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Fish and Game**

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**MEMORANDUM**

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DATE: October 2, 2018

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SUBJECT: 2018 Chignik Salmon  
Season Summary

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The following is a brief overview of the 2018 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. The 2018 overall sockeye salmon run of 539,825 fish (escapement and harvest) was the poorest return on record since statehood. As a result, the early- and late-run Chignik River sockeye salmon combined total run was well below all recent averages. There was no commercial fishing targeting sockeye salmon in 2018. Two 48-hour fishing periods did occur in select inner bays of the CMA; the first in July to target early opportunity on pink and chum salmon and the second in September to target coho salmon. Very little effort occurred in either fishing period. A total of 6 permits made deliveries in 2018.

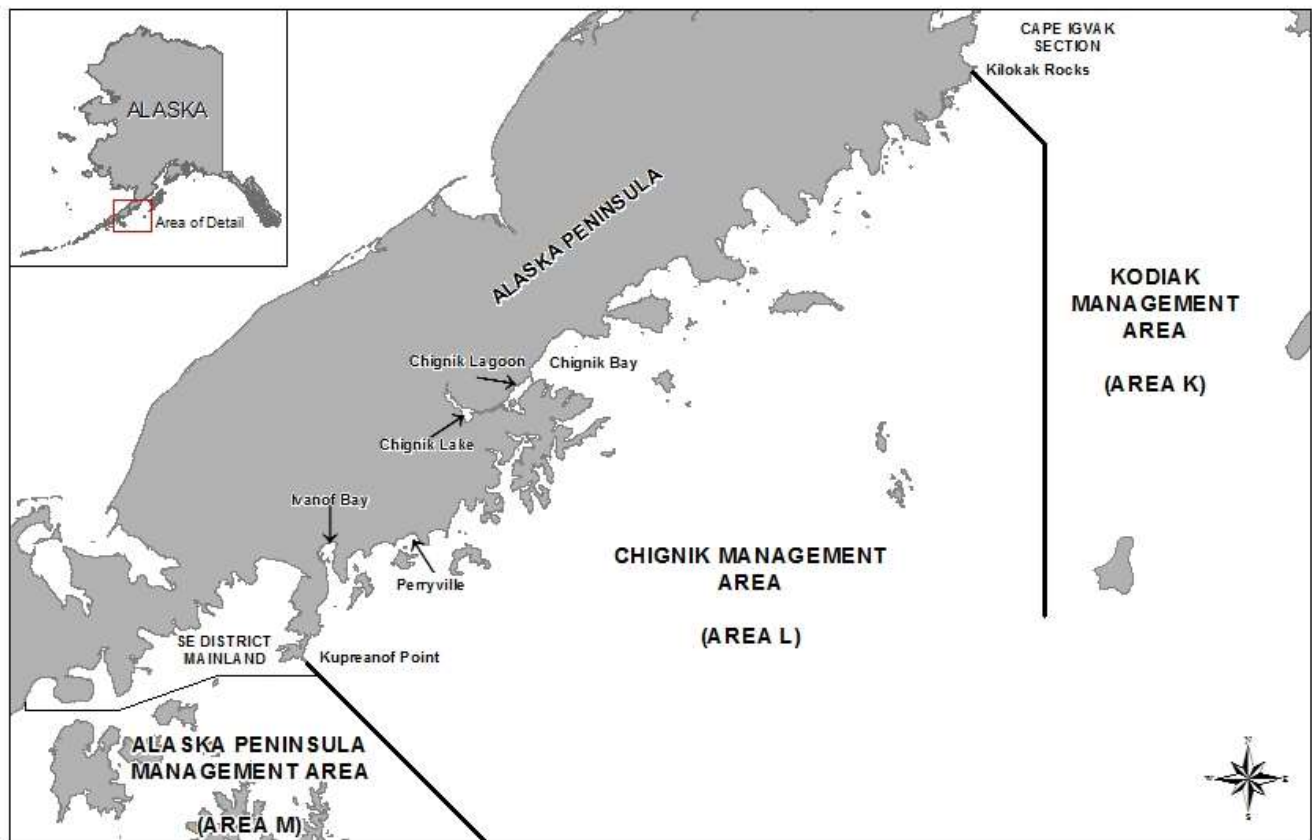


Figure 1.- Map of the Alaska Peninsula illustrating the relative locations of the Chignik, Kodiak, and Alaska Peninsula Management Area.

## ESCAPEMENT

Escapement through the Chignik River weir was monitored using underwater digital video equipment from June 1 through August 18. Two underwater gates in the weir were open to provide uninterrupted escapement. Fish passing 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.

Two DIDSON (Dual Identification Sonar) acoustic units were also installed in the Chignik River simultaneous to weir operations from August 1 through August 18 (when the weir was removed early due to a high water event). From August 19 through September 6, the DIDSON units were the sole method used to record fish passage. The numbers of fish passing upstream of the DIDSONs were counted for the first 10 minutes of each hour. The counts were then expanded to obtain hourly escapement estimates. Species apportionment was determined by fishing with a seine net every couple of days. This project is funded by an Alaska Sustainable Salmon Fund (AKSSF) grant with the purpose of providing a direct comparison between weir and DIDSON operations in order to develop a correction factor between the two methods. This was the last year of the three year AKSSF grant. At this time, the department is still analyzing the 2016–2018 seasons. Data in this report does not include preliminary DIDSON information for 2016 and 2017. However; the Chignik river weir was removed much earlier

than normal in 2018 and DIDSON estimates will be used for this season since they are the only estimates available for a portion of August and September.

Aerial surveys were flown throughout the season to monitor escapement into other CMA streams. Peak aerial survey counts, by index stream and species, were summed and compared to available escapement goals established by Schaberg et al. (2015). Pink and chum salmon escapements were measured against established area-wide 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. 2015). The 2018 Chignik River Chinook salmon escapement, above the weir, was very poor (825 fish; Table 1) and did not meet the escapement goal. State subsistence fishing and sport fishing for Chignik River Chinook salmon closed on July 13 in order to protect the run and allow as many spawning fish to escape as possible. State subsistence and sport fishery harvest of Chinook salmon prior to the closure will not be known until permits and questionnaires are returned and tabulated by the spring of 2019.

### **Sockeye Salmon**

The Chignik River sockeye salmon run in 2018 was extremely poor and well below all recent averages. Through July 31, a total of 359,646 sockeye salmon passed the weir, slightly more than half of the 10-year average total escapement for this time of year (617,000 fish). The final estimated escapement (including weir, DIDSON and post-weir estimates) through September 30 of 539,697 sockeye salmon was the lowest final estimated escapement for the Chignik River sockeye salmon run since 1969 (485,144 fish). The total 2018 estimated sockeye salmon escapement to the Chignik River was approximately 70% of the 10-year average escapement.

The Chignik River sockeye salmon early and late runs overlap in run timing from approximately mid-June through July. Each run is managed based on separate escapement objectives (early run BEG of 350,000–450,000 sockeye salmon and late run SEG of 275,000–400,000 sockeye salmon). In order to estimate the early- and late-run fish passing the weir in season, the department applied an average stock proportion curve developed from genetic data collected during the 2010–2017 seasons. The model from which the curve was developed assumes that early-run fish escape upriver through July 31. Late-run sockeye salmon begin escaping in mid-June and all fish passing the weir beginning August 1 are considered late run. Through July 31, the early run was estimated to be approximately 192,000 fish, well below the final early-run goal. The late-run sockeye salmon escapement was estimated to be approximately 168,000 fish through July 31, and was tracking slightly above the minimum escapement objectives for that time of year.

In 2018, genetic samples were again taken at the weir to determine the final proportion of early- to late-run fish during the peak of the overlap period (late-June through late-July). The samples were collected every 4 or 5 days from approximately June 26 to July 27. The samples were sent to the genetics lab in Anchorage and analyzed after the final sampling period. The transition between runs was estimated by fitting the stock proportion data to a common logistic equation adapted from Quinn and Deriso (1999).

Once the samples were analyzed, the new model was applied to the 2018 escapement and the daily proportions for early- and late-run sockeye salmon from June 1 through July 31 were readjusted. The estimated Chignik River early-run sockeye salmon escapement was adjusted to 263,979 fish, still well below the final escapement goal and all recent averages. The late-run sockeye salmon estimated escapement through July 31 was adjusted to 95,667 fish, dropping the estimated escapement well below escapement objectives. The late-run escapement lagged behind escapement objectives most of the season; however it did begin meeting the lower bound objectives at the end of August. The final Chignik River late-run sockeye salmon estimated escapement through September met the lower bound of the SEG with 275,718 fish.

The Chignik River also has an inriver run goal (IRRG) of 75,000 sockeye salmon (25,000 in August and 50,000 in September) to provide for additional freshwater subsistence fishing opportunity. The IRRG requires that 25,000 fish escape in August in addition to the minimum escapement needs for the month (73,000 sockeye salmon) so that a total of 98,000 sockeye salmon escape in August. In 2018, the estimated August escapement was approximately 145,136 fish, meeting minimum escapement requirements for the month as well as the August IRRG component of 25,000 fish. Approximately 34,915 sockeye salmon were estimated during September 1–30 from DIDSON estimates and a post weir/DIDSON analysis based on the rate of decay of the run. September escapement did not meet the September IRRG component of 50,000 fish.

In response to the poor 2018 Chignik river sockeye salmon early run, unprecedented management actions were taken by the department in the Area M June South Unimak and Shumagin Islands fishery. The department again took action in the post-June fishery (mid-July) by leaving a portion of the Dolgoi Island area closed during scheduled fishing periods. Additionally, in early July, Chignik fishermen petitioned the Board of Fisheries (BOF) to take future emergency action in portions of Area M to protect the remainder of the 2018 Chignik River sockeye salmon run. During the Alaska Board of Fisheries Emergency Petitions Meeting in Anchorage on July 17, the BOF found an emergency based on the petitions and established emergency regulatory action by extending the department's existing closures in Area M through early August unless late run interim escapement objectives were being met.

### **Coho Salmon**

Coho salmon begin to enter CMA drainages in mid-August and continue through November. The coho salmon run is generally building when the weir is removed. The 2018 Chignik River coho salmon escapement was 64,214 fish which was above the most recent 5- and 10-year average escapement estimates (Table 1).

### **Pink Salmon**

An estimated 3,222 pink salmon passed the Chignik River weir in 2018, which was below previous even 5- and 10-year average pink salmon escapements (Table 1). Pink salmon escapements into other CMA streams were estimated via aerial surveys. A new even-year pink salmon SEG was adopted at the 2016 BOF meeting of 170,000–280,000 pink salmon for 4 of the 5 districts combined and is based on 8 index streams within the districts. Aerial surveys indicated that local pink salmon stocks were late arriving in the CMA and overall escapement was weak in 2018. Pink salmon estimated total peak escapement was 41,900 fish (Table 2) for all index streams, well below recent even-year averages.

## Chum Salmon

The 2018 Chignik River chum salmon escapement was 54 fish, which was below average for the Chignik River (Table 1). Chum salmon escapements to other CMA streams were estimated via aerial surveys. A new chum salmon SEG was adopted at the 2016 BOF meeting of 45,000–110,000 fish based on escapement into 6 index streams within 4 of the 5 districts (Schaberg et al. 2015). The 2018 estimated total peak chum salmon escapement for all index streams of 33,400 fish (Table 2) did not meet the minimum escapement goal. It should be noted however, that aerial surveys in late July and August were extremely limited due to inclement weather and poor visibility in 2018. Surveys early in the season indicated local chum salmon stocks were arriving as expected and it is likely that the escapement goal would have been met if there had been better survey conditions.

Table 1.- Estimated Chinook, sockeye, coho, pink, and chum salmon, and Dolly Varden escapement to the Chignik River, 2008 to 2018.

Year	Escapement						
	Chinook <sup>a</sup>	Sockeye		Coho	Pink	Chum	Dolly Varden
		Early-run	Late-run <sup>b</sup>				
2008	1,730	377,579	328,479	13,958	22,341	124	14,776
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 <sup>c</sup>	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 <sup>c</sup>	825	263,979	275,718	64,214	3,222	54	4,550
Averages							
2008-17	2,045	419,676	351,889	17,476	19,672	146	18,899
2013-17	1,836	430,560	385,472	28,004	27,738	183	22,153

<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.

<sup>c</sup> Due to the early removal of the weir in 2015 (August 23) and 2018 (August 19), the late-run post weir escapement reported includes weir estimates, DIDSON estimates and a post weir estimate using a time series analysis.

Table 2.- Estimated indexed, peak pink and chum salmon escapement in the Chignik Management Area, 2008 to 2018.

Year	Indexed Peak Escapement	
	Pink <sup>a</sup>	Chum
2008	260,800	116,240
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
Averages		
2008-17	125,108	98,679
2013-17	77,670	89,364

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

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

## COMMERCIAL FISHERY

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 late June through 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 and on the department'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.

There was no established fishing periods to target sockeye salmon in the CMA during the 2018 commercial salmon season due to weak sockeye salmon runs. One 48-hour commercial fishing period occurred in specific inner bays on July 7–8, to target the early pink and chum salmon returning to local streams. A second 48-hour commercial fishing period occurred in select bays on September 3–4 to target local stocks of coho salmon. A total of 6 permit holders made a total of 6 landings (Table 3).

## **Harvest**

### **Chinook Salmon**

No Chinook salmon were commercially harvested in the CMA during 2018 (Table 3).

### **Sockeye Salmon**

A total of 128 sockeye salmon were incidentally harvested during the commercial fishing period targeting pink and chum salmon in the CMA during 2018. Sockeye salmon harvest was the lowest on record since statehood and below all recent averages (Table 3).

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

### **Coho Salmon**

One coho salmon was commercially harvested in 2018. The most recent 10-year average for coho salmon harvest in the CMA is approximately 111,000 fish (Table 3).

### **Pink Salmon**

A total of 6 pink salmon were commercially harvested in the CMA in 2018 (Table 3). The most recent 10-year average harvest (even years only) for pink salmon in the CMA is approximately 702,000 fish.

### **Chum Salmon**

A total of 924 chum salmon were commercially harvested in 2018 (Table 3). The recent 10-year average harvest for chum salmon in the CMA is approximately 253,000 fish.

Table 3.- Total commercial salmon harvests, including home pack, and department test fishery from the Chignik Management Area by species and year, 2008 through 2018.

Year	Permits Making		Chignik Management Area Harvest					
	Deliveries <sup>a</sup>	Landings	Chinook	Sockeye	Coho	Pink	Chum	Total
2008	55	2,217	970	687,270	161,536	2,389,958	209,325	3,449,059
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
Averages <sup>b</sup>								
2008-17	67	2,437	7,062	1,443,185	110,927	702,095	252,650	3,389,022
2013-17	72	2,383	9,135	1,373,913	113,610	246,514	207,761	3,788,626

<sup>a</sup> Includes ADF&G's test fishery permit.

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

### Economic Value

Very little harvest opportunity occurred in the CMA due to extremely poor sockeye and pink salmon runs. The exvessel value of the 2018 CMA commercial salmon fishery was about \$3,000, or approximately \$500 per active permit holder (Table 4).



Table 4.- Value, by species, and average value per active permit, in dollars, in the Chignik Management Area, 2008 to 2018.

Year	Chinook		Sockeye		Coho		Pink		Chum		(\$ Total Value	Number of 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>			
2008	15,249	282	4,121,611	76,326	778,282	14,412	1,810,965	33,536	533,358	9,877	7,259,465	54	134,435
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	1	3	1	1,235	206	3,041	6	507
Averages													
2008-17	71,848	1,072	10,482,960	156,457	326,903	5,213	1,313,413	20,352	671,806	10,406	12,866,903	66	193,501
2013-17	81,462	1,166	9,965,563	138,398	265,582	3,847	1,754,083	25,670	466,972	6,768	12,533,661	71	175,850

<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.

<sup>d</sup> Values are from the ADF&G fish ticket database, represent the initial price paid, and do not include any postseason adjustments by processors. The average 2018 exvessel prices per pound were: sockeye - \$1.45, coho - \$0.35 pink - \$0.23, chum - \$0.17.

## Department Test Fishery

The department did not conduct test fisheries in the CMA during the 2018 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 only federally qualified subsistence users with a Social and Cultural Harvest permit from June 22 through July 31 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 beginning August 1.

Beginning July 11, subsistence fishing for Chinook salmon was closed for the season in the Chignik River drainage. As of this writing subsistence harvest numbers for 2018 have not been finalized.

## LITERATURE CITED

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