



United States Department of the Interior
Fish and Wildlife Service
Mid-Columbia River Fishery Resource Office
7501 Icicle Road
Leavenworth, WA 98826
Phone: (509) 548-7573
Fax: (509) 548-5743



MEMORANDUM

August 19, 2013

To: Interested parties

From: Matt Hall

RE: Snorkel survey results for adult spring Chinook salmon and bull trout in Icicle Creek, 2013

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

In 2013, the survey was conducted on August 16. For all reaches the weather was sunny and water visibility was estimated at 4m and was “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 at the Icicle Bridge was 160cfs, which is low 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

All surveys were conducted in a downstream manner with snorkelers evenly spaced across the stream. The survey was broken into seven reaches. The number of adult Chinook salmon and bull trout observed (both live and carcass) and the number of snorkelers utilized per reach are indicated in Table 2. The surveyors enumerated a total of 134 adult spring Chinook salmon and 26 bull trout in Icicle Creek (Figures 1 and 3). Of these, 29 adult spring Chinook and 7 bull trout were observed above Leavenworth NFH intake (Figures 2, 4, 5 and 6). Though no spring Chinook or adult bull trout could be positively identified above the Boulder Falls, an unknown fish estimated to be >500mm was briefly glimpsed.

Table 2. Results of the 2013 Icicle Creek snorkel survey.

<u>Reach</u>	<u>Adult Chinook</u>	<u>Bull Trout</u>	<u>Bull Trout Size Range</u>	<u># Viewers</u>
USGS gauge – IPID	0	1	(310)	3
Boulder Falls – LNFH Intake	29	7	(350-650)	3
LNFH Intake –S2	33	3	(230-450)	3
S2-S5 (Historic Channel)	57	1	(610)	4
LNFH Spillway Pool	2	1	(290)	4
S5 – Stump Hole	12	6	(110 – 490)	4
Stump Hole – Icicle Mouth	1	7	(250-410)	2
Totals:	134	26	(110 – 650)	
‘06-‘12Ave:	149	57		
‘06-‘12 Max:	283	155		
‘06-‘12 Min:	48	10		

Of the 26 bull trout observed, 85% 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 Chinook salmon and bull trout was the primary objective, some additional observations were noted. Rainbow trout were abundant in most upstream reaches (S5-USGS Gauge). Mountain whitefish were encountered above S1 for the first time in the history of the snorkel with 3 observations. 10 Brook trout were counted in the area above and below the Boulder Falls. 1 adult summer steelhead was counted near the mouth of Icicle Creek. No sockeye and few summer Chinook were encountered.

The hot, dry summer of 2013 in the Pacific Northwest generally resulted in low river discharge and high temperatures throughout the Wenatchee Basin. One hypothesis regarding bull trout usage of Icicle Creek suggests that bull trout may seek “thermal refuge” in the cooler Icicle Creek in years when the Wenatchee River temperatures are high. There is a positive correlation between Wenatchee River July mean 7DADmax temperatures and bull trout abundance in Icicle Creek on the day of the snorkel survey (Figure 7). However, 2013 weakens this trend with only 26 bull trout encountered.

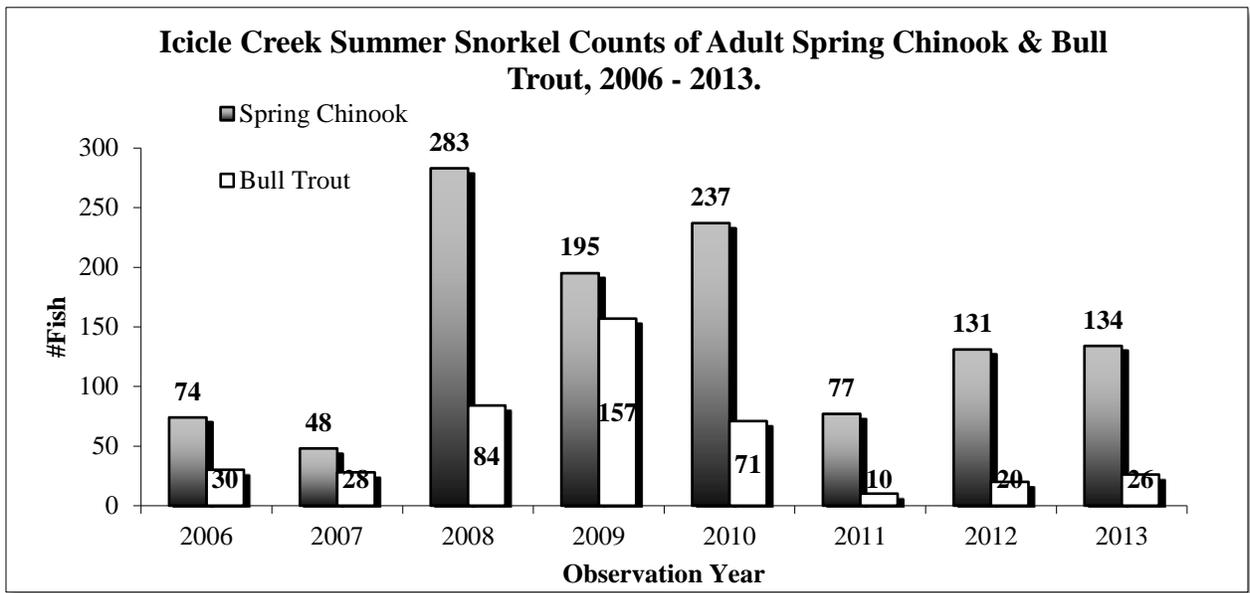


Figure 1. Icicle Creek snorkel survey counts by year.

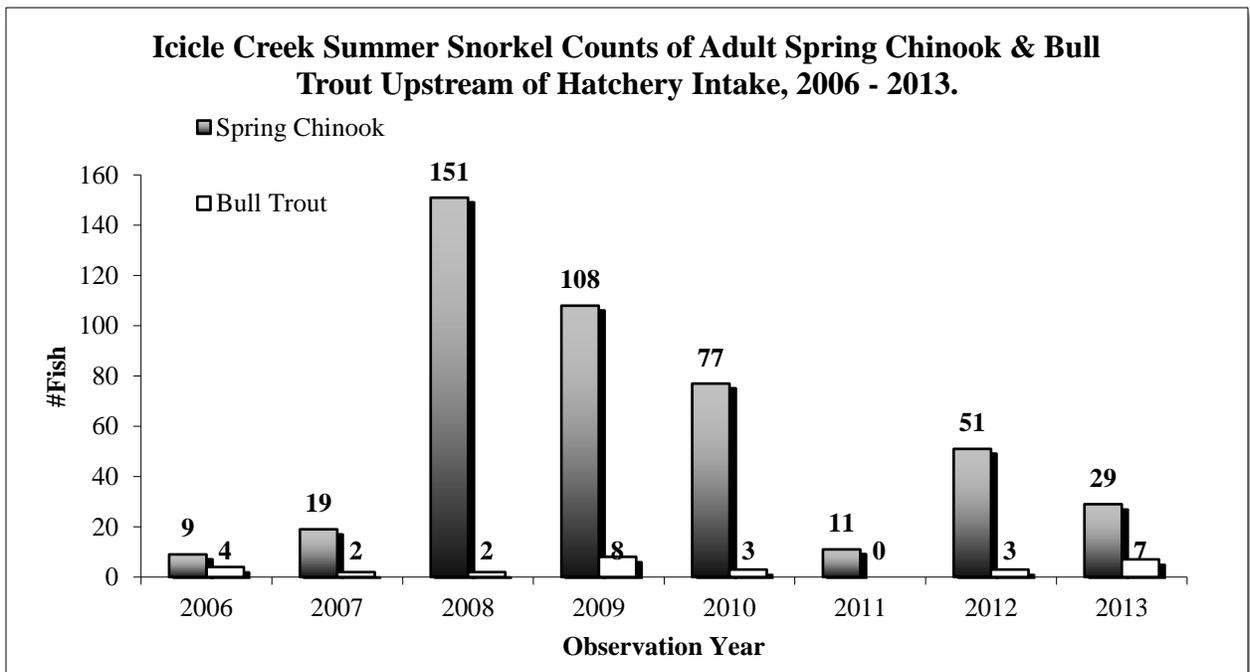


Figure 2. Icicle Creek snorkel survey counts above the Hatchery Intake, by year.

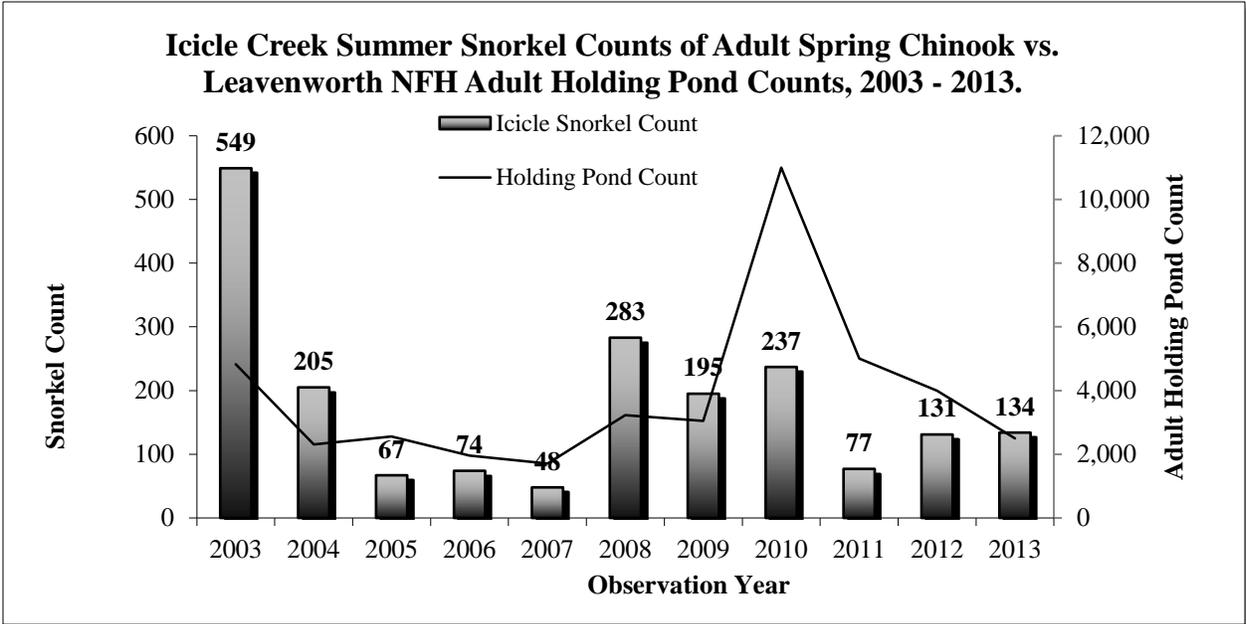


Figure 3. Icicle Creek snorkel counts vs. LNFH adult pond counts, by year.

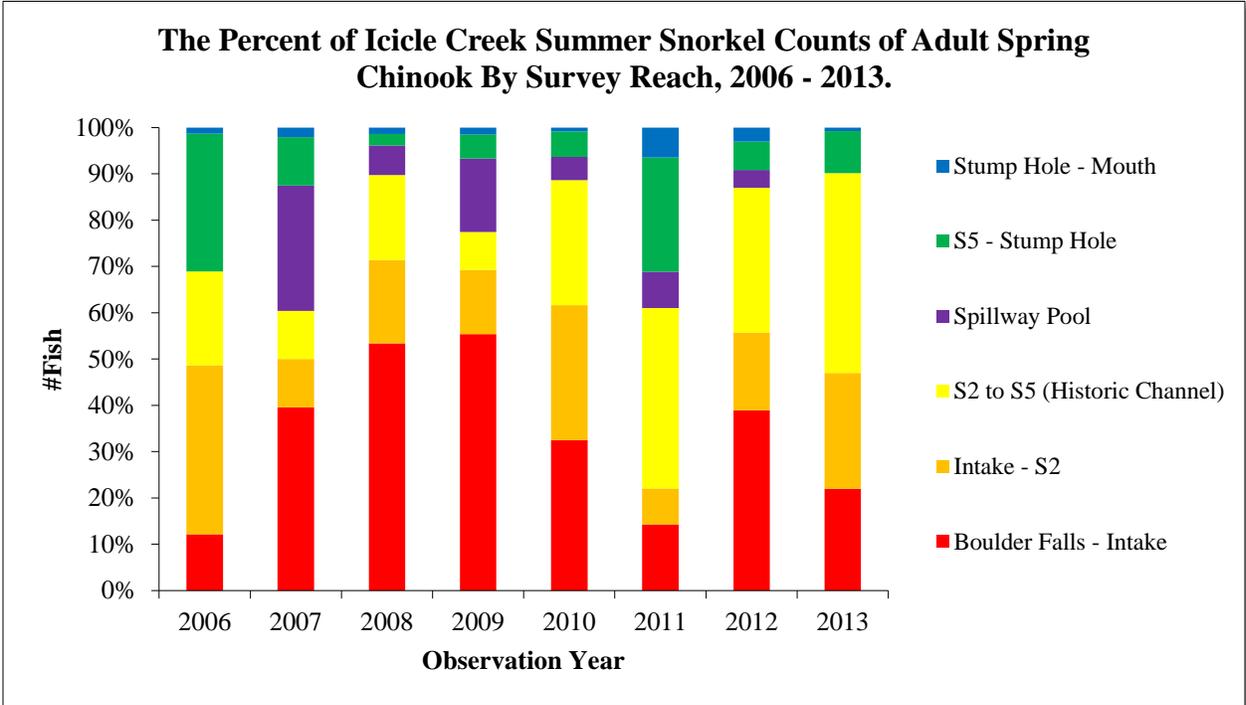


Figure 4. Spring Chinook distribution by reach and year.

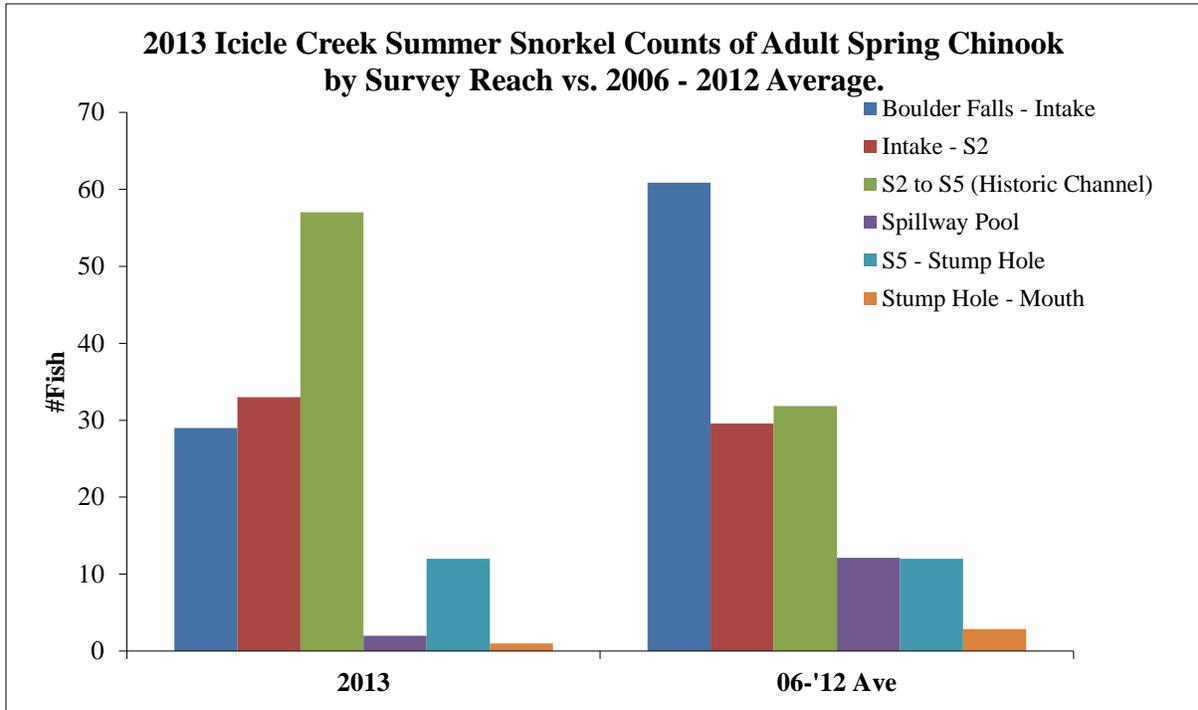


Figure 5. Spring Chinook counts, 2012 vs. average 2006-2011.

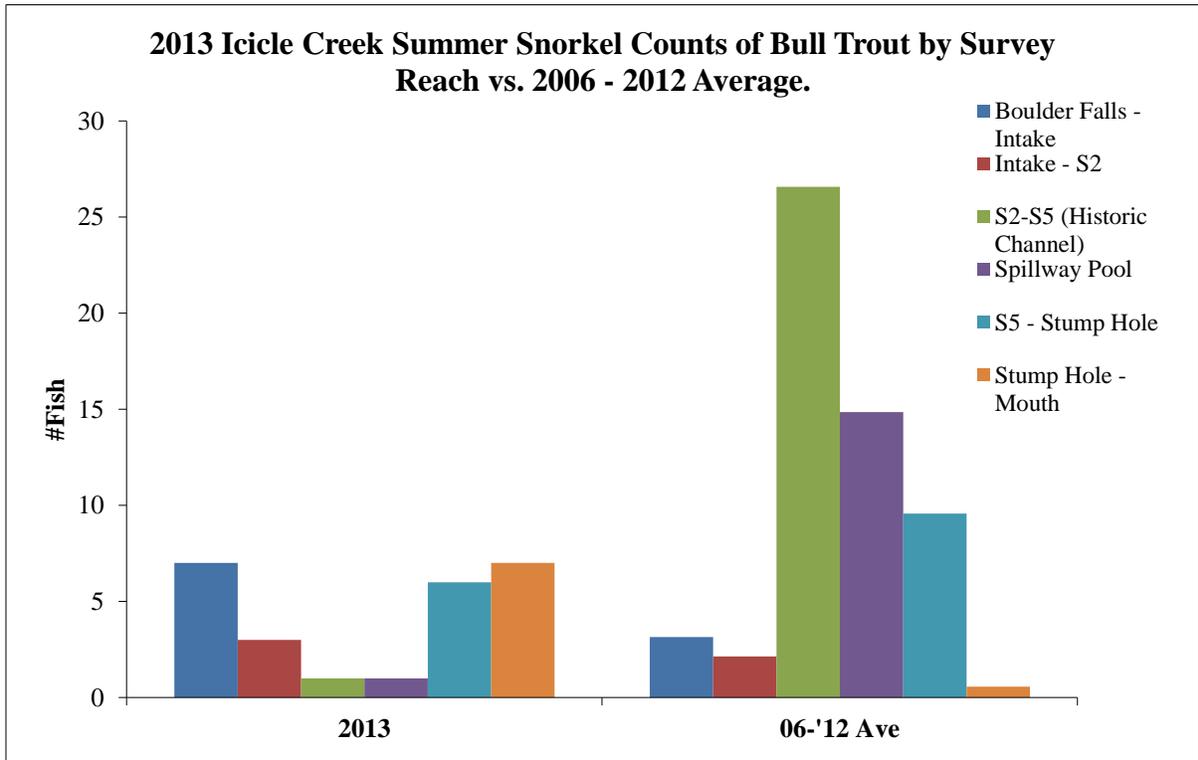


Figure 6. Bull Trout counts, 2012 vs. 2006-2011.

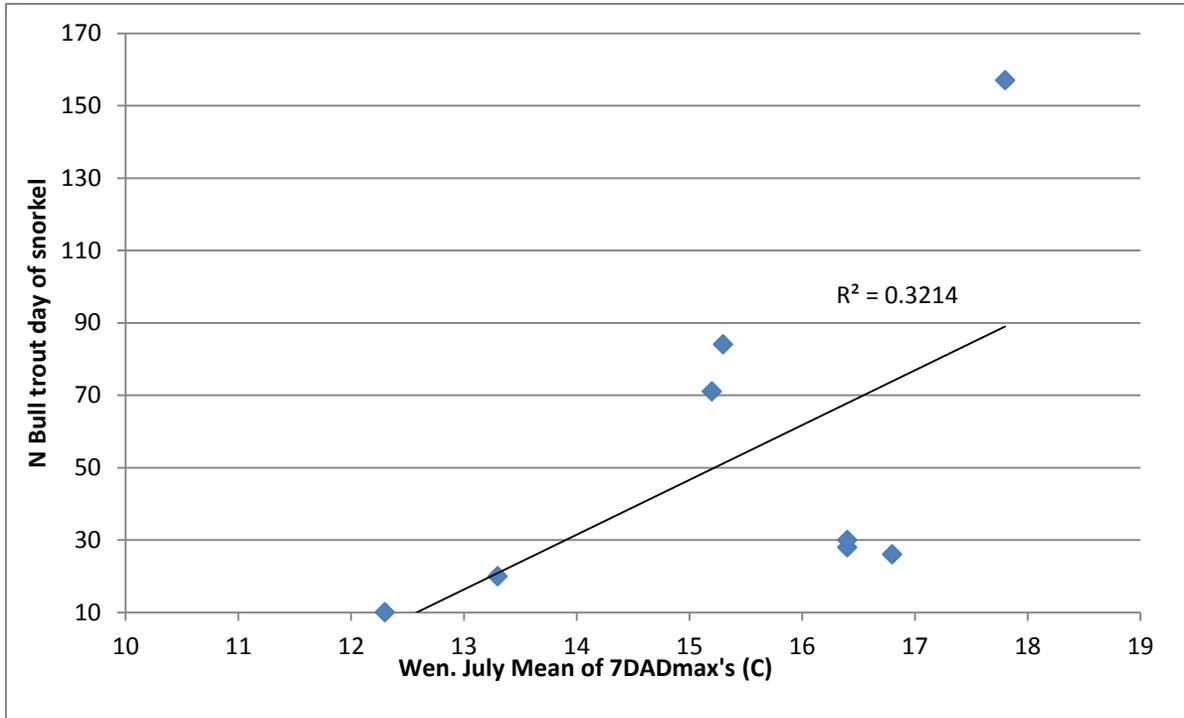


Figure 7. Wenatchee River summer high temperature predicting Bull trout in Icicle Creek.