

Salmon Stock Status and Escapement Goals in Southeast and Yakutat

**Alaska Board of Fisheries
January 11–January 23, 2018
Sitka**

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**Oral Report:
RC-3—Tab 15**

**Written Report:
RC-3—Tab 9**

Presentation Outline

- Escapement goal policies and definitions
- Current escapement goals
- Stock status
- Recommendations for escapement goal revisions



Escapement Goal Policies



- ***Policy for the Management of Sustainable Salmon Fisheries (SSFP; 5 AAC 39.222)***
 - Reviewed potential stocks of concern as defined in the SSFP

- ***Policy for Statewide Salmon Escapement Goals (5 AAC 39.223)***

- **Adopted to ensure salmon stocks are conserved, managed, and developed using the sustained yield principle**

Escapement Goal Policies

Transboundary Rivers (U.S./CAN Management):

- **Management under the auspices of the Pacific Salmon Treaty**
- **Review by the PSC technical committees and panels including staff from ADF&G and DFO**



Escapement Goal Policies - Definitions

Biological Escapement Goal (BEG)—

The escapement that provides the greatest potential for maximum sustained yield (MSY).



Escapement Goal Policies - Definitions

Sustainable Escapement Goal (SEG)—

A level of escapement, indicated by an index or an escapement estimate, that that is known to provide for sustained yield over a 5 to 10 year period and used in situations where a BEG cannot be estimated or managed for.



Escapement Goal Policies - Definitions

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.



Escapement Goals – King Salmon

2017 King Salmon Escapement Goals

System	Goal Type	Lower Bound	Upper Bound
Situk River	BEG	450	1,050
Alesek River	BEG	3,500	5,300
Klukshu (Alesek River)	BEG	800	1,200
Chilkat River	BEG	1,750	3,500
Taku River	BEG	19,000	36,000
King Salmon River	BEG	120	240
Stikine River	BEG	14,000	28,000
Andrew Creek	BEG	650	1,500
Unuk River	BEG	1,800	3,800
Chickamin River	BEG	450	900
Blossom River	BEG	150	300
Keta River	BEG	175	400

Abundance-Based Management

- The majority of the region's wild stock production is monitored annually



King Salmon Stocks

Inside Rearing:

Chilkat River
King Salmon River
Andrew Creek
Unuk River
Chickamin River
Blossom River
Keta River

Outside Rearing:

Situk River
Alek (and Klukshu) River
Taku River
Stikine River

Full Indicator Stocks:

Chilkat River
Taku River
Stikine River
Unuk River



King Salmon Stocks

Inside Rearing:

- Mature & rear mostly within SEAK waters
- Vulnerable to SEAK & Northern BC harvest throughout their life cycle
 - maturing/rearing & adults during spawning migration

Outside Rearing:

- Mature and rear mostly in GOA & Bering Sea
- Primarily harvested in SEAK fisheries during return spawning migrations in spring and early summer



King Salmon Stocks

Full Indicator Stocks:

- CWT juveniles—
 - Estimates of total smolt production
 - Estimates of marine (smolt-adult) survival
 - Estimates of freshwater (overwinter) survival
- Harvest Sampling—
 - Estimates of harvest by gear, area, time
- Adult Escapement—
 - Estimates of escapement by age, sex, and length



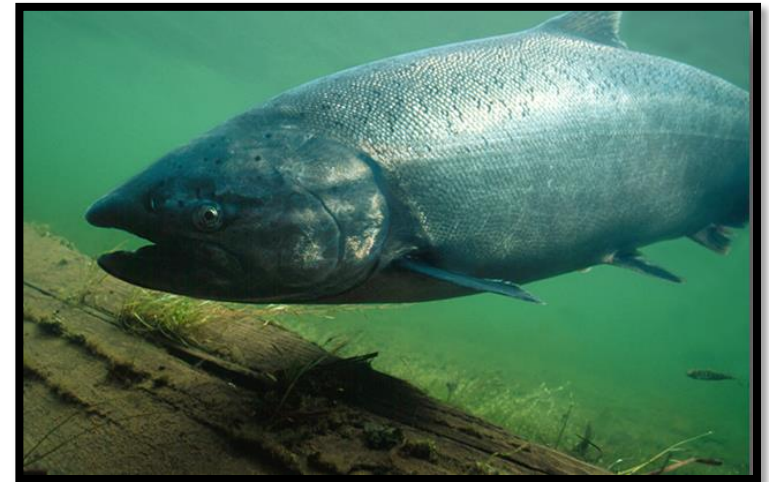
King Salmon – Stock Status

• Stock Status

- Despite low escapements across the region in 2016 and 2017, previous escapement levels from 2012–2015 were above the lower bounds of the BEG for 7 of the 12 indicator stocks in 3 of those 4 years
- Long-term: generally good
- Short-term: very poor

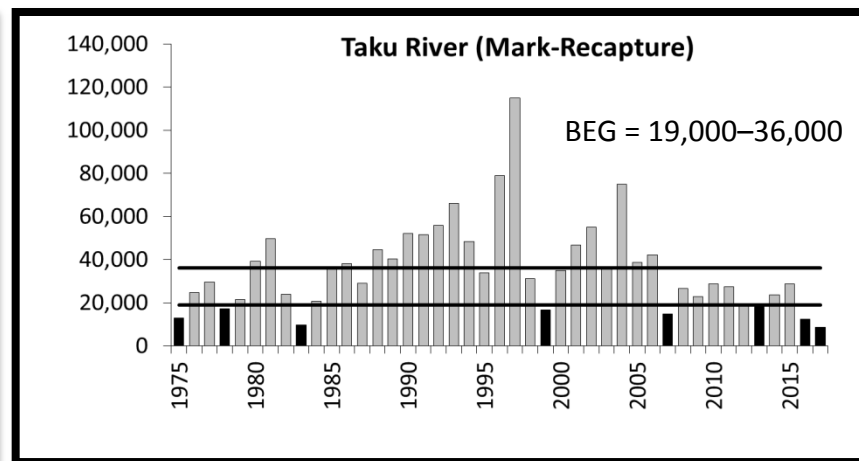
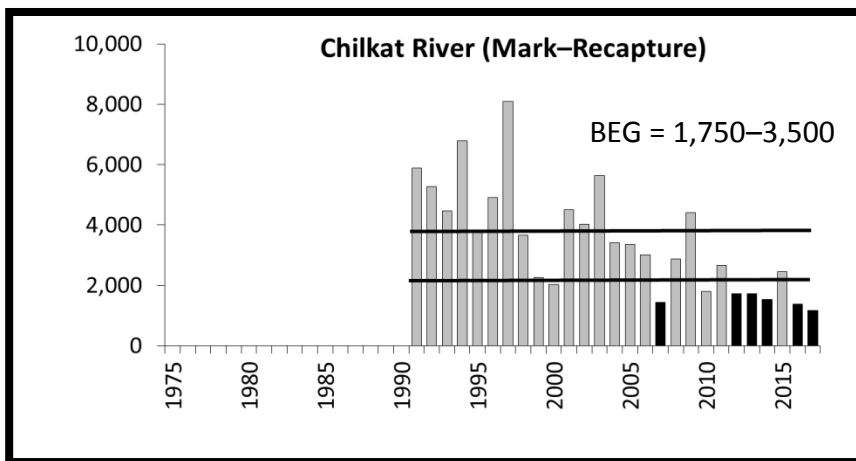
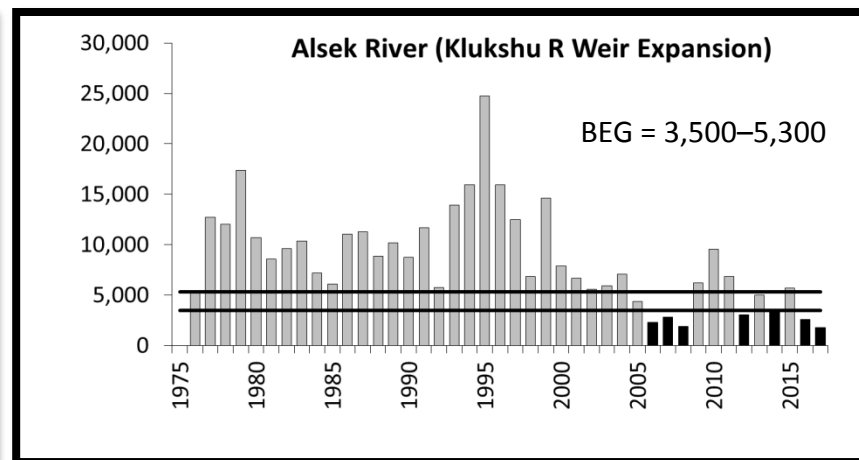
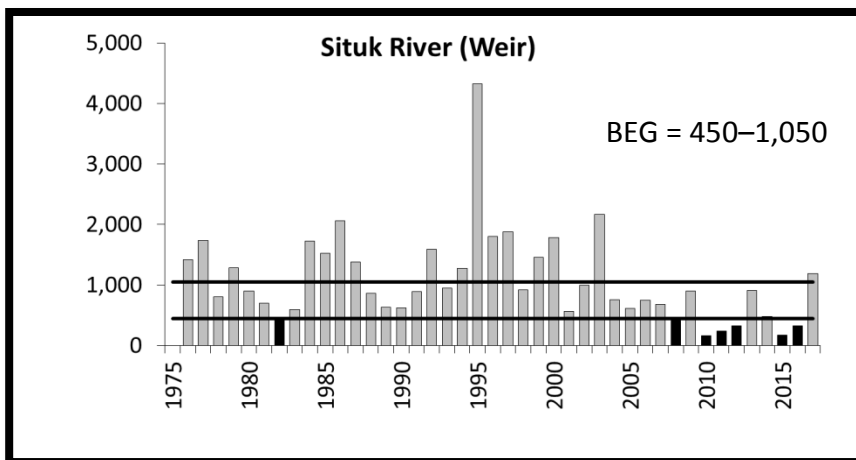
• Stocks of Concern

- Chilkat River, King Salmon River, and the Unuk River



King Salmon Escapement Trends

Escapement



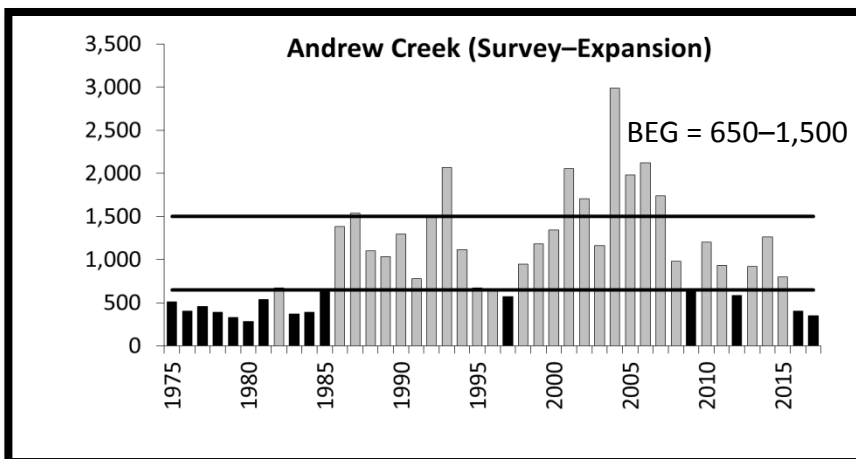
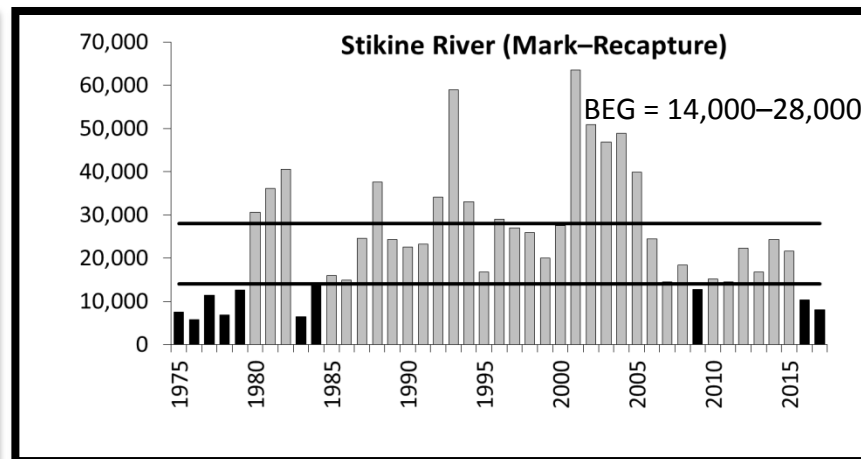
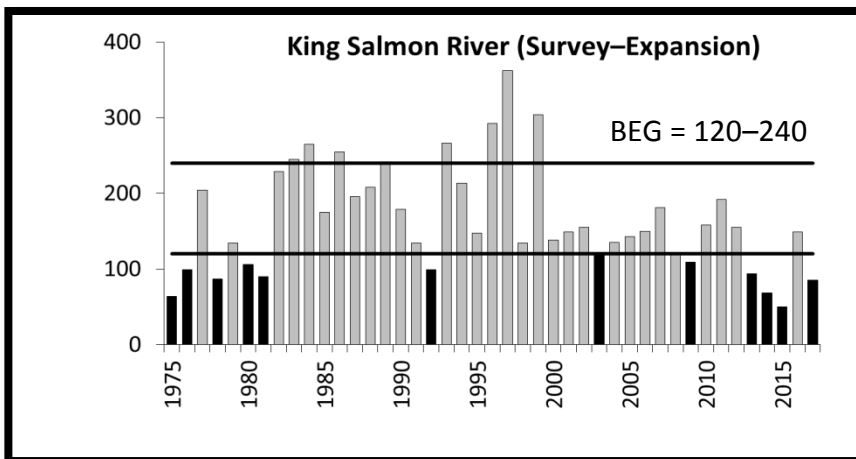
Achieved Goal



Below Goal

King Salmon Escapement Trends

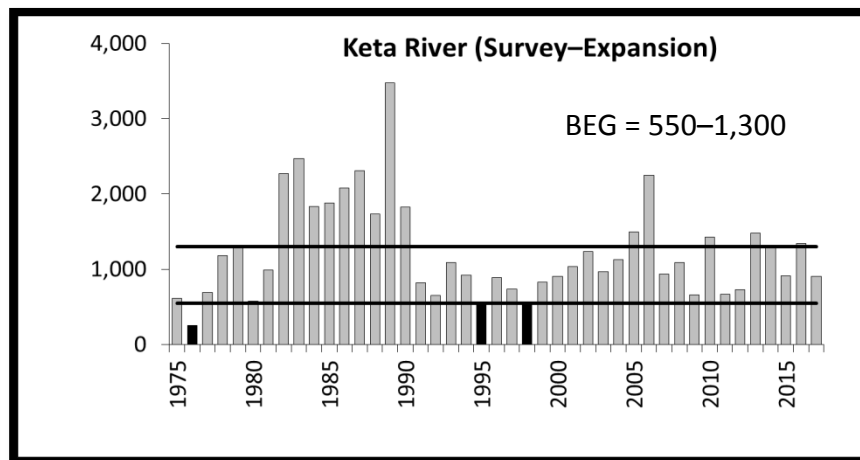
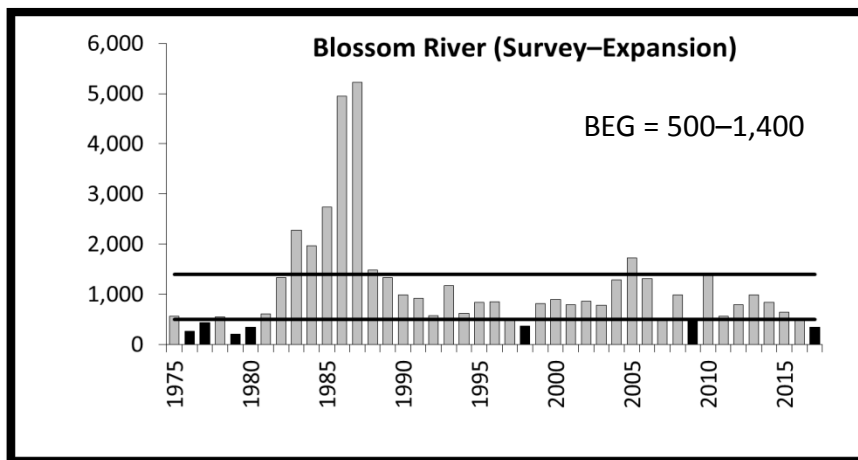
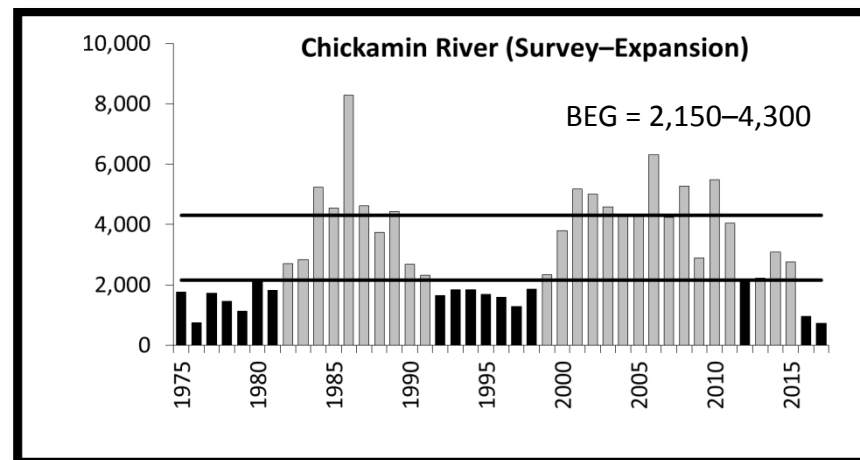
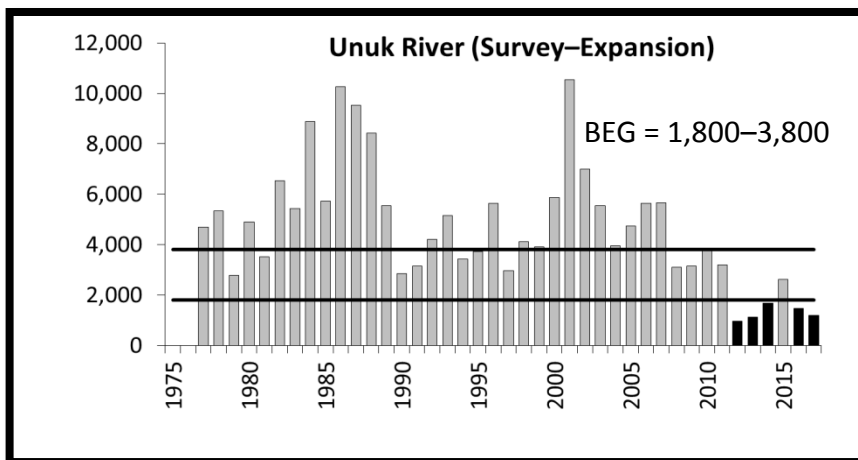
Escapement



Achieved Goal
 Below Goal

King Salmon Escapement Trends

Escapement



Achieved Goal



Below Goal

King Salmon – *Recommended Goal Revisions*

Chickamin, Blossom, and Keta rivers:

- Current BEGs expressed in terms of index (survey) units
- Expansion factors based on M-R studies meet PSC-CTC standards
- Expansion factors allow index units to be expressed in terms of total escapement, consistent with all other king salmon index systems

Stock	Current BEG	Recommended BEG
Chickamin River	450–900 (Index)	2,150–4,300 (total escapement)
Blossom River	150–300 (Index)	500–1,400 (total escapement)
Keta River	175–400 (Index)	550–1,300 (total escapement)

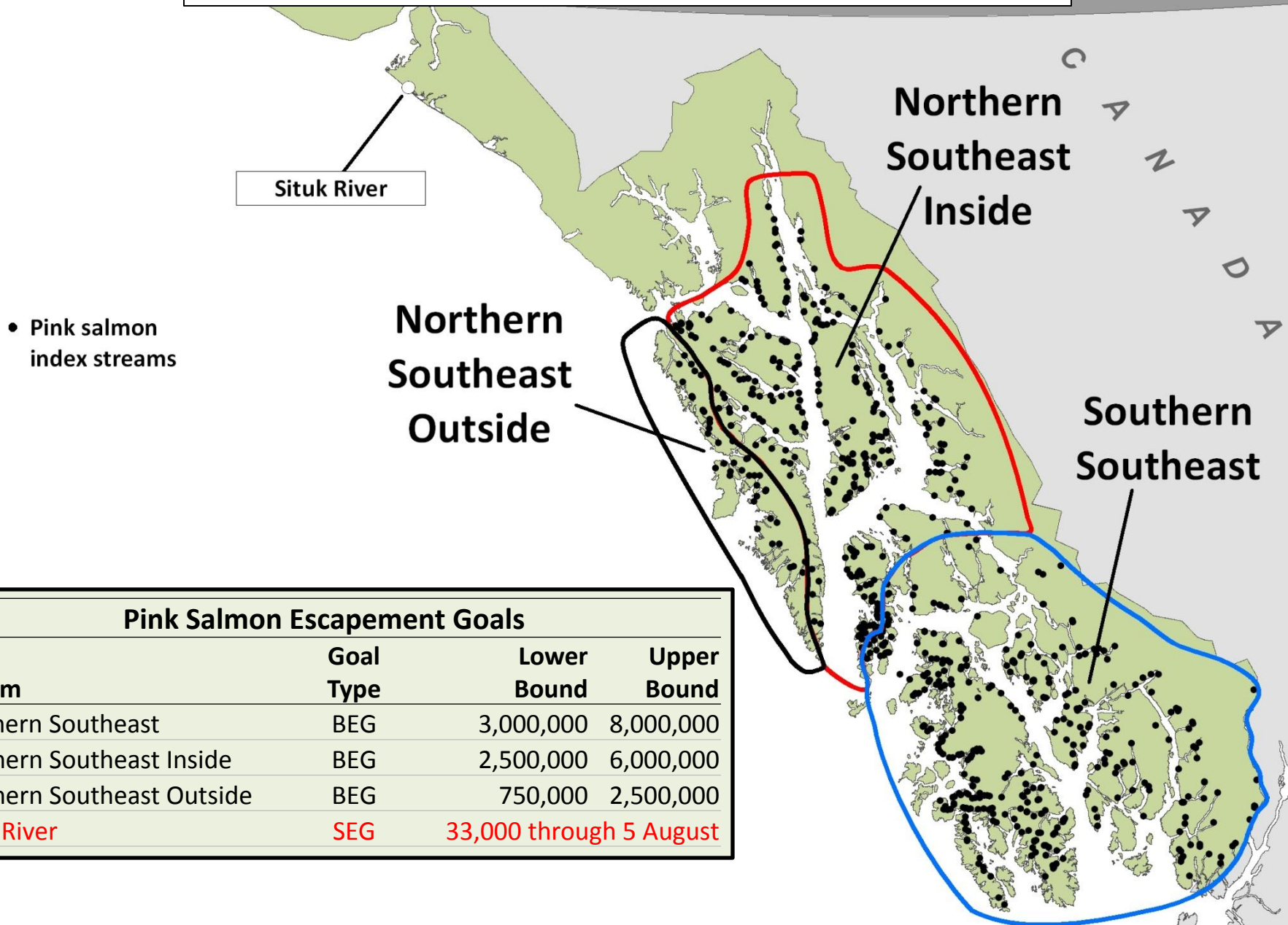
King Salmon – *Recommended Goal Revisions*

Klukshu (Asek) River:

- **Current BEG = 800–1,200, which corresponds with a drainage-wide BEG for the Asek River of 3,500–5,300**
- **Concurrent M-R and weir counts developed expansion factor meeting PSC-CTC standards**
- **Expansion factor allows Klukshu River weir count to be expressed in terms of total escapement for the Asek River, consistent with all other king salmon index systems**

Stock	Current BEG	Recommendation
Klukshu River	800–1,200 (Weir)	Eliminate
Asek River	3,500–5,300 (Weir Expansion)	Maintain

Pink Salmon

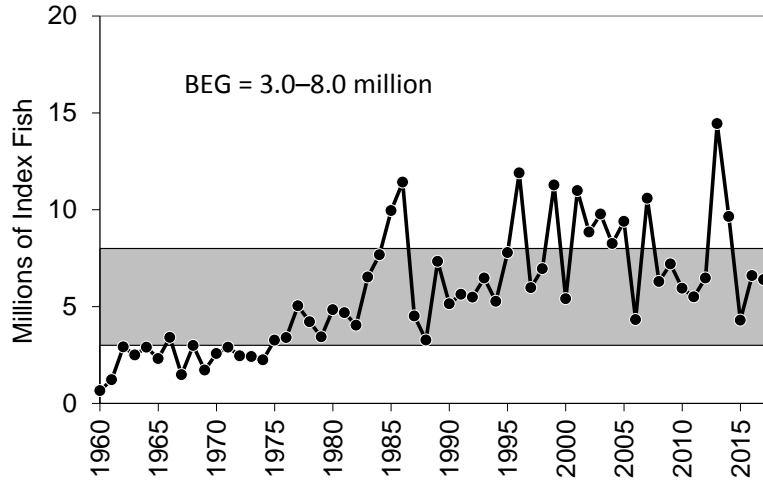


Pink Salmon Escapement Goals

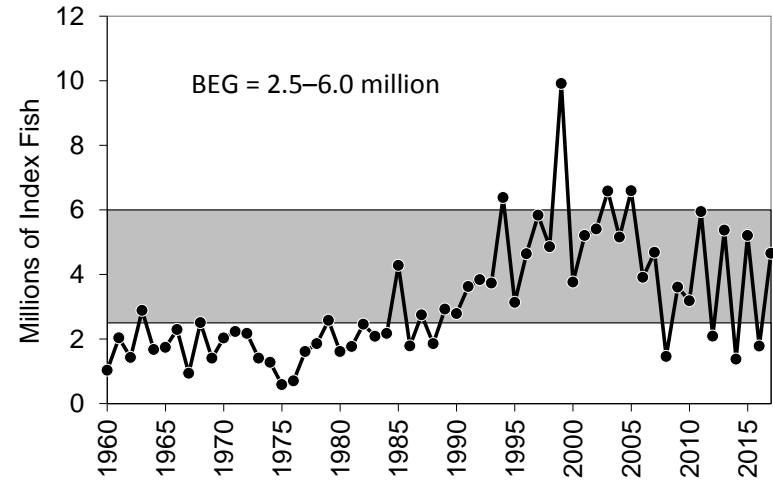
System	Goal Type	Lower Bound	Upper Bound
Southern Southeast	BEG	3,000,000	8,000,000
Northern Southeast Inside	BEG	2,500,000	6,000,000
Northern Southeast Outside	BEG	750,000	2,500,000
Situk River	SEG	33,000 through 5 August	

Pink Salmon

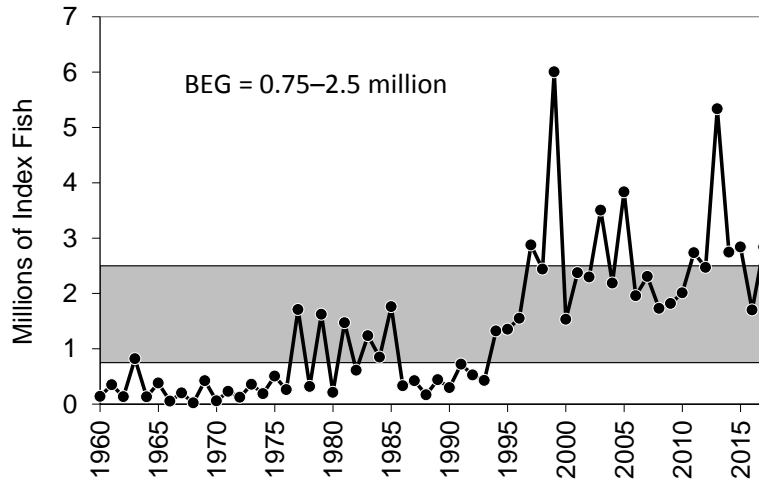
Southern Southeast (Aerial Survey)



Northern Southeast Inside (Aerial Survey)



Northern Southeast Outside (Aerial Survey)

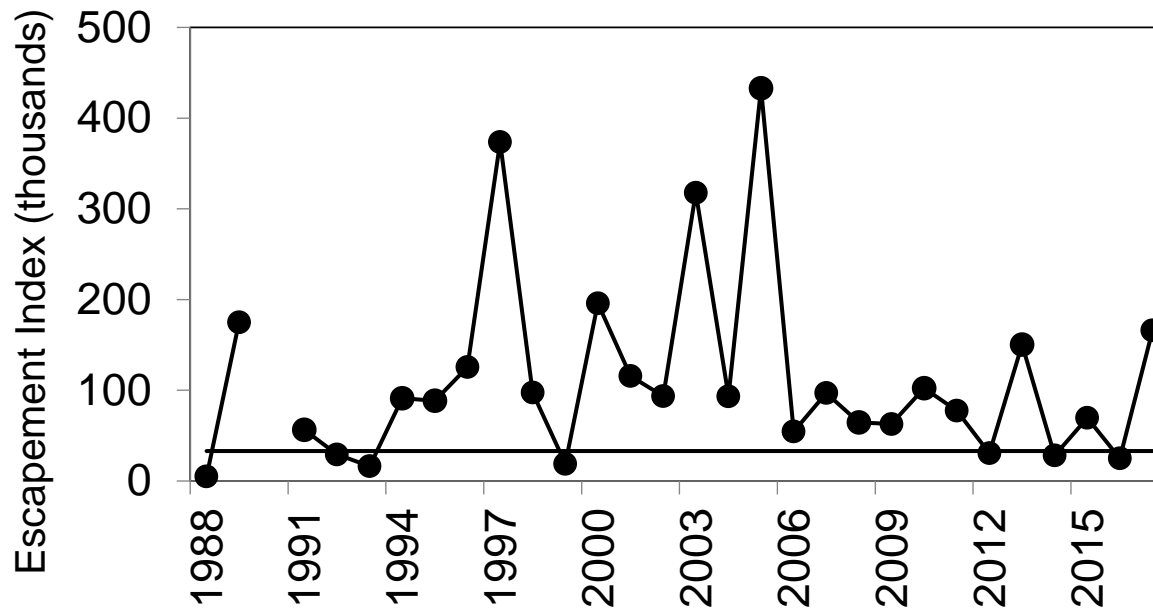


Pink Salmon – *Recommended Goal Changes*

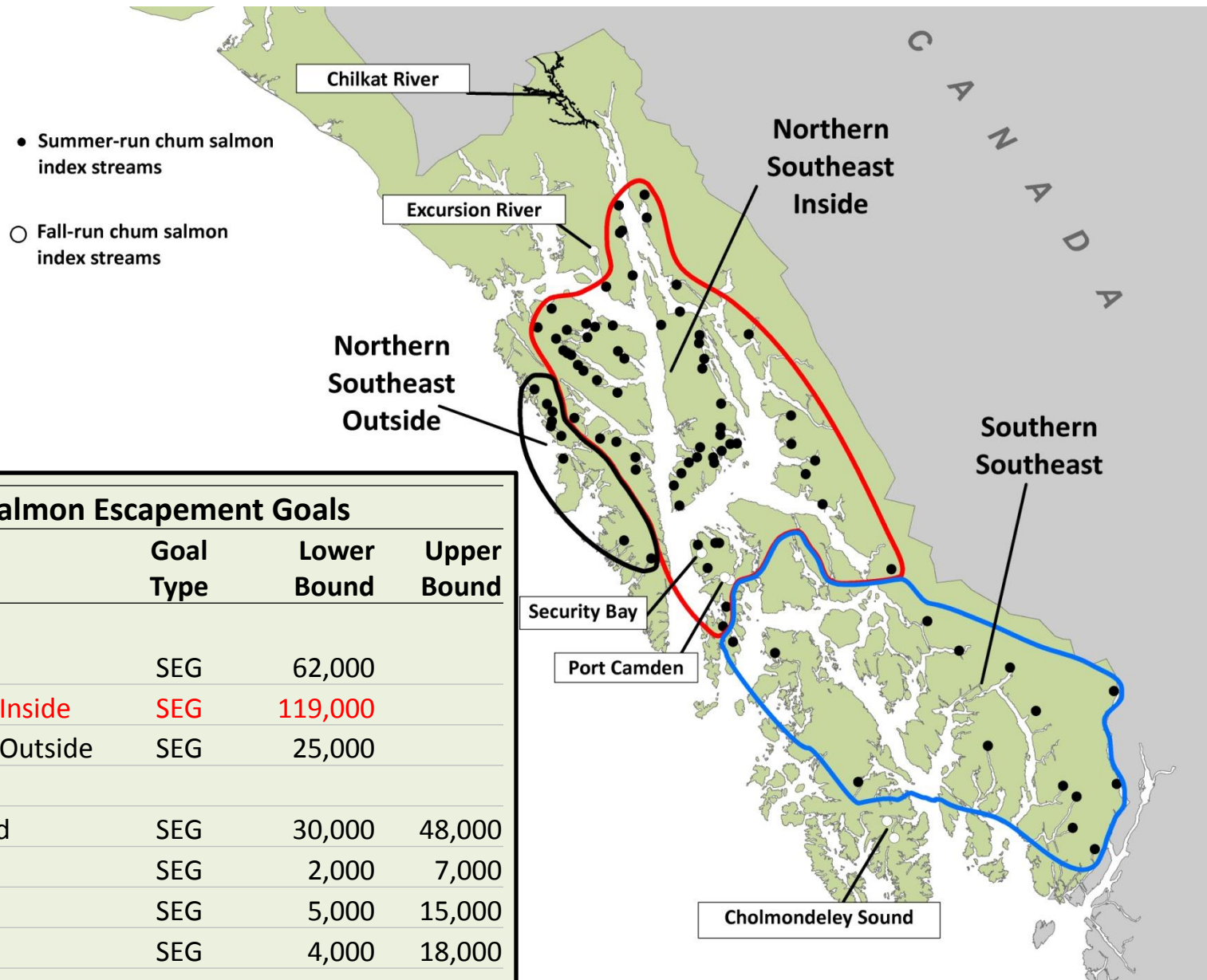
Situk River Pink Salmon

- **Recommended eliminating the lower bound SEG:**
 - Majority of the escapement moves upriver after weir is removed.
 - Weir counts through August 5th do not provide meaningful information about run size.
 - Harvest rates on Situk River pink salmon are very low.

Situk River (Weir Count Index)



Chum Salmon

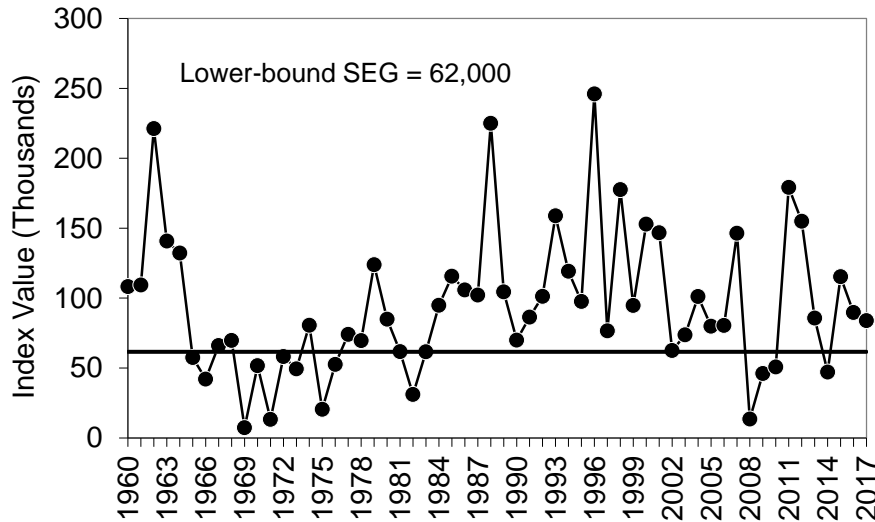


Chum Salmon Escapement Goals

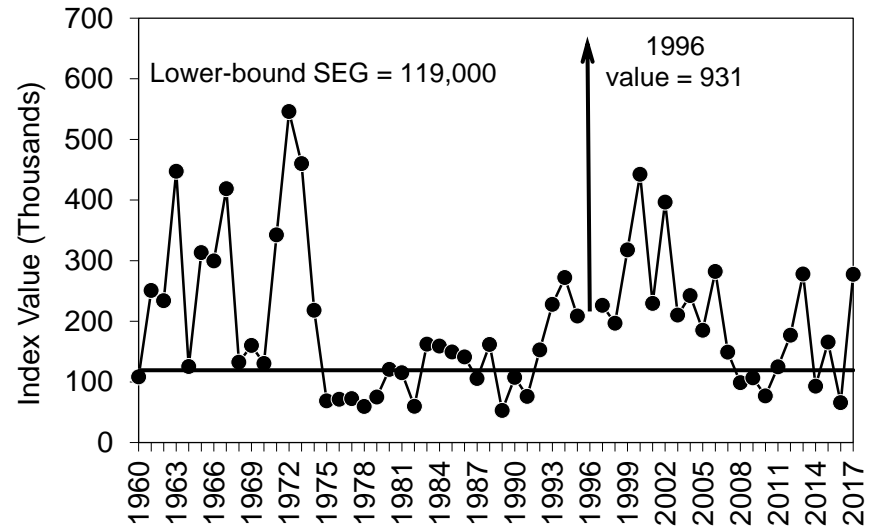
System	Goal Type	Lower Bound	Upper Bound
Summer-run:			
Southern Southeast	SEG	62,000	
Northern Southeast Inside	SEG	119,000	
Northern Southeast Outside	SEG	25,000	
Fall-run:			
Cholmondeley Sound	SEG	30,000	48,000
Port Camden	SEG	2,000	7,000
Security Bay	SEG	5,000	15,000
Excursion River	SEG	4,000	18,000
Chilkat River	SEG	75,000	250,000

Summer Chum Salmon

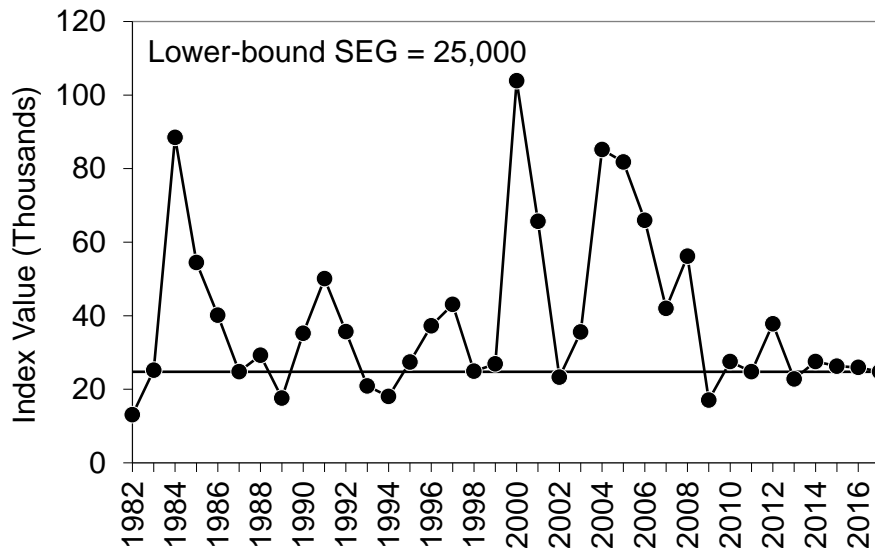
Southern Southeast (Index Survey)



Northern Southeast Inside (Index Survey)

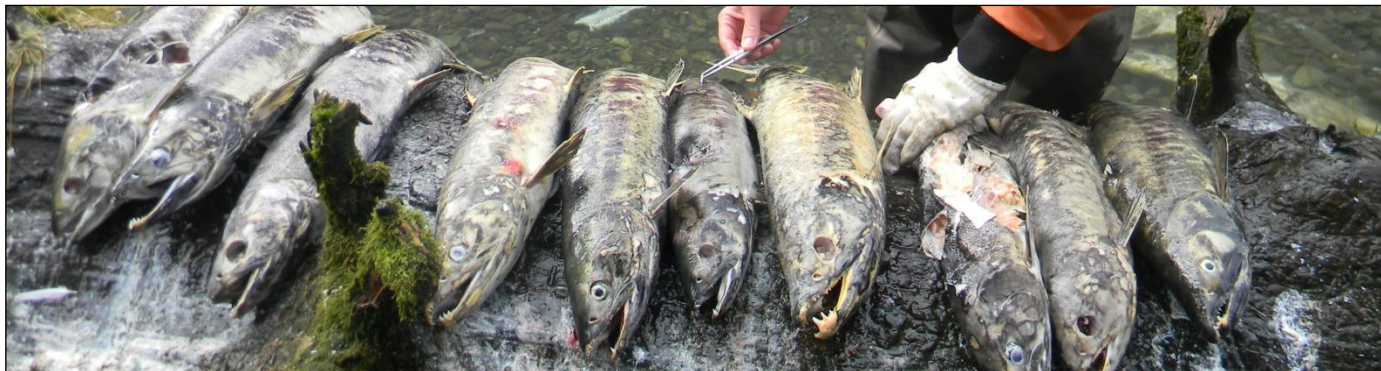


Northern Southeast Outside (Index Survey)



Fall Chum Salmon

Stock Enumeration Method	Cholmondeley Sound	Port Camden	Security Bay	Excursion River	Chilkat River
Run-type	Peak Index	Peak Index	Peak Index	Peak Index	Estimated Escapement
No. Streams	Fall	Fall	Fall	Fall	Fall
	2	2	1	1	1
2013	13,000	2,400	2,800	7,600	166,000
2014	48,000	4,300	6,300	10,800	142,000
2015	73,000	7,300	21,500	12,000	207,000
2016	30,000	4,700	14,300	1,400	218,000
2017	52,000	4,200	15,500	14,500	130,000
Goal Range:					
Lower Bound	30,000	2,000	5,000	4,000	75,000
Upper Bound	48,000	7,000	15,000	18,000	250,000



Chum Salmon – *Recommended Goal Changes*

Reviewed all of our percentile-based goals based on recommendations in Clark et al. (2014).

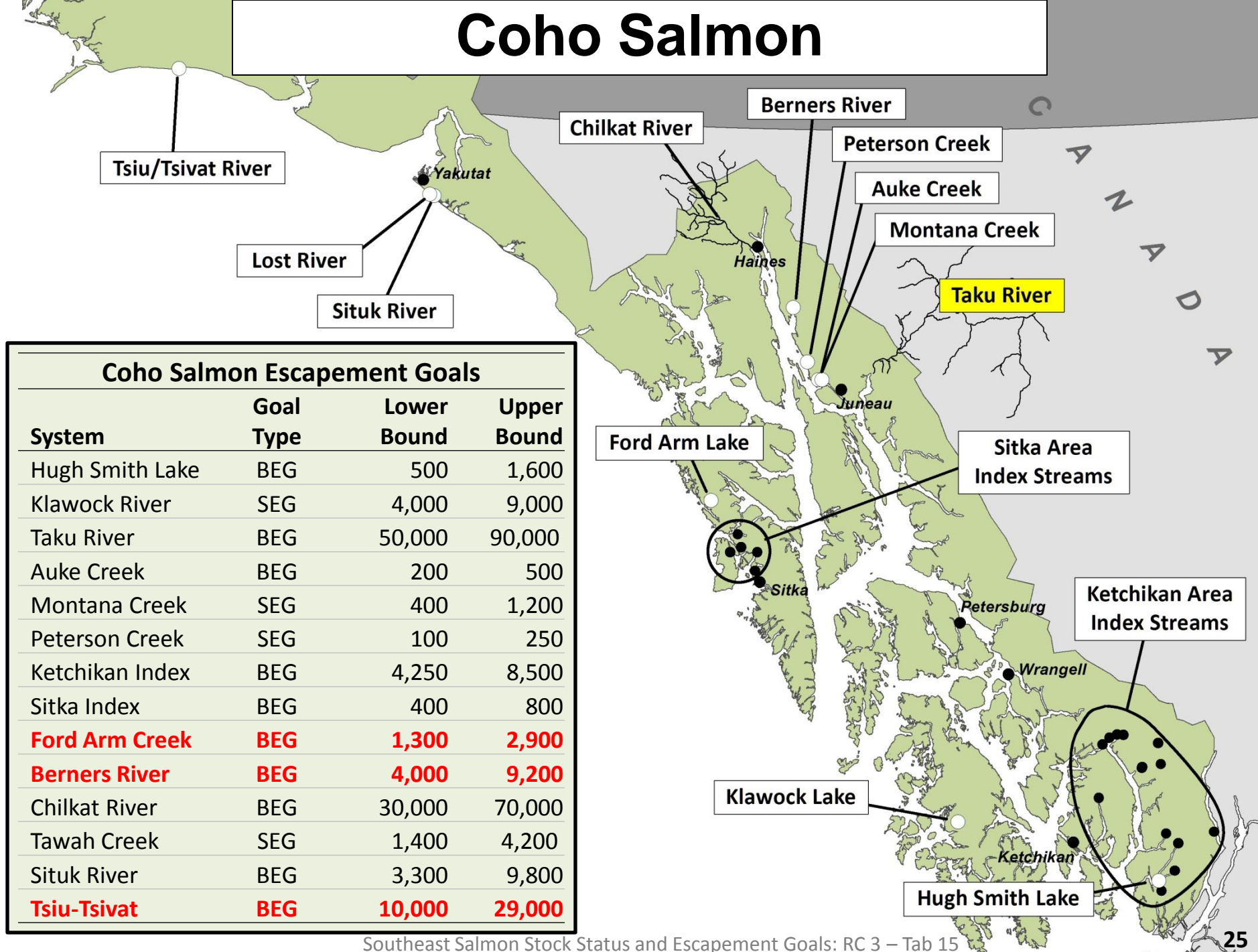
- Harvest rates on wild summer-run chum salmon likely average greater than 40%.
- Terminal harvest rates on fall-run chum salmon may approach or exceed 40%; total harvest rates unknown.

Northern Southeast Inside Summer Chum

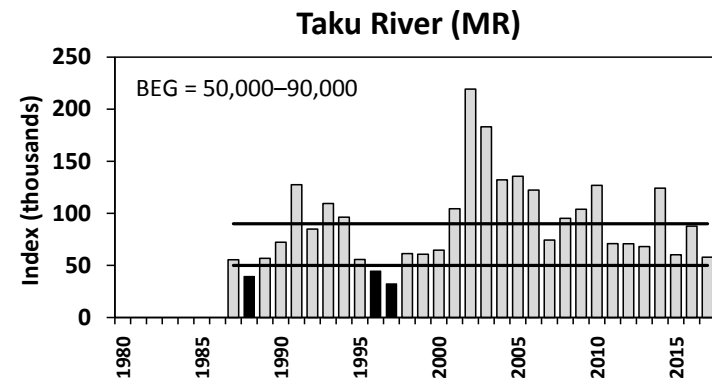
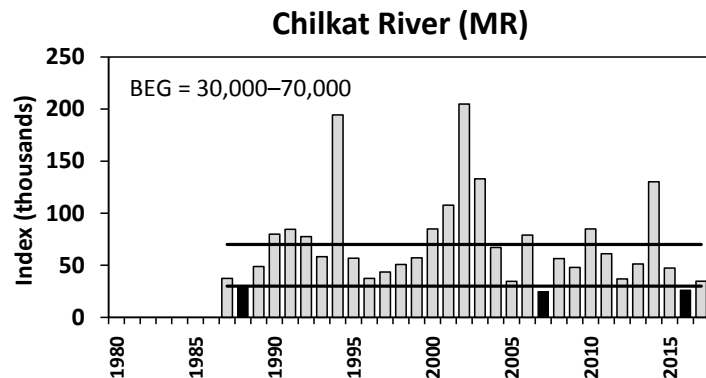
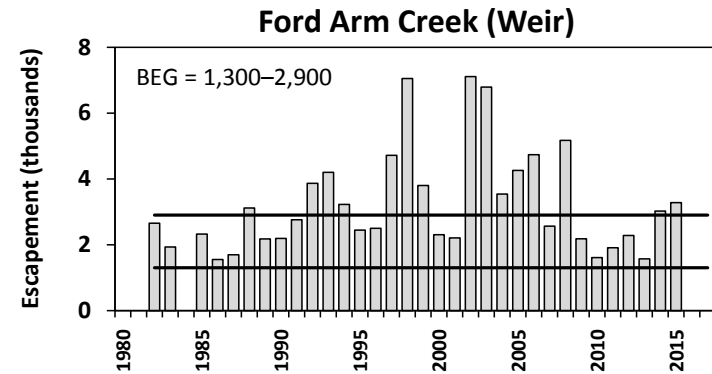
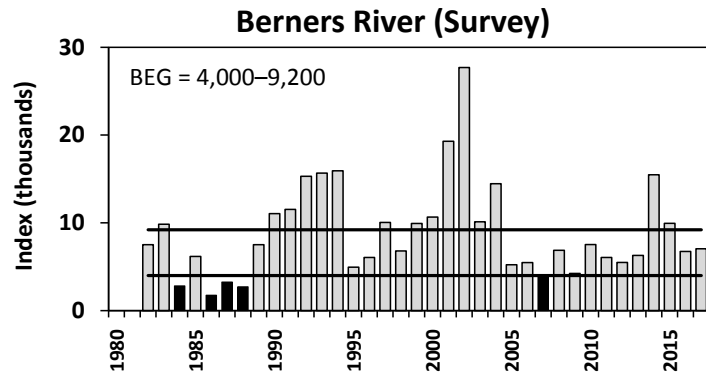
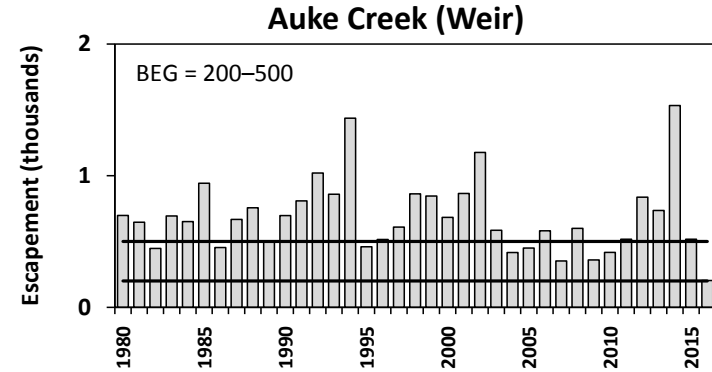
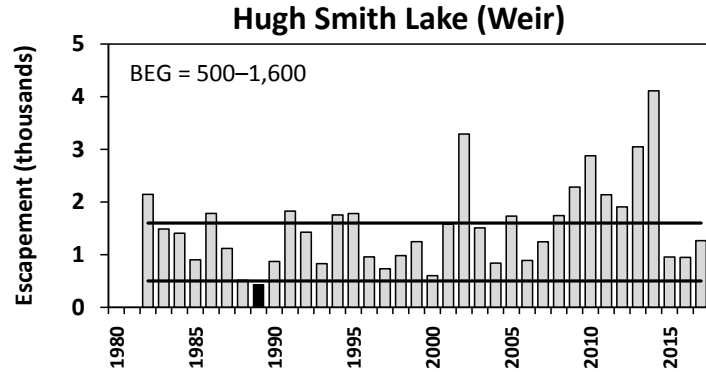
- Recommended new lower-bound SEG:
 - Current Goal = 119,000
 - Recommended Goal = 107,000



Coho Salmon



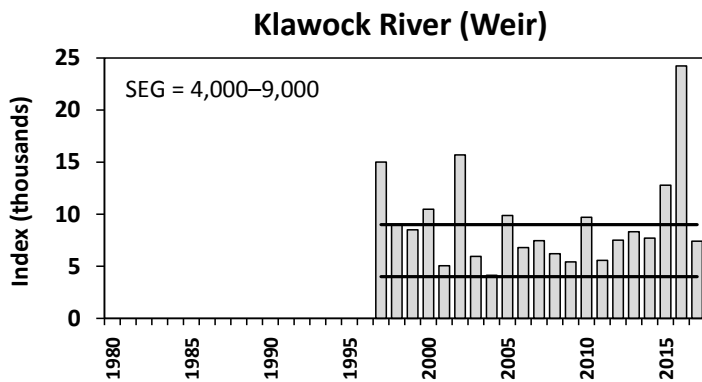
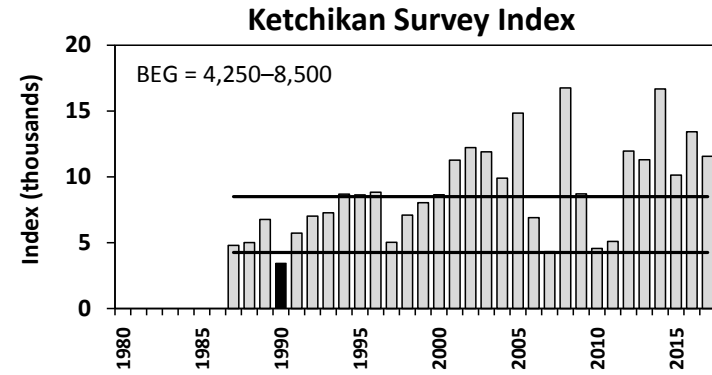
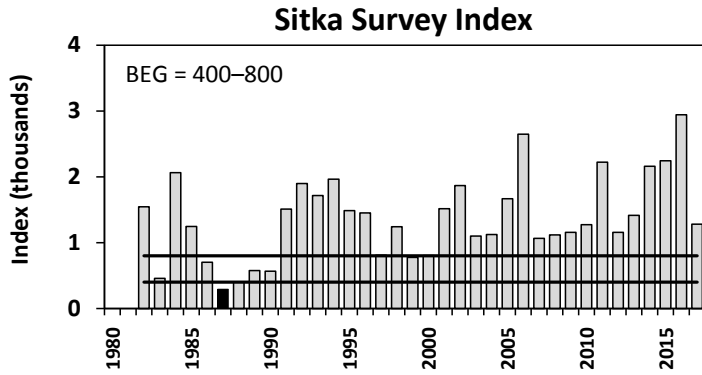
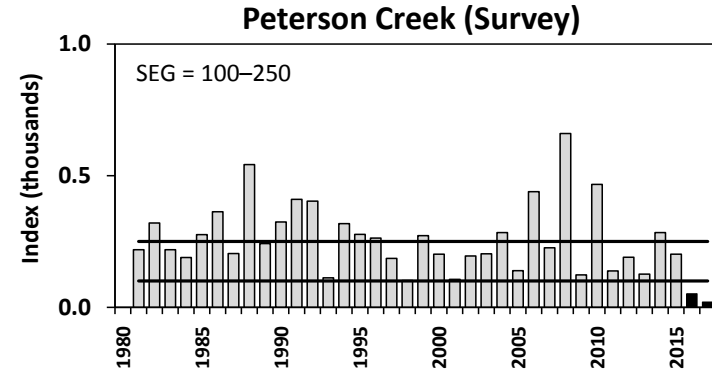
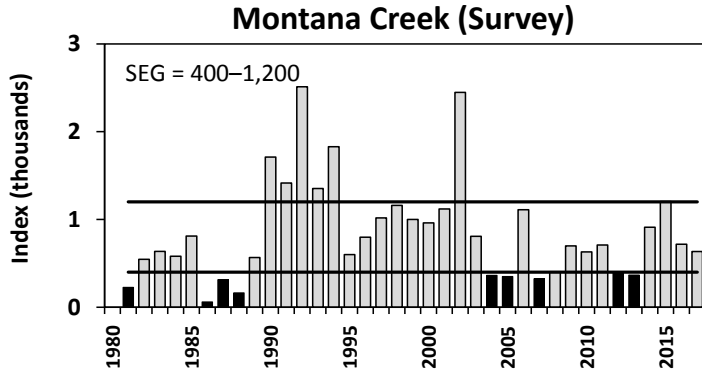
Coho Salmon – CWT Indicator Stocks



■ Achieved Goal

■ Below Goal

Coho Salmon – SE Stocks

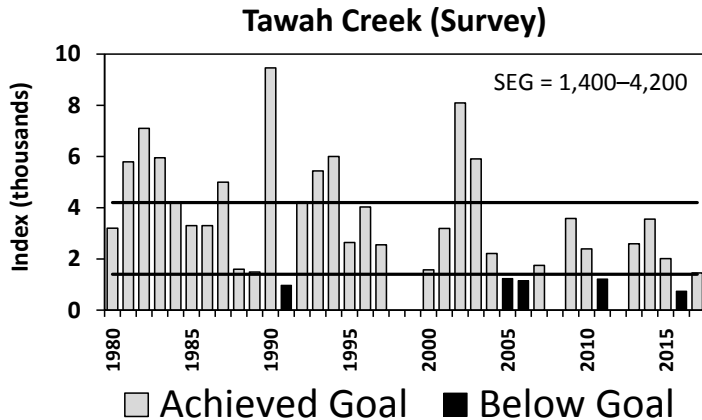
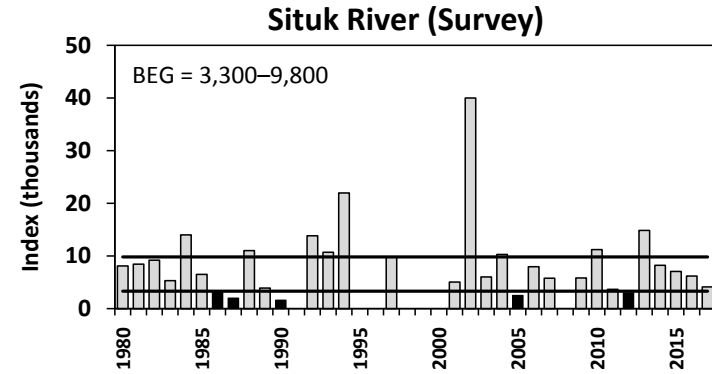
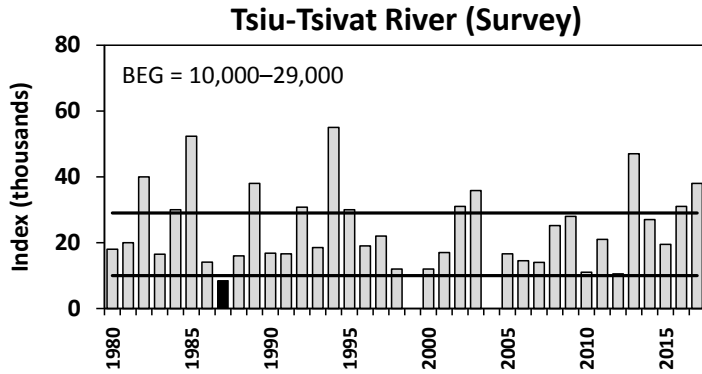


□ Achieved Goal ■ Below Goal



Photo by Scott Forbes

Coho Salmon – Yakutat Stocks



- **Coho runs met or exceeded goals 93% of time over past decade.**
- **No stocks of concern.**

Coho Salmon – *Recommended Goal Revision*

Berners River

- Current BEG: 4,000–9,200 (1994).
- Stock Assessment: Coded wire tag indicator stock.
- EG Methods: Spawner-recruit analysis 1989–2010 brood years.
- **Recommended new BEG: 3,600–8,100.**

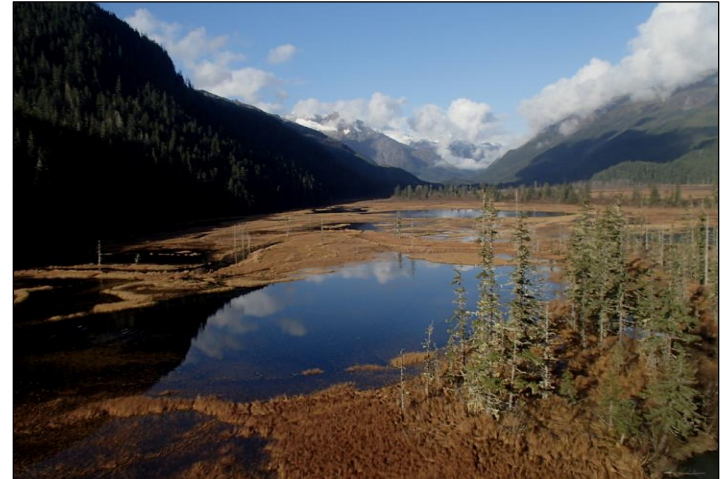
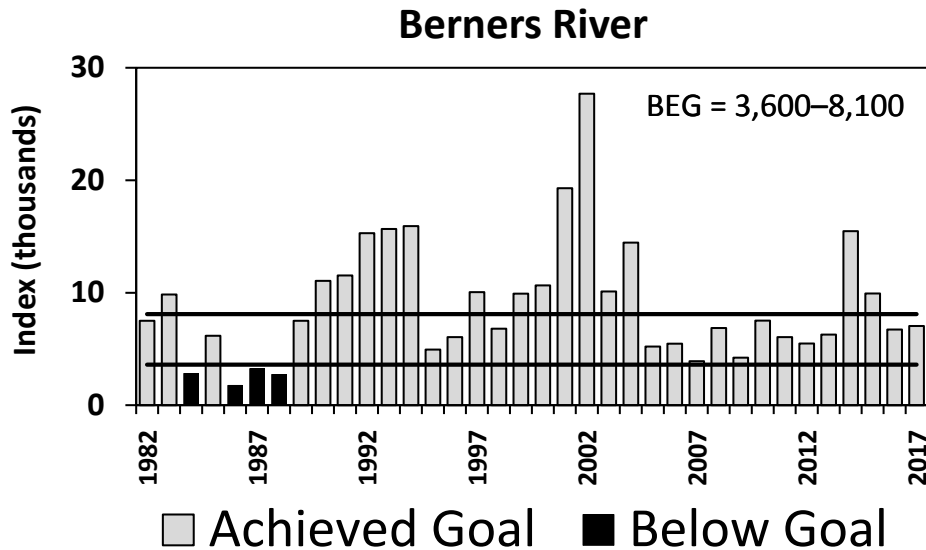


Photo by Scott Forbes

Coho Salmon – *Recommended Goal Revision*

Tsiu-Tsivat River

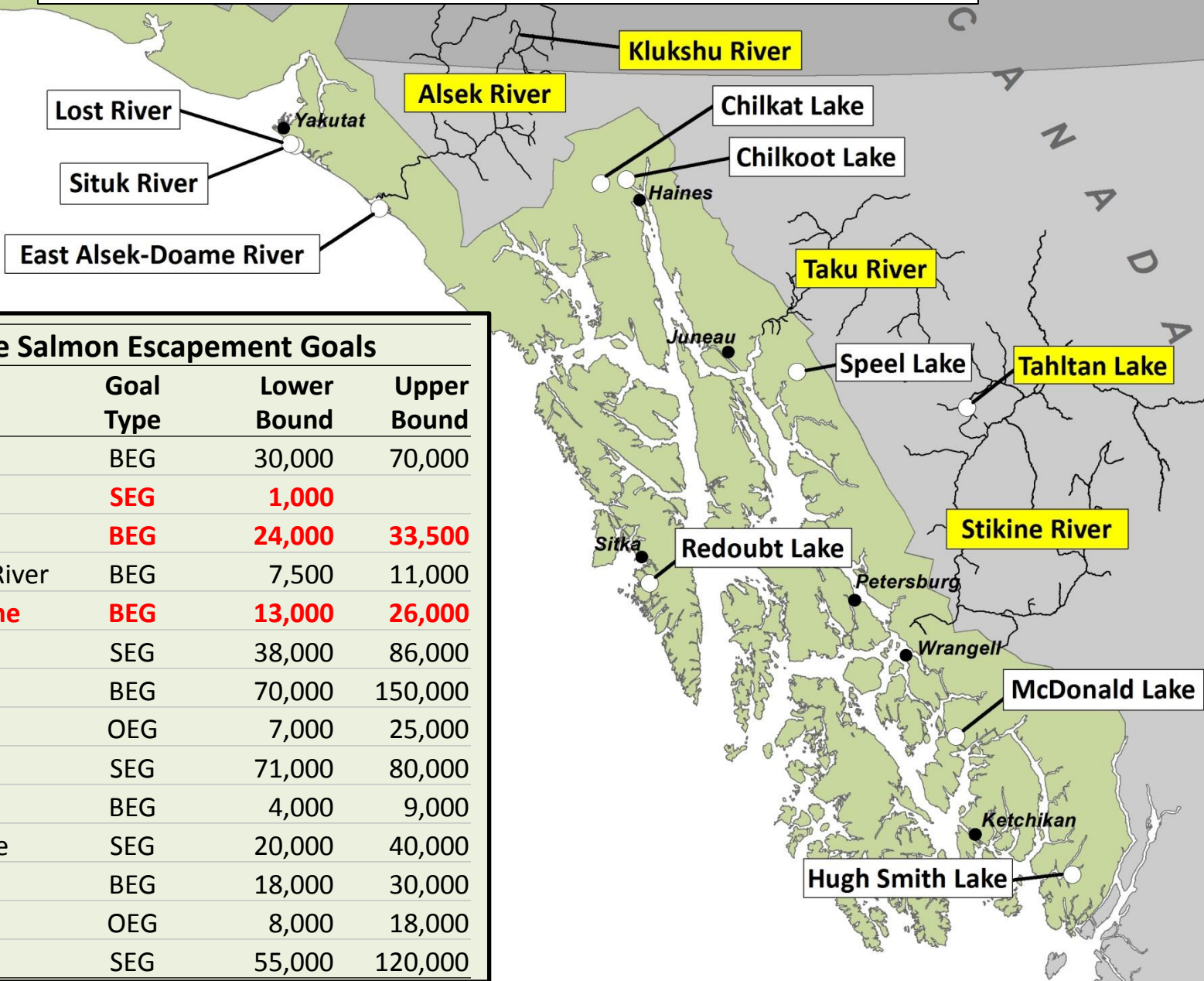
- **Current BEG: 10,000–29,000 (1994).**
- **Stock Assessment: Survey counts.**
- **EG Method: Percentile Approach (5th–65th percentiles).**
- **Recommended SEG 10,000–29,000.**

Coho Salmon – *Recommended Goal Elimination*

Ford Arm Creek

- **Current BEG: 1,300–2,900.**
- **Funding for stock assessment eliminated.**
- **Recommended eliminating goal.**

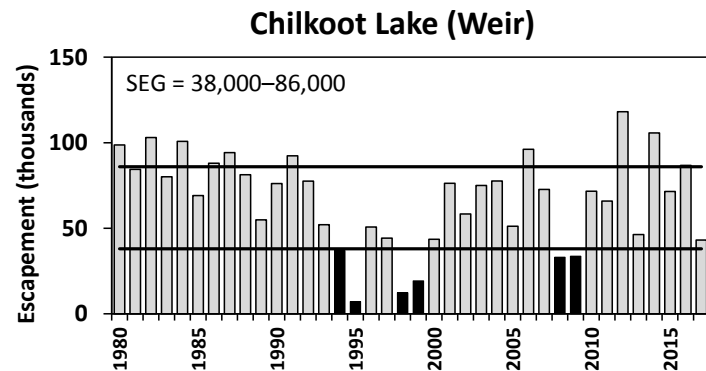
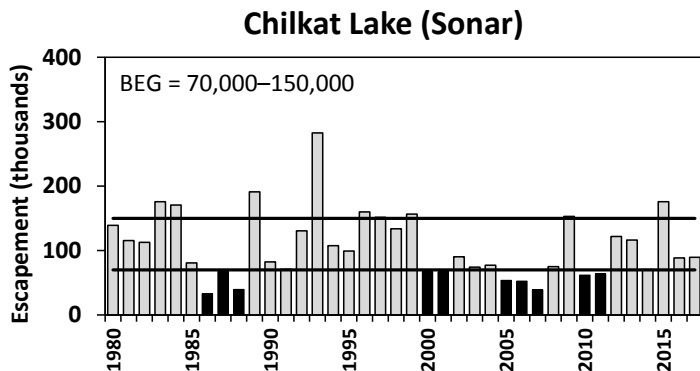
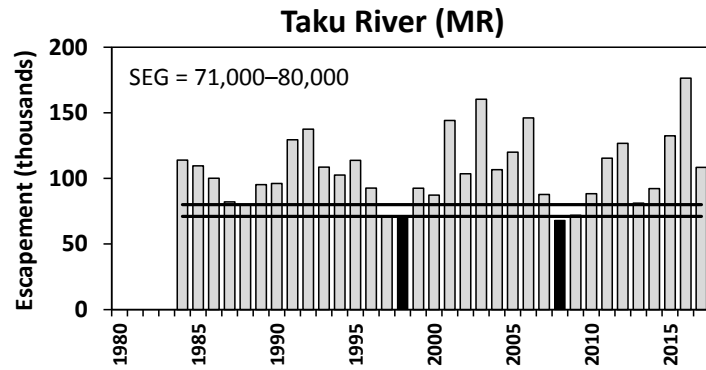
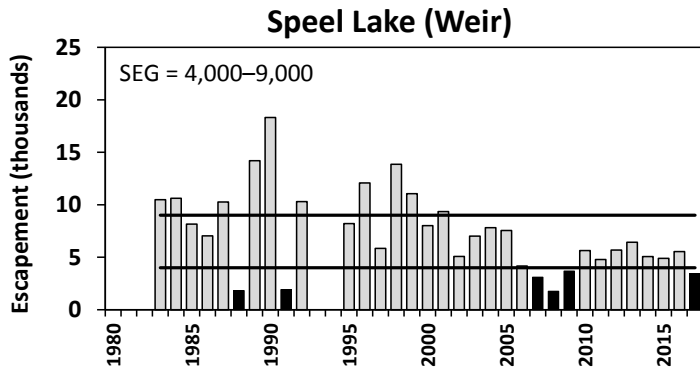
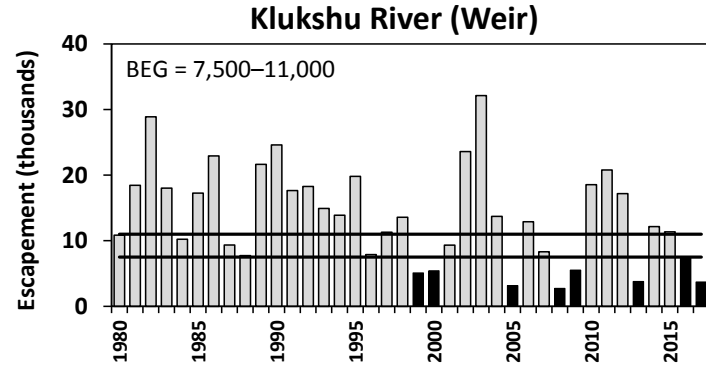
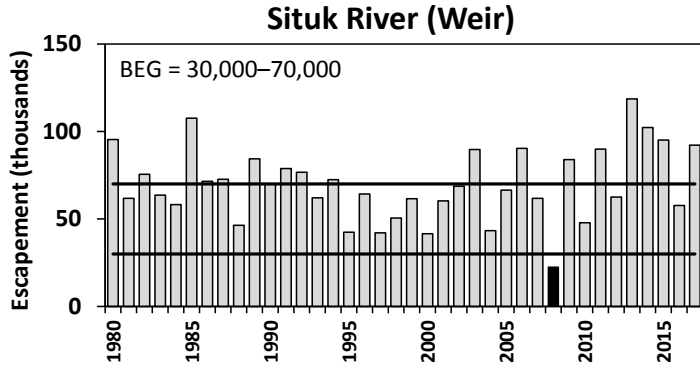
Sockeye Salmon



Sockeye Salmon Escapement Goals

System	Goal Type	Lower Bound	Upper Bound
Situk River	BEG	30,000	70,000
Lost River	SEG	1,000	
Alsek River	BEG	24,000	33,500
Klukshu (Alsek) River	BEG	7,500	11,000
East Alsek-Doame	BEG	13,000	26,000
Chilkoot Lake	SEG	38,000	86,000
Chilkat Lake	BEG	70,000	150,000
Redoubt Lake	OEG	7,000	25,000
Taku River	SEG	71,000	80,000
Speel Lake	BEG	4,000	9,000
Mainstem Stikine	SEG	20,000	40,000
Tahltan Lake	BEG	18,000	30,000
Hugh Smith Lake	OEG	8,000	18,000
McDonald Lake	SEG	55,000	120,000

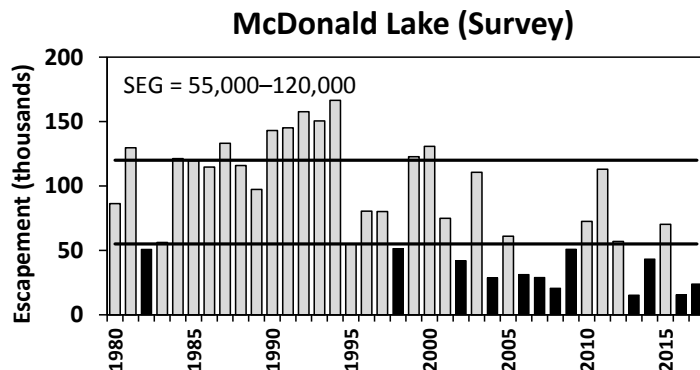
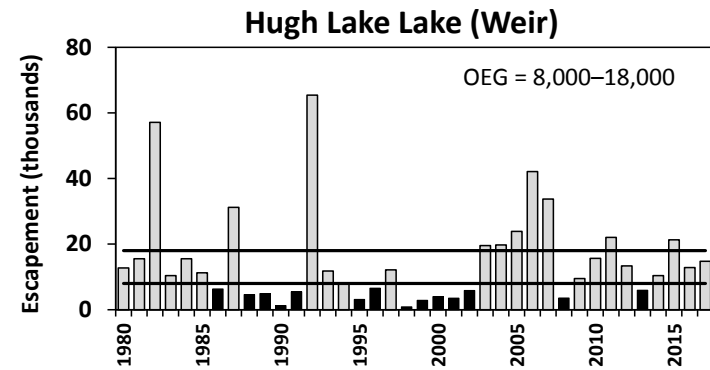
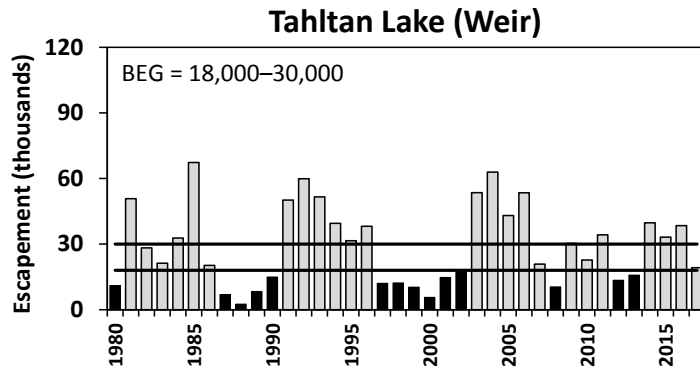
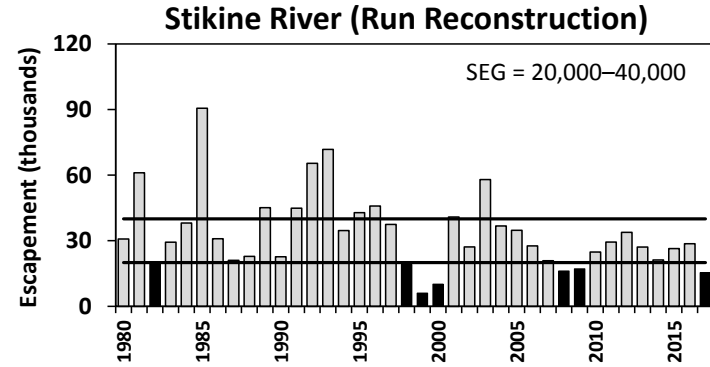
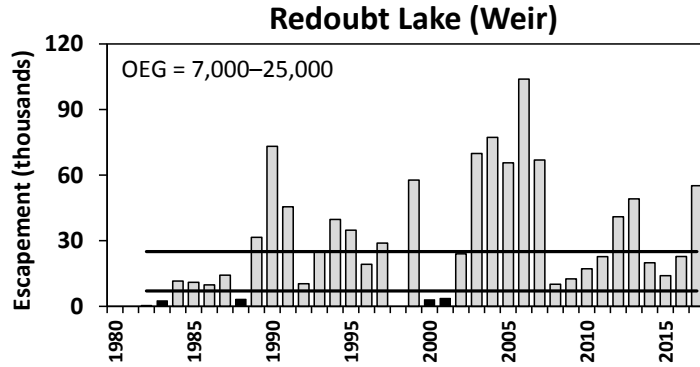
Sockeye Salmon - 1



■ Achieved Goal

■ Below Goal

Sockeye Salmon - 2



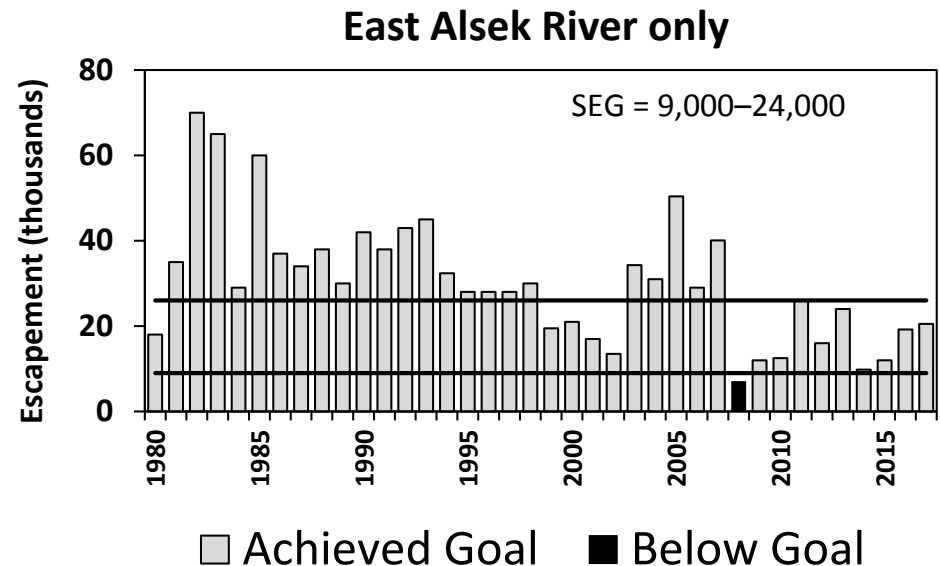
□ Achieved Goal ■ Below Goal

- Sockeye runs met or exceeded goals 73% of time over past decade.
- One stock of concern.

Sockeye Salmon – *Recommended Goal Revision*

East Alsek-Doame River:

- Current BEG: 13,000–26,000 (2003).
- Stock Assessment: Survey counts.
- EG Method: Percentile Approach (5th–65th percentiles).
 - Removed Doame River counts – based only on East Alsek River counts.
 - Recommended new East Alsek River SEG range: 9,000–24,000.



Sockeye Salmon – *Recommended Goal Elimination*

Alsek River:

- Current BEG: 24,000–33,500.
- Lack of current escapement estimates.
- Management of Alsek River sockeye run focused on Klukshu River.
- Recommended eliminating goal.

Lost River:

- Current Lower Bound SEG: $\geq 1,000$.
- Small run harvested incidentally in Situk-Ahrnklin fishery.
- Survey method not standardized over time = lack of comparable data.
- Recommended eliminating goal.

Review Summary

Recommended revisions to 12 of 52 escapement goals:

- **King Salmon**
 - Chickamin, Blossom, Keta: Expand BEGs to total escapement.
 - Klukshu River: Eliminate and maintain Alsek River BEG.
- **Coho Salmon**
 - Ford Arm Creek: Eliminate BEG.
 - Berners River: Change BEG to 3,600–8,100.
 - Tsiu-Tsivat rivers: Change BEG to SEG.
- **Sockeye Salmon**
 - East Alsek-Doame River: Eliminate BEG; establish East Alsek SEG 9,000–24,000.
 - Alsek River: Eliminate BEG.
 - Lost River: Eliminate Lower Bound SEG.
- **Pink Salmon**
 - Situk River: Eliminate Lower Bound SEG.
- **Chum Salmon – Summer Run**
 - Northern Southeast Inside: Change Lower Bound SEG to 107,000.