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Summary of Alaska's 2021 Pacific Salmon Escapement and Commercial Harvest

by

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Abstract

Since 1959, Alaska has used spawning escapement goal-based management of its Pacific salmon stocks and in 2000 codified escapement goal management into regulation. Annually, the Alaska Department of Fish and Game produces a report on statewide salmon escapements and associated escapement goals as well as a season summary and forecast report for commercial salmon fisheries. This report provides a summary of commercial salmon harvests and achievement of salmon escapement goals in 2021 based upon these reports.

Introduction

The Alaska Department of Fish and Game (ADF&G) manages salmon fisheries to achieve spawning escapement goals or targets that provide sustained yields and ensure long-term viability of salmon stocks. Escapement is defined as the number of salmon that "escape" fisheries (i.e., are not harvested) and return to fresh water to spawn. When Alaska gained statehood in 1959, escapement goal-based management was adopted and enshrined in the Alaska State Constitution and State Statue. Alaska adopted its first written escapement goal policy in 1992, and in 2000 escapement goal management was codified into regulation as the Policy for the Management of Sustainable Salmon Fisheries (5 AAC 39.222) and the Policy for Statewide Salmon Escapement Goals (5AAC 39.223). The sustainable salmon fisheries policy is a comprehensive policy for the regulation and management of sustainable fisheries management in Alaska and provides a framework of roles and responsibilities of the Alaska Board of Fisheries (the regulatory body) and ADF&G (the management and research agency). The escapement goal policy outlines the concepts, criteria, and procedures for establishing and modifying salmon escapement goals in Alaska and establishes a process that facilitates public review of allocative issues associated with salmon escapement goals. An overview of the methods that ADF&G uses to assess salmon escapement can be found in Volk and Munro (2015). Brief descriptions of the methods used to develop escapement goals can be found in the annual statewide escapement and escapement goal report (e.g., Munro and Brenner 2021), which includes references to more detailed descriptions and application within Alaska.

ADF&G produces an annual report on statewide salmon escapements and escapement goals (e.g., Munro and Brenner 2021) as well as an annual season summary and forecast report for commercial salmon fisheries (e.g., Brenner et al. 2021). ADF&G also collects

data on sport and subsistence harvest of salmon each year that are provided to NPAFC for inclusion in the annual statistics (https://npafc.org/statistics/), although these harvest estimates are lagged by one year because of the time it takes to compile the data. The report presented here provides a summary of commercial salmon harvests and achievement of salmon escapement goals in 2021 based upon these reports, which contain more details and interpretation.

Commercial Harvest

The commercial harvest of salmon in Alaska for 2021 totaled almost 235.0 million fish, about 24% more fish than the preseason forecast of 190.1 million fish (Brenner et al. *in press*). The 2021 harvest was composed of 275,500 Chinook salmon *Oncorhynchus tshawytscha*, 57.1 million sockeye salmon *O. nerka*, 2.8 million coho salmon *O. kisutch*, 161.4 million pink salmon *O. gorbuscha*, and 13.2 million chum salmon *O. keta* (Table 1). Chinook salmon were primarily harvested in Southeast Alaska (82%), as were coho salmon (56%), whereas most sockeye salmon were harvested in Bristol Bay (73%). Pink salmon were harvested primarily in Prince William Sound management area (41%), followed by Southeast Alaska (30%) and the areas of major commercial chum salmon harvest were Southeast Alaska (56%), South Alaska Peninsula (30%), and Prince William Sound (20%). Figures 2 through 6 show recent trends (2001–2021) in commercial salmon harvest by species and more detail can be found in Brenner et al. (*in press.*).

Achievement of Escapement Goals

In 2021 there were 264 salmon escapement goals in Alaska and 220 of the systems with escapement goals were successfully assessed for escapement (Table 2, Munro and Brenner *in prep.*). Overall, 70% of the escapement goals were achieved or exceeded—up from 65% in 2020, but 2% lower than the previous 5-year average. Achievement of escapement goals in 2021 increased for all species, compared to 2020, but remained low for Chinook and chum salmon. A summary by species is as follows:

Chinook salmon—In 2021, 51% of the escapement goals were met for Chinook salmon (Figure 2) compared to a recent high of 72% in 2019 and a 5-year average of 53%.

Sockeye salmon—Within Alaska, 81% of the sockeye salmon escapement goals were achieved in 2021 (Figure 3), this was an increase from 76% in 2020, but lower than the 5-year average of 83%.

Coho salmon—Achievement of escapement goals for coho salmon in 2021 increased to 82% compared to the previous 3 years where achievement of coho salmon escapement goals was a little over 70% (Figure 4).

Pink salmon—The percentage of pink salmon escapement goals met in 2021 was 94% (Figure 5), an 8% increase from 2020 and the 5-year average of about 83%.

Chum salmon—For chum salmon, 47% of the escapement goals were met in 2021 (Figure 6), which was a 2% increase from the low in 2020.

Additional details by management area and species for 2021 can be found in Table 2 and historical information in Munro and Brenner (*in prep.*).

Summary by Species

Chinook salmon—Chinook salmon runs continue to be poor throughout the state. This is reflected in the low proportion of escapement goals met in 2021 (Figure 2) and harvests that were below the 10-year averages across the state. For example, commercial harvest was the 10th lowest in the past 59 years in Southeast Alaska and 2nd lowest since statehood in Copper River (see Brenner et al. *in press*). Conservation measures for commercial, sport, and subsistence fisheries continue to be implemented to try to provide enough spawning fish to achieve escapement goals. 2021 marked the 14th consecutive year that there were no commercial fishery openings for Chinook salmon in the Yukon management area.

Sockeye salmon—Sockeye salmon runs were variable in Alaska in 2021. In major sockeye-producing areas, at least 65% of the escapement goals were met or exceeded (Table 2), with over 80% of the escapement goals achieved statewide (Figure 3). Bristol Bay sockeye salmon continue to be abundant with 2021 being the largest run (67.7 million fish) and third largest commercial harvest on record with all escapement goals met or exceeded (see Brenner et al. *in press*). In contrast, Copper River had the 7th smallest commercial harvest since 1976, and the runs to the Karluk and Chignik rivers were below average to weak. Sockeye salmon runs were late for both the Kenai and Kasilof rivers (8 and 3 days, respectively) and the average weight of Copper River sockeye in the commercial harvest continues to be lower than the historical average (see Brenner et al. *in press*).

Coho salmon—Coho salmon runs are generally difficult to assess in Alaska because of their late timing, but in 2021 the commercial harvest continued to be below average across the state. For example, harvest in Southeast Alaska was the 11th lowest since 1962 (see Brenner et al. *in press*). Although there was a slight increase in commercial harvest in 2021 compared to 2020, the proportion of escapement goals achieved also increased (Figure 4).

Pink salmon—Pink salmon are a major component of the commercial salmon fishery in Alaska. The 2021 commercial harvest was 30% above the preseason forecast and 32.8 million fish more than in 2019 (see Brenner et al. *in press*). Escapement goals were achieved throughout much of the state with over 94% being met or exceeded (Figure 5).

Areas, such as Norton Sound, continue to see strong pink salmon returns and increased harvest because of interest from buyers (see. Brenner et al. *in press*).

Chum salmon—Chum salmon runs were generally poorer than expected throughout Alaska in 2021, resulting in some fisheries being restricted or closed to try to meet escapement goals. Despite actions to restrict harvest, less than 50% of the escapement goals were achieved (Figure 6) and escapements for some systems were the lowest on record. As an example, chum salmon runs in western Alaska were extremely low and there were no commercial fisheries openings for summer or fall chum on the Yukon River and subsistence fisheries were also closed (see Brenner et al. *in press*). In addition, it was noted that the Yukon River summer chum run was estimated to be 9 days later than average (see Brenner et al. *in press*).

Acknowledgements

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References

Brenner, R.E., S.J. Larsen, A.R. Munro, and A.M. Carroll, editors. 2021. Run forecasts and harvest projections for 2021 Alaska salmon fisheries and review of the 2020 season. Alaska Department of Fish and Game, Special Publication No. 21-07, Anchorage.

Brenner, R.E., S.J. Larsen, and A.R. Munro, editors. *In press*. Run forecasts and harvest projections for 2022 Alaska salmon fisheries and review of the 2021 season. Alaska Department of Fish and Game.

Munro, A.R., and R.E. Brenner. 2021. Summary of Pacific salmon escapement goals in Alaska with a review of escapements from 2012 to 2020. Alaska Department of Fish and Game, Fishery Manuscript Series No. 21-05, Anchorage.

Munro, A.R., and R.E. Brenner. *In prep*. Summary of Pacific salmon escapement goals in Alaska with a review of escapements from 2013 to 2021. Alaska Department of Fish and Game, Anchorage.

Volk, E.C., and A.R. Munro. 2015. Pacific Salmon Escapement Estimation Methods and Data for Alaska NPAFC Doc. 1588. 22 pp. Alaska Department of Fish and Game (Available at https://npafc.org).

Table 1. 2021 Alaska commercial salmon harvests, by fishing area (see Figure 1) and species, in thousands of fish (from Brenner et al. *in press*).

	Species					
Fishing area	**Chinook**	**Sockeye**	**Coho**	**Pink**	**Chum**	**Total**
Southeast Region Total[a,b,c]	226	1,124	1,568	48,534	7,416	58,868
Prince William Sound[a,d]	9	1,345	263	66,404	2,690	70,712
Lower Cook Inlet[a,e,f]	0	267	3	1,971	27	2,269
Upper Cook Inlet[f,g]	4	1,411	148	81	70	1,714
Bristol Bay[g]	7	41,979	48	4	204	42,242
Central Region Total	20	45,002	462	68,461	2,992	116,937
Kodiak Area[f,g]	9	3,291	306	26,180	409	30,196
Chignik[g]	1	119	84	1,321	43	1,569
South Peninsula[f,g]	14	4,599	333	16,550	2,241	23,736
North Peninsula	2	2,878	25	63	28	2,996
Westward Region Total	27	10,887	749	44,115	2,722	58,498
Arctic-Yukon-Kuskokwim Region Total[f,g]	3	115	21	290	109	538
Total Alaska	275	57,128	2,801	161,399	13,238	234,841

Note: Missing data indicates no harvest, and zeros indicate harvest activity but <500 fish.

Note: Columns may not total exactly due to rounding.

Note: Confidential data omitted

[a] Chinook salmon adults and jacks are totaled.

[b] Catch accounting period for the 2021 Chinook salmon troll season spans from October 1, 2020, to September 30, 2021.

[c] Total includes fish that were confiscated, harvested in sport fisheries derbies and later sold, and test fishery harvest.

[d] Total includes hatchery sales for operating expenses and broodstock harvests.

[e] Total includes hatchery sales for operating expenses and hatchery donated fish but not broodstock.

[f] Total includes commercially harvested fish retained for personal use.

[g] Total includes commercial harvest that was discarded, confiscated, seized, or donated.

Table 2. 2021 Alaska Department of Fish and Game achievement of escapement goal objectives, by fishing areas (see Figure 1), and species (data from Munro and Brenner *in prep.*).

			Number of Systems			Percent
Region	**Area**	**Species**	**Under range**	**Within range**	**Over range**	**Within or over goal range**
Region 1	Southeast Alaska	Chinook	4	5	2	64%
		sockeye	3	2	7	75%
		coho	2	6	2	80%
		pink		2	1	100%
		chum	4	3	1	50%
			13	**18**	**13**	**70%**
Region 2	Upper Cook Inlet	Chinook	6	6	1	54%
		sockeye		2	5	100%
		coho		1	1	100%
		chum			1	100%
	Lower Cook Inlet	Chinook		2		100%
		sockeye	3	2	3	63%
		pink	2	8	8	89%
		chum	3	4	5	75%
	Bristol Bay	Chinook	1			0%
		sockeye		3	6	100%
		coho				NA
		pink				NA
		chum	1			0%
	Prince William Sound	sockeye	1		1	50%
		pink		3	5	100%
		chum	4	1		20%
	Copper/Bering River	Chinook	1			0%
		sockeye	1	2		67%
		coho		2		100%
			23	**36**	**36**	**76%**
Region 3	Yukon River	Chinook	4			0%
		coho	1			0%
		chum (fall)	5			0%
		chum (summer)	3			0%
	Kuskokwim	Chinook		5		100%
		sockeye		1	2	100%
		coho		1		100%
		chum	1			0%
	Norton Sound	Chinook	2			0%
		sockeye	1			0%
		coho				NA
		pink		3		100%
		chum	2	2		50%
	Kotzebue	chum				NA
			19	**12**	**2**	**42%**

Table 2. (Continued)

	Area	Species	Number of Systems Under range	Within range	Over range	Percent Within or over goal range
Region 4	Kodiak	Chinook	2			0%
		sockeye	3	5	4	75%
		coho	1	3		75%
		pink		2		100%
		chum		1		100%
	Chignik	Chinook	1			0%
		sockeye	1	1		50%
		pink			1	100%
		chum			1	100%
	South Alaska Peninsula	sockeye	1	1	1	67%
		pink			1	100%
		chum		1	2	100%
	North Alaska Peninsula	Chinook		1		100%
		sockeye		5	4	100%
		coho		2		100%
		chum	2			0%
	Aleutian Islands	sockeye		1		100%
			11	**23**	**14**	**77%**
Statewide Totals			**66**	**89**	**65**	**70%**

Note: Escapement goals that are only a lower-bound threshold (known as lower-bound sustainable escapement goals in Alaska) were classified as "within goal" if escapement was above the goal.
Note: Region 1 = Southeast Alaska, Region 2 = Central Region; Region 3 = Arctic-Yukon-Kuskokwim Region; Region 4 = Westward Region.

Figure 1. Map of Alaska fishery management regions and management areas for the Alaska Department of Fish and Game, Division of Commercial Fisheries.

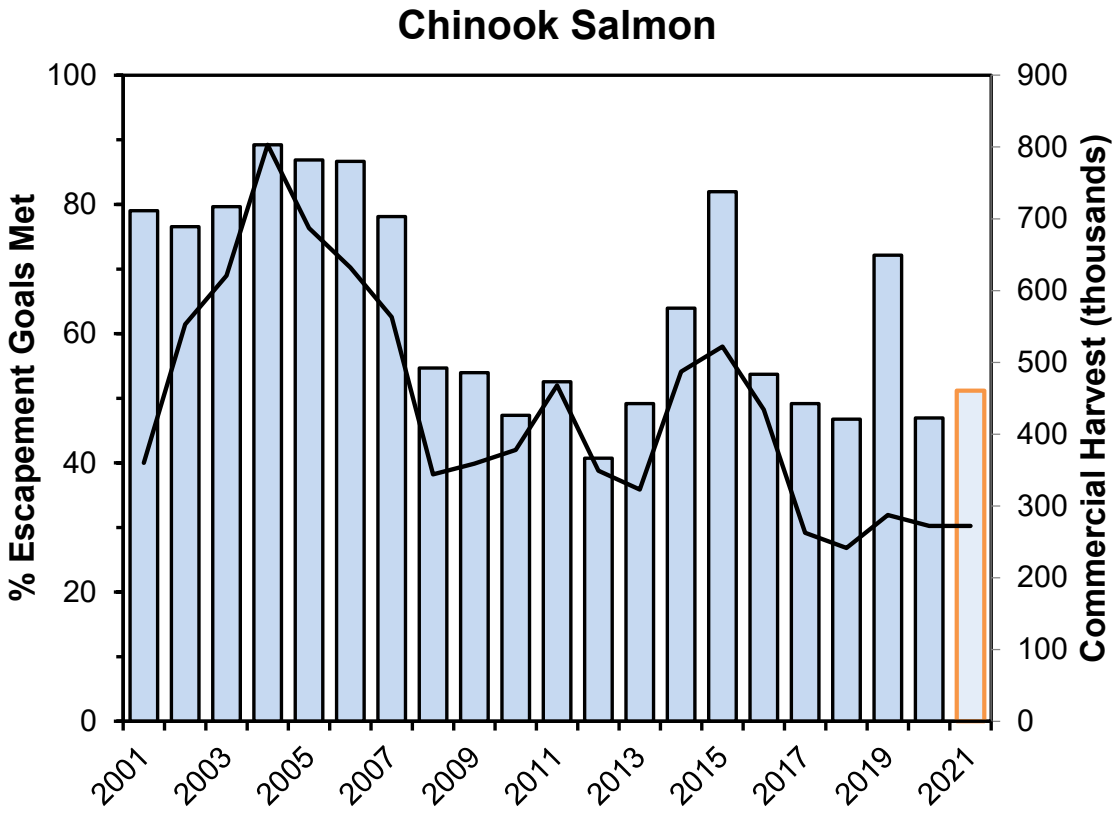

Figure 2. Percent of Chinook salmon escapement goals met or exceeded in Alaska from 2001 to 2021 (primary axis; bars) and Alaska commercial harvest in thousands of fish from 2001 to 2021 (secondary axis; black line).

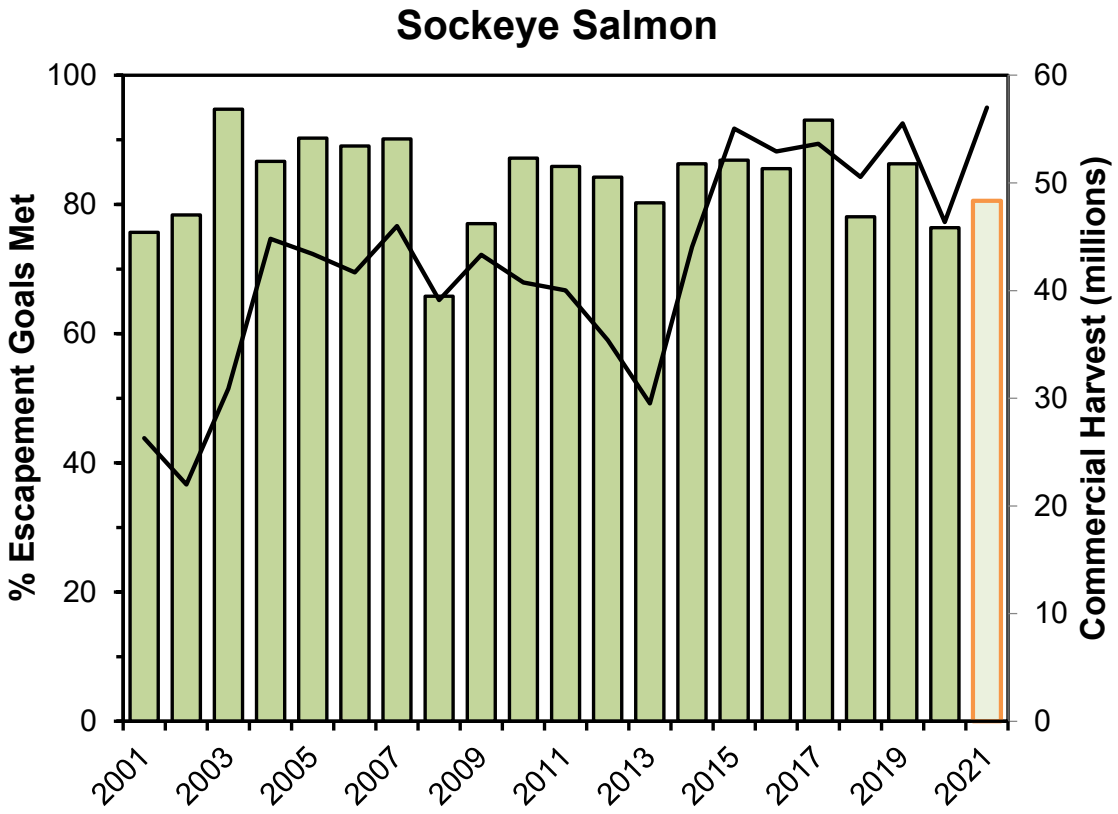

Figure 3. Percent of sockeye salmon escapement goals met or exceeded in Alaska from 2001 to 2021 (primary axis; bars) and Alaska commercial harvest in millions of fish 2001 to 2021 (secondary axis; black line).

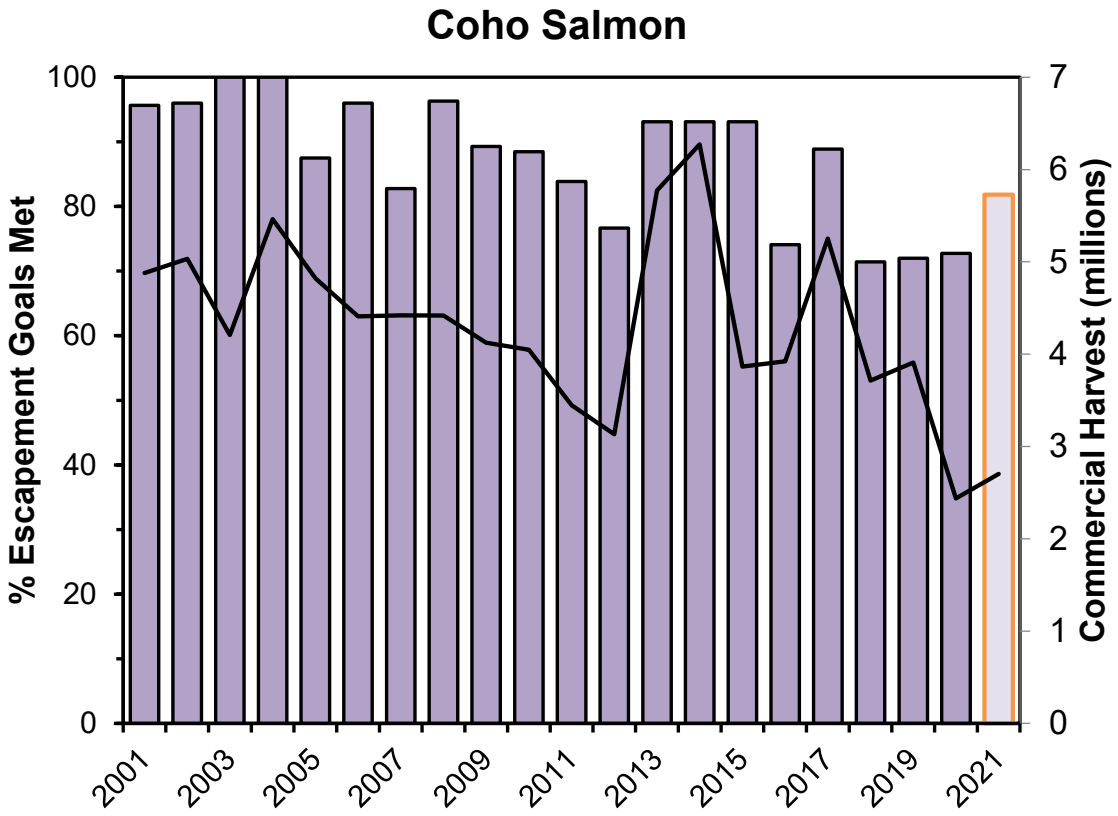

Figure 4. Percent of coho salmon escapement goals met or exceeded in Alaska from 2001 to 2021 (primary axis; bars) and Alaska commercial harvest in millions of fish 2001 to 2021 (secondary axis; black line).

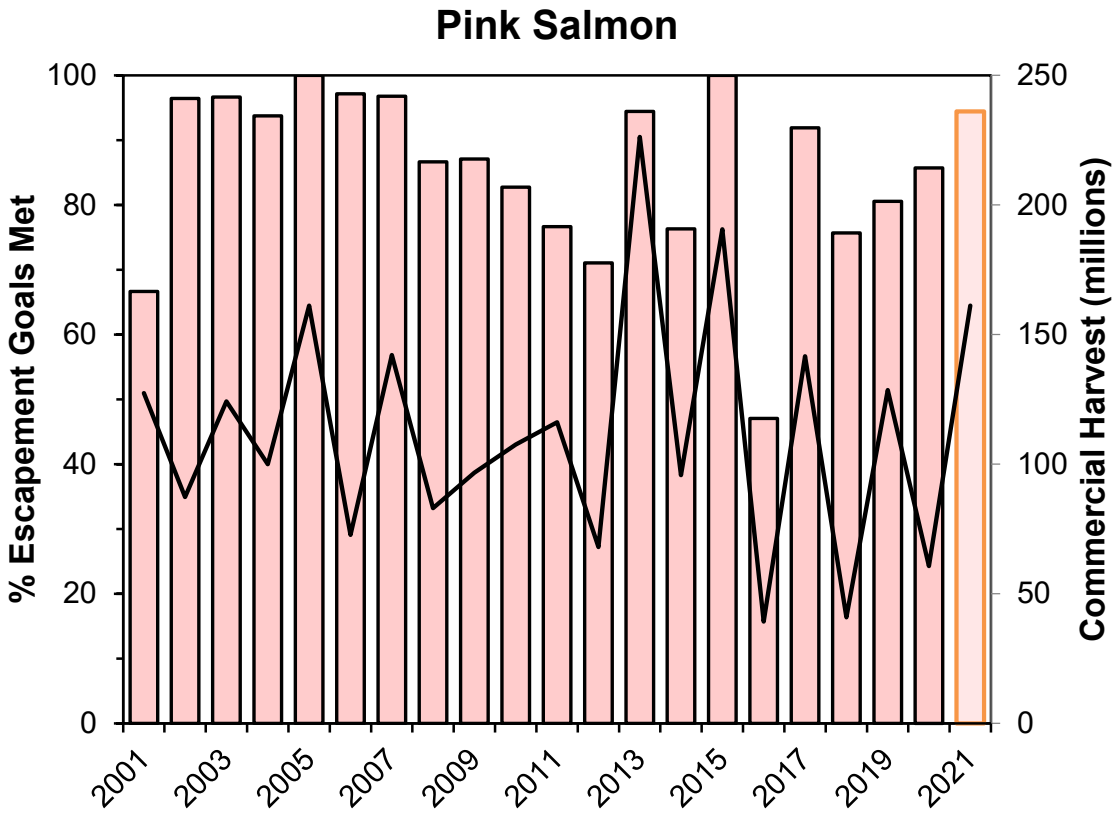

Figure 5. Percent of pink salmon escapement goals met or exceeded in Alaska from 2001 to 2021 (primary axis; bars) and Alaska commercial harvest in millions of fish 2001 to 2021 (secondary axis; black line).

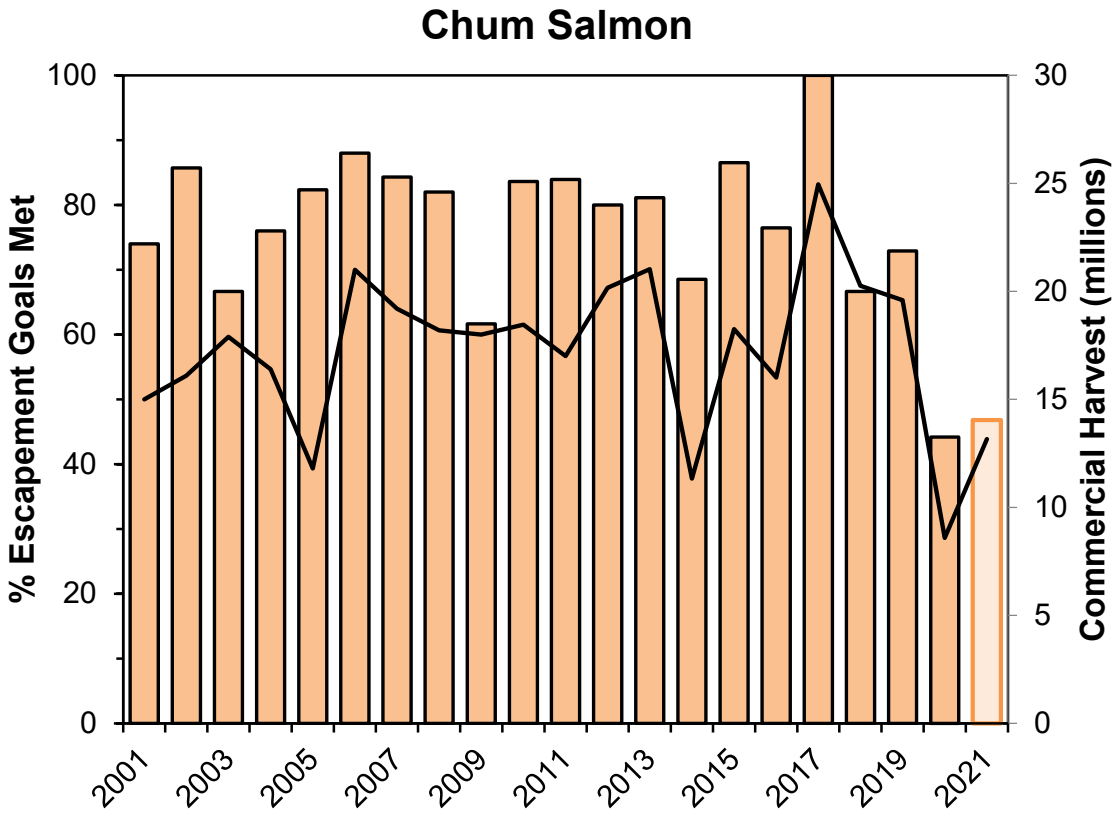

Figure 6. Percent of chum salmon escapement goals met or exceeded in Alaska from 2001 to 2021 (primary axis; bars) and Alaska commercial harvest in millions of fish 2001 to 2021 (secondary axis; black line).