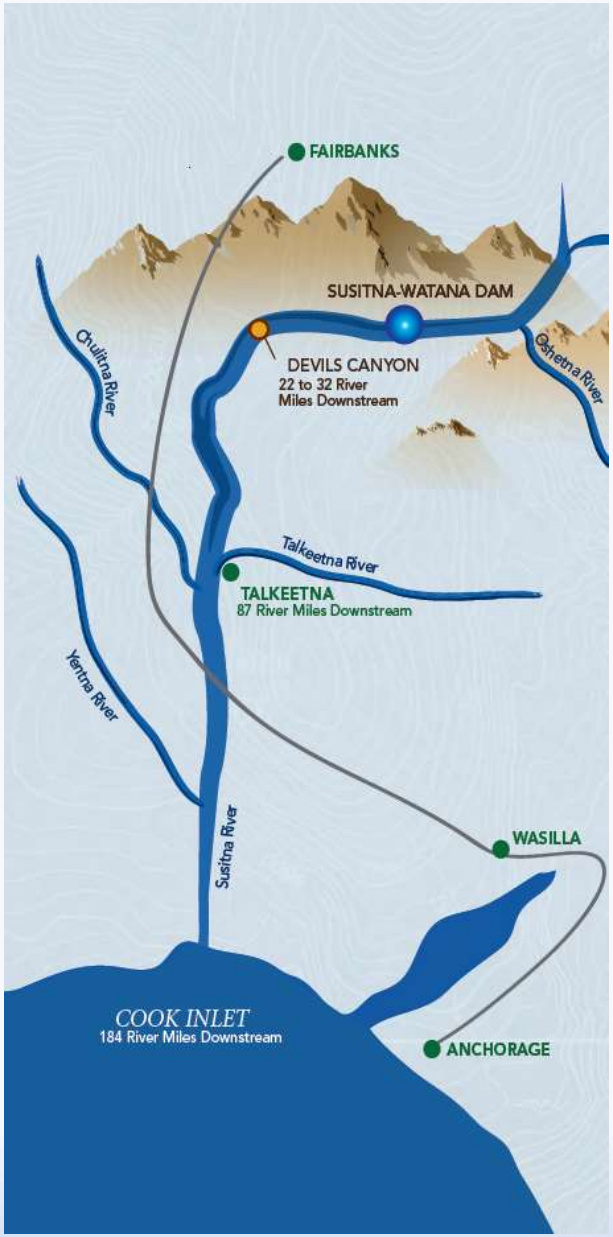


Initial Study Report Meeting

Study 9.7 Salmon Escapement

October 15, 2014

Prepared by
LGL Alaska and ADF&G

Study 9.7 Objectives

1) Capture, radio-tag, and track adults of five species of Pacific salmon in the Middle and Upper Susitna River in proportion to their species-specific abundance. Capture and tag Chinook, coho, and pink salmon in the Lower Susitna River
2) Characterize the migration behavior and spawning locations of radio-tagged salmon in the Lower, Middle, and Upper Susitna River
3) Characterize adult salmon migration behavior and timing within and above Devils Canyon
4) If shown to be an effective sampling method, and where feasible, use sonar to aid in documenting salmon spawning locations in turbid water in 2013 and 2014
5) Compare historical and current data on run timing, distribution, relative abundance, and specific locations of spawning and holding salmon
6) Generate counts of adult Chinook salmon spawning in the Susitna River and its tributaries to estimate the proportions of fish with tags for populations in the watershed
7) Collect tissue samples to support the Fish Genetic Baseline Study (Study 9.14)
8) Estimate the system-wide Chinook salmon escapement to the entire Susitna River, the coho salmon escapement to the Susitna River above the confluence with the Yentna River, and the distribution of Chinook, coho, and pink salmon among tributaries of the Susitna River (upstream of Yentna River confluence) in 2013 and 2014

Study 9.7 Components

- Capture, radio-tag, and track adults of five species of Pacific salmon in the Middle and Upper Susitna River in proportion to their abundance. Capture and tag Chinook, coho, and pink salmon in the Lower Susitna and Yentna rivers (ISR Part A, Section 4.1; pg 3)
- Determine the migration behavior and spawning locations of radio-tagged fish in the Lower, Middle, and Upper Susitna River (ISR Part A, Section 4.2; pg 12)
- Characterize adult salmon migration behavior and timing within and above Devils Canyon (ISR Part A, Section 4.3; pg 16)
- Use available technology to document salmon spawning locations in turbid water (ISR Part A, Section 4.4; pg 18)
- Compare historical and current data on run timing, distribution, relative abundance, and specific locations of spawning and holding salmon (ISR Part A, Section 4.5; pg 20)
- Generate counts of adult Chinook salmon spawning in the Susitna River and its tributaries (ISR Part A, Section 4.6; pg 21)
- Collect tissue samples to support the Fish Genetics Study (ISR Part A, Section 4.7; pg 22)
- Estimate the system-wide Chinook and coho salmon escapement to the Susitna River above Yentna River and the distribution of those fish among tributaries of the Susitna River (ISR Part A, Section 4.8; pg 22)

Study 9.7 Variances (2013)

- Due to CIRWG land access limitations, AEA did not operate a fishwheel in Devils Canyon to supplement the Middle River fishing effort for Chinook salmon (see Section 4.1.8.1). Instead, **AEA increased the tagging goal (from 400 to 560) and fishing effort at the Curry fishwheels. (RSP Section 9.7.4.1)**
- AEA operated a floating picket weir and underwater video system on the Indian River in 2013 to sample adult salmon for mark rates and size distributions (to test capture probabilities at the tag and recovery locations; see Section 4.1.8.3). The Study Plan (RSP Section 9.7.4.1.5) indicated these samples would be collected on selected spawning grounds
- Due to CIRWG land access limitations, five of the fixed-station receiver sites listed in the Study Plan (RSP Section 9.7.4.2.1) were not installed in 2013. Because of this, AEA added six new fixed-station receiver sites (see Section 4.2.4). In addition, to compensate for the absence of fixed stations within Devils Canyon (RSP Section 9.7.4.3), **helicopter surveys for tagged fish were flown through Devils Canyon daily** starting in late June, and twice daily during the period of Chinook salmon passage (see Section 4.3.5)
- Due to high stream discharges, it was not safe or feasible to operate weirs as recapture sites on Willow and Lake Creeks, or the Talachulitna and Middle Fork Chulitna rivers. Instead of Willow Creek, **Montana Creek was selected as a weir site in 2013; and sonar was operated on the Talachulitna and Middle Fork Chulitna rivers.** (RSP Section 9.7.4.8; see Section 4.8.1 for more detail)

Study 9.7 Summary of Results in ISR (ISR Study 9.7, Part A – Section 5)

Basin wide, 2013

- **Tagging goals for Chinook salmon were achieved** in the Middle Susitna, Lower Susitna, and Yentna rivers. AEA tagged 603 Chinook salmon (536 large, 67 small) in the Middle Susitna River, and ADF&G tagged 698 large Chinook salmon in the Lower Susitna River and 692 large Chinook salmon in the Yentna River.

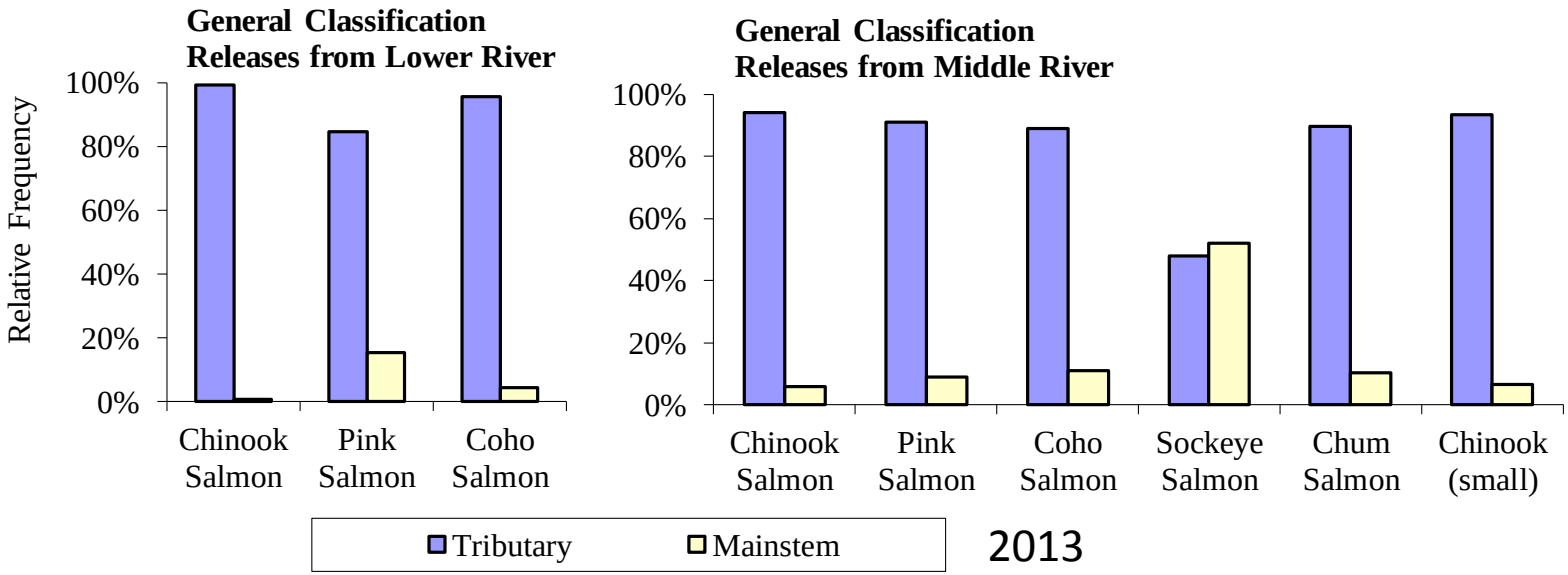
- **Chinook salmon continued to be the only salmon species tracked above Devils Canyon.** In 2013, 3 Chinook salmon radio-tagged in the Middle Susitna passed upstream of Devils Canyon, and did so at water discharges of 14,400, 16,700, and 18,800 cfs.

- Of the **3 radio-tagged Chinook salmon passing Devils Canyon**, one tag moved into Devil Creek, one into Tsusena Creek, and the other moved back downstream of Devils Canyon into Portage Creek.

- The estimated escapement of Chinook salmon to the Susitna River above the Yentna River confluence was 89,463 (SE = 9,523).

- The estimated escapement of coho salmon to the Susitna River above the Yentna River confluence was 130,026 (SE = 24,342).

Study 9.7 Summary of Results in ISR (ISR Study 9.7, Part A – Section 5)



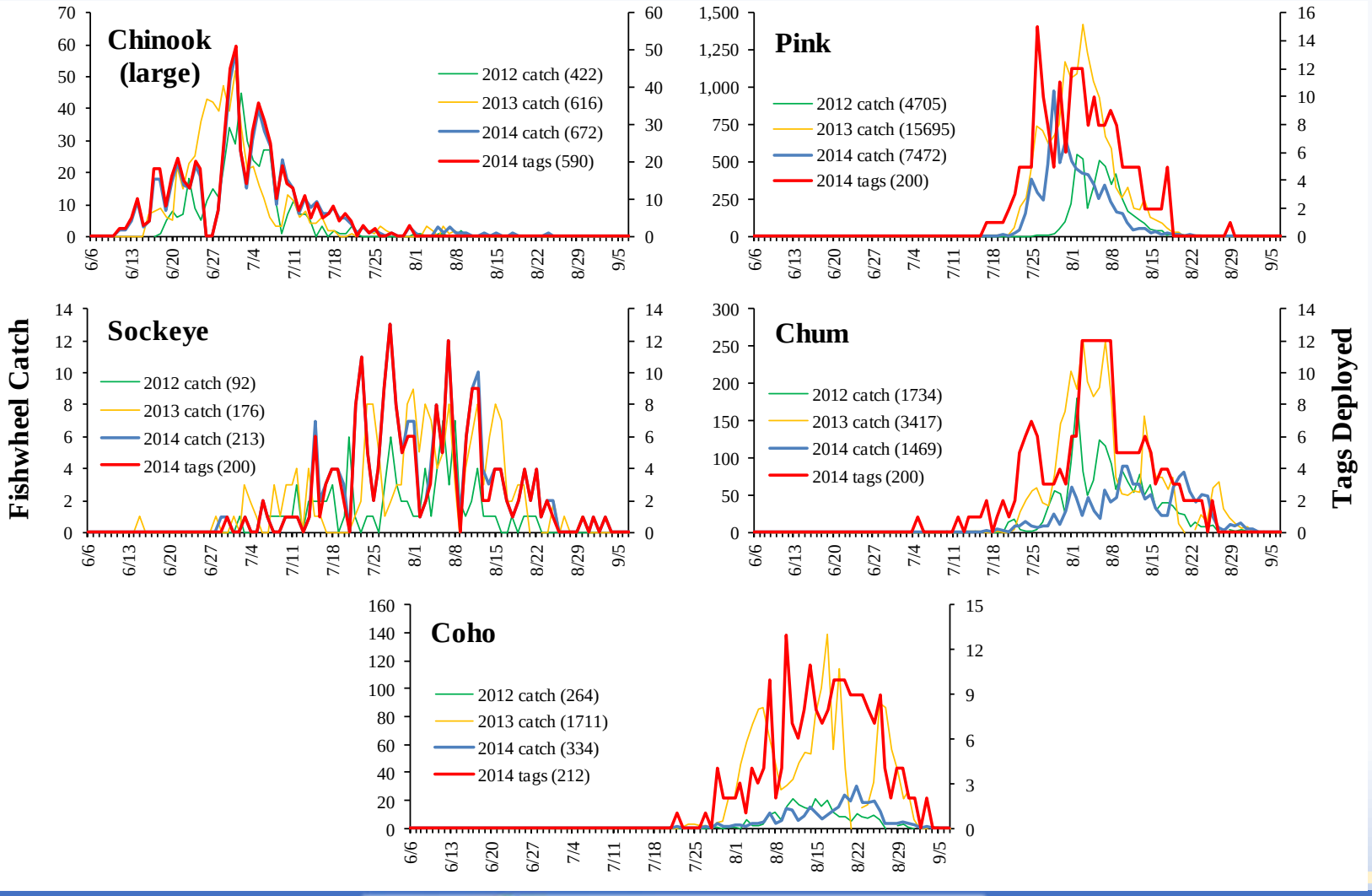
AEA Proposed Modifications to Study 9.7 in ISR (ISR Study 9.7, Part C – Section 7.1.2)

- On the Yentna River, **use fishwheels at a new site for recapture**, instead of weirs, and deploy fewer Chinook salmon radio tags (RSP Section 9.7.4.1 and 9.7.4.8).
- Use beach seining in September near Curry, instead of fishwheels, to capture and radio-tag salmon (RSP Section 9.7.4.1.1 and FERC SPD).
- **Operate three fishwheels near Curry**, instead of two, and not operate a fishwheel at Devils Canyon (RSP Section 9.7.4.1.1).
- **Radio tag 650 Chinook salmon at Curry** (550 large, 100 small) (RSP Section 9.7.4.1).
- Operate a picket weir and underwater video system on the Indian River to enumerate tagged and untagged Chinook salmon (RSP Sections 9.7.4.1.3 and 9.7.4.1.5).
- Tag fish at the Curry fishwheels as soon as they are caught, thus precluding the need to examine any effects of holding times and density (RSP Section 9.7.4.1.6).
- Not use sex and age composition of radio-tagged fish to assess fishwheel selectivity (RSP Section 9.7.4.1.7).
- **Increase the frequency of aerial telemetry surveys** in the Middle River between Curry and Impediment 1 to every three days (RSP Section 9.7.4.2.2).
- Change some of the fixed-station receiver sites that were proposed in the Study Plan (RSP Section 9.7.4.2.1).
- Use ARIS sonar only to confirm Chinook salmon spawning activity in turbid waters (RSP Section 9.7.4.4.2).

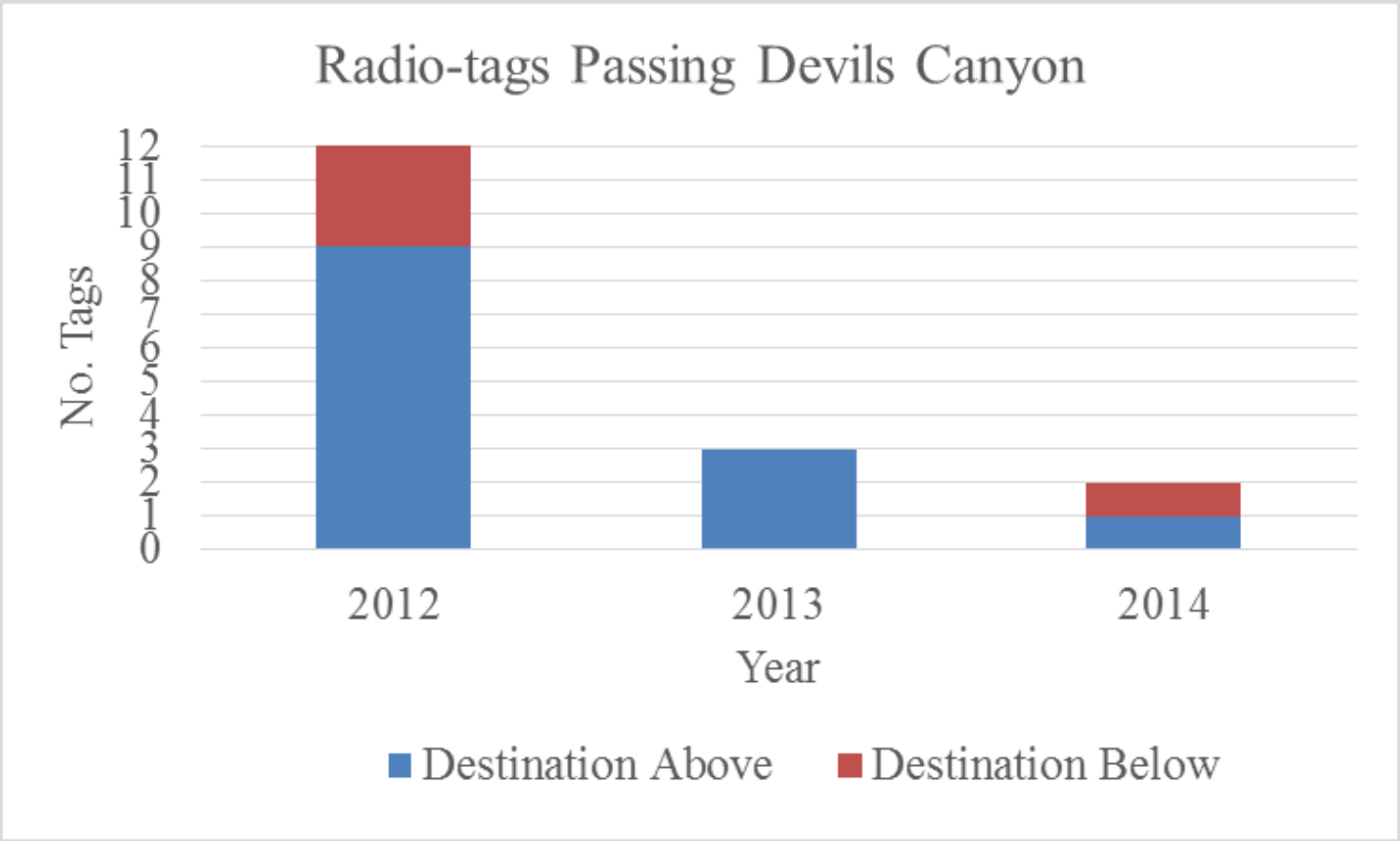
Study 9.7 Summary of Results since ISR

(Salmon Escapement Study 9.7 – September 2014 Technical Memo)

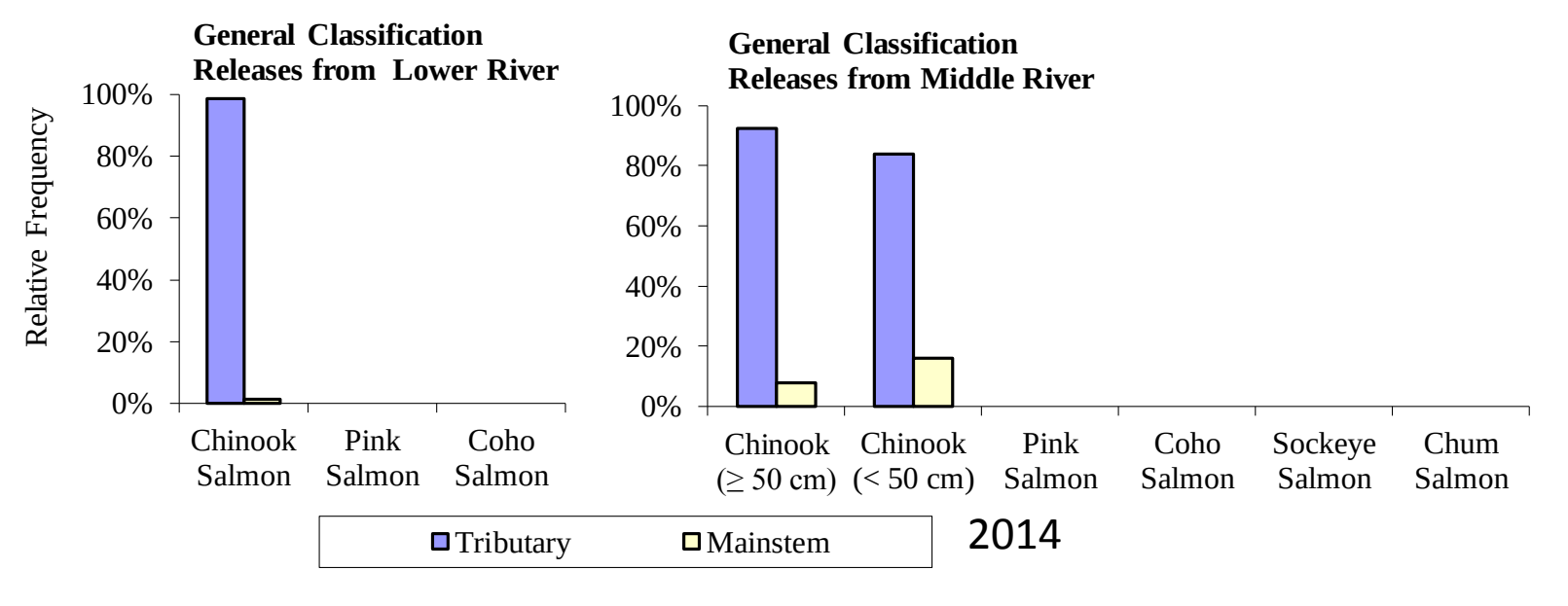
Middle River released



Study 9.7 Summary of Results since ISR
(Salmon Escapement Study 9.7 – September 2014 Technical Memo)

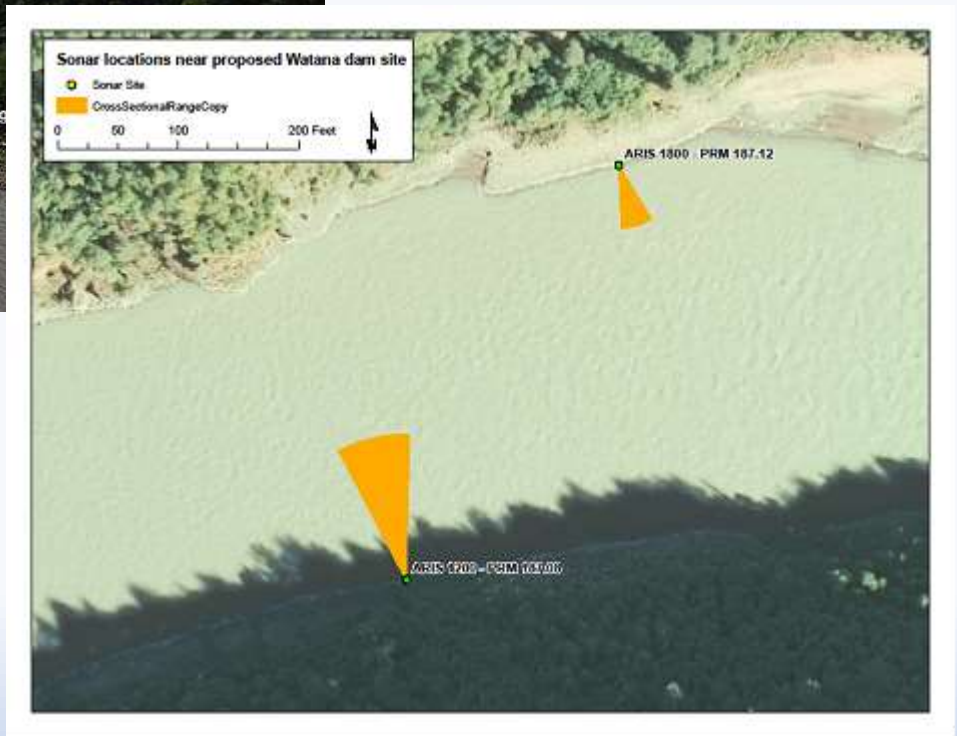


Study 9.7 Summary of Results since ISR
(Salmon Escapement Study 9.7 – September 2014 Technical Memo)



Data for pink, coho, sockeye and chum salmon are being processed

Decision Points from Study Plan
(Salmon Escapement Study 9.7 – September 2014 Technical Memo)

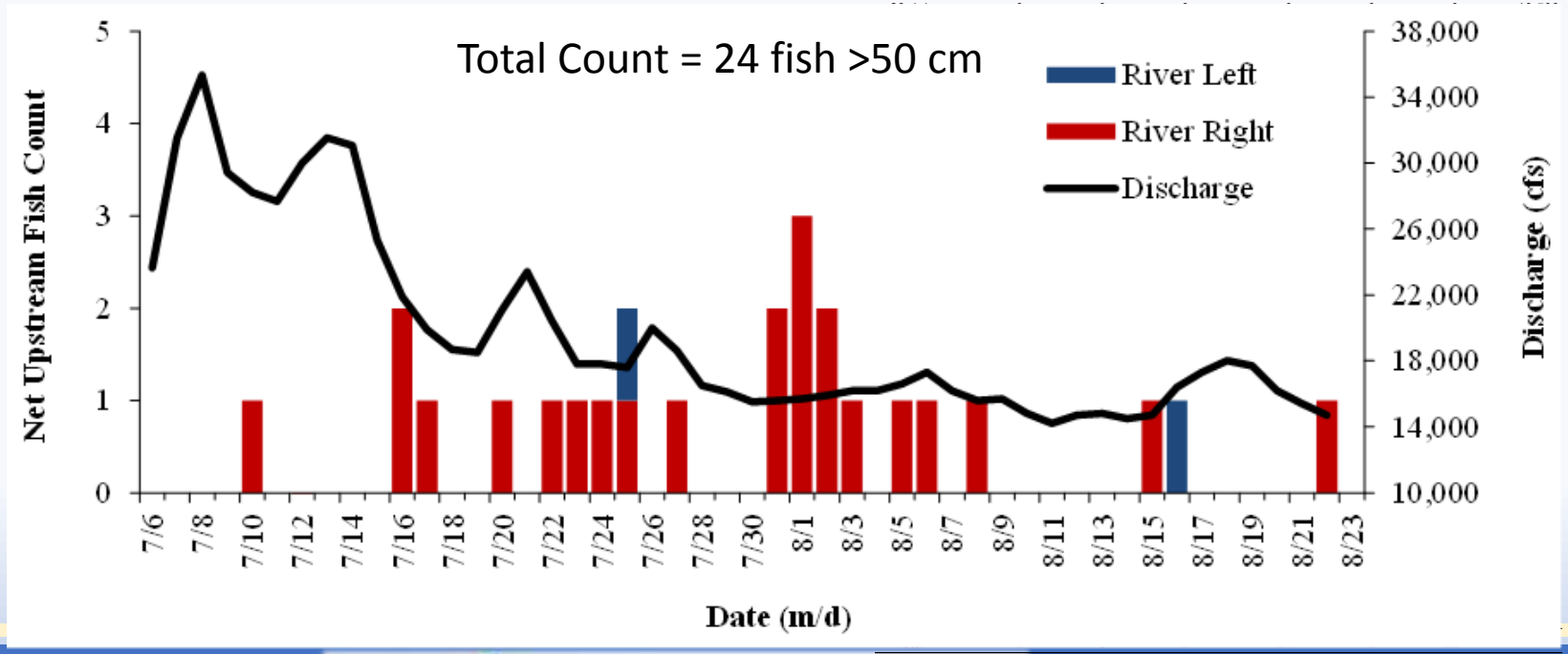


FERC SPD request

Decision Points from Study Plan (Salmon Escapement Study 9.7 – September 2014 Technical Memo)

Sonar at dam site demonstrated as feasible in 2013; 2 stations installed on July 6, 2014.

	River Left			River Right			
	Fish Count			Fish Count			Mean
Date	Upstream	Down-stream	Net Upstream	Upstream	Down-stream	Net Upstream	Discharge (cfs)
6-Jul	0	0	0				23,648
7-Jul	0	0	0	0	0	0	31,521
8-Jul	0	0	0	0	0	0	35,331
9-Jul	0	0	0	0	0	0	29,431
10-Jul	0	0	0	1	0	1	28,232
11-Jul	0	0	0	0	0	0	27,668
12-Jul	0	0	0	0	1	-1	30,000
13-Jul	0	0	0	0	0	0	31,527
14-Jul	0	0	0	0	0	0	31,069
15-Jul	0	0	0	0	0	0	25,300
16-Jul	0	0	0	2	0	2	21,900
17-Jul	0	0	0	1	0	1	19,900
18-Jul	0	0	0	0	0	0	18,700
19-Jul	0	0	0	1	1	0	18,500
20-Jul	0	0	0	1	0	1	21,100
21-Jul	0	0	0	0	0	0	23,400
22-Jul	0	0	0	1	0	1	20,400
23-Jul	0	0	0	1	0	1	17,800
24-Jul	0	0	0	1	0	1	17,800
25-Jul	1	0	1	1	0	1	17,600
26-Jul	0	0	0	0	0	0	20,000
27-Jul	0	0	0	1	0	1	18,600



Current Status and Steps to Complete Study 9.7

- All data collection for Chinook salmon is complete.
- Data collection for pink, chum, sockeye and coho salmon will be completed during fourth quarter 2014.
- Analyses of and reporting on for Chinook salmon is complete except for a basin wide population estimate (Objective 8).
- Analysis and reporting for pink, chum, sockeye and coho salmon will be completed during fourth quarter 2014, except for a basin wide population estimate of coho (Objective 8).
- USR - Comprehensive assembly of data and results from study activities in 2012, 2013, and 2014 will be complete by March.

Licensing Participants Proposed Modifications to Study 9.7?

- Agencies
- CIRWG members and Ahtna
- Public