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MEMORANDUM

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DATE: October 1, 2018

SUBJECT: Arctic-Yukon-Kuskokwim Area Escapement Goal Recommendations

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The purpose of this memorandum is to inform you of our progress in reviewing and recommending escapement goals for the Arctic-Yukon-Kuskokwim (AYK) Region. The *Policy for Statewide Salmon Escapement Goals* (5 AAC 39.223) recognizes the establishment of salmon escapement goals as a joint responsibility of the Alaska Department of Fish and Game (department) and the Alaska Board of Fisheries (board) and describes the concepts, criteria, and procedures for establishing and modifying salmon escapement goals. Under the policy, the board recognizes and describes the department's responsibility for establishing and modifying biological escapement goals (BEG) and sustainable escapement goals (SEG).

An interdivisional escapement goal review team (review team) was convened to review available escapement and other data and make escapement goal recommendations where appropriate.

Escapement goals recommended in this memorandum are the products of collaborative work among division staff, including several meetings of the review team, other department staff, and stakeholders from federal agencies and various non-governmental organizations. The review team coordinated and directed the work of other staff and reviewed that work in the process of making escapement goal recommendations.

Pertinent escapement goal definitions are:

> 5 AAC 39.222 (f)(3) "*Biological Escapement Goal* (BEG): the escapement that provides the greatest potential for maximum sustained yield (MSY);"
>
> 5 AAC 39.222 (f)(36) "*Sustainable Escapement Goal* (SEG): a level of escapement, indicated by an index or an escapement estimate, that is known to provide for sustained yield over a 5 to 10 year period, used in situations where a BEG cannot be estimated or managed for;" and
>
> 5 AAC 39.222 (f)(25) "*Optimal Escapement Goal* (OEG): a specific management objective for salmon escapement that considers biological and allocative factors and may differ from the SEG or BEG."

Since inception of the *Policy for the Management of Sustainable Salmon Fisheries* and the *Policy for Statewide Salmon Escapement Goals* in 2000 and 2001, comprehensive escapement goal reviews have been conducted every 3 years for the AYK Region (ADF&G 2004; Brannian et al. 2006; Molyneaux and Brannian 2006; Volk et al. 2009; Conitz et al. 2012; Conitz et al. 2015). This review focused on stocks for which a new goal is needed, for which recent data or other evidence suggested an updated analysis might result in a revised escapement goal, or for which a goal should be discontinued.

The review team compiled the most current information for each salmon stock having an existing goal, and other monitored, exploited stocks without an existing goal. For stocks with an existing goal, the team decided upon a recommendation to: 1) retain the existing goal, 2) revise the goal, or 3) discontinue the goal. For stocks without an existing goal, the team decided whether or not to recommend establishing a new goal. The team decided which analytical methods were appropriate for revising a goal or establishing a new goal. All revisions that were based on the Percentile Approach used percentile recommendations as presented in Clark et al. 2014.

Oral and written reports concerning escapement goals and specific recommendations for numerous stocks in all areas of the AYK Region will be presented to the board in January 2019. These reports will list all existing escapement goals along with the new recommendations for all management areas of the AYK Region. The recommendations for each management area are summarized below.

Norton Sound-Port Clarence and Kotzebue Management Areas

A total of 28 escapement goals for 23 stocks exist in the Norton Sound-Port Clarence and Kotzebue Management Areas (Table 1). BEGs exist for 4 stocks: Norton Sound Subdistrict 1 chum salmon, Tubutulik River chum salmon, Kwiniuk River chum salmon, and Kotzebue (all areas) chum salmon. A total of 19 SEGs exist for 18 stocks (one pink stock has separate even and odd year goals). Additionally, optimal escapement goals (OEG) were established by the

board for 5 chum salmon stocks that also have associated BEGs or SEGs. Three of those OEGs are identical to the established SEGs.

The review team is recommending revisions to a subset of escapement goals. Unless otherwise stated, the recommended changes do not have implications for existing management plans or fishery allocations.

The review team recommends discontinuation of the aggregate Norton Sound Subdistrict 1 chum salmon BEG, and revising Eldorado, Nome and Snake River goals to be based on tower/weir data rather than proportions of the aggregate goal. The subdistrict-wide aggregate goal has not been useful for management. Most of the data used in estimating subdistrict-wide escapement is provided by 3 rivers that also have escapement goals (Nome, Snake and Eldorado rivers). In recent years there have been productivity differences for stocks migrating into rivers east of Cape Nome compared to those rivers west of Cape Nome. The better productivity in eastern subdistrict rivers has masked the poorer productivity patterns of western subdistrict rivers when evaluating a subdistrict-wide escapement goal. Consistent with these patterns, regulatory changes adopted during the 2016 board meeting allowed chum salmon within the subdistrict to be managed separately for stocks east and west of Cape Nome. During recent Arctic Area stakeholder meetings, stakeholders and the department have agreed that the assessment of subdistrict escapement is most accurately indicated by the 3 individual river goals on the Nome, Snake and Eldorado rivers.

The current SEGs for chum salmon on the Eldorado, Nome and Snake rivers were established based on proportions of the aggregate Subdistrict 1 escapement goal. By discontinuing the subdistrict-wide goal, the river goals should be established using available tower and weir data and standard analytical techniques.

Eldorado River: The current Eldorado River escapement goal uses expanded aerial surveys, but sufficient weir data are now available and provide greater accuracy and precision of escapement estimates than an expanded aerial survey estimate. A SEG of 4,400–14,200 chum salmon is recommended based on the 15^{th}–65^{th} percentiles of historical weir escapements using the percentile method. The dataset upon which this recommendation is provided includes 16 escapement estimates with high data contrast since 1995 and consideration that harvest rate on this stock is low to moderate. It should be noted that an OEG was established in 2005 that was identical to the SEG established at that time. The OEG goal range is listed in regulation (5AAC 04.358) and revision or removal of the OEG should be considered for consistency with revised methodology in escapement goal determination.

Nome River: A SEG of 1,600–5,300 chum salmon is recommended based on the 5^{th}–65^{th} percentiles of historic weir escapements using the percentile method. The dataset upon which this recommendation is provided includes 23 escapement estimates with low data contrast since 1993 and consideration that harvest rate on this stock is low. It should be noted that an OEG was established in 2005 that was identical to the SEG established at that time. The OEG goal range is listed in regulation (5AAC 04.358) and revision or removal of the OEG should be considered for consistency with revised methodology in escapement goal determination.

Snake River: A SEG of 2,000–4,200 chum salmon is recommended based on the 15^{th}–65^{th} percentiles of historic tower/weir escapements using the percentile method. The dataset upon

which this recommendation is provided includes 22 escapement estimates with high data contrast since 1995 and consideration that harvest rate on this stock is low to moderate. It should be noted that an OEG was established in 2005 that was identical to the SEG established at that time. The OEG goal range is listed in regulation (5AAC 04.358) and revision or removal of the OEG should be considered for consistency with revised methodology in escapement goal determination.

The review team recommends revising the Kwiniuk River chum salmon BEG of 10,000–20,000 to a SEG of 9,100–32,600. The current escapement goal was based on a poorly informed spawner-recruit analysis that relied on unsubstantiated assumptions of harvest. The review team determined that a SEG based on direct observations of escapement would be more appropriate. The review team updated escapement estimates and a revised goal of 9,100-32,600 chum salmon escapement is recommended based on the 15^{th}–65^{th} percentiles of historic tower escapements using the percentile method. The dataset upon which this recommendation is provided includes 32 escapement estimates with high data contrast since 1981 and consideration that harvest rate on this stock is low. It should be noted that an OEG was established in 2001, based on the BEG recommended at that time, and included a buffer to account for potential subsistence harvest above the tower. The OEG goal range is listed in the Subdistrict 2 and 3 of the Norton Sound District Salmon Management plan and revision or removal of the OEG should be considered for consistency with revised methodology in escapement goal determination. The OEG associated with this stock was established prior to the implementation of subsistence harvest permits, when the amount of subsistence harvest occurring above the tower was unknown and there was a need to accommodate for that harvest. Since implementation of the OEG, subsistence harvest permit data suggests 3% or less of the harvest on this stock occurs upstream of the tower and all harvest can now be accounted for and used in determination of spawning escapement.

The review team recommends revising the Tubutulik River chum salmon BEG of 8,000–16,000 to a SEG of 3,100–9,900. The current escapement goal was based on a poorly informed spawner-recruit analysis that relied on unsubstantiated assumptions of harvest and expanded aerial survey estimates. The review team determined the current expansion applied to aerial survey estimates used in the current goal may not be appropriate and unexpanded estimates may be more robust for assessing escapement; so a methodological change was recommended that may give the appearance of a lower goal simply because the numbers are not expanded. The revised goal of 3,100–9,900 chum salmon escapement is recommended based on the 20^{th}–60^{th} percentiles of historic unexpanded aerial survey escapements using the percentile method. The dataset upon which this recommendation is provided includes 37 escapement estimates with high data contrast since 1963 and consideration that harvest rate on this stock is low to moderate. It should be noted that an OEG was established in 2001, based on the BEG recommended at that time, and included a buffer to account for potential subsistence harvest. The OEG goal range is listed in the Subdistrict 2 and 3 of the Norton Sound District Salmon Management plan and revision or removal of the OEG should be considered for consistency with revised methodology in escapement goal determination. The OEG associated with this stock was established prior to the implementation of subsistence harvest permits. Aerial survey assessment of spawning escapement occurs after majority of the inriver subsistence harvest occurs, and aerial survey estimates are considered to be a reliable index of spawning escapement.

The review team recommends revising the Salmon Lake/Grand Central River sockeye salmon SEG of 4,000–8,000 to a SEG of 6,800–36,000 for Pilgrim River. The current goal is

based on aerial survey estimates. The review team determined weir-based assessment of escapement would be more robust than aerial survey assessment in this system; so a methodological change was recommended that may give the appearance of a higher goal simply because the escapement is assessed at a weir rather than through aerial surveys. A goal of 6,800–36,000 sockeye salmon escapement is recommended based on the 15th–65th percentiles of historic weir data using the percentile method. The dataset upon which this recommendation is provided includes 14 escapement estimates with high data contrast since 2003 and consideration that harvest rate on this stock is considered low to moderate. An escapement estimate for 2017 was not available at the time of review.

The review team recommends discontinuation of the Kotzebue-wide BEG for chum salmon, discontinuation of Salmon, Squirrel and Tutuksuk rivers aerial survey SEGs, and revising Noatak River and Upper Kobuk River SEGs to be based on aerial survey data rather than proportions of the aggregate goal. The current Kotzebue-wide goal and the river goals that are based on proportions of the Kotzebue-wide goal employ many assumptions and cannot be assessed in most years because there are too many data gaps necessary to create estimates. The Kotzebue area would be better served by focusing on individual river goals that can be assessed regularly with robust data. As with the Norton Sound Subdistrict 1 chum salmon goals, current individual river goals were established as proportions of the aggregate goal and, if the aggregate goal is discontinued the individual goals should be established using available aerial survey data and standard analytical techniques. Escapement has not been assessed for the Salmon, Squirrel, and Tutuksuk rivers since 1999 (except for one survey in 2005), therefore, the review team recommends that these goals be discontinued.

Noatak River: A SEG of 43,000–92,800 chum salmon is recommended based on 20th–60th percentiles of historic aerial survey escapements using the percentile method. The dataset upon which this recommendation is provided includes 14 escapement estimates with high data contrast since 1974 and consideration that harvest rate on this stock is moderate to high. The dataset upon which this recommendation is provided is based on aerial survey counts from the Noatak River mainstem combined with counts from Eli and Kelly rivers which are tributaries of the Noatak River.

Upper Kobuk/Selby rivers: A SEG of 12,000–32,100 chum salmon is recommended based on 5th–65th percentiles of historic aerial survey escapements using the percentile method. The dataset upon which this recommendation is provided includes 15 escapement estimates with low data contrast for both rivers in the same year since 1974 and consideration that harvest rate on this stock is moderate to high.

The review team recommends that all other existing escapement goals for salmon stocks in the Norton Sound-Port Clarence and Kotzebue management areas continue without revision.

Yukon Management Area

In the Yukon Management Area, which includes the entire Yukon River drainage within Alaska, there are currently 14 established escapement goals including: 6 king salmon, 3 summer chum salmon, 4 fall chum salmon, and 1 coho salmon (Table 2). Seven of these goals are BEGs and 7 are SEGs. Not included in this listing are 3 goals for Canadian stocks that were established as part of the *Yukon River Salmon Agreement*. Escapement targets for these Canadian stocks

(mainstem Yukon River king salmon, mainstem Yukon River fall chum salmon, and Fishing Branch River fall chum salmon) are set annually by the Yukon River Panel (JTC 2018).

The review team is recommending revisions to a subset of escapement goals. The recommended changes do not have implications for existing management plans or fishery allocations.

The review team recommends discontinuation of the Tanana River fall chum salmon BEG and revising the Delta River fall chum salmon BEG of 6,000–13,000 to a SEG of 7,000–20,000 fish. Escapement of Tanana River fall chum salmon has not been directly monitored since 2007, and as such, the review team recommends discontinuing the goal. Instead, indirect assessment has been achieved using historical relationships between Tanana River fall chum salmon escapement and escapement to the 1) Delta River, which is a tributary of the Upper Tanana River or 2) abundance of Canadian mainstem fall chum salmon. Escapement of fall chum salmon to the Delta River is assessed annually using replicate foot survey methods and provides an index of fall chum salmon escapement to the Tanana River. The existing escapement goal for the Delta River is a BEG based on a percentage of the Tanana River goal. The review team recommends revising the Delta River goal based on direct estimates of escapement to that system. A SEG of 7,000–20,000 fall chum salmon is recommended based on the 15^{th}–65^{th} percentiles of historic escapements. The 15^{th}–65^{th} range was chosen because the survey methods produce estimates with low measurement error. The dataset upon which this recommendation is provided includes 44 escapement estimates since 1974 with high data contrast and consideration that harvest rate on this stock is low to moderate.

The review team recommends revising the Chandalar River fall chum salmon BEG of 74,000–152,000 to a SEG of 85,000–234,000. The existing fall chum salmon escapement goal for the Chandalar River is a BEG and was based on a percentage of the Upper Yukon River aggregate goal which was discontinued in 2016. The review team determined that the escapement goal should be revised based on direct assessment of escapement as measured by the Chandalar River sonar. A SEG of 85,000–234,000 fall chum salmon is recommended based on the 5^{th}–65^{th} percentile of historic sonar-based escapement estimates using the percentile method. The dataset upon which this recommendation is provided includes 23 escapement estimates since 1995 with low data contrast and consideration that harvest rate on this stock is low to moderate.

The review team recommends that all other existing escapement goals for salmon stocks in the Yukon Management Area continue without revision.

Kuskokwim Management Area

The Kuskokwim Management Area, which includes the Kuskokwim River and Kuskokwim Bay drainages, currently has 23 established escapement goals for 14 king salmon, 2 chum salmon, 3 coho salmon, and 4 sockeye salmon stocks (Table 3). A total of 21 goals are SEGs and 2 goals are BEGs.

The review team is recommending revisions to a subset of escapement goals. The recommended changes do not have implications for existing management plans or fishery allocations.

The review team recommends discontinuation of the Holtina River king salmon aerial survey SEG. The review team determined that the Holitna River aerial survey goal was redundant with the weir-based goal established for the Kogrukluk River, which is a tributary of the Holitna River. The Holitna River aerial survey produces an index of escapement to the Holitna River compared to a census of escapement through the Kogrukluk River weir.

The review team recommends revising the Middle Fork Goodnews River king salmon weir-based BEG of 1,500–2,900 to an SEG of 1,500–3,600. The existing BEG was based on a poorly informed spawner-recruit analysis. A SEG of 1,500–3,600 king salmon is recommended based on the 15^{th}–65^{th} percentile of historic weir-based escapement estimates using the percentile method. The dataset upon which this recommendation is provided includes 26 escapement estimates since 1991 with high data contrast and consideration that harvest rate on this stock is low to moderate.

The review team recommends revising the Middle Fork Goodnews River sockeye salmon weir-based BEG of 18,000–40,000 to an SEG of 22,000–43,000. The existing BEG was based on a poorly informed spawner-recruit analysis. A SEG of 22,000–43,000 sockeye salmon is recommended based on the 5^{th}–65^{th} percentile of historic weir-based escapement estimates using the percentile method. The dataset upon which this recommendation is provided includes 23 escapement estimates since 1991 with low data contrast and consideration that harvest rate on this stock is low to moderate. Record escapements were observed in 2016 and 2017. Those escapements were attributed, in part, to the lack of a commercial fishery in District 5, which represented a substantial reduction in harvest of Middle Fork Goodnews River sockeye salmon. The review team did not use the 2016 or 2017 escapements in the percentile-based analysis because the department lacks return data from these record escapements.

The review team recommends that all other existing escapement goals for salmon stocks in the Kuskokwim Management Area continue without revision.

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Table 1.–Summary of escapement goal recommendations for Norton Sound/Port Clarence and Kotzebue Management Areas for 2019.

Stock unit	Assessment method	Current escapement goal			Escapement goal recommendation for 2019		
		Goal	Type	Year established or last revised	Action	New or revised goal	Type
Norton Sound/Port Clarence Management Area							
King Salmon							
Kwiniuk River	Tower	>250	LB SEG	2016	No change		
North River (Unalakleet R.)	Tower	1,200–2,600	SEG	2005	No change		
Chum Salmon							
Nome Subdistrict 1 Aggregate	Multiple	23,000–35,000	BEG	2001	Discontinue		
Eldorado River	Expanded peak aerial survey	6,000–9,200	SEG/OEG	2005	Revise Goal	4,400–14,200	SEG
					Revise OEG contingent on board action		
Nome River	Weir	2,900–4,300	SEG/OEG	2005	Revise Goal	1,600–5,300	SEG
					Revise OEG contingent on board action		
Snake River	Tower/weir	1,600–2,500	SEG/OEG	2005	Revise Goal	2,000–4,200	SEG
					Revise OEG contingent on board action		
Kwiniuk River	Tower	11,500–23,000	OEG	2001	Revise OEG contingent on board action		
Kwiniuk River	Tower	10,000–20,000	BEG	2001	Revise Goal	9,100–32,600	SEG
Tubutulik River	Expanded peak aerial survey	8,000–16,000	BEG	2001	Revise Goal	3,100–9,900	SEG
Tubutulik River	Expanded peak aerial survey	9,200–18,400	OEG	2001	Revise OEG contingent on board action		

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AYK Escapement Goal Recommendations

Table 1.–Page 2 of 3.

Stock unit	Assessment method	Current escapement goal			Escapement goal recommendation for 2019		
		Goal	Type	Year established or last revised	Action	New or revised goal	Type
Coho Salmon							
Kwiniuk River	Peak aerial survey	650–1,300	SEG	2005	No change		
Niukluk River/Ophir Creek	Peak aerial Survey	750–1,600	SEG	2016	No change		
North River (Unalakleet R.)	Peak aerial Survey	550–1,100	SEG	2005	No change		
Pink Salmon							
Kwiniuk River (all years)	Tower	>8,400	LB SEG	2005	No change		
Nome River (even year)	Weir	>13,000	LB SEG	2005	No change		
Nome River (odd year)	Weir	>3,200	LB SEG	2005	No change		
North River (Unalakleet. R. all years)	Tower	>25,000	LB SEG	2005	No change		
Sockeye Salmon							
Salmon Lake	Peak aerial survey	4,000–8,000	SEG	2005	Revise Goal	6,800–36,000	SEG
Glacial Lake	Peak aerial survey	800–1,600	SEG	2005	No change		

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AYK Escapement Goal Recommendations

Table 1.–Page 3 of 3.

Stock unit	Assessment method	Current escapement goal			Escapement goal recommendation for 2019		
		Goal	Type	Year established or last revised	Action	New or revised goal	Type
Kotzebue Management Area							
Chum Salmon							
Kotzebue (all areas)	Expanded peak aerial survey	196,000–421,000	BEG	2007	Discontinue		
Noatak/Eli Rivers	Peak aerial survey	42,000–91,000	SEG	2007	Revise	43,000–92,800	SEG
Salmon River (Kobuk R. drainage)	Peak aerial survey	3,300-7,200	SEG	2007	Discontinue		
Squirrel River (Kobuk R. drainage)	Peak aerial survey	4,900–10,500	SEG	2007	Discontinue		
Tutuksuk River (Kobuk R. drainage)	Peak aerial survey	1,400–3,000	SEG	2007	Discontinue		
Upper Kobuk and Selby Rivers	Peak aerial survey	9,700–21,000	SEG	2007	Revise	12,000–32,100	SEG

LB = Lower bound

Table 2.–Summary of escapement goal recommendations for Yukon Management Areas for 2019.

Stock unit	Assessment method	Current escapement goal			Escapement goal recommendation for 2019		
		Goal	Type	Year established	Action	New or revised goal	Type
King salmon[1]							
Andreafsky River (East Fork)	Weir	2,100–4,900	SEG	2010	No change		
Andreafsky River (West Fork)	Peak aerial survey	640–1,600	SEG	2005	No change		
Nulato River (forks combined)	Peak aerial survey	940–1,900	SEG	2005	No change		
Anvik River	Peak aerial survey	1,100–1,700	SEG	2005	No change		
Chena River	Tower/Mark-Recapture	2,800–5,700	BEG	2001	No change		
Salcha River	Tower/Mark-Recapture	3,300–6,500	BEG	2001	No change		
Chum Salmon, Summer							
Yukon River (entire drainage)		500,000—1,200,000	BEG	2016	No change		
East Fork Andreafsky River	Weir	>40,000	LB SEG	2010	No change		
Anvik River	Sonar	350,000–700,000	BEG	2005	No change		

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[1] The Canadian border king salmon escapement goal was established under the *Yukon River Salmon Agreement* and is reviewed annually by the Yukon River Panel. It is not included as part of this summary.

Table 2.–Page 2 of 2.

Stock unit	Assessment method	Current escapement Goal			Escapement goal recommendation for 2019		
		Goal	Type	Year established	Action	New or revised goal	Type
Chum Salmon, Fall[2]							
Yukon R Drainage[3]	Multiple[4]	300,000–600,000	SEG/ biological analysis	2010	No change		
Tanana River	Multiple[4]	61,000–136,000	BEG	2001	Discontinue		
Delta River	Foot survey	6,000–13,000	BEG	2001	Revise	7,000–20,000	SEG
Chandalar River	Sonar	74,000–152,000	BEG	2001	Revise	85,000–234,000	SEG
Coho Salmon (1 existing goal)							
Delta Clearwater River	Boat survey	5,200–17,000	SEG	2005	No change		

LB = Lower bound

[2] The Canadian fall chum salmon mainstem border and Fishing Branch River escapement goals, established under the *Yukon River Salmon Agreement* and reviewed annually by the Yukon River Panel, are not included in this summary.

[3] This goal includes all Alaskan and Canadian stocks.

[4] Includes combination of any of the following methods: foot survey, aerial survey, weir, and sonar.

Table 3.–Summary of escapement goal recommendations for Kuskokwim Management Area salmon stocks for 2019.

Stock Unit	Assessment method	Current escapement goal			Escapement goal recommendation for 2019		
		Goal	Type	Year established	Action	New or revised goal	Type
King Salmon							
Kuskokwim River and tributaries							
Kuskokwim River	Run Reconstruction[5]	65,00–120,000	SEG	2013	No change		
Aniak River	Peak aerial survey	1,200–2,300	SEG	2005	No change		
Cheeneetnuk River	Peak aerial survey	340–1,300	SEG	2005	No change		
Gagarayah River	Peak aerial survey	300–830	SEG	2005	No change		
George River	Weir	1,800–3,300	SEG	2013	No change		
Holitna River	Peak aerial survey	970–2,100	SEG	2005	Discontinue		
Kisaralik River	Peak aerial survey	400–1,200	SEG	2005	No change		
Kogrukluk River	Weir	4,800–8,800	SEG	2013	No change		
Kwethluk River	Weir	4,100–7,500	SEG	2013	No change		
Pitka Fork Salmon River	Peak aerial survey	470–1,600	SEG	2005	No change		
Salmon River (Aniak Drainage)	Peak aerial survey	330–1,200	SEG	2005	No change		
Kuskokwim Bay							
Kanektok River	Peak aerial survey	3,900—12,000	SEG	2016	No change		
Middle Fork Goodnews River	Weir	1,500–2,900	BEG	2005	Revise	1,500–3,600	SEG
North (Main) Fork Goodnews River	Peak aerial survey	640–3,300	SEG	2005	No change		

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[5] Run reconstruction is conducted postseason, and uses a model to estimate total return from harvest and escapement monitoring projects.

Table 3.–Page 2 of 2.

Stock Unit	Assessment method	Current escapement goal			Escapement goal recommendation for 2019		
		Goal	Type	Year established	Action	New or revised goal	Type
Chum Salmon							
Kuskokwim River and tributaries							
Kogrukluk River	Weir	15,000–49,000	SEG	2005	No change		
Kuskokwim Bay							
Middle Fork Goodnews River	Weir	>12,000	LB SEG	2005	No change		
Coho Salmon							
Kuskokwim River and tributaries							
Kogrukluk River	Weir	13,000–28,000	SEG	2005	No change		
Kwethluk River	Weir	>19,000	LB SEG	2010	No change		
Kuskokwim Bay							
Middle Fork Goodnews River	Weir	>12,000	LB SEG	2005	No change		
Sockeye Salmon							
Kuskokwim River and tributaries							
Kogrukluk River	Weir	4,400–17,000	SEG	2010	No change		
Kuskokwim Bay							
Kanektok River	Peak aerial survey	15,300—41,000	SEG	2016	No change		
NorthFork Goodnews River	Peak aerial survey	9,600—18,000	SEG	2016	No change		
Middle Fork Goodnews River	Weir	18,000–40,000	BEG	2007	Revise	22,000-43,000	SEG

LB = Lower bound