Hatchery Chum Salmon Straying Study, 2008–2010

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Chum Salmon Monitoring

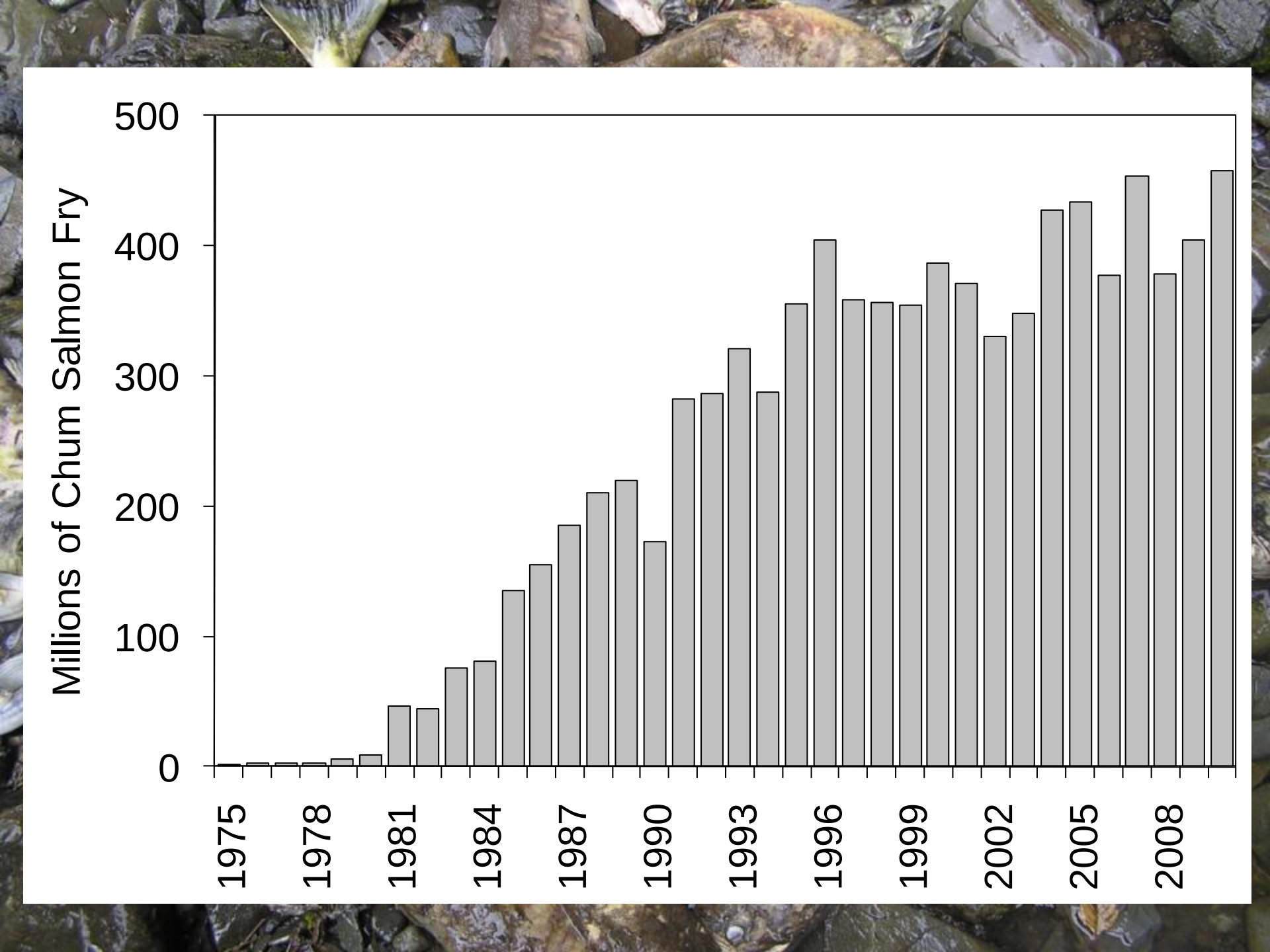
Chum Salmon spawn in more than 1,200 streams in Southeast Alaska.

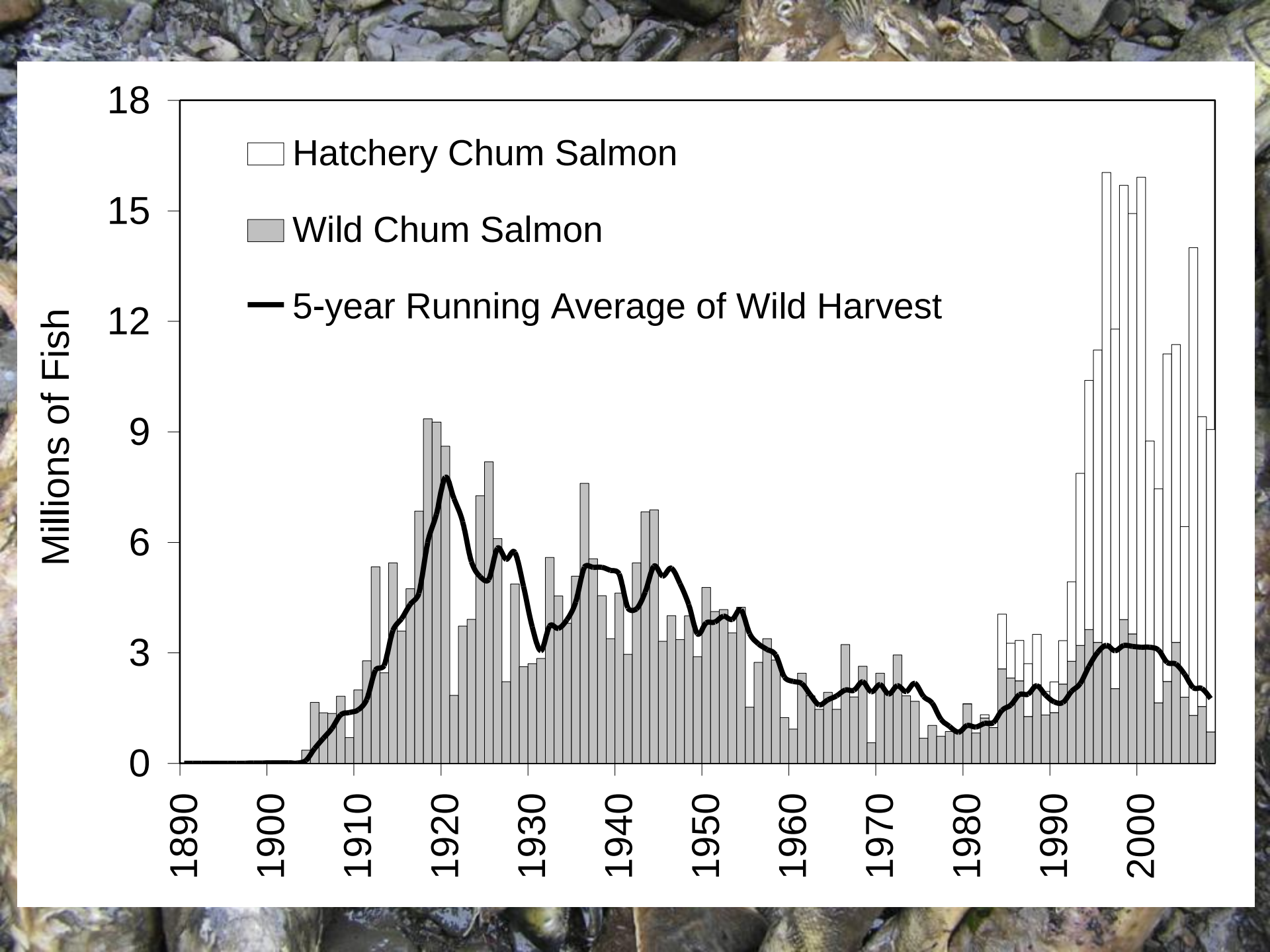
Chum Salmon Monitoring

63 Index Streams

5 Index Streams

13 Index Streams


Millions of Chum Salmon Fry
500
400
300
200
100
0
1975
1978
1981
1984
1987
1990
1993
1996
1999
2002
2005
2008


Hatchery Chum Salmon
Wild Chum Salmon
5-year Running Average of Wild Harvest
Millions of Fish
0
3
6
9
12
15
18
1890
1900
1910
1920
1930
1940
1950
1960
1970
1980
1990
2000

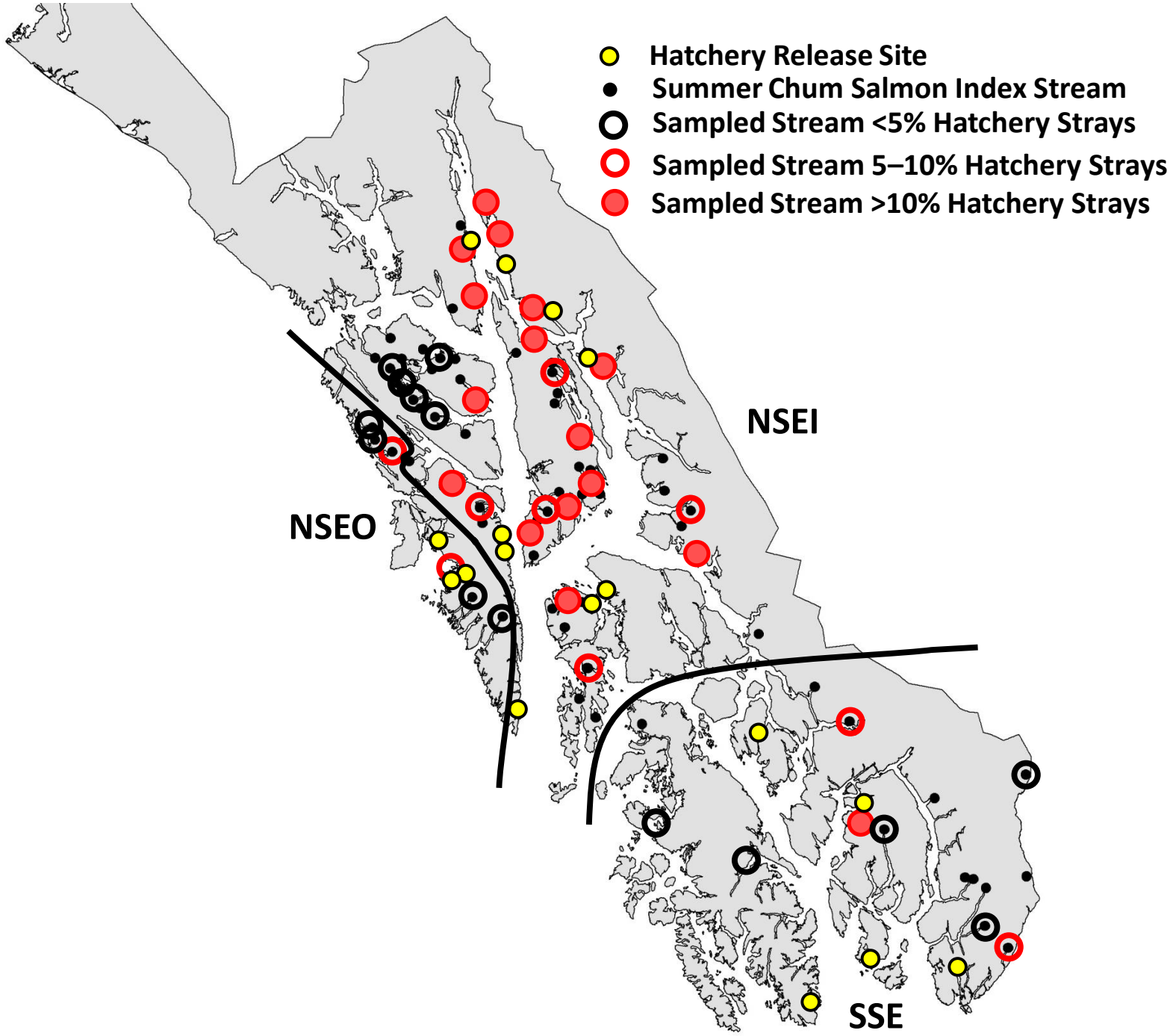
Purpose of Straying Study

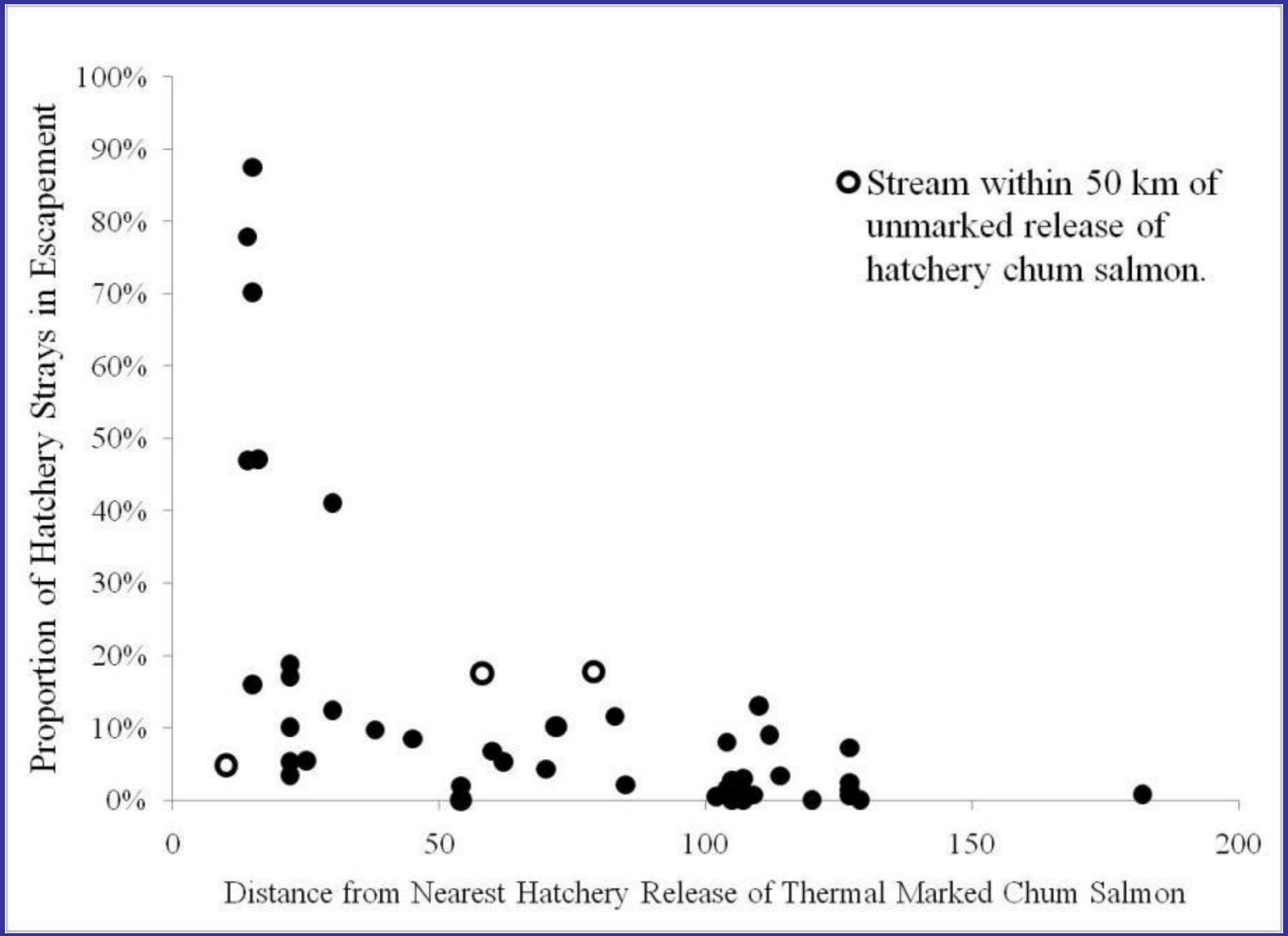
- ADF&G established escapement goals for Southeast Alaska wild chum salmon stocks in 2009.
- What is the geographic extent of hatchery chum salmon straying in Southeast Alaska?
- How do hatchery strays affect our estimates of wild chum salmon abundance?

Sampling Goals and Methods

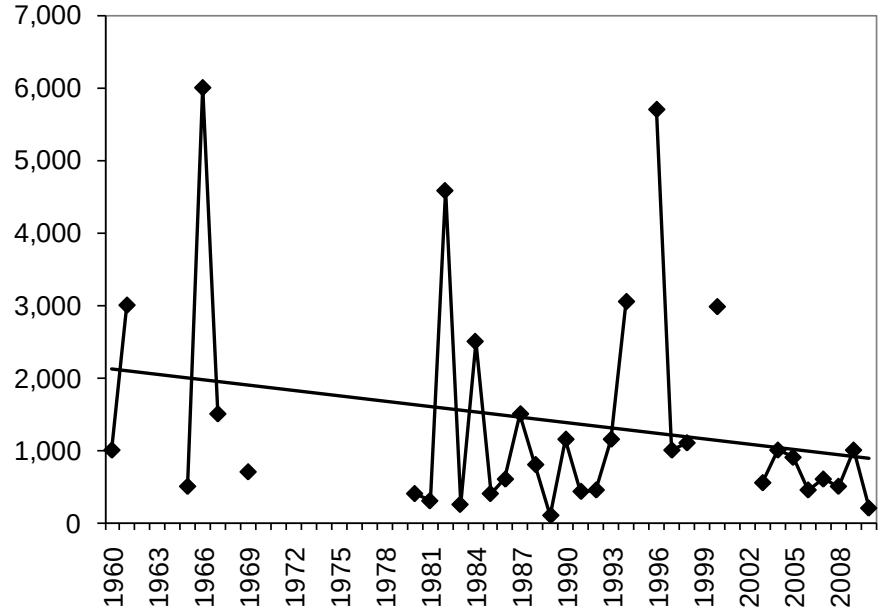
- Focused sampling on chum salmon index streams.
- Attempted to collect samples on at least two sampling events, and throughout the length of each creek if possible.
- Sample size goal of 96 otoliths per sampling event, 192 otoliths per stream.


SIMMS

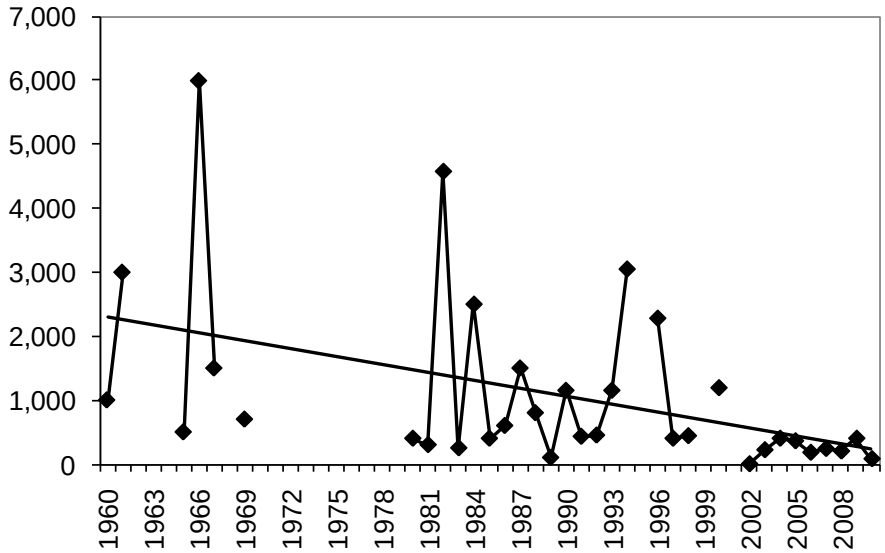

Hatchery Release Site
Summer Chum Salmon Index Stream
Sampled Stream <5% Hatchery Strays
Sampled Stream 5–10% Hatchery Strays
Sampled Stream >10% Hatchery Strays
NSEI
NSEO
SSE


Proportion of Hatchery Strays in Escapement
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
0
50
100
150
200
Distance from Nearest Hatchery Release of Thermal Marked Chum Salmon
Stream within 50 km of unmarked release of hatchery chum salmon.

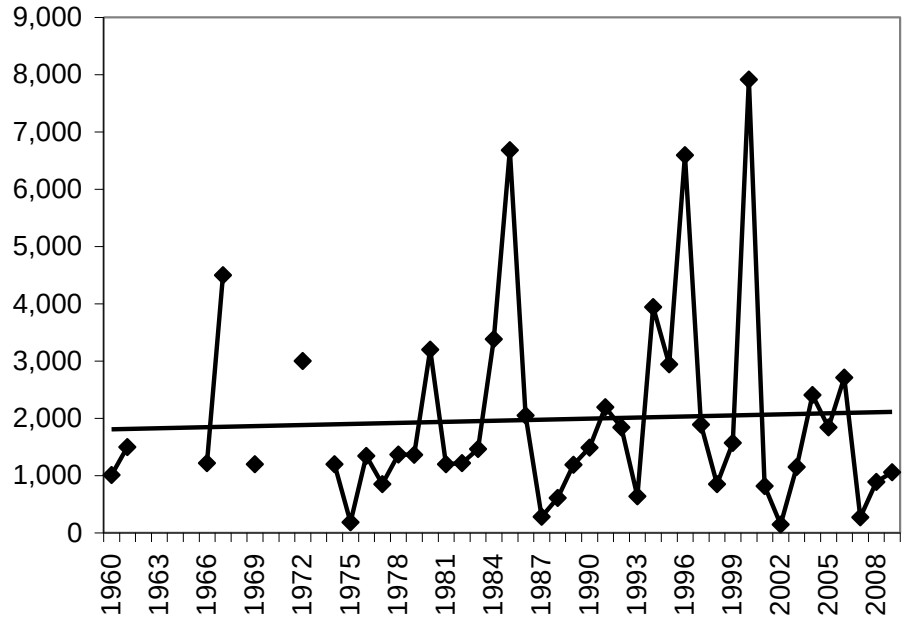
Sawmill Creek



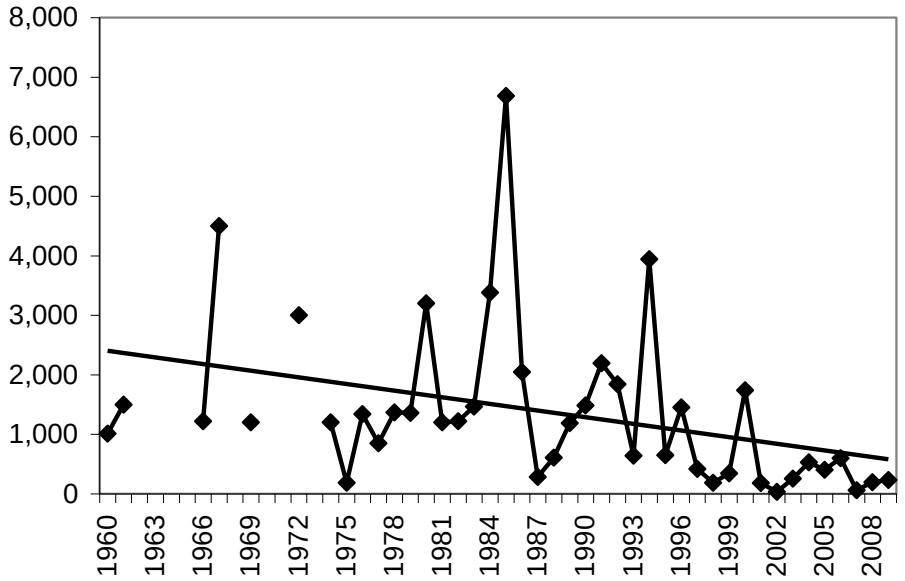
Sawmill Creek Assuming 60% Hatchery Fish Proportion since 1995



Fish Creek-Douglas Island



Fish Creek-Douglas Island Assuming 78% Hatchery Fish Proportion since 1995



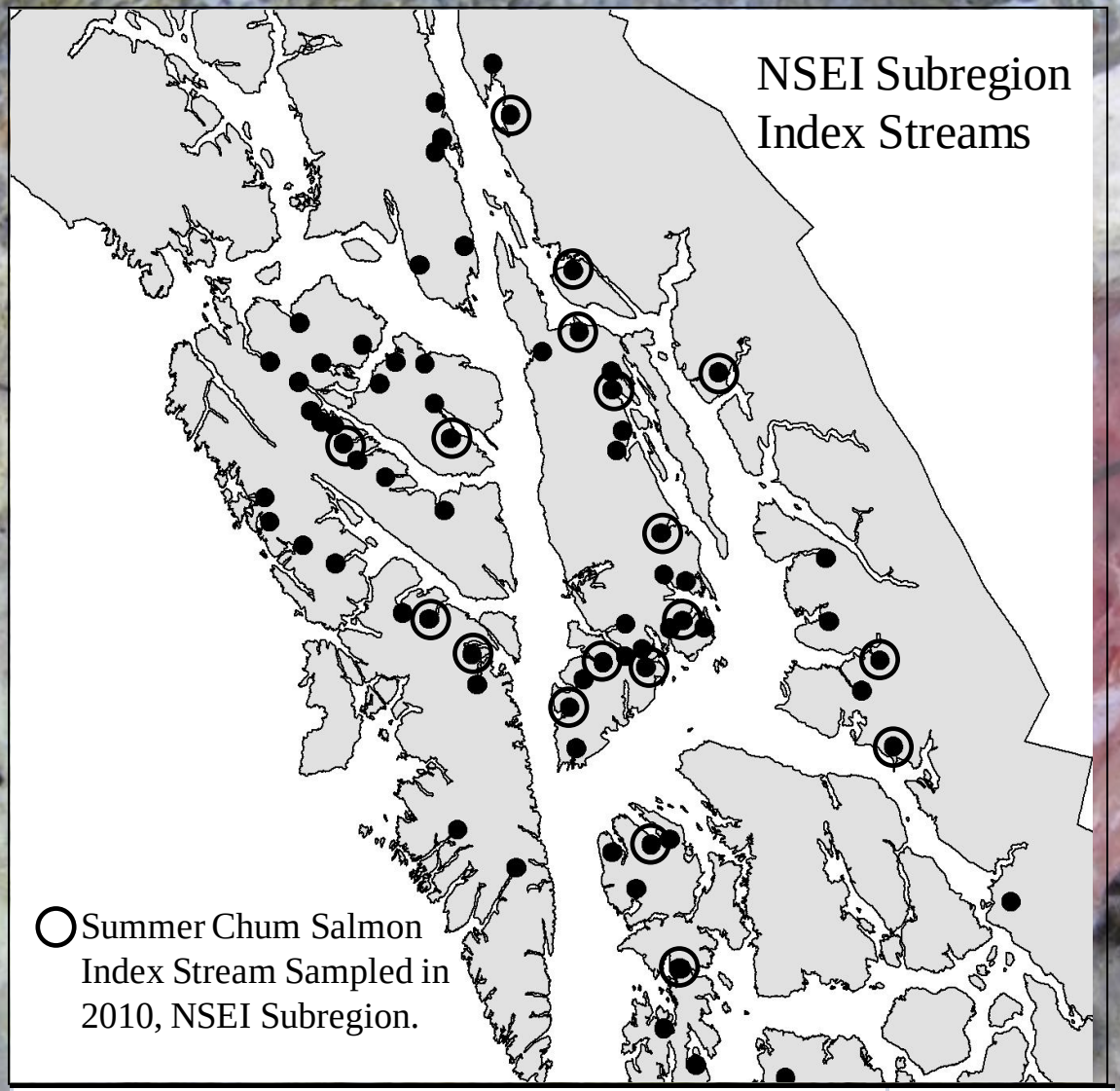
Northern Southeast Outside Index

Overall Proportion of Hatchery Fish

Year	Stream	Sample Size	% Hatchery Fish	Peak Survey	Hatchery Fish	Overall % Hatchery Fish	SE of Proportion	95% CI Lower	95% CI Upper
2008	West Crawfish NE Arm Head	192	1.9%	4,300	83				
2008	Sisters Lake SE Arm Head	192	0.5%	14,900	78				
2008	Lake Stream Ford Arm	184	1.4%	8,475	115				
2008	NSEO Index Total	568		27,675	276	**1.00%**	0.42%	0.35%	2.22%
2009	West Crawfish NE Arm Head	96	0.0%	3,500	0				
2009	Lake Stream Ford Arm	269	2.4%	820	20				
2009	NSEO Index Total	365		4,320	20	**0.46%**	0.36%	0.03%	1.88%
2010	Whale Bay Great Arm Head	95	2.1%	2,420	51				
2010	Lake Stream Ford Arm	291	7.2%	595	43				
2010	Black River	92	0.0%	7,500	0				
2010	NSEO Index Total	478		10,515	94	**0.89%**	0.43%	0.24%	2.24%

SSE Subregion

Year	Stream	Anadromous Stream Number	Index Stream	Sample Size	% Hatchery Fish	SE of Proportion	95% CI Lower	95% CI Upper
2009	Hidden Inlet	101-11-01010	Yes	74	**6.8%**	2.9%	2.23%	15.07%
2009	Fish Creek-Portland Canal	101-15-10500-2028	Yes	120	**0.8%**	0.8%	0.02%	4.56%
2009	Marten River	101-30-10600	Yes	87	**1.1%**	1.1%	0.03%	6.24%
2010	Marten River	101-30-10600	Yes	64	**1.6%**	1.6%	0.04%	8.40%
2008	Carroll River	101-45-10780	Yes	190	**0.0%**	0.0%	0.00%	1.56%
2009	Carroll River	101-45-10780	Yes	202	**3.0%**	1.2%	1.10%	6.35%
2010	Ketchikan Creek	101-47-10250	No	188	66.2%	3.5%	59.26%	73.19%
2010	Harris River	102-60-10820	No	84	**1.2%**	1.2%	0.03%	6.46%
2010	Staney Creek	103-90-10310	No	60	**3.3%**	2.3%	0.41%	11.53%
2010	Harding River	107-40-10490	Yes	188	**5.3%**	1.6%	2.58%	9.56%



Overall NSEI Hatchery Fish Proportion	**13.91%**
SE of Proportion	0.73%
95% CI Lower	12.51%
95% CI Upper	15.40%

Summary and Conclusions

- Virtually all chum salmon index streams in SE Alaska have some hatchery strays present.
- Escapement estimates in the NSEI sub-region have been most influenced by the presence of stray hatchery fish.
- Stray proportions in streams generally decreases with distance.
- Major knowledge gaps exist, regarding the effects of hatchery chum salmon strays on wild stock chum salmon in Southeast Alaska.

Future Plans

- We will be sampling a random set of streams from the NSEI Subregion in 2011.
- Estimates of the proportion of hatchery fish in our escapement indices should be obtained whenever releases change significantly.
- Endless opportunities exist for studies looking at interactions between hatchery and wild stock chum salmon.

Thanks to:

- Bev Agler, Lorna Wilson, Megan Lovejoy, and all the staff at the mark, tag, and age lab.
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Questions?