted that year.

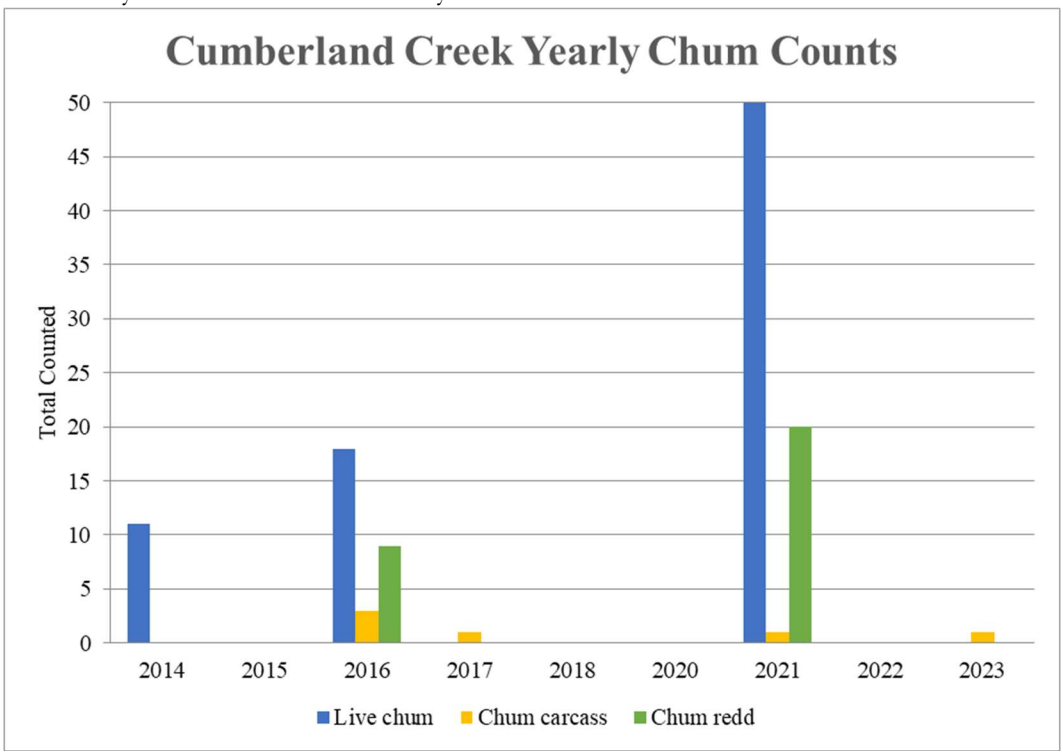

Figure 63: One chum carcass was seen this season, while 50 live chum were seen in 2021, which was the first live chum sighting since 2016 when 18 live chum were documented. 2019 was omitted as surveys were not conducted that year.

Little Cascade (Lyric Creek)

Little Cascade Creek, also known as Lyric Creek, is a tributary of the Cascade River that, downstream, joins very quickly with the Skagit River (Figure 64). Little Cascade Creek is the uppermost survey reach within the Skagit River Watershed and is located on Skagit Land Trust property. This creek is fed by Lookout Mountain east of Marblemount. Little Cascade Creek has documented all three (spring, summer, and fall) runs of Chinook, chum, and coho salmon, and according to SalmonScape (WDFW), this creek is gradient accessible to pink salmon and steelhead trout but they have not been physically documented. In 2015, SFEG worked with volunteers to remove a fish passage barrier culvert; the previously used crossing was abandoned as access was no longer necessary for Skagit Land Trust. During this project, native trees and shrubs were installed to aid in restoring natural riparian processes such as leaf litter and LWD recruitment, shade, and bank stabilization. The survey reach is 0.25 miles long.

During the 2023-2024 season, Little Cascade was surveyed primarily by Hal Lee and various other volunteers such as Doug Davidson, Regina Wandler, Connor Garrod, Jessica Lang, Kurt Buchanan, Phil McLoud, and Clare Spain. From October 14, 2023, to February 4, 2024, they completed 16 surveys. This creek saw fish on the greatest number of surveys and fish were observed the latest into the season in comparison to any other creek surveyed by SFEG. This year, coho were observed almost three weeks earlier than the previous season, with the first 4 live fish observed on December 8, 2023 (Figure 65). Up until that survey, volunteers had noted that the creek had been dry or incredibly low below the two of three lower beaver dams. The December 8 survey took place after the largest rain event of the season in the Skagit River and Hal Lee noted that it was the most water he had ever seen in the channel. Still, live fish were only observed below the lowest beaver dam. It is hard to say what the peak of the season is with similar amounts of fish occurring various times throughout the season. Only two carcasses were seen this season and neither had enough identifying features left to take complete data on them (Figure 66). Since 2021 the coho run on Little Cascade has continued to decrease. Last season, volunteers saw 54 live coho, which is almost four times as many seen this year. In 2021, volunteers saw the most amount of coho SFEG has recorded on the stream with 393 live coho.

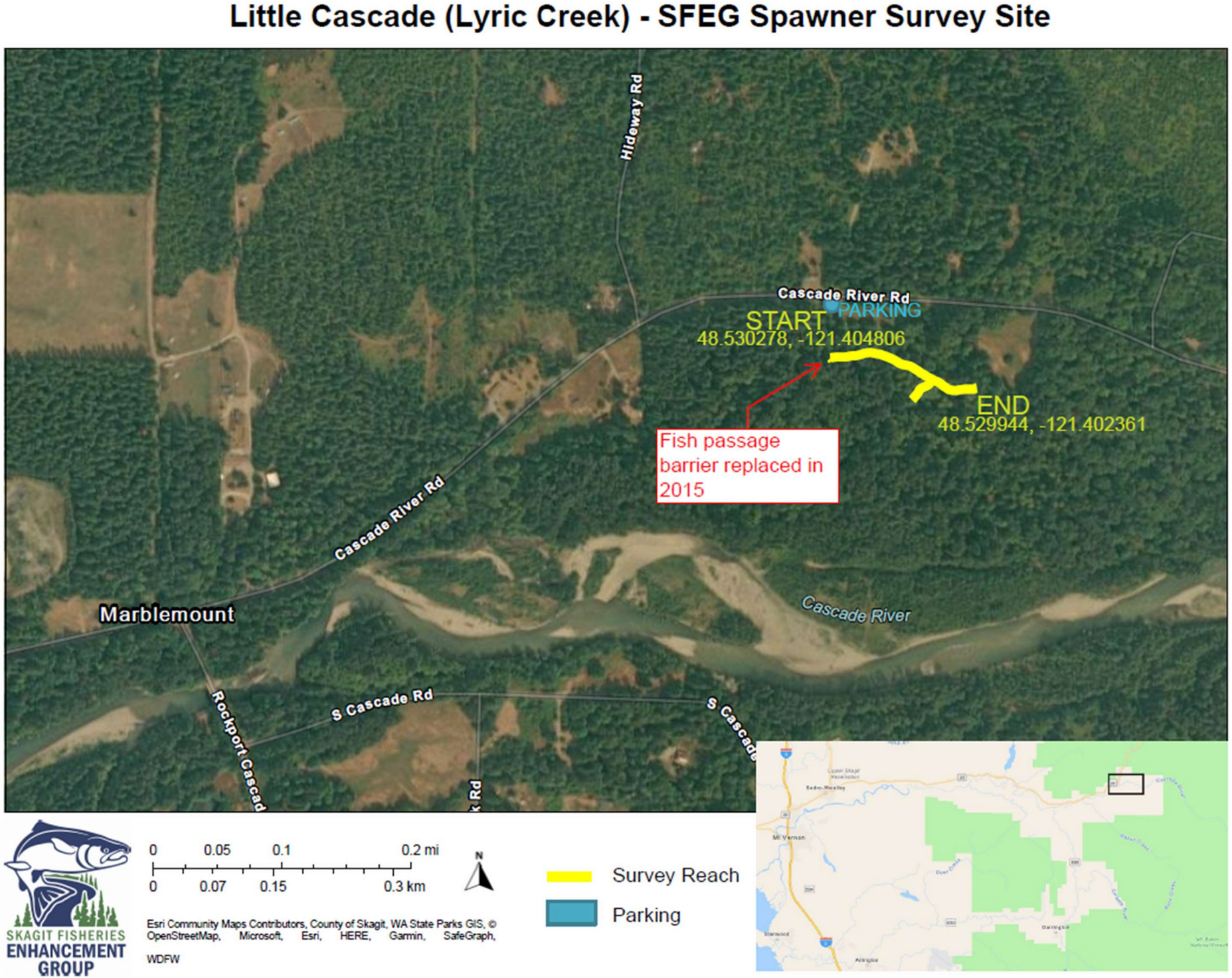

Figure 64: A map of the Little Cascade (Lyric) Creek reach and parking area in the Skagit Watershed near Marblemount, Washington.

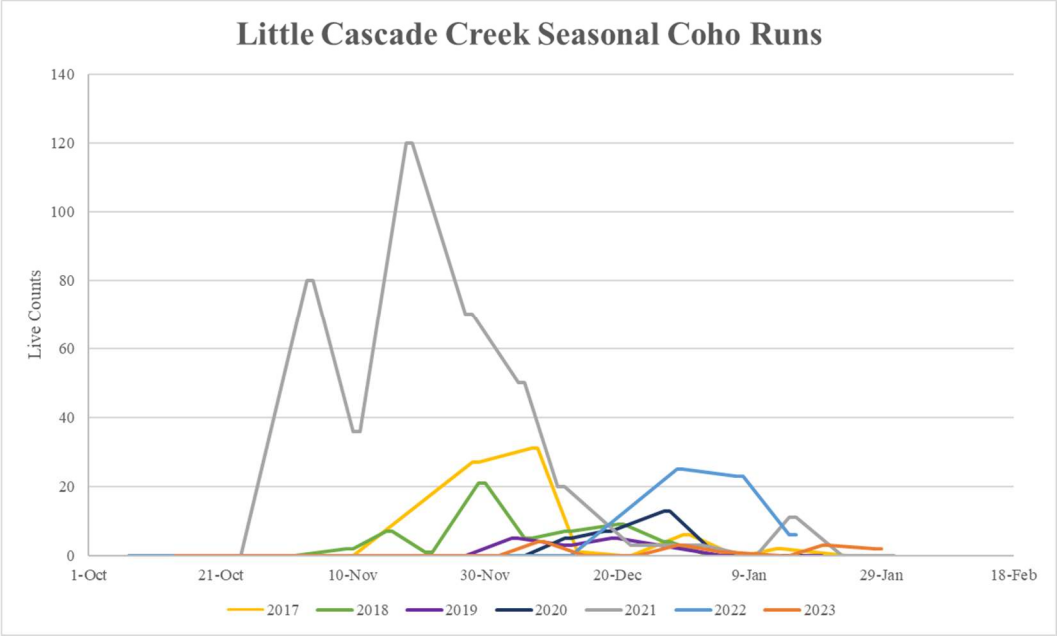

Figure 65: This year's peak live count occurred on December 8th, 2023, with 4 live coho. Last year, the peak was 25 live coho and in 2021 there were 120 live coho seen on a single survey.

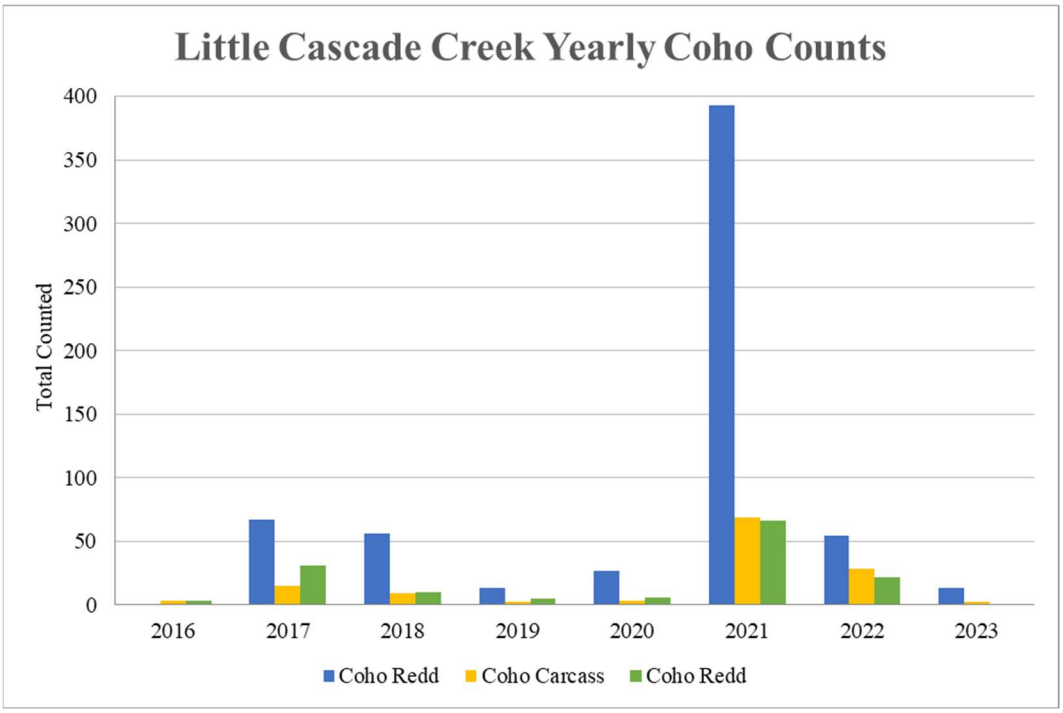

Figure 66: A total of 13 live coho were seen this season. This is the lowest count of fish on this stream since 2019 when 13 live coho were also seen. Last year, 54 live coho were seen and in 2021, 393 live coho were documented.

Pressentin Side Channel

The Pressentin Side Channel is a result of a very large-scale restoration project completed by SFEG in 2021. A 0.5-mile Skagit River side channel was constructed adjacent to Marblemount Channel in Pressentin Park and the entirety of this new channel is surveyed (Figure 67). Pressentin Park is part of the Skagit County Parks system and is largely undeveloped, containing open space and hiking trails for residents. Side channel and floodplain habitat is severely lacking in the upper Skagit River and acts as a very important refuge to rearing juvenile salmonids. Pre-project surveys of Marblemount Channel (located south of the newly constructed channel) found high usage of this habitat by multiple species of adult and juvenile salmonids, including Chinook, chum, coho and steelhead. Following the construction phase SFEG staff and volunteers completed 10 acres of native plantings in areas disturbed by construction and previously occupied by invasive species. Just a few short months after construction was finished a few hundred pinks were counted in the side channel! However, in November 2021, the Skagit River experienced historic rainfall and flooding, during which much of the newly planted natives within the 10-acre planting site were washed away and large sediment deposition occurred. At one point during the floods, the entire constructed channel and planting area was submerged in several feet of water. This severely changed the sediment distribution in the recently established channel and is restricting water from flowing into the channel. The side channel habitat was replanted in the fall and winter of 2022 by Washington Conservation Corps, SFEG staff and Concrete Elementary 3rd Graders; however, it remains to be seen how the shift in sediment will affect the ability of salmon to use the channel.

During the 2023-2024 season, couple Karen Schwenk and Don Daschuk surveyed Pressentin Side Channel. They completed 9 surveys between October 14, 2023 and December 28, 2023. Like the previous season, the side channel did not have consistent water running through the channel. The only day that volunteers noted there was continuous flow throughout the channel was November 28, 2023. This was the first year that a live coho was seen in the channel, as well as redds and a higher number of carcasses (Figure 68 and 69). In 2021, pink salmon took advantage of the newly made channel with almost 200 live pinks surveyed, unfortunately none were observed this season despite it being an odd "pink" year (Figure 70). In November 2023, there was a larger rain event that caused substantial flow increase throughout the length of the Skagit River and seemed to change some of the sediment that was placed at the ends of the channel in 2021. The next survey season will prove interesting as the effects of this restoration project vary year to year. On December 8, 2023, a mountain whitefish (*Prosopium williamsoni*) was found by the surveyors in a puddle of the channel, a fish species that hasn't been recorded on any spawner surveys before.

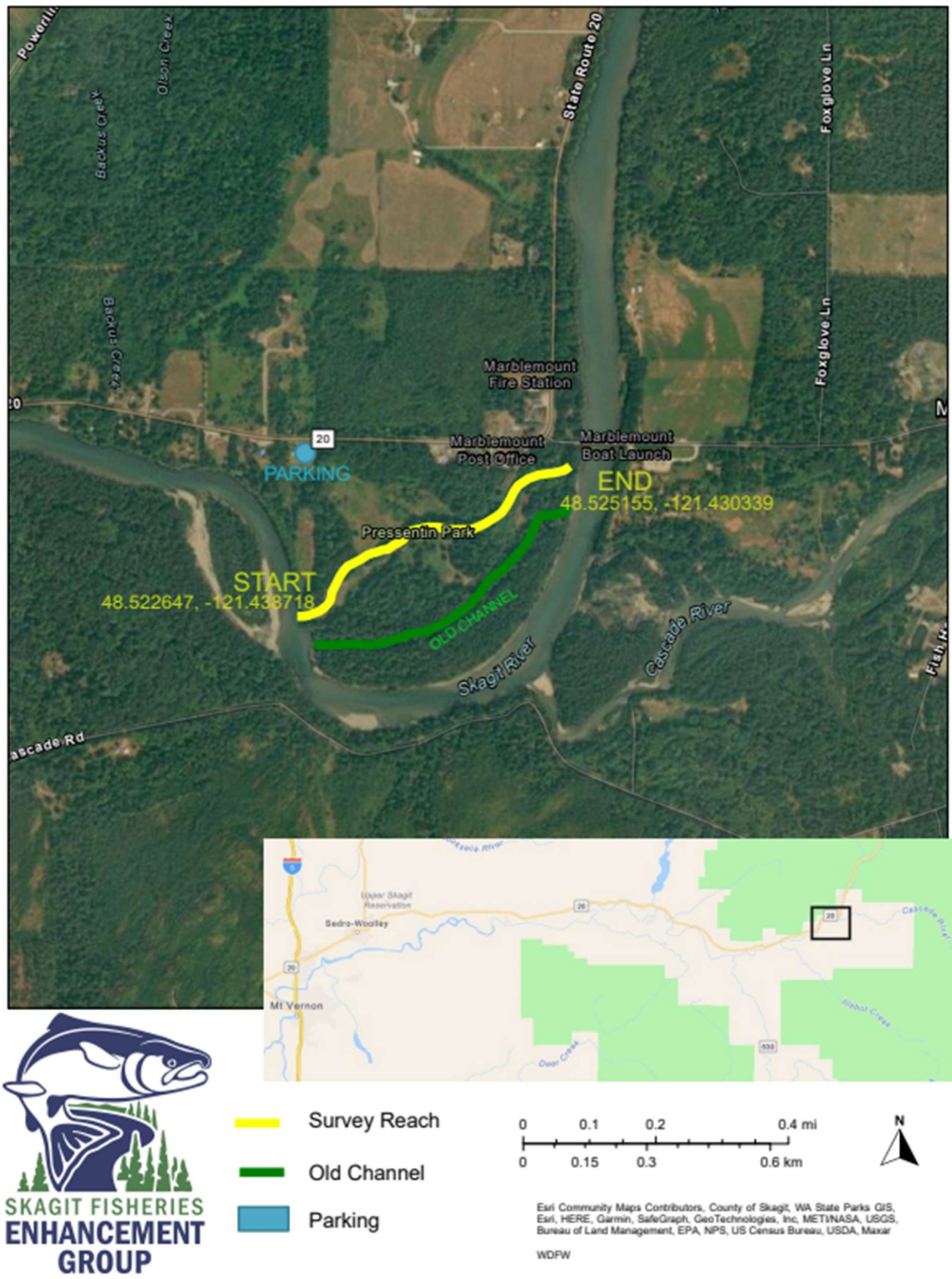

Figure 67: A map of the Pressentin Side Channel and parking area in the Skagit Watershed near Marblemount, Washington.

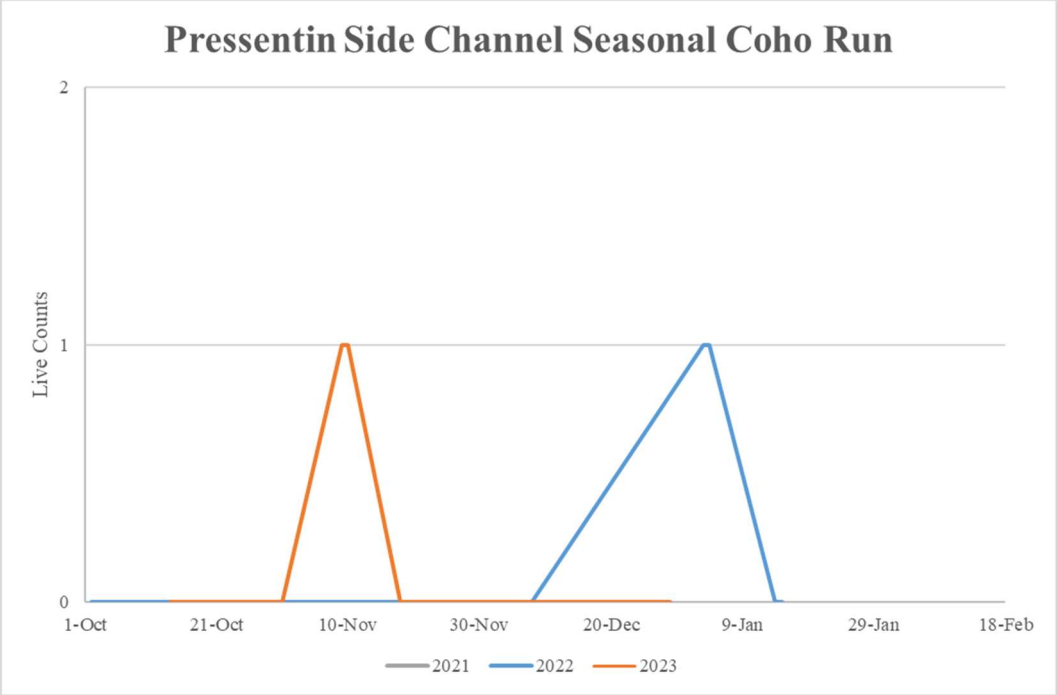

Figure 68: A single coho was seen this entire season on November 9th, 2023. Last year also saw only one coho but later in the season on January 3rd, 2023.

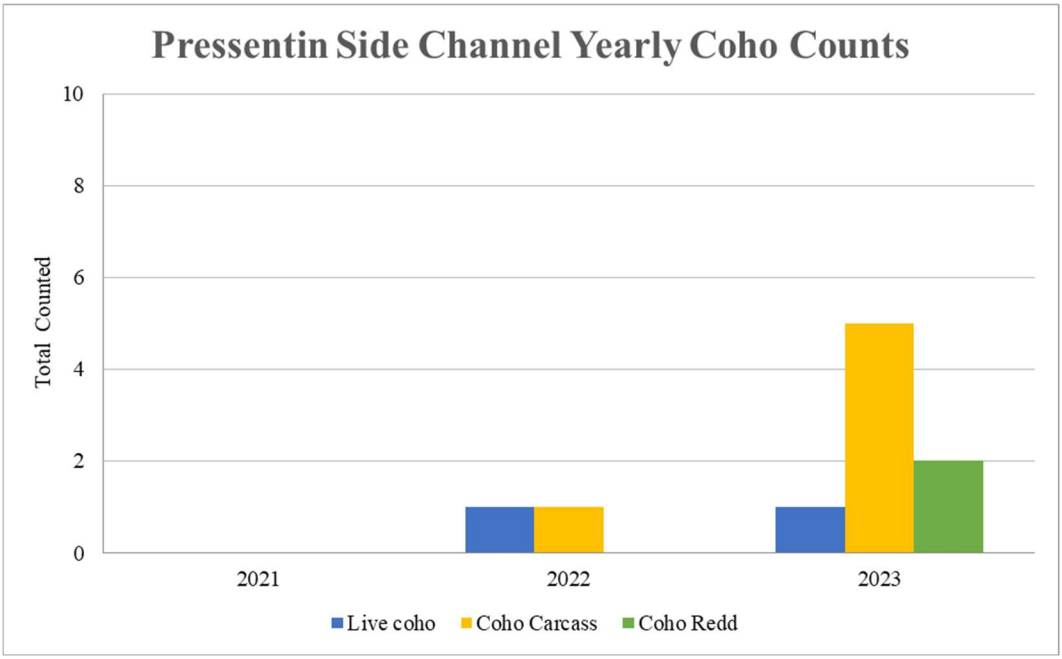

Figure 69: Only 1 live coho was seen in the side channel this season, along with 5 carcasses and 2 redds. This is the first live fish seen in this side channel since 2021.

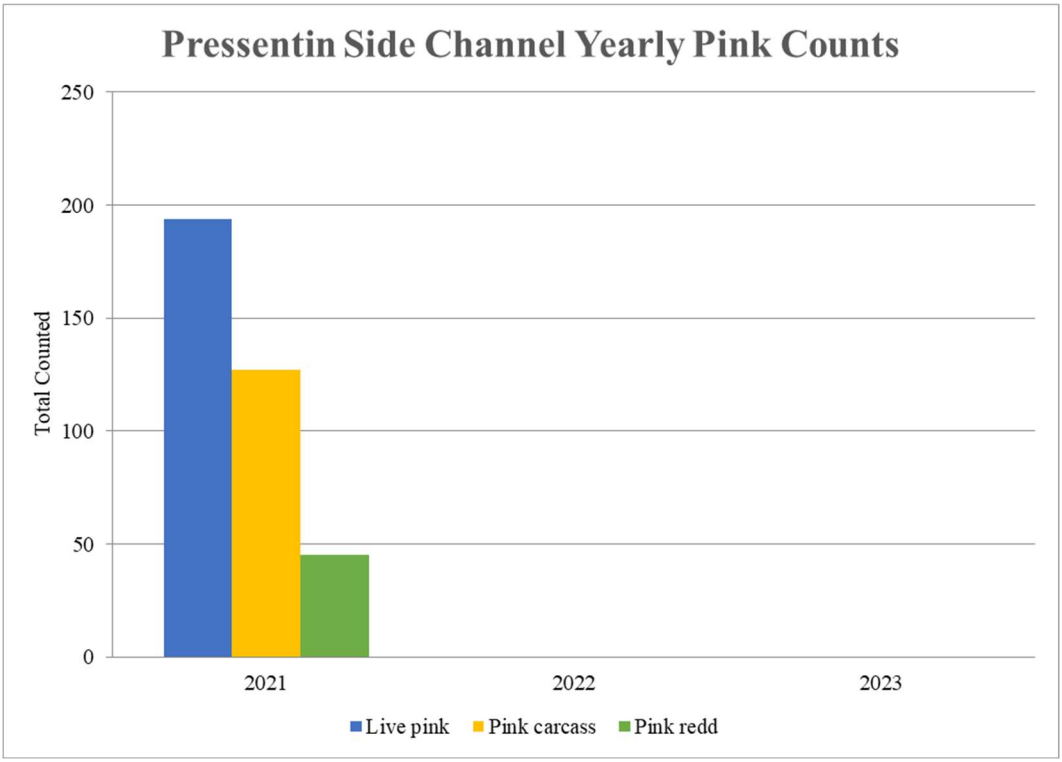

Figure 70: No live pinks were seen in Pressentin Side Channel this season. In 2021, 194 live pinks were seen inhabiting this creek. Pink salmon only return to streams in odd years.

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Appendix A: Spawner Survey Data Sheet

SKAGIT FISHERIES ENHANCEMENT GROUP
Spawning Survey Data Sheets

Stream Name:_____ Crew Members:_____

Crew Leader:_____ Date_____ ☐ I certify that all team members have all required PPE necessary for today's survey including high visibility vests.

TOTAL

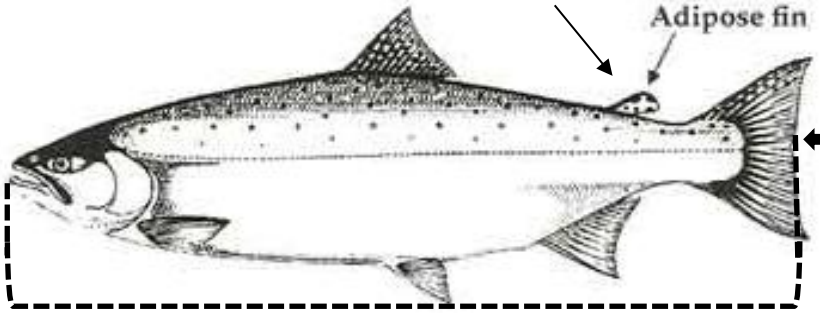
Species	Live	Carcass	Redd
Chinook (CK)			
Chum (CH)			
Coho (CO)			
Pink (PK)			
Sockeye (SO)			
Kokanee (KK)			
Other			

FLOW TYPE:	VISIBILITY:
____ 1 - Dry	____ 1 - Excellent
____ 2 - Low	____ 2 - Very Good
____ 3 - Medium	____ 3 - Good
____ 4 - High	____ 4 - Fair
____ 5 – Flooding	____ 5 - Poor
____ 6 – Medium-low	____ 6 - Not Survey-able
____ 7 – Medium-high	

WATER CONDITIONS:	VIEWING CONDITIONS:
____ 20 - Low-Clear	____ 30 - Dark
____ 21 - Med Color	____ 31 - Dark in pools
____ 22 - Low-Muddy	____ 32 - High Glare
____ 23 - Med Clear	____ 33 - Some Glare
____ 24 - Med - Med Color	____ 34 - Raining
____ 25 - Med - Muddy	____ 35 - Snowing
____ 26 - High - Clear	____ 36 - Frozen
____ 27 - High - Med Color	____ 37 - Partly Frozen
____ 28 - High - Muddy	____ 38 - Water Turbid
	____ 39 - Other:_____

NOTES:

Does this fish have an adipose fin? If Yes = Wild, if No = Hatchery



Measure to the center divot of the caudle fin, not the tip of the fin - this may be damaged.

Fork Length (m)

FLAGGING REDDS CRITERIA:

SFEG, Date, Species

Chinook = CK	Coho = CO
Chum = CH	Pink = PK
Sockeye = SO	Kokanee = KK

CARCASS DATA

(Examine carcasses of first 30 of each species. W/H = Wild or Hatchery? *PSM = Pre-spawner Mortality)

SPECIES	W/H	SEX (M/F)	FORK LENGTH (m)	PSM* (Y/N)	NOTES

ADDITIONAL CARCASS NOTES:

*PSM – pre-spawner mortality

ADDITIONAL CARCASS DATA

SPECIES	WILD or HATCHERY?	SEX (M/F)	FORK LENGTH (m)	PSM* (Y/N)	NOTES

*PSM – pre-spawner mortality

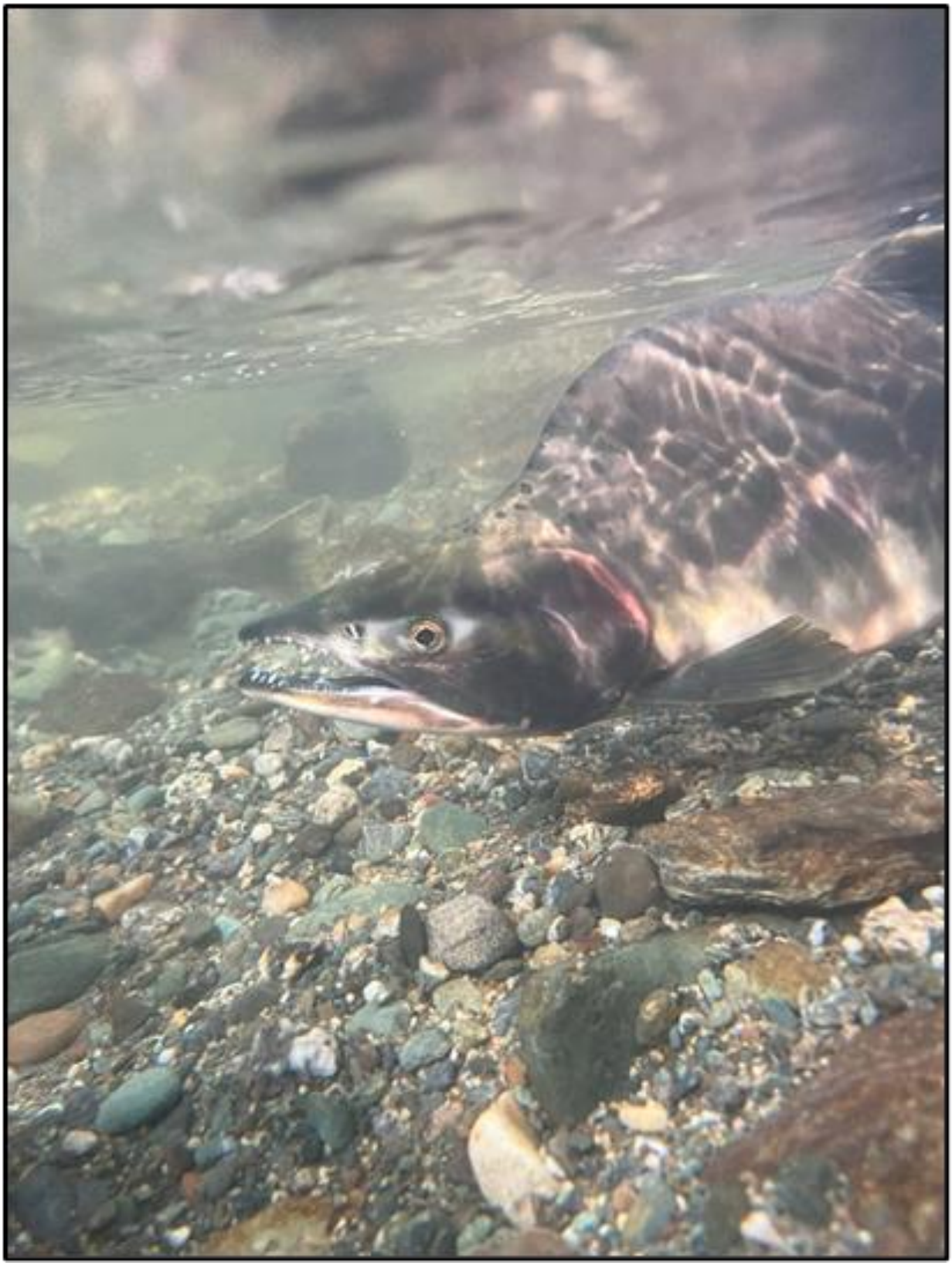


Photo credit: Holly Henderson