

## ***Articles***

# **Catalog of Chinook Salmon Spawning Areas in Yukon River Basin in Canada and United States**

**Randy J. Brown,\* Al von Finster, Robert J. Henszey, John H. Eiler**

***R.J. Brown, R.J. Henszey***

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***A. von Finster***

Fisheries and Oceans Canada, Whitehorse, Yukon Y1A 2T9, Canada; Retired

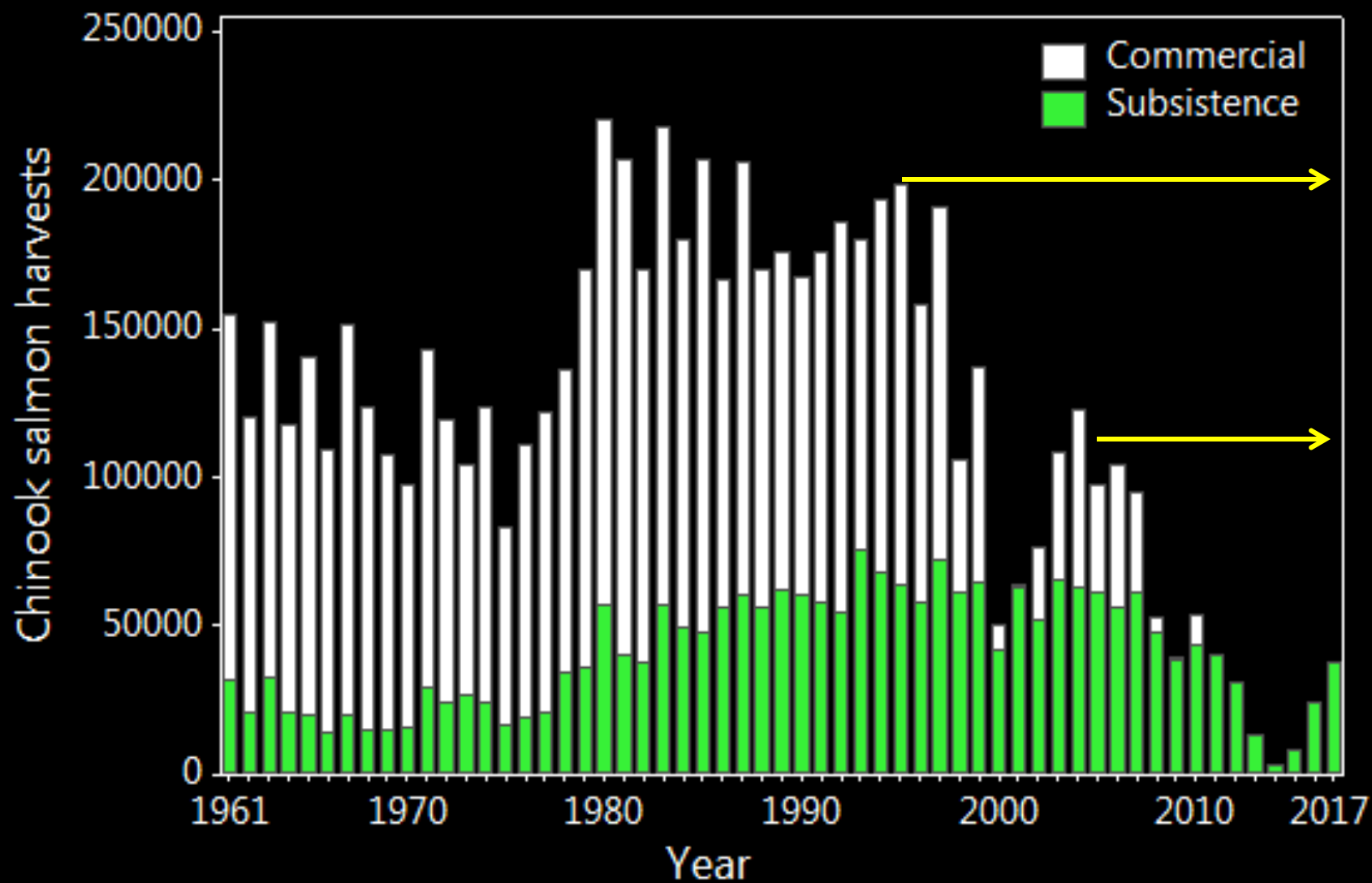
***J.H. Eiler***

National Marine Fisheries Service, 17109 Point Lena Loop Road, Juneau, Alaska 99801

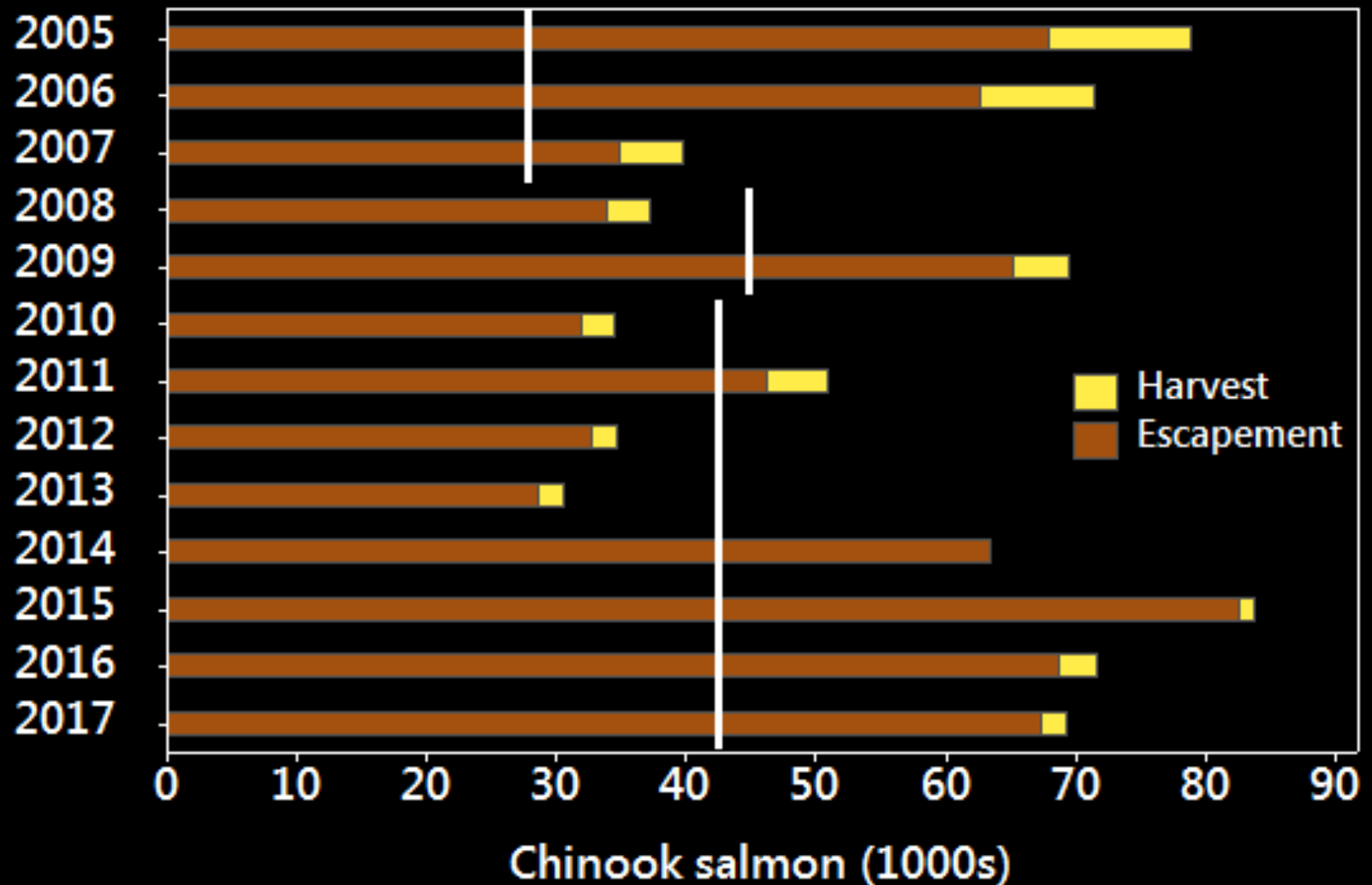
## Outline for the Presentation:

- 1) Inspiration for the research
- 2) Brief note on methodology
- 3) Summary of the major findings
- 4) Demographics of Chinook Salmon spawning runs





# Sonar estimates of border passage (escapement plus harvest)

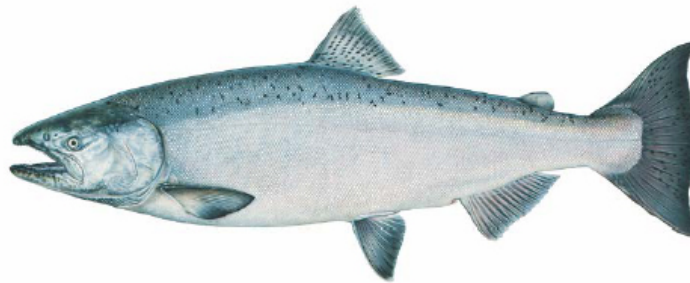




# ARCTIC-YUKON-KUSKOKWIM CHINOOK SALMON RESEARCH ACTION PLAN

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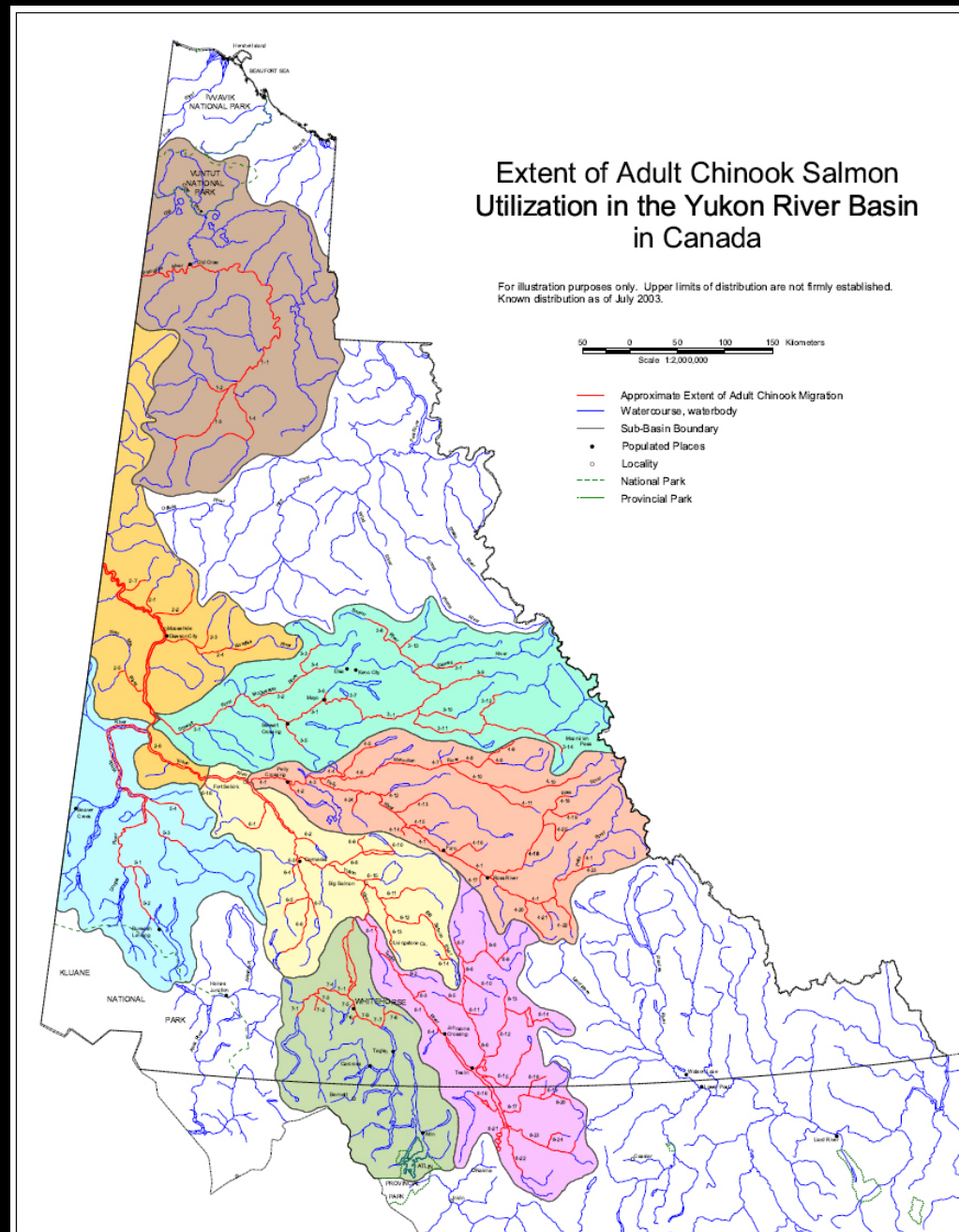
EVIDENCE OF DECLINE OF CHINOOK SALMON  
POPULATIONS AND RECOMMENDATIONS FOR FUTURE  
RESEARCH



ARCTIC-YUKON-KUSKOKWIM  
SUSTAINABLE SALMON INITIATIVE  
AYK SSI CHINOOK SALMON EXPERT PANEL

August 2013

Developed by  
Al von Finster, DFO



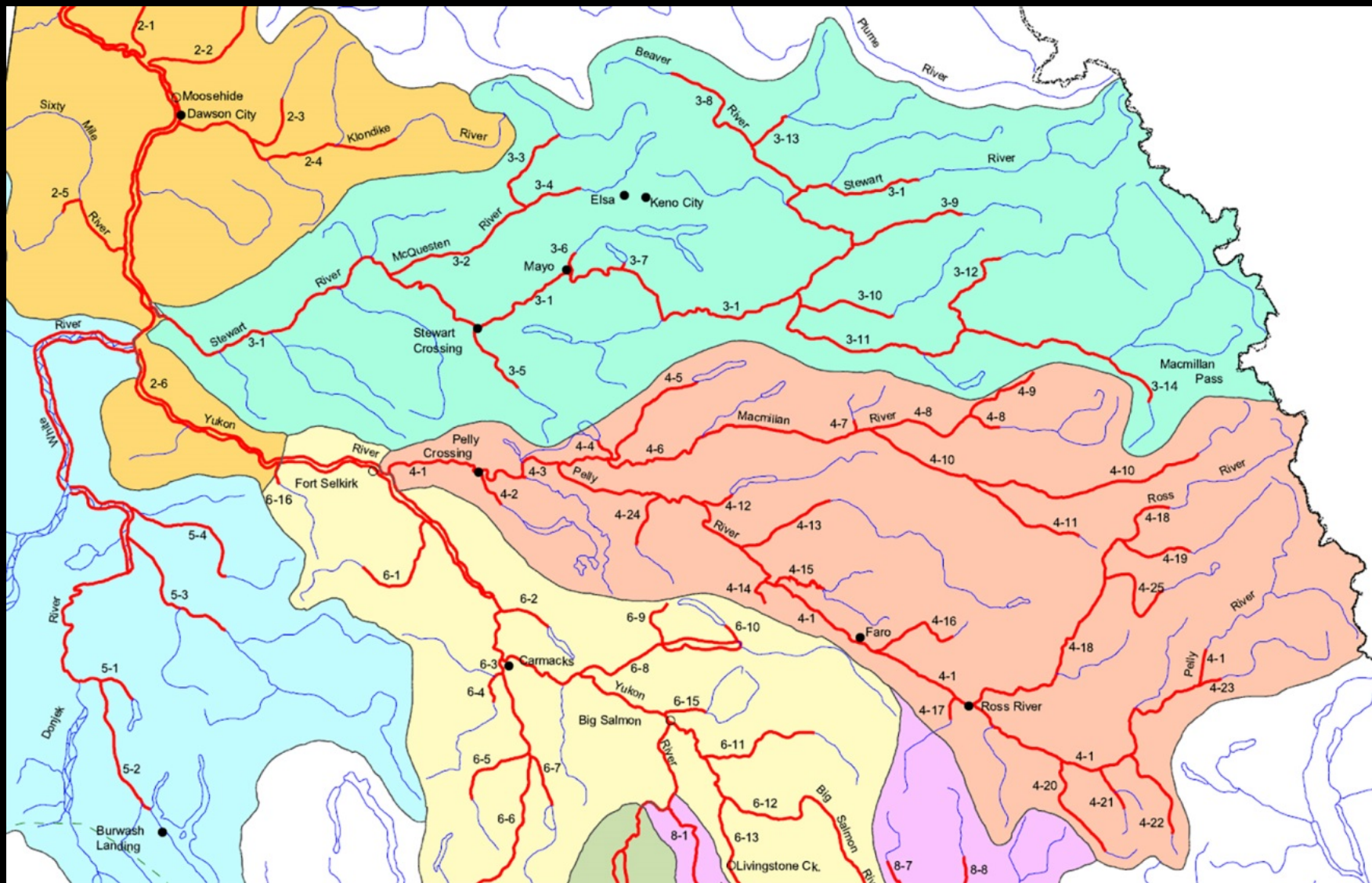






photo courtesy of USFWS, Subsistence 8



## A CATALOG OF YUKON RIVER SALMON SPAWNING ESCAPEMENT SURVEYS

By:  
Louis H. Barton

July 1984





photo courtesy of ADFG

NAME (# = ALTERNATE NAME)		DRAINAGE		LATITUDE LONG																
NULATO R #		YUKON R		64-42-00N 158-																
SEQ	DATE	K I N G		C H U M		P I N K		R E D		C O H O		UNIDEN- TIFIED	C O D E S							
		LIVE	DEAD REDDS	LIVE	DEAD	LIVE	DEAD	LIVE	DEAD	LIVE	DEAD		ME	WI	WE	WA/VI	BOT	TI	DIS	
14	07-20-77	95		5950									03	1	1	1	1	1	1	100
15	07-23-77	486		69660									02	1	2	2	2	2	1	DIS
15	07-23-77	12		15070								AREA 101								
15	07-23-77	274		43205								AREA 102								
15	07-23-77	201		11385								AREA 103								
16	07-13-78	453		47956									06	1	3	1	1	1	1	DIS
16	07-13-78	1		15589								AREA 101								
16	07-13-78	281		21815								AREA 102								
16	07-13-78	171		10552								AREA 103								
17	07-26-78	736	184	36998	17482								06	1	2	1	2	1	1	DIS
17	07-26-78			4750								AREA 101								
17	07-26-78	398	100	25837	11072							AREA 102								
17	07-26-78	338	84	6411	6410							AREA 103								
18	07-16-79	1507		35250	1854								01	1	1	1	1	1	1	DIS
18	07-16-79	13		2409	126							AREA 101								
18	07-16-79	1080		31410	1653							AREA 102								
18	07-16-79	414		1431	75							AREA 103								

## SEQ R E M A R K S

- 14 SURVEYED SOUTH FK ONLY. SURVEY EARLY. LIGHT SMOKE AND HAZE. RATING 70-80% EFFECTIVE.
- 15 100=TOTALS 101=MOUTH TO FKS. 102=NORTH FK 103=SOUTH FK. SMOKE HAZE AFFECTED CTS SLIGHTLY. COULD NOT SURVEY UPPER SECTIONS DUE CLOUD COVER. PROBABLY MISSED SOME KINGS.
- 16 100=SURVEY TOTAL 101=MOUTH TO FORKS 102=NORTH FK 103=SOUTH FK.
- 17 100=SURVEY TOTAL 101=MOUTH TO FORKS 102=NORTH FK 103= SOUTH FK.
- 18 100=SURVEY TOTALS. 101=MOUTH TO FORKS 102=NORTH FK 103=SOUTH FK. SURVEY TOO EARLY ESPECIALLY FOR KINGS.



## ARTICLE

# Distribution, Stock Composition and Timing, and Tagging Response of Wild Chinook Salmon Returning to a Large, Free-Flowing River Basin

**John H. Eiler\*** and **Michele M. Masuda**

*National Marine Fisheries Service, Alaska Fisheries Science Center, Auke Bay Laboratories, Juneau, Alaska 99801, USA*

**Ted R. Spencer** and **Richard J. Driscoll**

*Alaska Department of Fish and Game, Division of Commercial Fisheries, Anchorage, Alaska 99518, USA*

**Carl B. Schreck**

*U.S. Geological Survey, Oregon Cooperative Fish and Wildlife Research Unit, Department of Fisheries and Wildlife, Oregon State University, Corvallis, Oregon 97331, USA*

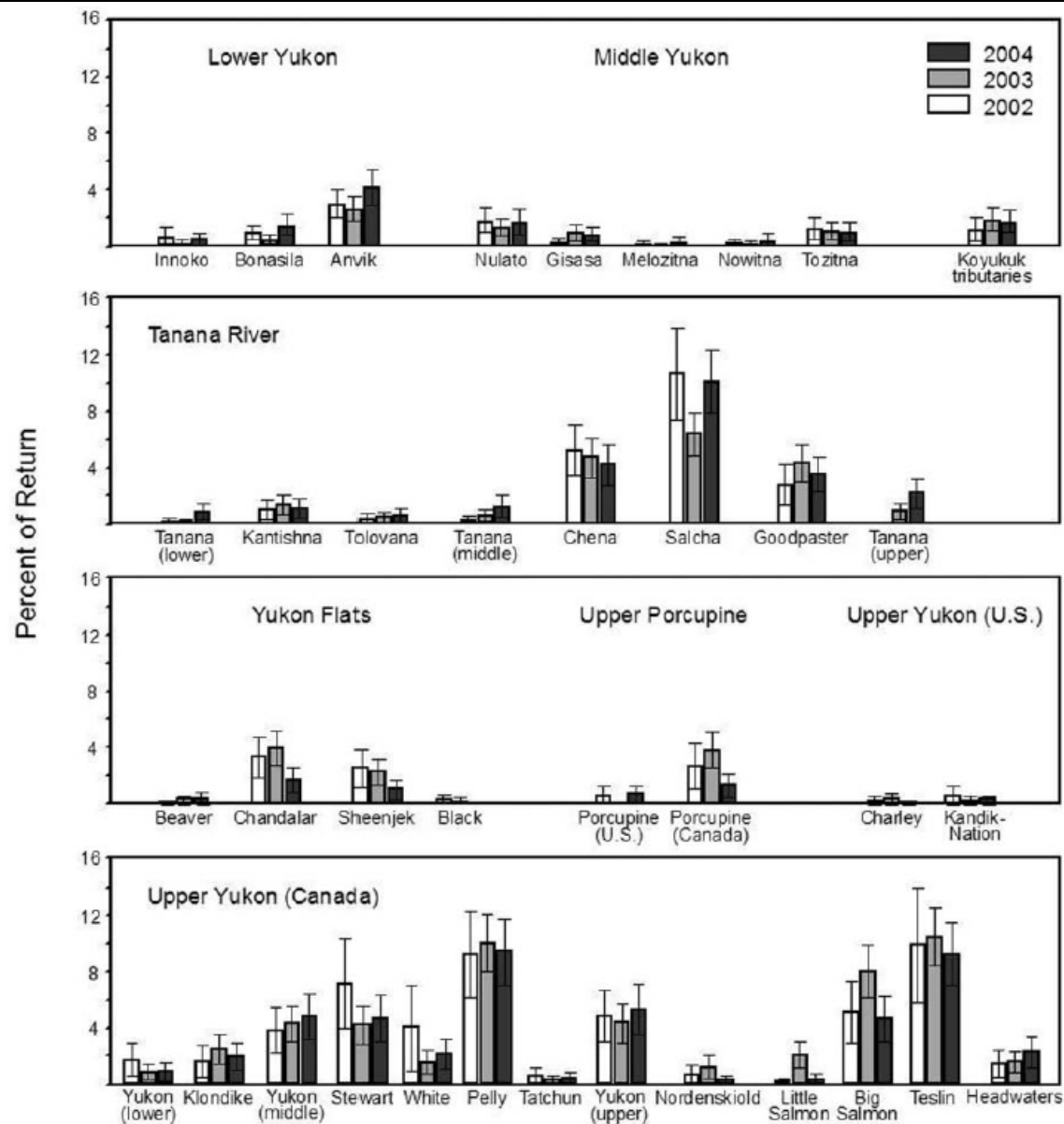


FIGURE 9. Stock composition of Chinook Salmon stocks returning to terminal reaches of the Yukon River basin in 2002–2004, based on the distribution of radio-tagged fish weighted by catch per unit effort information at the Russian Mission tagging site and adjusted for the harvest of tagged individuals in upriver fisheries. Error bars = 95% confidence intervals.



Locations map

▼ 2008

▼ Conservation



CRE-16N-08 Klondike River Chinook Sonar Report



CRE-19-08 Lower Mayo River Chinook Habitat Restoration –  
Assessment of Juvenile Habitat Year 4



CRE-27-08 Porcupine River Chum Mark Recapture Report



CRE-29-08 Chum Recovery Minto Report



CRE-37-08 Blind Creek Chinook Enumeration Report



CRE-41-08 Big Salmon River Chinook Sonar Report



CRE-46N-08 Upper Teslin River Chum Tracking Pilot Report



CRE-51-08 Michie Creek Salmon and Habitat-Monitoring  
Report



CRE-63-08 Whitehorse Rapids Hatchery Coded Wire Tagging  
Report

State of Alaska  
Department of Fish and Game  
Nomination for Waters  
Important to Anadromous Fish

1985  
Year of Revision  
85-412

AWC Volume & Number Interior Region IV  
USGS Quad Charlie River B-2, A-2 (111)  
Name of Waterway Nation River  
AWC# of Waterway 334-45-11000-2401

Change to \_\_\_\_\_ Atlas  
Catalog Both ALASKA DEPT. OF  
FISH & GAME

Addition X  
Deletion \_\_\_\_\_  
Correction \_\_\_\_\_  
SEP 30 1985  
REGION II  
HABITAT DIVISION

Name addition Nation River  
USGS name n  
Local name n

For Office Approval

Nomination II _____	
<u>R. Pett</u> Regional Supervisor	<u>9-25-85</u> Date
<u>OKSBS</u>	<u>11/17/85</u>
<u>TJB</u> Drafted	<u>10-23-85</u>

Species	Date(s) Observed	Spawning	Rearing	Migration
<u>King Salmon</u>	<u>8-19-85</u>	<u>X</u>		



We used three indicators of abundance to classified spawning areas as major or minor producers:

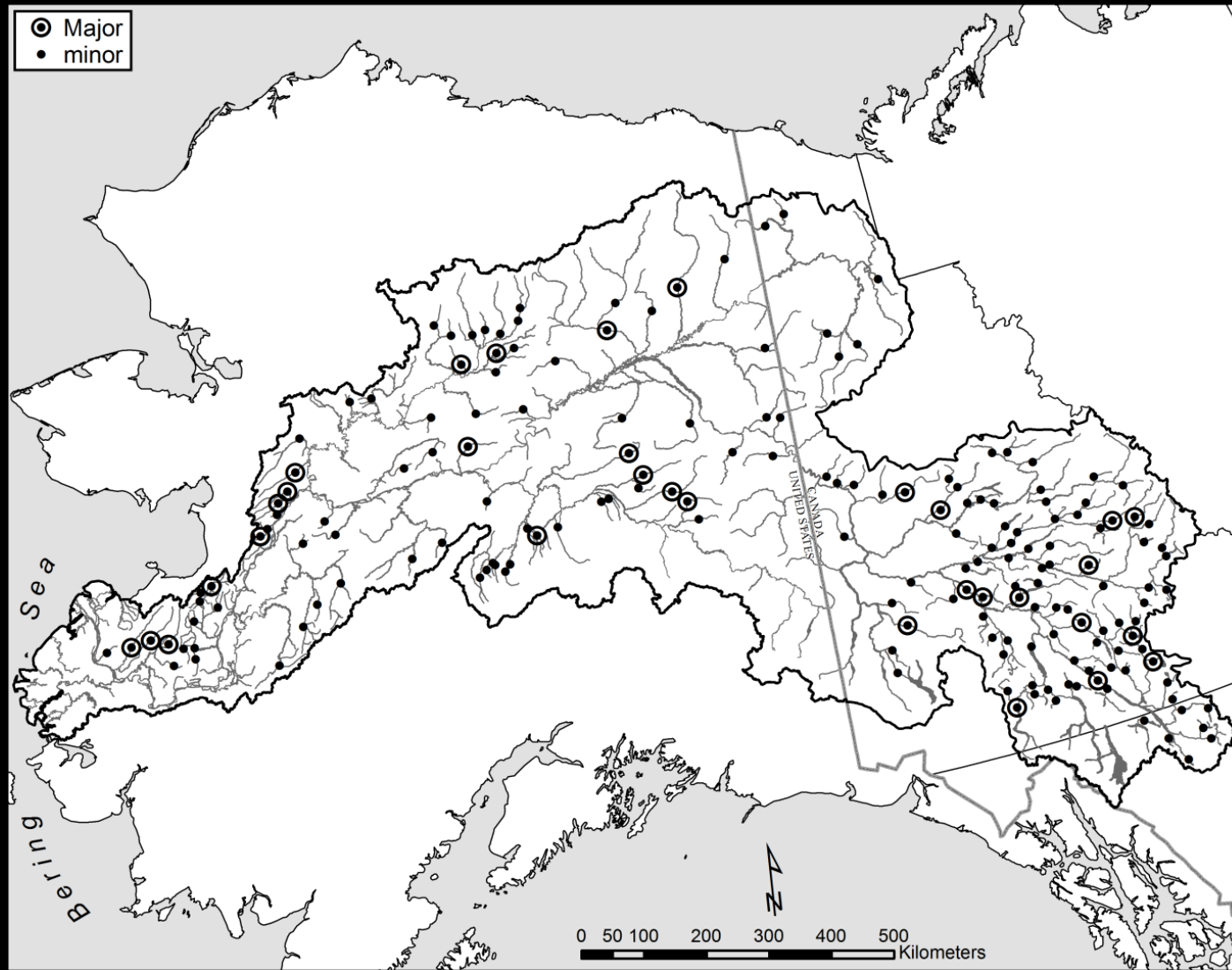
1) escapement estimates, major producer if annual average  $\geq 500$  fish, minor producer if  $< 500$  fish;

2) radio telemetry proportions, major producer if annual average proportion of run  $\geq 1\%$ , minor producer if  $< 1\%$ ;

3) aerial survey counts, major producer if annual average  $\geq 165$ , minor producer if  $< 165$ .



We classified 32 spawning areas as major producers  
and 151 spawning areas as minor producers



Region	Spawning area <sup>a</sup>	Escapements	Telemetry	Survey counts
R1	Andreafsky R.			1,130 (48)
R1	Anvik R.		~3.2% (3)	1,075 (34)
R1	Atchuelinguk R.			456 (13)
R1	EF Andreafsky R.	3,748 (25)		1,306 (46)
R1	Nulato R.			789 (33)
R1	Rodo R.			314 (13)
R1	SF Nulato R.			580 (35)
R2	Gisasa R.	2,289 (22)		723 (34)
R2	Henshaw Cr.	966 (14)		306 (18)
R2	SF Koyukuk R.	1,438 (2)		301 (20)
R2	Tozitna R.	1,381 (9)	1.1% (3)	
R3	Barton Cr.			232 (9)
R3	Chatanika R.	997 (7)		
R3	Chena R.	6,450 (28)	4.8% (3)	1,956 (15)
R3	Goodpaster R.	2,034 (9)	3.6% (3)	860 (20)
R3	Salcha R.	9,051 (28)	9.1% (3)	3,583 (17)
R4	Teedriinjik R.		3.0% (3)	
R5	Sheenjek R.		2.0% (3)	
R6	Klondike R.	2,377 (3)	2.0% (3)	
R6	McQuesten R.		~2.6% (3)	
R7	Big Salmon R.	~5,380 (11)	~5.2% (3)	911 (43)
R7	Little Salmon R.			559 (27)
R7	MS Yukon R.		4.9% (3)	
R7	Nisling R.		~1.3% (3)	
R7	Tatchun Cr.	618 (3)		201 (27)
R8	Blind Cr.	588 (17)		
R8	Ross R.			331 (15)
R8	S Macmillan R.		~1.1% (2)	
R9	L Teslin R.	~5,000 (4)	~4.9% (3)	
R9	Takhini R.			260 (16)
R9	U Nisutlin R.			439 (41)
R9	Wolf R.			221 (36)









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R1	Nulato R.			789 (33)
R1	Rodo R.			314 (13)
R1	SF Nulato R.			580 (35)
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R8	Ross R.			331 (15)
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R9	L Teslin R.	~5,000 (4)	~4.9% (3)	
R9	Takhini R.			260 (16)
R9	U Nisutlin R.			439 (41)
R9	Wolf R.			221 (36)



# Salcha River tower counting operation



photo courtesy of Chris Stark<sub>22</sub>

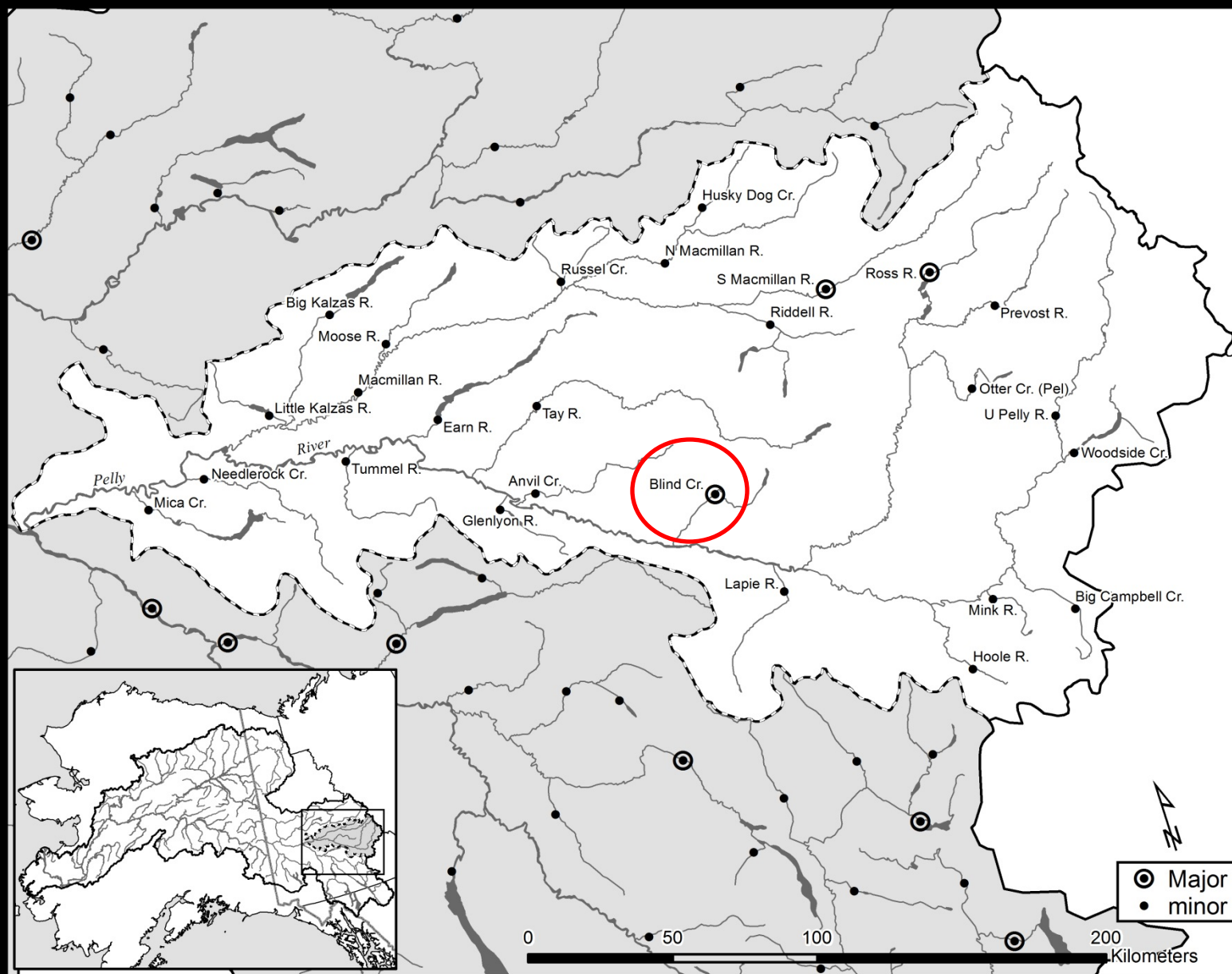




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R9	U Nisutlin R.			439 (41)
R9	Wolf R.			221 (36)







Region	Spawning area	River kilometer	Latitude	Longitude	PC	Source(s)
R6	S McQuesten R.	2491	63.84439	-136.30215	m	Barton 1984a; Nacho Nyak Dun First Nation 1998; Tobler 2003a
R6	Sixty Mile R.	2246	63.56330	-139.76211	m	Mercer 2005; Duncan 2006
R6	U Stewart R.	2608	63.56046	-133.96579	m	Osborne et al. 2003
R6	Watson Cr.	2548	63.53574	-135.15401	m	Osborne et al. 2003; Mercer 2005
R7	Bearfeed Cr.	2654	62.16793	-135.07765	m	Walker et al. 1974; Tobler and Marjanovic 2011
R7	Big Cr.	2450	62.61606	-136.99351	m	Mercer and Eiler 2004; Tobler and Marjanovic 2011
R7	Big Salmon R.	2652	61.88011	-134.92084	M	Tobler and Marjanovic 2011; Estensen et al. 2012; Eiler et al. 2014
R7	Drury Cr.	2692	62.19613	-134.38761	m	Walker et al. 1974; Tobler and Marjanovic 2011
R7	Incised Cr.	2583	62.04335	-136.27931	m	Pumphrey 2001; Tobler and Marjanovic 2011
R7	Kirkland Cr.	2669	61.74405	-136.04099	m	von Finster 1995 (personal communication)*; Pumphrey 2001; Tobler and Marjanovic 2011
R7	Klottasin Cr.	2415	62.56538	-139.51004	m	Otto 1998a; Cox 1999; Mercer and Eiler 2004
R7	Kluane R.	2523	61.87685	-139.72029	m	Beak Consultants Limited 1977; Cox 1999
R7	Klusha Cr.	2676	61.73597	-136.01366	m	Otto 1998b; Pumphrey 2001; Tobler and Marjanovic 2011
R7	Little Salmon R.	2591	62.05396	-135.66633	M	Estensen et al. 2012; Sandone 2013; Eiler et al. 2014
R7	MS Yukon R.	2422	62.76184	-137.30600	M	Walker 1976; Milligan et al. 1985; Mercer and Eiler 2004
R7	N Big Salmon R.	2684	61.76209	-134.61391	m	Mercer 2005; Tobler and Marjanovic 2011; von Finster 2014
R7	Nisling R.	2429	62.46299	-139.48170	M	Otto 1998a; Mercer 2005; Wilson 2006
R7	Nordenskiold R.	2573	62.10214	-136.30123	m	Tobler and Marjanovic 2011; Flannery et al. 2012; Eiler et al. 2014
R7	Northern Cr.	2748	61.84719	-133.97581	m	Walker et al. 1974; Mercer 2005; Tobler and Marjanovic 2011
R7	S Big Salmon R.	2710	61.60735	-134.43774	m	Walker et al. 1974; Barton 1984a; Tobler and Marjanovic 2011
R7	Scurvy Cr.	2798	61.21519	-133.24122	m	Walker et al. 1974; Osborne et al. 2003; Tobler and Marjanovic 2011
R7	Selwyn R.	2373	62.80351	-138.28462	m	von Finster 1985 (personal communication)*
R7	Tatchun Cr.	2510	62.28553	-136.32524	M	Flannery et al. 2012; Eiler et al. 2014; JTC 2016
R7	Tincup Cr.	2535	61.88768	-139.54533	m	Wilson 2002; Estensen et al. 2012; MacDonald 2013
R7	Walsh Cr.	2644	61.92001	-134.94149	m	Tobler and Marjanovic 2011
R8	Anvil Cr.	2713	62.44431	-134.12903	m	Mercer 2005
R8	Big Campbell Cr.	2963	61.77272	-131.12878	m	Mercer and Eiler 2004; Mercer 2005
R8	Big Kalzas R.	2580	62.89228	-135.48500	m	Sparling 2003; Flannery et al. 2012; MacDonald 2013
R8	Blind Cr.	2792	62.17998	-133.22044	M	Estensen et al. 2012; Flannery et al. 2012; Wilson 2017
R8	Earn R.	2648	62.73648	-134.69729	m	Sparling 2003; Flannery et al. 2012; State of Alaska 2016b
R8	Glenlyon R.	2701	62.48280	-134.16357	m	Cox 1999; Tobler and Marjanovic 2011; Flannery et al. 2012

# **Pacific Salmon at the Crossroads: Stocks at Risk from California, Oregon, Idaho, and Washington**

Willa Nehlsen, Jack E. Williams, and James A. Lichatowich

Fisheries 1991

Populations having recent escapements under 200, in the absence of evidence that they were historically small, were classified as being at high risk of extinction.

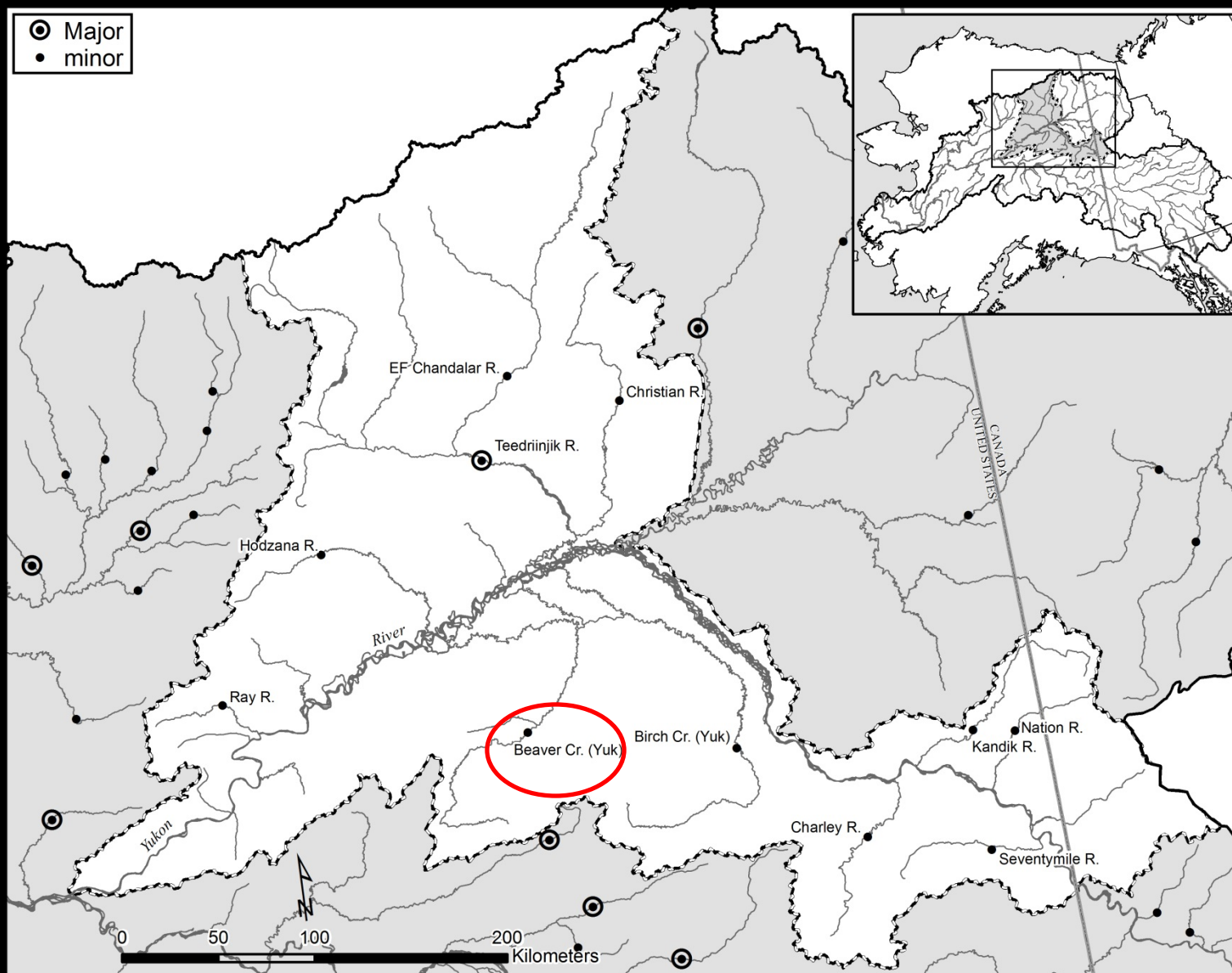
1996: 192 Chinook  
1997: 315 Chinook  
1999: 128 Chinook  
2000: 114 Chinook

## Adult Salmon Runs and Streamflow Data at a Resistance Board Weir on Beaver Creek, Alaska, 1998-2000

Nathan Collin, Lon Kelly and Jon Kostohrys







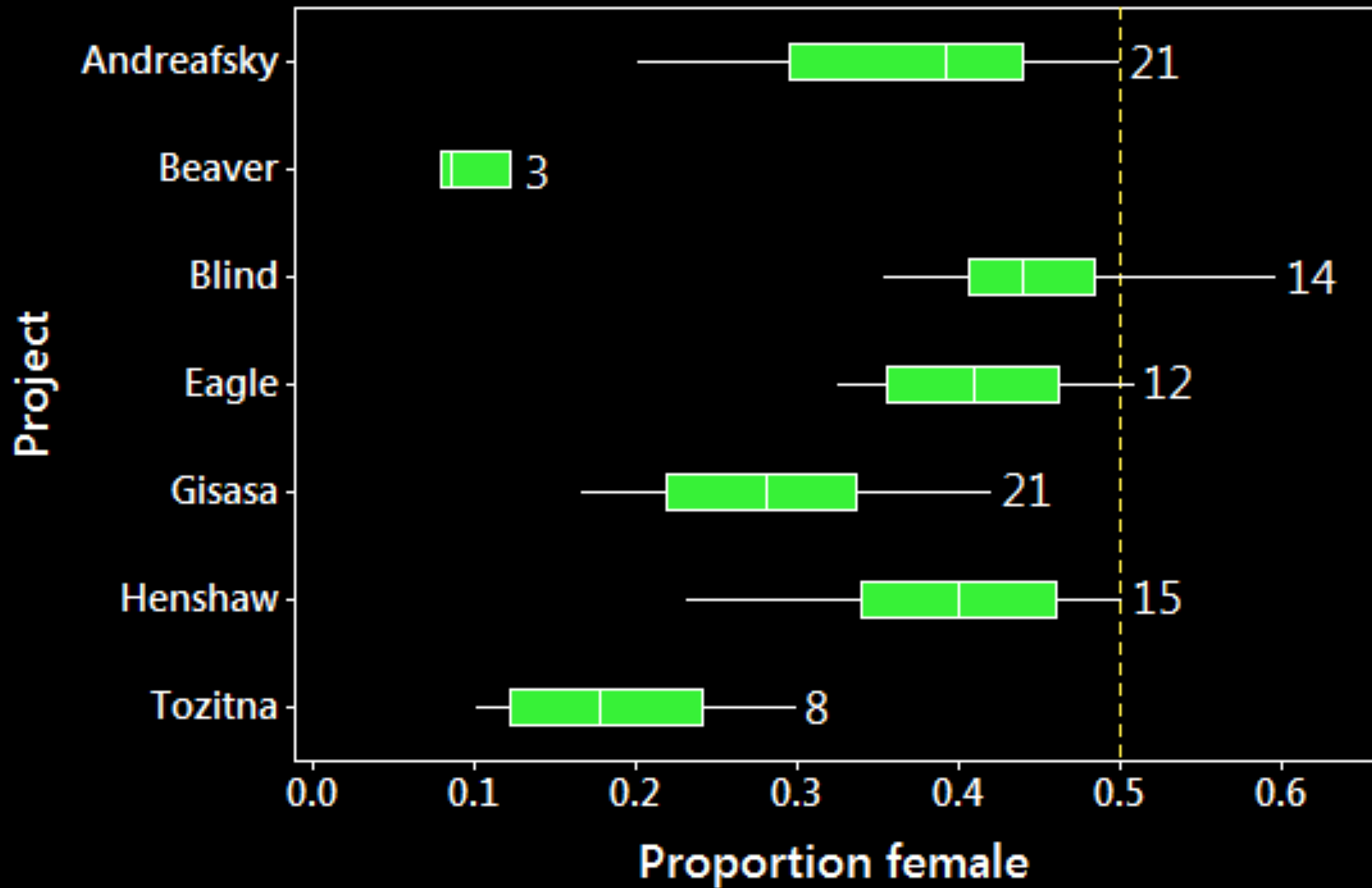
## Adult Salmon Runs and Streamflow Data at a Resistance Board Weir on Beaver Creek, Alaska, 1998-2000

Nathan Collin, Lon Kelly and Jon Kostohrys



1996: 192 Chinook  
1997: 315 Chinook, 25 F  
1999: 128 Chinook, 11 F  
2000: 114 Chinook, 14 F

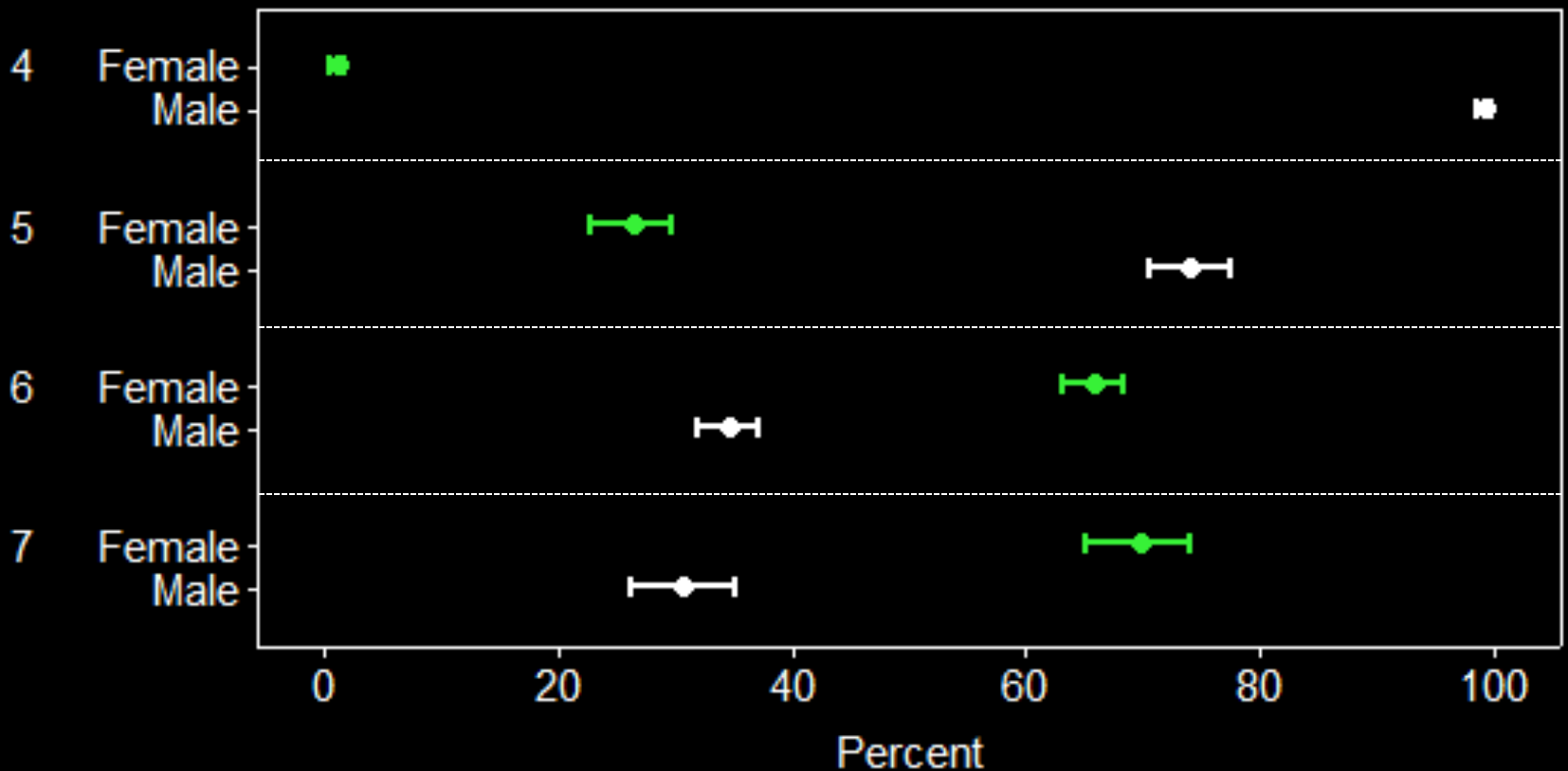
Proportion female for Chinook Salmon spawning runs are almost always  $< 0.5$



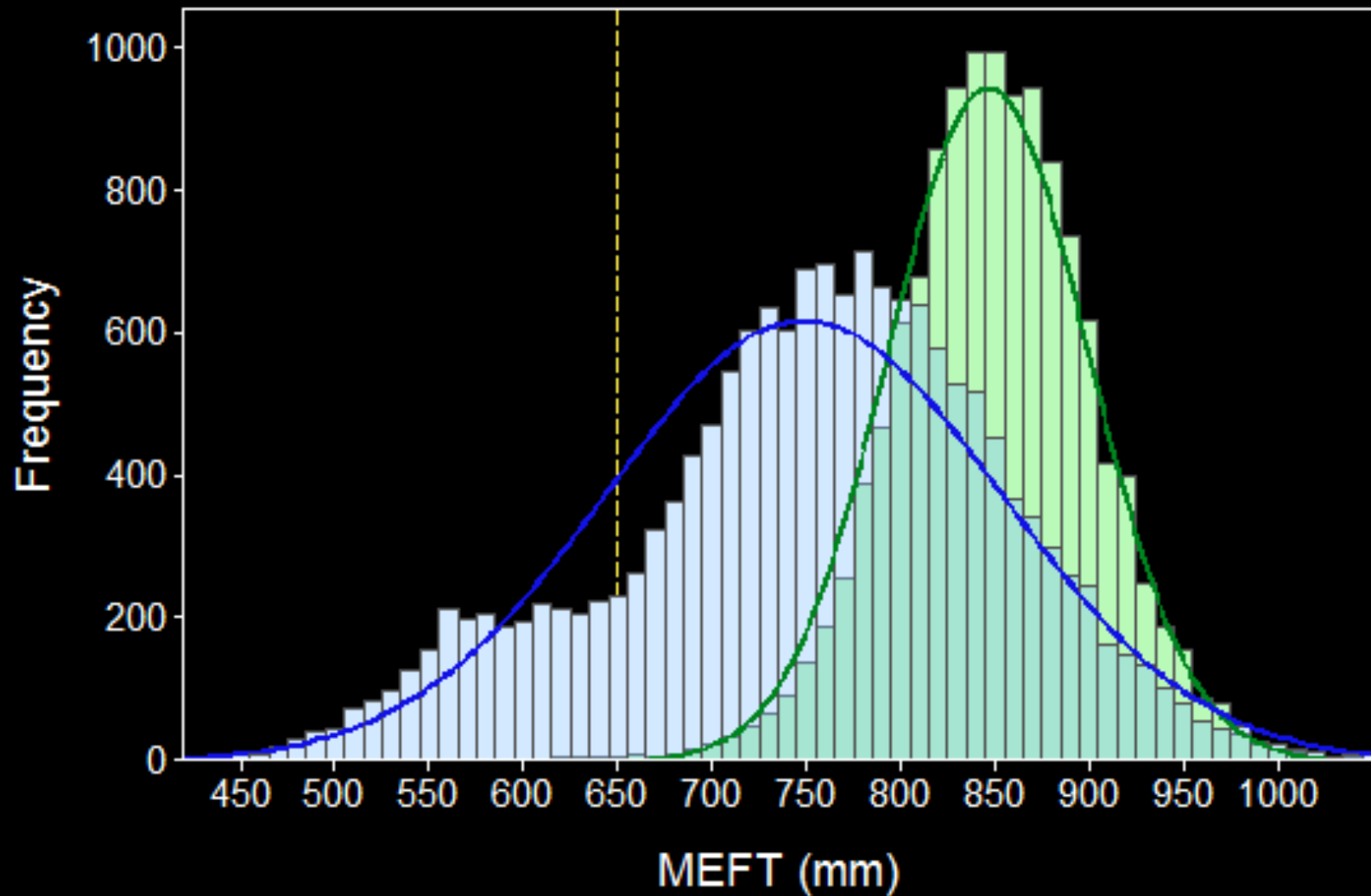


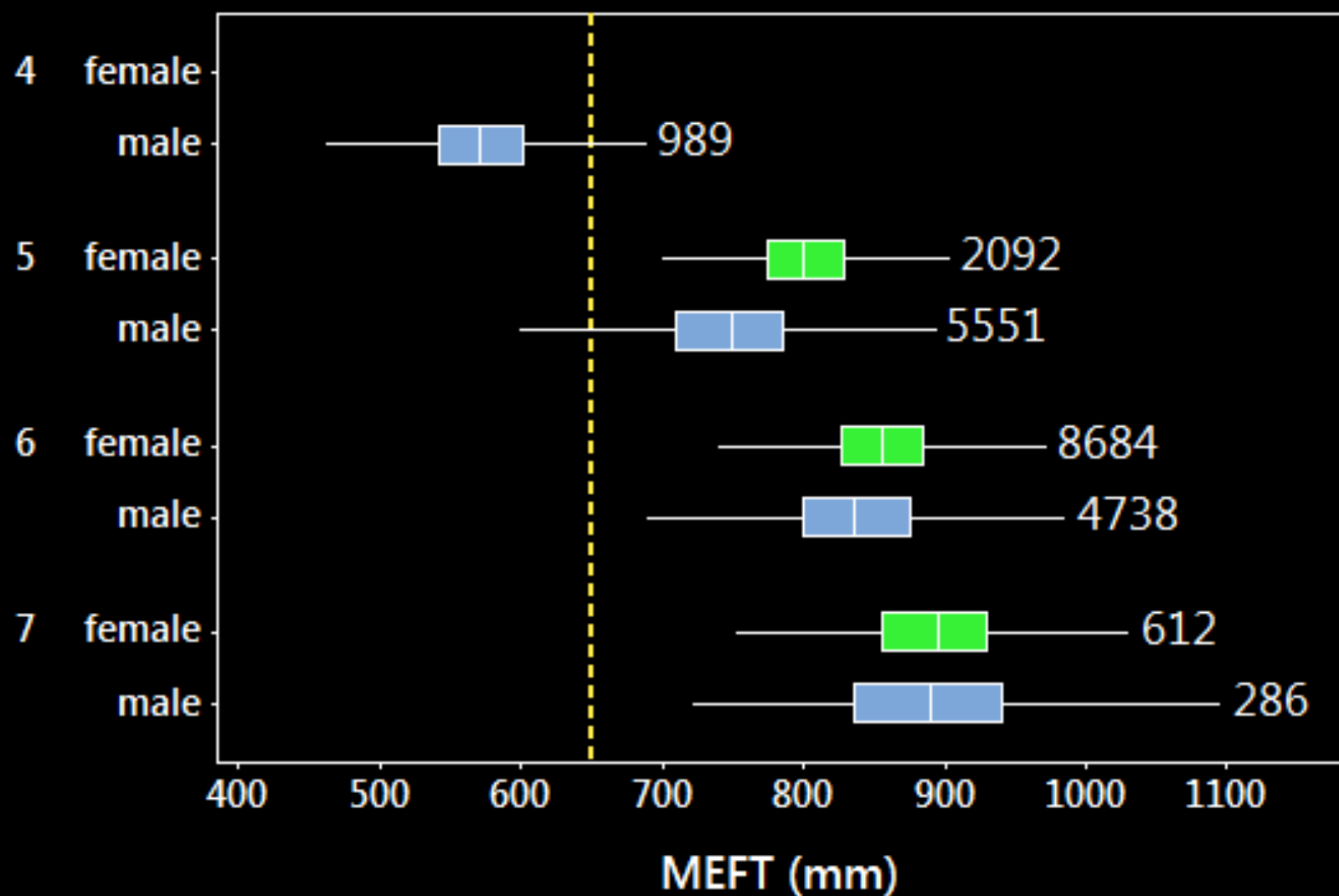
# Sex composition within the 4 dominant age classes

22,952 known-sex samples, 18 years of data



Length distributions of known sex male ( $n = 16,261$ ; blue bars to the left) and female ( $n = 12,614$ ; green bars to the right) Chinook Salmon







Pilot Station (1998 – 2017) and Eagle (2005 – 2017) sonars  
 East Fork Andreafsky (1994 – 2016) and Gisasa (1995 – 2016) weirs

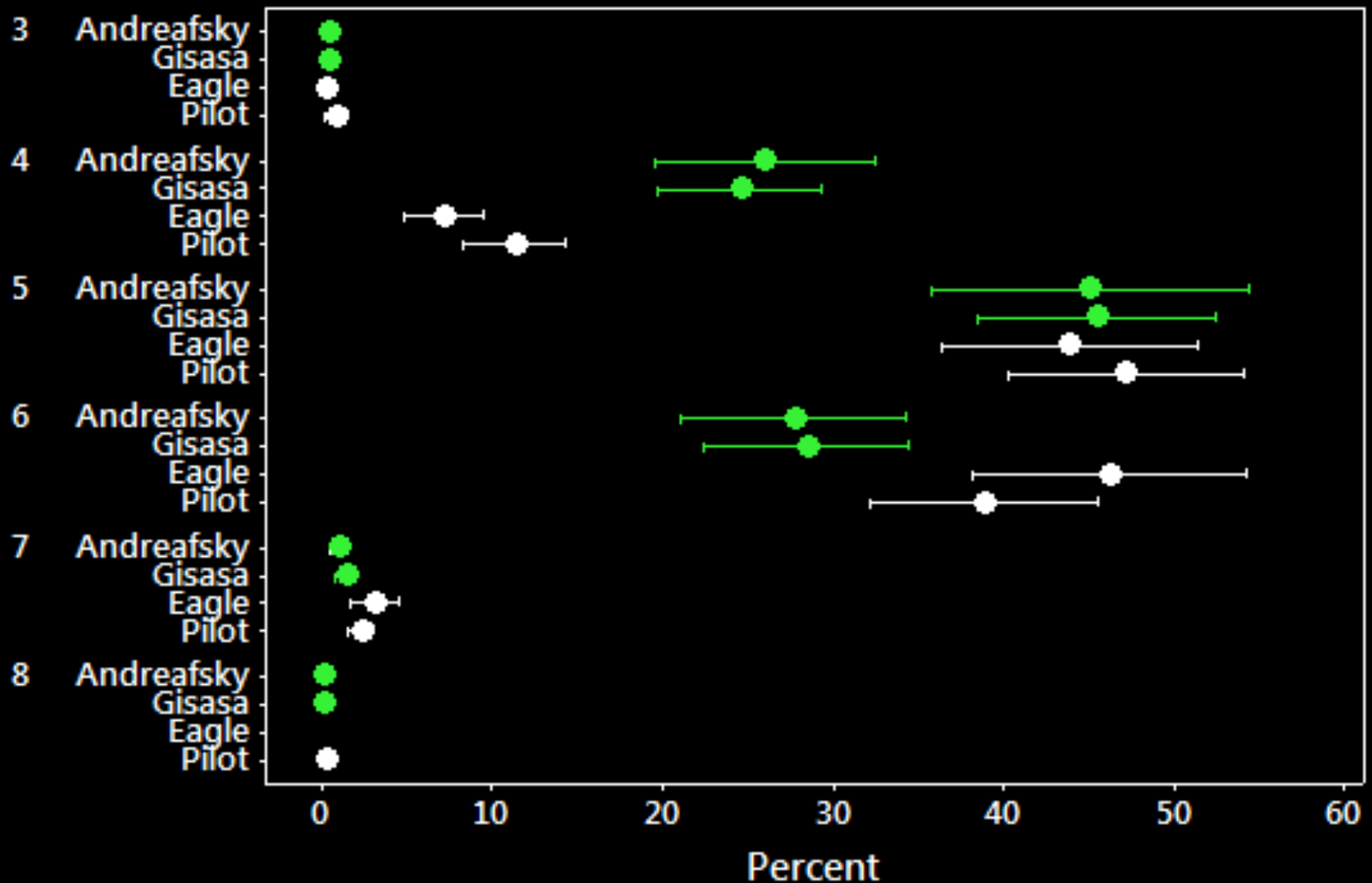




Photo by Paul Vecsei

