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Fish and Wildlife Service
Mid-Columbia River Fishery Resource Office
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MEMORANDUM

August 5, 2015

To: Interested parties

From: Hayley Potter

RE: Snorkel survey results for adult spring Chinook Salmon and bull trout in Icicle Creek, 2015

The Mid-Columbia River Fisheries Resource Office has conducted an annual summer snorkel survey in Icicle Creek since 2003, with the primary objective of enumerating adult spring Chinook salmon and bull trout. Methods have evolved as a result of Icicle Creek water management. The current survey paradigm has been in place since 2006 (Table 1) based on stage height and flows of Icicle Creek to maximize survey potential. The surveyed area begins at the Boulders Falls on Icicle Creek (~RM 5.6) and continues downstream to the Icicle Creek/Wenatchee River confluence.

In 2015, the snorkel survey was conducted on July 29. The weather was sunny with the water visibility at an estimated 4.5m and “fair” for all sections of the river with the exception of turbulence/bubbles that obscured viewing in some small areas (ie. Hatchery ladder, headgate, boulder pockets). The flow at the DOE gage, located at the Icicle Bridge on East Leavenworth Road, was 103cfs, which is below average for this time of year. All bull trout lengths indicated were visually estimated to the nearest odd centimeter. For consistency all lengths are expressed in millimeters.

Table 1. Annual Icicle Creek snorkel dates.

2006	8/3
2007	7/31
2008	8/6
2009	8/5
2010	8/12
2011	8/10
2012	8/9
2013	8/16
2014	7/31
2015	7/29

The survey was broken into six reaches and was conducted in a downstream manner with snorkelers evenly spaced across the stream. The number of adult Chinook Salmon and bull trout observed (live and carcass are combined) and the number of snorkelers utilized per reach are in Table 2. The surveyors enumerated a total of 306 adult spring Chinook salmon and 82 bull trout in Icicle Creek (Figures 1 and 3). Of these, 246 adult spring Chinook and 26 bull trout were observed above Leavenworth NFH intake (Figures 2, 4, 5 and 6).

Table 2. Results of the 2014 Icicle Creek snorkel survey.

<u>Reach</u>	<u>Adult Chinook</u>	<u>Bull Trout</u>	<u>Bull Trout Size Range</u>	<u># Viewers</u>
Boulder Falls – LNFH Intake	246	26	(230-750)	3
LNFH Intake –S2	39	4	(310-610)	3
S2-S5 (Historic Channel)	9	0		4
LNFH Spillway Pool	4	33	(270-630)	3
S5 – Stump Hole	7	18	(250-450)	4
Stump Hole – Icicle Mouth	1	1	(470)	3
Totals:	306	82	(230 – 750)	
‘06-’14 Ave:	170	54		
‘06-‘14 Max:	357	157		
‘06-‘14 Min:	48	10		

Of the 82 bull trout observed, 84% were 450mm or less indicating they were juvenile/sub-adult fluvial bull trout (M. Nelson pers. comm.). This is similar to previous years, when >80% of observed bull trout were classified as juvenile/sub-adult fluvial fish.

Although enumeration of spring Chinook Salmon and bull trout was the primary objective, some additional observations were noted. Rainbow trout were abundant in most upstream reaches (Boulder Falls-S2). Seven mountain whitefish were encountered above S1. Three brook trout were counted in small pool below the confluence with Snow Creek. Seventy-one sockeye and 57 summer Chinook were encountered.

The winter of 2014/2015 in the Pacific Northwest was very mild with well below average snowpack, leading to low spring runoff and warmer surface water than average years. The Icicle Creek along with Wenatchee River have had record low water flows and temperatures above normal levels. However, the surface water temperatures in Icicle Creek usually run cooler than the Wenatchee River due to the immediate access to alpine tributaries which contribute to colder stream flow. For this reason it is thought that many fish species may use Icicle Creek as a “thermal refuge”. The weeks preceding this survey, the average daily water temperature was 4 degrees cooler in Icicle Creek than the Wenatchee River.

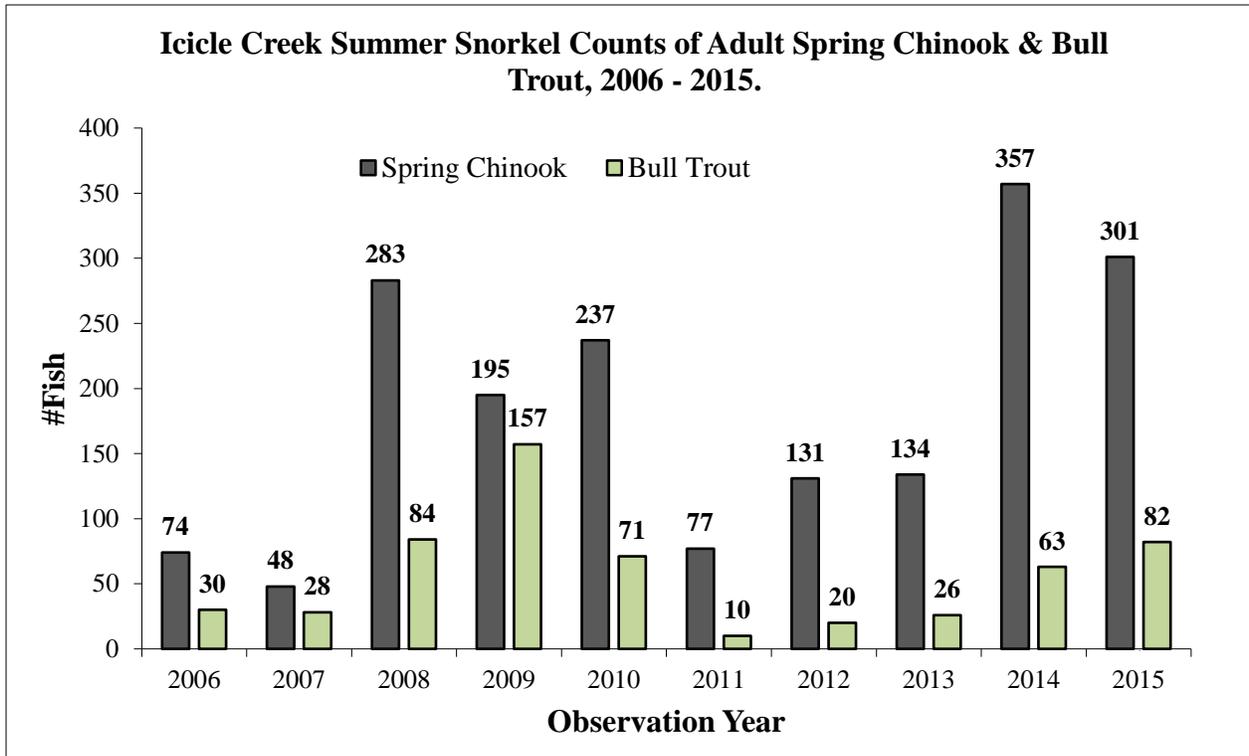


Figure 1. Icicle Creek snorkel survey counts by year.

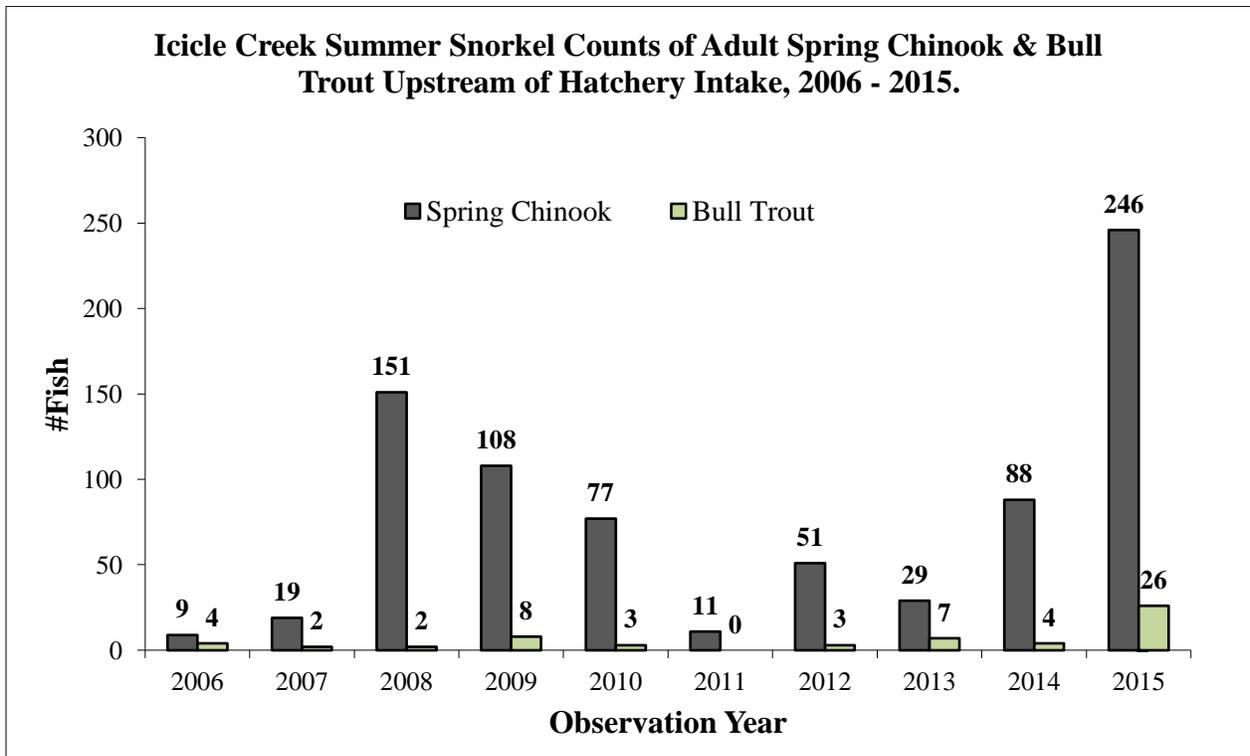


Figure 2. Icicle Creek snorkel survey counts above the Hatchery Intake, by year.

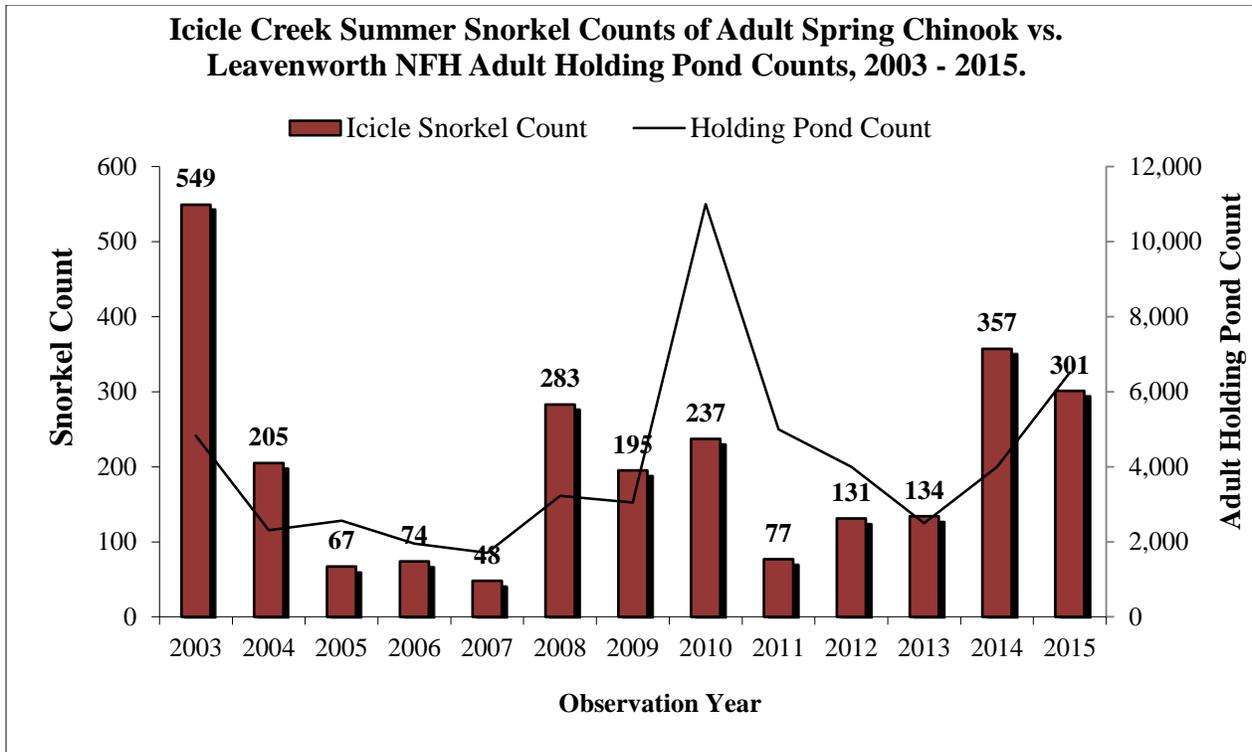


Figure 3. Icicle Creek snorkel counts vs. LNFH adult pond counts, by year.

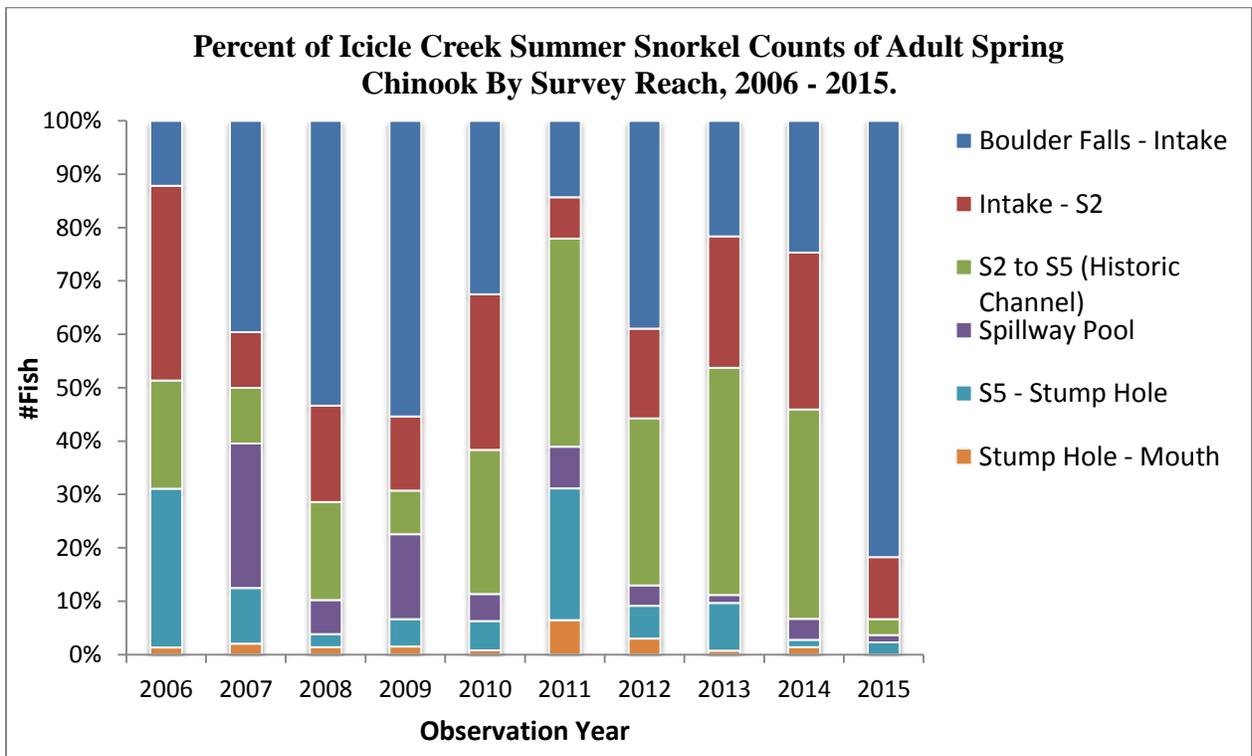


Figure 4. Spring Chinook distribution by reach and year.

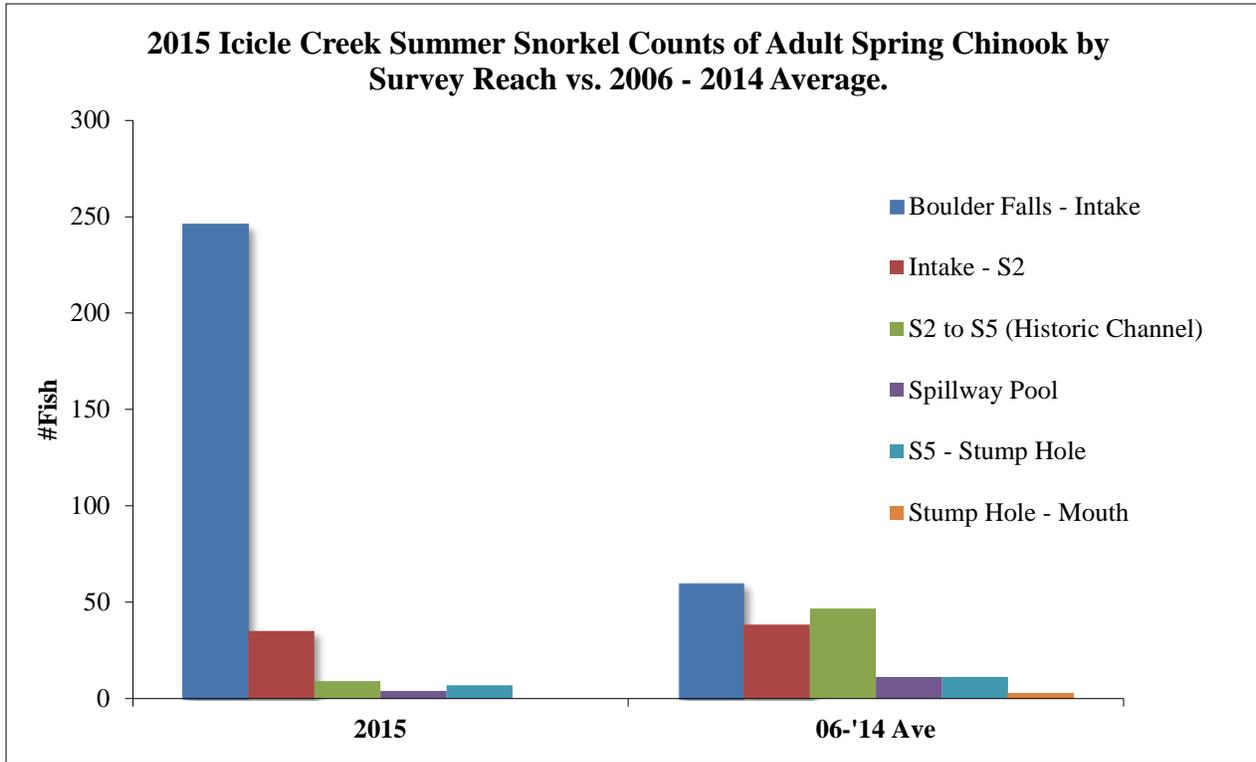


Figure 5. Spring Chinook counts, 2015 vs. average 2006-2014.

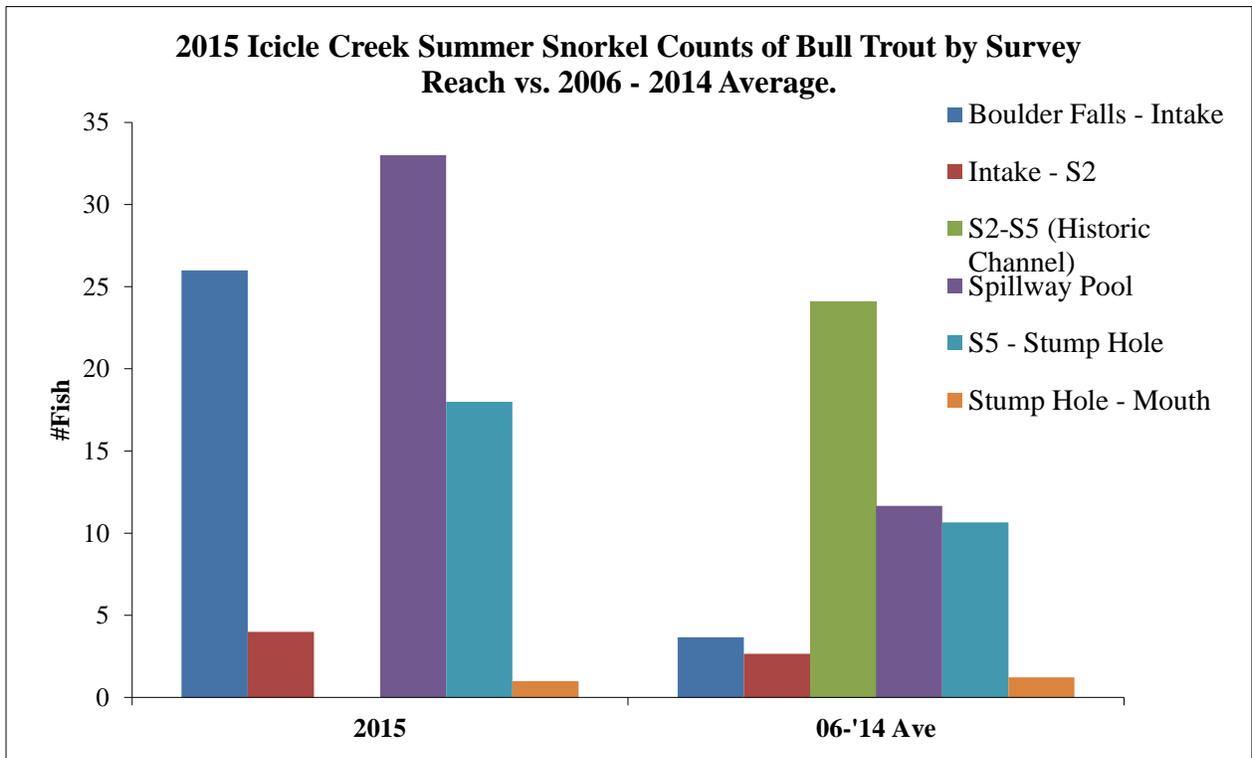


Figure 6. Bull Trout counts, 2015 vs. 2006-2014.