

This RC is submitted in support of Proposal 61 and highlights important harvest and escapement information that demonstrates the dire economic and sustained yield issues that exist with Chignik's early and late sockeye runs:

- Early-run BEG 350,000-450,000
- Late-run SEG: 200,000-400,000
- 2018 early-run sockeye escapement: 263,979
- 2019 early-run sockeye escapement: 345,918
- There were no commercial fishing periods targeting sockeye in June and early July.
- On July 6, a 48-hour opener targeting pink and chums within inner bays occurred.
- Another 48-hour opener targeting pinks was scheduled for July 16-17 in the Eastern, Western, and Perryville districts. Chignik Bay and Central districts remained close.
- The Chignik Management Area (CMA) opened area-wide on July 21.
- In total, the CMA was open to commercial salmon fishing for approximately 59 days in 2019, and 51 permit holders made 1,503 landings.




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### MEMORANDUM

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SUBJECT: 2019 Chignik Salmon  
Season Summary

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The following is a brief overview of the 2019 Chignik Management Area (CMA; Figure 1) commercial salmon season.

The Chignik River watershed supports two genetically distinct sockeye salmon runs which traditionally provide the majority of directed harvest opportunities within the CMA. In 2019, the overall sockeye salmon run was approximately 1,320,779 fish (harvest and escapement), well below the recent 5- and 10-year averages (Table 1 and 3). The first commercial fishing period began on June 6, and the final fishing period closed September 18. A total of 51 permit holders made deliveries in 2019.

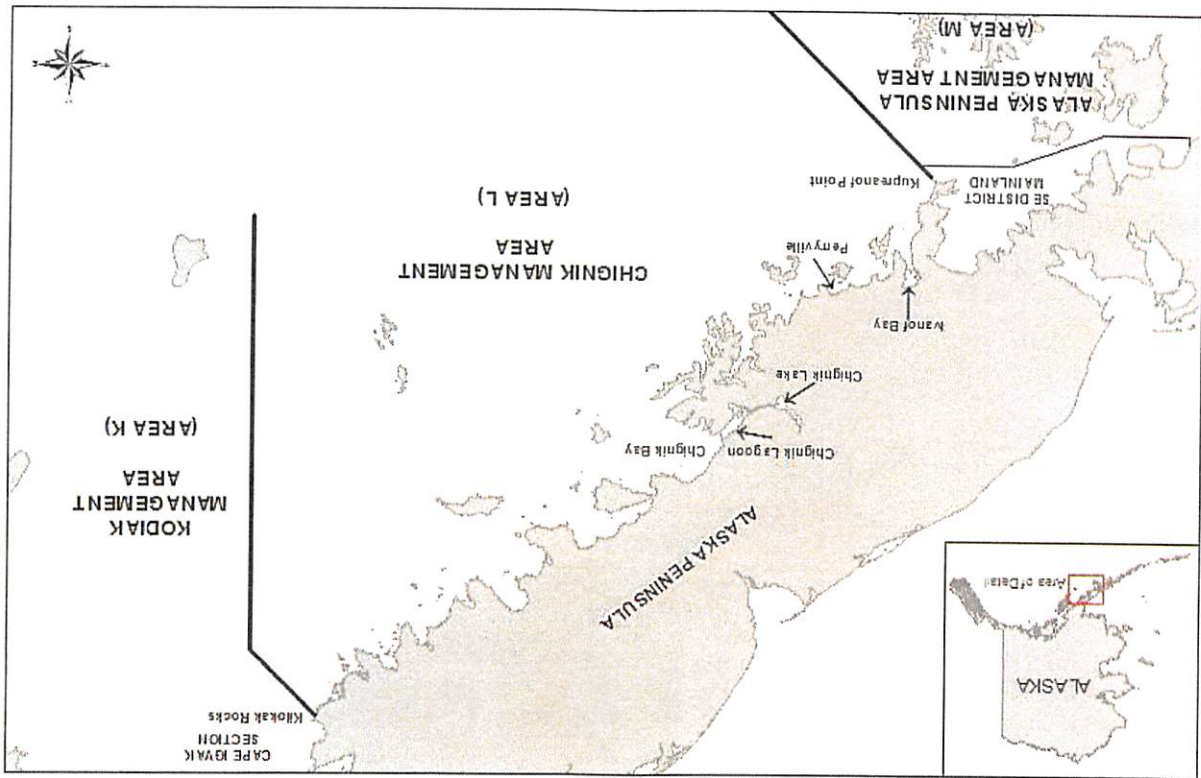


Figure 1.- Map of the Alaska Peninsula illustrating the relative locations of the Chignik, Kodiak, and Alaska Peninsula Management areas.

## ESCAPEMENT

Escapement through the Chignik River weir was monitored using underwater digital video equipment from June 1 through August 18. Two underwater camera gates in the weir were open to provide uninterrupted passage. Fish passing through the weir were counted, by species, for the first 10 minutes of each hour. The counts were expanded to obtain hourly escapement estimates, and then summed to provide an estimate of daily fish passage. A digital video archive was kept of each 10-minute counting period.

Aerial surveys were flown throughout the season to monitor escapement into other CMA streams. Peak survey counts, by index stream and species, were summed and compared to escapement goals established by Schaberg et al. (2019). Pink and chum salmon escapements were measured against established areawide sustainable escapement goals (SEG).

## Chinook Salmon

The Chignik River is the only major Chinook salmon-producing stream within the CMA, and one of the largest Chinook salmon streams on the South Alaska Peninsula. The biological escapement goal (BEG) for Chinook salmon into the Chignik River watershed is 1,300–2,700 fish (Schaberg



et al. 2019). The 2019 Chignik River Chinook salmon escapement, above the weir, of 1,517 fish (Table 1) met the escapement goal but was still below recent averages. State subsistence and sport fishery harvest of Chinook salmon will not be known until permits and questionnaires are returned and tabulated in the spring of 2020.

### **Sockeye Salmon**

Sockeye salmon escapement to the Chignik River is managed based on separate escapement objectives for both Black Lake (early run) and Chignik Lake (late run) sockeye salmon. Black Lake sockeye salmon have a BEG of 350,00–450,000 fish. During 2019, escapement fell below minimum management objectives and continued to lag for the remainder of the early run. **Black Lake escapement was not met in 2019, with an estimated escapement of 345,918 fish (Table 1).** The early-run sockeye salmon escapement was below the 5- and 10-year average escapements.

In 2019, genetic samples were taken at the weir to proportion early- and late-run fish during the peak of the overlap period (late June through mid-July). Samples were collected every 4 to 5 days from approximately June 25 to July 29. The samples were sent to the ADF&G genetics lab after each sample was collected for analysis. Samples were analyzed inseason, but stock specific apportionment was not adjusted until the final sample from July 29 was collected and analyzed. Once all the samples were analyzed, a new logistic curve was applied to the 2019 daily and cumulative escapement from June 1 through July 31. The transition between runs was estimated by fitting the stock proportion data to a common logistic equation adapted from Quinn and Deriso (1999).

The Chignik River has an inriver run goal (IRRG) of 20,000 additional sockeye salmon (10,000 in August and 10,000 in September) to provide for additional freshwater subsistence fishing opportunity. The IRRG is incorporated into the late-run SEG of 220,000 to 400,000 sockeye salmon. In 2019, the late-run SEG was met with an estimated total escapement of 336,077 fish (Table 1). Of these fish, a total of 287,745 late-run sockeye salmon passed through the weir, and 48,332 late-run fish were estimated to have escaped post-weir (August 19 through September 30). Sockeye salmon escapement during the month of August was estimated to be 91,218 fish, meeting the minimum management objective of 50,000 sockeye salmon in August and the August IRRG component of an additional 10,000 fish. An estimated 42,820 fish escaped during the month of September and were included in the total late-run escapement estimate. The total late-run estimated escapement was similar to the 10-year average and below the 5-year average (Table 1).

### **Coho Salmon**

Coho salmon begin to enter CMA drainages in mid-August and continue through November. In 2019, coho salmon escapement was 282 fish which is well below the most recent 5- and 10-year averages (Table 1). It should be noted that the weir was removed on August 18 when the coho salmon run typically begins to build.

## Pink Salmon

Pink salmon escapement through the Chignik River weir in 2019 was estimated at 18,073 fish, which is similar to the 5-year average, but below the 10-year average (Table 1). Pink salmon escapements into other CMA streams were estimated via aerial surveys. The odd-year pink salmon SEG of 260,000–450,000 fish is based on pink salmon escapement for 4 of the 5 districts and 8 total index streams within those districts (Schaberg et al. 2019). In 2019, pink salmon peak estimated escapement was strong in the CMA with an area wide estimated index escapement of 432,373 fish, just below the upper bound of the escapement goal (Table 2). Low water in the Perryville District was observed during 2019, and minimum escapement in this district was not observed. However, water levels increased in late August and although visibility was poor during surveys, minimum escapement was likely achieved based on previous observations showing large buildups of fish at the mouths of streams in this district.

## Chum Salmon

The 2019 Chignik River chum salmon escapement was 67 fish, which is below the 5- and 10-year averages (Table 1). Chum salmon escapements to other CMA streams were estimated via aerial surveys. The chum salmon SEG of 45,000–110,000 fish is based on escapement of 6 total index streams within 4 of the 5 districts (Schaberg et al. 2019). The 2019 estimated total peak chum escapement for the 6 index streams was 98,000 fish, similar to the 10-year average and above the 5-year average (Table 2).

Table 1.— Estimated Chinook, sockeye, coho, pink, and chum salmon, and Dolly Varden escapement to the Chignik River, 2009 to 2019.

Year	Escapement						
	Chinook <sup>a</sup>	Sockeye		Coho	Pink	Chum	Dolly Varden
		Early-run	Late-run <sup>b</sup>				
2009	1,680	391,476	328,586	7,670	12,873	109	8,618
2010	3,679	432,535	310,634	5,152	3,670	95	17,578
2011	2,728	488,930	264,887	5,293	16,298	145	19,225
2012	1,449	353,441	358,948	2,663	2,849	73	18,032
2013	1,253	386,782	369,319	16,783	7,231	72	17,230
2014	2,895	360,381	291,228	15,572	3,171	58	44,899
2015	2,054	534,088	589,810	60,209	4,269	54	16,346
2016	1,843	418,290	337,698	14,187	486	114	24,625
2017	1,137	453,257	339,303	33,270	123,531	615	7,664
2018	825	263,979	275,718	64,214	3,222	54	4,550
2019	1,517	345,918	336,077	282	18,073	67	6,242
<b>Averages</b>							
2009–18	1,954	408,316	345,655	20,481	17,760	139	17,877
2014–18	1,751	405,999	366,751	37,490	26,936	179	19,617

<sup>a</sup> No escapement adjustments were made for Chinook salmon that spawn below the weir, or those removed by the sport and subsistence fisheries above the weir.

<sup>b</sup> Late-run sockeye salmon totals include a weir estimate and post-weir escapement estimate using a time series analysis.

Table 2.– Estimated indexed, peak pink and chum salmon escapement in the Chignik Management Area, 2009 to 2019.

Year	Indexed Peak Escapement	
	Pink	Chum
2009	344,050	108,300
2010	98,400	102,625
2011	272,000	119,000
2012	111,000	93,800
2013	231,800	109,900
2014	87,240	46,720
2015	404,000	123,400
2016	68,100	69,900
2017	586,000	96,900
2018	41,900	33,400
2019	432,373	98,000
Averages <sup>a</sup>		
2009–18	367,570	90,395
2014–18	495,000	74,064

Note: Peak escapements are calculated using aerial surveys from the 8 pink salmon and 6 chum salmon index streams established in Schaberg et al. 2015.

<sup>a</sup> Pink salmon averages include odd years only.

## COMMERCIAL FISHERY

The CMA was open to commercial salmon fishing for approximately 59 days during the 2019 commercial salmon season. A total of 51 permit holders made a total of 1,503 landings (Table 3).

In June, commercial salmon fishing is based on the strength of the Chignik River early-run sockeye salmon. The first commercial fishing period, established by emergency order, is typically based on escapement monitored at the weir, and future fishing periods are determined by daily escapement as well as harvest information. In June and July, the CMA is managed largely to achieve adequate escapement of the Chignik River early- and late-run sockeye salmon, as well as local pink and chum salmon stocks. Beginning in early July, opportunity to target early pink and chum salmon may occur in select bays of the Central, Western, Eastern, and Perryville districts. In August, and for the remainder of the season, management of the CMA is based on achieving the Chignik River late-run sockeye salmon goals or on ADF&G's evaluation of local stocks of pink, chum, and coho salmon. If the Chignik River late sockeye salmon run is not meeting the escapement goal objectives and a harvestable surplus of pink, chum, or coho salmon is available, the department may restrict fishing to certain areas in the CMA to allow fishing, while minimizing the harvest of sockeye salmon.

In 2019, ADF&G applied an average stock proportion curve developed from genetic data collected during the 2010–2018 seasons. This approach allows the department to assign daily escapement to the two genetically distinct stocks of sockeye salmon present in Chignik. Post transition, this

curve is updated with the results from the 2019 genetic samples, and escapement allocations to the early and late runs are adjusted accordingly. The Black Lake sockeye salmon run fell behind management objectives early in the season and continued to lag throughout June and early July. As a result of poor early run escapement, there were no fishing periods targeting sockeye salmon scheduled in June and early July. Approximately mid-July, escapement of sockeye salmon began to increase and although the early run was behind minimum management objectives, early indications showed that late-run sockeye salmon were arriving as expected.

Starting on July 6 a 48-hour opener targeting early local pink and chum salmon within inner bays occurred. As sockeye salmon escapement continued to increase and aerial surveys of surrounding CMA streams showed early indications of a strong pink salmon run, a fishing period was scheduled for 48 hours and occurred on July 16–17 in the Eastern, Western and Perryville districts only, along with the Kujulik Bay Section of the Central District. This opener provided opportunity for harvest of late-run sockeye salmon and pink salmon in the outside districts. The Chignik Bay and Central districts remained closed to allow more early-run sockeye salmon to escape into the Chignik River in an attempt to meet minimum escapement goals. Escapement through the Chignik weir continued to build and the commercial salmon fishery was extended by an additional 48 hours. After a 24-hour closure, the CMA opened areawide on July 21. At this time, management shifted to late-run sockeye salmon as indications showed a large presence of Chignik Lake sockeye salmon escaping through the weir.

From July 21–August 31, the majority of the CMA was open to commercial salmon fishing, except for two short closures in late-July and early August. The Perryville District was closed on August 16 due to low water in streams which prevented pink and chum salmon escapement. From September 1–14, commercial salmon fishing in the CMA was closed for approximately 4 days (September 1–2 and 7–8). These brief closures were to ensure the IRRG of 10,000 sockeye salmon was met in September. Beginning September 15, the Chignik Bay and Central districts may open for no more than 48 hours per week per regulation. The entire CMA was opened September 15–18 for four 12-hour periods in order to harvest late-season sockeye and coho salmon. After these four 12-hour openings, the CMA closed and remained closed the rest of the season.

Table 3.– Total commercial salmon harvests, including home pack and department test fishery, from the Chignik Management Area by species and year, 2009 through 2019.

Year	Permits <sup>a</sup>	Landings	Chignik Management Area Harvest					Total
			Chinook	Sockeye	Coho	Pink	Chum	
2009	56	2,172	3,319	1,198,105	110,373	1,408,339	256,425	2,976,561
2010	66	2,532	10,380	1,379,785	159,198	489,781	581,329	2,620,473
2011	65	2,617	6,586	2,497,004	76,792	905,166	269,503	3,755,051
2012	70	2,915	3,687	1,800,121	33,316	137,706	171,112	2,145,942
2013	77	3,153	2,962	2,405,151	32,312	871,871	154,964	3,467,260
2014	71	1,525	8,846	620,339	132,459	352,115	55,152	1,168,911
2015	72	2,276	9,204	1,552,495	82,054	1,978,211	101,017	3,722,981
2016	70	2,554	20,719	1,394,091	94,397	140,913	118,435	1,768,555
2017	68	2,408	3,946	897,489	226,829	7,077,924	609,236	8,815,424
2018	6	6	0	128	1	6	924	1,059
2019	51	1,503	4,312	638,784	248,282	2,452,838	157,517	3,501,733
Averages <sup>b</sup>								
2009–18	62	2,216	6,965	1,374,471	94,773	2,448,302	231,810	3,044,222
2014–18	57	1,754	8,543	892,908	107,148	4,528,068	176,953	3,095,386

<sup>a</sup> Includes the department's test fishery permit.

<sup>b</sup> Pink salmon averages include odd years only.

## HARVEST

### Chinook Salmon

A total of 4,312 Chinook salmon were commercially harvested in the 2019 season, well below all recent averages (Table 3). A majority of the harvest occurred in the Chignik Bay and Western districts (Table 4).

### Sockeye Salmon

A total of 638,784 sockeye salmon were commercially harvested in the CMA during the 2019 season, which is well below all recent averages (Table 3). The largest sockeye salmon harvest came from the Chignik Bay and Western districts (Table 4).

The Southeastern District Mainland (SEDM) and Cape Igvak fisheries were not opened during the allocation period (June 1–July 25), as the Chignik Area sockeye salmon harvest did not exceed the required 600,000 fish harvest through July 25.

### Coho Salmon

Coho salmon harvest in the CMA was 248,282 fish. This was more than double the recent 5- and 10-year averages for the CMA (Table 3). The majority of the harvest came from the Western District (Table 4).



### Pink Salmon

A total of 2,452,838 pink salmon were harvested in 2019. This is similar to the 10-year average and 5-year averages for pinks in the CMA (Table 3). Most of the pink salmon harvest occurred in the Eastern and Western districts (Table 4).

### Chum Salmon

A total of 157,517 chum salmon were harvested in 2019. This is well below the most recent 5- and 10-year averages (Table 3). A majority of the chum salmon harvest occurred in the Central and Western districts (Table 4).

Table 4.— Chignik Management Area commercial salmon harvest, excluding home pack, by district, 2019.

District	Chinook		Sockeye		Coho		Pink		Chum	
	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds
Chignik Bay	1,137	12,017	275,304	1,604,944	32,365	214,632	153,279	450,041	12,205	79,633
Central	344	3,570	83,040	459,191	47,639	313,221	380,257	1,172,951	52,173	342,999
Eastern	862	7,930	43,791	245,043	32,141	224,687	735,710	2,275,808	15,249	101,958
Perryville	680	6,140	40,246	229,662	19,416	114,412	258,287	817,106	27,215	174,335
Western	1,263	9,878	196,391	1,077,125	116,720	714,446	925,305	2,867,985	50,675	338,272
<b>Total</b>	<b>4,286</b>	<b>39,535</b>	<b>638,772</b>	<b>3,615,965</b>	<b>248,281</b>	<b>1,581,398</b>	<b>2,452,838</b>	<b>7,583,891</b>	<b>157,517</b>	<b>1,037,197</b>

### Exvessel Value

The exvessel value for the 2019 CMA commercial salmon fishery was approximately \$8 million, or about \$157,000 per active participant in the fishery (Table 5). The sale of sockeye salmon accounted for approximately 63% of the total exvessel value, followed by pink salmon at about 26%. The harvest of Chinook, coho, and chum salmon provided approximately \$620, \$9,922, and \$7,118 respectively, per active permit holder.

Table 5.– Total value, by species, and average value per active permit, in dollars, in the Chignik Management Area, 2009 to 2019.

Year	Chinook		Sockeye		Coho		Pink		Chum		Total value (\$)	Permits <sup>c</sup>	Value per permit (\$)
	Total <sup>a</sup>	Average <sup>b</sup>	Total <sup>a</sup>	Average <sup>b</sup>	Total <sup>a</sup>	Average <sup>b</sup>	Total <sup>a</sup>	Average <sup>b</sup>	Total <sup>a</sup>	Average <sup>b</sup>			
2009	30,714	558	7,058,058	128,328	220,824	4,015	800,530	14,555	520,791	9,469	8,630,917	55	156,926
2010	160,076	2,463	9,549,462	146,915	566,191	8,711	565,941	8,707	1,774,763	27,304	12,616,433	65	194,099
2011	57,524	899	21,469,153	335,456	278,391	4,350	1,040,264	16,254	919,586	14,369	23,764,918	64	371,327
2012	47,612	690	12,803,505	185,558	97,430	1,412	146,011	2,116	634,705	9,199	13,729,263	69	198,975
2013	37,620	495	21,960,018	288,948	86,953	1,144	868,071	11,422	385,172	5,068	23,337,834	76	307,077
2014	66,875	955	6,040,512	86,293	434,394	6,206	286,942	4,099	185,016	2,643	7,013,739	70	100,196
2015	74,403	1,048	6,600,110	92,959	101,967	1,436	940,236	13,243	164,225	2,313	7,880,941	71	110,999
2016	176,800	2,562	8,044,321	116,584	158,010	2,290	95,776	1,388	161,028	2,334	8,635,935	69	125,158
2017	51,611	770	7,182,853	107,207	546,586	8,158	6,579,390	98,200	1,439,418	21,484	15,799,858	67	235,819
2018	0	0	860	143	1	0	3	1	1,235	206	2,099	6	350
2019	31,628	620	5,062,351	99,262	506,047	9,922	2,047,651	40,150	363,019	7,118	8,010,696	51	157,072
<b>Averages</b>													
2009–18	65,317	975	9,530,042	142,247	297,184	4,739	1,194,012	18,502	610,845	9,479	11,697,400	61	175,942
2014–18	73,938	1,067	5,573,731	80,637	248,192	3,618	1,580,469	23,386	390,184	5,796	7,866,514	57	114,505

*Note:* Values represent the initial price paid and do not include any postseason adjustments by any processor. The average 2019 exvessel prices per pound were: Chinook - \$0.80, sockeye - \$1.40, coho - \$0.32, pink - \$0.27, chum - \$0.35.

<sup>a</sup> Total value of commercial catch in dollars, by species. Value does not include home pack or department test fishery.

<sup>b</sup> Average value of commercial catch per permit in dollars, by species. Average value does not include home pack or department test fishery.

<sup>c</sup> Includes the number of commercial permits that received income from the harvest. These figures do not include department test fishery harvests.

## Department Test Fishery

The department did not conduct test fisheries in the CMA during the 2019 season.

## SUBSISTENCE

State subsistence fishing was open for sockeye salmon the entire season in the CMA; however, the Federal Subsistence Board restricted fishing for sockeye salmon to federally qualified users only from June 26 through July 24 in all federal public waters of the Chignik River drainage. Subsistence fishing in the Chignik River for sockeye salmon reopened to all state subsistence users on July 25.

## LITERATURE CITED

- Quinn, T. J., II, and R. B. Deriso. 1999. Quantitative fish dynamics. Oxford University Press, New York.
- Schaberg, K. L., M. B. Foster, A. St. Savior. 2019. Review of salmon escapement goals in the Chignik Management Area, 2018. Alaska Department of Fish and Game, Fishery Manuscript Series No. 19-02, Anchorage.