2022 Preliminary Yukon River Salmon Fisheries Review

Presented by the U.S. Fish and Wildlife Service Yukon Team
For the Fall Regional Advisory Council Meetings

This summary is considered preliminary as estimates of abundance may change post season. Fall season data is still being compiled at time of submission, and therefore should be considered incomplete. This report is compiled by U.S. Fish and Wildlife Service (Service) in cooperation with the Alaska Department of Fish and Game (ADF&G).

Going into the season, the Yukon Chinook and Chum salmon had very poor projected run sizes. There was little to no expected harvestable surplus available for subsistence salmon fishing, and therefore salmon fishing closures were needed throughout the season. We tried to give plenty of notice to fishermen on what to expect. The outlook and management strategy were discussed in depth during the spring of 2022 at the following meetings: Yukon River Panel, the Yukon River Intertribal Fish Commission preseason meeting, and the Yukon River Drainage Fishermen's Association (YRDFA) Board meeting, and preseason fishermen's meeting.

The colored Outlook flier with the pre-season management strategy was mailed to all Yukon River households in April. Below we outline how each run compared to their respective preseason forecast and historical run sizes.

Summer Season

The 2022 Chinook Salmon drainage wide outlook was for a run size of 99,000 to 150,000 fish, with the Canadian component forecast to be approximately 41,000 to 62,000 fish. The Chinook Salmon drainage wide run was much lower than the preseason outlook and the worst on record with approximately 45,000 Chinook Salmon passing Pilot Station sonar (Figure 1). Of those passing the sonar, approximately 20,000 were Canadian-Origin and were expected at the Eagle sonar. Only 12,000 Canadian-origin Chinook Salmon passed the Eagle sonar (Figure 2), well below the Interim Management Escapement goal of 42,500 to 55,000. For the fourth season in a row, nearly half as many Canadian-origin Chinook Salmon as expected arrived at the Eagle sonar. While we do not know what is causing this discrepancy, there are indications Chinook Salmon may be dying during their migration in the upper river (known as en route mortality). See details of our collaborative research in the "*Ichthyophonus*" section below.

The summer Chum Salmon run was projected to be 162,000 to 542,000 fish. The run fell within the forecast, but too poor inseason to provide any surplus for subsistence harvest. As of the transition date to fall season at the Pilot Station sonar, July 18, the run appeared to have fallen short of meeting the drainage wide escapement goal of 500,000 to 1.2 million. As of July 18, 437,000 summer Chum Salmon had passed the sonar (Figure 3). However, there is a bright spot for this species, as the run was more than twice the size of as the record low return in 2021. Further, once genetic mixed stock data are applied to the summer Chum Salmon counts, and estimates of harvest and escapement below the sonar are considered post season, it may be that the summer Chum Salmon run met the lower end of the drainage wide escapement goal. However, the escapement goals for summer Chum Salmon were not met at the Anvik river and counts at other assessment projects were still well below average.

Fall Season

The fall Chum Salmon outlook was between 78,100 to 148,000 fish. Inseason the run came in stronger than was forecast but still well below the lower end of the drainage wide escapement goal of 300,000 fish. The final day of counting at Pilot Station sonar was September 7. Approximately 325,000 Chum Salmon passed the sonar between July 19 and September 7 (Figure 4). Inseason, genetic mixed stock analysis (MSA) was applied to Pilot Station sonar counts to provide a more accurate index of fall Chum Salmon abundance. The inriver abundance estimate of fall Chum Salmon was approximately 237,000 and is short of the 300,000 fish to meet escapement needs or to provide any subsistence harvest. As of September 7, the Fall chum salmon count at Eagle sonar was 3,198, which is below the average of 15,664 for this date. While the Eagle sonar project has counted just under the first quarter of the run, MSA estimates indicate counts at the Eagle sonar will be similar to 2021, and therefore Canadian border objectives for fall Chum Salmon will not be met this season. The passage estimates of fall Chum salmon at Teedriinjik sonar are well below average and it is unlikely the escapement goal will be met. Sheenjek River sonar counts are also well below average. Upper River sonar escapement projects for fall Chum Salmon are ongoing at time of submission of this document and estimates are incomplete.

The Coho Salmon run outlook was for a below average return. The Coho Salmon run came in better than the record low return in 2021, with approximately 92,000 fish counted at the Pilot Station sonar through September 7, which is below the average of 145,000 fish. (Figure 5).

While forecasts for next year are not available, it is heartening to see the Chum and Coho salmon runs both increased over last year, which may indicate runs could be larger next year.

Management Actions

The Federal Subsistence Board closed Federal public waters of the Yukon River drainage to the harvest of Chinook, summer and fall Chum, and Coho salmon except by Federally qualified subsistence users, effective on June 1, 2022, through September 30, 2022, with specific Federal subsistence fishing schedules, openings, closures, and fishing methods to be determined by the Federal Fisheries Manager. Under the Delegated letter of Authority, and in consultation with Regional Advisory Council chairs and Office of Subsistence management staff, the Federal inseason Manager began issuing emergency special actions to close salmon fishing in each

district, starting on June 2, and moving the closures upriver based on salmon migration timing. These management actions were taken in consultation and concurrently with ADF&G announcements which restricted state-managed waters.

Unfortunately, due to the poor outlook and returns, subsistence salmon fishing for Chinook and Chum salmon were essentially closed for the entire season. Managers provided liberal opportunity for subsistence fishers to harvest non-salmon species using 4-inch or smaller mesh gillnets (restricted to 60 feet maximum length) and other selective gear types while allowing the retention of Pink, Sockeye, and Coho salmon. Fishers were encouraged to avoid fishing in areas with high Chinook and Chum salmon abundance and to release healthy fish back to the river, however, retention of dead or injured Chinook and Chum salmon was allowed. Fishers on the YRDFA teleconference reported that some people were returning healthy Chinook and Chum salmon back to the river. While the mainstem restrictions for subsistence salmon fishing will be relaxed in October, some tributaries such as the Koyukuk River, Teedriinjik and Porcupine rivers will need to stay closed through December in order to avoid harvest of actively spawning fall Chum Salmon.

The Service acknowledges the last two years with no directed subsistence salmon fishery has resulted in tremendous hardship, loss of cultural practices, and unprecedented sacrifice within Yukon River households and communities. We recognize all of those who continue to be stewards of their surrounding lands and waters and would like to express a special thank you to those who have stayed involved at various public outreach meetings during these disheartening times of low abundance.

Tribal Consultation, Public Outreach, and Meetings.

The U.S. Fish and Wildlife Service (Service) has a core mission to consult with Federally Recognized Tribal Governments and the Yukon Fisheries team has been working to expand and improve government-to-government consultation. This spring 2022, the Service held six district-wide formal Tribal Consultation teleconference meetings with Yukon River Tribal Governments. The Federal Subsistence Fishery Manager presented information on the outlook and management strategy for the 2022 salmon season, provided opportunity for discussion among Tribal representatives and Service staff on the provided information as well as other topics such as the Federal special action (22-01), updates on *Ichthyophonus* research and other topics chosen by Tribal representatives.

This fall 2022, the Service will offer one-to-one Tribal Consultations with any Tribal Government that requests one with the Inseason manager. An invitation will be sent to each Yukon River Tribal Government and ANCSA offering the opportunity to schedule any requested meetings. This approach will allow each Tribal Government to tailor the consultation around their individual topics of concern, questions or recommendations regarding Yukon River fisheries management. In spring, district-wide Tribal Government Consultations may be offered to share salmon outlooks prior to the 2023 fishing season.

Inseason assessment data and management actions were shared weekly on the Tuesday YRDFA teleconferences. Throughout the fishing season, management staff also responded to daily emails and phone calls from community members. The Federal emergency special actions were announced on the same day as ADF&G Advisory Announcements, and were emailed to City and

Tribal Government offices, posted online under Fisheries Special Actions on the Office of Subsistence Management website and Subsistence Facebook page and distributed by email to anyone signed up to receive Federal announcements. **If you did not receive Federal announcements this summer, please contact the Service management staff (listed at the end of document) to get signed up for future notices. If you have feedback about federal management and how it went this season, we would love to hear it; please call or email the Federal team.**

***Ichthyophonus* Study**

Ichthyophonous is a parasite that can affect Yukon River Chinook Salmon and was studied in the past when the disease was more pervasive in the run. Research dropped off when we saw very low levels of the disease in the population. However, trained subsistence fishers in the Rapids area reported an increase of *Ichthyophonous* (as detected by spots on the heart or poor meat quality in Chinook Salmon) during the 2020 season. Feasibility sampling and laboratory analysis during the 2021 season confirmed high prevalence of the infection in the fish and high severity in fish lower in the river than we have seen in the past. The Service and the ADF&G worked together to plan and implement a multi-year study to look at the amount of disease in the population, the severity of the disease, and whether Chinook Salmon are dying, as a result of disease, before reaching upper portions of the mainstem and spawning locations.

Unfortunately, there is no way to study this disease without taking samples from internal organs, which requires sacrificing the fish. While this is controversial, especially in these times of closures to fishing and poor escapements, it is essential we study this disease while it has a strong presence in the population, document the impacts of the disease on the run and escapement, and develop tools to address impacts in future years. *Ichthyophonus*-related inriver mortality is the leading hypothesis to explain the difference between the estimate of Canadian-origin Chinook Salmon at Pilot Station sonar and the observed passage at Eagle sonar. Without a focused investigation, we cannot conclude if *Ichthyophonus* disease-associated mortality explains the disparity and lack of management success, but the continued high prevalence of disease paired with the large difference between estimates does indicate a pressing need to study this disease now.

Steps were taken to minimize the impact of the study and ensure that sampled fish were used to the greatest possible benefit. Careful planning of the minimum sample sizes needed for statistical rigor were considered, and all fish taken in the study were donated to local elders, tribes and individuals for traditional use. Furthermore, Lower Yukon Test Fishery had a considerably reduced harvest this season which reduced the overall number of sacrificed Chinook Salmon necessary in usual seasons.

Official sampling began in 2022 at three sites: Pilot Station sonar test fishery (in the lower River), Rapids at a fish wheel test fishery contracted by USFWS (in the middle river), and at the Eagle Sonar test fishery (upper river). Sampling goals were achieved at Pilot Station (n = 202) and the Rapids (n = 200), however, due to the very low catches, sampling at Eagle sonar was reduced (n = 50). Preliminary results will be shared this winter.

The overall goal of the project is to establish a new long-term *Ichthyophonus* disease monitoring platform in the lower Yukon River, build capacity and support for community-based *Ichthyophonus* monitoring, and determine if *Ichthyophonus* is associated with en route mortality so management adjustments can be made if necessary.

The fish in this study were also sampled for a variety of additional research projects addressing Yukon Chinook salmon health and life history. This is a collaborative effort between ADF&G, the Service, and multiple fish disease experts, affected communities, and local fishermen.

The following figures show inseason abundance indices for each species compared to previous seasons. These estimates should not be used to compare to escapement goals, as runs are reconstructed post season using methods that account for harvest, escapement, and genetic mixed stock analysis.

Figure 1. Cumulative passage of Chinook salmon at the Pilot Station Sonar from 1995 through 2022, excluding 1996 and 2009.

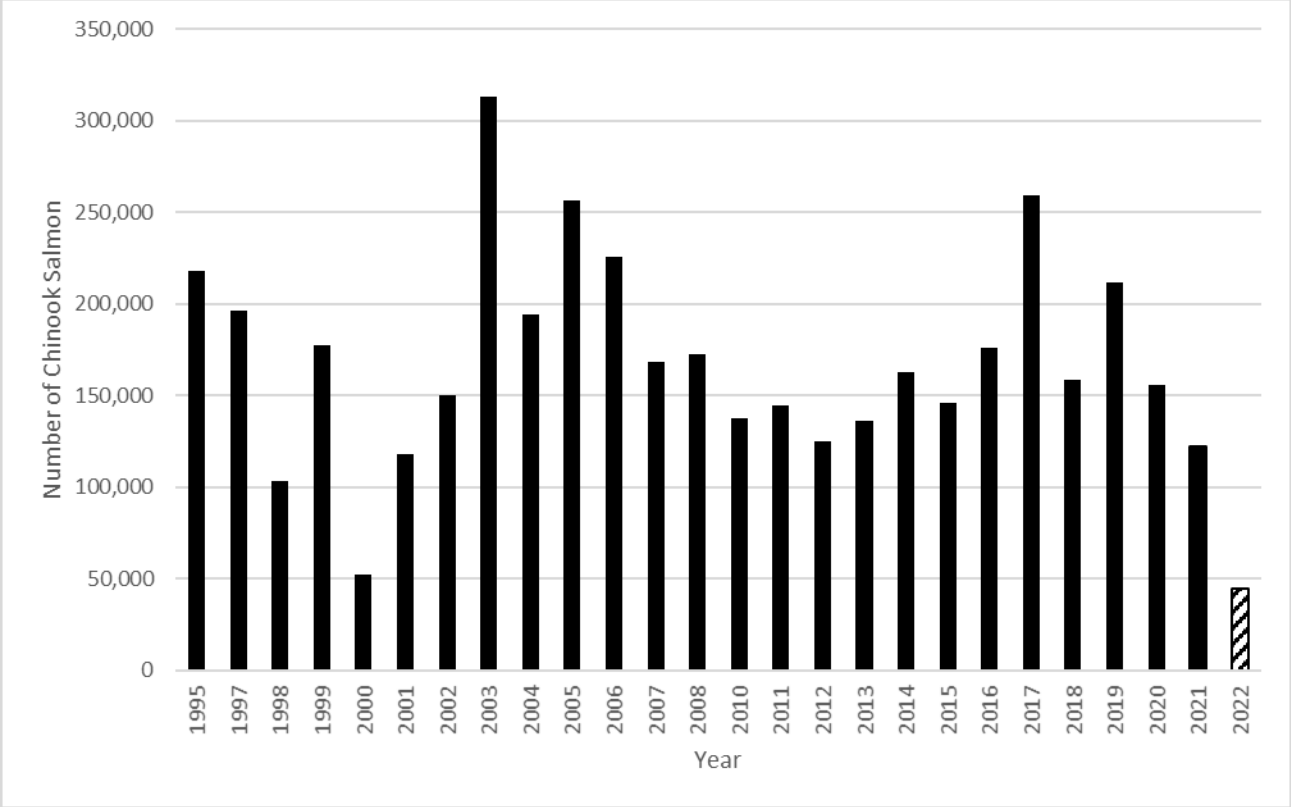


Figure 2. Cumulative passage estimates of Canadian-origin Chinook Salmon at Eagle Sonar from 2005 through 2022.

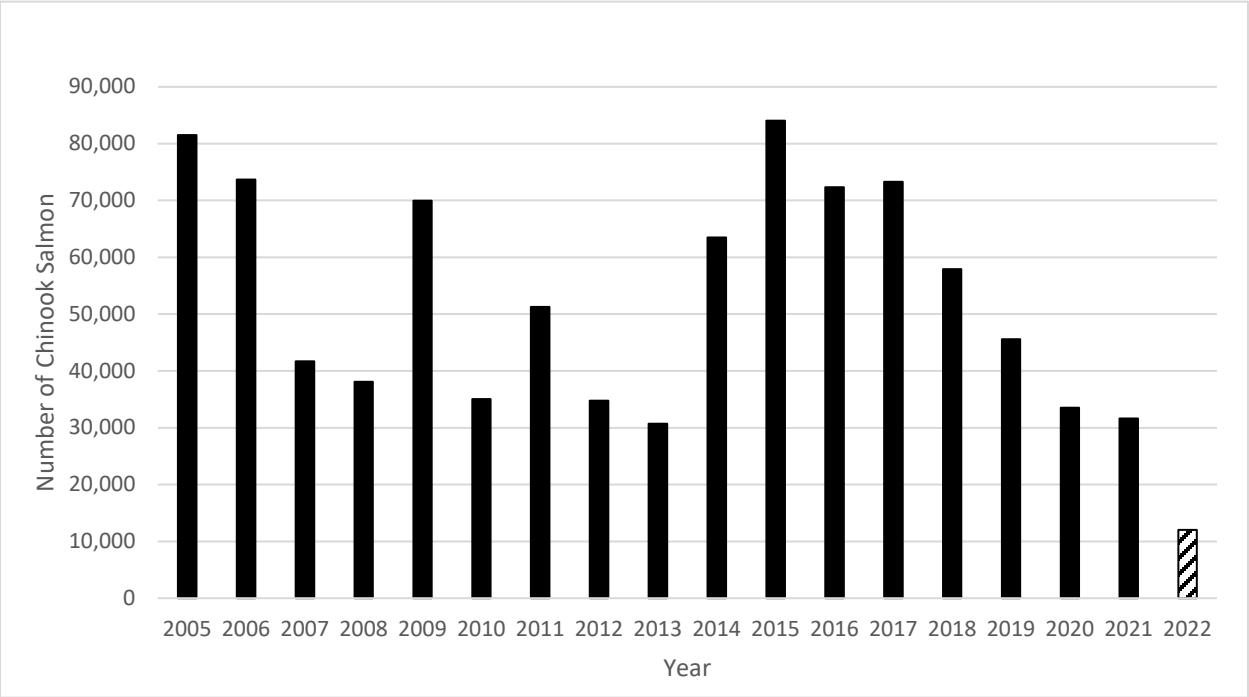


Figure 3. Cumulative passage of summer Chum Salmon at the Pilot Station Sonar project (through July 18) from 1995 through 2022, excluding 1996.

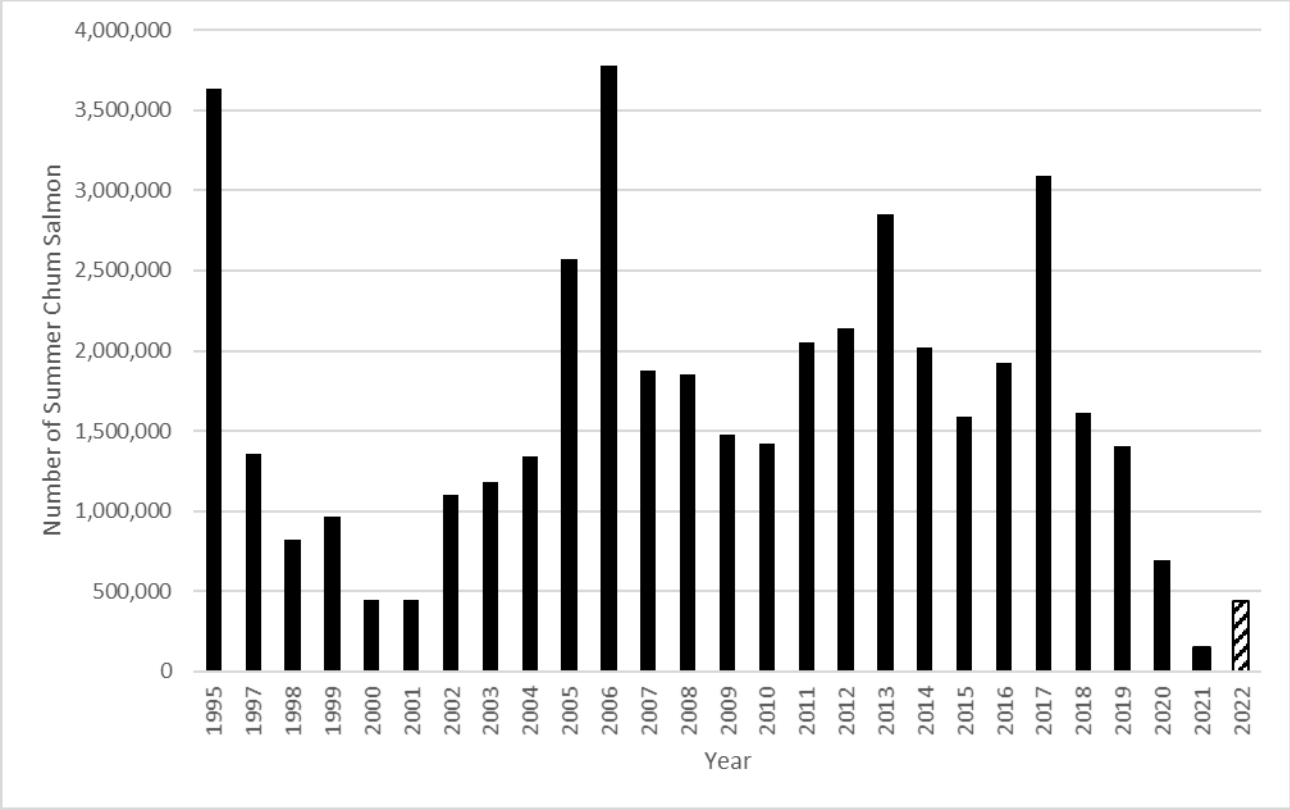


Figure 4. Cumulative passage of fall Chum Salmon (after July 18) at the Pilot Station Sonar project from 1995 through 2022, excluding 1996 and 2009.

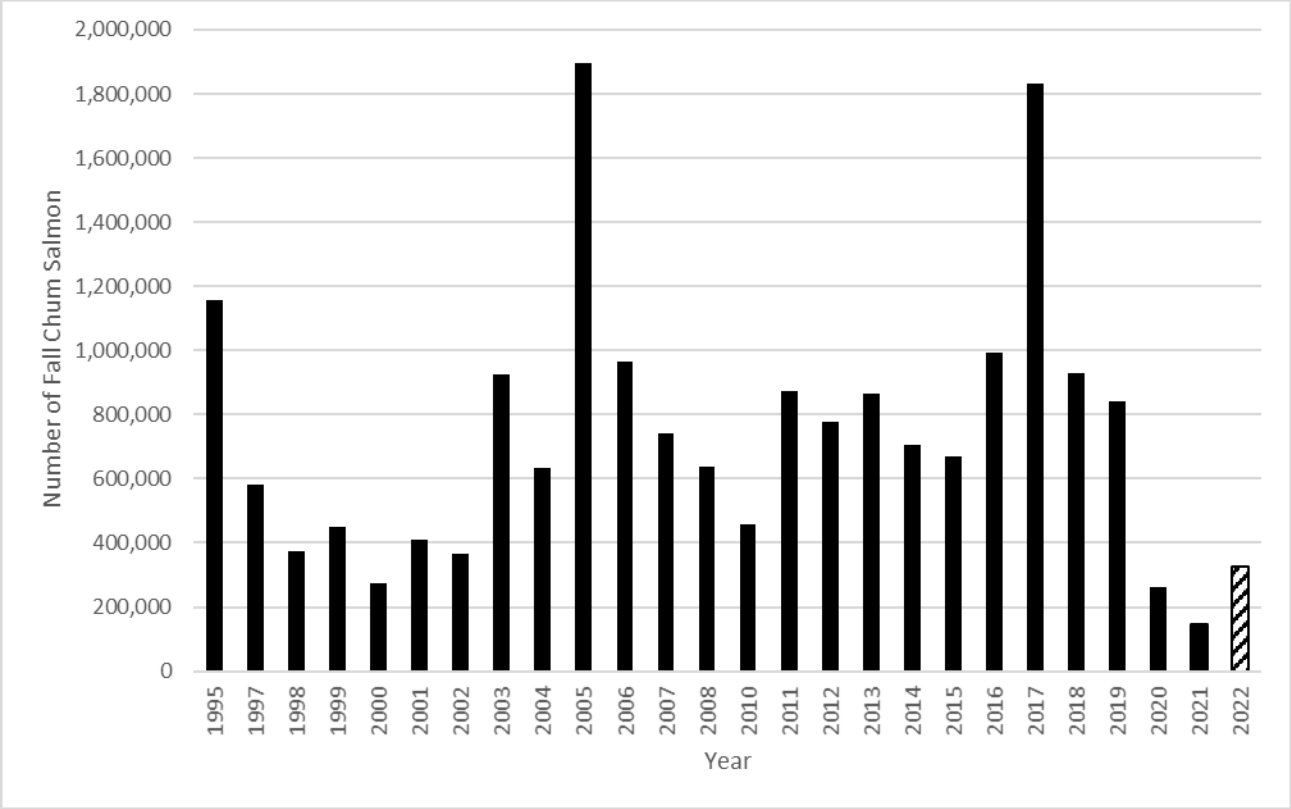
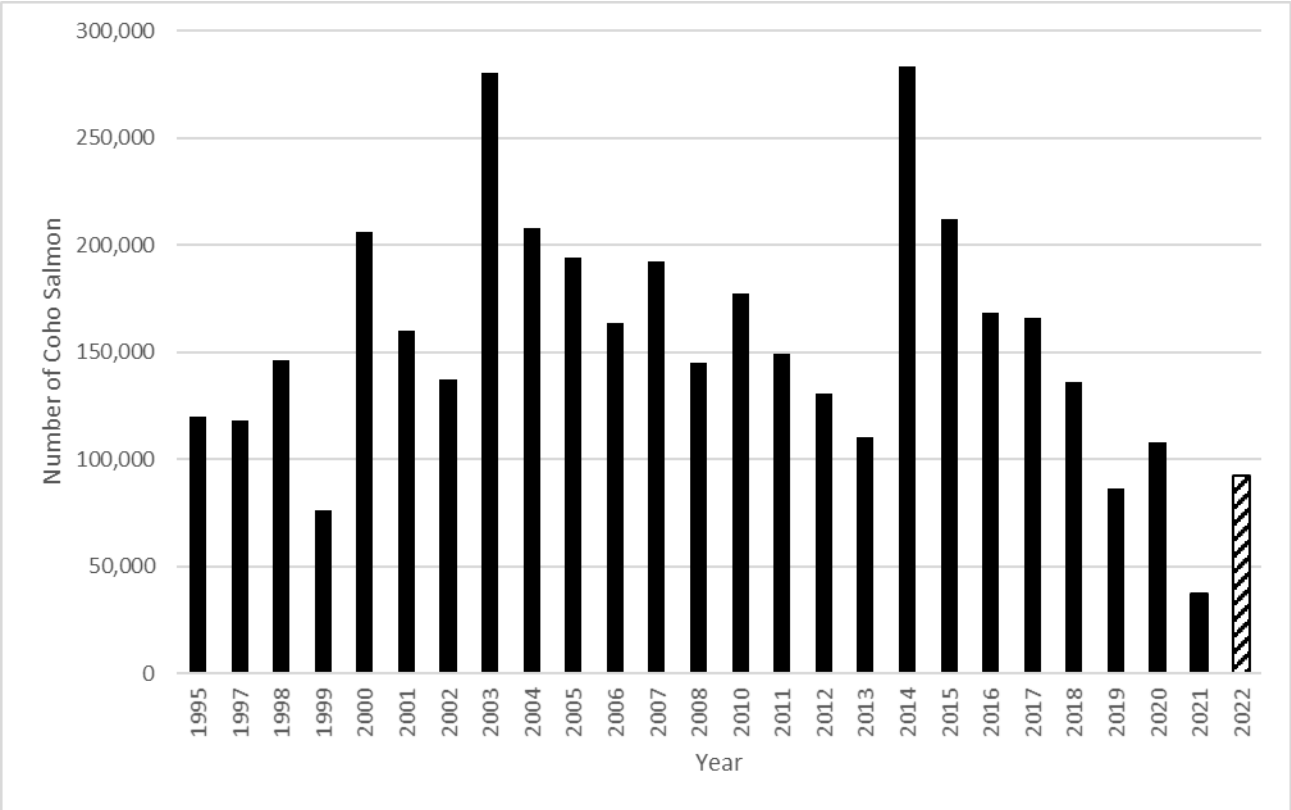


Figure 5. Cumulative passage of Coho Salmon at the Pilot Station Sonar project from 1995 through 2022, excluding 1996 and 2009. The sonar ceases operations before the Coho Salmon run is complete, so estimates are considered an index.



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