
**Alaska Department of Fish and Game Report to the Kodiak-
Aleutian Islands Subsistence Regional Advisory Council: Buskin
River Sockeye Salmon Fishery and Stock Assessment Project
Update through July 31, 2022**

**By
Mark Witteveen**



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Division of Sport Fish

INTRODUCTION

The Buskin River drainage, located on Kodiak Island approximately 2 miles southwest from the city of Kodiak, traditionally supports the single largest subsistence salmon fishery within the Kodiak/Aleutian Islands Region in federal waters. The fishery occurs in nearshore marine waters adjacent to the river mouth and targets several species of salmon (Table 1). Sockeye salmon typically comprise about 70% of the total subsistence harvest (Table 1), but due to low runs in the past several years, the most recent 5-year average is 55% sockeye salmon. Between 2017 and 2021, federally qualified subsistence users harvested an average of 1,607 Buskin River sockeye salmon, which accounted for 20% of the total federal subsistence sockeye salmon harvest reported for Kodiak Island (Table 2).

During 2008 and 2009, low sockeye salmon escapement on the Buskin and closure of the subsistence fishery prompted subsistence users to fish elsewhere. Participation and harvests have been sporadic since then, corresponding with variable sockeye salmon runs to the Buskin River drainage (Table 3). During 2018, the Buskin River sockeye salmon run was well below average and virtually no subsistence harvest occurred. In 2019 and 2020, the sockeye salmon run rebounded; however, it was still lower than previous years. During 2021, the sockeye salmon was the lowest on record and escapement failed to meet the lower end of the goal despite subsistence, sport, and commercial fisheries closures. Historically, 40 to 50% of the sockeye salmon harvest in the Kodiak area has come from the Buskin fishery and half of all permit holders in the region report fishing the Buskin area.

Table 1.- Buskin River drainage reported subsistence salmon harvest by species, 2017-2021^a.

Year	Permits	Reported Subsistence Harvest									
		<u>Chinook</u>		<u>Sockeye</u>		<u>Coho</u>		<u>Pink</u>		<u>Chum</u>	
		No. Fish	% of Total	No. Fish	% of Total	No. Fish	% of Total	No. Fish	% of Total	No. Fish	% of Total
2017	242	11	<1%	4,916	93%	300	6%	60	1%	6	<1%
2018	108	1	<1%	473	29%	1,107	69%	26	2%	0	0%
2019	111	4	<1%	836	62%	340	25%	145	11%	31	0%
2020	163	8	<1%	1,620	64%	760	30%	152	6%	4	0%
2021	52	0	<1%	188	26%	516	73%	7	1%	0	0%
Average	135	5	<1%	1,607	55%	605	40%	78	4%	8	<1%

^a Source: ADF&G Division of Commercial Fisheries, Kodiak. 2022 data unavailable.

Table 2.- Kodiak Area reported federal subsistence harvest of sockeye salmon by location, 2017-2021^a.

Location	2017	2018	2019	2020	2021	2017-2021 avg.
Buskin River	4,916	473	836	1,620	188	1,607
Old Harbor/Sitkalidak	298	20	67	73	43	100
Alitak Bay	495	204	262	125	185	254
Karluk	107	152	72	2,245	1,126	740
Larsen Bay/Uyak Bay	410	866	504	533	559	574
Uganik Bay	277	245	291	44	202	212
Afognak Bay	1,882	483	1,026	1,329	934	1,131
Remainder Afognak Island	2,050	1,392	1,094	1,971	1,155	1,532
Total	10,435	3,835	4,152	7,940	4,392	7,902

^a Source: ADF&G Division of Commercial Fisheries, Kodiak. 2022 data unavailable.

Table 3.- Federal subsistence harvest locations in the Kodiak Area by number of permits fished, 2017-2021^a.

Location	2017	2018	2019	2020	2021	2017-2021 avg.
Buskin River	242	108	109	163	52	135
Old Harbor/Sitkalidak	15	8	3	6	1	7
Alitak Bay	6	6	6	2	2	4
Karluk Village	5	4	3	18	7	7
Larsen Bay/Uyak Bay	16	18	12	22	21	18
Uganik Bay	16	20	17	2	2	11
Afognak Bay	79	50	66	71	54	64
Remainder Afognak Island	35	34	17	36	25	29
Number issued	1,429	1,289	1,205	1,324	1,080	1,265

^a Source: ADF&G Division of Commercial Fisheries, Kodiak. 2022 data unavailable.

In 2000, in order to ensure sustained sockeye salmon production over time, a stock assessment study was initiated by Alaska Department Fish and Game (ADF&G) on the Buskin River. It was funded by the United States Fish and Wildlife Service, Office of Subsistence Management with the goal to establish a Biological Escapement Goal (BEG) for the sockeye salmon run on the Buskin River. The BEG is based on a population model which incorporates annual escapement and harvest figures with the age composition of annual returns to estimate the total production of each year of spawning (known as a brood table). Samples of male to female ratios, average length and age classes are collected each year over the course of the run from the escapement and the subsistence harvest. The current escapement goal range is set at 5,000 - 8,000 sockeye salmon and is used for management of the subsistence, sport, and commercial fisheries to ensure a sustained yield from the population. An annual sockeye salmon escapement objective for Catherine and Louise lakes (reported as Lake Louise) has not been established.

Sockeye salmon escapements are annually enumerated through inseason counts of adult fish migrating into the drainage. A salmon counting weir located on Buskin River has been operated by ADF&G for this purpose since 1985. In 2002 through 2021, a second weir was installed on a tributary stream flowing into the Buskin River from Catherine and Louise Lakes. Escapement through the second weir into Louise Lake was sporadic and generally small and was not included in funding for the 2022-2025 project cycle.

2022 PROGRESS REPORT

ESCAPEMENT

Through July 31, the count of sockeye salmon at the Buskin River was 7,427 fish. This is near the upper range of the escapement goal range of 5,000 to 8,000 fish (Figure 1) and will likely exceed the goal by the end of the season. The Buskin River weir, located at the outlet of Buskin Lake, was operational on May 16 and was removed on August 3. A weir associated with a separate project was installed in the lower portion of the river on August 1 and sockeye salmon continued to be counted at the time of this writing. The 2022 run started fairly slow and the subsistence, sport, and commercial fisheries were closed for a period of about 3 weeks during June (Figure 2).

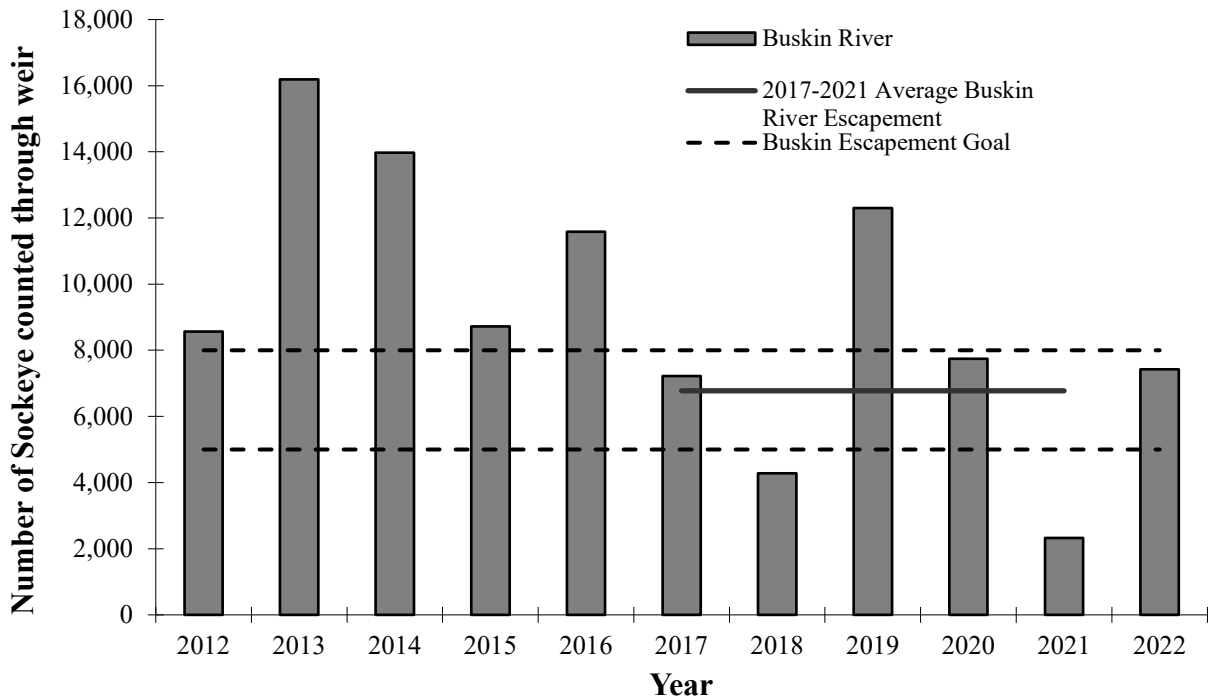


Figure 1.- Buskin River sockeye salmon escapement, 2012-2022.

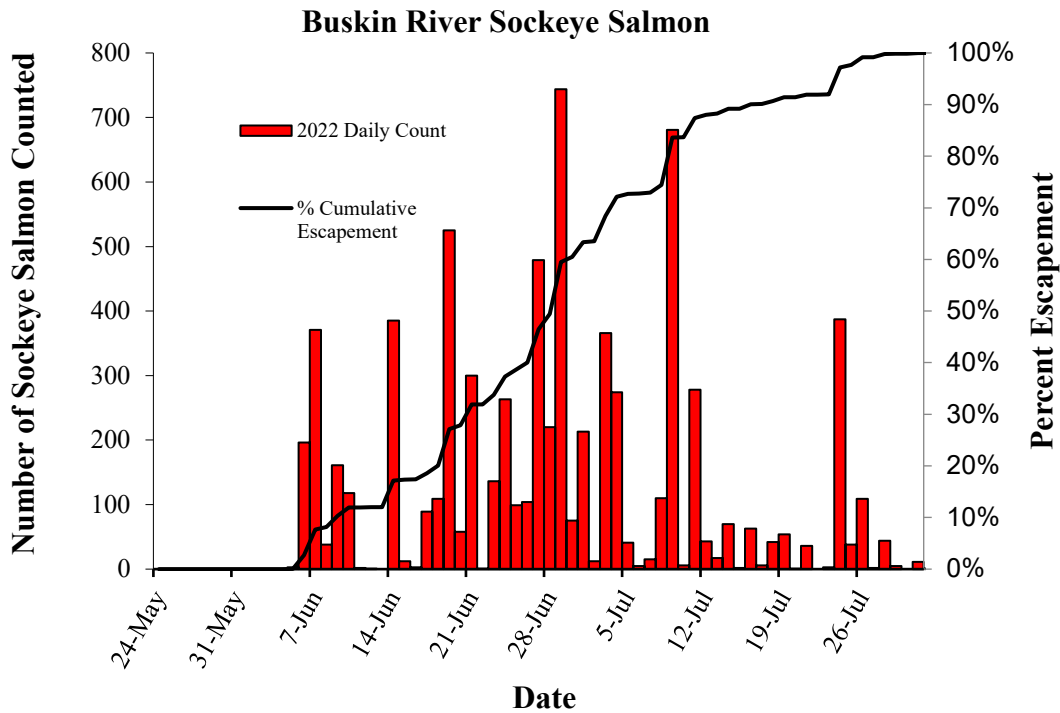


Figure 2.- Daily and cumulative sockeye salmon weir counts into Buskin Lake through July 31, 2022.

The Lake Louise tributary weir was monitored in the previous budget cycle of this project; however, a weir was not installed as part of the current budget cycle. In occasional observations of the tributary very few fish were observed, even during high water events.

Emergency orders were issued in early June 2022 closing Buskin River sockeye salmon for subsistence, sport, and commercial fishing; however, increased escapements resulted in the emergency orders being rescinded about 3 weeks later.

STOCK ASSESSMENT- 2022 RESULTS

Samples and data collected from the 2021 season were analyzed during the spring of 2022. The escapement goal was reviewed and details are provided in the final report for the previous budget cycle (Stock Assessment of Sockeye Salmon in the Buskin River, 2018–2021). A spawner-recruit analysis was used to assess the Buskin Lake sockeye salmon BEG using four additional years of data. The analysis indicated that an escapement range of about 4,300 to 8,000 fish would provide for sustained yields within 90% of maximum sustained yields with 90% or greater probability. While the lower end of the escapement goal range was slightly lower than the current 5,000 fish, it was recommended to retain the current BEG of 5,000 to 8,000 fish.

Data was collected for further future stock assessment during 2022. Temporal sample goals were exceeded with a total of 401 fish sampled for age, sex, and length (goal: 320). Data summarization and scale aging is currently underway, so no age information for 2022 is available at this time.

The 2021 Buskin River sockeye salmon escapement was primarily composed of age-1.3 fish at 54.3% of the escapement followed by age-1.2 (24.6%), age-2.3 (13.1%), and age-2.2 (6.5%). Female sockeye salmon averaged 492 mm (mid-eye to tail-fork), only slightly smaller than the 2016-2020 average of 494 mm. Similarly, males on average were 509 mm which was slightly below the recent five-year average size of 512 mm.

CAPACITY BUILDING

Since 2003, the Buskin River project has been a vehicle for fisheries-based education and development of career interests for young subsistence users through establishment of a high school intern program. During this internship, students gain knowledge of the principles involved in fisheries management and research while obtaining field experience in fisheries data collection methods and techniques. The intern program annually employs two top qualified students who work on the Buskin project under supervision of ADF&G staff between June 8 and August 8; however, there was only one applicant this season. The high school intern program has had outstanding success, to the extent that at least six former interns are currently employed with ADF&G as seasonal Fish and Wildlife Technicians or Fisheries Biologists, and 22 of 33 former interns have returned to work for the Department at some point.

CONCLUSION

The 2022 season was slightly below average and anecdotal information suggested that subsistence fishing pressure was very low. Timing of the run was fairly typical but escapement was sporadic (Figure 2). While no formal forecasting is calculated for the Buskin River sockeye salmon run, it appears that the 2022 run was similar to the informal estimate. Sport and subsistence harvests have yet to be estimated, so total run information is not available.

The new component of this project includes scale measurement to estimate growth at various life stages and to explore that variability with climate conditions. Equipment will be purchased this fall and scale measurement will begin this winter. Over the course of the 4 years of this funding cycle, scales collected during previous years will be measured for growth.

It is important to note that the Buskin River sockeye salmon run size has been on a decreasing trend over the past 20 years or so. The causal factors for this decline is unknown and further investigation will be beneficial.

Annual implementation of the Buskin River sockeye salmon weir project, made possible with funding from the Fisheries Research Monitoring Program, has been essential for inseason management that is necessary to sustain the health of the Buskin River sockeye salmon stock while providing maximum harvest opportunity for subsistence users. Continuation of this project will allow for additional analysis of run productivity to aid in the ongoing assessment of sockeye salmon returns to the Buskin River. It will also aid in refining the BEG concurrent with triennial Board of Fisheries meetings, as in the 2011 cycle when the goal was changed as a direct result of this project.