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2025 Unuk River Eulachon (*Thaleichthys pacificus*) Monitoring Report



Photo by Jen Hanlon KIC



Forest Service

2025



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EXECUTIVE SUMMARY

During the 2025 Unuk River monitoring season the run of Eulachon or Ooligan, *Thaleichthys pacificus*, arrived on the Unuk River March 12 in large numbers, with the peak of the run between March 12 and 17. Based on the numbers of Ooligan observed by biologists, and reports from local subsistence users, the 2025 Unuk River Ooligan run appeared to be Abundant¹ (Figure 3).

The USDA Forest Service (USFS) has monitored the Unuk River, located in District 1, since 2001 using combinations of aerial, foot & boat surveys, satellite cameras, and on-site reports from local subsistence users and cabin owners.

District 1 historically supported subsistence, personal use, and commercial fisheries for Ooligan primarily in the Unuk River system (Figure 1 and Figure 2). In 2005 the district 1 Ooligan population collapsed, with less than 150 fish seen each year between 2005 and 2010 on the Unuk River, resulting in State and Federal closures to fishing beginning in 2005. In 2011 Ooligan began returning to the Unuk River in greater numbers. In 2018 the USFS partnered with the Ketchikan Indian Community (KIC) to increase on-the-ground monitoring efforts on the Unuk River system. Annual monitoring has documented variable return levels from 2011 to present (Figure 3), though stock sizes are still at levels lower than those observed prior to the 2005 population collapse.

Because monitoring efforts have documented consistent returns of Ooligan since 2011 the Federal subsistence fishery was reopened on the Unuk River in 2021 to federally qualified subsistence users with a limited harvest and gear restrictions. This limited harvest has continued to date.

Harvest permits were issued to 37 federally qualified users during the 2025 season. Harvest was restricted to one five-gallon bucket per household and limited to cast net and dip net only methods. The State of Alaska Ooligan fishery remained closed.

Due to budget constraints overnight monitoring efforts were cancelled in 2025, restricting field personnel to short day trips from Ketchikan by boat or float plane. Onsite surveys were conducted on the Unuk River March 5, 11, 13, and 17. In addition to onsite relative abundance surveys, our partners at the Ketchikan Indian Community continued their partnership with the Ocean & Earth Environmental Services (OEES) to collect Environmental DNA (eDNA) to better aid our assessment and long-term management of the Unuk River Ooligan population.

LOCATION and HISTORY

The Unuk River, located within District 1, drains into Burroughs Bay (Figure 1 and Figure 2) on the mainland approximately 54 miles (87 km) northeast of Ketchikan Alaska and is an important system for Eulachon (Ooligan), *Thaleichthys pacificus*. Populations of Ooligan in District 1 have been at critically low levels since 2005. Monitoring efforts by the Forest Service, Alaska Department of Fish and Game, the Ketchikan Indian Community (KIC), and local subsistence users since 2001 have provided base line information that showed a decline in the populations of District 1 Ooligan.

¹ *Relative Abundance Definitions:* **Abundant** = large high density schools (>10,000 fish) widespread along multiple major channels and present beyond one week; **Good** = moderately large high density schools (1000 – 10,000) spread throughout one or more major channels and present for at least a week; **Moderate** = Some high density schools, small to moderate in size (500-1000 fish), spread out over multiple channels and present for at least a week; **Weak** = small schools of fish (<500 fish), scattered, no large high density schools, and present less than a week; **Absent/Nearly Absent** = Little to no fish observed, or small pockets of individuals seen throughout run.



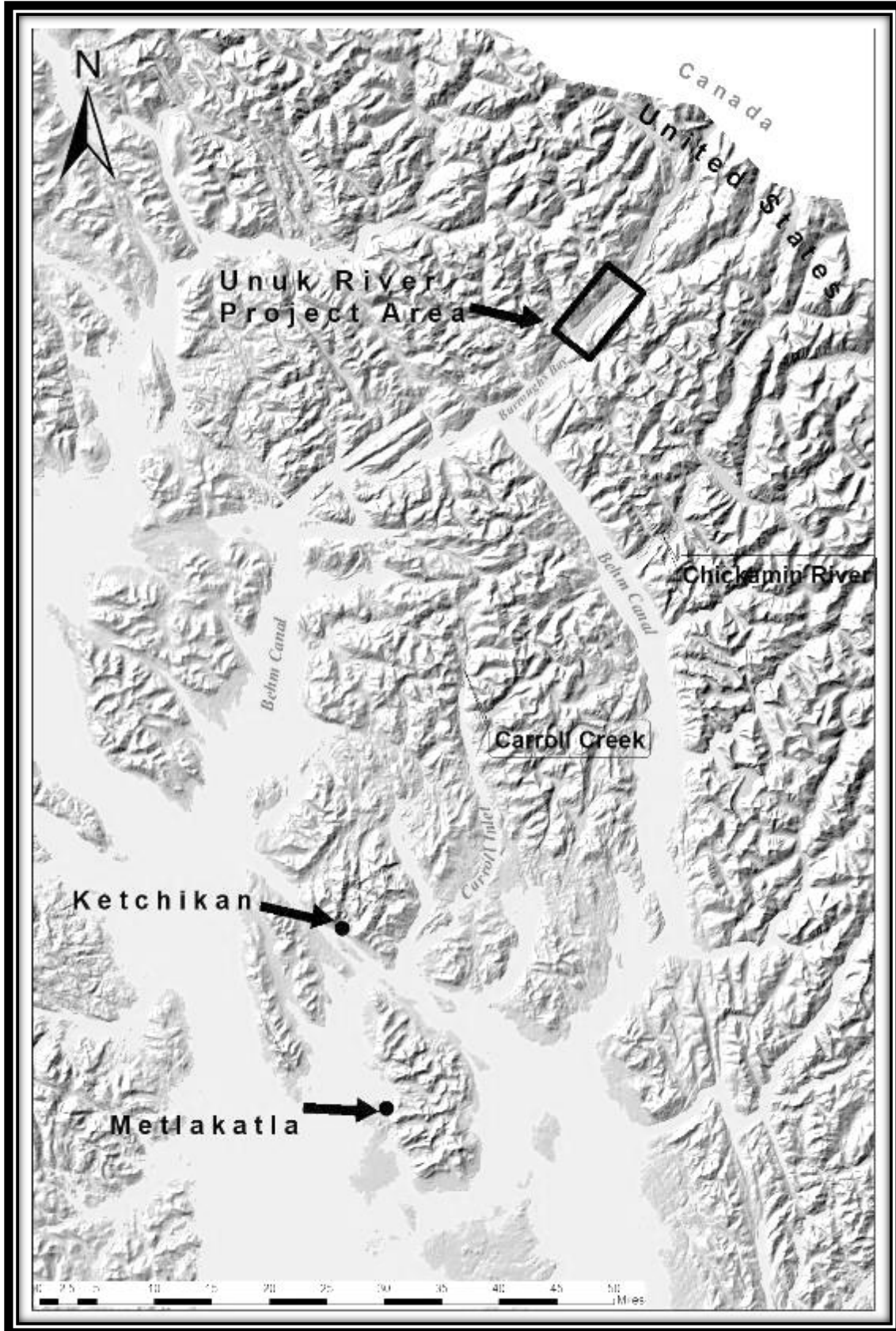


Figure 1. Project Area



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District 1 historically supported traditional use, subsistence use, personal use, and commercial fisheries for Ooligan, primarily in the Unuk River system. Annual harvest of Ooligan from the 1980's through the 1990's averaged over 12,000 pounds (Figure 4), with some harvest years exceeding 30,000 pounds (Van Alen, 2011 unpublished).

In 2001, the U.S. Forest Service (USFS) and the Alaska Department of Fish and Game (ADF&G) began a pilot study to learn more about the level of harvest, distribution, run timing, and life history characteristics of Ooligan in the Unuk River. By 2004, only 1500 pounds of Ooligan were harvested on the Unuk River and very low numbers of returning Ooligan were observed by subsistence fisherman and Forest Service personnel. In 2005, surveys found Ooligan to be nearly absent in the Unuk River system, with only two fish seen, resulting in State and Federal closures of the Ooligan fishery on the Unuk River. Intensive onsite monitoring surveys between 2005 and 2009 documented less than 100 fish each year, and only 126 fish in 2010 (Figure 3).

This five-year absence of Ooligan alarmed managers because the Ooligan life cycle is typically only four to five years, suggesting an entire life cycle may have been lost. With the stocks at low levels, there were few options available to managers for conservation other than closure. Due to the sharp declines in the overall number of Ooligan, along with critically low numbers returning to the area, the Ooligan fishery within the Unuk River and other portions of District 1 was closed to the harvest of Ooligan in 2005.

Ooligan began returning to the Unuk River in 2011. Between 2011 and 2015, Ooligan were seen in both the Unuk River, Burroughs Bay area, and in the Carroll Inlet area. Genetic analysis of Carroll Inlet fish showed these fish to be genetically comparable to Unuk River Ooligan. Ooligan have continued to return to the Unuk River area between 2016 and present, with variable numbers (Figure 3).

Though Ooligan appear to be returning to the Unuk River regularly since 2011, the stock sizes within District 1 remain at levels lower than those seen prior to the 2005 population collapse. However, because Ooligan have returned regularly to the Unuk River since 2011, managers felt that allowing a limited harvest would aid in our efforts to obtain biological data and better assess run sizes, as well as provide Federally qualified subsistence users with an opportunity to harvest. Data collected will help managers decide if the Ooligan population can support sustained harvest and if future harvest limits should be altered.

In 2021 a limited Federal fishery was opened on the Unuk River for the first time since 2004, limited to one five-gallon bucket (Approximately 50 pounds) per household using cast net and dip net only methods. The State fishery remained closed, all other waters in District 1 also remained closed. Due to the success of the 2021 season the limited opening on the Unuk River has continued to date.

Our partnership with the Ketchikan Indian Community has resulted in the collection of environmental-DNA (eDNA) samples on the Unuk River since 2022.



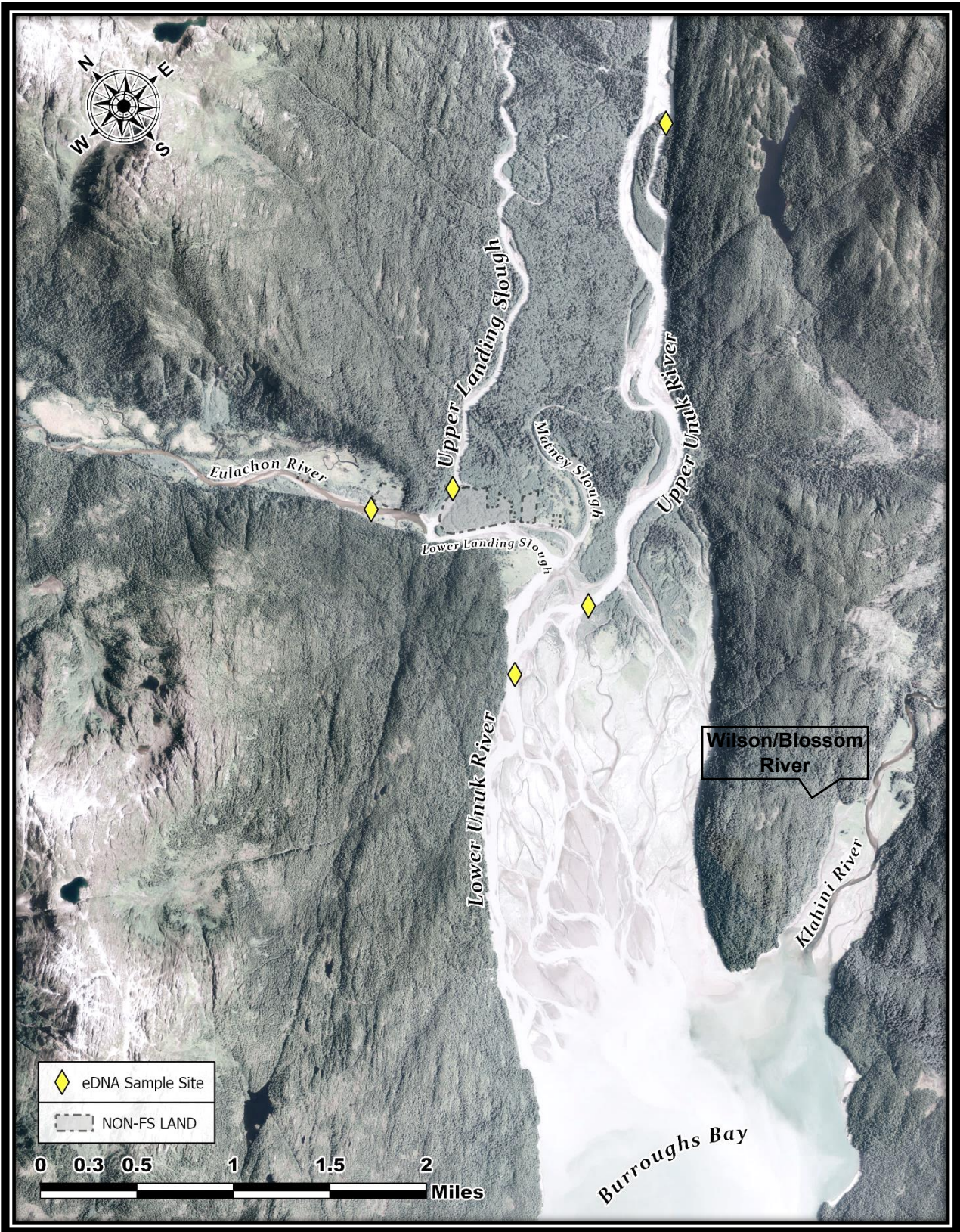


Figure 2. Lower Unuk River system, including major side channels and main tributaries.

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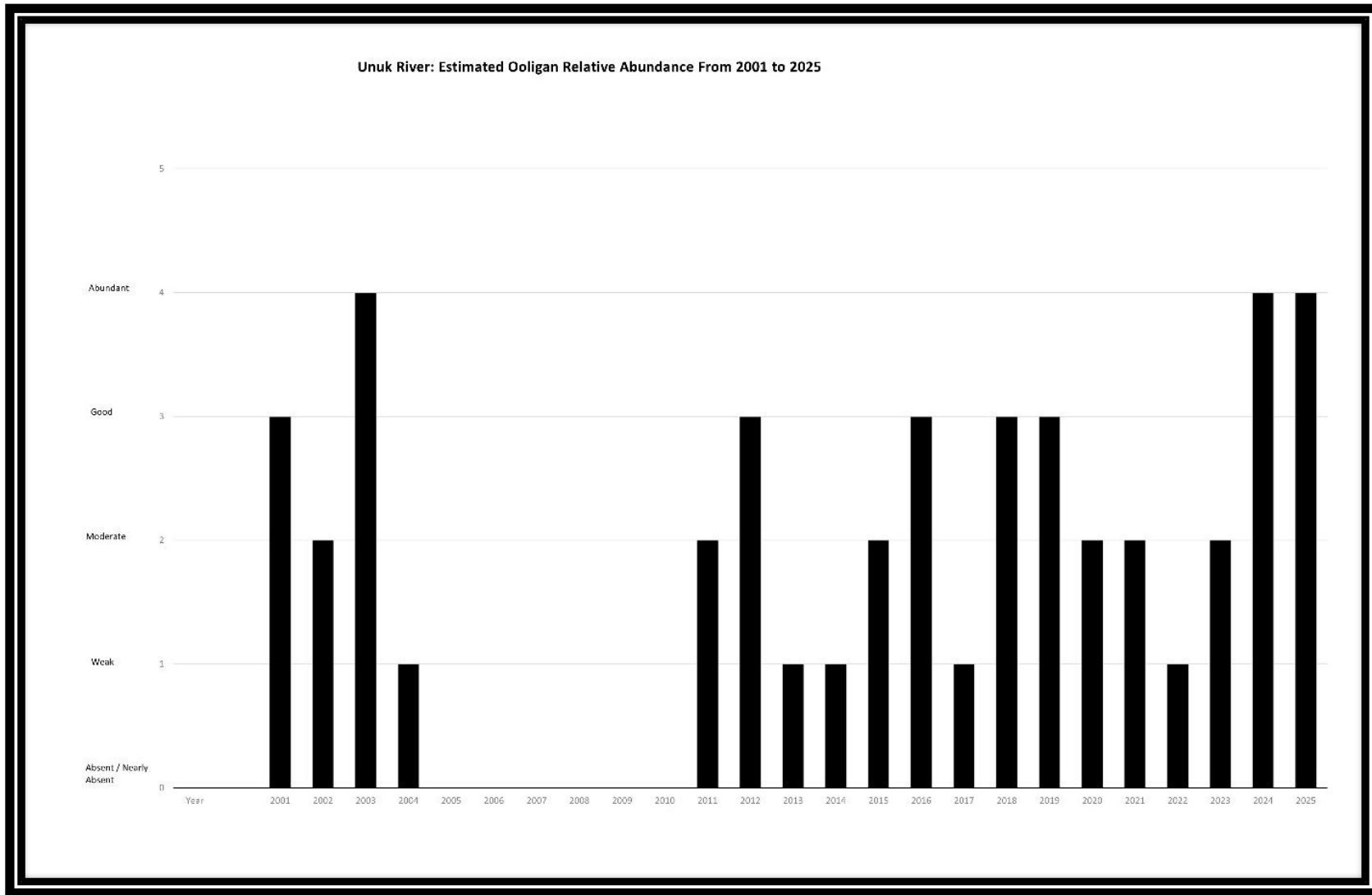


Figure 3. Estimated relative abundance from visual observations of Ooligan in the Unuk River between 2001 to 2025.

DEFINITION: **Abundant** = large high density schools (>10,000 fish) widespread along multiple major channels and present beyond one week; **Good** = moderately large high density schools (1000 – 10,000) spread throughout one or more major channels and present for at least a week; **Moderate** = Some high density schools, small to moderate in size (500-1000 fish), spread out over multiple channels and present for at least a week; **Weak** = small schools of fish (<500 fish), scattered, no large high density schools, and present less than a week; **Absent/Nearly Absent** = Little to no fish observed, or small pockets of individuals seen throughout run.



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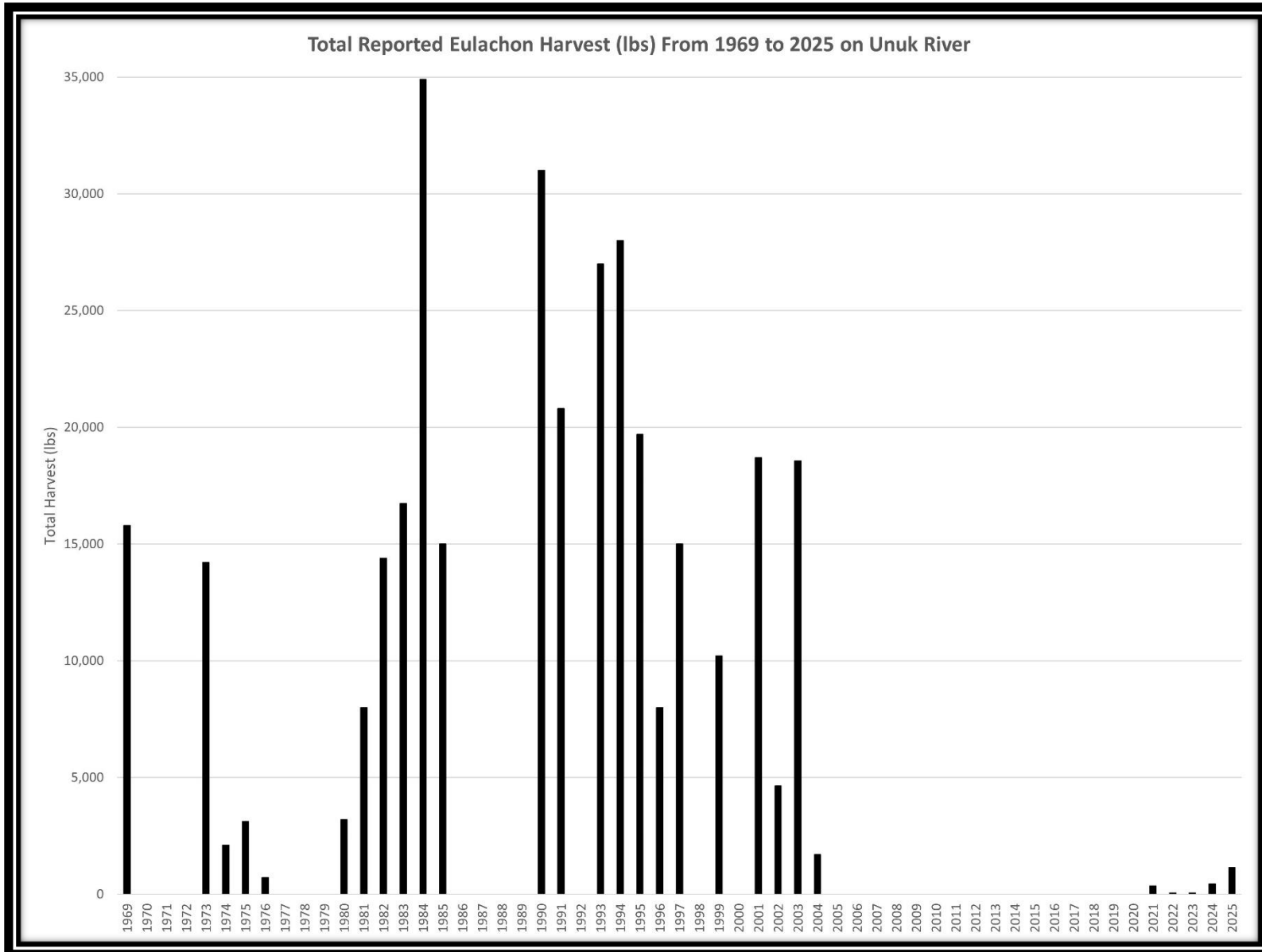


Figure 4. Total harvest (Commercial, State Personal Use / Subsistence, Federal Subsistence) reported from 1969 to 2025 District 1 (Van Alen 2011 – Unpublished).

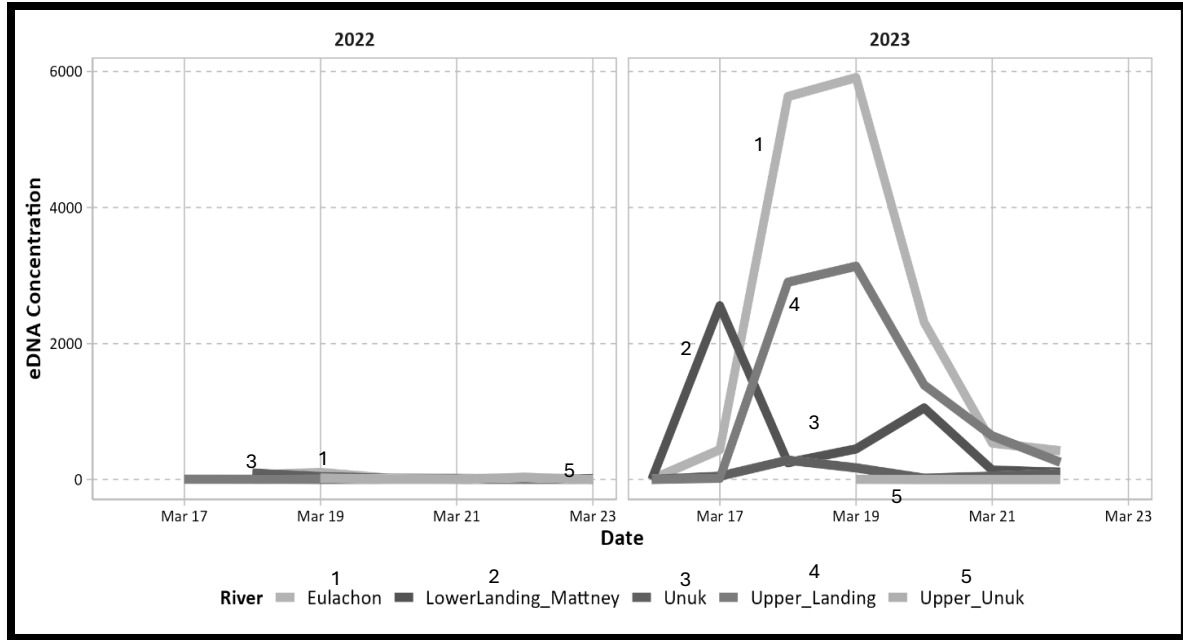


Figure 5. Environmental DNA (eDNA) concentrations from 2022 and 2023 collected at five site locations (Figure 2).

2025 FIELD INVESTIGATION METHODS and FINDINGS

Overnight onsite survey efforts were cancelled in 2025 due to budget constraints. Surveys included day trips performed weekly and included a combination of walking and jet-boat surveys on multiple areas within the Unuk drainage (Figure 1 and Figure 2), with jet-boat surveys being the most common.

Personnel from Ketchikan Indian Community (KIC), and Oceans Earth Environmental Services (OEEs) accompanied Forest Service staff during the ground surveys again in 2025 to help in assess the run size and implement environmental DNA sampling. Also aiding in surveys were local fisherman & cabin owners on the Unuk River. Environmental DNA (eDNA) samples were collected during each survey event at five sites. Locations surveyed included the Upper and Lower Unuk River, Unuk River Upper Landing & Lower Landing and Matney (Will’s) Sloughs, and the Eulachon River (Figure 2).

Fish counts use visual methods to estimate relative abundance which can be highly subjective, and we acknowledge that our accuracy will likely diminish as the density of fish increases. All reported counts should be taken generally. Methods for estimating numbers include counting a percentage of fish in an area and using that area as a guide to estimate numbers of remaining fish in a similar sized area, recounting again as density changes, until the entire school is estimated.

Our partners at the Ketchikan Indian Community and Oceans Earth Environmental Services are working hard to complete data analysis from eDNA samples collected. Due to changes in laboratory equipment multiple analysis methods were used between sample seasons. The 2022 and 2023 seasons (Figure 5) used the digital droplet polymerase chain reaction (PCR) method, and the 2024 and 2025 samples used quantitative PCR methods. A full comparison in results between these analytical methods is underway to better interpret results from the full time series.

An Alaska Department of Fish and Game (ADF&G) Fisheries Resource Permit for collections was issued to Forest Service in 2025, with intentions to collect samples to assess genetics, length, and weight of Ooligan. Due to time constraints and tidal effects no samples were collected in 2025.

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During the 2025 monitoring season 37 harvest permits were issued to Federally qualified subsistence users for the fifth time since 2005. Twenty three of the 37 permittees reported successful harvest.

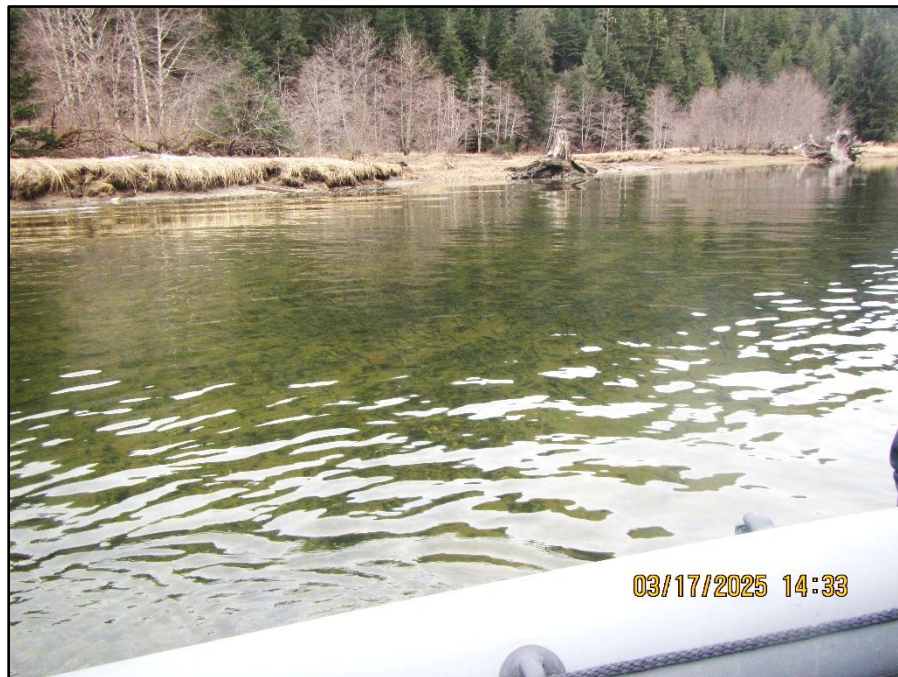


Figure 6. Large numbers of Ooligan observed in Eulachon River on March 17, this smaller school was observed about 0.15 miles upstream.

Daily Log

All surveys were performed by day trips accessed by boat or float plane. Refer to Figure 2 for site location references.

February 11 – Pre-survey efforts by boat to document river conditions noted no ice in Burroughs Bay but did see many porpoises.

February 17 – Communications with local subsistence user and Unuk River landowner reported the river was free of ice downstream from the Eulachon River in the Lower Landing Slough and Lower Unuk channels but still iced over upstream.

March 4 – Communications with local subsistence users said they were hearing reports that Ooligan were coming in on the nearby Nass and Skeena Rivers around February 19 and that the Unuk River is usually about two weeks later, so we should expect Ooligan to arrive any day.

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Figure 7. Iphigenia (Jen) Arvanitis (KIC) in the cockpit of float plane surveying Unuk River near confluence with Lower Unuk River (Photo by Jen Hanlon KIC).

March 5 – Survey crew arrived at Unuk River by boat and using jet boat surveyed five miles upstream on Upper Unuk River, ½ mile up Upper Landing, Eulachon River, Lower Landing, and Lower Unuk. Foot surveys were conducted in the tidal flats between Lower Landing Slough and Upper Unuk (Figure 2). Environmental DNA (eDNA) samples were collected at five sites. No signs of fish were noted, only two seals observed in bay, and two eagles. No feeding behavior was noted. The water was very low and clear, and the tide was low. Access by jet boat was difficult due to low flows and low tide.



Figure 8. Jon Hyde collects eDNA samples from the Upper Landing Slough of the Unuk River.

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March 11 – Survey crew arrived on site by float plane and noted no sign of Ooligan, no marine mammal or bird activity. The water was low and clear, despite high tidal conditions. Surveyors using jet boat covered five miles of main stem Unuk (Upper Unuk), two miles of Eulachon River, ½ mile of Upper Landing Slough, Lower Landing Slough, and Lower Unuk River (Figure 2). eDNA samples were collected at five sites. The Jet boat was left onsite for future surveys.

March 13 – Ground surveys were canceled due to high winds preventing float plane landing. Aerial surveys noted significant marine mammal and bird activity. Several hundred seal and sea lions were observed exhibiting feeding behavior throughout the Lower Landing Slough, Lower Unuk, and Upper Unuk River channels. Numerous gulls were observed grouped up and diving on the river within the Lower Unuk River channel. Due to winds and waves on the river surveyors were unable to confirm fish presence from the air but noted indicators that appeared to be low densities of fish. However, due to significant marine mammal and bird activity surveyors are confident fish have arrived.

March 14 – Surveys cancelled due to extreme winds out of the east. Communications with a local subsistence user and landowner on the 14th reported the fish entered the Unuk on Wednesday March 12 with the tide and quickly dispersed into all channels in large numbers and are very spread out.

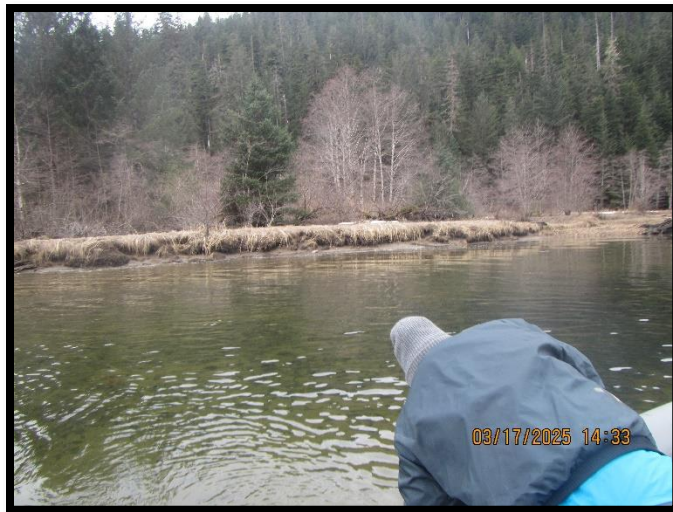


Figure 9. *Iphigenia (Jen) Arvanitis (KIC)* collects eDNA samples from the Eulachon River.

March 17 – Surveyors arrived in afternoon by float plane and noted large numbers of Ooligan spread out in all channels with largest concentrations in Upper Landing Slough and Eulachon River (Figure 2 and Figure 6). Two subsistence users were seen fishing in Upper Landing Slough. Environmental DNA (eDNA) samples were collected at four of five sample sites. Due to low flow levels inhibiting jet boat access and time constraints, the upstream Upper Unuk River eDNA sample was abandoned (Figure 2). Communications with a local subsistence user and landowner said that before he left the river on March 16 the run appeared to be as big and potentially bigger than last year’s run, and about a 7/10 in size from historic runs. Local subsistence user also stated fish were in all over with small to medium schools in Upper and Lower Landing Slough, a fair amount within the Unuk Mainstem, heavy densities in the Eulachon River from mouth up past last cabin, about ¾ mile, and he has never seen so many seals in all his years on the river.

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Figure 10. Mark Eldridge collects eDNA samples from Upper Unuk River.

March 19 – Communications with a local subsistence user and cabin owner on Tuesday March 17 they saw another push of Ooligan enter the Unuk River and travel up the Eulachon River after survey crews left. They noticed a lot of gulls and some sea lions working their way upriver as well and the river looked black from so many Ooligan. They said the storm may have helped push these fish into the river.

March 25 – Surveys were cancelled due to mechanical issues with boat. Flight booked for March 27 to conclude survey efforts.

March 27 – Flights were cancelled due to weather. High winds out of the Northeast. Flight rescheduled for March 28 to conclude survey efforts.

March 28 – Flight cancelled due to weather. Surveyors successfully accessed Burroughs Bay by boat. Winds out of the Northeast were too extreme to launch jetboat. The waves on the Lower Unuk River exceeded 3 feet. Some porpoise activity was seen in North Behm Canal between Claude Point and Grant Creek, a few sea lions were observed on the beach in Burroughs Bay, several miles from the Unuk River. About five roaming sea lions were spotted in Burroughs Bay on the south shore near the mooring buoy. No bird activity was noted.

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Figure 11. Mark Eldridge (USFS) surveys tidal flats of the Lower Unuk River.



Figure 12. Mark Eldridge collects eDNA samples from Eulachon River at low tide.

Other Ooligan Monitoring

Due to budget constraints, other river systems were not monitored during the 2025 season.

CONCLUSION & RECOMMENDATIONS

Based on the numbers of live and dead Ooligan observed by Forest Service and KIC biologists between March 13 and March 17, and reports from local subsistence users from March 11 to March 19, the 2025 Ooligan run appears to be Abundant² in size and sufficient to continue allowing limited harvest on the Unuk River with gear restrictions. If we continue to see future run sizes at the scale of 2025, we will consider relaxing restrictions to allow increased harvest.

Future surveys should continue to work with our partners at the Ketchikan Indian Community to collect environmental DNA (eDNA) on the Unuk River to aid our long-term efforts to manage the Unuk River fishery; and continue to use partners and local fisherman to aid in real time management of the Unuk River fishery and maximize survey efforts within the Unuk River system.

The small size of Ooligan, their schooling behavior and their wide and variable distribution within the Unuk River system makes enumeration difficult. Use of a limited test fishery with feedback and reporting from local users combined with onsite surveys by biologists appears to be the most successful methods in obtaining real time biological information on the Unuk River system. With the fish run duration on the Unuk River being shorter than on larger rivers, in combination with the presence of multiple tidally influenced channels, it is highly doubtful that other methods of monitoring, such as mark/recapture estimates, would be successful.

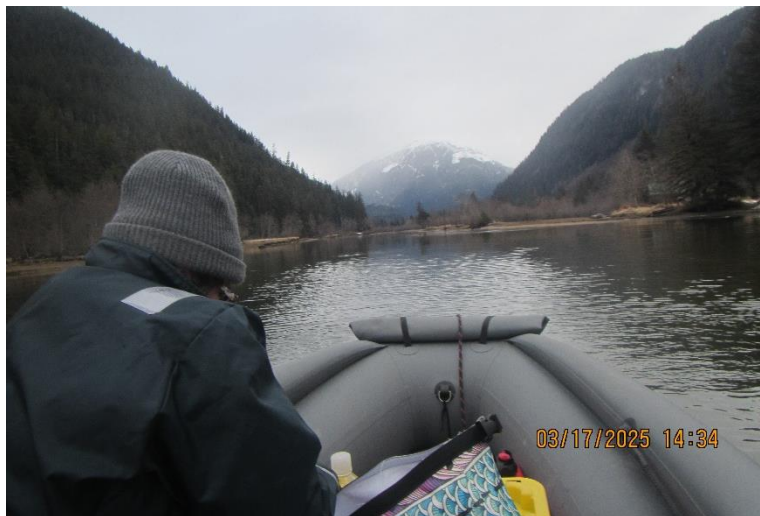


Figure 13. Iphigenia Arvanitis (KIC) rides in the US Forest Service jet boat while surveying for Ooligan in Eulachon River.

Bias between observers will continue to be an issue as visual surveys can be affected by light and weather conditions, tide levels, ice buildup, river turbidity, observer turnover, and the variation of the observation methods (e.g., boat vs foot surveys). Larger numbers of fish are also harder to quantify than smaller numbers resulting in higher error with estimates of larger schools of fish.

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With limited ideal tidal conditions, areas such as the Eulachon River, Matney Slough, and portions of the Mainstem Unuk cannot be surveyed easily or at times not at all because of the aggressive tidal fluctuations during ebbs and floods that limit time in these areas.

Although further improvement of monitoring is desired, current survey methods are believed to provide valuable information to managers about the current distribution and relative abundance within the system.

The recently installed water quality and stream gauge station installed by the U. S. Geological Survey provides data on current stream flow and water quality conditions on the Unuk River (USGS 2025) ([APPENDIX A.APPENDIX A.APPENDIX A.](#)).





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LITERATURE CITED

Marston, B. H., M. F. Willson and S. M. Gende. 2002. Predator aggregations during eulachon *Thaleichthys pacificus* spawning runs. *Marine Ecology Progress Series* 231: 229– 236.

U.S. Geological Survey. “USGS 15015595 UNUK R BL BLUE R NR WRANGELL AK”.
<https://waterdata.usgs.gov/monitoring-location/15015595/#parameterCode=00065&startDT=2023-03-01&endDT=2023-03-31> . March 01 to March 31, 2025.

Van Alen, B. W. 2011 Unpublished. Unuk River Eulachon Stock Assessment, 2001 to 2010. U.S. Fish and Wildlife Service, Office of Subsistence Management, Fisheries Resource Monitoring Program, Final Report Study No. 08-607. Anchorage, Alaska.

Washington Department of Fish & Wildlife and Oregon Department of Fish & Wildlife. 2001. Washington and Oregon Eulachon Management Plan. 39 pp.



APPENDIX A.

Available USGS Stream Gage Data: USGS 15015595 UNUK R BL BLUE R NR WRANGELL AK, March 2025 (USGS 2025)

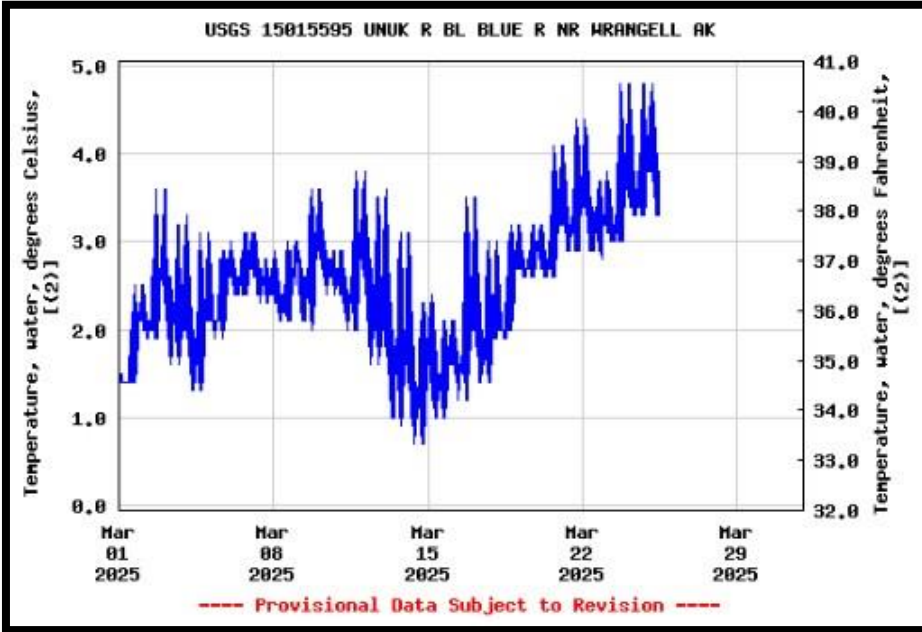


Figure 14. Temperature, water, degrees Celsius (USGS 2025)



Figure 15. Gage Height in feet (USGS 2025).

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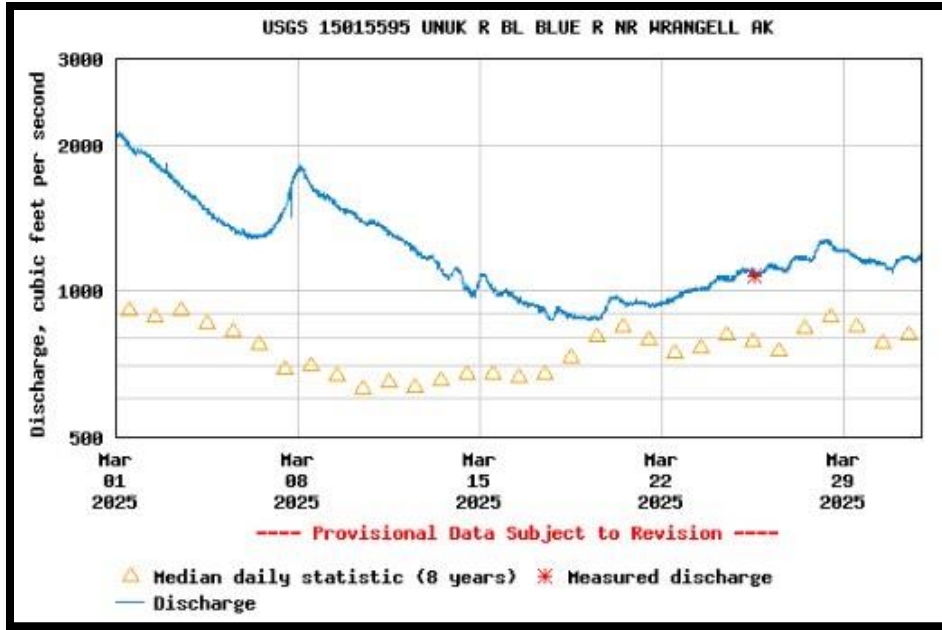


Figure 16. Stream flow in cubic feet per second on the Unuk River, March 2025 (USGS 2025).

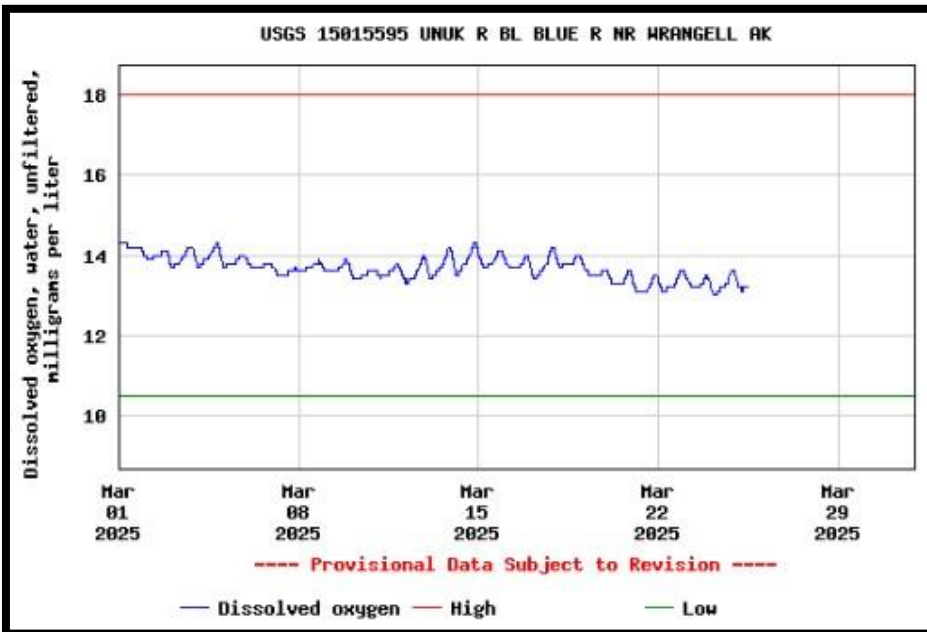


Figure 17. Dissolved oxygen, water, unfiltered, milligrams per liter (USGS 2025).

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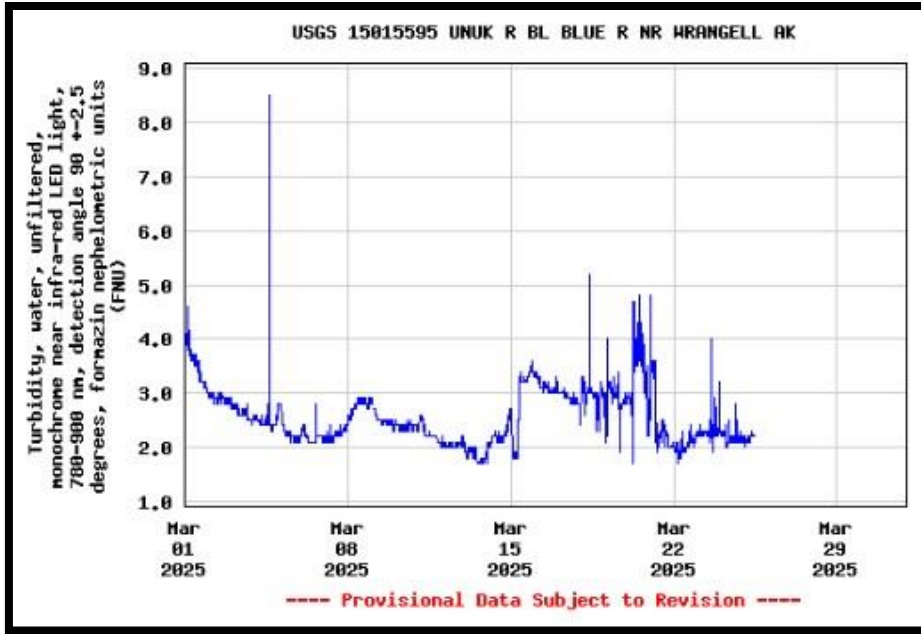


Figure 18. Turbidity, water, unfiltered, monochrome near infra-red LED light detection angle 90 +/-2.5 degrees, formazin nephelometric units (FNU) (USGS 2025).