

An Overview of Fish and Aquatics and Instream Study Programs for the Susitna-Watana Hydroelectric Project

Alaska Chapter National Hydropower Association
19 September 2017

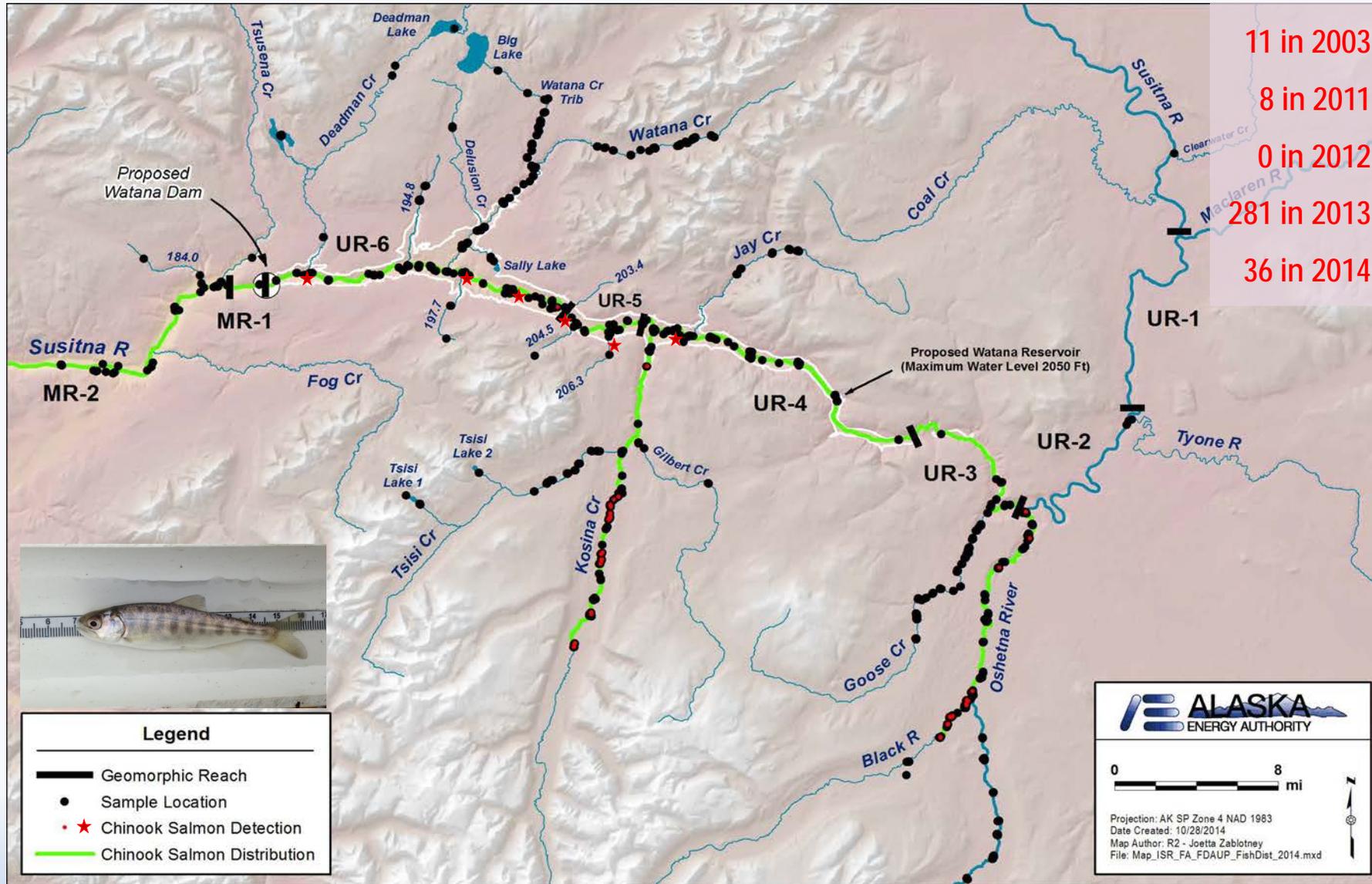
*Presented by Dr. MaryLouise Keefe
R2 Resource Consultants, Inc.*

Overview of Upper River Fish Sampling

- >22,750 fish observations; 326 juvenile Chinook Salmon
- Arctic Grayling, Sculpin, Dolly Varden, Burbot, Humpback Whitefish, Longnose Sucker, Lake Trout, Chinook Salmon
- 2,796 fish caught in rotary screw traps, 41 juvenile Chinook salmon
- 2,670 fish PIT tagged, 81 relocated
- 248 fish radio tagged, 5 fish species
- Tissue samples collected for metals/mercury, and genetics (studies 5.5, 5.7 & 9.14).



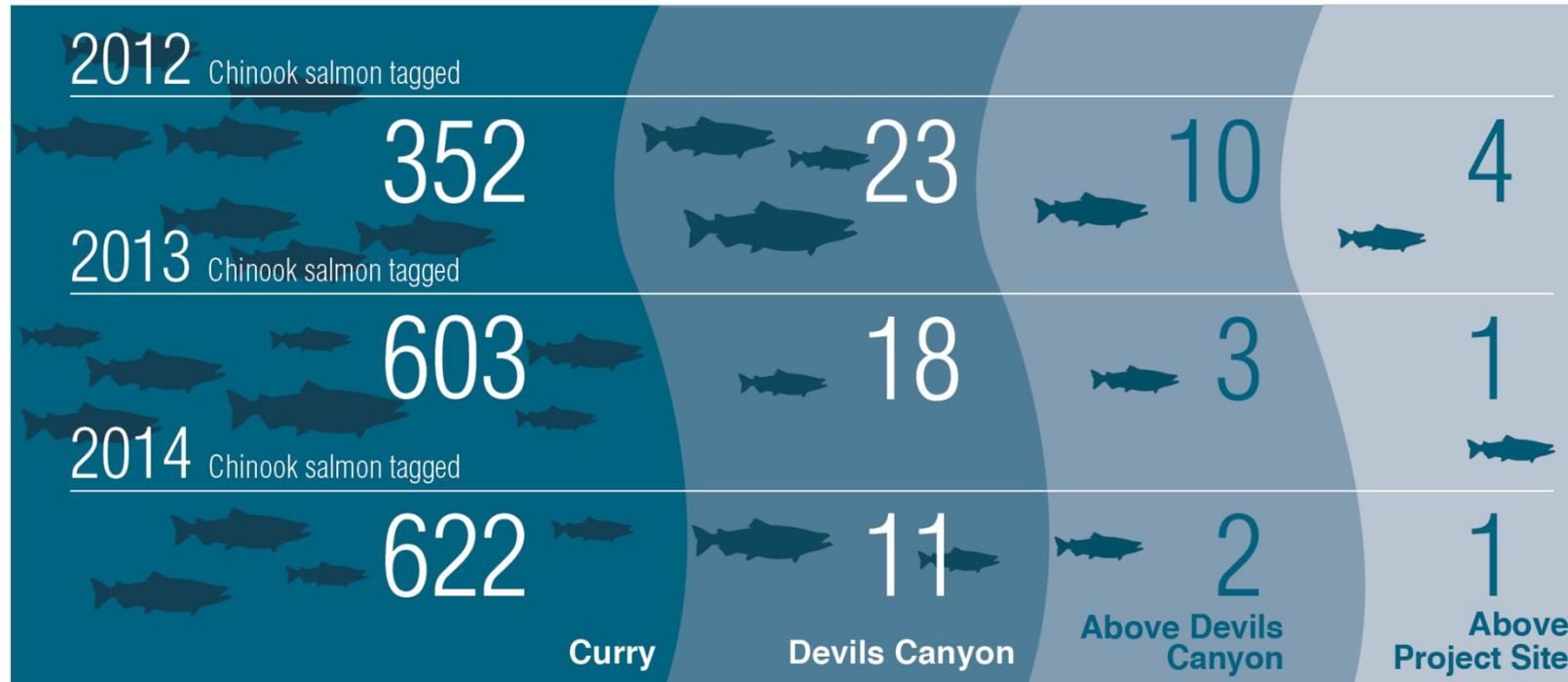
Juvenile Chinook Salmon Observations (2012-2014)



Chinook by the Numbers

Tagged Chinook Salmon and Devils Canyon

Only one salmon species has been documented within 30 miles of the project site.



Peak Counts of Chinook Salmon from Aerial Surveys

Stream	1982	1983	1984	1985	2012	2013	2014
<u>Within Devils Canyon</u>							
Cheechako Creek	16	25	29	18	5	40	16
Chinook Creek	5	8	15	1	5	2	5
<u>Upstream of Devils Canyon</u>							
Devil Creek	0	1	0	0	7	25	10
Fog Creek	--	--	2	0	1	2	3
Tsusena Creek	--	--	0	0	0	4	0
<u>Upstream of dam site</u>							
Kosina Creek	--	--	--	--	16	3	0

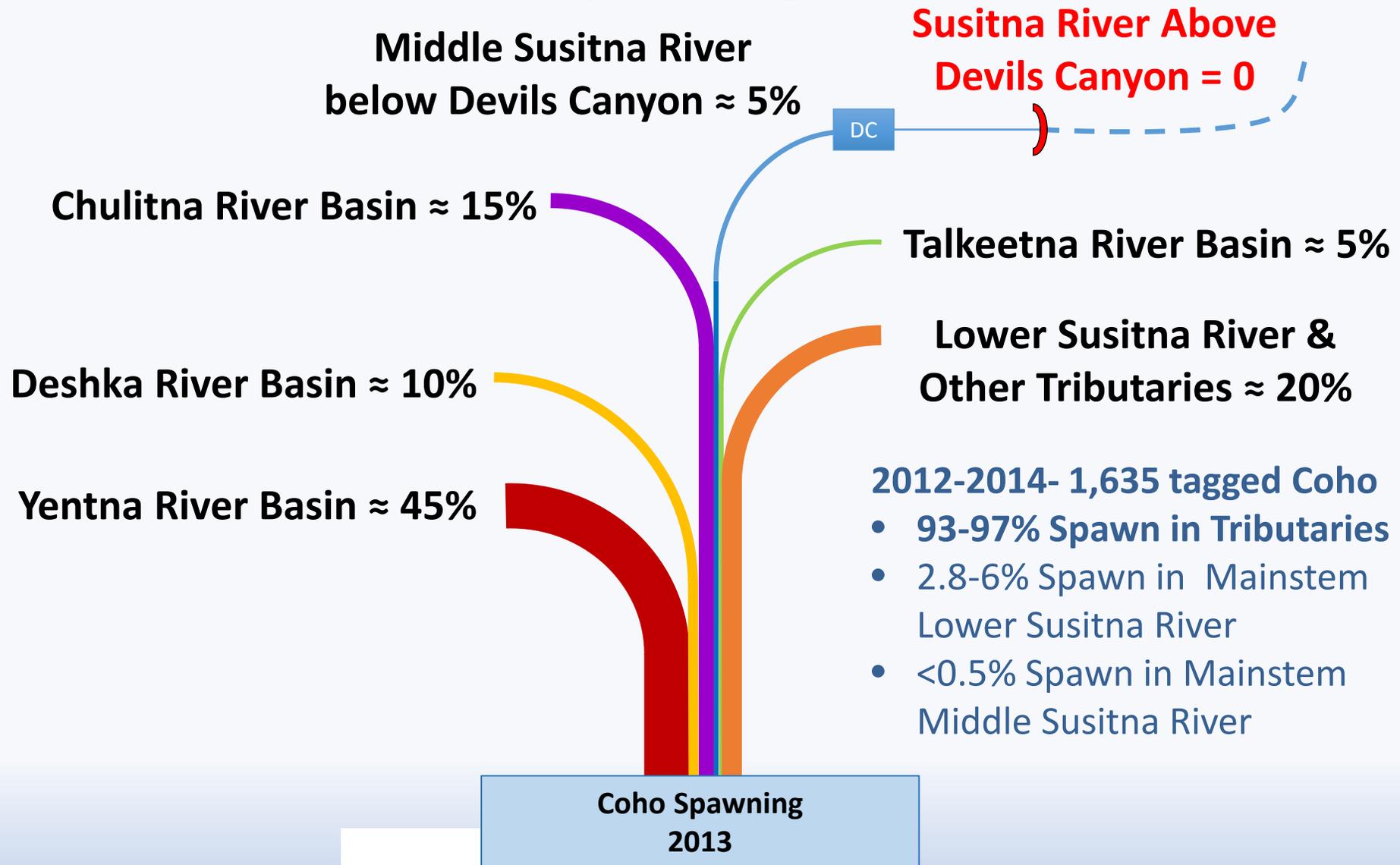
Overview of Middle and Lower River Sampling

(2014 data preliminary)

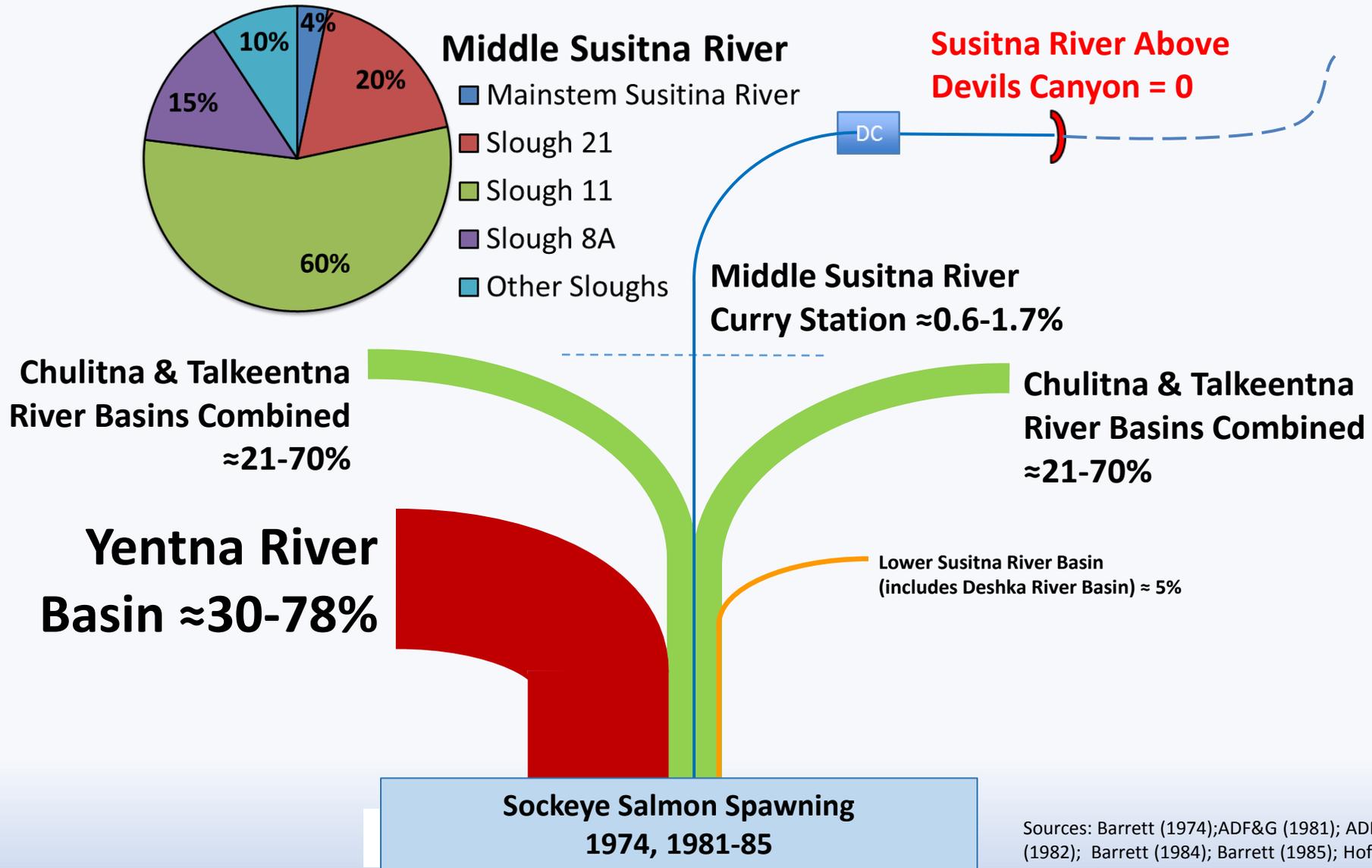
- 18 fish species
- FDA observations
 - Middle River: 51,707
 - Lower River: 8,649
- Early Life History observations
 - > 20,000 juvenile salmon
- Rotary screw trap catch
 - Indian River: 4,551
 - Curry Station: 1,457
 - Talkeetna Station: 2,696
 - Montana Creek: 2,861
- PIT tagging
 - ~ 5,590 fish tagged
 - >126,000 detections
 - 826 fish re-sighted (>15%)
- Radio tagging
 - 179 fish tagged from 8 species
- Fish/tissue collected for other studies



2013 Coho Salmon Spawning Distribution by Basin

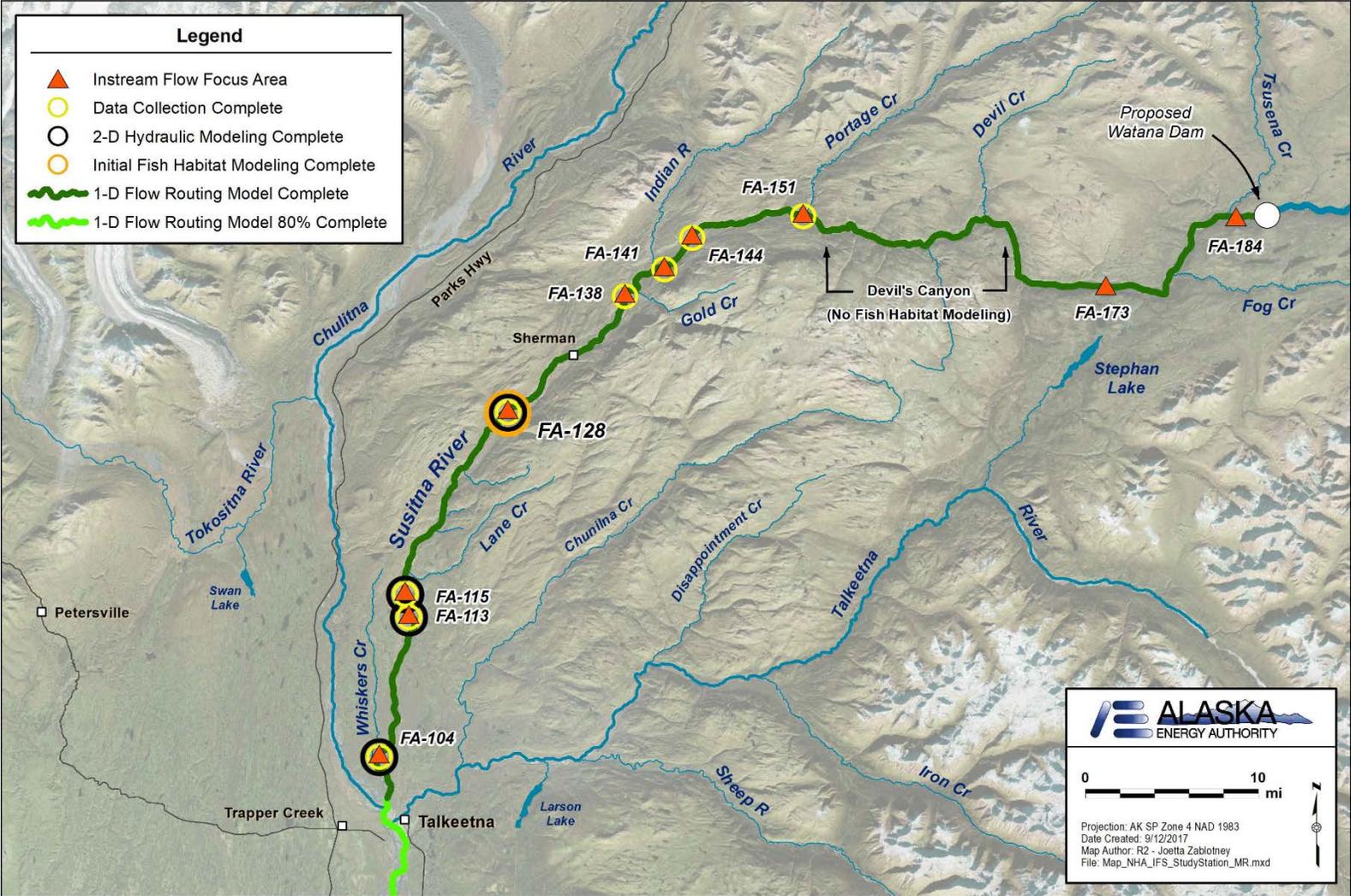


Historical Middle River Sockeye Salmon Spawning Distribution

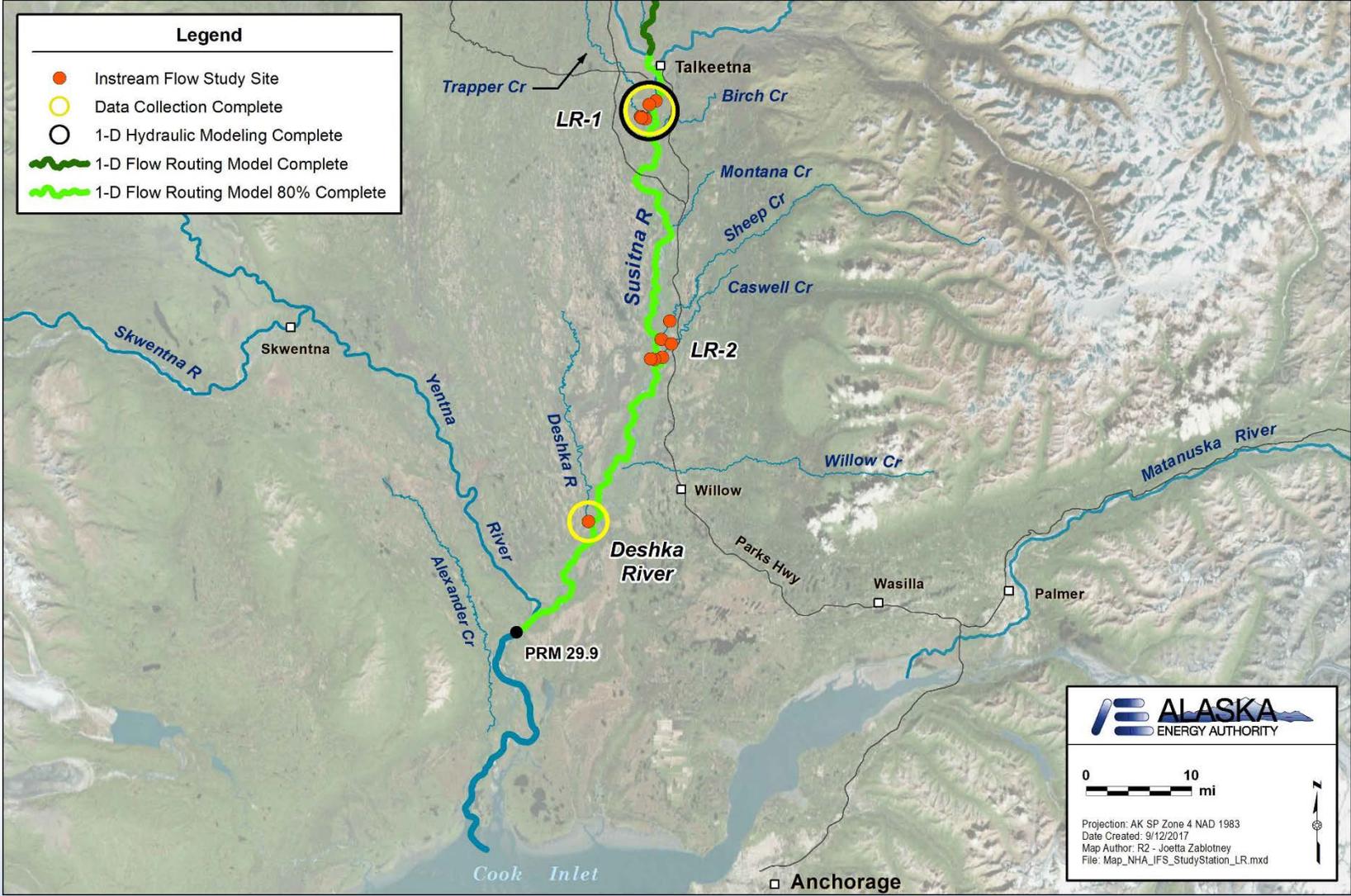


Sources: Barrett (1974); ADF&G (1981); ADF&G (1982); Barrett (1984); Barrett (1985); Hoffman (1985); Thompson (1986)

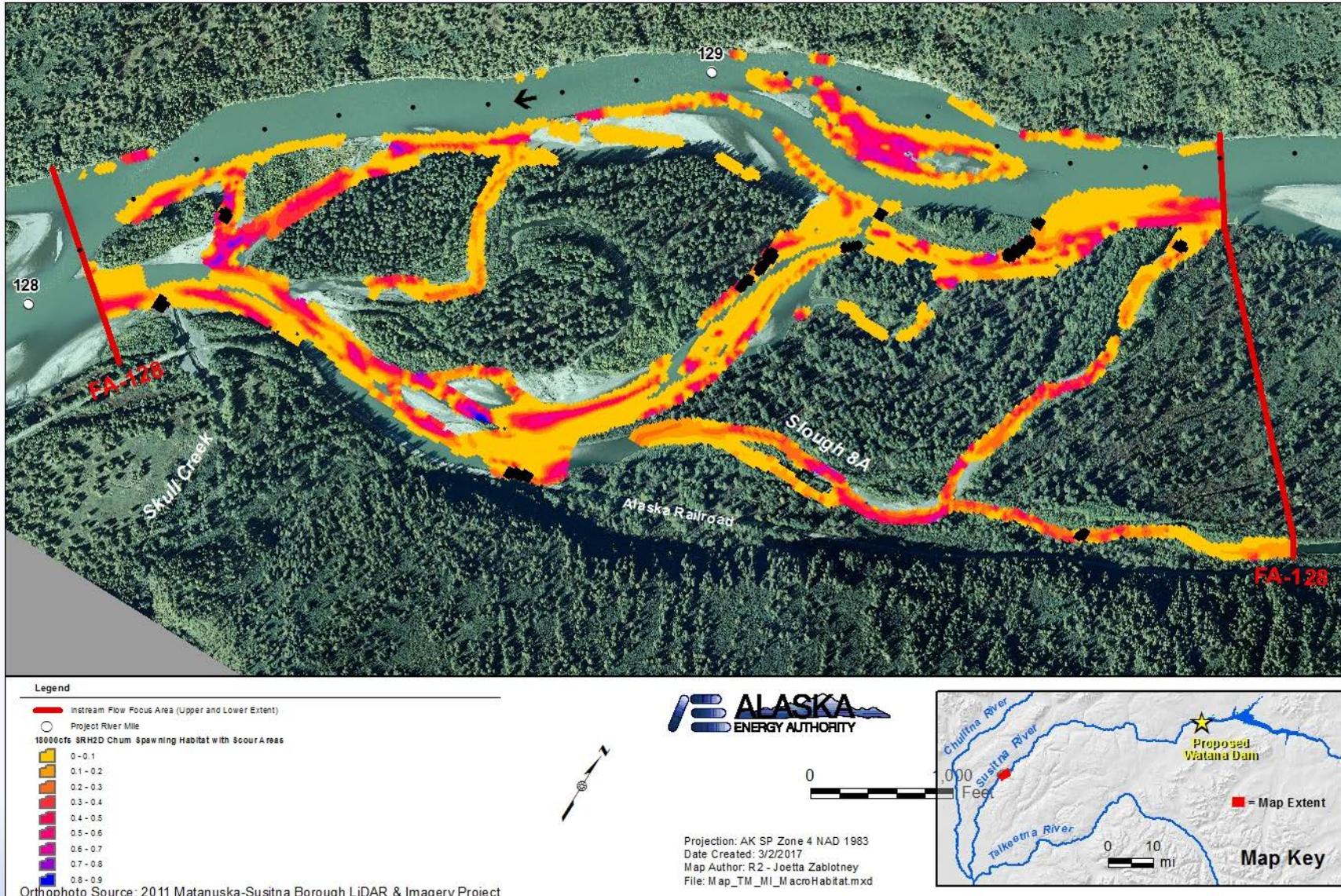
Study 8.5 Instream Flow Modeling in Middle River



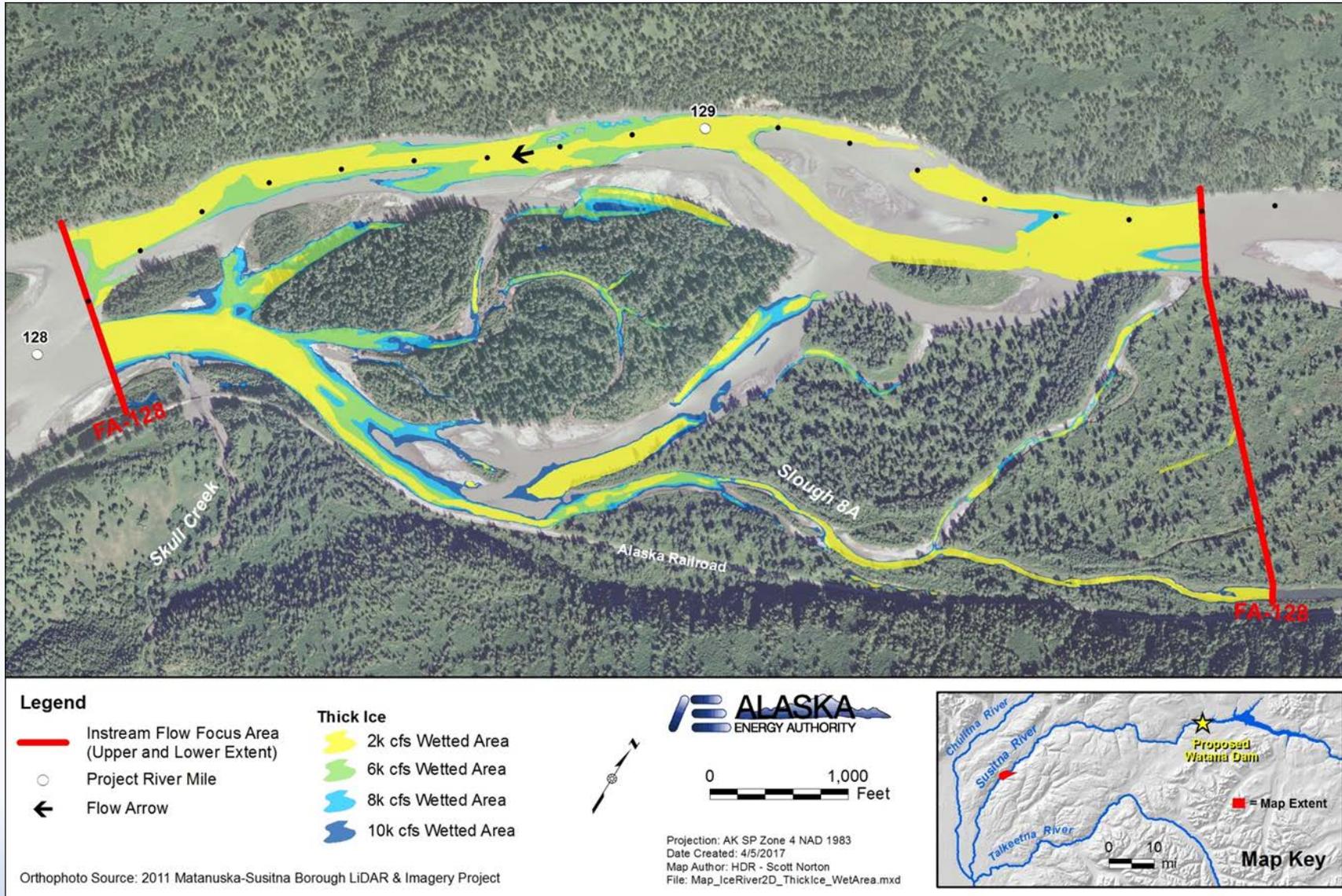
Study 8.5 Instream Flow Modeling in Lower River



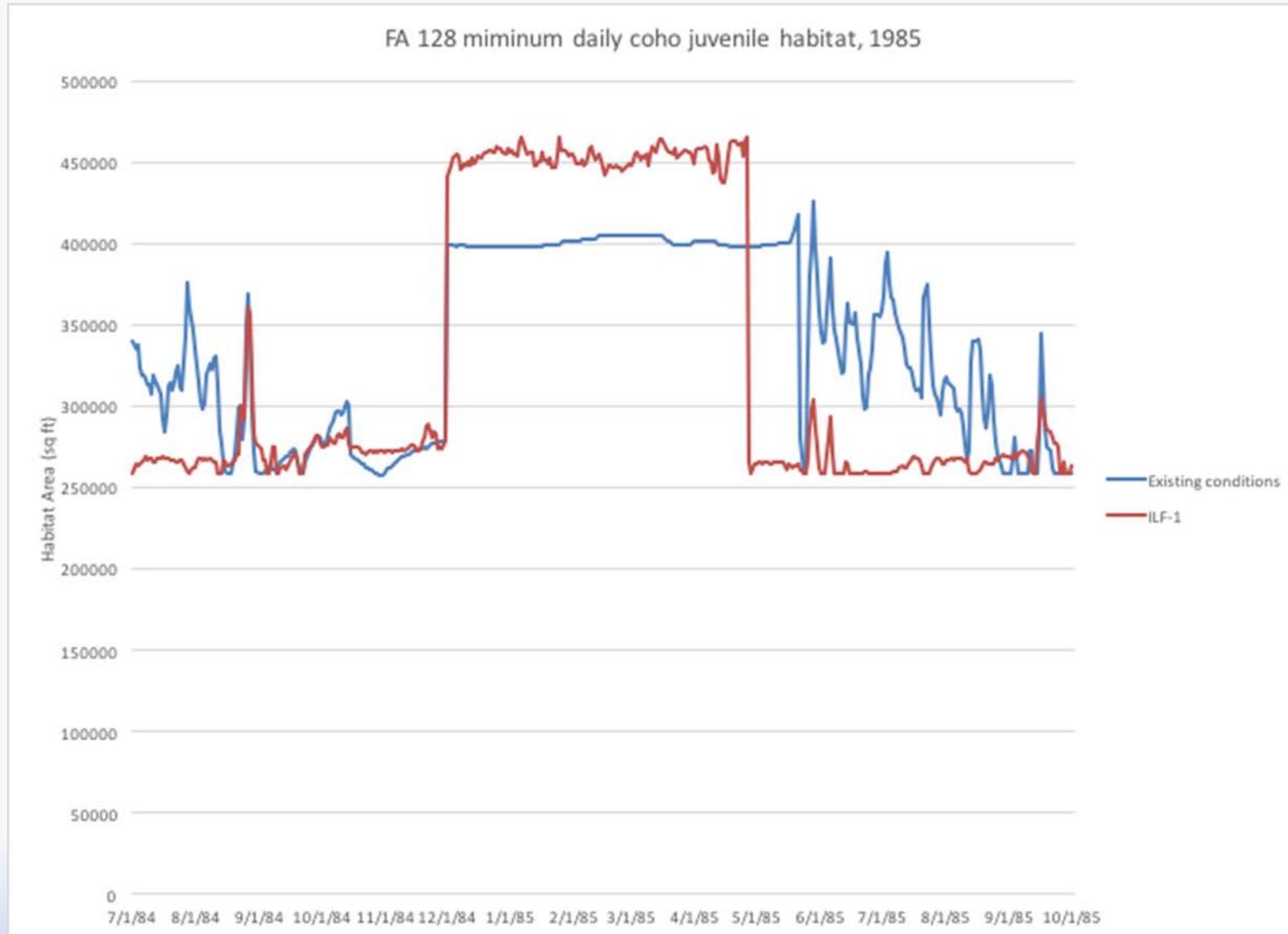
Ex. Project Effects Analysis Chum Spawning



Ex. Project Effects Analysis Wetted Channel



Ex. Project Effects Analysis of Juvenile Coho Salmon



FERC Director's Determination

FERC approved without modification 7 Fish and Aquatic and Instream Flow studies; AEA's plan forward was accepted for:

- Study 9.17 Cook Inlet Beluga Whales
- Study 9.16 Eulachon Run Timing, Distribution, and Spawning
- Study 9.14 Genetics
- Study 9.13 Aquatic Resources Study within Access Alignment, Transmission Alignment and Construction Areas
- Study 9.11 Fish Passage Feasibility at Watana Dam
- Study 9.7 Salmon Escapement
- Study 8.5 Riparian Instream Flow

FERC Director's Determination (cont.)

Adopted in part modifications for:

Study 9.12, add a clarifying table in the Updated Study Report (USR)

Study 9.9, add clarifying text and tables be prepared for the USR

Study 9.8, make minor adjustments to sampling and analysis to
show strength of data for the USR

Study 9.5 and 9.6, consult with agencies regarding adjusting PIT array location

Study 8.5, add descriptive text to USR and continue sampling of VHG

Adopted modifications for Study 8.5:

Include results of HSC site selection in USR

Continue to evaluate relationship with HSC parameters and fish abundance

AEA agrees with and will incorporate FERC's recommendations in the next year of study.