



United States Department of the Interior  
Fish and Wildlife Service  
Mid-Columbia River Fishery Resource Office  
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MEMORANDUM

August 6, 2009

To: Files

From: FRO Hatchery Staff

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

Mid-Columbia River Fishery Resource Office conducted a snorkel survey in Icicle Creek on August 5, 2009. Primary objectives were to enumerate adult spring Chinook salmon and bull trout. The traditionally surveyed area began at the boulder fall area directly upstream of Snow Creek trailhead parking lot and continued downstream (~rm 5.6) to the Icicle/Wenatchee River confluence. In addition to the area described a snorkel was also conducted above the Boulder Falls for ~50 meters below IPID Dam upstream to the falls above the gauging station. Weather was sunny and water visibility was adequate for all sections of the river including the bottom of the spillway pool. Generally areas of turbulence/bubbles obscured viewing in some small areas (ie. hatchery ladder, headgate, boulder pockets). All surveys were conducted in a downstream manner with snorkelers evenly spaced across the stream. The survey was broken into six reaches. The number of fish observed (both live and carcass) and the number of snorkelers utilized per reach are indicated below. Specific notes by reach are described below.

<u>Reach</u>	<u>Adult Chinook</u>	<u>Bull Trout</u>	<u>Bull Trout Size Range</u>	<u># Viewers</u>
Gage Station Falls – Below IPID	0	2	(190mm – 300mm)	2
Boulder Falls – LNFH Intake	108	8	(390mm – 550mm)	3
LNFH Intake -Head gate	27	9	(250mm – 600mm)	3
Head gate - Dam 5 (historic channel)	16	57	(130mm – 410mm)	3
LNFH Spillway Pool*	31	74	(130mm – 710mm)	5
Dam 5 – Stump Hole	10	7	(150mm – 350mm)	3
Stump Hole – Icicle Mouth	3	0		2
<b>Totals:</b>	<b>195</b>	<b>157</b>	(130mm – 710mm)	

\*average count of two passes.

A total of **195** adult SCS including 9 carcasses and 157 bull trout were estimated in Icicle Creek from the gauging station above the boulder falls area to the mouth. Of these, 108 adult spring Chinook and 10 bull trout were observed above Leavenworth NFH intake.

Although enumeration of Chinook and bull trout was the primary objective some additional observations were noted by crews and are included in the notes below. Generally, whitefish,

suckers, rainbow trout and juvenile salmonids were encountered throughout the surveyed area. They are only included if the surveyors made a special note to document their presence. All fish lengths indicated were visually estimated often to the nearest odd centimeter. For consistency all lengths are expressed in millimeters. From the notes below it is of interest the large numbers (363) of sockeye both live (171) and dead (192) located throughout much of the downstream surveyed area. No sockeye were observed above the LNFH intake, however, four sockeye were noted in the area between the intake and headgate. Also, adult summer Chinook (11 total, 3 live + 8 carcasses) were also noted in addition to 118 precocial spring Chinook.

Summarized notes by reach: (actual notes archived in MCRFRO files)

~50 Meters Downstream IPID Dam to Falls upstream of Gage Station notes:

-Surveyed by Nelson and Yonce, 1015 – 1230 hours. Distance ~500 meters. Counts included: a total of 316 *O. mykiss* (size range: 30mm - 250mm), 1 cutthroat @ 210mm, 5 brook trout (size range: 90mm – 110mm) and 2 bulltrout (sizes 190mm & 300mm).

Boulder Falls to LNFH Intake notes:

-Surveyed by Johnsen, Jenkins and Pieratt from 0900 to 1145 hours. Counts included: 53 adult and 55 jack live (108 total) spring Chinook salmon, no Chinook carcasses, 31 precocial spring Chinook, 3 brook trout (no size given) and 8 bull trout observed in the following sizes: 1 @ 390mm, 2 @ 410mm, 2 @ 430mm, 1 @ 450mm, 1 @ 510mm, 1 @ 550mm.

LNFH Intake to Headgate notes:

-Surveyed by Johnsen, Jenkins and Pieratt from 1145 to 1238 hours. Counts included: 12 adult and 15 jack live (27 total) spring Chinook salmon, no Chinook carcasses, 4 precocial spring Chinook, 4 adult sockeye salmon and 9 bull trout observed in the following sizes: 1 @ 250mm, 3 @ 350mm, 1 @ 390mm, 1 @ 430mm, 1 @ 500mm, 1 @ 530mm, and 1 @ 600mm.

Headgate to Dam 5 (Historic Channel) notes:

-Surveyed by Cooper, Nelle and Hall from 1015 to 1215 hours. Counts included: 13 live adult, 2 live jack, and 1 adult carcass for 16 total spring Chinook salmon, 34 precocial spring Chinook, 12 live adult and 7 carcasses for a total of 19 sockeye salmon, 3 cutthroat (size range: 310mm – 430mm), 11 pikeminnow (size range: 210mm – 350mm), 1 live adult summer Chinook and 57 bull trout observed in the following sizes: 3 @ 130mm, 5 @ 150mm, 2 @ 170mm, 6 @ 190mm, 4 @ 210mm, 1 @ 230mm, 12 @ 250mm, 3 @ 270mm, 6 @ 290mm, 6 @ 310mm, 2 @ 330mm, 2 @ 350mm, 3 @ 370mm and 2 @ 410mm.

Spillway Pool notes:

-Surveyed by Cooper, Nelle, Hamstreet, Terrell-Lewis and Hall from 0900 to 1005 hours. Two passes were conducted through the spillway pool by alternating snorkelers. All counts are averages of both passes. Counts by pass were similar (ie. 70 and 78 on 1<sup>st</sup> and 2<sup>nd</sup> pass for bull trout counts) precluding the necessity for additional passes and harassment of the fish. Average counts are as follows: 21 live adult, 8 live jack, 1 adult carcass, and 1 jack carcass for 31 total spring Chinook salmon, 38 precocial spring Chinook, 79 live adult and 74 carcasses for a total of 153 sockeye salmon, 1 live adult summer Chinook, 10 cutthroat trout (size range 150mm – 200mm), 1 pikeminnow (size 450mm) and 74 bull trout (size range: 200mm – 710mm).

Dam 5 to Stump Hole notes:

-Surveyed by Cooper, Nelle and Hall from 1215 to 1415 hours. Counts included: 4 live adult, 2 live jack, 3 adult carcass and 1 jack carcass for 10 total spring Chinook salmon, 15 precocial spring Chinook, 7 live adult and 37 carcasses for a total of 44 sockeye salmon, 4 summer Chinook carcasses, 21 pikeminnow and 7 bull trout observed in the following sizes: 1 @ 150mm, 3 @ 170mm, 1 @ 230mm, 1 @ 270mm and 1 @ 350mm.

Stump Hole to Icicle confluence notes:

-Surveyed by Hamstreet and Terrell-Lewis from 1100 to 1245 hours. Survey needed three snorkelers and subsequently 25% of the time both snorkelers could not see entirety of river. Counts included: 1 live adult and 2 adult carcasses for 3 total spring Chinook salmon, 69 live adult and 74 carcasses for a total of 143 sockeye salmon, 1 live and 4 carcasses for a total of five summer Chinook carcasses, no bull trout observed.

## Icicle Snorkel Summary Table:

### Summary of Annual Icicle Creek Summer Snorkel Survey to Enumerate Adult Spring Chinook Salmon and Bull Trout, 2003 - 2009.

SCS = adult spring Chinook salmon (>300mm in length), counts include both live and carcass observation counts.

BT = bull trout counts of any size class.

Year Survey Date	2003		2004		2005		2006		2007		2008		2009		Reach Summary	
	4-Aug		4-Aug		6-Jul		3-Aug		31-Jul		6-Aug		6-Aug		06'-09'Ave#/Reach	
Area	SCS	BT	SCS	BT	SCS	BT	SCS	BT	SCS	BT	SCS	BT	SCS	BT	SCS	BT
Boulder Falls - Intake	Not Surveyed		Not Surveyed		Not Surveyed		9	4	19	2	151	2	108	8	72	4
Intake - Headgate	Not Surveyed		Not Surveyed		Not Surveyed		27	1	5	0	51	0	27	9	28	3
Headgate - Dam 5 (historic channel)	Not Surveyed		Not Surveyed		Not Surveyed		15	10	5	1	52	64	16	57	22	33
Spillway Pool	183	75	196	125	61	12	0	8	13	16	18	4	31	74	16	26
Dam 5 - Stump Hole	278	0	8	55	5	4	22	7	5	9	7	11	10	7	11	9
Stump Hole - Mouth	88	0	1	0	1	1	1	0	1	0	4	3	3	0	2	1
<b>Totals:</b>	<b>549</b>	<b>75</b>	<b>205</b>	<b>180</b>	<b>67</b>	<b>17</b>	<b>74</b>	<b>30</b>	<b>48</b>	<b>28</b>	<b>283</b>	<b>84</b>	<b>195</b>	<b>155</b>	<b>150</b>	<b>74</b>
<b># SCS mortalities</b>	182		9		0		1		2		10		9		34	
<b>% SCS mortality</b>	33%		4%		0%		1%		4%		4%		5%		8%	
<b># SCS above intake</b>	NS		NS		NS		9		19		151		108		72	
<b>% SCS above intake</b>	NS		NS		NS		12%		40%		53%		55%		36%	

