Josephson, R., et al. In review

Proportions of hatchery fish in escapements of summer-run Chum Salmon in Southeast Alaska, 2013-2015

For submission to

North American Journal Fisheries Management

Acknowledgements

Prince William Sound Science Center
Sitka Sound Science Center
ADF&G Regional Mark, Tag, And Age Laboratory

Piston and Heinl. 2012a,b. Hatchery chum salmon straying in Southeast Alaska.

What is the extent and annual variability of straying in SEAK chum salmon escapements?

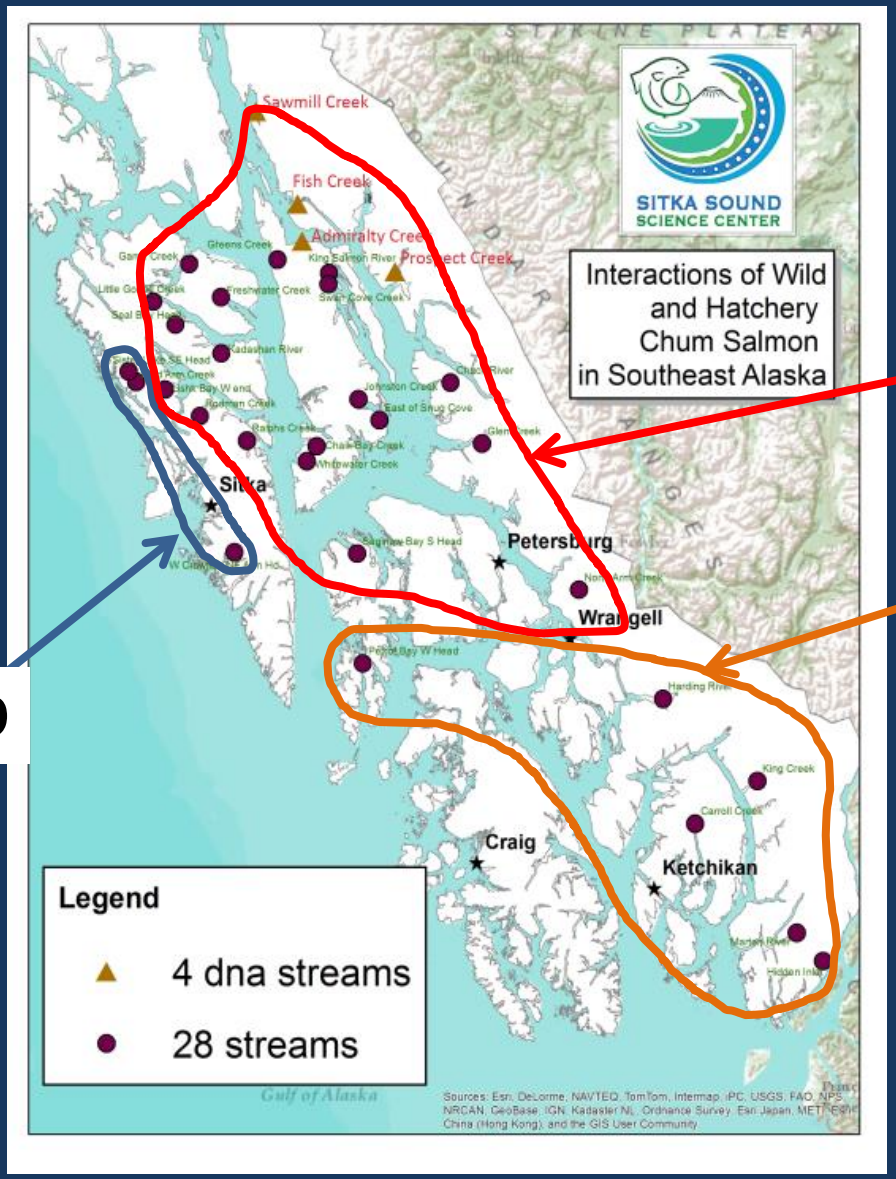
1,200 chum streams

Two runs: summer and fall

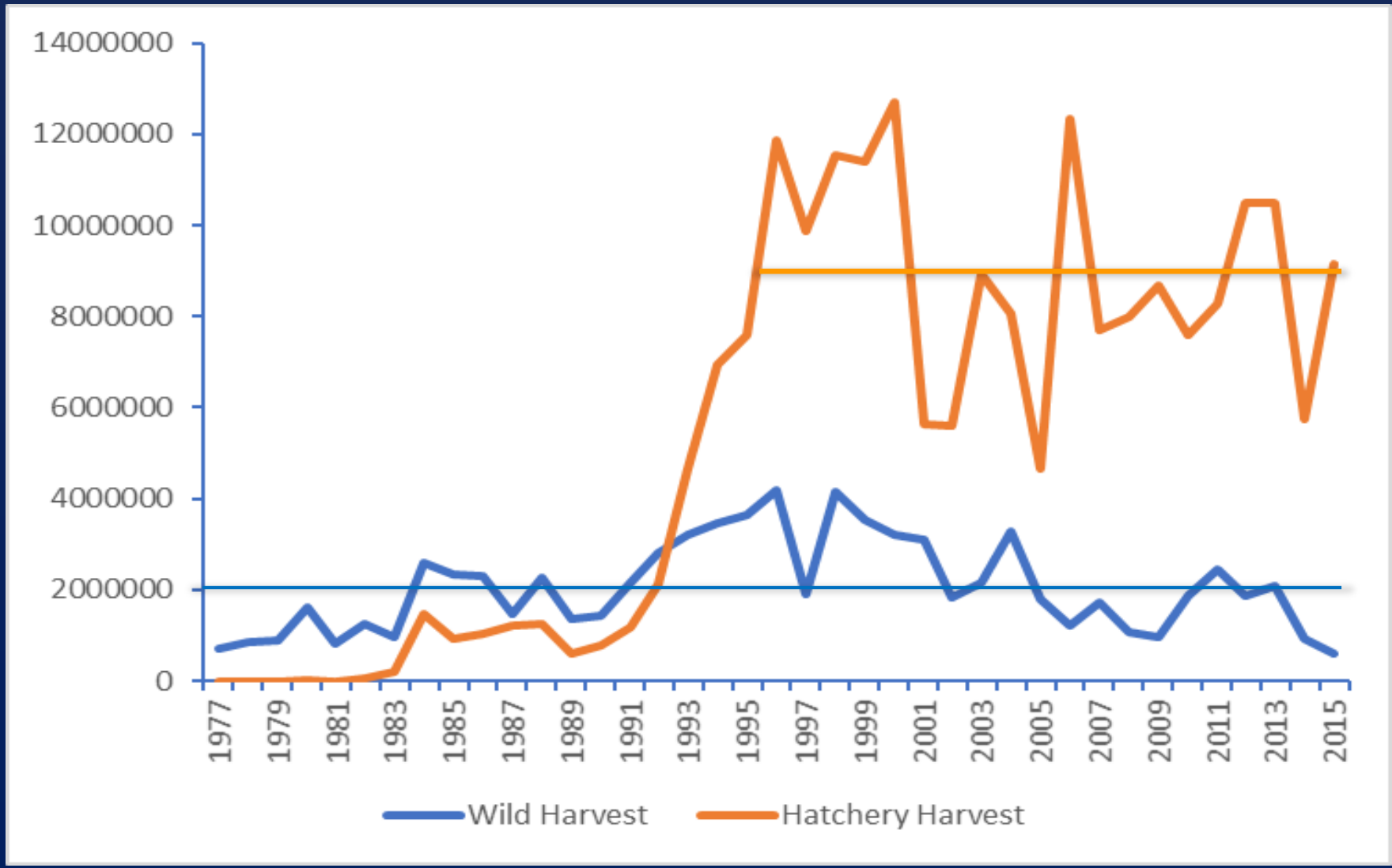
Three stock groups

81 escapement index streams
- NSI: 66
- NSO: 6
- SSE: 9

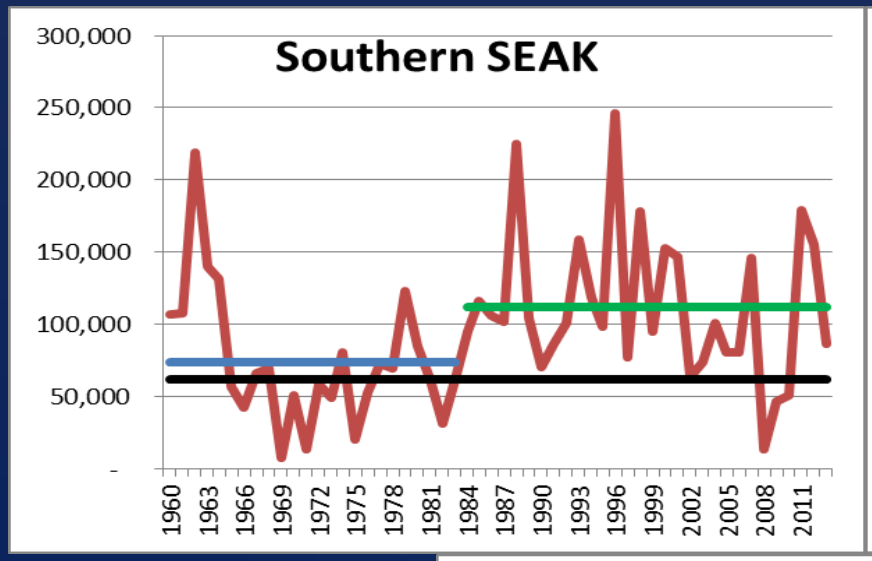
32 streams selected for study
- NSI: 24
- NSO: 3
- SSE: 5

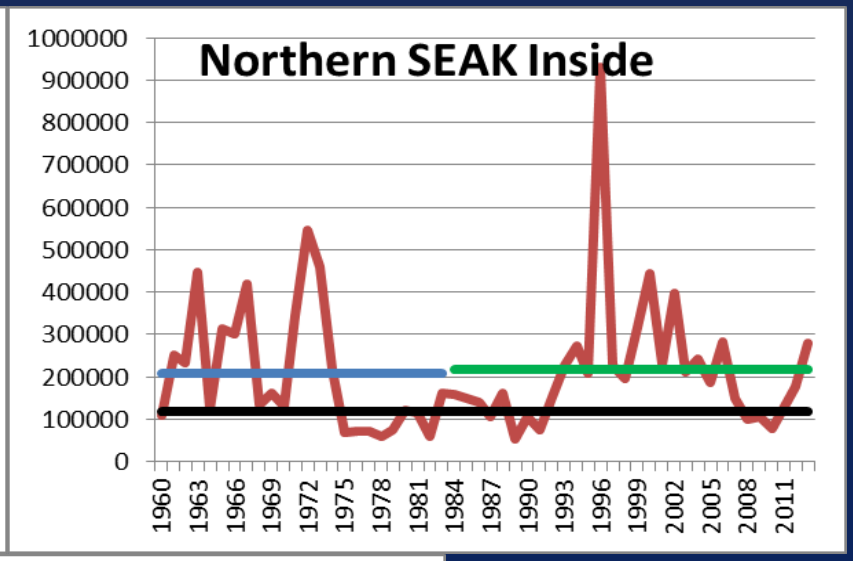


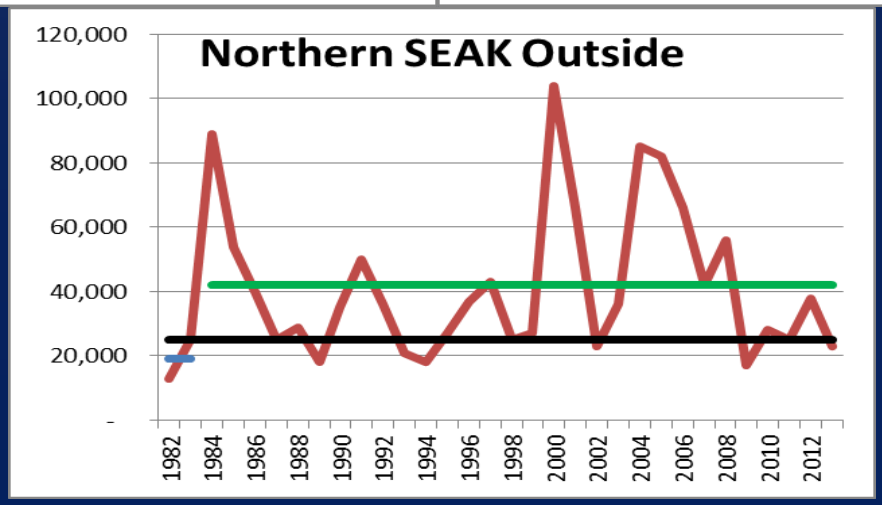
SEAK Chum Salmon: Hatchery and Wild Harvests 1977-2015



SEAK Summer Chum Salmon Escapements By Management Unit

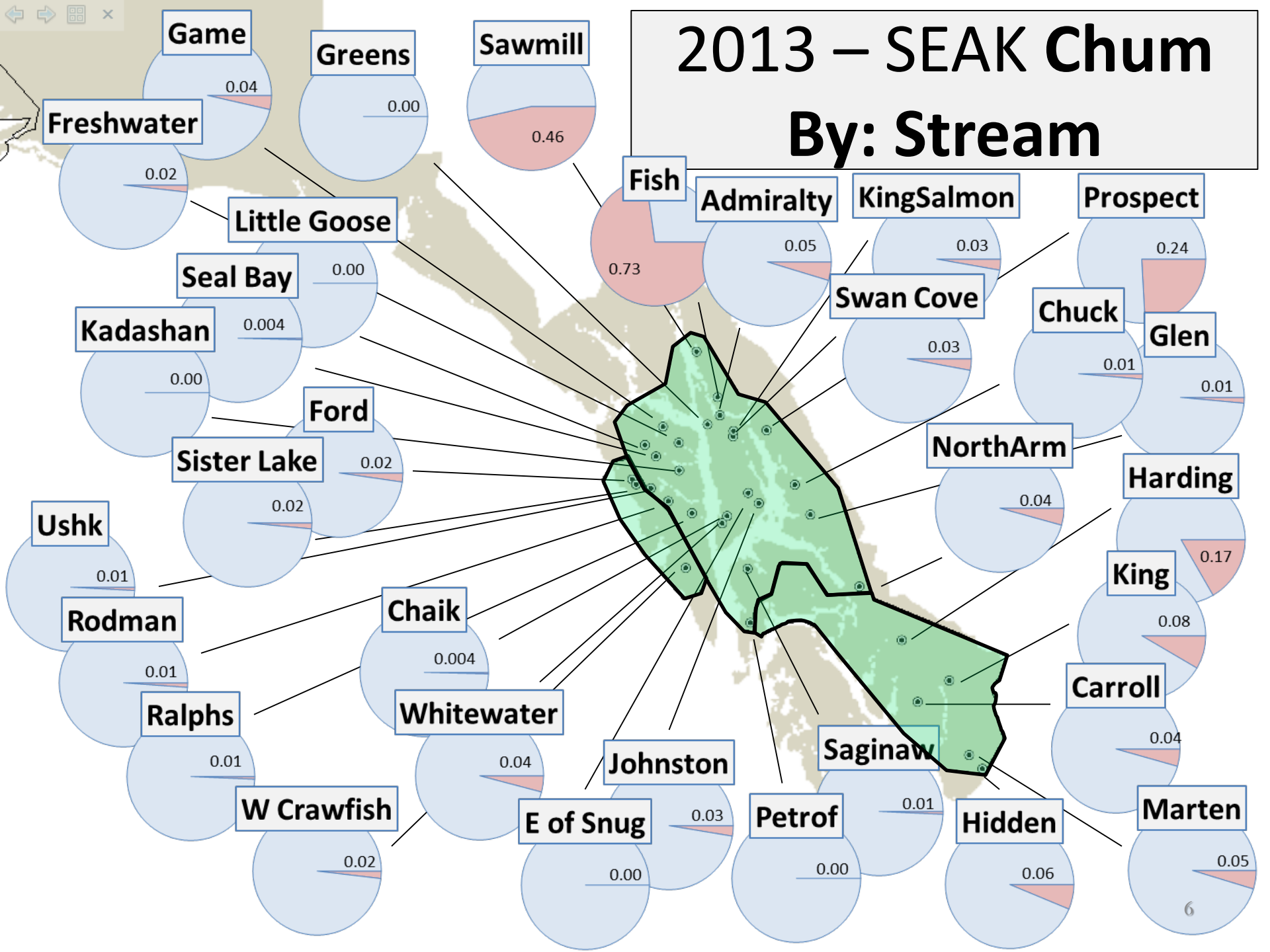


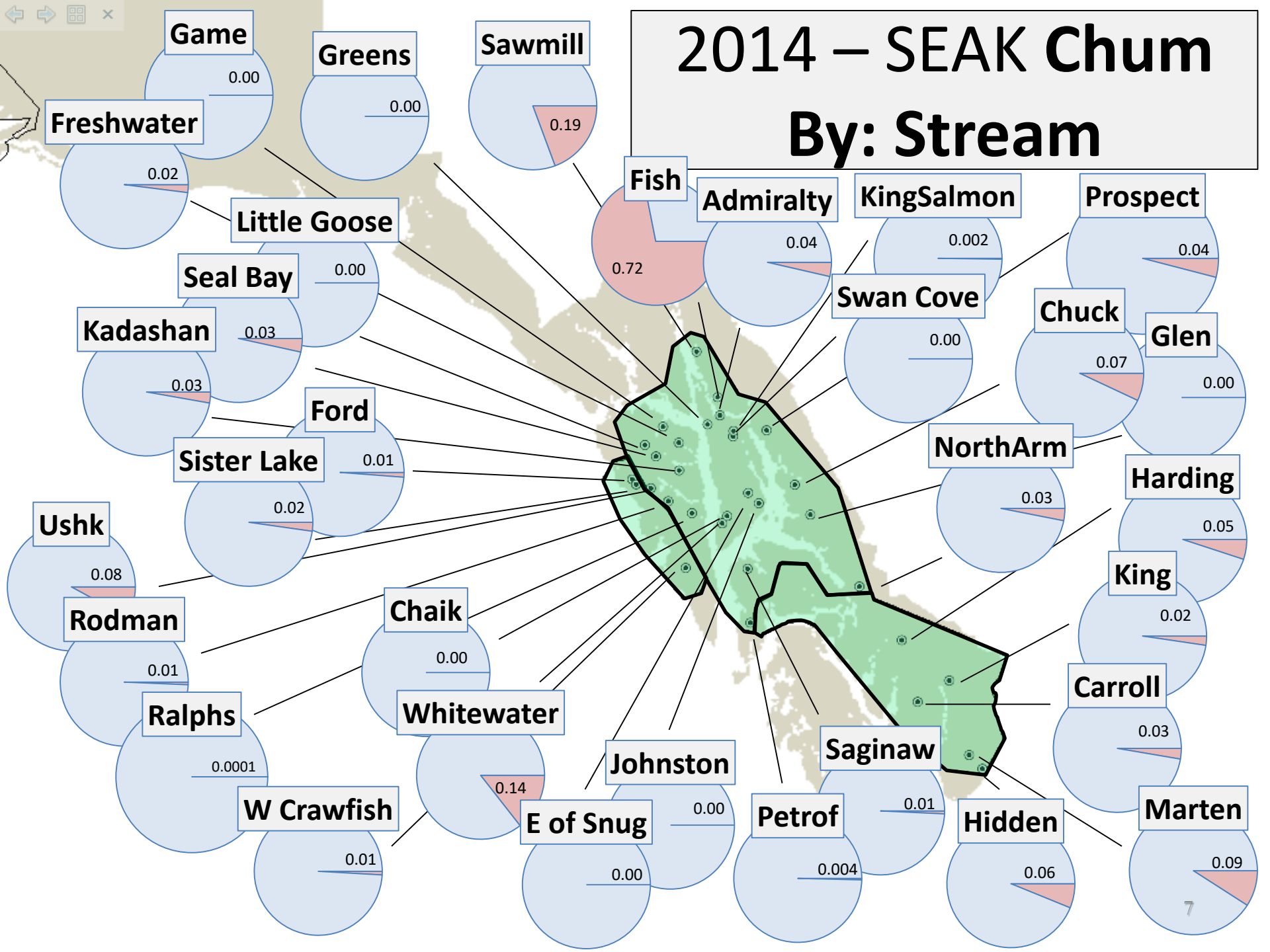


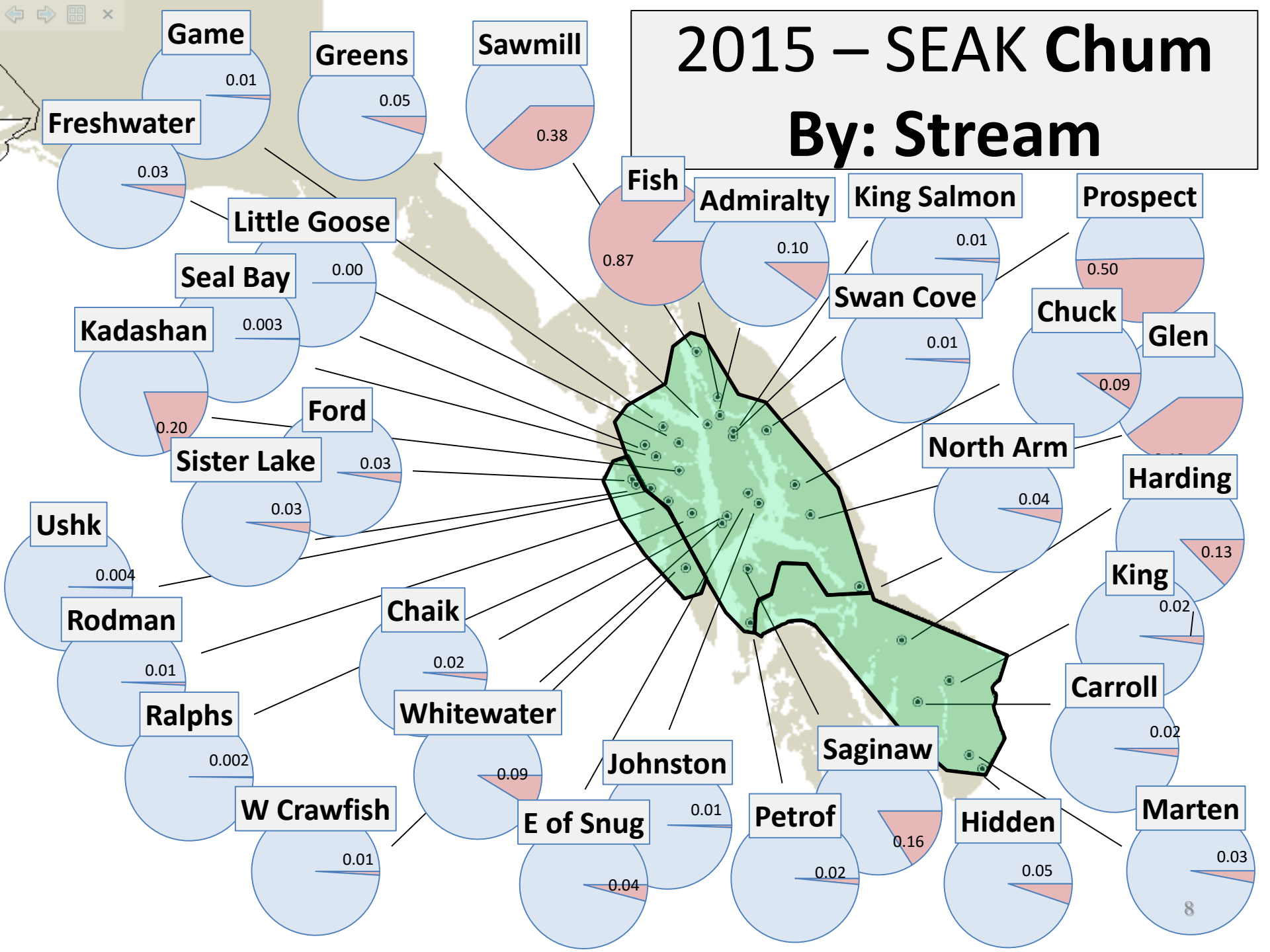


Red = Estimated Escapement Black = 2011 Escapement Goal Lower Bound

Blue = Pre-hatchery Period Average Green = Hatchery Period Average


2013 – SEAK Chum
By: Stream
Game
0.04
Greens
0.00
Sawmill
0.46
Freshwater
0.02
Little Goose
Fish
0.73
Admiralty
0.05
KingSalmon
0.03
Prospect
0.24
Seal Bay
0.00
Swan Cove
0.03
Chuck
0.01
Glen
0.01
Kadashan
0.004
0.00
Ford
Sister Lake
0.02
0.02
NorthArm
0.04
Harding
0.17
Ushk
0.01
King
0.08
Rodman
0.01
Chaik
0.004
Carroll
0.04
Ralphs
0.01
Whitewater
0.04
Johnston
0.03
Saginaw
0.01
W Crawfish
0.02
E of Snug
0.00
Petrof
0.00
Hidden
0.06
Marten
0.05
6

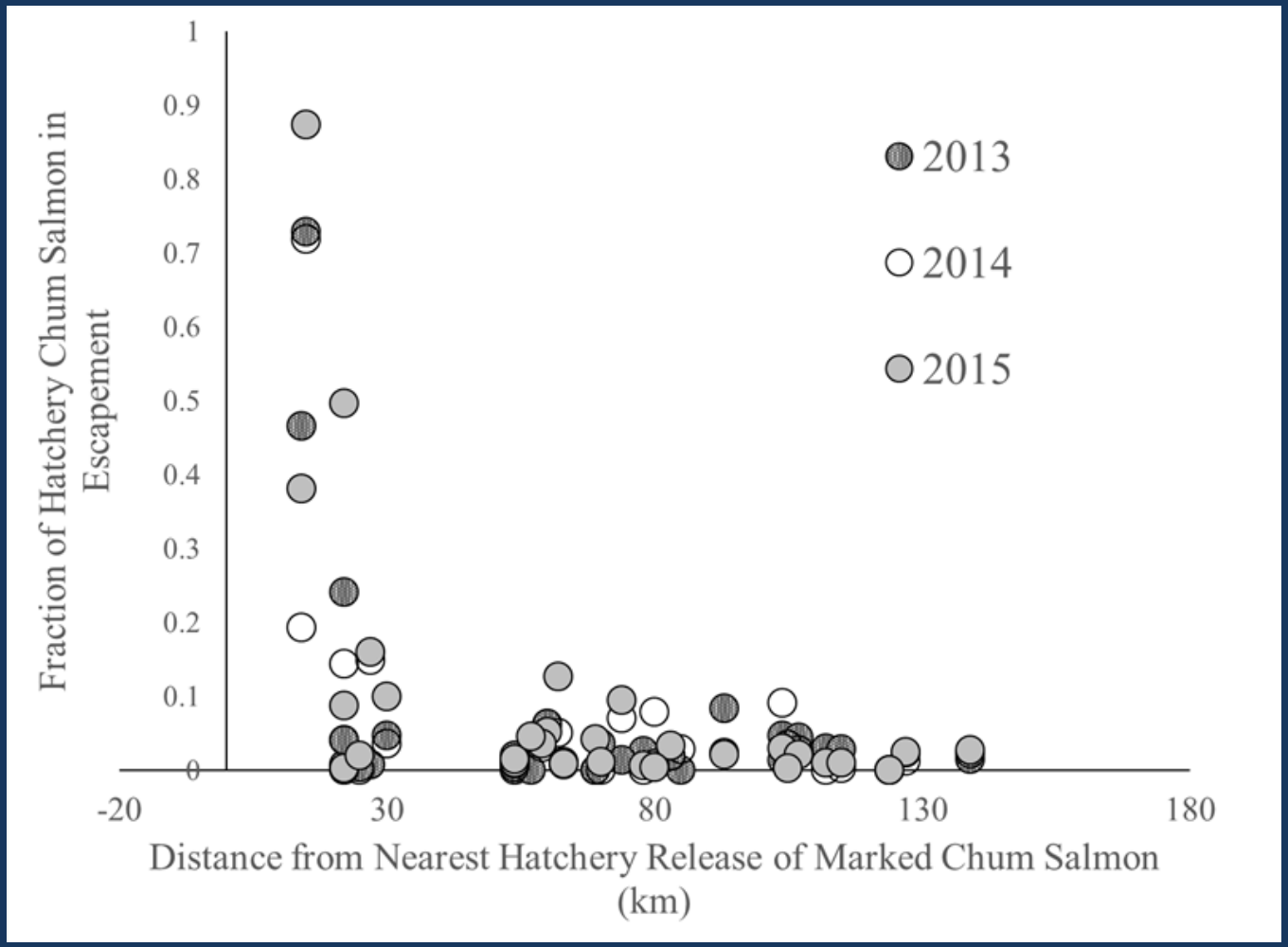

2014 – SEAK Chum
By: Stream
Game
0.00
Greens
0.00
Sawmill
0.19
Freshwater
0.02
Fish
0.72
Admiralty
0.04
KingSalmon
0.002
Prospect
0.04
Little Goose
Seal Bay
0.00
Swan Cove
0.00
Chuck
0.07
Glen
0.00
Kadashan
0.03
0.03
Ford
Sister Lake
0.01
0.02
NorthArm
0.03
Harding
0.05
Ushk
0.08
King
0.02
Rodman
0.01
Chaik
0.00
Whitewater
0.14
Carroll
0.03
Ralphs
0.0001
Johnston
0.00
Saginaw
0.01
W Crawfish
0.01
E of Snug
0.00
Petrof
0.004
Hidden
0.06
Marten
0.09


2015 – SEAK Chum
By: Stream
Game
0.01
Freshwater
0.03
Greens
0.05
Sawmill
0.38
Fish
0.87
Admiralty
0.10
King Salmon
0.01
Prospect
0.50
Little Goose
Seal Bay
0.00
Kadashan
0.003
0.20
Swan Cove
0.01
Chuck
0.09
Glen
Ford
Sister Lake
0.03
0.03
North Arm
0.04
Harding
0.13
Ushk
0.004
Rodman
0.01
Chaik
0.02
King
0.02
Ralphs
0.002
Whitewater
0.09
Carroll
0.02
Johnston
0.01
Saginaw
W Crawfish
0.01
E of Snug
0.04
Petrof
0.02
0.16
Hidden
0.05
Marten
0.03
8

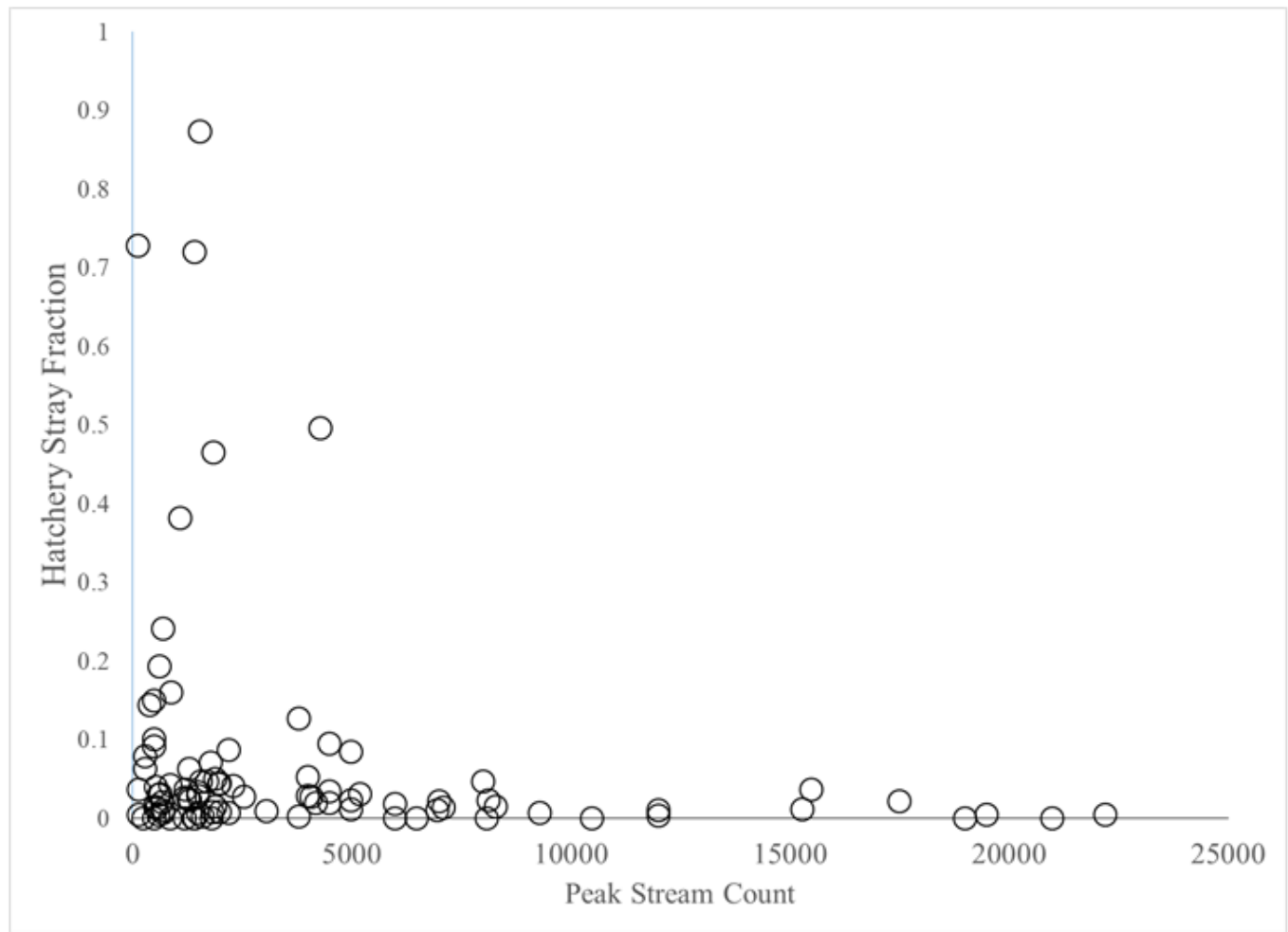
Summary of Annual Observations

- 96 stream/year observations
- 14 with no hatchery fish
- 72 pHOS < 0.05
- 9 pHOS 0.05- 0.10
- 15 pHOS > 0.10
- Highest observation 0.85 (Fish Creek)

Relationship of hatchery fractions to distance from the nearest release site in SEAK summer chum escapements, 2013-2015.



Relationship of hatchery fractions to peak stream counts in SEAK summer chum escapements, 2013-2015.



Estimated Hatchery Fraction SEAK Summer Chum For Management Unit and Regional Escapements 2013-2015.

Management unit	Number of streams sampled	2013	2014	2015
SSE	5	0.078	0.030	0.036
NSI	24	0.019	0.034	0.080
NSO	3	0.016	0.018	0.017
SEAK Region	32	0.025	0.031	0.062

Conclusions

- Proportion hatchery strays in streams is affected by distance from hatchery release sites and size of natural spawning escapement

- Proportion of hatchery strays can be highly variable between years at the stream level

- Hatchery origin chum salmon can be expected at low levels in most chum salmon spawning streams in SEAK, and at higher levels in systems with relatively small escapements closer to hatchery release sites

- At the management unit and regional levels, the proportion of hatchery strays in the escapement was typically <0.04, and did not exceed 0.08 in this study.