

CITY OF UNALASKA
UNALASKA, ALASKA

RESOLUTION 2019-41

A RESOLUTION OF THE UNALASKA CITY COUNCIL AUTHORIZING FUNDING OF A PORTION OF THE COST TO CONDUCT AERIAL SALMON SURVEYS DURING 2019 BY ALEUTIAN AERIAL LLC IN THE AMOUNT OF \$5,200

WHEREAS, Unalaska residents and the Alaska Department of Fish and Game (ADF&G) are concerned that a lack of escapement estimates for sockeye salmon into Summer Bay, Morris Cove, and Iliuliuk Lake could jeopardize future opportunities for subsistence and sport fishing; and

WHEREAS, ADF&G no longer provides funding for estimating such escapement; and

WHEREAS, as a result of this concern, during 2018 the Unalaska Native Fishermen's Association (UNFA) provided funding to contract Aleutian Aerial LLC to conduct drone aerial surveys of sockeye salmon for Summer Bay, Morris Cove, and Iliuliuk drainages; and

WHEREAS, ADF&G stated that utilizing drone surveys as a method to estimate salmon escapement is a new and innovative technique that has potential to be a reliable and cost-effective data source, particularly in small river and lake systems that are accessible by road; and

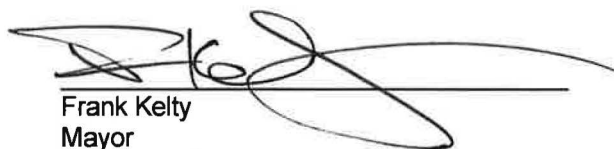
WHEREAS, ADF&G found the video provided to them by Aleutian Aerial LLC in 2018 to be sufficient for their purposes in estimating such escapement; and

WHEREAS, for the 2019 season, UNFA requested participation in funding the aerial salmon surveys from both the City of Unalaska and the Ounalashka Corporation, and requested \$5,200 from the City of Unalaska, pursuant to the attached proposal; and

WHEREAS, the City Council for the City of Unalaska believes that the aerial video surveys to be of benefit to the citizens of Unalaska in order to allow for subsistence and sport fishing seasons.

NOW THEREFORE BE IT RESOLVED that the City Council agrees to participate in the funding of aerial salmon surveys to be conducted during 2019 by Aleutian Aerial LLC in the amount of \$5,200, with funding coming from the Council Sponsorship Contingency line item of the City Council's FY20 budget.

PASSED AND ADOPTED by a duly constituted quorum of the Unalaska City Council on July 9, 2019.


Frank Kelty
Mayor

ATTEST:


Marjie Veeder
City Clerk



MEMORANDUM TO COUNCIL

To: City Council Members
From: Mayor Frank Kelty
Date: July 9, 2019
Re: Resolution 2019-41, authorizing funding of a portion of the cost to conduct aerial salmon surveys during 2019 by Aleutian Aerial, LLC, in the amount of \$5,200

SUMMARY: Passage of this resolution will approve \$5,200 to be taken from the Council's FY20 sponsorship contingency budget, to partner with the Unalaska Native Fishermen's Association (UNFA) and Ounalashka Corporation (OC), to cover the cost of aerial drone salmon surveys. The drone video will be provided to the Alaska Department of Fish and Game for analysis. I recommend that Council approve this funding by adoption of Resolution 2019-41.

PREVIOUS COUNCIL ACTION: Council discussed this topic during a work session on May 14, 2019.

BACKGROUND: Lack of escapement estimates for sockeye salmon into Summer Bay, Morris Cove, and Iliuliuk Lake could jeopardize future opportunities for subsistence and sport fishing for the residents of Unalaska. ADF&G no longer provides funding to conduct escapement surveys.

During the summer of 2018 UNFA provided funding to contract with Aleutian Aerial LLC to conduct drone aerial surveys of sockeye salmon for Summer Bay, Morris Cove, and Iliuliuk drainages. ADF&G stated that utilizing drone surveys as a method to estimate salmon escapement is a new and innovative technique that has potential to be a reliable and cost-effective data source, particularly in small river and lake systems that are accessible by road. Personnel at ADF&G found the video provided to them by Aleutian Aerial LLC in 2018 to be sufficient for their purposes in estimating such escapement.

UNFA requested funding participation from both the City of Unalaska and the Ounalashka Corporation, and is requesting \$5,200 from the City of Unalaska.

ALTERNATIVES: Council may choose to participate in funding the salmon surveys as requested; participate at a lower level of funding; or not participate at all.

FINANCIAL IMPLICATIONS: The FY20 council contingency line item contains sufficient funding to cover the \$5,200 requested.

LEGAL: None needed.

PROPOSED MOTION: I move to approve Resolution 2019-41.

ATTACHMENTS: Mayor's memo dated May 7, 2019
Aleutian Aerial proposal dated April 12, 2019
Letter from ADFG biologist dated April 18, 2019

Memorandum

To: Unalaska City Council Members,

CC: City Manager Thomas, Asst. Manager Reinders, City Clerk Veeder,

From: Mayor Frank Kelty,

Date: May 7, 2019

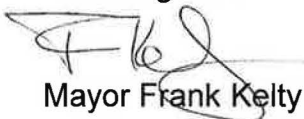
Subject: Funding assistance to Aleutian Aerial in the amount of \$5,200 for the second season of aerial drone salmon survey's work on the road system three nearshore waters, Unalaska Lake, Summers' Bay and Morris Cove salmon species.

I have been contacted Andy Dietrick, and I have attached his proposal asking for the City Council's assistance with the second season aerial surveys on the road system lakes. As you may recall last year's road system survey work was totally funded by the Unalaska Native Fishermen's Association (UNFA). This year's proposal is a joint venture between UNFA, and the Ounalashka Corporation (OC) they have already agreed to fund \$5,000 each; the cost to the City would be the above mentioned \$5,200.

The survey work videos are turned over to ADFG for their analysis, and last year's work was very well received by ADFG. I have included a letter from Lisa Fox; biologist from ADFG Kodiak, to UNFA with her overview of last year's work, and the salmon counts from all three lake systems that were surveyed. I believe it is very important to assist with this work as most of you know we have very little data on these road system lakes that our facing very small returns; so it is important to start building a data base on what is going on with these three lake systems.

In conclusion, I think it is very important to assist with this project, we all know that ADFG doesn't have funding available at this time to assist. I would hope the Council would be supportive of this joint venture to continue to get the data needed for ADFG. If the City Council is in support of funding a third of the costs for the survey work; I would bring a Resolution to take the \$5,200 from Council Contingency from FY 2020 funding, at the first Council meeting in July. I look forward to the Councils discussion, on this important issue. I believe Mr. Dietrick will be calling in to this meeting to answer any question on the project.

Best Regards



Mayor Frank Kelty



ALEUTIAN AERIAL

Aleutian Aerial LLC
PO Box 53
Unalaska, Alaska 99685
907.957.1680
andy@aleutianaerial.com

April 12, 2019

To: Unalaska City Council

Re: **2019 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, 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). UNFA funded the data collection and the Alaska Department of Fish and Game (ADF&G) provided biologist' time to analyze and report on the data. ADF&G is supportive of using sUAS technology for this type of salmon counting.

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 of Unalaska Lake, Summer Bay Lake, and Morris Cove Lake – aerial pictures attached.

Scope of Work and Schedule of Values:

Aleutian Aerial has the financial and technical resources, capability, and in-house capacity to successfully perform this data collection.

The following rates are applicable to this project:

- Project execution including aerial media acquisition, quality check, and creation of deliverables for analysis by Alaska Department of Fish and Game (ADF&G) biologists. As advised by ADF&G, this will include four (4) sets of data from each lake, taken at regular intervals between mid-August and the end of September (as allowed by Mother Nature). This includes daily weather monitoring to capitalize on available weather windows throughout the duration of the project.
\$15,200

Seeking multiple funding sources. This request for the City of Unalaska is \$5,200.

Note: This is a reduction of approximately 10% from the 2018 cost of \$16,950. In 2018, part of the cost went to specific planning and preparation for the initial year's surveys. We are able to use that knowledge again this year and do not need to charge for it again.

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 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 USB drive.
- It is understood media acquisition will be performed on different days due to weather, aircraft, and lighting limitations.
- Aleutian Aerial agrees to make a good faith effort to take advantage of flyable weather windows as soon as a contract has been negotiated and signed. It is the intent to complete this project as soon as practicable and reasonable within the constraints of previous committed contracts and Mother Nature.
- 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. Aleutian Aerial will hold this proposal open for 30 days from the date of the Proposal. 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
907.957.1680



MEMORANDUM

TO: Unalaska Native Fishermen's Association

DATE: April 18, 2019

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

PHONE: (907) 486-1882

SUBJECT: Escapement Estimates using
Drone Surveys on Unalaska road-system
salmon streams

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

Local Unalaska residents and the Alaska Department of Fish and Game (ADF&G) are concerned that a lack of escapement estimates for sockeye salmon *Oncorhynchus nerka* into Summer Bay, Morris Cove, and Iliuliuk lakes could jeopardize the health of the run as well as future opportunities for subsistence fishing. As a result of this concern, the Unalaska Native Fishermen's Association (UNFA) provided funding to contract Aleutian Aerial LLC to conduct drone aerial surveys of sockeye salmon for Summer Bay, Morris Cove, and Iliuliuk drainages in the 2018 season.

With funding provided by UNFA, drone surveys were flown and video recorded by Aleutian Aerial LLC to capture sockeye salmon abundance in Summer Bay, Morris Cove, and Iliuliuk lakes. These surveys were conducted when the weather was optimal (good visibility and low wind) in Dutch Harbor. The video files were sent to the ADF&G Commercial Fisheries Division to be counted post season. ADF&G did not receive any funds from UNFA for this service.

Aleutian Aerial LLC was contracted to fly four drone surveys on each lake in 2018 in order to characterize the peak of the sockeye salmon run in each system. This expectation was exceeded, as six drone surveys were conducted on Iliuliuk Lake and five surveys were conducted on both Summers Bay and Morris Cove lakes. Drone survey footage was reviewed, and sockeye salmon were enumerated by South Alaska Peninsula and Aleutian Islands biologists. The surveys were uploaded into the Kodiak ADF&G database and the escapements will be published in the Department's 2019 Annual Management Report of the Aleutian Islands and Atka-Amlia Islands Management Areas.

Aerial surveys flown with a drone are similar to traditional aerial surveys flown with a fixed-wing aircraft and would be considered scientifically defensible in the same manner. Standardized

methodology used to create escapement estimates from traditional aerial surveys flown with a fixed-wing aircraft (Fox et al. 2018) were used to create escapement estimates from drone video footage. Escapement of sockeye salmon was estimated using drone survey peak counts. Aleutian Aerial LLC conducted drone surveys on the three Unalaska road-system lakes between August 15 and September 18, 2018. Aleutian Aerial was able to schedule surveys around good weather days, which resulted in video of good quality and clarity. By surveying during optimal conditions, interference such as glare from the sun and wind waves on the water's surface was minimized. The drone video has the added benefit of allowing the reviewer to slow down and rewind the video as needed to provide a more accurate count. Additionally, salmon species could be differentiated from other salmon species without difficulty. Video reviewers were able to observe fish utilizing different parts of the lake during different survey times. Salmon were observed on spawning grounds and in schools near tributary mouths and in deeper parts of the lake. Since the drone survey video was of good quality, reviewers were able to provide adequate sockeye salmon escapement estimates comparable to aerial surveys conducted from manned, fixed-wing aircraft.

The Iliuluk Lake sockeye salmon escapement estimate was 583 fish, the Summer Bay Lake sockeye salmon escapement estimate was 3,622 fish, and the Morris Cove Lake sockeye salmon escapement estimate was 315 fish (Table 1). Pink salmon *O. gorbuscha* and coho salmon *O. kisutch* that were observed during the drone surveys were also tallied, and peak counts for these species are summarized in Table 2. The observed pink salmon escapement is likely an underestimate, as pink salmon were observed heading upstream from the lakes which was outside of the scope of the survey. Additionally, coho salmon have a later run timing in comparison to sockeye salmon. The coho salmon that were observed in each lake were likely the beginning of the run and counts during the peak of the run were not captured. Therefore, the coho salmon escapement observed is an underestimate of the total run.

Utilizing drone surveys as a method to estimate salmon escapement is a new and innovative technique that has potential to be a reliable and cost-effective data source, particularly in small river and lake systems that are accessible by road. However, this technique is still being developed, and there is some room for improvement and possible expansion. Although all the drone video was of good quality and sufficient to provide escapement estimates, during video review the ADF&G reviewer took note to highlight drone video of exceptional quality. If drone surveys are utilized to create salmon escapement estimates in future years, ADF&G and Aleutian Aerial LLC would be able to work together to optimize the efficacy and efficiency to shorten the time needed to review video post-season. Additionally, escapement estimates of other salmon species in the Unalaska road-system lakes could be completed if the survey area was expanded to include upstream tributary waters as well as the stream terminus where the freshwater enters the bay. It was apparent that pink salmon utilized upstream tributaries above the lakes, and it is possible that sockeye salmon utilize these areas as well. The drone surveys conducted on Summer Bay, Iliuluk, and Morris Cove lakes were a good utilization of developing technology to provide information on systems that have proven difficult to enumerate in the past with traditional fixed-wing aircraft. Additional years of surveys to compare variability in run strength and timing are needed to assess the salmon stocks in these lakes further.

TABLES

Table 1.—2018 Sockeye Salmon Indexed Total Escapement

Lake Name	Sockeye Salmon Escapement
Iliuliuk Lake (Unalaska Lake)	583
Summer Bay Lake	3,622
Morris Cove Lake	315

Table 2.—2018 Pink salmon and coho salmon minimum escapement

Lake Name	Pink Salmon Escapement ^a	Coho Salmon Escapement ^b
Iliuliuk Lake (Unalaska Lake)	605	21
Summer Bay Lake	4,105	201
Morris Cove Lake	7	0

^a Pink salmon estimates are underestimates. The surveyed area did not include all habitat used by pink salmon.

^b Coho salmon estimates are underestimates. Surveys are not flown during peak coho salmon abundance.

REFERENCES CITED

Fox, E.K.C., L.K. Stumpf, and C.J. Whiteside. 2018. South Alaska Peninsula salmon annual management report, 2018 and the 2017 subsistence fisheries in the Alaska Peninsula, Aleutian Islands, and Atka-Amlia Islands management areas. Alaska Department of Fish and Game, Regional Information Report No. 4K19-01, Kodiak.

Attachment #1: Unalaska Lake Overview



Unalaska Lake details:

Approximate length – 1.8 miles

Approximate width – 0.60 miles

Approximate perimeter – 1.8 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

Attachment #3: Morris Cove Lake Overview



Morris Cove Lake details:

Approximate length – 0.40 miles

Approximate width – 0.20 miles

Approximate perimeter – 1.1 miles