THE STATE of ALASKA
GOVERNOR MICHAEL J. DUNLEAVY

Department of Fish and Game

DIVISIONS OF SPORT FISH AND COMMERCIAL FISHERIES
333 Raspberry Rd
Anchorage, Alaska 99518-1565
Main: 907.267.2105
Fax: 907.267.2442

MEMORANDUM

TO: Members
Alaska Board of Fisheries

DATE: October 3, 2019

FROM: Dave Rutz, Director
Division of Sport Fish

and

Sam Rabung, Director
Division of Commercial Fisheries

SUBJECT: Lower 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 (SOC) evaluation for Lower Cook Inlet (LCI) 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, pink, and chum salmon stocks in the LCI management area were examined for potential SOC status (Munro 2018). Currently, there is only 1 stock of concern listed in LCI (McNeil River chum salmon; stock of management concern). Three additional stocks were reviewed for SOC consideration given that recent runs were often below their respective sustainable escapement goal (SEG) ranges (Aialik Lake sockeye salmon, South Nuka Island pink salmon and China Poot Creek pink salmon) and are discussed below.

McNeil River Chum Salmon

The board designated McNeil River chum salmon a stock of management concern in 2016 (Otis et al. 2016a). Since 1976, McNeil River chum salmon escapement has been monitored using periodic aerial survey counts spaced throughout the run, which are then converted into a final escapement index using the area-under-the-curve method (Otis and Hollowell 2019, Peirce et al.

2011). The SEG range for McNeil River chum salmon (Table 1; 24,000–48,000 fish) was established in 2007 and first implemented in 2008 (Otis and Szarzi 2007; Otis et al. 2016b). Despite virtually no commercial harvest of chum salmon in the McNeil River Subdistrict since 1993, escapements to this system were below the SEG range in 7 of the 10 years prior to 2016. The recent trend of poor productivity is believed to be due to poor seeding of abundant high-quality spawning areas upstream of McNeil Falls, which is located very low in the drainage (Otis and Szarzi 2007; Otis et al. 2016a). While the falls are passible, they represent a physical obstacle to upstream migration and make salmon more vulnerable to predation by the high density of brown bears that frequent the McNeil River State Game Sanctuary during the chum salmon run (Peirce et al. 2011, Peirce et al. 2013). When runs are abundant, enough fish escape the bears to seed upriver spawning areas and maintain high stream-wide productivity. But when runs are less abundant it appears bear predation can effectively constrict production to the limited spawning areas available below McNeil Falls (Peirce et al. 2013).

Following the series of poor escapements that led to the SOC designation, the SEG for McNeil River chum salmon has been achieved in 3 of the past 4 years (2016–2019; Table 1). However, the department is recommending continuing the stock of management concern designation for McNeil River chum salmon, because: a) the 2019 escapement was well below the SEG range, which undermines the expectation that SEGs will continue to be met consistently in the future, b) the escapement goal was only achieved the previous 3 years due to fishery restrictions as prescribed in the stock of concern action plan (Otis et al. 2016a), and c) the life cycle of chum salmon is 4-6 years and the department would like to see a full generation of improved escapement and production before recommending that the SOC designation for this stock be removed.

Aialik Lake Sockeye Salmon

Since 1976, Aialik Lake sockeye salmon escapement has been monitored annually using periodic aerial survey counts spaced throughout the run, with the peak count representing the final escapement index each year (Otis and Hollowell 2019). The SEG range for Aialik Lake sockeye salmon is 3,200–5,400 fish (Table 1; Otis et al. 2016b). In some years over the past decade, above normal temperatures have resulted in increased melting of the glacier that contributes water to Aialik Lake. As a result, the water becomes more turbid and the ability of aerial surveyors to see salmon within the lake declines. These conditions likely contributed to some of the low aerial survey counts in 5 of the past 10 years. However, as sockeye salmon escapement to Aialik Lake has been within the SEG range during 2 of the past 3 years, the department does not recommend designating Aialik Lake sockeye salmon a SOC. We will continue to assess this stock and may explore other methods of monitoring escapement more effectively (e.g. remote video) if increased water turbidity continues to hamper the efficacy of aerial surveys.

South Nuka Island Creek Pink Salmon

Since 1976, South Nuka Island Creek pink salmon escapement has been monitored annually using periodic aerial or ground survey counts spaced throughout the run. The SEG range for South Nuka Island Creek pink salmon is 2,800–11,200 (Table 1; Otis et al. 2016b). This short drainage has produced highly variable runs over the years, with a peak total run of 495,000 fish

in 2015 followed by only 10 fish being documented in the stream in 2016. Although this stock did not achieve the SEG range in 5 of the past 8 years (3 even, 2 odd), the department does not recommend designating South Nuka Island Creek pink salmon a SOC. Most of the historical data used to establish the current SEG range were derived using ground survey counts, which are often higher than aerial counts on streams with thick riparian cover like this one. Ground surveys of this stock were curtailed in 2010 due to persistently difficult and dangerous float plane access to this remote and exposed location in the Gulf of Alaska. The recent trend of lower escapement indices is likely significantly influenced by this change in monitoring method. The department will continue to monitor escapements to this stream using aerial survey and evaluate whether the SEG should be recalibrated to the current monitoring method once enough data are available.

China Poot Creek Pink Salmon

Since 1976, China Poot Creek pink salmon escapement has been monitored annually using periodic ground survey counts spaced throughout the run. The SEG range for China Poot Creek pink salmon is 2,500–6,300 (Table 1; Otis et al. 2016b). Pink salmon returning to this extremely short stream with very limited spawning habitat (an impassible waterfall occurs ~300 meters above tidewater) are not currently targeted in commercial fisheries, but they are incidentally harvested by seiners targeting hatchery sockeye salmon returning to China Poot Creek. Despite the lack of a targeted fishery on pink salmon, an escapement goal has been maintained there since 1982 (Fried 1994) because it is one of the index streams the department historically used to forecast natural production of pink salmon in LCI. A recent change in the methods used to forecast pink salmon harvests in LCI obviates the need to continue closely monitoring this stock. However, given the relatively poor pink salmon escapements to China Poot Creek in recent years (Table 1), area staff intend to implement strategic late-season time and area closures to the sockeye salmon fishery in the China Poot Subdistrict to reduce pink salmon harvest. For these reasons, the department does not recommend designating China Poot Creek pink salmon a SOC but will continue monitoring escapements to evaluate the efficacy of our management actions.

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Table 1. Escapement goals and escapement indices for McNeil River chum salmon (stock of management concern) and select stocks in Lower Cook Inlet reviewed for stock of concern designation. Escapements shaded in gray were below the escapement goal in place that year for that stock. NS = no survey.

Stock	Current SEG	SEG Adopted	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019[a]
McNeil River - chum salmon[b]	24,000–48,000	2007	10,520	30,977	10,388	9,498	17,475	20,494	26,262	38,679	37,331	9,205
Aialik Lake - sockeye salmon[c]	3,200–5,400	2016	5,315	3,480	2,140	3,530	450	3,182	400	4,900	2,620	5,000
S. Nuka Island Ck - pink salmon[d]	2,800–11,200	2016	NS	NS	1,250	8,442	11,000	8,900	10	540	545	2,453
China Poot Ck - pink salmon[e]	2,500–6,300	2016	2,220	3,462	8,392	7,119	1,409	7,366	698	2,379	2,280	[f]

[a] 2019 escapement index estimates are preliminary.
[b] McNeil River chum salmon was designated a stock of management concern in 2016 (Otis et al. 2016a).
[c] The SEG range for Aialik Lake sockeye salmon during 2010–2016 was 3,700–8,000 (Otis et al. 2016b).
[d] The SEG range for South Nuka Island pink salmon during 2010–2016 was 2,700–14,250 (Otis et al. 2016b).
[e] The SEG range for China Poot Creek pink salmon during 2010–2016 was 2,900–8,200 (Otis et al. 2016b).
[f] The 2019 final escapement index for China Poot Creek pink salmon is not yet available, but will likely be below the SEG.