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MEMORANDUM

TO: Members
Alaska Board of Fisheries

DATE: October 3, 2019

FROM: Dave Rutz, Director
Division of Sport Fish DSR

and

Sam Rabung, Director
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SUBJECT: Upper Cook Inlet Stock of Concern Recommendations

The *Policy for the management of sustainable salmon fisheries* (SSFP; 5 AAC 39.222) directs the Alaska Department of Fish and Game (department) to report to the Alaska Board of Fisheries (board) on the status of salmon stocks and identify any stocks that present a concern related to yield, management, or conservation during regular board meetings. This memorandum summarizes the results of the stock of concern evaluation for Upper Cook Inlet (UCI) salmon stocks for the 2019–2020 board regulatory cycle. The evaluation includes input from headquarters, regional, and area staff from both fishery divisions.

Following the 2019 salmon season all king, sockeye, coho, and chum salmon stocks in the UCI management area were examined for potential stock of concern status. Currently, there are 8 stocks of concern in UCI (Munro 2018; Table 1).

King salmon

Since the 2011 UCI board meeting, the board has designated 7 king salmon stocks as stocks of concern; 3 stocks in West Cook Inlet, and 4 tributary stocks of the Susitna River (Table 1).

West Cook Inlet

Lewis River

The current Lewis River king salmon sustainable escapement goal (SEG) of 250–800 fish was established in 2002. In 2011, this stock was designated a stock of management concern. At that

time salmon migration was effectively eliminated by natural changes to the river channel such that it no longer flows into Cook Inlet. Attempts to restore the channel and fish passage proved unsuccessful. Few if any adult king salmon have been documented in this river system since these natural channel changes cut off access to saltwater. It is unlikely these channel changes and associated blockage of fish passage will allow for a viable population of king salmon in the Lewis River.

In a separate document, an addendum to the Upper Cook Inlet 2019 Escapement Goal memo, the department's UCI escapement goal review committee is recommending that the escapement goal be discontinued for Lewis River king salmon, as its connection with Cook Inlet is intermittent at best. For the same reasons, the department is recommending that the stock of management concern designation for Lewis River king salmon be discontinued.

Theodore River

In 2011 the board designated Theodore River king salmon a stock of management concern. The escapement goal for the Theodore River was last achieved in 2006. The department recommends continuing the stock of management concern designation for this stock.

Chuitna River

Chuitna River king salmon were designated a stock of management concern in 2011. The king salmon escapement goal for the Chuitna River has been achieved in 4 of the last 6 years, including the most recent year. The department is recommending continuing the stock of management concern designation, as the escapement goal was achieved in only 1 of the last 3 years, even with fishery restrictions as prescribed in the stock of concern action plan.

Susitna River

Alexander Creek

The board designated Alexander Creek king salmon a stock of management concern in 2011. This stock has been heavily impacted by the spread of invasive northern pike. Despite the removal of over 21,000 northern pike in the last 9 years, the king salmon escapement goal in Alexander Creek was last achieved in 2005. The department recommends continuing the stock of management concern designation for this stock.

Goose, Sheep, Willow, Little Willow, and Montana creeks (the Eastside Susitna stock)

The board designated Willow Creek and Goose Creek king salmon as stocks of yield concern in 2011; the designation of Goose Creek and Sheep Creek as stocks of management concern occurred in 2014. The department last documented an escapement within the goal range for Goose Creek in 2006, and in Sheep Creek in 2006. The escapement goal for Willow Creek king salmon has been achieved in 2 of the last 6 years.

The individual escapement goals for all five king salmon spawning populations (including Little Willow Creek and Montana Creek) of the Eastside Susitna stock are recommended to be discontinued and replaced with a single escapement goal for the Eastside Susitna River stock (Figure 1). Accordingly, the department recommends delisting Goose, Sheep, and Willow creeks

as stocks of concern, and listing the Eastside Susitna River stock collectively as a stock of management concern.

Prairie Creek and Clear (Chunilna) Creek (the Talkeetna River stock)

Neither Prairie Creek nor Clear Creek have been recommended by the department for stock of concern status. The SEG for Prairie Creek was last updated in 2002 with the previous four-tier percentile approach and has only been achieved in 1 of the last 6 years; however, the lower bound of this SEG was probably too high (Clark et al. 2014). Based on recent performance of the recommended escapement goal for the Talkeetna River stock, we are not recommending this stock as a stock of concern.

Chulitna River

The king salmon escapement goal for the Chulitna River has been achieved in 2 of the last 6 surveyed years. Even considering the difference between the lower end of the recommended goal (1,200) and the current goal (1,800), escapements have been low. However, as escapement performance of this stock does not fit the criteria for a stock of concern, the department is not recommending it for stock of concern status.

Sockeye salmon

Susitna River

The department recommends the Susitna River sockeye salmon stock of yield concern designation be discontinued. This recommendation is based on: (1) average yield for the three indicator stocks has increased since Susitna River sockeye salmon were designated a stock of yield concern, (2) escapements in the three indicator systems have been met in most years, and (3) reduced yield can in part be attributed to invasive northern pike.

Since 2008, modifications have been made to the ***Northern District Salmon Management Plan*** (5 AAC 21.358) and the ***Central District Drift Gillnet Fishery Management Plan*** (5 AAC 21.353) to allow passage of salmon into the Susitna River drainage and increase spawning escapement. The department recommends the board consider if current restrictions should remain in effect with the discontinuation of the stock of concern status.

The board designated Susitna River sockeye salmon a stock of yield concern in 2008. The following year, the sonar-based Yentna River SEG was eliminated and replaced with three Susitna River drainage weir-based SEGs: Chelatna Lake (Yentna River), Judd Lake (Yentna River), and Larson Lake (Susitna River mainstem) (Fair et al. 2009). These escapement goals were implemented in the 2009 season and were updated during the 2016–2017 board cycle. Since 2009 the Chelatna Lake escapement goal has been met in 10 of 11 years, Larson Lake in 7 of 11 years, and Judd Lake in 6 of 10 years. Judd Lake weir was not operated in 2016 due to lack of funding (Table 1).

The department believes recent sockeye salmon total returns represent current production capacity of Susitna River sockeye salmon in the presence of northern pike. Reduced production of Susitna River sockeye salmon due to northern pike was identified as an issue during the 2008 review and development of the Susitna River drainage sockeye salmon escapement goals (Fair et

al. 2009). At that time, invasive northern pike were found in 15 of the 24 known Susitna River sockeye salmon-producing lakes. In an attempt to increase salmon production, the department and Cook Inlet Aquaculture Association implemented northern pike reduction programs in Alexander, Chelatna, Shell, Whiskey, and Hewitt systems. Due to these efforts, combined with inseason management actions and regulatory changes, the average yield has increased since being designated a stock of yield concern (Table 2).

As part of the UCI board meeting in February 2020, staff will include an update on stocks of concern and review the department's recommendations for stock of concern.

References Cited

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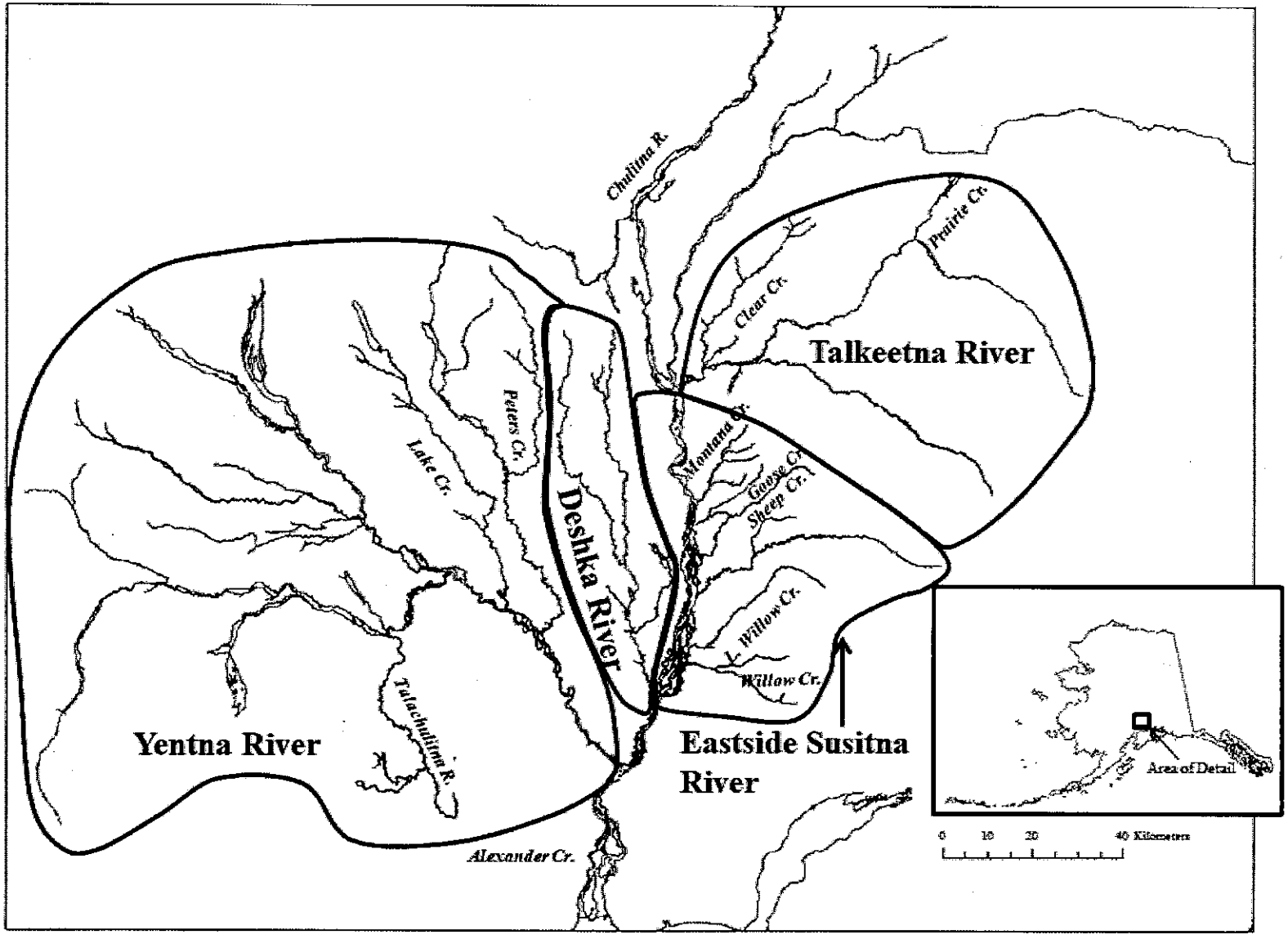

Figure 1.–Map of Susitna River king salmon escapement goals.

Table 1.– Upper Cook Inlet stocks reviewed for stock of concern status, including current and recommended SOC designation, current and recommended escapement goals, and escapements, 2009–2019. Escapement shaded in grey were below the escapement goal in place that year for that stock.

Species, system, and stock	SOC estab	Type of SOC	Type of Survey	Type of Goal	Current goal	Recommended Goal	Recommended SOC action	Escapements 2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
King salmon																		
West Cook Inlet																		
Lewis R	2011	mngt	SAS	SEG	250–800	discontinue	discontinue	111	56	92	107	61	61	5	0	0	0	0
Theodore R	2011	mngt	SAS	SEG	500–1,700	500–1,000	continue	352	202	327	179	476	312	426	68	21	18	201
Chuitna R	2011	mngt	SAS	SEG	1,200–2,900	1,000–1,500	continue	1,040	735	719	502	1,690	1,398	1,965	1,372	235	939	2,115
Susitna River																		
Alexander Cr	2011	mngt	SAS	SEG	2,100–6,000	1,900–3,700	continue	275	177	343	181	588	911	1117	754	170	296	1,297
Eastside Susitna River Stock						13,000–25,000[b]	mngt. (NEW)											
Goose Cr[a]	2014	mngt	SAS	SEG	250–650	discontinue	discontinue	65	76	80	57	62	232	NS	NS	148	90	NS
Sheep Cr	2014	mngt	SAS	SEG	600–1,200	discontinue	discontinue	500	NS	350	363	NS	262	NS	NS	NS	334	NS
Willow Cr	2011	yield	SAS	SEG	1,600–2,800	discontinue	discontinue	1,133	1,173	1,061	756	1,752	1,335	2,046	1,814	1,329	411	897
Little Willow	–	none	SAS	SEG	450–1,800	discontinue	-	776	468	713	494	858	684	788	675	840	280	631
Montana Cr	–	none	SAS	SEG	1,100–3,100	discontinue	-	1,460	755	494	416	1,304	953	1,416	692	603	473	789
Talkeetna River Stock						9,000–17,500[b]												
Clear (Chunilna) Cr	–	none	SAS	SEG	950 3,400	discontinue	-	1,205	903	512	1,177	1,471	1,390	1,205	NS	780	940	1,511
Prairie Cr	–	none	SAS	SEG	3,100 9,200	discontinue	-	3,500	3,022	2,038	1,185	3,304	2,812	3,290	1,853	1,930	1,194	2,371
Chulitna R	–	none	SAS	SEG	1,800–5,100	1,200–2,900	-	2,093	1,052	1,875	667	1,262	1,011	3,137	1,151	NS	1,125	2,765
Sockeye salmon																		
Susitna River																		
Yentna R[c]	2008	yield					discontinue	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chelatna Lake	–	none	weir	SEG	20,000–45,000	no change		17,721	37,734	70,353	36,736	70,555	26,374	69,897	60,792[d]	26,986	20,434	26,2303
Judd Lake[e]	–	none	weir	SEG	15,000–40,000	no change		44,602	18,466	39,909	18,715	14,088	22,229	47,934	NS	35,731	30,844	44,415
Larson Lake	–	none	weir	SEG	15,000 35,000	no change		40,930	20,324	12,225	16,567	21,821	12,430	23,185	14,333	31,866	23,632	9,699[f]

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Note: SAS is a single aerial survey shaded cells identify years that stocks did not meet the lower bound of the SEG during that particular year.

[a] Goose Creek king salmon stock was originally designated a stock of yield concern in 2011.

[b] Water was too low to access Study Reach 3 and most of Study Reach 2.

[c] Yentna River sockeye salmon escapement goal was replaced by SEGs on Chelatna, Judd, and Larson lakes in 2009.

[d] Goose Creek king salmon stock was originally designated a stock of yield concern in 2011.

[e] Judd Lake weir was not operated in 2016.

[f] 3,200 dead fish observed between confluence and weir; 59 of 60 females sampled still gravid.

Table 2.– Susitna River drainage yield estimates based on genetic analysis of sockeye salmon harvest in the Upper Cook Inlet commercial fishery, 2005–2018.

Year	Susitna-Yentna	Judd-Chelatna-Larson	Susitna River drainage
2005	27,178	27,748	54,926
2006	16,230	28,231	44,461
2007	134,100	104,842	238,942
2008	66,315	47,092	113,407
2009	45,224	57,296	102,520
2010	55,659	58,425	114,084
2011	92,480	125,039	217,519
2012	90,128	88,826	178,954
2013	110,754	76,336	187,090
2014	56,109	67,659	123,768
2015	40,993	159,452	200,445
2016	47,868	76,548	124,416
2017	37,489	148,646	186,135
2018	52,596	50,558	103,154
Average			
2005–2008	60,956	51,978	112,934
2009–2018	62,930	90,879	153,809

Source: Barclay (2019)