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Department of Fish and Game

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MEMORANDUM

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DATE: September 17, 2012

SUBJECT: Alaska Peninsula/ Aleutian Islands Escapement Goal Memo

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The purpose of this memorandum is to inform you of our progress in reviewing and recommending escapement goals for the Alaska Peninsula and Aleutian Islands Management Area (Area M) of the Westward Region. The *Policy for the Management of Sustainable Salmon Fisheries* (SSFP; 5 AAC 39.222) directs the department to provide the Alaska Board of Fisheries (board) with a review of salmon escapement goals every three years in concert with the regulatory cycle for each management area. Escapement goals were evaluated and recommended based on the SSFP and the *Policy for Statewide Salmon Escapement Goals* (5 AAC 39.223).

In February 2012, an interdivisional team, including staff from the divisions of Commercial Fisheries and Sport Fish, was formed to review existing salmon escapement goals in Area M. This memorandum summarizes the preliminary results of the salmon escapement goal review and subsequent recommendations. The team has reached consensus on all recommendations outlined below.

Two important definitions are:

5 AAC 39.222(f)(3) *"Biological Escapement Goal* (BEG): the escapement that provides the greatest potential for maximum sustained yield (MSY);" and

> 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."

The Area M salmon escapement goals were last reviewed in 2009 (Witteveen et al. 2009). The 2012 review of the present 28 escapement goals resulted in consensus to leave 24 goals unchanged and eliminate four goals (Table 1 and Figure 1). This resulted in the following 24 escapement goals for Area M: one BEG for king salmon; one BEG and 13 SEGs for sockeye salmon; two SEGs for coho salmon; two aggregate SEGs for pink salmon , and five aggregate SEGs for chum salmon.

The review team determined the appropriate goal type for each Area M salmon stock with an existing goal, based on the quality and quantity of available data, and then determined the most appropriate methods to evaluate the escapement goal ranges. If a sufficient time series of escapement and total return estimates were available and the data contained sufficient information to provide a scientifically defensible, accurate estimate of the spawning escapement with the greatest potential to produce maximum sustained yield (S_{msy}), then the data were considered sufficient to attempt to develop a BEG. If return estimates were not available and/or the data were not sufficient to estimate S_{msy}, the data were used to establish an SEG. Methods used to develop BEGs included spawner-recruit analysis and a habitat-based model (Liermann et al. 2010). Methods used to develop SEGs included the percentile approach (Bue and Hasbrouck *Unpublished*) and risk analysis (Bernard et al. 2009).

After analyzing available data for each stock, the team estimated escapement goals, compared these estimates with the current goals, and then made recommendations to establish new goals or maintain (no change), change, or eliminate the current goals. The methods used to evaluate Area M escapement goals, as well as the rationale used to make subsequent recommendations, will be described in detail in a department Fishery Manuscript Report which will be published prior to the February Alaska Board of Fisheries (board) meeting. Preliminary results of the review are summarized below.

King salmon

The team recommends that the current Nelson River king salmon BEG of 2,400 to 4,400, as established in 2003, remain unchanged. Recent escapements were similar to historical counts and the team concluded that further analysis was not necessary.

Sockeye salmon

The team recommends no changes to the existing escapement goals for sockeye salmon. Overall, recent sockeye salmon runs have met or exceeded their respective escapement goals with one exception. The Swanson Lagoon sockeye salmon stock has been below the escapement goal range in each of the last four years (2008–2011), despite little fishing effort directed at this stock. Escapement is very difficult to assess because the system has frequent large algae blooms, obscuring visibility.

Coho salmon

The team recommends that the current Nelson River coho salmon SEG of 18,000 and the Ilnik River coho salmon SEG of 9,000 remain unchanged. There is no recent information that would warrant changing the current SEGs for these stocks.

The team recommends eliminating the coho salmon SEG for Thin Point. There is little directed effort for Thin Point coho, and the system is rarely surveyed because escapement usually occurs after staff have completed aerial surveys.

Pink salmon

Four South Peninsula pink salmon escapement goals (even- and odd-year goals for two aggregate stocks) were evaluated during this review. The team recommends that the current South Peninsula pink salmon SEG ranges of 1,864,600 to 3,729,300 for even years, and 1,637,800 to 3,275,700 for odd years, remain unchanged. The team recommends eliminating the Bechevin Bay pink salmon SEG for even and odd years. Effort in Bechevin Bay targets chum salmon, rather than pink salmon, and aerial escapement estimates are unreliable because a large portion of fish are believed to spawn in the bay in areas difficult to survey.

Chum salmon

The team recommends that the current South Peninsula chum salmon SEG ranges of 106,400 to 212,800 for the Southeastern District; 89,800 to 179,600 for the South Central District; and 133,400 to 266,800 for the Southwestern District remain unchanged. The team also recommends that the North Peninsula chum salmon SEG ranges of 100,000 to 215,000 fish for the Northwestern District and 119,600 to 239,200 fish for the Northern District remain unchanged. Recent escapements were similar to historical counts and the team concluded that further analysis was not necessary. However, the team recommends that the SEG threshold of 800 fish for the Unimak District should be eliminated. There is little fishing effort and surveys in the area are limited.

In summary, the Area M Escapement Goal Review Team reviewed 28 existing salmon escapement goals, resulting in consensus to leave 24 goals unchanged and eliminate four goals. Staff are now preparing a report for the February 2013 board meeting. Escapement goal recommendations for each stock will be presented to the board orally and in writing. This report will list all current and recommended escapement goals, as well as detailed descriptions of the analyses performed.

References Cited

Bernard, D. R., J. J. Hasbrouck, B. G. Bue and R. A. Clark. 2009. Estimating risk of management error from precautionary reference points (PRPs) for non-targeted salmon stocks. Alaska Department of Fish and Game, Special Publication No. 09-09, Anchorage.

Bue, B.G., and J.J. Hasbrouck. *Unpublished.* Escapement goal review of salmon stocks of Upper Cook Inlet. Alaska Department of Fish and Game, Report to the Board of Fisheries, 2001, Anchorage.

Liermann, M.C., R. Sharma, C. K. Parken. 2010. Using accessible watershed size to predict management parameters for Chinook salmon *Oncorhynchus tshawytscha*, populations with little or no spawner-recruit data: a Bayesian hierarchical modeling approach. Fisheries Management and Ecology. 17, 40-51.

Witteveen, M.J., H. Finkle, M. Loewen, M.B. Foster, and J.W. Erickson. 2009. Review of salmon escapement goals in the Alaska Peninsula and Aleutian Islands Management Areas; A Report to the Alaska Board of Fisheries, 2010. Alaska Department of Fish and Game, Fishery Manuscript No. 09-09, Anchorage.

Table 1.–Current escapement goals, escapements observed from 2009 through 2011, king, sockeye, coho, pink, and chum salmon stocks of the Alaska Peninsula and Aleutian Islands management areas.

System	Escapement Data[a]	Current Escapement Goal Type (BEG, SEG)	Range			Escapements 2009	2010	2011	2012 Recommendation
King Salmon									
Nelson River	WC/PAS	BEG	2,400	to	4,400	2,048	2,769	1,404	No change
Sockeye Salmon									
Orzinski Lake	WC	SEG	15,000	to	20,000	21,457	18,039	16,764	No change
Thin Point Lake	PAS	SEG	14,000	to	28,000	33,500	12,400	14,500	No change
Mortensens Lagoon	PAS	SEG	3,200	to	6,400	25,000	6,600	500	No change
Christianson Lagoon	PAS	SEG	25,000	to	50,000	48,100	27,900	35,200	No change
Swanson Lagoon	PAS	SEG	6,000	to	16,000	1,000	1,700	1,000	No change
North Creek	PAS	SEG	4,400	to	8,800	8,000	18,500	10,200	No change
Nelson River	WC	BEG	97,000	to	219,000	157,000	108,000	89,000	No change
Bear Lake									
Early	WC	SEG	176,000	to	293,000	216,237	226,534	207,451	No change
Late	WC	SEG	117,000	to	195,000	133,263	142,966	132,549	No change
Sandy River	WC	SEG	34,000	to	74,000	36,000	37,000	37,500	No change
Ilnik River	WC	SEG	40,000	to	60,000	66,000	59,000	43,000	No change
Meshik River	PAS	SEG	25,000	to	100,000	88,000	63,700	93,900	No change
Cinder River	PAS	SEG	12,000	to	48,000	133,600	108,900	106,000	No change
McLees Lake	WC/PAS	SEG[b]	10,000	to	60,000	10,120	32,842	36,602	No change
Coho Salmon									
Thin Point Lake	PAS	SEG	3,000			900		200	Remove SEG
Nelson River	PAS	SEG	18,000			22,000	15,000	21,000	No change
Ilnik River	PAS	SEG	9,000			24,000	19,600	22,000	No change
Pink Salmon									
South Peninsula Total-even years	PAS	SEG	1,864,600	to	3,729,300		742,912		No change
South Peninsula Total-odd years	PAS	SEG	1,637,800	to	3,275,700	3,067,000		2,494,950	No change
Bechevin Bay Section-even years	PAS	SEG	31,000				13,600		Remove SEG
Bechevin Bay Section-odd years	PAS	SEG	1,600			72,000		2,400	Remove SEG
Chum Salmon									
Southeastern District	PAS	SEG	106,400	to	212,800	84,460	144,100	151,400	No change
South Central District	PAS	SEG	89,800	to	179,600	18,600	85,600	169,000	No change
Southwestern District	PAS	SEG	133,400	to	266,800	385,730	142,650	176,425	No change
Unimak District	PAS	SEG	800			1,400	1,050	7,000	Remove SEG
Northwestern District	PAS	SEG	100,000	to	215,000	84,460	144,100	151,400	No change
Northern District	PAS	SEG	119,600	to	239,200	154,131	145,310	96,952	No change

[a] PAS = Peak Aerial Survey, WC= Weir Count.

[b] McLees Lake sockeye salmon SEG will be in effect if a weir is in place; there will be no goal if a weir is not operated.

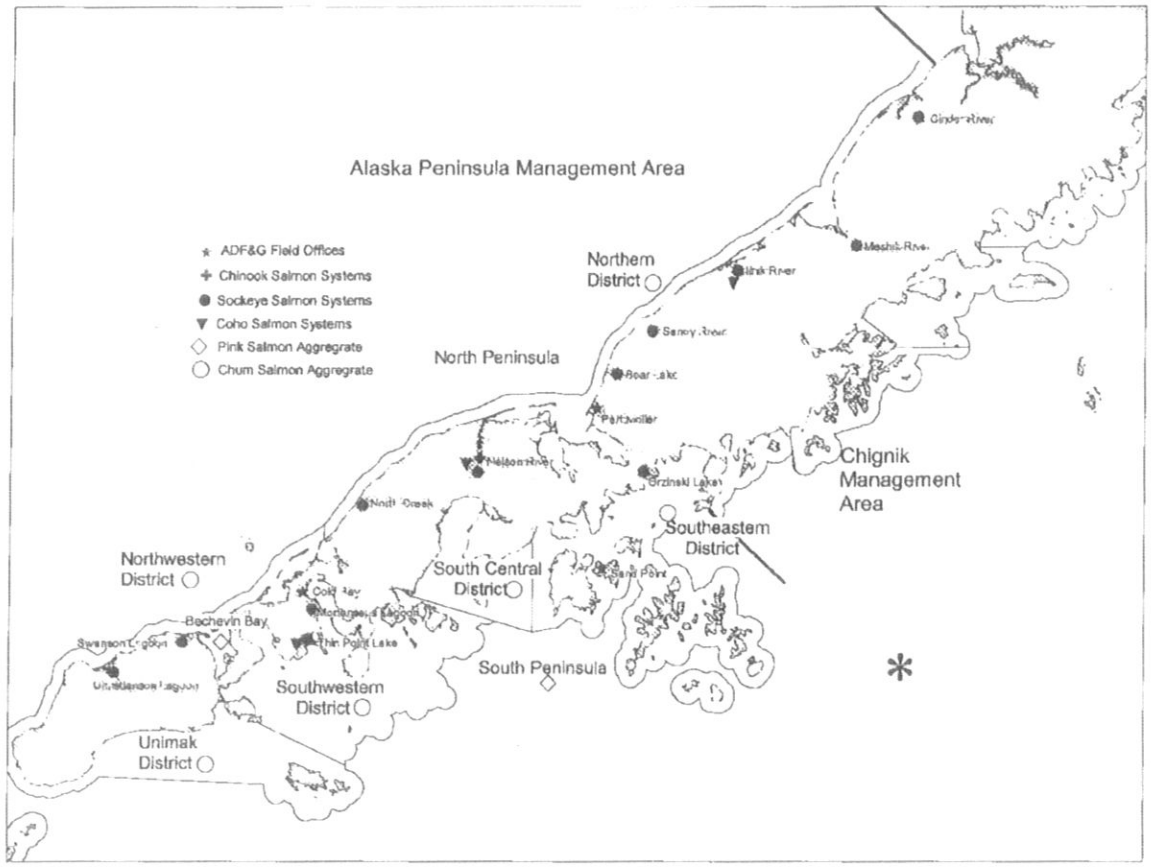

Figure 1.–Map of the Alaska Peninsula Management Area with the major king, sockeye, coho, pink, and chum salmon systems depicted.