

CITY OF UNALASKA  
UNALASKA, ALASKA

RESOLUTION 2022-22

A RESOLUTION OF THE UNALASKA CITY COUNCIL AUTHORIZING FINANCIAL SUPPORT OF AERIAL SALMON SURVEYS DURING CALENDAR YEAR 2022 BY ALEUTIAN AERIAL LLC IN THE AMOUNT OF \$2,550 WITH FUNDING FROM FY23 COUNCIL PLANNED SPONSORSHIPS BUDGET

WHEREAS, in 2018 the Unalaska Native Fishermen Association (UNFA) provided funding to Aleutian Aerial for sockeye salmon surveys of three road system drainages of Morris Cove, Summer Bay and Iliuliuk Lake; and

WHEREAS, in 2019 the City of Unalaska joined with Ounalashka Corporation (OC) and the Unalaska Native Fishermen Association (UNFA) to financially support the same aerial salmon surveys; and

WHEREAS, in 2020 the Qawalangin Tribe of Unalaska (Q-Tribe) joined the City, OC, and UNFA to financially support the aerial salmon surveys and an aerial survey of McLees Lake was also included; and

WHEREAS, in 2021, the financial support from these four entities continued; and

WHEREAS, Aleutian Aerial LLC has submitted a proposal to provide aerial drone salmon survey and is seeking funding support from these groups once again; and

WHEREAS, there continues to be concerns that the lack of escapement estimates for sockeye salmon in local lake drainages could jeopardize future opportunities for subsistence and sport fishing; and

WHEREAS, ADFG has indicated that drone surveys show the potential to be a reliable and cost-effective way to survey small river and lake systems; and

WHEREAS, the Unalaska City Council believes the aerial salmon surveys to be a benefit to the citizens of Unalaska to allow for continued subsistence and sport fishing seasons.

NOW THEREFORE BE IT RESOLVED that that the Unalaska City Council approves funding in the amount of \$2,550 to support aerial salmon surveys during calendar year 2022 to be performed by Aleutian Aerial LLC, with funding from the Council Planning Sponsorships line item in the FY23 budget.

PASSED AND ADOPTED by a duly constituted quorum of the Unalaska City Council on May 24, 2022.

  
Vincent M. Tutiakoff, Sr.  
Mayor

ATTEST  
  
Marjie Veeder, CMC  
City Clerk



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## MEMORANDUM TO COUNCIL

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To: Mayor and City Council Members  
From: Erin Reinders, City Manager  
Date: May 24, 2022  
Re: Resolution 2022-22: Authorizing financial support of aerial salmon surveys during calendar year 2022 by Aleutian Aerial LLC in the amount of \$2,550, with funding from FY23 Council Planned Sponsorships Budget

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**SUMMARY:** Andy Dietrick of Aleutian Aerial LLC has proposed performing aerial drone salmon surveys and has requested support from City Council. The passage of this resolution will approve City Council's financial support in the amount of \$2,550 for surveys of Morris Cove, Summer Bay and Iliuliuk Lakes road system drainages. These surveys will then be provided to the Alaska Department of Fish and Game (ADFG) for use in their analysis.

**PREVIOUS COUNCIL ACTION:** The Unalaska City Council provided \$5,200 in FY20. Funding came from Council Sponsorships Contingency. The partnership in 2019 had three participants including the City of Unalaska, Ounalashka Corporation (OC), and Unalaska Native Fishermen Association (UNFA).

Council provided \$6,550 in FY21 and again in FY22. Funding again came from Council Sponsorships Contingency. The partnership and scope expanded in FY21 to include the Qawalangin Tribe and McLees Lake.

Council's Draft FY23 budget includes support for this effort in the amount of \$6,550 in the Council Planned Sponsorships Budget.

**BACKGROUND:** On May 18, 2022, Andy Dietrick of Aleutian Aerial emailed a proposal and request for financial support for the aerial drone salmon surveys. The surveys will assist ADFG in their analysis. This request is included in your packet, as is a letter of support from ADFG. The funding request for this year is less than previously requested, because grant funding is covering the survey for McLees Lake. He is only seeking funding for a limited survey of Unalaska Lake, Summer Bay Lake and Morris Cove Lake.

To proceed with the project, he needs commitments from all four funding entities by May 25, 2022. Mr. Dietrick has stated that he has a signed committed from the Qawalangin Tribe, and a verbal commitment from UNFA. I understand that OC will also be supporting this effort as well, but that has not been formally communicated to Mr. Dietrick. Staff has prepared a resolution should Council wish to provide financial support.

**DISCUSSION:** The passage of this resolution will approve City Council's financial support in the amount of \$2,550 for aerial drone salmon surveys of the road system drainages of Morris Cove, Summer Bay, and Iliuliuk Lake as well as McLees Lake. The plan is for the City's contribution to be combined with the contributions of the Q-Tribe, UNFA and OC. This information will be provided to the Alaska Department of Fish and Game for analysis.

The lack of salmon escapement on the local lake drainages has been a concern of the local residents who participate in subsistence and sport fishing activities. ADFG has faced budget constraints that have impacted their ability to perform the needed survey work. Continued participation in the drone salmon surveys will help provide needed information to ADFG on the status of the local drainages.

**ALTERNATIVES:** Council may choose not to get involved with this issue, or may choose to support a different contribution amount. Council may also choose to defer this item and consider it at a future date.

**FINANCIAL IMPLICATIONS:** The Draft FY23 Council Planned Sponsorships line item contains sufficient funding to cover a \$2,550 contribution.

**PROPOSED MOTION:** I move to adopt Resolution 2022-22.

**ATTACHMENTS:**

1. [May 18, 2022 memo from Aleutian Ariel LLC; 2022 Project Proposal for Unmanned Aerial Salmon Counting](#)
2. [April 20, 2022 memo from State of Alaska; Letter of Support, Aleutian Ariel LLC – 2022 Unalaska Roadside Lake Salmon Drone Surveys](#)
3. [April 15, 2022 memo from State of Alaska; 2021 Indexed Escapement of Salmon using Drone Surveys at McLees Lake and Unalaska Road –System Lakes](#)



Aleutian Aerial LLC  
PO Box 53  
Unalaska, Alaska 99685  
907.957.1680  
[andy@aleutianaerial.com](mailto:andy@aleutianaerial.com)

May 18, 2022

To: City of Unalaska City Council

**Re: 2022 Project Proposal for Unmanned Aerial Salmon Counting**

Aleutian Aerial LLC (Aleutian Aerial) is pleased to provide a proposal for data collection services to support aerial lakeshore sockeye salmon counting on three Unalaska roadside drainages (Morris Cove, Summer Bay, Unalaska). Aleutian Aerial utilizes small unmanned aerial systems (sUAS) to perform video collection for salmon counting. All data collection is performed by a FAA Part 107 certified remote pilot. Aleutian Aerial will provide all personnel and equipment for data collection for this project.

**Background:**

This project began in 2018 with funding from the Unalaska Native Fishermen's Association (UNFA). The goal was to perform aerial surveys to determine sockeye salmon escapement estimates on local streams. UNFA funded the data collection and the Alaska Department of Fish and Game (ADF&G) provided biologist support to analyze and report on the data. ADF&G supports using sUAS technology for this type of salmon counting.

In 2019, the project was continued with ongoing support from UNFA and additional support from the Ounalashka Corporation (OC) and the City of Unalaska.

In 2020, the project was supported by a total of 4 funding agencies: UNFA, OC, City of Unalaska, and the Qawalangin Tribe. ADF&G continued to support the project with biologist time for data collection recommendations, data analysis and reporting. A big addition to the 2020 survey was including McLees Lake (which had a weir in operation after two years without any weir data).

In 2021, the project continued with another year of paired weir and shoreside spawning-bed counts for the McLees Lake location. Also in 2021, significant stream mileage was added to the survey by including inlet and outlet streams on all the drainages.

For 2022, grant funding is covering surveys at McLees Lake and we are seeking financial support for a limited survey of Unalaska Lake, Summer Bay Lake, and Morris Cove Lake.

**Site Logistics:**

Aleutian Aerial is familiar with the complicated site logistics of working in the Aleutian Islands. Based in Unalaska/Dutch Harbor, Aleutian Aerial is capable of taking advantage of flight weather windows and lighting conditions as they are presented by Mother Nature. This can provide a significant cost savings by reducing transportation, freight, housing, and per diem costs. Specific sites for this project include the nearshore waters and inlet streams of Unalaska Lake, Summer Bay Lake, and Morris Cove Lake – aerial pictures attached.

**Execution of Work and Schedule of Costs:**

Aleutian Aerial has the financial and technical resources, capability, and in-house capacity to successfully perform this video data collection. Data collection using sUAS will be performed during a target window of August 1 to September 4. Start timing is based on the last four years of drone surveys. The primary sUAS used will be a DJI Matrice 300. The camera sensor and lenses have the capability of capturing 45-megapixel still images and 4K (60 frames per second) video. Flight heights are generally 50– 80 feet above lake level with variable speed depending on the salmon volume encountered. Polarized lenses will also be used to aid in seeing individual salmon underwater. Flights start at the same point on the lakeshore each lap and travel the perimeter with the camera pointed 50-90 degrees down from horizontal depending on optimal visibility into the water. Generally, you can see the entire nearshore spawning area in one field of view. In areas where shallows extend far out from shore, flight height is increased and a grid pattern is flown using rocks or unique features on the lake bed to keep the biologist oriented and prevent double counting or missing fish.

The following rates are applicable to this project:

- Project execution including all field logistics, drone and support equipment, aerial media acquisition, quality check, and creation of deliverables for analysis by ADF&G biologists. As advised by ADF&G, this will include two (2) sets of data from each roadside lake and inlet stream (~9.6 shoreline miles per lap surveyed, total of ~28.8 shoreline miles surveyed for the project), taken at regular intervals during a target window of August 1 to September 4 (as allowed by Mother Nature). Daily weather monitoring and forecasting during the entire project period and collaboration with ADF&G biologists for data quality assurance.

***Project Total \$10,200***

***Seeking multiple funding sources. Based on 4 contributing entities, this request to the City of Unalaska is \$2,550.***

**Exclusions:**

Any condition outside the control of Aleutian Aerial and any item of work not specified in this proposal.

**Assumptions:**

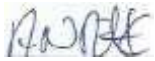
- Flight weather windows are out of the control of Aleutian Aerial.
- Aleutian Aerial will operate sUAS under FAA Part 107 rules in the Class G airspace in and around Unalaska/Dutch Harbor during data collection.
- Any land use permissions required (except for licenses/certifications related to flight operations) are the responsibility of the funding organizations.
- Image acquisition will be done using a camera sensor capable of recording 4K, 60 fps video, on a professional grade sUAS platform.
- Photo/video media deliverables will be in common formats and delivered on an external hard drive to ADF&G in Kodiak.
- Aleutian Aerial agrees to process and deliver media to ADF&G during the course of the project so data quality can be reviewed.

This proposal is offered and limited to the terms specified. A notice-to-proceed must be received by each of the 4 funding entities no later than May 25, 2021.

Please feel free to contact me if you have any questions or comments regarding this proposal.

Thank you for considering Aleutian Aerial for data collection on Unalaska's salmon streams.

Sincerely,



Andy Dietrick  
Owner, Aleutian Aerial LLC  
[andy@aleutianaerial.com](mailto:andy@aleutianaerial.com)  
907.957.1680

## Attachment #1: Unalaska Lake Overview



### Unalaska Lake details:

Approximate length – 1.8 miles

Approximate width – 0.60 miles

Approximate perimeter – 1.8 miles

Approximate inlet stream area of interest – 1.32 miles

## Attachment #2: Summer Bay Lake Overview



### Summer Bay Lake details:

Approximate length – 0.85 miles

Approximate width – 0.30 miles

Approximate perimeter – 2.3 miles

Approximate inlet stream area of interest – 2.25 miles





**Morris Cove Lake details:**

Approximate length – 0.40 miles

Approximate width – 0.20 miles

Approximate perimeter – 1.1 miles

Approximate inlet stream area of interest – 1 mile



THE STATE  
of **ALASKA**  
GOVERNOR MICHAEL J. DUNLEAVY

## Department of Fish and Game

DIVISION OF COMMERCIAL FISHERIES  
Westward Region Office  
351 Research CT  
Kodiak, Alaska 99615  
Phone: 907.486.1882  
Fax: 907.486.1841

April 20, 2022

Unalaska Native Fishermen's Association,  
Ounalashka Corporation,  
City of Unalaska,  
and the Qawalangin Tribe of Unalaska  
Unalaska, Alaska 99692

**Re: Letter of Support, Aleutian Aerial LLC**  
2022 Unalaska Roadside Lake Salmon Drone Surveys

Dear Leaders of Unalaska:

As the Assistant Area Management Biologist for the Alaska Peninsula and Aleutian Islands, I support Aleutian Aerial's proposal for funding drone surveys of Morris Cove, Summer Bay, and Unalaska Lakes this upcoming summer.

If awarded, Aleutian Aerial LLC would continue to provide high quality drone survey footage of important subsistence salmon runs on the island. Since 2018, ADF&G has reviewed this footage to estimate the strength of your local salmon runs. Since they are a local company, Aleutian Aerial LLC can conduct multiple surveys on good weather days during the peak of the salmon run which allows us to make accurate population estimates. Without this drone footage, ADF&G is typically only able to conduct 1 fixed-wing aerial survey of Unalaska streams every 1 to 2 years.

It is also worth noting for 2022 and 2023, ADF&G and Aleutian Aerial LLC have been awarded funding from the Alaska Sustainable Salmon Fund to continue drone surveys at McLees Lake. Along with reducing the funding request from Unalaska organizations, the tagging study we plan to run for this project will further refine the accuracy of all drone surveys and also serve as a backup tool in case the McLees Lake weir is unable to procure funding in the future.

Aleutian Aerial LLC's drone surveys provide critical information concerning the community of Unalaska's salmon.

Sincerely,

A handwritten signature in blue ink that reads "Tyler Lawson".

Tyler Lawson  
Alaska Department of Fish and Game  
Alaska Peninsula & Aleutian Islands  
Assistant Area Management Biologist  
351 Research Ct, Kodiak, AK 99615  
907-486-1882



## MEMORANDUM

DATE: April 15, 2022

TO: Unalaska Native Fishermen's Association,  
the Ounalashka Corporation, the City of  
Unalaska, and the Qawalangin Tribe of  
Unalaska

THROUGH: Lisa Fox, Area Management  
Biologist, South Alaska Peninsula and  
Aleutian Islands, Division of Commercial  
Fisheries, Region IV

FROM: Tyler Lawson, Assistant Area  
Management Biologist, South Alaska  
Peninsula and Aleutian Islands, Division  
of Commercial Fisheries, Region IV

PHONE: (907) 486-1882

SUBJECT: 2021 Indexed Escapement of  
Salmon using Drone Surveys at McLees  
Lake and Unalaska Road-system Lakes

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Since 2018, indices of salmon escapement from drone surveys have been completed for important subsistence sockeye salmon *Oncorhynchus nerka* runs into Summer Bay, Morris Cove, and Unalaska (Iliuliuk) Lakes (Figure 1; Tables 1-3). Additionally, 2021 was the second year a comparison was made between McLees Lake weir salmon counts and indices of escapement from drone surveys (Table 4). While not a primary objective, indices of escapement for coho salmon *O. kisutch* and pink salmon *O. gorbuscha* were opportunistically included in surveys (Tables 1-4). In 2021, the Unalaska Native Fishermen's Association, the Ounalashka Corporation, the City of Unalaska, and the Qawalangin Tribe of Unalaska provided funding to contract Aleutian Aerial LLC to conduct drone aerial surveys of salmon for Summer Bay, Morris Cove, Iliuliuk, and McLees Lake drainages. ADF&G does not receive funding for these surveys but does contribute to efforts by reviewing surveys and providing indices of escapement.

Surveys flown by Aleutian Aerial LLC on the three Unalaska road-system lakes and McLees Lake took place between August 4 and September 21, 2021. Four individual surveys were conducted for the road-system lakes and three surveys were conducted on McLees Lake during this time. Drone surveys were performed when the weather was ideal, which resulted in video of good quality and clarity. By surveying during optimal conditions, interference such as glare from the sun and waves on the water's surface were minimized. Drone video has the added benefit of allowing the reviewer to slow down and rewind video as needed to provide a more accurate count. Additionally, salmon species could typically be differentiated from other species without difficulty and reviewers were able to observe fish utilizing different parts of lakes and streams. As a result, the indices of escapement obtained from drone surveys are in many ways like those obtained from aerial surveys conducted from manned, fixed-wing aircraft.

Video files were sent to the ADF&G Division of Commercial Fisheries Kodiak office to be analyzed by management biologists post-season. Standardized methodology used for traditional aerial surveys flown

with a fixed-wing aircraft were used to calculate indices of escapement from drone video footage (Fox et al. 2022). The indexed total escapement for sockeye and coho salmon is the peak escapement count of live fish and carcasses. Due to a relatively short stream life, the indexed total escapement of pink salmon is calculated by assuming a 21-day stream life so that any stream counts 21 days or more prior to the peak count are added to the total count (Fox et al. 2022). However, survey dates did not target peak run timing for coho and pink salmon, so their estimates are minimum estimates. Survey data were entered into the ADF&G aerial survey database and escapement data will be published in the Department's 2022 Annual Management Report of the Aleutian Islands and Atka-Amlia Islands Management Areas.

In 2021, the total indexed escapement of sockeye salmon in Iliuliuk Lake was 540 fish, including 4 sockeye in the inlet stream, with a peak survey date of September 6. The outlet of the lake (Town Creek aka Iliuliuk Creek) was not surveyed which may explain the absence of coho for Iliuliuk surveys (Table 1). Total indexed escapement of sockeye salmon in Summer Bay Lake was 1,580 fish, including 483 salmon in the inlet stream, with the peak survey data occurring on September 5 (Table 2). Morris Cove Lake's total indexed escapement was 41 sockeye with the peak survey occurring on August 14. No salmon were observed in the inlet to Morris Cove Lake (Table 3).

The 2021 drone survey of McLees Lake showed a total indexed escapement of 13,170 sockeye, with the peak survey date being August 4, compared to a fixed-wing survey estimate of 6,000 fish on August 18 and the estimated escapement of 16,173 sockeye at the McLees Lake outlet weir which was pulled on July 28 (Table 4). Drone surveys of the Southeast and Southwest inlets of McLees had a total indexed escapement of 3,542 and 1,529 sockeye salmon respectively with the peak survey date of those systems being August 28. Inclusion of inlet streams for the 2021 survey made results more comparable to those obtained from the weir. ADF&G has received AKSSF funding for 2022 and 2023 to pair mark-recapture population estimates with drone surveys of McLees Lake to assess how drone indices of escapement compare to more traditional population estimate methods.

ADF&G and Aleutian Aerial LLC's partnership continues to improve efficacy and efficiency of surveys. Time necessary to review videos has declined while the quality of surveys and ability to enumerate salmon has increased since the first drone surveys in 2018. ADF&G suggests surveys continue in future years to compare variability in run strength and timing to help adequately assess salmon stocks. The remote location and unpredictable weather of this region makes it difficult to perform traditional fixed-wing aerial surveys. Thus, the data provided by Aleutian Aerial LLC surveys are invaluable.

## **REFERENCES CITED**

Fox, E. K. C., T. D. Lawson, and R. Renick. 2022. 2021 South Alaska Peninsula salmon annual management report and 2020 subsistence fisheries in the Alaska Peninsula, Aleutian Islands, and Atka-Amlia Islands management areas. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 4K.22-01, Kodiak.

Figure 1.– Map of Unalaska Island showing the location of McLees Lake, Unalaska (Iliuliuk) Lake, Summer Bay Lake, and Morris Cove Lake.

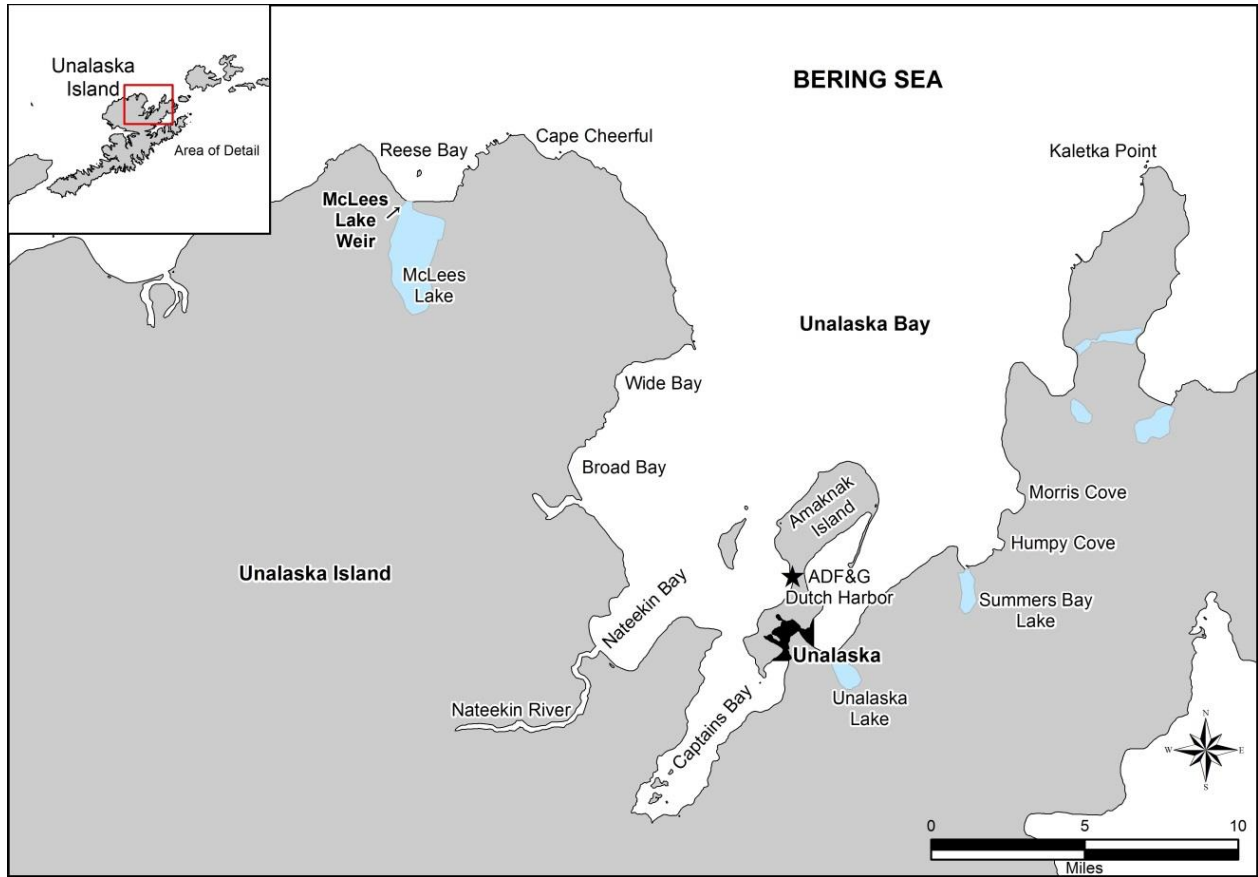


Table 1.– Total indexed salmon escapements by species and year for Iliuliuk (Unalaska) Lake drone surveys.

<b>Year</b>	<b>Sockeye Salmon</b>	<b>Pink Salmon<sup>a</sup></b>	<b>Coho Salmon<sup>b</sup></b>
2018	583	605	21
2019	350	25	0
2020	815	1,550	0
2021	540	515	0

Table 2.– Total indexed salmon escapements by species and year for Summer Bay Lake drone surveys.

<b>Year</b>	<b>Sockeye Salmon</b>	<b>Pink Salmon<sup>a</sup></b>	<b>Coho Salmon<sup>b</sup></b>
2018	3,622	4,105	201
2019	2,575	4,090	415
2020	4,507	7,454	33
2021	1,580	4,522	50

Table 3.– Total indexed salmon escapements by species and year for Morris Cove Lake drone surveys.

<b>Year</b>	<b>Sockeye Salmon</b>	<b>Pink Salmon<sup>a</sup></b>	<b>Coho Salmon<sup>b</sup></b>
2018	315	7	0
2019	376	0	0
2020	106	354	0
2021	41	97	17

Table 4.– Total indexed salmon escapements by species and year for McLees Lake.

<b>Year</b>	<b>Drone Survey Sockeye</b>	<b>Fixed-wing Survey Sockeye</b>	<b>Weir Count Sockeye</b>	<b>Drone Survey Pink<sup>a</sup></b>	<b>Drone Survey Coho<sup>b</sup></b>
2020	2,428 <sup>c</sup>	—	5,037	0	0
2021	13,170	6,010	16,173	306	150

<sup>a</sup> Pink salmon estimates are minimum estimates, as the surveyed area did not include all habitat used by pink salmon or were conducted prior to the peak of the run.

<sup>b</sup> Coho salmon estimates are minimum estimates, as surveys concluded prior to when coho salmon runs peak.

<sup>c</sup> Surveys did not include inlet streams where some sockeye salmon spawn.