

FISHERY MANAGEMENT INVESTIGATIONS



IDAHO DEPARTMENT OF FISH AND GAME FISHERY MANAGEMENT ANNUAL REPORT

Cal Groen, Director



SALMON REGION

2009



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SALMON REGION FISHERY MANAGEMENT 2009 ANNUAL REPORT

Mountain Lake Stocking

ABSTRACT

The Idaho Department of Fish and Game (IDFG) stocked 89 mountain lakes in the Salmon-Challis National Forest (SCNF), Sawtooth Wilderness Area (SWA), and Sawtooth National Recreation Area (SNRA) in 2009. Seventy-three lakes were stocked with 60,394 westslope cutthroat trout *Oncorhynchus clarkii lewisi* fry and fingerlings. Thirteen lakes were stocked with 8,125 Troutlodge triploid rainbow trout *O. mykiss* fry and four lakes received 300 Arctic grayling *Thymallus arcticus* fry.

INTRODUCTION

The Salmon Region has approximately one thousand mountain lakes within its borders. Of these 1,000 lakes, 201 are requested to be stocked on a three-year rotation with westslope cutthroat trout, triploid rainbow trout, Arctic grayling, and golden trout *O. aquabonita* fry. These yearly stockings provide diverse mountain lake fishing opportunities to the public. Stocking rotation A includes 60 mountain lakes, rotation B is comprised of 96 lakes, and rotation C has 45 lakes.

OBJECTIVES

Mountain Lake Stocking

Maintain a viable and diverse mountain lake fishery in the Salmon Region.

STUDY AREA AND METHODS

Mountain Lake Stocking

Salmon Region mountain lakes in the SCNF were stocked with rainbow trout fry by Mackay Fish Hatchery personnel and Sawtooth Flying Service using a Cessna – 185 fixed-wing aircraft. Salmon Region mountain lakes located in the SNRA and SWA were stocked with westslope cutthroat trout by Sawtooth Fish Hatchery personnel and Sawtooth Flying Service using a Cessna – 185 fixed-wing aircraft. Sawtooth Fish Hatchery personnel, in conjunction with Cabinet Gorge Fish hatchery and Eagle Fish Hatchery, planted westslope cutthroat trout fingerlings in Yellowbelly Lake using a tanker truck in September 2009.

Regional stocking of fry into mountain lakes follows a three-year rotation with each lake in the stocking list usually receiving fish once every three years (Table 1). Salmon Region biologists use the nomenclature rotations A, B, and C to describe which lakes are stocked each year. Mountain lakes included in rotations A, B, and C are listed in Appendix A, including their IDFG catalog numbers, locations on national forest, national recreation land or in the wilderness area, and species and number of fish stocked. Lake names and LLIDs (concatenated latitude and longitude coordinates in decimal degrees) are listed in Appendix B.

Generally, Sawtooth Fish Hatchery stocks westslope cutthroat and golden trout fry when available while Mackay Fish Hatchery stocks triploid rainbow trout and Arctic grayling fry, also when available.

RESULTS AND DISCUSSION

Mountain Lake Stocking

In 2009, Mackay Fish Hatchery personnel stocked 17 mountain lakes by aircraft in the SCNF on October 1, 2009. Thirteen lakes were stocked with 8,125 Troutlodge triploid rainbow trout while another four lakes received 300 Arctic grayling fry (Appendix A). Rainbow trout fry were approximately 41.9 mm total length and the Arctic grayling measured about 40.6 mm each at the time of stocking. The total flight time was one hour at a cost of \$1,606, or an average of \$94.47 per lake. By comparison, in 2008 nine lakes were stocked with a total flight time of 3.5 hours at a cost of \$1,200.00, or an average of \$133.33 per lake. Stocking of Arctic grayling was reduced this year due to the limited supply of available eggs. Five lakes, Alpine Creek lakes #4, #13, and #15, Seafoam Lake #6, and Upper Redfish Lake #1, were not stocked with Arctic grayling as scheduled for Rotation B (Appendix A). Of note, the four Arctic grayling lakes stocked this year were to be stocked with 800 more fry than was available (Appendix A).

Sawtooth Fish Hatchery personnel stocked 72 mountain lakes in the SCNF and SNRA on September, 11, 17, 23, and 30, 2009. Westslope cutthroat trout weight at stocking was approximately 1,900 per pound or three to five fish per g for a total of 28,850 fry. A total of five flights were flown at an average cost of \$49.93 per lake. Stocking followed Rotation B in 2009 (Appendix A). Additionally, Yellowbelly Lake was stocked with 12,500 surplus westslope cutthroat trout fry and 19,044 fingerling westslope cutthroat. Some mountain lake stocking was delayed this year due to broodstock difficulties. Sawtooth Fish Hatchery received approximately 49,250 westslope cutthroat eggs from Washoe Park Fish Hatchery (Anaconda, MT) on July 2, 2009. Unfortunately, 31,500 eggs died after delivery. A second group of 40,000 eggs from Westslope Trout Co. (Ronan, MT) were received July 27. One lake slated to receive golden trout fry in this year's stocking rotation was not stocked due to the unavailability of fry (Appendix A).

MANAGEMENT RECOMMENDATIONS

Continue stocking mountain lakes using Rotation C in 2010.

Stock all Arctic grayling and golden trout lakes in 2010 that were not stocked in 2007, 2008, and 2009.

Coordinate with the IDFG's Fisheries Bureau to find a reliable, consistent source of Arctic grayling, westslope cutthroat trout, and golden trout fry.

Encourage fish hatchery managers to schedule stocking to coincide with availability of zooplankton in mountain lakes. Stocking fry in August would enable more fish growth before winter. This change in stocking would be predicated on earlier egg availability.

Table 1. Salmon Region stocking rotations A,B,and C by year, 2009 through 2019.

	<u>Stocking Rotation</u>		
	A	B	C
Year of Stocking	2011	2009	2010
	2014	2012	2013
	2017	2015	2016
		2018	2019

Appendix A. Salmon Region mountain lakes stocked using Rotations A, B, and C.

Lake Name	IDFG Catalog No.	Land Area ^a	Species ^b	No. Fish Stocked
<u>Rotation A:</u>				
Big Frog #2	0700001385.00	SNRA	C2	1,000
Cache Creek #1	0700000843.00	SCNF	C2	250
Cache Creek #3	0700000845.00	SCNF	GR	250
Cache Creek #5	0700000848.00	SCNF	GR	375
Castle	0700001420.00	SNRA	C2	650
Castle #1	0700000835.00	SCNF	C2	125
Castle View	0700001440.00	SNRA	C2	250
Challis Creek #2	0700001333.00	SCNF	C2	750
Challis Creek #3	0700001335.00	SCNF	C2	950
Chamberlain #7	0700001439.00	SNRA	C2	500
China #3	0700000885.00	SCNF	GN	400
Cirque	0700001369.00	SNRA	C2	1,150
Cove	0700001364.00	SNRA	C2	1,100
Crater	0700001460.00	SNRA	C2	875
Drift	0700001424.00	SNRA	C2	375
East Basin Creek#1	0700001514.00	SCNF	C2	475
Elk	0700001479.00	SNRA	C2	675
Feldspar	0700001380.00	SNRA	GR	550
Fourth of July	0700001685.00	SNRA	C2	725
Garland #1	0700001468.00	SNRA	C2	500
Garland #2	0700001469.00	SNRA	C2	500
Garland #3	0700001470.00	SNRA	C2	350
Gentian	0700001370.00	SNRA	TT	325
Goat	0700001375.00	SNRA	C2	1,150
Gunsight	0700001350.00	SNRA	C2	450
Hindman #1	0700001495.00	SCNF	C2	500
Honey	0700001433.00	SNRA	C2	200
Hoodoo	0700001463.00	SNRA	C2	250
Hope	0700001430.00	SNRA	GR	650
Liberty #1	0700000830.00	SCNF	TT	150
Liberty #2	0700000833.00	SCNF	TT	200

Appendix A. Continued.

Lake Name	IDFG Catalog No.	Land Area ^a	Species ^b	No. Fish Stocked
Lightning	0700001680.00	SNRA	C2	275
Little Redfish	0700001347.00	SNRA	C2	250
MacRae	0700001450.00	SNRA	GR	600
Martendale #1	0700000815.00	SCNF	GR	250
Martendale #2	0700000816.00	SCNF	C2	200
Mystery #3	0700000879.00	SNRA	C2	75
Nelson #2	0700000873.00	SCNF	GR	500
Ocalkens #1	0700001464.00	SNRA	C2	500
Ocalkens #2	0700001465.00	SNRA	C2	750
Phyllis	0700001683.00	SNRA	C2	375
Pipe	0700001732.00	SNRA	C2	200
Pole	0700000834.00	SCNF	TT	175
Rainbow	0700001727.00	SNRA	C2	200
Rock #1	0700000863.00	SCNF	TT	125
Rock #2	0700000864.00	SCNF	TT	550
Sapphire	0700001367.00	SNRA	C2	1,250
Sheep	0700001356.00	SNRA	C2	500
Six #1	0700001672.00	SNRA	C2	475
Slide	0700001363.00	SNRA	C2	275
Snow	0700001374.00	SNRA	C2	375
Swimm	0700001467.00	SNRA	C2	875
Thunder	0700001679.00	SNRA	C2	225
Tin Cup	0700001349.00	SNRA	GR	1,350
Twin Creek #2	0700001319.00	SCNF	TT	125
West Fork Bear Creek #1	0700001328.00	SCNF	C2	200
West Fork Camas Creek #1	0700000818.00	SCNF	C2	1,200
West Fork Camas Creek #3	0700000820.00	SCNF	C2	750
West Fork Camas Creek #5	0700000824.00	SCNF	C2	500
Washington #2	0700001444.00	SNRA	C2	750
Rotation A Total				30,525
<u>Rotation B:</u>				
Alpine	0700001540.00	SWA	GN	3,850
Alpine Creek #2	0700001784.00	SWA	C2	375
Alpine Creek #4	0700001787.00	SWA	GR	2,375
Alpine Creek #5	0700001788.00	SWA	TT	125
Alpine Creek #6	0700001789.00	SWA	C2	300
Alpine Creek #7	0700001790.00	SWA	C2	350
Alpine Creek #11	0700001797.00	SWA	TT	425
Alpine Creek #12	0700001798.00	SWA	C2	50
Alpine Creek #13	0700001800.00	SWA	GR	1,250
Alpine Creek #14	0700001802.00	SWA	GR	400
Alpine Creek #15	0700001804.00	SWA	GR	925
Baldwin Creek	0700001007.00	SWA	C2	350
Bear Creek #1	0700001137.00	SCNF	C2	200
Cabin Creek #3	0700001503.00	SCNF	C2	100

Appendix A. Continued.

Lake Name	IDFG Catalog No.	Land Area ^a	Species ^b	No. Fish Stocked
Cabin Creek #4	0700001504.00	SCNF	C2	600
Cabin Creek #7	0700001508.00	SCNF	C2	200
Cabin Creek Peak #1	0700001487.00	SCNF	C2	150
Cliff Creek #1	0700001144.00	SCNF	C2	150
Cliff Creek #4	0700001146.00	SCNF	C2	75
Collie Creek #1	0700001111.00	SCNF	C2	1,075
Decker Creek #1	0700001659.00	SWA	C2	575
Elizabeth	0700001570.00	SCNF	C2	500
Elk	0700001163.00	SCNF	C2	675
Finger #3	0700001094.00	SCNF	C2	475
Fishhook Creek #2	0700001607.00	SWA	C2	75
Fishhook Creek #3	0700001610.00	SWA	C2	75
Goat #1	0700001530.00	SWA	C2	2,225
Goat #4	0700001535.00	SWA	C2	425
Goat #5	0700001536.00	SWA	C2	50
Hanson #1	0700001555.00	SWA	C2	225
Hanson #3	0700001558.00	SWA	C2	725
Hanson #5	0700001561.00	SWA	C2	125
Harlan Creek #1	0700000980.00	SCNF	C2	300
Harlan Creek #2	0700000983.00	SCNF	C2	250
Hasbrook #1	0700000992.00	SCNF	C2	375
Helldiver	0700000989.00	SCNF	C2	550
Hidden	0700001573.00	SCNF	C2	250
Hindman #1	0700001495.00	SCNF	C2	500
Imogene #1	0700001713.00	SWA	TT	1,850
Imogene #2	0700001714.00	SWA	C2	200
Imogene #3	0700001715.00	SWA	C2	625
Imogene #4	0700001717.00	SWA	C2	100
Imogene #6	0700001719.00	SWA	C2	525
Iris #1	0700001074.00	SCNF	C2	225
Iris #3	0700001077.00	SCNF	C2	350
Iron Creek #6	0700001547.00	SWA	TT	75
Iron Creek #7	0700001548.00	SWA	TT	75
Island	0700001127.00	SNRA	TT	1,575
Kidney #2	0700001033.00	SCNF	C2	150
Knapp #7	0700001169.00	SCNF	C2	200
Knapp #14	0700001179.00	SCNF	GR	250
Langer #1	0700001133.00	SCNF	TT	1,000
Lola #2	0700001148.00	SCNF	C2	500
Lola #3	0700001149.00	SCNF	C2	500
Loon Creek #3	0700000904.00	SCNF	C2	150
Loon Creek #11	0700000917.00	SCNF	C2	175
Loon Creek #13	0700000919.00	SCNF	C2	225
Loon Creek #15	0700000923.00	SCNF	C2	175
Lost	0700000988.00	SCNF	C2	200
Lower Island	0700001129.00	SCNF	C2	550
Lower Valley Creek	0700001584.00	SNRA	C2	550

Appendix A. Continued.

Lake Name	IDFG Catalog No.	Land Area ^a	Species ^b	No. Fish Stocked
Lucille	0700001708.00	SWA	C2	775
Marshall #2	0700001525.00	SWA	C2	500
Martha	0700001569.00	SCNF	C2	200
McGowan #3	0700001565.00	SWA	C2	250
Muskeg #1	0700001043.00	SCNF	TT	500
Muskeg #3	0700001046.00	SCNF	TT	500
P 38	0700001160.00	SCNF	C2	325
Parks Peak #1	0700001745.00	SWA	C2	500
Profile	0700001710.00	SWA	C2	775
Rainbow	0700001153.00	SCNF	GR	250
Rocky	0700001135.00	SCNF	C2	450
Ruffneck	0700001130.00	SCNF	TT	1,250
Saddleback #1	0700001618.00	SWA	C2	775
Saddleback #2	0700001619.00	SWA	C2	325
Seafoam #6	0700001005.00	SCNF	GR	600
Soldier #4	0700001050.00	SCNF	C2	975
Soldier #7	0700001055.00	SCNF	C2	250
Soldier #8	0700001057.00	SCNF	C2	250
Soldier #10	0700001059.00	SCNF	C2	250
Soldier #11	0700001060.00	SCNF	C2	250
Tango #4	0700000893.00	SCNF	C2	675
Tango #5	0700000894.00	SCNF	C2	250
Tango #6	0700000895.00	SCNF	C2	900
Thompson Cirque	0700001604.00	SWA	C2	900
Upper Cramer	0700001657.00	SWA	C2	500
Upper Hell Roaring #1	0700001687.00	SWA	C2	275
Upper Hell Roaring #2	0700001688.00	SWA	C2	275
Upper Redfish #1	0700001634.00	SWA	GR	725
Upper Redfish #2	0700001635.00	SWA	C2	425
Upper Redfish #3	0700001636.00	SWA	C2	625
Valley Creek #2	0700001587.00	SCNF	C2	400
Vanity #1	0700001009.00	SCNF	TT	300
Vanity #4	0700001014.00	SCNF	TT	250
Vanity #5	0700001015.00	SCNF	C2	125
Vanity #7	0700001017.00	SCNF	TT	200
Vanity #13	0700001027.00	SCNF	GR	250
Rotation B Total				48,950
<u>Rotation C:</u>				
Basin Creek #5	0700001237.00	SCNF	C2	1,000
Bear Valley #3	0700001245.00	SCNF	C2	150
Birdbill	0700001197.00	SCNF	C2	500
Broncho	0700000566.00	SCNF	C2	725
Buck Creek #4	0700001242.00	SCNF	GR	225
Crater	0700001185.00	SCNF	GN	700
Devils	0700001260.00	SCNF	C2	350

Appendix A. Continued.

Lake Name	IDFG Catalog No.	Land Area ^a	Species ^b	No. Fish Stocked
Everson	0700001257.00	SCNF	C2	1,500
Glacier	0700001189.00	SCNF	GN	275
Golden Trout	0700001201.00	SCNF	GN	950
Gooseneck	0700001187.00	SCNF	GN	200
Harbor	0700000796.00	SCNF	C2	3,000
Heart	0700000793.00	SCNF	C2	1,675
Hidden	0600000616.00	BNF	C2	1,125
Hindman #1	0700001495.00	SCNF	C2	500
Iron #1	0700001279.00	SCNF	C2	1,000
Line	0600000603.00	BNF	C2	350
Lost Packer	0700000564.00	SCNF	TT	1,000
Middle Fork Hat Creek #2	0700001288.00	SCNF	GR	500
Middle Fork Hat Creek #3	0700001289.00	SCNF	TT	1,000
Middle Fork Hat Creek #4	0700001290.00	SCNF	TT	300
Middle Fork Hat Creek #5	0700001293.00	SCNF	TT	1,075
McNutt	0700001236.00	SCNF	C2	350
North Fork East Fork Reynolds #2	0700000575.00	SCNF	C2	1,325
North Fork East Fork Reynolds #4	0700000578.00	SCNF	C2	1,000
Nez Perce	0700001273.00	SCNF	GR	250
Paragon	0700000756.00	SCNF	C2	275
Park Fork Creek	0700001261.00	SCNF	C2	150
Pass	0700001307.00	SCNF	GN	350
Patterson Creek #1	0700001258.00	SCNF	C2	125
Patterson Creek #2	0700001259.00	SCNF	C2	200
Puddin Mountain #1	0700000764.00	SCNF	TT	500
Puddin Mountain #2	0700000766.00	SCNF	TT	500
Puddin Mountain #5	0700000770.00	SCNF	TT	1,000
Puddin Mountain #6	0700000773.00	SCNF	TT	1,000
Puddin Mountain #10	0700000778.00	SCNF	C2	275
Puddin Mountain #15	0700000787.00	SCNF	C2	675
Right Fork Big Eightmile	0700001264.00	SCNF	C2	150
Ramshorn	0700000755.00	SCNF	C2	350
South Fork Moyer Creek	0700001205.00	SCNF	GR	275
Ship Island #5	0700000618.00	SCNF	C2	1,000
Ship Island #7	0700000620.00	SCNF	C2	325
U P	0700001220.00	SCNF	C2	1,000
Welcome	0700000790.00	SCNF	C2	1,225
Wilson	0700000794.00	SCNF	C2	1,000
Rotation C Total				48,950

^a SNRA = Sawtooth National Recreation Area, SCNF = Salmon-Challis National Forest, SWA = Sawtooth Wilderness Area, and BNF = Bitterroot National Forest.

^b C2 = Westslope cutthroat trout, GR = Arctic grayling, GN = Golden trout, and TT = Troutlodge triploid rainbow trout.

Appendix B. Mountain lake locations in the Salmon Region for stocking rotations A, B, and C using WGS84 datum, and latitude and longitude decimal degree coordinates.

Lake Name	LLID ^a	Location in WGS84 Decimal Degrees	
		Latitude °N	Longitude °W
<u>Rotation A:</u>			
Big Frog #2	1145459440792	44.079250	-114.545810
Cache Creek #1	1147060447696	44.775190	-114.688770
Cache Creek #3	1146887447754	44.774900	-114.697300
Cache Creek #5	1146975447750	44.769540	-114.706070
Castle	1145764440463	44.046210	-114.576400
Castle #1	1143719448008	44.802600	-114.372930
Castle View	1145949440206	44.020780	-114.594860
Challis Creek #2	1145181445498	44.551940	-114.518750
Challis Creek #3	1145208445520	44.553440	-114.521820
Chamberlain #7	1145928440269	44.026550	-114.593030
China #3	1147857444767	44.477240	-114.785850
Cirque	1146208441064	44.106500	-114.620950
Cove	1146086441013	44.101360	-114.611630
Crater	1146082441415	44.144320	-114.609790
Drift	1145991440632	44.065380	-114.600230
East Basin Creek#1	1147924443262	44.333560	-114.794030
Elk	1147476442291	44.230960	-114.748740
Feldspar	1145904440905	44.090320	-114.590420
Fourth of July	1146313440433	44.045050	-114.632160
Garland #1	1147832441610	44.162680	-114.783950
Garland #2	1147932441657	44.167420	-114.794210
Garland #3	1148012441759	44.177670	-114.801960
Gentian	1146122440972	44.098900	-114.613110
Goat	1145813440983	44.099770	-114.581040
Gunsight	1146076441271	44.127240	-114.607900
Hindman #1	1149217443864	44.384720	-114.922120
Honey	1146054440368	44.036710	-114.605170
Hoodoo	1146418441669	44.168830	-114.642720
Hope	1146102440386	44.038620	-114.610130
Liberty #1	1146502447588	44.760590	-114.651080
Liberty #2	1146485447545	44.756340	-114.649360
Lightning	1146643440160	44.016010	-114.664190
Little Redfish	1145361441038	44.105610	-114.536970
MacRae	1146294439391	43.940570	-114.630040
Martendale #1	1146159448298	44.830080	-114.615940
Martendale #2	1146208448312	44.831240	-114.620610
Mystery #3	1147985444939	44.493830	-114.798550
Nelson #2	1148143445060	44.505650	-114.813960
Ocalkens #1	1146360441277	44.129430	-114.637090
Ocalkens #2	1146412441245	44.126060	-114.641300
Phyllis	1146491440230	44.022900	-114.648950
Pipe	1146638440043	44.001900	-114.656400
Pole	1146578447652	44.765170	-114.657720

Appendix B. Continued.

Lake Name	LLID ^a	Location in WGS84 Decimal Degrees	
		Latitude °N	Longitude °W
Rainbow	1152303443363	43.985920	-114.722160
Rock #1	1146696447553	44.756980	-114.670470
Rock #2	1146718447535	44.755310	-114.672660
Sapphire	1146152441033	44.102940	-114.615180
Sheep	1146111441133	44.113240	-114.611200
Six #1	1146766440245	44.028900	-114.678040
Slide	1146198441124	44.114100	-114.620570
Snow	1146138440957	44.095740	-114.614060
Swimm	1146675441491	44.146980	-114.667800
Thunder	1146605440221	44.022240	-114.660520
Tin Cup	1146095441228	44.124650	-114.610470
Twin Creek #2	1144768445832	44.583200	-114.476850
West Fork Bear Creek #1	1144874445667	44.566760	-114.487650
West Fork Camas Creek #1	1146492448005	44.802280	-114.650120
West Fork Camas Creek #3	1146624447965	44.801840	-114.659300
West Fork Camas Creek #5	1146689447976	44.798620	-114.662450
Washington #2	1146211440319	44.033720	-114.621990
<u>Rotation B:</u>			
Alpine	1150532441816	44.178690	-115.055150
Alpine Creek #2	1146242450685	45.068280	-114.624180
Alpine Creek #4	1149726439072	43.907370	-114.973600
Alpine Creek #5	1149815439052	43.905090	-114.981870
Alpine Creek #6	1149828439107	43.910850	-114.982850
Alpine Creek #7	1149925439093	43.909060	-114.992770
Alpine Creek #11	1149701439146	43.915040	-114.968880
Alpine Creek #12	1149699439196	43.919900	-114.970610
Alpine Creek #13	1149734439270	43.928180	-114.972200
Alpine Creek #14	1149599439213	43.919970	-114.958770
Alpine Creek #15	1149715439307	43.930590	-114.971690
Baldwin Creek	1151123444950	44.495310	-115.112540
Bear Creek #1	1150941444859	44.485840	-115.094180
Cabin Creek #3	1149032444206	44.419090	-114.901800
Cabin Creek #4	1148916444210	44.420160	-114.890590
Cabin Creek #7	1148889444145	44.414960	-114.889690
Cabin Creek Peak #1	1149156444024	44.402080	-114.914790
Cliff Creek #1	1150329444797	44.479410	-115.033070
Cliff Creek #4	1150439444816	44.481550	-115.043700
Collie Creek #1	1152261444092	44.408810	-115.225410
Decker Creek #1	1149344440479	44.049550	-114.935350
Elizabeth	1151514442658	44.267580	-115.152330
Elk	1150395444121	44.412440	-115.038450
Finger #3	1151499444898	44.489510	-115.149750
Fishhook Creek #2	1149823441139	44.115790	-114.983070
Fishhook Creek #3	1149877441107	44.110610	-114.987610
Goat #1	1150196441721	44.174010	-115.020080
Goat #4	1150154441600	44.161000	-115.015200
Goat #5	1150183441535	44.158450	-115.017620

Appendix B. Continued.

Lake Name	LLID ^a	Location in WGS84 Decimal Degrees	
		Latitude °N	Longitude °W
Hanson #1	1151172442217	44.223420	-115.118410
Hanson #3	1151171442093	44.209390	-115.117180
Hanson #5	1151174441998	44.199710	-115.117540
Harlan Creek #1	1151400445303	44.530280	-115.140220
Harlan Creek #2	1151481445220	44.521850	-115.148040
Hasbrook #1	1151786445219	44.521780	-115.178580
Helldiver	1151724445350	44.534840	-115.172170
Hidden	1151174442952	44.295540	-115.116440
Hindman #1	1149217443864	44.384720	-114.922120
Imogene #1	1149513439966	43.996310	-114.951190
Imogene #2	1149601439991	44.001100	-114.961110
Imogene #3	1149639439897	44.888330	-114.932430
Imogene #4	1149672439895	43.991670	-114.965020
Imogene #6	1149730439892	44.889210	-114.941270
Iris #1	1151940445113	44.511110	-115.192690
Iris #3	1152023445170	44.517510	-115.201320
Iron Creek #6	1150367441642	44.164050	-115.036660
Iron Creek #7	1150434441672	44.167080	-115.043360
Island	1151425444755	44.477640	-115.144030
Kidney #2	1149724445226	44.522440	-114.972270
Knapp #7	1149238444228	44.422250	-114.923670
Knapp #14	1149411444341	44.433410	-114.939960
Langer #1	1151347444803	44.482280	-115.135720
Lola #2	1152248443910	44.391150	-115.225770
Lola #3	1152402443907	44.391320	-115.239970
Loon Creek #3	1149282444426	44.442450	-114.928120
Loon Creek #11	1149496444671	44.466940	-114.948710
Loon Creek #13	1149456444909	44.492650	-114.946640
Loon Creek #15	1149426444965	44.498370	-114.943570
Lost	1151596445294	44.530620	-115.158170
Lower Island	1151399444776	44.472290	-115.136590
Lower Valley Creek	1150375443726	44.372810	-115.037890
Lucille	1149687440054	44.005170	-114.968350
Marshall #2	1149960441553	44.155200	-114.996040
Martha	1150956442871	44.285750	-115.096130
McGown #3	1150760441778	44.179580	-115.076730
Muskeg #1	1152100445438	44.544260	-115.209710
Muskeg #3	1152187445407	44.540570	-115.219910
P 38	1150727443980	44.422390	-115.084120
Parks Peak #1	1149425439593	43.960810	-114.943600
Profile	1149737440151	44.013900	-114.973670
Rainbow	1152303443363	44.335600	-115.267100
Rocky	1151353444863	44.488290	-115.135860
Ruffneck	1151473444730	44.475100	-115.147710
Seafoam #6	1151322445041	44.504070	-115.132280
Soldier #4	1151941445301	44.530240	-115.194340
Soldier #7	1151989445294	44.530040	-115.198550
Soldier #8	1152017445263	44.527450	-115.202480

Appendix B. Continued.

Lake Name	LLID ^a	Location in WGS84 Decimal Degrees	
		Latitude °N	Longitude °W
Soldier #10	1152020445293	44.529260	-115.201980
Soldier #11	1152032445309	44.530820	-115.203360
Tango #4	1148984444467	44.448510	-114.898750
Tango #5	1148931444432	44.444110	-114.892860
Tango #6	1148967444401	44.440830	-114.895790
Thompson Cirque	1150019441447	44.146410	-115.003210
Upper Cramer	1149873440296	44.030020	-114.989700
Upper Hell Roaring #1	1149516440275	44.027510	-114.951900
Upper Hell Roaring #2	1149599440307	44.030640	-114.960080
Upper Redfish #1	1150339440494	44.047230	-115.036180
Upper Redfish #2	1150360440459	44.045180	-115.036800
Upper Redfish #3	1150363440398	44.038310	-115.035390
Valley Creek #2	1149534443724	44.374200	-114.954130
Vanity #1	1150528444936	44.493440	-115.052970
Vanity #4	1150493444883	44.488150	-115.049230
Vanity #5	1150560444885	44.488490	-115.055990
Vanity #7	1150648444848	44.484830	-115.064910
Vanity #13	1150796444774	44.477210	-115.079630
<u>Rotation C:</u>			
Basin Creek #5	1138550448415	44.841450	-113.855360
Bear Valley #3	1138585448175	44.817300	-113.858560
Birdbill	1145875451504	45.152550	-114.588010
Broncho	1146536454675	45.467510	-114.653580
Buck #4	1138529447819	44.782480	-113.852860
Crater	1145787451632	44.144320	-114.609790
Devils	1135400446019	44.603420	-113.540790
Everson	1136134446256	44.627420	-113.615120
Glacier	1145853451684	45.170300	-114.586970
Golden Trout	1145218451119	45.113730	-114.522460
Gooseneck	1145820451649	45.167170	-114.583370
Harbor	1145917451426	45.144460	-114.593520
Heart	1145949451353	45.137250	-114.595710
Hidden	1146759454772	45.477080	-114.675600
Hindman #1	1149217443864	44.384720	-114.922120
Iron #1	1141832449129	44.906620	-114.195050
Line	1145750455726	45.572150	-114.573500
Lost Packer	1147777454716	45.471560	-114.777330
Middle Fork Hat Creek #2	1142104448747	44.874960	-114.209060
Middle Fork Hat Creek #3	1142044448775	44.876110	-114.204410
Middle Fork Hat Creek #4	1142040448793	44.857780	-113.445620
Middle Fork Hat Creek #5	1142101448782	44.879410	-114.209920
McNutt	1138488448272	44.826980	-113.847940
North Fork East Fork	1145482455479	45.547570	-114.547940
Reynolds #2			
North Fork East Fork	1145447455576	45.557390	-114.544890
Reynolds #4			
Nez Perce	1133908445099	44.509190	-113.390220

Appendix B. Continued.

Lake Name	LLID ^a	Location in WGS84 Decimal Degrees	
		Latitude °N	Longitude °W
Paragon	1146198450829	45.084940	-114.620640
Park Fork Creek	1135408445340	44.534030	-113.540350
Pass	1137575440901	44.090290	-113.757230
Patterson Creek #1	1136694445994	44.637330	-113.654780
Patterson Creek #2	1136561446259	44.627760	-113.657040
Puddin Mountain #1	1145954450977	45.099590	-114.596410
Puddin Mountain #2	1145991450982	45.099980	-114.600190
Puddin Mountain #5	1146043451058	45.107350	-114.604880
Puddin Mountain #6	1146045451006	45.102430	-114.605220
Puddin Mountain #10	1146131451117	45.113510	-114.614180
Puddin Mountain #15	1146087451196	45.119610	-114.608800
Right Fork Big Eightmile	1136089445899	44.591680	-113.609920
Ramshorn	1146133450851	45.087000	-114.614240
South Fork Moyer Creek	1142310448846	44.884180	-114.229930
Ship Island #5	1145991451563	45.156820	-114.601200
Ship Island #7	1146037451501	45.151100	-114.603270
U P	1140147452354	45.237060	-114.015070
Welcome	1145911451288	45.130600	-114.592080
Wilson	1145865451439	45.145590	-114.587800

^a LLID = Concatenated latitude-longitude in decimal degrees for centroid of lake.

SALMON REGION FISHERY MANAGEMENT 2009 ANNUAL REPORT

Surveys and Inventories - Lowland Lakes

ABSTRACT

Regional fishery staff sampled fish populations in selected lowland lakes to assess population size structures, relative weights, and relative changes in zooplankton abundance and forage availability. In Herd and Carlson lakes, survey results were used in a continuing effort to determine the effectiveness of tiger muskellunge (northern pike *Esox lucius* x muskellunge *E. masquinongy*) introductions to improve the size structure of fish populations. Mean relative weights declined slightly for fish populations in both lakes compared to 2008. Gill net samples from both lakes showed an overall increase in mean total length. Rainbow trout in Jimmy Smith Lake were sampled by experimental gill nets. The average catch rate of 9.9 rainbow trout per hours this year decreased slightly from 2008 when 10.1 fish per hour were captured. Rainbow trout mean relative weight has also declined for the last two sample periods. In Herd Lake, zooplankton quality index (ZQI) values showed a decrease to 0.22 from values of 0.98 and 1.28 found in 2008 and 2007, respectively. The 2009 value is still higher than previous values found prior to tiger muskellunge introductions. Zooplankton quality index values for Jimmy Smith and Yellowbelly lakes showed little variation compared with 2008 findings; indicating the forage resources are limited and competition is likely occurring. The Williams Lake ZQI value of 0.70 was comparable with the 2008 finding of 0.73. A dissolved oxygen (DO) profile of Williams Lake indicated acceptable DO levels in the first two m of depth below the ice, but dropped to 3.68 mg/L to 1.41 mg/L from three m to ten m.

Gill net surveys of Iron Lake resulted in 80 fish captured, of which 75 were rainbow trout and 5 were westslope cutthroat trout. Similar surveys in Yellowjacket Lake yielded 20 fish captured, of which 17 were rainbow trout and 3 were westslope cutthroat trout.

INTRODUCTION

The Salmon Region contains 23 lowland lakes, 2 reservoirs, and 11 public ponds (Table 4). Regional fishery staff defines its lowland lakes as being generally accessible by road and currently stocked with fish by truck. IDFG manages lowland lake fisheries to provide diverse recreational and angling opportunities for the public, and collects and maintains information on lowland lakes that helps managers meet objectives of the Fisheries Management Plan, 2007-2012 (IDFG 2007).

OBJECTIVES

Carlson Lake

Assess the effects of the tiger muskellunge introduction on the brook trout *Salvelinus fontinalis* population.

Herd Lake

Assess the effects of a tiger muskellunge introduction to control the localized, self sustaining rainbow trout population. Monitor the ZQI to detect relative changes in zooplankton populations following the 2006 tiger muskellunge introduction.

Hyde Pond

Assess the harvest contribution of January-stocked rainbow trout in Hyde Pond for an ice derby in January 2009 relative to previously stocked rainbow trout using uniquely numbered Floy T-bar anchor tags.

Iron Lake

Sample the fish population in Iron Lake to assess the survival of stocked rainbow and cutthroat trout.

Jimmy Smith Lake

Monitor the Jimmy Smith Lake rainbow trout population to determine whether management action is necessary to improve the overall size structure. Monitor Jimmy Smith Lake's ZQI to detect relative changes in zooplankton population and use the lake as a "control" for comparison with ZQI results in Herd Lake.

Williams Lake

Monitor ZQI values to detect relative changes in zooplankton population and forage availability. Spawn rainbow trout collected from Lake Creek, the inlet tributary to Williams Lake, and release progeny back into Lake Creek to alleviate public pressure to stock Williams Lake from a hatchery source.

Yellowbelly Lake

Survey the fish population in Yellowbelly Lake to assess the status of westslope cutthroat trout introductions. Monitor ZQI values to detect relative changes in the zooplankton population and forage availability.

Yellowjacket Lake

Assess fish and amphibian populations in Yellowjacket Lake.

STUDY AREA AND METHODS

Carlson Lake

Carlson Lake is a sub-alpine lake approximately two ha in size located in the Pahsimeroi River drainage (WGS84 datum, latitude longitude decimal degrees coordinates of 44.28153°N, 113.75283°W) and is situated at 2,438 m in elevation. Subterranean flow from the lake drains into Double Springs Creek, a tributary of the Pahsimeroi River. Currently, brook trout is the only reproducing fish species found in Carlson Lake.

Surveys in the early 1990's revealed a stunted brook trout population in Carlson Lake (Liter and Lukens 1994). IDFG initiated various population control measures to manipulate the brook trout population and its size structure, but no measurable response was observed (Brimmer et al. 2006). In 2002, 41 tiger muskellunge were introduced into Carlson Lake in an effort to increase the size structure of the brook trout population. An additional 32 tiger muskellunge were stocked in 2006 in a continuing effort to improve the brook trout size structure.

Carlson Lake was sampled on July 7-8 using eight experimental variable mesh gill nets, four floating and four sinking. The nets were set in the afternoon of July 7, fished overnight, then checked and removed the following morning. Captured fish were identified to species, measured for total length (mm), and weighed (g). Brook trout length and weight data was used to calculate relative weights using formulas developed by Murphy et al. 1991. Otolith samples were collected and stored in individually labeled vials at IDFG's Salmon Regional office for age and growth analysis.

Herd Lake

Herd Lake is a landslide lake located in Custer County at 2,187 m elevation (WGS84 datum, latitude longitude decimal degrees coordinates of 44.08921°N, 114.17364°W). The lake has a surface area of 6.7 ha and is a coldwater rainbow trout fishery managed under general fishing rules. The inlet to Herd Lake is Lake Creek in the East Fork Salmon River drainage. In an effort to improve the size and weight of the lake's rainbow trout population, 72 tiger muskellunge were stocked in 2006.

Regional fishery staff sampled Herd Lake on May 20-21 using four experimental variable mesh gill nets. The nets were set in the afternoon of May 20, fished overnight, checked and removed the following morning. Fish captured were identified to species, measured in total length, and weighed. Fish length and weight data were used to calculate

relative weights using formulas developed by Murphy et al. 1991. Otolith samples were collected and stored in individually labeled vials at IDFG's Salmon Regional office for age and growth analysis.

Zooplankton samples were taken from three locations on Herd Lake on September 1, 2009 following methods outlined by Teuscher (1999). The 2009 sampling methodology varied from Teuscher's (1999) guidelines due to decreased lake depth near the outlet. Sampling nets at the outlet were deployed to a depth of 8.5 m. Zooplankton samples were stored in 100% ethyl alcohol for eight days before zooplankton quality was analyzed using ZQI methodology developed by the Wyoming Game and Fish Department (Yule, unpublished data; Table 5) and Teuscher (1999).

Hyde Pond

Hyde Pond is a man-made pond managed by the U. S. Department of the Interior, Bureau of Land Management's (BLM) Salmon Office, and is located 11.8 km south of the City of Salmon. Situated 0.9 km above the Hyde Creek Ranch on Hyde Creek Road, the pond is located at WGS84 datum, latitude and longitude decimal degree coordinates of 45.09403°N, -113.88173°W. The pond covers 0.2 ha surface area and resides at 1,206 m in elevation.

IDFG, in cooperation with the Salmon Office BLM, began stocking the pond in 1994 with rainbow trout catchables (>152mm total length) to provide a recreational fishing opportunity for young anglers near Salmon. Hyde Pond is listed in IDFG's fishing rules brochure as a family fishing water, meaning the pond is open to fishing year-round and has a six-fish limit per day with standard fishing gear. The pond is stocked annually with rainbow trout catchables. For the past four years (2006 to 2009), Hyde Pond has received an average of approximately 1,400 triploid Troutlodge Kamloops rainbow trout per year.

IDFG and other agency personnel sponsor an annual ice fishing day at the pond each January for children 1 to 16 years of ages. For the past 19 years, fishing success has been variable despite stocking of 200-300 rainbow trout prior to the ice fishing event. In an effort to determine which fish contribute to the most harvest the day of the fishery, 12 rainbows were caught by hook and line from the November 2009 stocking at the pond and were given uniquely numbered Floy T-bar anchor tags on January 20, 2010. The next day, 8 of 300 rainbows brought from Mackay Fish Hatchery were also Floy tagged before being stocked in the pond.

Iron Lake

Iron Lake is a cirque lake located in Lemhi County at the headwaters of Iron Creek in the Salmon River drainage (WGS84 datum, latitude and longitude decimal degree coordinates of 44.90662°N, -114.19505°W). Located in the SCNF, the drive-to lake is accessible via the Salmon River Mountain Road and Williams Creek Road off U.S. Highway 93 South approximately 60 km south of the City of Salmon. Elevation at lakeside is 2,685 m. The lake has a surface area of 6.6 ha with one outlet on the northeast end.

The lake has an extensive stocking history of cutthroat and rainbow trout, beginning with rainbow trout and steelhead fry in 1937. Cutthroat fry were stocked in the 1960's and 1970's with a switch to primarily rainbow trout in the 1980s. Iron Lake is currently stocked

annually with approximately 1,000 triploid Troutlodge Kamloops rainbow trout twice per summer.

Two experimental variable mesh gill nets (both floating) were used August 7-8, 2009 to sample the fish population in Iron Lake. The nets were set in the early evening of August 7, fished overnight, then checked and removed the following morning. Captured fish were identified to species, measured for total length, and weighed. Fish length and weight data were used to calculate relative weights using formulas developed by Murphy et al. 1991.

Jimmy Smith Lake

Jimmy Smith Lake is a landslide lake located in north central Custer County in the East Fork Salmon River drainage at 1,948 m elevation with a surface area of 26 ha (WGS84 datum, latitude and longitude decimal degree coordinates of 44.16907°N, 114.40249°W). The lake has one outlet and two inlet streams. The outlet stream is located at the north end of the lake and two inlet streams are located at the west and south ends of the lake.

The lake supports a naturally reproducing population of rainbow trout that likely originated from 184,600 rainbow trout stocked from Mackay Hatchery between 1927 and 1938. The lake has not been stocked since that time.

Four experimental variable mesh gill nets, two floating and two sinking, were used from May 20-21 to sample the fish population of Jimmy Smith Lake. The nets were set in the afternoon of May 20, fished overnight, checked and removed the following morning. Captured fish were identified to species, measured for total length, and weighed. Rainbow trout length and weight data was used to calculate relative weights using formulas developed by Murphy et al. 1991. Otolith samples were collected and stored in individually labeled vials at IDFG's Salmon Regional office for age and growth analysis.

On September 1, zooplankton samples were taken in Jimmy Smith Lake at three locations following methods outlined by Teuscher (1999). Zooplankton tows were adjusted due to decreased lake depth. Sampling locations were selected using a hand-held depth detector; tow depths were 5.5 m at the inlet, 7.0 m at mid-lake, and 6.4 m near the outlet. Samples were stored in 100% ethyl alcohol for eight days, at which time a ZQI value was analyzed using methodology developed by Yule and Teuscher (Table 5).

Williams Lake

Williams Lake, an early eutrophic lake, is located in central Lemhi County (WGS84 datum, latitude and longitude decimal degree coordinates of 45.01643°N, 113.97619°W) at 1,600 m elevation. The lake has a surface area of 72.8 ha, a maximum depth of 58 m, and a mean depth of 23 m. The principle in-flow is provided by Lake Creek, with other water sources originating from springs and intermittent streams. The lake supports a naturally reproducing rainbow trout population that includes trophy sized fish. Bull trout *Salvelinus confluentus* is the only other fish species recorded inhabiting the lake. A posted boundary sign at the mouth of Lake Creek limits fishing in Lake Creek during rainbow trout spawning season prior to the fishing season opener for the creek on July 1.

On the morning of October 1, 2009, five experimental variable mesh gill nets were set to sample the fish community in Williams Lake. Nets were checked every hour to reduce

the number of bull trout mortalities. IDFG personnel pulled and removed the nets late that afternoon. All fish were identified to species, measured for total length, and weighed. Live bull trout were released following measurement while mortalities were kept for genetic sampling.

Zooplankton samples were taken from three locations, near the inlet, mid-lake, and near the outlet of Williams Lake, on the afternoon of August 31, 2009 following methods outlined by Teuscher. Samples were stored in 100% ethyl alcohol for eight days, at which time ZQI values were analyzed using methodology developed by Yule and Teuscher.

A rainbow trout spawning project has been implemented annually in Lake Creek since 1997, in an effort to address the request of Williams Lake property owners and anglers that stocking is needed to increase the lake's fish population.

Dissolved oxygen (DO) levels have been sampled at Williams Lake during the winter months for seven of the past eleven years. On February 11, 2010, a regional fishery biologist and an IDFG cooperater drilled a hole in the ice at the approximate location of lake's deepest point (Zmax) to perform DO sampling. The team used a YSI Model 556 DO multi-probe sensor, sampling the DO level at the lake's surface and at one m intervals through the water column from one to ten m in depth. One water temperature reading was also recorded at the open water surface.

Yellowbelly Lake

Yellowbelly Lake, an oligotrophic lake, is located in southern Custer County at 2,157 m elevation. The lake has 77.9 ha of surface area, a maximum depth of 24.5 m, and 8.4 km of shoreline. The lake is located at WGS84 datum, latitude and longitude decimal degree coordinates of 44.00050°N, 114.87677°W. The principle in-flow is provided by Yellowbelly Lake Creek. Yellowbelly Lake is managed as a catch-and-release westslope cutthroat trout fishery. Documented fish species in the lake are brook trout, westslope cutthroat trout, rainbow trout, bull trout, northern pikeminnow *Ptychocheilus oregonensis*, and sucker (*Catostomus sp.*). In an effort to reestablish native fish populations, the lake was treated with Rotenone in 1990. Additionally, a fish barrier located at the outlet of Yellowbelly Lake was removed in 2000 by SNRA personnel to reestablish connectivity with the main-stem Salmon River.

Eight experimental variable mesh gill nets, four floating and four sinking, were used from June 4-5, 2009 to sample the fish population of Yellowbelly Lake. The nets were set in the early evening, fished overnight, then checked and removed the following morning. Captured fish were identified to species, measured for total length, and weighed. Genetic and otolith samples were collected from westslope cutthroat trout and bull trout and stored in individually labeled vials at IDFG's Salmon Regional office for age and growth analysis.

Zooplankton samples were taken from three locations on Yellowbelly Lake, near the inlet, at mid-lake, and near the outlet, on the afternoon of August 27, 2009 following methods described above. Samples were stored in 95% ethyl alcohol for eight days prior to lab analysis of ZQI values using methodology developed by Teuscher and Yule.

Yellowjacket Lake

Yellowjacket Lake is a cirque lake located in western Lemhi County at the headwaters of Yellowjacket Creek, which flows into the Middle Fork Salmon River (MFSR) via Camas Creek (WGS84 datum, latitude and longitude decimal degree coordinates of 45.06712°N, -114.55354°W). Located at an elevation of 2,422 m, the lake has a surface area of 2.7 ha with one outlet on the northeast end.

This drive-to lake is adjacent to a popular trailhead and campground for hikers and horseback entry into the Bighorn Crags-Frank Church River of No Return Wilderness Area. The lake has an extensive history of primarily rainbow trout stocking beginning in 1937, according to IDFG stocking records. Cutthroat trout fry were stocked three times in the 1990's. The lake's two most recent stockings occurred in 2003 and 2005 when 701 triploid Troutlodge Kamloops rainbow trout fry and 200 westslope cutthroat trout fingerlings were planted, respectively.

Two experimental variable mesh gill nets, both floating, were deployed in Yellowjacket Lake on August 7, 2009, allowed to set overnight, and pulled the following morning. Captured fish were identified to species, measured for total length, and weighed. Additionally, the presence of amphibians was determined by a modification of the timed visual encounter survey (VES) methodology of the lake's shoreline perimeter. The main deviation from the VES methodology was that the fisheries crew performed a full perimeter search without accounting for various habitat types.

RESULTS AND DISCUSSION

Carlson Lake

A total of 246 brook trout and five tiger muskellunge were collected during this year's survey of Carlson Lake. Results indicate a decrease in brook trout relative weights during recent sampling, from 113.6 calculated in 2006 to 96.6 in 2008, and 95.8 in 2009 (Table 6). A value of 100 is considered average for North American populations. Of note is that the 2008 data was a hook and line survey in contrast to gill net data for all other years. This year's survey showed brook trout had a size range of 130 - 319 mm total length, similar to findings in the last two sample years (Figure 1). Brook trout averaged 234 mm total length in 2009 compared to 216 in 2006 and 225 mm in 2008. This year's average weight of 129.4 g mirrored gill net findings in 2006 of 129.5 g, but was greater than the 115.0 g average weight of brook trout sampled by angling in 2008.

Tiger muskellunge encountered during the gill-net set ranged in size from approximately 690 - 770 mm total length. Length measurements were approximate as fishery crews were able to release three of the five tiger muskellunge alive. The two tiger muskellunge sacrificed in the nets each measured 770 mm total length and weighed more than 2.5 kg (the largest weight measurement available on the field scale).

Herd Lake

A gill net set on May 20-21, 2009 resulted in a total catch of 129 rainbow trout (Table 7). Results of this year's survey showed an increase in average total length while the average fish weight decreased 3 g from 2008. In 2009, rainbow trout had an average total length of 230 mm compared to 226 mm in 2008. Average rainbow trout weight in 2009 was 119.1 g compared to 122.1 g in 2008. The average relative weight of fish sampled this year showed a continuing decrease in relative weight values compared to the previous two post treatment samples. This year's average relative weight value of 76.6 is lower than the 79.9 value found in 2008 and the 86.8 value in 2006. However, these three most recent values are still higher when compared to the relative weight values of 73.8 and 71.8 observed in the pre-treatment samples of 2005 and 2003, respectively (Table 7). It seems likely that the small gain in average total length of Herd Lake rainbow trout sampled in 2009 was offset by a decrease in average weight and resulted in a lower relative weight value. Changes in the rainbow trout population resulting from the 2006 tiger muskellunge introduction may take more time to be realized. The earlier sampling date in 2009 could explain the lower relative weights in that the adults would have had less time to recover from the rigors of spawning. ZQI results reported below may also explain the decrease in relative weights.

Using Teuscher's ZQI ratings in Table 5, the 2009 value of 0.22 in Herd Lake suggests that competition for food may be occurring. ZQI values for Herd Lake have ranged from 0.01 to 1.28 respectively (Table 8; Figure 2). ZQI values found prior to 2007, before tiger muskellunge introduction, indicated that competition for food was likely (Figure 2). While the 2009 value is greater than values prior to 2007, the drop in ZQI values the last two years suggest further monitoring of forage resources is needed.

Hyde Pond

On January 30, 2010, approximately 120 rainbow trout were captured during the ice fishing derby. Six captured fish were Floy tagged. Of these six captured fish, five were from the November 2009 stocking and one was from the more recent stocking of January 21, 2010. Likely, the carry-over fish from the November stocking are providing most of the harvest on the day of the ice fishery.

Iron Lake

The fish community in Iron Lake was surveyed using two experimental variable mesh gill nets August 8-9, 2009. A total of 80 fish were captured, comprised of 5 westslope cutthroat trout and 75 rainbow trout (Table 9). More fish were captured but the fishery crew tipped their canoe on the first gill-net retrieval. The survey crew estimated they lost approximately half of the fish that were in the craft when it capsized. The five cutthroat trout ranged in size from 280 - 310 mm total length with a mean of 282 mm. Their weights ranged from 100 - 315 g and averaged 236 g. Rainbow trout lengths ranged from 190 - 350 mm total length and averaged 272 mm. Rainbow trout weights ranged from 60 - 380 g with a mean of 188 g. Relative weight calculations for the 75 rainbows produced a value of 75.4. A value of 100 is considered average for North American populations. Likely, all the fish captured were the result of the hatchery stocking program. The combined gill net set time of 33.97 hours resulted in a catch per unit effort (CPUE) of 2.4 fish/hour.

Jimmy Smith Lake

Regional fishery staff captured 689 rainbow trout during 69.8 gill net hours in 2009 (Table 10). Rainbow trout had a size range of 132 - 325 mm total length with an average of 203 mm (Figure 3). The 2009 catch rate of 9.9 fish per hour was slightly lower than the 2008 rate of 10.1 fish per hour. Mean average weight of rainbow trout dropped to 84 g in 2009 compared to 100 g in 2008. The mean relative weight of rainbow trout decreased to 77.7 this year compared to 80.3 in 2008 and 107.5 in 2006. Higher catch rates, decreased weight of rainbow trout, and lower relative weight values for the past two sample years suggest an increased population size and increased competition for available food resources is likely occurring in Jimmy Smith Lake.

Results of zooplankton analysis generated a ZQI value of 0.01 in 2009 in Jimmy Smith Lake (Table 11). Teuscher's (1999) ZQI rating of < 0.1 suggests that forage resources in the lake are limiting (Table 5). ZQI values in Jimmy Smith Lake have varied little, with values of 0.00 to 0.17, over the years that the lake has been surveyed (Table 11).

Williams Lake

A daytime gill net set on October 1, 2009 at Williams Lake produced a catch of 20 rainbow trout and 32 bull trout (Table 12). Rainbow trout ranged in size from 145 - 430 mm total length and averaged 294.6 mm. While the size range of rainbow trout sampled closely mirrored results found in 2007, mean total length decreased 16 mm from 310.6 mm in 2007. The number of bull trout encountered this year represents the largest sample of this species obtained to date. Gill net protocol of checking the nets approximately every hour may have contributed to the increased encounters. Bull trout in 2009 had a size range of 230 - 455 mm total length and averaged 342.5 mm (Table 12). This year's size range appeared to include older-aged bull trout than the 2007 sample when the longest fish measured 335 mm total length. In addition, the mean total length of bull trout encountered increased over 60 mm when compared to the 2007 sample.

Zooplankton sampling produced a ZQI average value of 0.70 in 2009 (Table 13), suggesting that competition for food is unlikely using Teuscher's ratings in Table 5. ZQI values have been greater than 0.60 for all years sampled except for 2005 which produced a 0.56 ZQI value (Table 13; Figure 4). ZQI average values have ranged from 0.56-0.92 during this period. The zooplankton ratio (ZPR) value for Williams Lake was calculated at 0.51 in 2009, the lowest value for the seven years sampled (Table 13; Figure 4).

On May 13, 2009, 10 female and 10 male rainbow trout were collected and spawned, followed by an additional 10 pairs of rainbow trout collected and spawned on May 15, 2009. Three IDFG cooperators tended the fertilized eggs until "button up." Approximately 40,000 fry were released into Lake Creek on June 22, 2009.

On February 11, 2010, dissolved oxygen sampling at the deepest point of Williams Lake (Zmax) indicated acceptable dissolved oxygen (DO) levels in the first two m of depth below the ice (Table 14). DO readings of 11.13 parts mg/L (milligrams per liter) at one m and 4.67 mg/L at two m were recorded, respectively. From three m to ten m, DO levels decreased from 3.68 mg/L to 1.41 mg/L, respectively. This sampling profile is one which has repeated itself during most winter DO samplings of the lake (Table 14; Figure 5) and indicates that habitable space is limited during the winter months at Williams Lake.

Yellowbelly Lake

Regional fishery staff captured a total of 106 fish during 123.5 gill net hours in 2009 (Table 15). Salmonids comprised 12.3% of the catch and non-game species added the remaining 87.7%. The catch consisted of 8 bull trout, 3 brook trout, 2 westslope cutthroat trout, 21 northern pikeminnow, and 72 largescale suckers *Catostomus macrocheilus*. Sampled bull trout had a mean total length of 280.0 mm, brook trout 227.7 mm, westslope cutthroat trout 314.5 mm, northern pikeminnow 310.6 mm, and largescale sucker 272.7 mm. A CPUE of 0.9 fish/hour represents the lowest catch rate recorded for Yellowbelly Lake gill net sampling efforts.

The 2009 results in Table 15 indicate a slight increase in the number of salmonids (12%) compared to 2007(10%). However, salmonid numbers continue to be sampled in the single-digit realm and the proportion of salmonids in Yellowbelly Lake has remained depressed since 2001 when the salmonid proportion was 59%. Eight bull trout were counted in this year's sample while one bull trout was encountered in the 2007 survey (Table 15). Likewise, three brook trout were observed in this year's gill net sample compared to eight in 2007, and two westslope cutthroat trout were recorded this year compared to five fish in 2007. No rainbow trout were observed in this year's sample although three were netted in 2007. As noted by Esselman et al. (2008), the removal of the migration barrier at the outlet may be contributing to the movement and/or colonization of different species from the main-stem Salmon River. Yellowbelly Lake gill net surveys from 2004 to 2009 indicate the continued dominance of non-game species, particularly sucker species.

From 2002 to 2006, between 1,200 and 6,600 westslope cutthroat trout fry were stocked in Yellowbelly Lake every year, but apparently these stockings were unsuccessful in establishing a westslope cutthroat trout population. This may be due to the relatively low numbers of westslope cutthroat trout fry available for stocking along with an inconsistent stocking pattern in past years. The goal of establishing a westslope cutthroat fishery in a drainage and lake system dominated by non-salmonids and exotic salmonids continues to challenge regional fishery staff. In 2008, cutthroat stocking was increased to 11,000 fry. This year, a total of 19,044 cutthroat fingerlings and 12,500 cutthroat fry were stocked in the lake. The IDFG stocking database was updated to reflect the region's request for 30,000 cutthroat fingerlings for five years.

Genetic samples from eight bull trout and two cutthroat trout along with otoliths from seven bull trout and two cutthroat trout were archived in the Salmon Regional office.

ZQI values averaged 0.02 in 2009, slightly less than the 2008 finding of 0.03 (Table 16; Figure 6). These results indicate that forage resources are limited and competition for food is likely occurring for fish in Yellowbelly Lake.

Yellowjacket Lake

The August 7-8, 2009 gill net set resulted in the capture of 3 westslope cutthroat trout and 17 rainbow trout. The combined gill net set time produced a CPUE of 0.65 fish/hour. Sampled cutthroat trout ranged in length from 215 - 260 mm total length and averaged 241.7 mm. Their weight ranged from 100 - 170 g and averaged 135 g. Rainbow trout lengths ranged from 135 - 304 mm total length and averaged 229.1 mm while weights ranged from 35 - 240 g and averaged 131 g. Likely, the captured fish are the result of

hatchery stocking. Relative weight calculations on this year's rainbow trout sample showed a mean value of 85.4. A value of 100 is considered average for North American populations.

Regional fishery staff conducted a two-man amphibian survey August 7, 2009 at Yellowjacket Lake during a 69-minute interval (combined time). Nine Columbia spotted frog *Rana luteiventris* adults, 2 spotted frog juveniles, and one western long-toed salamander *Ambystoma macrodactylum* adult were observed (Table 9).

MANAGEMENT RECOMMENDATIONS

Carlson Lake

Continue monitoring Carlson Lake to determine the effects of tiger muskellunge introduction on the size structure of the brook trout population. Develop a management plan to include the addition of more predators and an objective size range for brook trout.

Herd Lake

In 2011, monitor Herd Lake to determine the effects of tiger muskellunge introduction on the size structure of the rainbow trout population. Consider using angling prior to gill netting to look at bias of sampling gear. Move the timeframe of angling and gill net sampling to correspond to previous June surveys.

Hyde Pond

Request approximately 300 triploid rainbow trout be added to the November stocking of Hyde Pond by Mackay Fish Hatchery for the annual ice fishing derby the following January.

Jimmy Smith Lake

Monitor the fish population in Jimmy Smith Lake as a control for the Herd Lake tiger muskellunge experiment. Move sampling timeframe to correspond to previous surveys.

Williams Lake

Perform a power analysis to determine numbers of nets to deploy during gill net efforts.

As funds and personnel are available, continue to monitor DO levels and water temperature at specified location and depth to provide a long-term dataset of water quality parameters in Williams Lake. Consider having an IDFG cooperators monitor DO levels on a monthly, semi-monthly or quarterly schedule.

Request an increased take of bull trout to allow overnight gill net sets that will make survey data compatible to previous years. A consistent sample methodology would allow a more accurate evaluation of bull trout and rainbow trout proportion.

Continue rainbow trout trapping and spawning operations in Lake Creek. Stock the resulting fry in Lake Creek.

Yellowbelly Lake

Stock westslope cutthroat fry at a rate of 200 fry per surface acre or 38,000 fry total.

Perform a power analysis to determine numbers of gill nets to deploy for fish population assessments.

Yellowjacket Lake

Results of the recent survey show that amphibians were detected at Yellowjacket Lake, indicating that current stocking strategies allow for the presence of amphibians. Re-survey the lake every five years to ensure continued amphibian presence.

Table 4. Names and locations of Salmon Region's lowland lakes, reservoirs, and ponds.

Name	IDFG Catalog No.	Location in WGS84 Decimal Degrees	
		Latitude °N	Longitude °W
Lowland Lakes:			
Alturas Lake	0700001778.00	43.915180	-114.859160
Bayhorse Lake #1	0700001338.00	44.420066	-114.387990
Bayhorse Lake #2	0700001339.00	44.411810	-114.389570
Buster Lake	0700001337.00	44.430930	-114.412430
Cape Horn Lake #1	0700001112.00	44.403310	-115.136170
Cape Horn Lake #2	0700001113.00	44.412480	-115.131400
Carlson Lake	0700001303.00	44.281590	-113.752660
Grouse Creek Lake	0700001296.00	44.400600	-113.962100
Herd Lake	0700001343.00	44.088740	-114.173500
Iron Lake	0700001279.00	44.960620	-114.195050
Jimmy Smith Lake	0700001345.00	44.168830	-114.402050
Josephus Lake #1	0700000985.00	44.549180	-115.141900
Little Redfish Lake	0700001347.00	44.161190	-114.908750
Meadow Creek Lake	0700001274.00	44.432240	-113.315920
Mill Creek Lake	0700001254.00	44.656900	-113.660390
Perkins Lake	0700001770.00	43.928670	-114.840510
Pettit Lake	0700001757.00	43.979550	-114.876740
Redfish Lake	0700001617.00	44.100880	-114.929830
Stanley Lake	0700001553.00	44.244680	-115.057640
Wallace Lake	0700001218.00	45.246140	-114.006150
Williams Lake	0700001277.00	45.016340	-113.974880
Yellowbelly Lake	0700001734.00	44.001280	-114.875720
Yellowjacket Lake	0700000803.00	45.068900	-114.554340
Reservoirs:			
Mosquito Flat Reservoir	0700001327.00	44.517870	-114.435860
Stone Reservoir	0700001269.00	44.588050	-113.470400
Ponds:			
Blue Mountain Pond	0700001326.00	44.503620	-114.239360
Hayden Creek Ponds	0700001231.00	44.838300	-113.662540
Haynes Creek Pond	0700001231.00	44.998950	-113.733190
Hyde Creek Pond	0700001219.00	45.094030	-113.881730
Kelly Creek Pond	0700001518.00	44.283100	-114.922300
Kids Creek Pond	0700001222.00	45.168230	-113.890230
Squaw Creek Pond	0700001346.00	44.252860	-114.455870
Yankee Fork Dredge Pond #1	0700001434.00	44.312130	-114.716010
Yankee Fork Dredge Pond #2	0700001435.00	44.336910	-114.722820
Yankee Fork Dredge Pond #3	0700001436.00	44.342290	-114.723030
Yankee Fork Dredge Pond #4	0700001437.00	44.346830	-114.725290

Table 5. Zooplankton ratio (ZPR) and zooplankton quality index (ZQI) ratings from Teuscher, 1999.

ZPR > 0.6	Stock heavy density fingerlings (150-300 per acre)
0.6 > ZPR <= 0.25	Stock moderate density of fingerlings (75-150 per acre)
ZPR < 0.25	Stock less than 75 fingerlings per acre or catchables

ZQI > 0.60	Competition for food unlikely.
0.60 > ZQI > 0.10	Competition for food may be occurring.
ZQI < 0.10	Forage resources are limiting.

Table 6. Summary of brook trout sampling efforts in Carlson Lake, 1998 to 2000, 2002 to 2006, 2008, and 2009.

Year	Sample Dates	Total No. Fish	Total length (mm)	Mean Total Length (mm)	Mean Weight (g)	Total Gill Net Hours	Fish/Net Hour (CPUE)	Relative Weight	Population Estimate
1998	05/22-23	818	120-292	196.0	--	488.3	1.7	--	--
1999	05/27-29	1,151	112-300	198.0	--	386.1	3.0	--	--
2000	10/08-09	665	108-270	191.0	--	270.9	2.5	--	--
2002 ^a	06/13-14	546	102-266	191.8	77.3	147.8	3.7	89.6	9,900
2003	06/13-14	562	96-270	209.0	78.1	416.9	1.3	89.8	9,027
2004	06/15-16	48	156-251	223.9	96.1	60.5 ^b	0.8	85.9	--
2005	06/22-24	599	145-290	230.5	127.3	369.5	1.6	98.5	6,024
2006 ^a	06/19-20	151	127-301	216.0	129.5	160.7	0.9	113.6	--
2008	07/22-23, 08/14-15	67	154-270	224.5	115.0	20.5 ^c	3.3	96.6	--
2009	07/07-08	246	130-319	233.8	129.4	151.7	1.6	95.8	--

^a Tiger muskellunge introduction years.

^b Hoop net survey.

^c Hook and line survey.

Table 7. Summary of rainbow trout sampling efforts in Herd Lake for 1994, 1996, 2001 to 2003, 2005, 2006, 2008, and 2009.

Survey Dates	Sample Size	Size Range (Total Length mm)	Mean Total Length (mm)	Mean Weight (g)	No. Gill Nets	Total Gill Net Hours	Fish/Net Hour (CPUE ^a)	Relative Weight
08/01-02/1994	113	140-260	199	--		30.0	3.8	--
06/11-12/1996	15	160-292	258	--		16.0	0.9	--
06/21-22/2001	30	95-280	178	49.1		32.6	0.9	--
06/06-07/2002	81	97-350	200	106.7	4	51.2	1.6	--
07/31-08/01/2003	93	107-308	212	101.6	2	49.3	1.9	73.8
06/07-08/2005	272	163-292	207	82.7	4	65.2	4.2	71.8
06/13-15/2006 ^b	682	141-268	192	78.9	16	165.8	4.1	86.8
06/05/2008	100	135-312	226	122.1	-- ^c	--	10.0 ^d	79.9
05/20-21/2009	129	157-306	230	119.1	4	98.3	1.3	76.6

^a CPUE=Catch per unit effort.

^b Tiger muskellunge introduction year.

^c Sampled by angling.

^d Reported as fish/angling hour.

Table 8. Zooplankton quality index (ZQI) values for Herd Lake from 2002 to 2004, and 2006 to 2009.

Year	ZQI Sample			ZQI Average	ZPR Average
	Inlet	Mid-lake	Outlet		
2002	0.01	0.01	--	0.01	0.04
2003	0.01	0.01	--	0.01	0.05
2004	--	0.07	0.00	0.04	0.02
2006	0.01	0.02	--	0.02	0.14
2007	--	1.30	1.26	1.28	0.50
2008	--	1.13	0.82	0.98	1.02
2009	0.20	0.20	0.26	0.22	0.36

Table 9. Summary of fish and amphibian surveys conducted on Salmon Region lowland lakes during summer 2009.

LLID ^a	IDFG Catalog No.	Lake Name	Survey Date	Fish Species Observed	Amphibian Species Observed
1141832449129	0700001279.00	Iron Lake	08/08/2009	westslope cutthroat trout, rainbow trout	--
1145535450671	0700000805.00	Yellowjacket Lake	08/07/2009	westslope cutthroat trout, rainbow trout	Columbia spotted frog, Western long-toed salamander

^a LLID = Concatenated latitude-longitude in decimal degrees for centroid of lake.

Table 10. Summary of rainbow trout sampling efforts in Jimmy Smith Lake for 1964, 1996, 2001, 2003, 2005, 2006, 2008, and 2009.

Survey Date	Sample Size	Size Range (Total length mm)	Mean Total Length (mm)	Mean Weight (g)	No. Gill Nets	Total Gill Net Hours	Fish/Net Hour (CPUE ^a)	Relative Weight
12/15/1964	ND ^b	130-380	233	ND	ND	Creel sample	ND	ND
06/11/1996	157	155-332	213	ND	1	15.0	10.5	ND
06/21-22/2001	113	110-370	203	ND	1	16.5	6.8	ND
07/21/2003	144	112-368	277	283.3	4	62.2	2.3	105.5
06/07-08/2005	351	138-412	238	311.4	4	65.2	5.4	107.8
06/13-15/2006	809	133-419	222	162.7	4	181.8	4.4	107.5
07/31-08/01/2008	914	147-320	201	100.0	4	90.3	10.1	81.0
05/20-21/2009	689	132-325	203	83.7	4	69.8	9.9	77.7

^a CPUE=Catch per unit effort.

^b ND = No data.

Table 11. Zooplankton quality index (ZQI) values and average zooplankton ratio values for Jimmy Smith Lake, 2002, 2003, and 2006 to 2009.

Year	ZQI ^a . Sample Location			ZQI	ZPR ^b
	Inlet	Mid-lake	Outlet	Average	Average
2002	ND ^c	0.00	0.00	0.00	0.00
2003	0.10	0.20	ND	0.17	0.11
2004	ND	ND	ND	0.03	0.03
2006	0.02	0.26	0.17	0.15	0.23
2007	ND	0.02	0.02	0.02	0.16
2008	ND	0.02	0.02	0.02	0.25
2009	0.01	0.01	0.01	0.01	0.05

^a ZQI = Zooplankton quality index.

^b ZPR = Zooplankton ratio.

^c ND = No data; location not sampled.

Table 12. Summary of rainbow trout and bull trout gill net sampling in Williams Lake, 1992, 1993, 1996, 2000, 2003, 2007, and 2009.

Sample Date	Species ^a and No. Fish Encountered	Total No. Fish	RBT		BU		Total Gill-net Hours	Fish/Hour (CPUE ^b)	RBT Relative Weight
			Range	Mean	Range	Mean			
06/09/1992	RBT 180 BU 13	193	140-470	303.0	170-340	255.0	94.4	2.0	--
06/24/1993	RBT 48 BU 9	57	160-440	323.8	225-355	289.4	55.8	1.0	--
06/14/1996	RBT 42 BU 4	46	140-500	271.0	205-455	295.0	26.3	1.7	--
10/23/2000	RBT 10 BU 1	11	180-430	314.5	378	378.0	7.0	1.2	--
09/16/2003	RBT 78 BU 15	93	164-480	279.9	180-400	268.6	77.8	1.2	88.6
09/27/2007	RBT 183 BU 17	200	145-420	310.6	230-335	279.1	25.7	7.8	79.9
10/01/2009	RBT 20 BU 32	52	145-430	294.6	230-455	342.5	22.9	2.3	94.6

^a RBT = Rainbow trout, BU = Bull trout.

^b CPUE = Catch per unit effort.

Table 13. Zooplankton quality index (ZQI) values and average zooplankton ratio (ZPR) values at Williams Lake, 2000 to 2003, 2005, 2008, and 2009.

Year	ZQI ^a . Sample Location			ZQI	ZPR ^b
	Inlet	Mid-lake	Outlet	Average	Average
2000	ND ^c	ND	ND	0.67	0.86
2001	0.65	0.71	1.40	0.92	0.65
2002	0.29	0.98	0.71	0.66	0.70
2003	0.50	0.80	0.80	0.72	1.55
2005	0.15	0.60	0.92	0.56	0.71
2008	0.24	0.72	1.23	0.73	0.80
2009	0.85	0.85	0.39	0.70	0.51

^a ZQI = Zooplankton quality index.

^b ZPR = Zooplankton ratio.

^c ND = No data.

Table 14. Summary of dissolved oxygen samplings taken at Williams Lake, 2000, 2002 to 2006, and 2010.

Year	Sample Date	Dissolved Oxygen Measurements (mg/L) Taken at 1 Meter Depth Increments											Water Temp. (°C)
		Surface	1 m	2 m	3 m	4 m	5 m	6 m	7 m	8 m	9 m	10 m	
2000	06/20	-- ^a	9.6	--	--	--	--	--	9.4	8.5	--	4.9	--
2002	03/06	9.80	8.00	6.00	4.20	3.70	3.40	3.20	3.00	1.90	0.50	0.40	0.0
2003	03/19	--	1.88	1.75	1.73	1.74	1.76	1.77	1.78	1.79	1.79	1.80	4.0
2004	02/06	9.40	8.80	8.20	7.60	6.90	6.30	5.70	5.10	4.40	3.80	3.20	0.0
2005	02/15	6.20	4.40	3.20	2.40	2.20	2.10	2.10	1.90	1.90	1.70	1.20	--
2006	01/20	12.80	10.80	10.10	10.00	10.00	9.70	9.40	9.20	9.00	8.60	8.20	--
2010	02/11	13.09	11.13	4.67	3.68	3.20	2.98	2.68	2.27	1.97	1.67	1.41	0.2

^a No measurement taken.

Table 15. Summary of Yellowbelly Lake gillnetting efforts, 1961, 1978, 2001, 2004 to 2007, and 2009.

Sample Month and Year	Total Catch	Salmonid Species ^a					Total Salmonids (%)	Other species ^b		Total Gill Net Hours	Fish/ Hour
		RBT	CT	EBT	BU	MWF		SUC	NPM		
Year 1961	57	0	0	0	2	3	5 (3.0)	43	9	--	--
October 1978	58	0	1	4	0	0	5 (9.0)	50	1	--	--
June 2001	96	0	1	56	0	0	57 (59.0)	39	0	35.2	2.8
July 2004	376	9	4	36	0	0	49 (14.0)	296	27	123.5	3.0
June 2005	240	0	5	20	12	0	37 (16.0)	166	35	141.8	1.7
June 2006	157	0	3	6	0	0	9 (6.0)	129	19	160.7	1.0
June 2007	163	3	5	8	1	0	17 (10.4)	127	19	64.9	2.5
June 2009	106	0	2	3	8	0	13 (12.3)	72	21	123.5	0.9

^a Salmonids: RBT = rainbow trout, CT = westslope cutthroat trout, EBT = brook trout, and BU = bull trout, and MWF = mountain whitefish.

^b Other species: SUC = sucker and NPM = northern pikeminnow.

Table 16. Zooplankton quality index (ZQI) values and average zooplankton ratio (ZPR) values at Yellowbelly Lake, 2007, 2008, and 2009.

Year	ZQI ^a . Sample Location			ZQI	ZPR ^b
	Inlet	Mid-lake	Outlet	Average	Average
2007	0.00	0.00	0.04	0.01	0.22
2008	0.05	0.02	0.01	0.03	0.40
2009	0.02	0.02	0.00	0.02	0.10

^a ZQI = Zooplankton quality index.

^b ZPR = Zooplankton ratio.

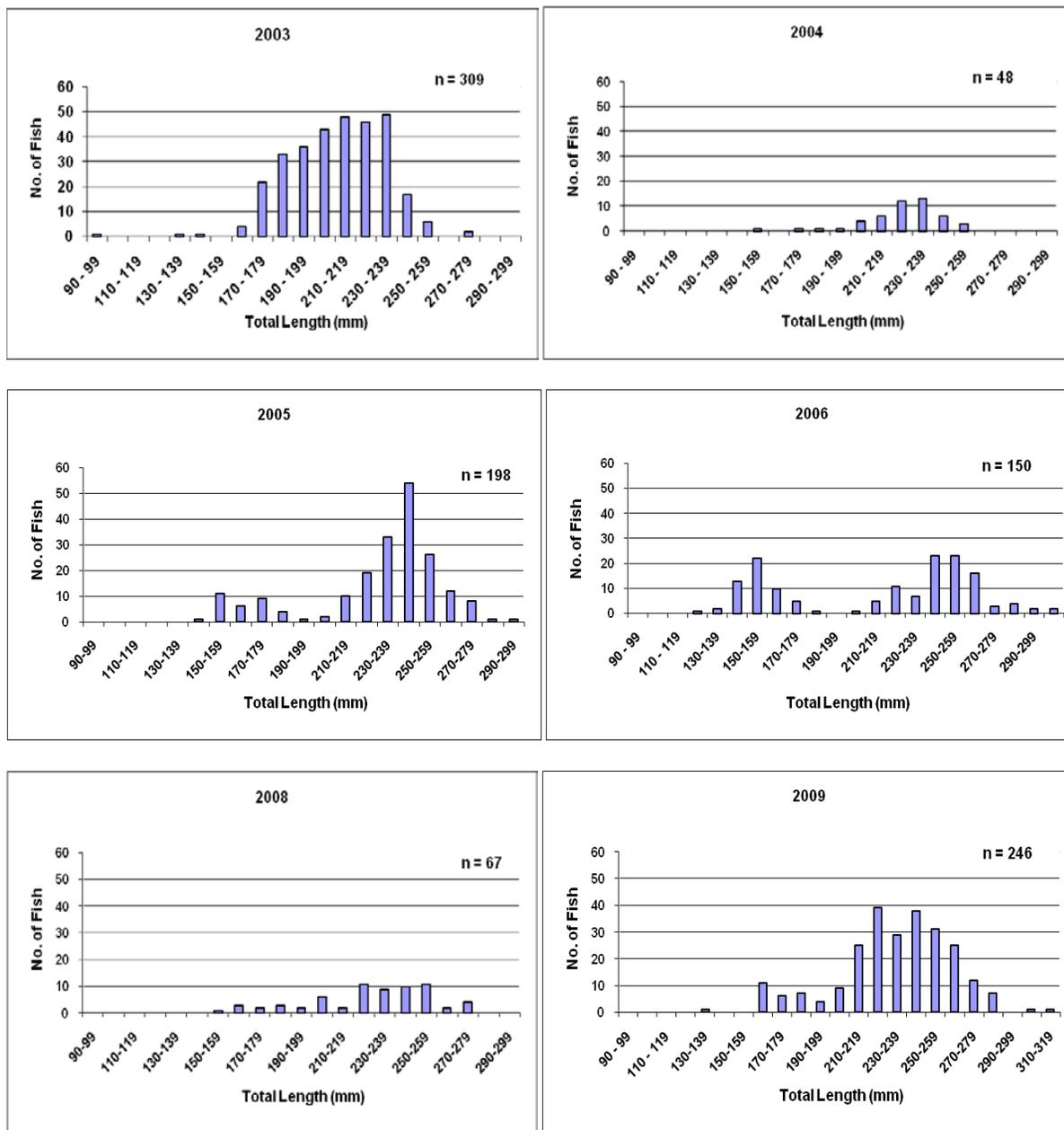


Figure 1. Brook trout length frequency histograms for Carlson Lake, 2003-2006, and 2008-2009.

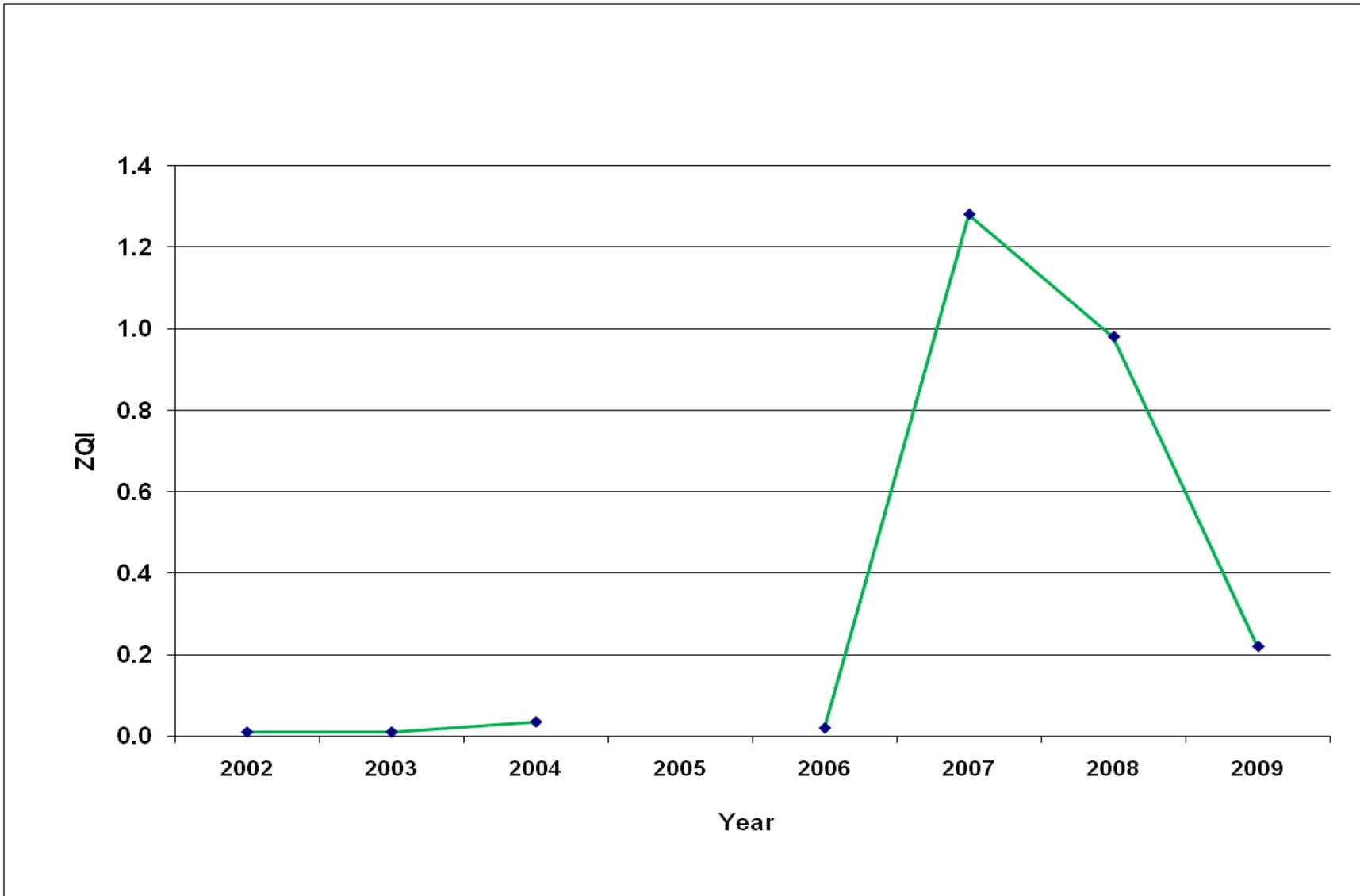


Figure 2. Mean zooplankton quality index (ZQI) values for Herd Lake from 2002-2004, and 2006 to 2009.

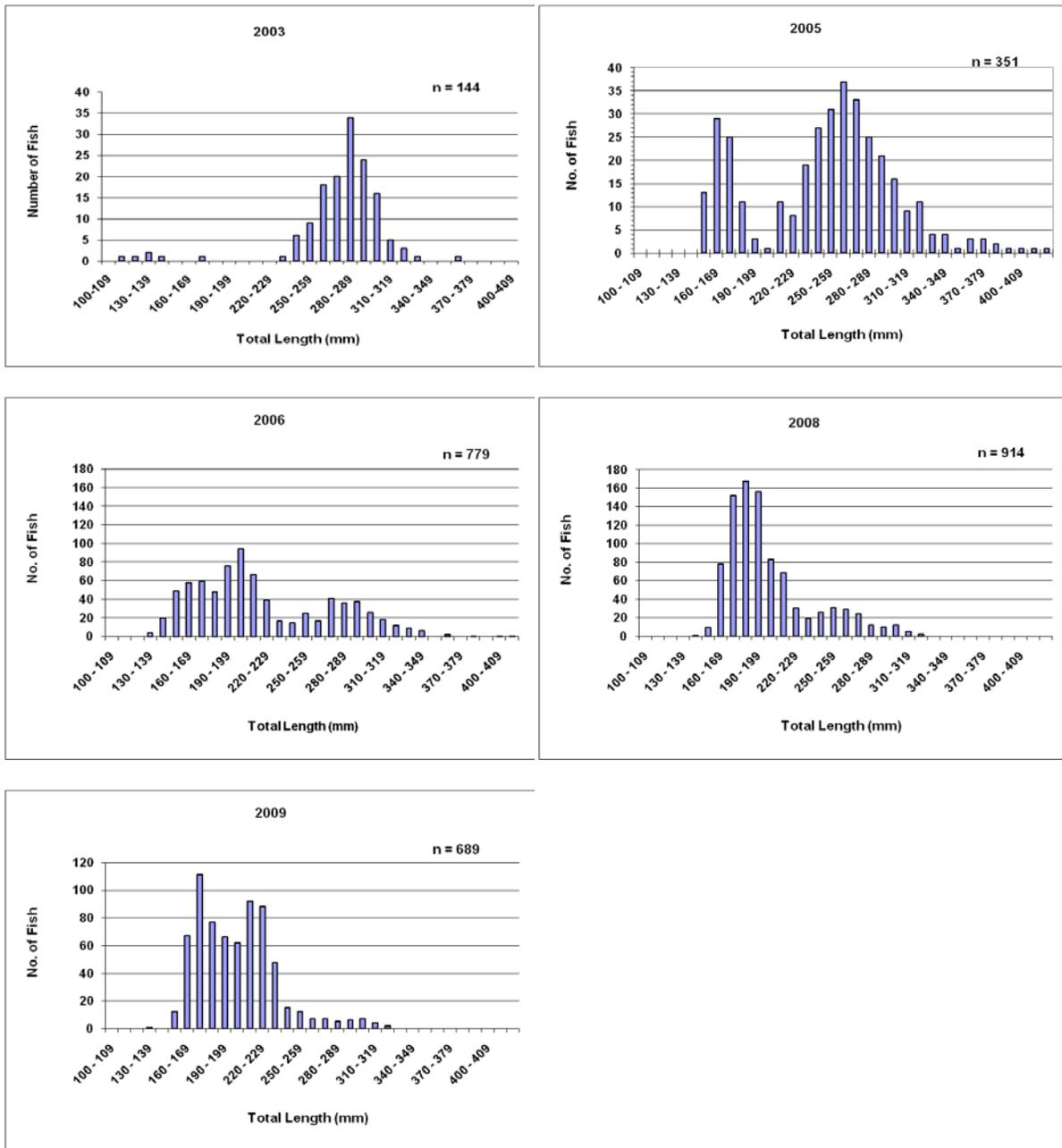


Figure 3. Comparison of rainbow trout length frequencies sampled in Jimmy Smith Lake in 2003, 2005, 2006, 2008, and 2009.

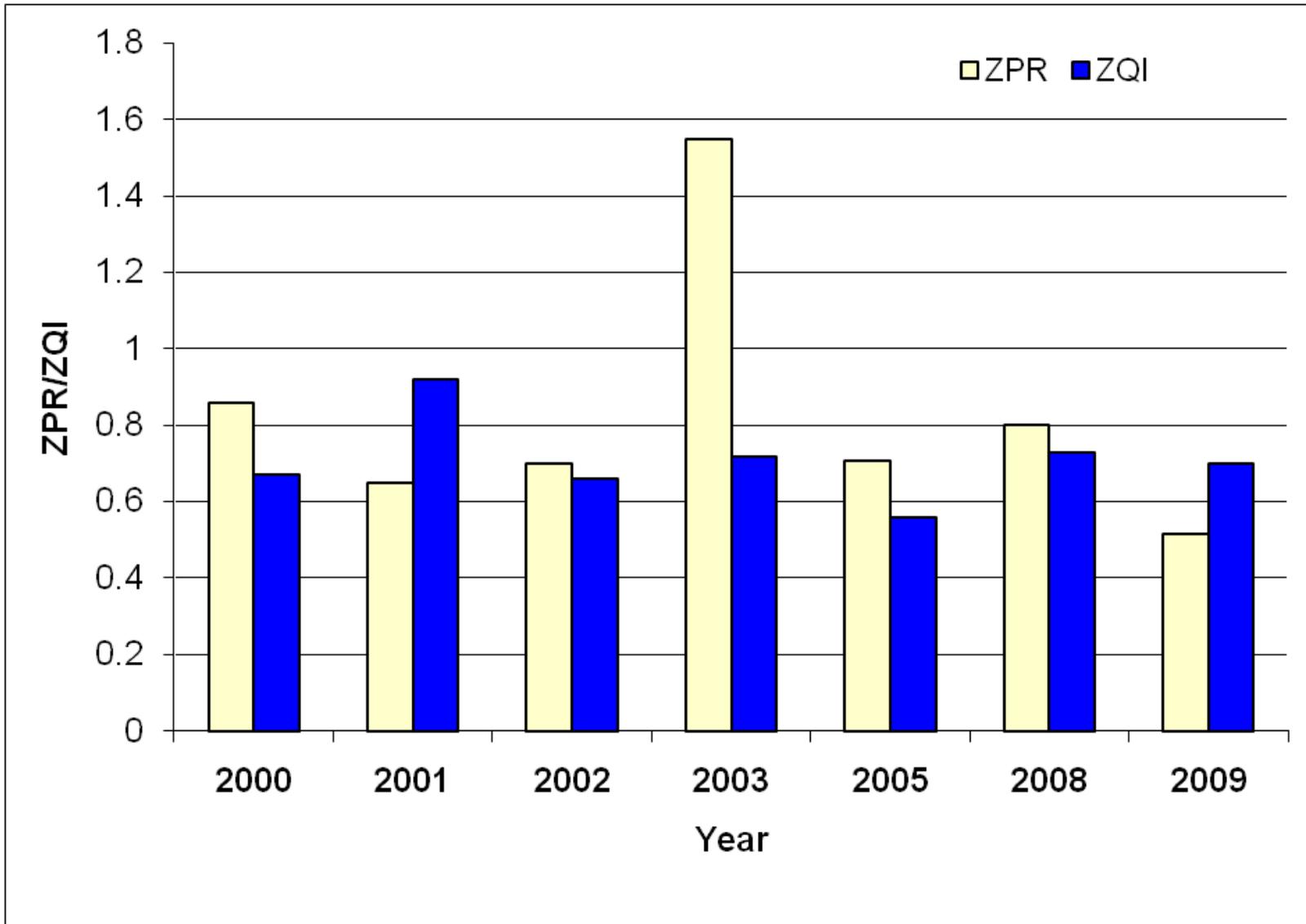


Figure 4. Zooplankton ratio (ZPR) and zooplankton quality index (ZQI) values at Williams Lake, 2000 to 2003, 2005, 2008, and 2009.

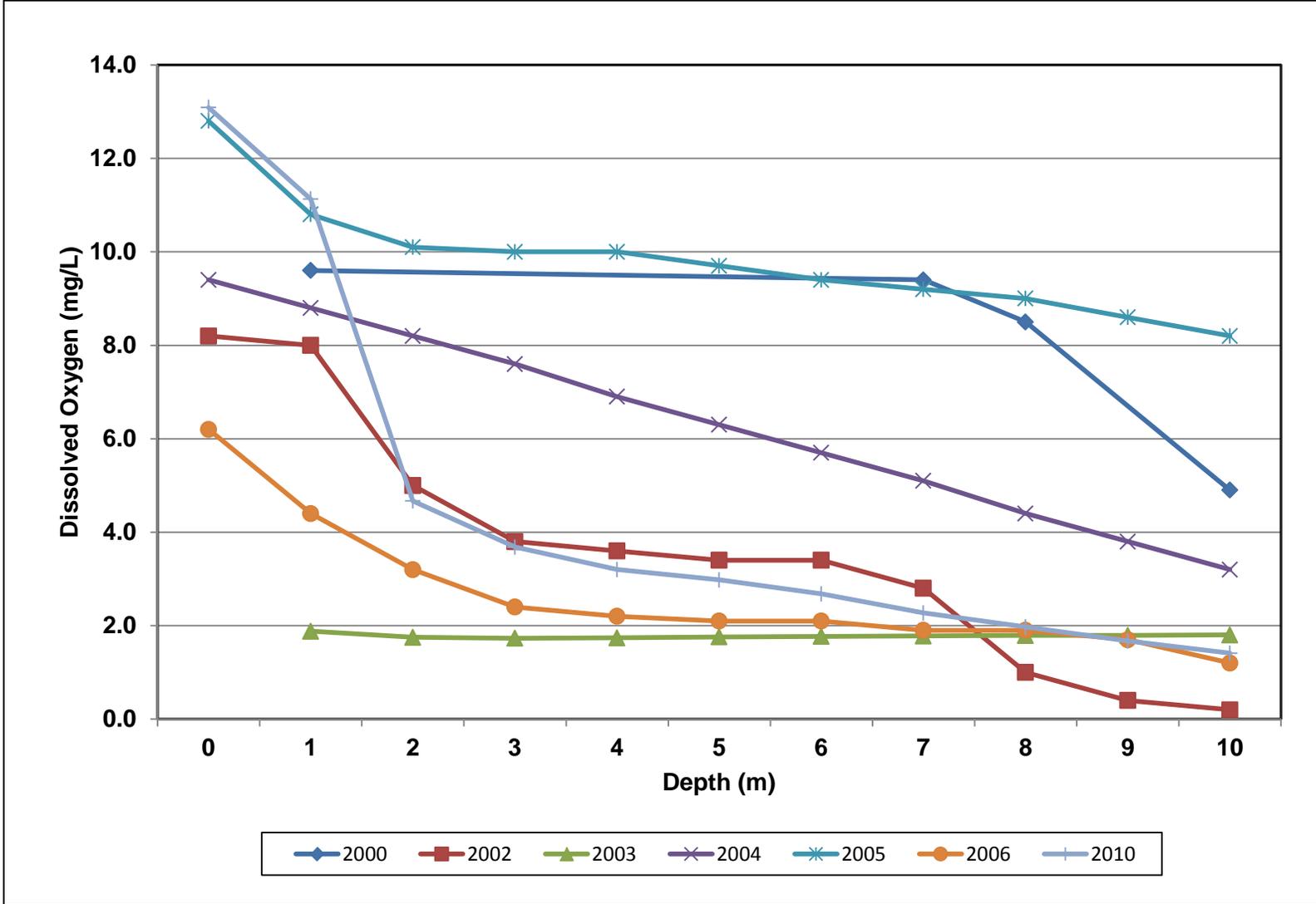


Figure 5. Dissolved oxygen profile sampling of Williams Lake, 2000, 2002 to 2006, and 2010.

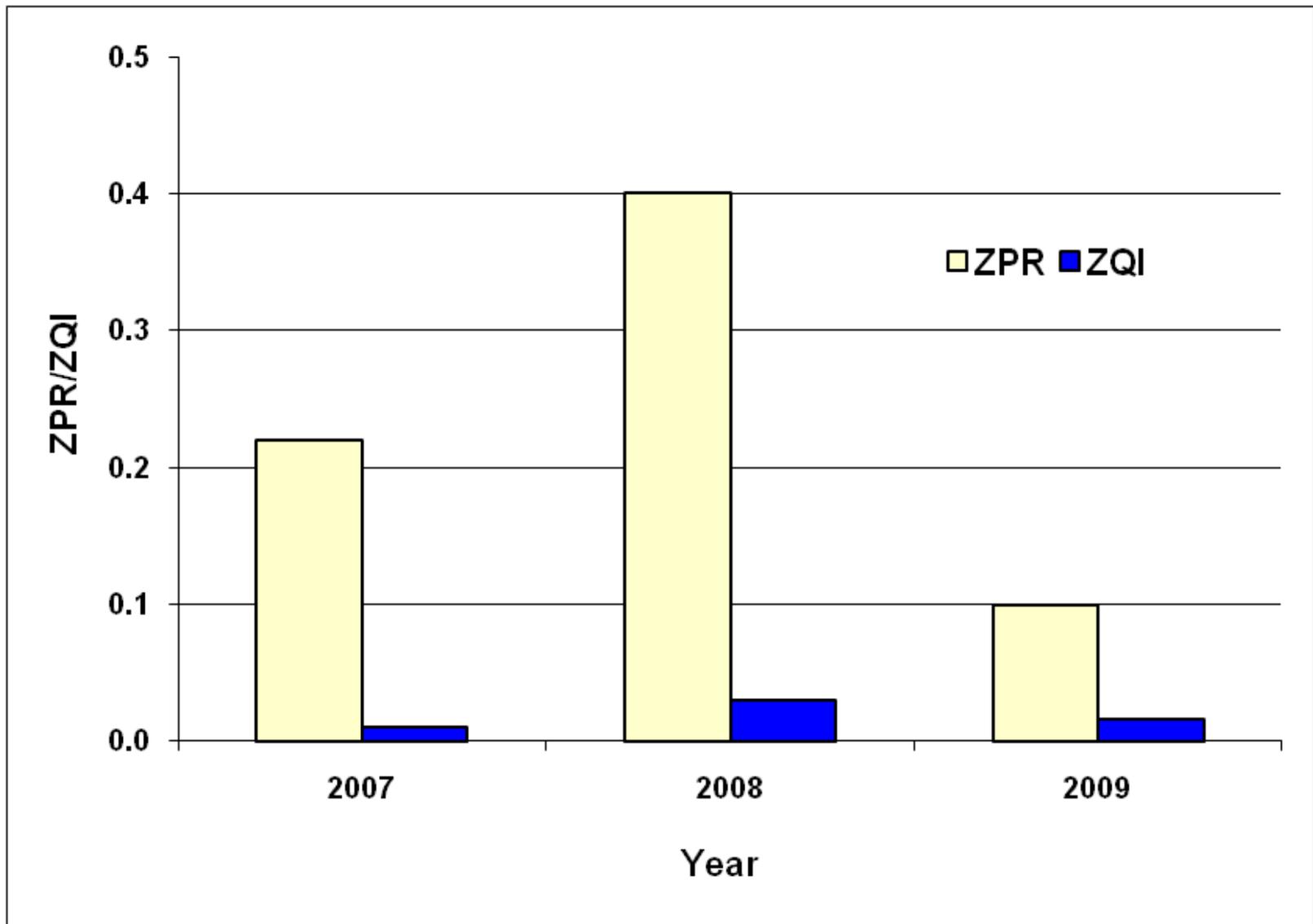


Figure 6. Zooplankton ratio (ZPR) and zooplankton quality index (ZQI) values at Yellowbelly Lake, 2007 to 2009.

SALMON REGION FISHERY MANAGEMENT 2009 ANNUAL REPORT

River and Stream Surveys - Wild Trout Population Monitoring

ABSTRACT

Personnel from IDFG, the SCNF, the Salmon District of the Bureau of Land Management (BLM), and the Sawtooth National Forest (SNF) sampled 165 streams of the upper Salmon River basin to determine fish species composition, relative abundance, and size distribution. Of these 165 creeks surveyed, 151 had salmonid or non-salmonid fish species present. Rainbow trout/steelhead were found in 58% of the 151 fish-bearing streams surveyed and had total lengths ranging from 27 to 430 mm. Westslope cutthroat trout were found in 59% of the fish-bearing streams surveyed and had total lengths ranging from 20 to 350 mm. Bull trout were found in 55% of the fish-bearing streams and had total lengths ranging from 35 to 700 mm. Brook trout were found in 17% of the surveyed streams with fish present and had total lengths ranging from 26 to 288 mm. Juvenile Chinook salmon *O. tshawytscha* were found in 6% of surveyed streams with fish present. Apparent cutthroat/rainbow hybrid trout *O. clarkii lewisi* x *O. mykiss* were found in 13% of streams where fish were detected and had total lengths ranging from 64 to 231 mm. Apparent bull/brook hybrid trout *S. confluentus* x *S. fontinalis* were found in 3% of the 151 fish-bearing streams and had total lengths ranging from 155 to 325 mm.

Other species recorded during 2009 stream surveys included sculpin *Cottus sp.*, which were found in 35% of the 151 fish-bearing streams, mountain whitefish *Prosopium williamsoni*, found in 5% of fish-bearing streams, and dace (including longnose dace *Rhinichthys cataractae* and speckled dace *R. osculus*), found in 3% of the fish-bearing creeks. Redside shiner *Richardsonius balteatus* and suckers were each found in 1% of fish-bearing creeks.

Redd counts were conducted on rainbow trout/redband and bull trout spawning areas to monitor trends in the Salmon Region. A total of 164 rainbow trout redds were counted in three survey transects in the upper Lemhi River and Big Springs Creek. Additionally, 22 bull trout redds were counted in a trend transect of upper Hayden Creek. Bull trout trend sites surveyed in the upper Salmon River drainage near Stanley documented 95 redds.

Fifty rainbow trout were counted at the Pahsimeroi Fish Hatchery rack. Fish encountered at the East Fork Satellite Facility included 200 bull trout, 7 westslope cutthroat trout, and 98 mountain whitefish. Twenty-four bull trout, 10 westslope cutthroat trout, 8 rainbow trout, 6 mountain whitefish, and 170 suckers were encountered at Sawtooth Fish Hatchery weir. The Redfish Lake Creek trap encountered 72 bull trout, 584 sockeye salmon *O. nerka*, 1 Chinook salmon, 1 mountain whitefish, 250 suckers, and 263 northern pikeminnow *Ptychocheilus oregonensis*.

INTRODUCTION

Wild Trout Population Surveys

During the summer and fall of 2009, personnel from IDFG, the SCNF, the Salmon Office BLM, and the SNF cooperatively inventoried fish communities in tributary streams of the upper Salmon River basin. Accurate and current information is needed to effectively manage fish stocks, particularly since several threatened fish species, including bull trout, Chinook salmon, and steelhead trout (anadromous rainbow trout), and one endangered fish species, sockeye salmon, are known to inhabit the upper Salmon River basin.

Fluvial Trout Monitoring

Alpine and Fishhook Creeks

In 1998, standardized bull trout redd count surveys were initiated on Alpine Creek (a tributary to Alturas Lake) and Fishhook Creek (the inlet to Redfish Lake) in the upper Salmon River drainage to monitor long-term bull trout spawning trends. These transects were established by and surveyed by the IDFG sockeye recovery team.

Bear Valley Creek

This year marked the eighth year of counting bull trout redds in Bear Valley Creek, a tributary of Hayden Creek in the Lemhi River drainage. The area surveyed in Bear Valley Creek is located within a relatively low gradient meadow formed by a historic landslide. The redd count transect is located about 3.2 km upstream from the confluence of Bear Valley Creek with Hayden Creek. Bear Valley Creek is an important tributary for spawning fluvial bull trout in the Lemhi River drainage (Esselman et al. 2008).

Big Springs Creek and Lemhi River

In 1994, IDFG initiated resident rainbow trout redd count surveys on Big Springs Creek, a tributary to the upper Lemhi River near Leadore. By 1997, regional fishery staff established three transect areas to monitor long-term resident rainbow trout population trends: two transects on Big Springs Creek and one on the upper Lemhi River. This annual monitoring effort is conducted to identify trends in the number of redds observed. Fishing rule changes on the Lemhi River were implemented in 1994 so that only rainbow trout 356 mm (14 inches) and greater could be harvested. Theoretically, rule changes, habitat improvement projects, and tributary reconnect projects should produce increased numbers of spawning rainbow trout within these transects.

Big Timber Creek

In 2007, trend transects were established in Big Timber Creek, a tributary to the Lemhi River, to monitor fish population responses to habitat improvement projects. Baseline data collected since 2007 will be used to assess changes in stream habitat, fish abundance, distribution, and survival as stream reconnect projects are completed.

East Fork Hayden Creek

East Fork Hayden Creek, a tributary to Hayden Creek in the Lemhi River drainage, has a bull trout spawning transect located in a meadow 5 km upstream from its confluence with Hayden Creek. Counts have been done in this trend transect since 2002. In 2009, the redd count area added a reach from the mouth of East Fork Hayden Creek upstream to the trend transect. This additional area was counted on September 28, 2009.

Fourth of July Creek

Bull trout redds in Fourth of July Creek were counted for the seventh year in 2009. Fourth of July Creek is a tributary to the main stem Salmon River, 23.4 km south of Stanley, in the SNRA. The survey transect starts approximately 6.8 km upstream from the mouth of Fourth of July Creek and ends approximately 5.8 km upstream from the start of the transect. Bull trout redd counts in Fourth of July Creek were initiated in 2003 to monitor fish population responses to recent flow improvement projects, elimination of passage barriers at diversion structures, and screening of irrigation ditches.

Hayden Creek

Historically, Hayden Creek has been monitored annually in early fall for Chinook salmon spawning redds. Within the Lemhi River drainage, the Hayden Creek watershed is the only known location where fluvial-sized bull trout rear and spawn (Lamperth et al. 2007). In 2005, many bull trout adults were observed spawning in upper Hayden Creek above the mouth of Bear Valley Creek. Consequently, regional fishery staff initiated bull trout redd counts on Hayden Creek from approximately the confluence of Bear Valley and Hayden Creek upstream to the mouth of Carol Creek.

Kenney Creek

Transects were established in Kenney Creek, a tributary to the Lemhi River, to monitor fish population responses to habitat improvement projects. Baseline data has been collected since 2007 that will be used to assess changes in stream habitat, fish abundance, distribution, and survival as stream reconnect projects are completed.

Pahsimeroi, East Fork, Squaw Pond, Redfish Lake Creek, and Sawtooth weirs and traps

Annually, resident salmonid species are encountered at the Pahsimeroi, East Fork, Squaw Pond, Redfish Lake Creek, and Sawtooth Fish Hatchery weirs as part of routine steelhead and Chinook salmon trapping activities. These resident salmonid catches provide a reliable method of enumerating fluvial fish migrating into the Pahsimeroi River, East Fork Salmon River, and the upper Salmon River drainage.

OBJECTIVES

Evaluate fish populations in rivers and streams of the Salmon Region.

Evaluate the effects of harvest restrictions and habitat improvement efforts on resident rainbow trout populations in Big Springs Creek and the upper Lemhi River.

Evaluate the number of bull trout redds in Bear Valley, East Fork Hayden, Hayden, Bray, Wright, West Fork Hayden, Alpine, Fishhook, and Fourth of July creeks to provide baseline and trend information relative to bull trout recovery efforts and harvest restrictions. Based on bull trout movement studies, transects were established to include other spawning reaches.

STUDY AREA AND METHODS

Wild Trout Population Surveys

Between June 15 and November 3, 2009, 165 streams of the Salmon River basin were surveyed for fish composition, relative abundance, and size distribution. Stream characteristics, including temperature, transect length, width, and area sampled, were typically recorded for each of the 365 electro-fishing transects surveyed in 2009. Drainage information and map coordinates were also documented.

Fish presence and abundance was determined using backpack electro-fishing methodologies. Site locations were selected to encompass a complete coverage of fish communities within various habitats, although some locations were based on adequate access and permission from landowners.

Streams were sampled by electro-fishing, typically with a backpack electrofisher (typically a Smith Root, Inc. Model 15 or 15D). Samplers attempted to catch all sizes of fish while moving upstream in transects that ranged from 50 to 320 m in length following one of two stream survey protocols. For a standard stream survey, a given transect was sampled one, two, three times, and in seven instances, four times. Captured fish were measured in total length (mm), placed in holding pens, and monitored for recovery. Once electro-fishing was completed, fish were released back into the surveyed reach. Genetic samples were taken on some game fish for analysis. Whitefish and non-game fish were enumerated and, at times, measured depending on the collecting agency. The second survey type used was presence and absence sampling whereby a stream section of unmeasured length and width was sampled to determine if fish could be detected. The deviation between sampling methods was a result of varying agency objectives and needs at sampling locations.

Where applicable, density estimates were expressed as the number of fish per 100 m². Population estimates were calculated using Microfish[®] population software (Van Deventer and Platts, 1986). Population estimates for all species of salmonids were calculated for two-, three-, and four-pass electro-fishing transect sites when a 50% reduction in salmonid numbers was counted. Estimates were based on total sample size of all salmonids sampled during each electro-fishing pass. When consecutive electro-fishing passes did not achieve a 50% reduction, no population estimate for the stream transect was calculated. Young of the year (age-0) fish were included in density estimate calculations. However, age-0 fish were not included in population estimates when individual species could not be identified during electro-fishing surveys. Negative 95% confidence interval values that resulted from population estimate calculations were noted but not reported in Table 15.

Fluvial Trout Monitoring

Alpine and Fishhook Creeks

Two counts are conducted annually about two weeks apart on both Alpine and Fishhook creeks in the Stanley Basin, to monitor the timing and numbers of bull trout spawning redds. In addition to the Fishhook Creek trend transect, a second transect site was established in 2008 after survey crews observed bull trout spawning below the trend transect site in 2006 and 2007 (K. Plaster, IDFG, personal communication). For each stream and transect, all redds in progress or completed redds were counted during the first survey and flagged for later identification. On the second survey in each transect, additional redds were counted and included with the number of flagged redds to provide a total number of redds counted. Latitude and longitude coordinates in decimal degrees for the Alpine Creek survey transect start at 43.90685°N, -114.93049°W, and end at 43.90509°N, -114.93806°W. Coordinates for the Fishhook Creek trend transect start at 44.13666°N, -114.96846°W, and end at 44.13962°N, -114.97864°W. Coordinates for the recently established (2008) Fishhook Creek transect begin at 44.13695°N, -114.96793°W and end at 44.13456°N, -114.97396°W. Redd counts were conducted by IDFG research personnel on Alpine Creek August 27 and September 9, 2009. The Fishhook Creek transect was surveyed on August 27 and September 11, 2009 while the recently established (2008) transect on Fishhook Creek was surveyed on August 27 and September 10, 2009.

Bear Valley Creek

Fluvial and resident bull trout redd counts on Bear Valley Creek were conducted September 9, 16, and 22, 2009 by regional fishery staff using visual ground count methods. Fluvial bull trout redds were classified as redds equal to or greater than 0.4 m by 0.6 m in diameter. Redds smaller in size were considered to be constructed by smaller, resident bull trout. The trend transect starts at latitude and longitude decimal degree coordinates of 44.77604°N, 113.74279°W and ends at 44.78339°N, -113.75476°W. The Bear Valley transect consists of "C"-channel habitat (Rosgen, 1996). In 2007, redd counts on Bear Valley Creek were expanded to include a reach beginning at the mouth of Wright Creek upstream to a point 0.8 km below Buck Creek (Start: 44.78339°N, -113.75476°W and end: 44.79727°N, -113.81159°W). This transect, located above the trend transect site in Bear Valley Creek, was surveyed on September 24 2009 using methods outlined above. A lower section of Wright Creek, a tributary to Bear Valley Creek, was not surveyed in 2009.

Big Springs Creek and Lemhi River

In 1997 we established three transects to monitor long-term resident rainbow trout population trends, two on Big Springs Creek and one on the upper Lemhi River near Leadore. The two sites on Big Springs Creek include the entire stream flowing through the property known as the Karl Tyler Ranch (latitude and longitude decimal degrees start location: 44.70896°N, -113.39917°W and end: 44.72855°N, -113.43430°W) and the historic Darwin Neibaur Ranch (Start: 44.70047°N, -113.38436°W, and end: 44.70896°N, -113.39917°W). The upper Lemhi River site includes that section of river flowing through the property known as the Merrill Beyeler Ranch from the fence line 100 m upstream of the upper water gap to the lower fenced boundary (Start: 44.68689°N, -113.36273°W, and end: 44.69945°N, -113.37074°W). Redd counts are usually conducted during the last week of April or the first week of May using visual ground count methods. This year, regional fishery personnel conducted redd counts on May 4, 2009.

Big Timber Creek

Five transects of Big Timber Creek in the upper Lemhi River drainage were surveyed in 2009 using electro-fishing methods described in “Wild Trout Population Studies” above. All salmonids were scanned with a passive integrated transponder (PIT) tag reader to detect recaptured fish. Captured rainbow trout were marked with a PIT tag inserted into the body cavity while bull trout were marked with a PIT tag inserted into the cheek. Cheek tagging of bull trout was done to ensure longer retention of PIT tags through spawning activity. However, bull trout less than 180 mm total length were not PIT tagged because of the smaller tagging zone in the cheek. No bull trout were tagged after September 1 when fish may have begun spawning. Cutthroat trout were not PIT tagged. Surveys were conducted from August 25 to September 29, 2009. Latitude and longitude decimal degree coordinates for the Big Timber Creek sections start at 44.66194°N, -113.37610°W, and end at 44.52880°N, -113.42548°W.

East Fork Hayden Creek

Resident bull trout redd counts on East Fork Hayden Creek were conducted September 9 and 16, 2009 using visual ground count methods. The trend transect starts at latitude and longitude decimal degree coordinates 44.72984°N, -113.67145°W, and ends at 44.72438°N, -113.66671°W. The East Fork Hayden Creek transect consists of “C”-channel (Rosgen, 1996) type habitat. An additional survey on East Fork Hayden Creek was conducted on September 28, 2009 from the mouth of East Fork Hayden Creek upstream to the start of the transect. Coordinates for this additional transect start at 44.75998°N, -113.71261°W and end at 44.72984°N, -113.67145°W.

Fourth of July Creek

Salmon Region fishery staff conducted the Fourth of July Creek bull trout redd count on September 10, 2009 using visual ground count methods. Coordinates for the Fourth of July Creek survey start at latitude and longitude decimal degree coordinates 44.04112°N, -114.75831°W and end at 44.05039°N, -114.69165°W.

Hayden Creek

Expanded transects, developed in 2006 on upper Hayden Creek, were surveyed for fluvial and resident bull trout redds in 2009 incidental to a yearly survey for Chinook salmon redds using visual ground count methods. Classification of fluvial and resident bull trout redds followed the same protocol as listed above for Bear Valley Creek. In past years, two survey dates were selected to correspond as closely as possible with the peak of fluvial bull trout spawning activity and approximately one week after the peak in the trend transect. In 2009, three counts were conducted in the trend transect (mouth of Bear Valley Creek upstream to the mouth of Carol Creek). Survey counts began September 10 and ended September 24, 2009. The trend transect site, located from the mouth of Bear Valley Creek upstream to Carol Creek, begins at latitude and longitude decimal degree coordinates 44.77281°N, -113.70777°W and ends at 44.70230°N, -113.73804°W. Transects located above Carol Creek previously surveyed were not completed in 2009 due to limited manpower and time (Table 23). UTM coordinates for the upper Hayden Creek transects (above Carol Creek) surveyed prior to 2009 start at 44.70230°N, -113.73804°W, and end at 44.70217°N, -113.77665°W.

Kenney Creek

Three transects in Kenney Creek, a tributary to the Lemhi River, were surveyed in 2009 using electro-fishing methods described above. Salmonids were scanned with a PIT tag reader to determine recaptured fish. Captured rainbow trout were marked with a PIT tag inserted into the body cavity while bull trout were marked with a PIT tag inserted into the cheek. Bull trout less than 180 mm total length were not PIT tagged because of the smaller tagging zone in the cheek. No bull trout were tagged after September 1 when fish may have begun spawning. Cutthroat trout were not PIT tagged in 2009. Surveys were conducted from July 21 to September 3, 2009 to collect baseline data before an IDFG cooperative stream reconnect project is initiated. Latitude and longitude decimal degree coordinates for the Kenney Creek transects begin at 45.04076°N, -113.62202°W, and end at 45.06121°N, -113.58539°W.

Pahsimeroi, East Fork, Squaw Pond, Redfish Lake Creek and Sawtooth weirs and traps

Pahsimeroi, East Fork, Squaw Pond, and Sawtooth Fish Hatchery personnel annually provide results of resident salmonids encountered during routine steelhead and Chinook salmon trapping operations for reporting and analysis by regional fisheries staff. Additionally, a temporary weir and trap was operated on Redfish Lake Creek to monitor salmonid movement in and out of Redfish Lake. The trap was installed on July 6, 2009 and operated until October 20, 2009. Counts of bull trout on Redfish Lake Creek were established to monitor migratory bull trout in Redfish Lake. In 2005, Schoby (2006) documented the movement of large proportions of bull trout from the main stem Salmon River into the Redfish Lake system to overwinter. The Redfish Lake Creek trap was operated until the third week of October 2009 to more accurately track migratory bull trout populations using the Redfish Lake system.

RESULTS AND DISCUSSION

Wild Trout Population Surveys

Salmonids and non-game fish were found in 151 (92%) of 165 streams surveyed in the Salmon Region (Tables 17-19). Rainbow trout (N = 3,759) was the most abundant salmonid species observed during this year's investigations. Rainbow trout were found in 87 (58%) of the 151 fish-bearing streams and ranged in size from 27 to 430 mm total length (Tables 17 and 18). The highest densities of rainbow trout were found in Boulder and North Fork Lawson creeks. Westslope cutthroat trout (N = 2,001) were found in 89 (59%) fish-bearing streams and had total lengths ranging from 20 to 350 mm. Squaw and Hammerean creeks had the highest densities of westslope cutthroat trout. Bull trout (N = 1,708) were observed in 83 (55%) fish-bearing streams and had total lengths ranging from 35 to 700 mm. The highest densities of bull trout occurred in Owl and Lick creeks. Brook trout (N = 1,398) were found in 26 (17%) fish-bearing streams and had total lengths ranging from 26 to 288 mm. The highest densities of brook trout were found in Flat and Hull creeks. Juvenile Chinook salmon (N = 119) were found in 9 (6%) fish-bearing streams. Two transects on Lyon Creek had the highest densities of juvenile Chinook salmon. Apparent cutthroat/rainbow hybrid trout (N = 273) were found in 20 (13%) of the 151 fish-bearing tributary streams. Cutthroat/rainbow hybrid trout lengths ranged from 64 to 231 mm with the highest densities found in Lick and Morgan creeks. Apparent bull/brook hybrid trout (N = 10) were found in 4 (3%) of the 151 fish-bearing tributary streams. Bull/brook hybrid trout lengths ranged from 155 to 325 mm total length with the highest densities were found in the Pahsimeroi River and Swamp Creek. Fish were not detected in 14 of the 165 streams surveyed during 2009.

Mountain whitefish, sculpin *Cottus sp.* species, longnose dace and speckled dace, and sucker species were also recorded during 2009 surveys (Table 19). Sculpin were detected and counted in 28 (19%) tributaries surveyed with fish present. The highest densities of sculpin enumerated during surveys were found in Sulphur and Lyon creeks. The number of sculpin (N = 3,055) shown in Table 19 should be considered very low since non-game species were not targeted during surveys by some cooperating agencies and were not enumerated on some surveys. Sculpin were detected in 25 additional stream transects in 2009, but were not individually tallied during surveys. Mountain whitefish (N = 35) were identified in 7 (5%) streams surveyed with fish present. Dace, including both longnose and speckled dace (N = 208), were encountered in 5 (3%) streams surveyed with fish present. Sucker and redbside shiner *Richardsonius balteatus* were each detected in one (1%) fish-bearing stream (Lemhi River) but were not enumerated. In future surveys, cooperating agencies will be asked to enumerate and account for mountain whitefish and other non-game fish.

Standard stream survey protocol was followed on 100 streams surveyed in 2009. The remaining 65 streams were sampled for presence and absence. More detailed information on stream survey sites is located in Appendix D, which lists stream transects, sampling dates, transect measurements, sub-basin locations, and UTM coordinates.

Fluvial Trout Monitoring

Alpine and Fishhook Creeks

No bull trout redds were observed in a trend transect on Alpine Creek in 2009, mirroring results of zero redds in 2008 (Table 20). In 2008, the survey crew suspected that a natural barrier prevented upstream migration of bull trout to their usual spawning areas (M. Peterson, IDFG, personal communication). However, to date, a crew has not walked the creek in its entirety from the mouth upstream to the survey transect to confirm a blockage or determine the extent of the suspected barrier. In 2009, bull trout were observed spawning below the trend transect in Alpine Creek (M. Peterson, IDFG, personal communication).

Thirty-three redds were observed in the trend transect in Fishhook Creek in 2009, compared to 13 redds counted in 2008 (Table 21). A new bull trout spawning transect was added downstream of the original trend transect site in Fishhook Creek in 2008. Twelve redds were observed in this new section in 2009 compared to 14 redds counted in 2008 (Table 22). Prior to 2008 and 2009, the Alpine Creek counts have remained relatively stable (Figure 7), varying from 9 to 18 redds counted each year. The Fishhook Creek trend transect data have shown more variation than Alpine Creek since 2000, with counts ranging from 11 to 33 per year (Figure 11). However, since bull trout may spawn every year or on alternating years, redd count numbers may vary from year to year (Willard et al. 2005).

Bear Valley Creek

Regional fishery staff counted 42 fluvial bull trout redds in the Bear Valley Creek trend transect in 2009, compared with 27 bull trout redds observed in 2008 (Table 23, Figure 8). Prior to 2009, the trend of bull trout redds counted in this transect has been fairly stable but reduced compared to the previous seasons. It was suggested that angling pressure and possible illegal harvest may be displacing spawning bull trout adults. The increase number of redds this year may indicate natural variability rather than some human influence. In 2009, reduced staff were unable to cover the Wright Creek transect.

Big Springs Creek and Lemhi River

We observed a total of 164 rainbow trout redds in two Big Springs Creek transects and one transect in the upper Lemhi River (Figure 9). One hundred redds were counted in the historic Neibaur Ranch transect while 54 redds were observed in the current Tyler Ranch transect (Table 24). Ten redds were counted in the Beyeler Ranch transect in the upper Lemhi River. This year's overall redd count decreased by 199 redds from 2008.

Reviewing redd counts from the three survey reaches over time suggests that our previous theory of alternate year spawning in this rainbow trout population is unlikely. Figure 6 shows a modest increase since 1997; however, the total number of redds counted has fluctuated from 39 to 556 annually and may indicate unknown factors are affecting the rainbow trout spawning population. These sites will continue to be monitored annually and trends will be evaluated in the rainbow trout population. Habitat changes will be monitored to document improvements in the riparian habitat.

Big Timber Creek

Six electro-fishing surveys resulted in a total of 221 salmonids detected during 2009 surveys (Table 25). This year's total was comprised of 50 bull trout, 166 rainbow trout, and 5 westslope cutthroat trout. Three bull trout and 162 rainbow trout received PIT tags during this year's surveys. An additional 8 PIT-tagged salmonids were recaptured from tagging operations in 2007 and 2008. These eight recaptures consisted of 5 bull trout and 3 rainbow trout.

East Fork Hayden Creek

A total of 54 bull trout redds were observed in East Fork Hayden Creek transect in 2009 compared to 61 found in 2008 (Table 23, Figure 10). An additional 11 redds were counted in below the trend transect (from the mouth of East Fork Hayden upstream to the trend transect start). Bull trout redds in this transect have been steadily increasing for the last five years. This population appears to be a solely resident population with individuals being appreciably smaller in size than the fluvial bull trout in Bear Valley Creek (Esselman et al. 2008; Lamperth 2007). Genetic evaluation of this and other Lemhi River bull trout populations confirmed that this population, while predominantly a resident population, has significant genetic diversity. This diversity may be due to connectivity with main stem Hayden Creek during high water years or to East Fork Hayden Creek's large population size, or combination of the two factors (Kozfkay et al. 2008).

Fourth of July Creek

Fifty completed bull trout redds were counted in the Fourth of July Creek transect (Table 26, Figure 12) in 2009; a 24-redd increase from 2008. Since counts were initiated in 2003, there has been a general upward trend in redd counts. This population is likely responding to improved passage conditions within the watershed, screening facilities on irrigation ditches that protect juvenile salmonids and increased flows during fall migration. A wildfire immediately after the 2005 survey changed the characteristics of the watershed. Long-term impacts to the bull trout population are yet to be determined.

Hayden Creek

Twenty-two bull trout redds were counted in the Hayden Creek trend site in 2009 compared to 21 bull trout redds counted in 2008 (Table 23). Both resident and fluvial-sized bull trout were observed spawning in Hayden Creek from the mouth of Bear Valley Creek upstream to the mouth of Carol Creek, marking the fifth consecutive year of this behavior being observed. Similar spawning behavior has also been observed in Bear Valley and Big Timber creeks in the Lemhi River drainage. A recent genetic study of this population confirmed that drainage size and connectivity have sustained high levels of genetic diversity (Kofzkay et al. 2008). Further, Kofzkay et al. noted that Hayden Creek and Bear Valley Creek populations experienced this highest degree of genetic cross-assignment of 14 Lemhi River drainages studied, and are not genetically differentiated from one another, suggesting high gene flow between these two tributaries.

Kenney Creek

Electro-fishing surveys in three transects resulted in the capture of 83 salmonids in Kenney Creek (Table 27). Rainbow trout was the most numerous salmonid encountered (N=60), followed by westslope cutthroat trout (N=14), bull trout (N=7), and brook trout (N=2). An additional 27 PIT tag recaptures were detected during surveys from previous tagging operations in Kenney Creek and elsewhere in the Lemhi River drainage (Curet et al. 2009a, 2009b).

Pahsimeroi, Squaw Pond, East Fork, Redfish Lake Creek, and Sawtooth weirs and traps

In the last 10 years, the trend in the number of resident rainbow trout migrating past the Pahsimeroi Fish Hatchery weir is increasing (Table 28; Figure 13). The male to female sex ratio continues to consistently favor females over the recorded period (Table 28). This year, 68% of the rainbow trout encountered at the Pahsimeroi trap were female. Current picket spacing at the Pahsimeroi weir possibly favors passage of resident male rainbow trout upriver through the weir while inhibiting female movement. No other incidental salmonids were counted at the Pahsimeroi weir during the spring steelhead spawning period.

Trapping at the East Fork Satellite Facility resulted in 200 bull trout, 7 westslope cutthroat trout, and 98 mountain whitefish counted (Table 29). Generally, bull trout numbers appear to be increasing in the last six years (Figure 14). Westslope cutthroat and rainbows are relatively stable since 2004. Mountain whitefish show a decreasing trend for the same period.

Sawtooth Fish Hatchery counted 24 bull trout, 10 westslope cutthroat trout (2 of which were apparent cutthroat/rainbow hybrid trout), 8 rainbow trout, 6 mountain whitefish, and 170 suckers during trapping operations in 2009 (Table 30). The number of bull trout captured at Sawtooth increased this year over 2008 while the number of rainbow and cutthroat trout remained unchanged from last year (Figure 15). Counts of resident salmonids have generally increased in the past five years. Rainbow trout counts at Sawtooth Fish Hatchery should be altered in future years to delineate wild/natural and hatchery-origin rainbow trout.

The Squaw Creek steelhead trap has not trapped any resident trout since its inception in 2002. Biologists have determined that the adult weir design is not appropriately sized to trap resident fish.

The Redfish Lake Creek trap captured 72 bull trout, 584 sockeye salmon, 1 Chinook salmon, 1 mountain whitefish, 263 northern pikeminnow, and 250 suckers encountered during its 107-day trapping season (Table 31). The overall salmonid count increased in 2009 when compared to 2008. Although there were 24 less bull trout counted this year compared to last year, the number of sockeye salmon increased 35% with 584 counted this year compared to 432 in 2008.

Table 17. Combined salmonid^a population estimates (including fry) with 95% confidence intervals (CI), and species composition for selected streams in the upper Salmon River basin, 2009.

Stream	Transect ^b	Sample Date	Transect Area (m ²)	No. Fish Sampled	Population Estimate (95% CI)	Fish/100 m ²	Species Composition % ^c							
							CT	RBT	BU	CTx RBT	EBT	CK	BUx EBT	
Agency	M	07/14/2009	ND ^d	10	--	--								
Agency	M	07/14/2009	ND	4	--	--								
Agency	U	06/30/2009	ND	7	7 (5, 9)	--								
Agency	U	06/30/2009	ND	30	--	--	3							
Agency	U	07/02/2009	ND	11	--	--								
Agency	U	09/10/2009	ND	28	--	--	11							
Allan	L	07/14/2009	153.0	9	--	5.9	89							
Arrastra	L	07/22/2009	270.0	20	--	7.4								
Basin	L	09/09/2009	ND	57	60 (54, 66)	--								
Basin	M	08/06/2009	ND	7	7 (5, 9)	--	100							
Basin	M	08/27/2009	ND	8	8 (6, 10)	--	100							
Bayhorse	U	10/06/2009	ND	14	--	--	21							
Bear Valley	L	07/27/2009	ND	59	--	--	1		2					
Bear Valley	M	08/03/2009	ND	31	--	--	3							
Bear Valley	M	08/18/2009	388.0	27	29 (23, 35)	7.0			4					
Beaver	L	07/13/2009	603.4	11	--	1.8								100
Beaver	L	07/13/2009	638.0	7	--	1.1			43					57
Beaver	L	07/13/2009	698.9	16	--	2.3								100
Beaver	L	07/13/2009	721.6	24	--	3.3								100
Beaver	L	07/14/2009	707.7	6	--	0.8								100
Beaver	M	07/14/2009	749.0	34	--	4.5								100
Beaver	L	10/28/2009	236.0	10	--	4.2	67			33				
Beaver	M	07/14/2009	559.8	10	--	1.8								100
Beaver	M	07/14/2009	743.0	7	--	0.9								100
Beaver	M	07/14/2009	630.0	8	--	1.3								100
Beaver	U	07/15/2009	668.0	32	--	4.8								100
Beaver	U	07/15/2009	172.3	21	--	12.1	100							
Beaver	U	07/15/2009	317.5	24	--	7.6	100							
Big Bear	L	07/09/2009	290.0	7	7 (5, 9)	2.4	29		28				43	

Table 17. Continued.

Stream	Transect ^b	Sample Date	Transect Area (m ²)	No. Fish Sampled	Population Estimate (95% CI)	Fish/100 m ²	Species Composition % ^c						
							CT	RBT	BU	CTx RBT	EBT	CK	BUx EBT
Big Bear	L	08/20/2009	ND	8	8 (5, 11)	--	100						
Big Bear	L	08/06/2009	ND	16	16 (14, 18)	--	44	12	44				
Big Bear	M	07/30/2009	ND	36	--	--	78		22				
Big Bear	M	08/20/2009	ND	12	--	--	75	8	17				
Big Boulder	L	08/03/2009	454.7	9	--	2.0		22		78			
Big Boulder	M	08/03/2009	539.7	12	--	2.2			17	83			
Big Boulder	M	08/03/2009	466.4	11	--	2.4		27	9	64			
Big Boulder	U	08/04/2009	460.8	5	--	1.1	40		40	20			
Big Boulder	U	08/04/2009	602.0	18	--	3.0		11	89				
Big Boulder	U	08/04/2009	458.5	7	--	1.5	29	14	14	43			
Big Boulder	U	08/04/2009	ND	4	--	--	25		25	50			
Big Boulder	U	08/05/2009	510.7	24	--	4.7	67	4	29				
Big Boulder	U	08/05/2009	488.0	24	--	4.9	62	38					
Big Boulder	U	08/05/2009	359.0	13	--	3.6	62			38			
Big Eightmile	M	08/19/2009	480.0	42	--	8.8			100				
Big Eightmile	U	09/01/2009	ND	108	--	--			100				
Big Eightmile	U	09/10/2009	ND	83	88 (80, 96)	--		2	98				
Big Hat	U	09/02/2009	270.0	36	--	13.3	17	83					
Big Jureano	L	10/27/2009	52.0	4	--	7.7		100					
Big Timber	L	08/25/2009	ND	7	--	--		86	14				
Big Timber	M	08/19/2009	646.0	13	13 (11, 15)	2.0		92	8				
Big Timber	M	09/15/2009	ND	62	66 (61, 72)	--		92	8				
Big Timber	M	09/29/2009	ND	59	72 (66, 78)	--		98	2				
Big Timber	U	09/14/2009	ND	49	53 (45, 61)	--	10	10	80				
Big Timber	U	09/17/2009	ND	52	55 (49, 61)	--		95	5				
Birdseye	L	07/22/2009	232.0	20	--	8.6		76	5		19		
Bog	L	07/09/2009	90.0	11	--	12.2	100						
Boulder	L	09/17/2009	262.0	66	--	25.2		95				5	
Buck	L	08/05/2009	ND	10	--	--	80	20					
Bull Spring	L	09/08/2009	118.0	0	--	--							
Camas	L	07/31/2009	ND	46	--	--		100					
Canyon	L	06/16/2009	ND	15	19 (6, 32)	--		73			27		

Table 17. Continued.

Stream	Transect ^b	Sample Date	Transect Area (m ²)	No. Fish Sampled	Population Estimate (95% CI)	Fish/100 m ²	Species Composition % ^c						
							CT	RBT	BU	CTx RBT	EBT	CK	BUx EBT
Canyon	L	06/18/2009	ND	26	27 (23, 31)	--		100					
Canyon	L	07/06/2009	ND	43	43 (40, 46)	--		100					
Canyon	L	09/09/2009	ND	55	59 (51, 67)	--		100					
Canyon	U	06/15/2009	ND	0	--	--							
Canyon	U	09/24/2009	ND	0	--	--							
Cape Horn	L	08/07/2009	510.4	47	50 (43, 57)	9.2		2	15	23	60		
Carmen	U	08/25/2009	644.0	83	87 (80, 94)	12.9			100				
Castle	L	09/10/2009	484.0	69	--	14.3		88	12				
Challis	U	07/22/2009	428.7	16	17 (13, 21)	3.7	44		13	25	13		5
Clear	M	08/19/2009	302.3	15	17 (9, 25)	5.0		93	7				
Clear	M	08/19/2009	111.8	9	--	8.1		11	89				
Cooper	L	09/23/2009	254.0	22	--	8.7			100				
Corral	L	07/16/2009	262.0	15	--	5.7	33	7		60			
Corral	L	07/30/2009	244.0	11	--	4.5	100						
Corral	M	07/16/2009	261.0	16	17 (12, 22)	6.1	88		12				
Cougar	M	08/05/2009	256.5	32	--	12.5			100				
Cruikshank	U	06/18/2009	ND	27	29 (23, 35)	--	100						
Dahlonge	M	09/29/2009	276.0	33	--	12.0	24	76					
Dairy	L	08/06/2009	274.0	29	--	10.6		14	86				
Deep	L	08/24/2009	226.0	27	--	11.9	100						
Deer	L	08/10/2009	294.0	33	--	11.2			85		15		
Deer	L	08/20/2009	134.0	0	--	--							
Deer	L	09/22/2009	30.0	0	--	--							
Deer	U	09/21/2009	250.0	5	--	2.0	100						
Ditch	M	07/14/2009	559.0	23	--	4.1	30	70					
Ditch	U	07/14/2009	615.0	23	--	3.7	100						
Divide	L	06/25/2009	ND	0	--	--							
Divide	L	06/25/2009	ND	0	--	--							
Divide	M	06/25/2009	ND	0	--	--							
East Fork Hayden	L	08/03/2009	ND	66	72 (63, 81)	--	12		88				
East Fork Indian	L	09/30/2009	ND	0	--	--							
East Fork Indian	M	09/30/2009	102.0	0	--	--							

Table 17. Continued.

Stream	Transect ^b	Sample Date	Transect Area (m ²)	No. Fish Sampled	Population Estimate (95% CI)	Fish/100 m ²	Species Composition % ^c							
							CT	RBT	BU	CTx RBT	EBT	CK	BUx EBT	
East Fork Indian	M	09/30/2009	78.0	0	--	--								
East Fork Mayfield	L	08/11/2009	608.6	33	34 (30, 38)	5.4		73	18				9	
East Fork Morgan	L	08/03/2009	566.0	13	13 (11, 15)	2.3	7		62	31				
East Fork Pahsimeroi River	M	08/10/2009	361.0	12	15 (3, 27)	3.3					100			
East Fork West Pass	U	08/04/2009	357.0	0	--	--								
East Fork West Pass	U	08/04/2009	310.0	0	--	--								
East Fork Pierce	L	09/29/2009	104.0	10	--	9.6	100							
East Fork Spring	L	08/04/2009	207.0	16	--	7.7	19	81						
East Pass Flat	L	08/04/2009	452.0	13	13 (12, 14)	2.9		62	38					
East Pass Ford	M	10/27/2009	112.0	52	60 (46, 74)	46.4						100		
Fourth of July	L	08/20/2009	128.0	8	--	6.3	100							
Frank Hall	U	08/25/2009	360.0	34	37 (30, 44)	9.4				100				
Frank Hall	M	07/15/2009	210.0	37	48 (27, 69)	17.6	100							
Friedorf Gulch	L	08/12/2009	ND	0	--	--								
Fritzer Gulch	L	10/27/2009	92.0	14	--	15.2		100						
Furnace	L	09/10/2009	450.0	14	--	3.1		93	7					
Garland	M	08/11/2009	295.0	15	--	5.1	93		7					
Garland	M	08/11/2009	321.4	29	--	9.0	97		3					
Garland	M	08/11/2009	190.9	13	--	6.8	100							
Gunsight	L	08/05/2009	217.9	30	--	13.8	90	3		7				
Hammerean	U	08/12/2009	202.0	40	--	19.8	100							
Hawley	L	07/15/2009	ND	0	--	--								
Hawley	L	07/15/2009	ND	0	--	--								
Hawley	M	06/23/2009	ND	0	--	--								
Hawley	M	06/23/2009	ND	0	--	--								
Hawley	M	08/18/2009	412.0	11	11 (9,13)	2.7	18	82						
Hayden	L	08/31/2009	ND	76	--	--		67	4				29	
Hayden	L	09/21/2009	ND	133	--	--		68	9				23	
Hayden	L	09/30/2009	ND	183	--	--		84	2				14	
Hayden	M	08/04/2009	ND	55	--	--	18	2	73				7	

Table 17. Continued.

Stream	Transect ^b	Sample Date	Transect Area (m ²)	No. Fish Sampled	Population Estimate (95% CI)	Fish/100 m ²	Species Composition % ^c						
							CT	RBT	BU	CTx RBT	EBT	CK	BUx EBT
Hayden	M	08/17/2009	ND	8	--	--			37	63			
Hayden	M	08/18/2009	ND	30	--	--			33	67			
Haynes	U	09/28/2009	ND	0	--	--							
Hood Gulch	L	08/06/2009	160.0	16	--	10.0			100				
Hot Springs	M	10/27/2009	32.6	0	--	--							
Hughes	M	07/20/2009	504.0	25	--	5.0	84			16			
Hughes	M	08/26/2009	468.0	83	88 (80, 96)	17.7	4		96				
Hull	L	08/26/2009	160.0	22	--	13.8			64			36	
Hull	L	10/01/2009	213.0	72	--	33.8			8			92	
Hull	M	09/30/2009	104.0	11	--	10.6	55		45				
Hull	M	10/01/2009	ND	0	--	--							
Hull	M	10/01/2009	ND	0	--	--							
Hull	U	09/30/2009	54.0	0	--	--							
Indian	M	07/30/2009	424.0	26	--	6.1	58			42			
Indian	M	07/30/2009	524.0	18	--	3.4	6		72	22			
Indian	M	09/30/2009	352.0	25	--	7.1	8		80	12			
Iron	L	07/20/2009	ND	0	--	--							
Iron	L	07/23/2009	374.0	23	--	6.4			91			9	
Iron	L	07/23/2009	529.2	77	--	14.6			71			29	
Iron	L	07/23/2009	353.5	9	--	2.5			78			22	
Iron	L	07/29/2009	468.3	84	--	17.9			11			89	
Iron	L	07/30/2009	400.0	33	--	8.3			58			42	
Iron	M	09/01/2009	514.0	23	--	4.5			96	4			
Iron	U	07/20/2009	284.4	3	--	1.1						100	
Iron	U	07/20/2009	397.9	14	--	3.5				50		50	
Jim	L	08/04/2009	711.5	5	--	0.7				100			
Johnson Gulch	M	08/12/2009	104.0	20	--	19.2	100						
Kadletz	L	08/20/2009	268.0	23	--	8.6	13			87			
Kenney	L	07/21/2009	ND	36	38 (31, 45)	--			100				
Kenney	L	09/03/2009	ND	55	--	--	1		93	2		5	
Kenney	M	07/22/2009	ND	20	--	--	65		5	30			
Kinnikinic	L	07/22/2009	268.0	18	--	6.7	100						

Table 17. Continued.

Stream	Transect ^b	Sample Date	Transect Area (m ²)	No. Fish Sampled	Population Estimate (95% CI)	Fish/100 m ²	Species Composition % ^c						
							CT	RBT	BU	CTx RBT	EBT	CK	BUx EBT
Kinnikinic	L	07/22/2009	310.2	24	--	7.7	100						
Lake	L	08/31/2009	34.0	8	--	23.5		75	25				
Lake	M	09/15/2009	328.0	34	--	10.4		53	47				
Lake	U	09/16/2009	202.0	0	--	--							
Lake	U	09/21/2009	182.0	2	--	1.1		50	50				
Lemhi River	L	08/10/2009	ND	2	--	--		100					
Lemhi River	L	08/17/2009	ND	7	--	--		100					
Lemhi River	M	08/25/2009	ND	17	--	--	5	65	24			6	
Lemhi River	M	08/24/2009	ND	23	31 (27, 35)	--		78	5			17	
Lemhi River	M	09/22/2009	ND	46	--	--		85	2			13	
Lemhi River	M	09/28/2009	ND	12	--	--		92	8				
Lemhi River	U	08/19/2009	ND	17	--	--		100					
Lemhi River	U	08/19/2009	ND	1	--	--		100					
Lick	L	09/14/2009	87.0	0	--	--							
Lick	M	07/15/2009	208.0	48	48 (46, 50)	23.1	19	2		79			
Lick	M	08/12/2009	178.0	49	53 (45, 61)	27.5	16		65	19			
Little Bear	L	09/22/2009	71.0	0	--	--							
Little Hat	U	07/07/2009	100.0	0	--	--							
Little Jureano	L	10/27/2009	15.2	0	--	--							
Little Springs	L	06/11/2009	ND	5	--	--		100					
Little Springs	M	06/11/2009	ND	3	--	--		100					
Little Springs	U	06/11/2009	ND	0	--	--							
Little Timber	M	08/01/2009	ND	0	--	--							
Loon	L	07/31/2009	ND	46	--	--		100					
Lyon	L	06/29/2009	138.7	30	36 (18,54)	21.6		83	4			13	
Lyon	L	07/28/2009	138.7	63	--	45.4		52	2			46	
Lyon	M	06/30/2009	391.6	70	94 (62, 126)	17.9		100					
Lyon	M	07/02/2009	242.0	18	--	7.4		100					
Lyon	U	07/28/2009	338.4	11	--	3.3		91		9			
Lyon	U	07/07/2009	137.4	0	--	--							
Marble	L	07/30/2009	ND	4	--	--		100					
Martin	L	07/29/2009	589.0	12	12 (11, 13)	2.0	58	25		17			

Table 17. Continued.

Stream	Transect ^b	Sample Date	Transect Area (m ²)	No. Fish Sampled	Population Estimate (95% CI)	Fish/100 m ²	Species Composition % ^c						
							CT	RBT	BU	CTx RBT	EBT	CK	BUx EBT
Martin	M	08/13/2009	257.0	41	41 (40, 42)	16.0	41		2	57			
McDevitt	M	06/29/2009	ND	14	--	--	7	93					
McDevitt	U	06/29/2009	ND	54	--	--	100						
McKay	L	07/22/2009	516.0	13	14 (9, 19)	2.5			92	8			
McKim	L	08/03/2009	365.0	40	--	11.0	57		43				
Middle Fork Little Timber	M	10/05/2009	286.0	13	--	4.5	100						
Mill	M	08/20/2009	362.0	31	--	8.6	19		81				
Mink	L	07/21/2009	202.0	2	--	1.0			100				
Moose	L	08/24/2009	202.0	33	34 (30, 38)	16.3	61		39				
Moose	U	08/05/2009	236.0	26	--	11.0	100						
Moose	U	08/05/2009	248.0	19	--	7.7	100						
Morgan	U	07/15/2009	149.0	29	29 (28, 30)	19.5	45			55			
Moyer	M	09/08/2009	648.0	40	-- ^e	6.2		43	57				
Moyer	M	09/28/2009	590.0	24	29 (19, 39)	4.1		37	63				
Musgrove	L	09/09/2009	466.0	19	--	4.1		89			11		
Napias	U	09/15/2009	310.0	58	80 (44, 116)	18.7		62	2		36		
North Fork Iron	L	09/01/2009	352.0	43	--	12.2		95	5				
North Fork Lawson	L	10/28/2009	98.0	17	--	17.3		100					
North Fork Little Timber	M	10/26/2009	524.0	17	--	3.2	94		6				
North Fork Morgan	M	08/03/2009	267.0	28	30 (24, 36)	10.5	7		71	22			
North Fork Salmon River	U	08/05/2009	298.0	35	--	11.7	91		9				
North Fork Williams	L	07/27/2009	210.0	21	--	10.0	100						
North Fork Williams	M	07/27/2009	254.0	31	--	12.2	100						
Opal	L	07/16/2009	250.0	7	--	2.8					100		
Otter	L	07/15/2009	306.0	29	--	9.5	31		69				
Owl	L	07/22/2009	827.8	33	-- ^e	4.0		91				9	
Owl	L	07/29/2009	260.6	81	83 (79, 87)	31.1		5	95				
Owl	M	07/30/2009	654.0	19	--	2.9		95	5				
Owl	M	07/30/2009	614.0	51	64 (42, 86)	8.3	2	94	2				2
Owl	U	08/20/2009	ND	24	--	--			100				

Table 17. Continued.

Stream	Transect ^b	Sample Date	Transect Area (m ²)	No. Fish Sampled	Population Estimate (95% CI)	Fish/100 m ²	Species Composition % ^c						
							CT	RBT	BU	CTx RBT	EBT	CK	BUx EBT
Owl	U	08/20/2009	265.7	20	--	7.5			100				
Pahsimeroi River	U	08/13/2009	1,240.0	15	--	1.2		47	47				6
Pahsimeroi River	U	08/13/2009	1,140.0	7	--	0.6			14				86
Panther	M	09/09/2009	522.0	29	--	5.6		86	10		4		
Panther	U	07/21/2009	308.0	20	--	6.5	90		10				
Panther	U	09/09/2009	498.0	25	--	5.0		24	4			72	
Patterson	M	06/17/2009	801.0	180	271 (191, 351)	22.5		3					97
Patterson	M	06/16/2009	850.9	31	-- ^e	3.6		13					87
Patterson	U	06/18/2009	602.0	107	116 (105, 127)	17.8		5					95
Patterson	U	06/18/2009	504.0	77	82 (74, 90)	15.2						100	
Patterson	U	07/13/2009	554.0	174	-- ^e	31.4		6					94
Patterson	U	07/15/2009	618.5	28	-- ^e	4.5		14					86
Payne	L	09/03/2009	123.0	1	--	0.8		100					
Perreau	L	09/02/2009	296.0	44	--	14.9	100						
Pierce	L	07/02/2009	196.0	26	27 (23, 31)	13.3	15	85					
Pigtail	L	08/10/2009	299.9	8	--	2.7	25		75				
Pigtail	L	08/10/2009	152.7	16	--	10.5	100						
Pigtail	L	08/12/2009	158.4	20	--	12.6	80		20				
Pigtail	M	08/12/2009	150.5	0	--	--							
Pigtail	M	08/12/2009	146.6	0	--	--							
Pigtail	U	08/12/2009	166.7	0	--	--							
Pine	L	08/27/2009	397.0	55	--	13.9		100					
Pine	L	08/27/2009	332.0	27	--	8.1		100					
Pine	U	08/04/2009	376.0	37	--	9.8	54		46				
Pistol	L	07/29/2009	ND	50	--	--		100					
Pole	L	07/27/2009	466.9	19	--	4.1		42				58	
Pole	L	07/27/2009	384.1	6	--	1.6					100		
Pole	L	07/30/2009	455.9	22	--	4.8		82				18	
Pole	M	07/22/2009	457.0	3	--	0.7						100	
Pole	M	07/22/2009	351.3	1	--	0.3						100	
Pole	M	07/22/2009	410.3	1	--	0.2						100	
Pole	U	07/22/2009	255.8	3	--	1.2						100	

Table 17. Continued.

Stream	Transect ^b	Sample Date	Transect Area (m ²)	No. Fish Sampled	Population Estimate (95% CI)	Fish/100 m ²	Species Composition % ^c						
							CT	RBT	BU	CTx RBT	EBT	CK	BUx EBT
Pole	U	07/27/2009	188.2	3	--	1.6							100
Pole	U	07/27/2009	212.4	2	--	0.9							100
Purcell	M	08/17/2009	486.0	16	--	3.3		100					
Quaking Asp	L	09/03/2009	102.0	0	--	--							
Quaking Asp	L	09/22/2009	84.2	9	--	10.7	100						
Quartz	U	08/12/2009	ND	0	--	--							
Rapid River	L	07/29/2009	ND	50	--	--			100				
Rattlesnake	U	08/31/2009	170.0	0	--	--							
Reservoir	L	07/09/2009	260.0	10	10 (9, 11)	3.8	90	10					
Roaring	M	08/06/2009	183.6	1	--	0.5				100			
Rough Canyon	L	07/15/2009	258.0	41	43 (38, 48)	15.9	93		7				
Sage	M	07/06/2009	79.1	16	--	20.2	100						
Sage	M	07/06/2009	169.2	0	--	--							
Sheep	M	09/14/2009	590.0	12	--	2.0	42	8	50				
Ship Island	L	08/02/2009	ND	57	--	--		88	12				
Short	L	08/20/2009	106.0	0	--	--							
Silver	L	07/29/2009	462.0	36	37 (32, 42)	7.8		84	8				8
Silver	M	07/22/2009	321.2	19	--	5.9		74				26	
Silver	M	10/19/2009	262.0	135	158 (124, 192)	51.5		57				43	
Silver	M	10/19/2009	165.0	68	78 (63, 93)	41.2		66				34	
Silver	U	07/29/2009	234.0	13	--	5.6		100					
South Fork Big	L	07/27/2009	425.7	12	12 (10, 14)	2.8	17		8	85			
South Fork Hull	L	10/01/2009	ND	0	--	--							
South Fork Iron	M	09/01/2009	232.0	21	--	9.1		90	10				
South Fork Moyer	L	09/08/2009	226.0	31	--	13.7			100				
South Fork Pigtail	L	08/10/2009	243.0	21	--	8.6	95		5				
South Fork Pigtail	L	08/10/2009	283.1	21	--	7.4	100						
South Fork Pigtail	L	08/10/2009	156.2	19	--	12.2	100						
South Fork Pigtail	L	08/10/2009	130.0	10	--	7.7	100						
South Fork Williams	M	07/27/2009	316.0	43	46 (39, 53)	13.6	86		14				
South Fork Williams	M	10/22/2009	154.0	0	--	--							

Table 17. Continued.

Stream	Transect ^b	Sample Date	Transect Area (m ²)	No. Fish Sampled	Population Estimate (95% CI)	Fish/100 m ²	Species Composition % ^c							
							CT	RBT	BU	CTx RBT	EBT	CK	BUx EBT	
South Fork Williams	U	10/22/2009	212.0	14	--	6.6	100							
Spring	L	08/04/2009	392.0	45	--	11.5		98					2	
Spring	M	09/17/2009	194.0	37		19.1	97	3						
Squaw	L	09/23/2009	72.0	80	--	111.1	100							
Squaw	M	07/29/2009	737.0	20	28 (4, 52)	2.7	5	95						
Squaw	M	07/29/2009	741.0	15	15 (12, 18)	2.0	40	60						
Squaw	M	08/27/2009	244.0	44	48 (40, 56)	18.0	18	25	57					
Squaw	U	07/29/2009	651.0	9	-- ^e	1.4	44	33	23					
Stanley Lake	L	07/29/2009	1,186.0	31	--	2.6		87				13		
Stanley Lake	L	07/29/2009	574.0	77	--	13.4		88				12		
Stanley Lake	L	07/29/2009	974.0	32	--	3.3		69				31		
Stanley Lake	L	07/29/2009	1,033.0	43	--	4.2		67				33		
Stanley Lake	L	07/29/2009	1,074.8	42	--	3.9		57				43		
Stanley Lake	L	07/29/2009	1,070.0	84	--	7.9		29				71		
Stroud	M	08/06/2009	300.0	26	--	8.7			100					
Sulphur	L	07/21/2009	173.0	2	--	1.2						100		
Sulphur	L	07/28/2009	ND	78	--	--	3	96	1					
Sulphur	L	07/08/2009	381.5	13	13 (7, 19)	3.4		100						
Sulphur	L	07/08/2009	441.6	36	--	8.2		100						
Sulphur	M	07/08/2009	305.1	74	97 (67, 127)	24.3		99		1				
Sulphur	U	07/10/2009	172.2	1	--	0.6		100						
Sulphur	U	07/10/2009	120.0	5	--	4.2		100						
Swamp	U	10/27/2009	306.0	8	--	2.6			25			63		12
Tater	M	11/03/2009	ND	7	--	--			100					
Texas	L	07/15/2009	ND	17	18 (13, 23)	--		12				88		
Texas	L	07/15/2009	ND	0	--	--								
Texas	L	07/16/2009	ND	54	61 (49, 73)	--		4				96		
Tobias	L	09/23/2009	172.0	41	--	23.8	100							
Trail	L	07/14/2009	207.0	16	--	7.7	12	69		19				
Trail	L	07/14/2009	231.0	31	32 (28, 36)	13.4	62	19		19				
Trail	L	07/15/2009	189.0	36	--	19.0	76			24				
Trail	L	10/28/2009	208.0	30	--	14.4	54	46						

Table 17. Continued.

Stream	Transect ^b	Sample Date	Transect Area (m ²)	No. Fish Sampled	Population Estimate (95% CI)	Fish/100 m ²	Species Composition % ^c						
							CT	RBT	BU	CTx RBT	EBT	CK	BUx EBT
Twelvemile	L	08/03/2009	462.3	30	--	6.5		100					
Twin	L	07/21/2009	200.7	7	--	3.5						100	
Twin	L	07/21/2009	84.1	0	--	--							
Twin	L	08/24/2009	464.0	47	51 (43, 59)	10.1	6		94				
Unnamed Tributary to Bear	M	08/07/2009	405.6.0	19	24 (9, 39)	4.7	6	5	84	5			
Vader	L	10/27/2009	109.0	15	15 (12, 18)	13.8						100	
Van Horn	M	07/14/2009	274.0	68	70 (65, 75)	24.8	54		21	25			
Vine	L	08/05/2009	156.0	48	--	30.8	67	33					
Wagonhammer	M	10/29/2009	166.0	32	--	19.3	96	4					
Warm Springs	U	08/10/2009	764.4	1	--	0.1		100					
Warm Springs	U	08/11/2009	375.4	58	--	15.5	100						
Warm Springs	U	08/11/2009	416.9	27	--	6.5	100						
Warm Springs	U	08/11/2009	296.9	41	--	13.8	100						
Warm Springs	U	08/11/2009	319.2	20	--	6.3	100						
Warm Springs	U	08/12/2009	516.5	6	--	1.2	100						
Warm Springs	U	08/12/2009	552.7	1	--	0.2	100						
Warm Springs	U	08/12/2009	600.9	7	--	1.2					100		
Warm Springs	U	08/12/2009	478.2	2	--	0.4					100		
Weasel	L	07/21/2009	210.0	0	--	--							
West Fork Camas	L	07/28/2009	622.0	29	30 (26, 34)	4.7	3	41	28			28	
West Fork Hughes	L	07/14/2009	268.0	9	--	3.4	100						
West Fork Hull	L	10/01/2009	ND	0	--	--							
West Fork Iron	L	09/01/2009	328.0	30	--	9.1		55	45				
West Fork Morgan	M	07/14/2009	335.0	63	66 (53, 79)	18.8	4	84		12			
West Fork Morgan	M	08/12/2009	292.0	26	26 (24, 28)	8.9	19	11	8	62			
West Fork North Fork Salmon River	L	08/05/2009	270.0	32	--	11.9	97		3				
West Fork Pahsimeroi River	L	08/10/2009	334.4	12	13 (7, 19)	3.6					100		
West Pass	L	08/07/2009	667.1	14	16 (8, 24)	2.1		86	14				
West Pass	L	08/06/2009	654.0	0	--	--							
West Pass	L	08/06/2009	1,089.7	6	--	0.6					100		

Table 17. Continued.

Stream	Transect ^b	Sample Date	Transect Area (m ²)	No. Fish Sampled	Population Estimate (95% CI)	Fish/100 m ²	Species Composition % ^c						
							CT	RBT	BU	CTxRBT	EBT	CK	BUx EBT
West Pass	M	08/06/2009	556.0	25	28 (20, 36)	4.5		16	84				
West Pass	M	08/05/2009	514.0	23	--	4.5			100				
West Pass	M	08/05/2009	517.0	61	82 (51, 113)	11.8			100				
West Pass	U	08/04/2009	642.4	0	--	--							
Wildcat	L	07/03/2009	ND	0	--	--							
Wildcat	L	09/24/2009	83.0	0	--	--							
Williams	M	08/03/2009	366.0	43	--	11.7	100						
Wimpey	L	07/13/2009	ND	36	--	--		97			3		
Wimpey	L	09/08/2009	ND	180	--	--	1	98	1				
Withington	M	07/13/2009	ND	11	--	--		100					
Withington	U	07/06/2009	ND	73	--	--	100						
Withington	U	07/09/2009	ND	74	--	--	100						
Woodtick	L	09/28/2009	205.0	43	--	21.0		19	81				
Wright	L	10/26/2009	350.0	32	--	9.1	4		96				
Wright	M	07/28/2009	ND	51	--	--			100				
Wright	M	08/05/2009	ND	66	79 (61, 97)	--			100				

^a Does not include mountain whitefish.

^b L = transect's lower reach, M = middle reach, and U = upper reach.

^c CT = Westslope cutthroat trout, RBT = Rainbow trout/steelhead, BU = Bull trout, CTxRBT = Apparent cutthroat/rainbow hybrid trout, EBT = Brook trout, CK = Chinook salmon, and BUxEBT = Apparent bull trout x brook trout hybrid.

^d ND = No data.

^e Population estimate calculation returned a negative value at the 95% confidence interval and was not reported.

Table 18. Salmonid species^a, number of fish observed, mean total length (mm), and size range (total length mm) for selected streams in the upper Salmon River basin, 2009.

Stream	No. Fish Observed	Salmonid Species ^b	Mean Total Length (mm)	Size Range (Total Length mm)
Agency	4	CT	169.5	162-184
Agency	86	RBT	139.7	53-238
Allan	8	CT	73.8	60-80
Allan	1	RBT	100.8	70-140
Arrastra	13	RBT	97.0	97
Arrastra	7	EBT	107.1	95-150
Basin	14	CT	140.3	61-198
Basin	57	RBT	107.8	52-201
Bayhorse	11	CTxRBT	118.6	72-195
Bayhorse	3	CT	104.0	89-119
Bear Valley	114	BU	173.6	60-550
Bear Valley	2	CT	197.5	180-215
Bear Valley	1	RBT	245.0	245
Beaver	6	CT	137.5	85-185
Beaver	3	BU	153.3	145-170
Beaver	45	CT	104.0	51-186
Beaver	152	EBT	117.4	33-242
Beaver	3	RBT	66.7	61-75
Big Bear	20	BU	160.2	60-286
Big Bear	54	CT	178.5	72-282
Big Bear	5	RBT	141.4	70-224
Big Boulder	13	BU	135.4	79-234
Big Boulder	40	CT	149.8	63-239
Big Boulder	56	CTxRBT	152.0	84-231
Big Boulder	17	RBT	157.3	95-213
Big Eightmile	231	BU	134.9	50-268
Big Eightmile	2	RBT	166.5	154-179
Big Hat	6	CT	134.2	90-200
Big Hat	30	RBT	120.2	70-180
Big Jureano	4	RBT	92.5	60-130
Big Timber	55	BU	186.0	89-288
Big Timber	5	CT	154.0	134-196
Big Timber	182	RBT	167.0	72-296
Birdseye	1	BU	125.0	125
Birdseye	4	EBT	96.3	80-140
Birdseye	15	RBT	119.3	90-150
Bog	11	CT	114.1	90-140
Boulder	3	CK	91.7	85-100
Boulder	63	RBT	101.5	55-190
Buck	8	CT	165.4	90-240
Buck	2	RBT	215.5	196-235
Camas	46	RBT	ND ^{c, d}	ND
Canyon	1	CT	223.0	223
Canyon	4	EBT	182.3	147-219

Table 18. Continued.

Stream	No. Fish Observed	Salmonid Species ^b	Mean Total Length (mm)	Size Range (Total Length mm)
Canyon	135	RBT	136.6	52-220
Cape Horn	7	BU	136.3	75-188
Cape Horn	11	CTxRBT	132.7	101-159
Cape Horn	28	EBT	110.4	42-199
Cape Horn	1	RBT	172.0	172
Carmen	83	BU	143.7	40-250
Castle	2	BU	132.5	125-140
Castle	15	RBT	121.7	75-200
Challis	2	BU	188.0	172-204
Challis	1	BUxEBT	217.0	217
Challis	7	CT	195.3	168-252
Challis	4	CTxRBT	166.3	127-217
Challis	2	EBT	204.0	194-214
Clear	9	BU	161.9	91-237
Clear	15	RBT	179.6	140-215
Cooper	18	BU	133.1	80-195
Corral	2	BU	70.5	70-71
Corral	30	CT	119.1	60-219
Corral	9	CTxRBT	128.0	75-187
Corral	1	RBT	206.0	206
Cougar	32	BU	106.6	60-145
Cruikshank	27	CT	131.1	62-225
Dahlonga	8	CT	156.3	100-210
Dahlonga	25	RBT	127.2	70-185
Dairy	25	BU	111.6	50-210
Dairy	4	RBT	157.5	140-180
Deep	11	CT	124.3	80-180
Deer	28	BU	170.2	85-255
Deer	5	CT	113.0	90-135
Deer	5	EBT	138.0	125-140
Ditch	30	CT	131.2	70-270
Ditch	16	RBT	87.2	50-170
East Fork Hayden	58	BU	176.5	60-349
East Fork Hayden	8	CT	216.8	100-250
East Fork Mayfield	6	BU	144.2	100-214
East Fork Mayfield	3	CK	206.0	58-500
East Fork Mayfield	24	RBT	135.0	73-240
East Fork Morgan	8	BU	117.1	78-142
East Fork Morgan	1	CT	205.0	205
East Fork Morgan	4	CTxRBT	193.3	172-226
East Fork Pahsimeroi R.	12	BU	99.9	70-127
East Fork Pierce	10	CT	91.5	65-150
East Fork Spring	3	CT	148.3	130-180
East Fork Spring	13	RBT	132.3	65-190
East Pass	5	BU	130.4	120-134
East Pass	8	RBT	131.5	85-179
Flat	52	EBT	101.3	50-184

Table 18. Continued.

Stream	No. Fish Observed	Salmonid Species ^b	Mean Total Length (mm)	Size Range (Total Length mm)
Ford	8	CT	156.3	130-185
Fourth of July	34	BU	156.5	90-220
Frank Hall	36	CT	113.9	70-195
Fritzer Gulch	15	RBT	81.0	65-110
Furnace	1	BU	110.0	110
Furnace	13	RBT	117.3	85-165
Garland	2	BU	182.5	182-183
Garland	70	CT	119.2	20-190
Gunsight	27	CT	114.9	62-316
Gunsight	2	CTxRBT	120.5	103-138
Gunsight	1	RBT	63.0	63
Hammerean	40	CT	99.3	50-190
Hawley	2	CT	165.0	110-220
Hawley	9	RBT	158.9	75-210
Hayden	84	BU	189.4	68-700
Hayden	82	CK	89.9	46-112
Hayden	12	CT	223.3	59-350
Hayden	309	RBT	127.4	48-284
Hood Gulch	16	RBT	114.4	40-230
Hughes	4	BU	158.8	125-200
Hughes	24	CT	123.1	50-175
Hughes	80	RBT	107.1	40-200
Hull	6	CT	90.0	70-135
Hull	74	EBT	125.0	50-235
Hull	25	RBT	128.4	70-260
Indian	18	BU	141.9	80-240
Indian	18	CT	164.2	70-280
Indian	33	RBT	169.5	75-285
Iron	1	BU	250.0	250
Iron	7	CTxRBT	129.9	81-168
Iron	127	EBT	77.6	26-222
Iron	131	RBT	98.7	34-280
Jim	5	BU	255.6	134-464
Johnson Gulch	20	CT	90.5	60-140
Kadletz	20	BU	138.0	110-225
Kadletz	3	CT	101.7	70-160
Kenney	7	BU	145.6	59-182
Kenney	14	CT	122.1	58-208
Kenney	3	EBT	100.0	74-120
Kenney	87	RBT	137.5	66-224
Kinnikinic	42	CT	114.3	50-250
Lake	16	BU	147.5	100-340
Lake	18	RBT	130.3	70-205
Lemhi River	7	BU	203.6	170-236
Lemhi River	11	CK	102.6	92-121
Lemhi River	1	CT	274.0	274
Lemhi River	106	RBT	188.9	55-430

Table 18. Continued.

Stream	No. Fish Observed	Salmonid Species ^b	Mean Total Length (mm)	Size Range (Total Length mm)
Lick	32	BU	133.7	61-207
Lick	17	CT	131.5	59-199
Lick	47	CTxRBT	134.3	78-191
Lick	1	RBT	64.0	64
Little Springs	8	RBT	172.9	120-285
Loon	46	RBT	ND ^d	ND ^d
Lyon	2	BU	210.0	205-215
Lyon	33	CK	--	--
Lyon	1	CTxRBT	135.0	135
Lyon	156	RBT	94.5	30-205
Marble	4	RBT	76.5	38-115
Martin	1	BU	150.0	150
Martin	24	CT	133.0	56-208
Martin	25	CTxRBT	130.7	81-207
Martin	3	RBT	111.7	111-112
McDevitt	55	CT	112.8	40-242
McDevitt	13	RBT	114.6	44-210
McKay	12	BU	135.2	76-229
McKay	1	CTxRBT	171.0	171
McKim	17	BU	180.6	140-250
McKim	23	CT	165.0	70-260
Middle Fork Little Timber	13	CT	145.0	85-235
Mill	25	BU	186.8	130-255
Mill	6	CT	193.3	160-250
Mink	2	BU	142.5	110-175
Moose	13	BU	101.5	65-240
Moose	65	CT	121.2	40-195
Morgan	13	CT	124.4	81-171
Morgan	16	CTxRBT	124.4	64-203
Moyer	38	BU	138.0	60-450
Moyer	26	RBT	163.1	110-205
Musgrove	17	RBT	119.7	50-185
Musgrove	2	EBT	250.0	240-260
Napias	1	BU	145.0	145
Napias	21	EBT	123.1	45-180
Napias	36	RBT	118.9	55-165
North Fork Iron	2	BU	139.0	70-200
North Fork Iron	41	RBT	125.0	90-160
North Fork Lawson	17	RBT	110.4	85-159
North Fork Little Timber	1	BU	210.0	210
North Fork Little Timber	16	CT	145.3	95-230
North Fork Morgan	20	BU	137.1	87-212
North Fork Morgan	2	CT	198.5	176-221
North Fork Morgan	6	CTxRBT	152.7	93-213
North Fork Salmon River	3	BU	198.3	170-235
North Fork Salmon River	32	CT	160.0	55-235
North Fork Williams	52	CT	99.1	50-180

Table 18. Continued.

Stream	No. Fish Observed	Salmonid Species ^b	Mean Total Length (mm)	Size Range (Total Length mm)
Opal	7	EBT	94.3	80-130
Otter	9	CT	146.1	110-175
Otter	20	BU	136.0	80-210
Owl	45	BU	121.9 ^e	65-315
Owl	1	BUxEBT	325.0	325
Owl	3	CK	78.3	70-85
Owl	5	CT	122.0	80-150
Owl	1	CTxRBT	200.0	200
Owl	173	RBT	101.9	30-235
Pahsimeroi River	8	BU	100.0	40-250
Pahsimeroi River	7	BUxEBT	214.3	180-270
Pahsimeroi River	7	RBT	144.3	80-210
Panther	6	BU	178.3	70-230
Panther	18	CT	133.9	80-190
Panther	19	EBT	143.2	80-210
Panther	31	RBT	148.9	70-220
Patterson	409	EBT	110.3	30-260
Patterson	29	RBT	136.2	40-295
Payne	1	RBT	115.0	115
Perreau	43	CT	128.3	70-200
Pierce	4	CT	127.5	100-140
Pierce	22	RBT	101.8	55-150
Pigtail	10	BU	121.0	93-140
Pigtail	34	CT	122.2	62-199
Pine	17	BU	141.8	75-195
Pine	20	CT	129.5	65-185
Pine	82	RBT	134.8	75-215
Pistol	50	RBT	ND ^d	ND ^d
Pole	31	EBT	96.0	38-227
Pole	26	RBT	53.8	27-92
Purcell	16	RBT	213.4	85-265
Quaking Asp	1	CT	220.0	220
Rapid River	50	RBT	ND ^d	ND ^d
Reservoir	9	CT	102.8	70-145
Reservoir	1	RBT	100.0	100
Roaring	1	BU	155.0	155
Rough Canyon	3	BU	150.0	65-195
Rough Canyon	38	CT	146.7	80-225
Sage	16	CT	102.2	60-145
Sheep	6	BU	185.0	160-220
Sheep	5	CT	107.0	75-130
Sheep	1	RBT	175.0	175
Silver	3	BU	177.5	175-180
Silver	3	CK	66.7	60-70
Silver	81	EBT	90.5	48-250
Silver	172	RBT	103.2	30-195
South Fork Big	1	BU	240.0	240

Table 18. Continued.

Stream	No. Fish Observed	Salmonid Species ^b	Mean Total Length (mm)	Size Range (Total Length mm)
South Fork Big	2	CT	191.0	172-210
South Fork Big	9	CTxRBT	156.2	72-230
South Fork Iron	2	BU	170.0	170
South Fork Iron	19	RBT	128.2	70-190
South Fork Moyer	28	BU	123.4	70-190
South Fork Pigtail	1	BU	149.0	149
South Fork Pigtail	70	CT	128.4	63-232
South Fork Williams	6	BU	104.2	70-145
South Fork Williams	51	CT	128.0	80-185
Spring	1	CK	110.0	110
Spring	36	CT	108.1	60-180
Spring	45	RBT	97.7	55-200
Squaw	25	BU	121.8	40-195
Squaw	61	CT	105.1	40-210
Squaw	2	CTxRBT	138.0	126-150
Squaw	42	RBT	119.6	70-171
Stanley Lake	115	EBT	66.7	31-159
Stanley Lake	194	RBT	83.1	30-252
Stroud	26	BU	155.4	60-230
Sulphur	1	BU	ND ^d	ND ^d
Sulphur	2	CT	ND ^d	ND ^d
Sulphur	1	CTxRBT	190.0	190
Sulphur	2	EBT	165.0	155-175
Sulphur	202	RBT	110.0	65-250 ^f
Swamp	2	BU	118.0	112-124
Swamp	1	BUxEBT	155.0	155
Swamp	5	EBT	131.2	88-167
Tater	7	BU	152.1	98-202
Texas	67	EBT	102.5	44-222
Texas	4	RBT	125.0	110-146
Tobias	40	CT	138.3	50-200
Trail	61	CT	106.7	51-195
Trail	17	CTxRBT	116.5	77-144
Trail	30	RBT	108.2	59-225
Twelvemile	30	RBT	123.3	60-205
Twin	44	BU	133.4	65-275
Twin	3	CT	153.3	110-185
Twin	7	EBT	141.7	89-216
Unnamed Tributary to Bear	16	BU	134.3	79-180
Unnamed Tributary to Bear	1	CT	164.0	164
Unnamed Tributary to Bear	1	CTxRBT	97.0	97
Unnamed Tributary to Bear	1	RBT	199.0	199
Vader	15	EBT	84.9	54-186
Van Horn	14	BU	112.9	69-165
Van Horn	37	CT	131.0	83-200
Van Horn	17	CTxRBT	123.0	86-192
Vine	32	CT	87.8	30-150

Table 18. Continued.

Stream	No. Fish Observed	Salmonid Species ^b	Mean Total Length (mm)	Size Range (Total Length mm)
Vine	16	RBT	110.0	60-145
Wagonhammer	25	CT	139.0	65-255
Wagonhammer	1	RBT	85.0	85
Warm Springs	15	BU	184.9	149-262
Warm Springs	147	CT	118.8	49-235
Warm Springs	1	RBT	82.0	82
West Fork Camas	8	BU	140.6	90-230
West Fork Camas	8	CK	51.3	40-65
West Fork Camas	1	CT	160.0	160
West Fork Camas	12	RBT	94.6	50-180
West Fork Hughes	9	CT	115.6	85-140
West Fork Iron	13	BU	116.2	90-190
West Fork Iron	16	RBT	159.1	85-220
West Fork Morgan	2	BU	212.0	189-235
West Fork Morgan	6	CT	163.7	128-228
West Fork Morgan	23	CTxRBT	141.8	85-208
West Fork Morgan	52	RBT	104.7	66-196
West Fork North Fork Salmon River	1	BU	165.0	165
West Fork North Fork Salmon River	31	CT	117.1	75-165
West Fork Pahsimeroi River	12	BU	131.9	51-305
West Pass	113	BU	136.6	60-510
West Pass	16	RBT	149.7	95-230
Williams	43	CT	107.7	55-215
Wimpey	2	BU	152.0	114-190
Wimpey	1	CT	188.0	188
Wimpey	1	EBT	288.0	288
Wimpey	212	RBT	109.0	42-210 ^g
Withington	147	CT	104.9	49-206 ^h
Withington	11	RBT	123.4	64-168
Woodtick	30	BU	110.7	70-190
Woodtick	7	RBT	132.9	110-180
Wright	140	BU	164.6	54-266
Wright	1	CT	190.0	190

^a Does not include mountain whitefish.

^b BU = Bull trout, BUxEBT = Apparent bull trout x brook trout hybrid, CK = Chinook salmon, CT = Westslope cutthroat trout, CTxRBT = Apparent cutthroat/rainbow hybrid trout, EBT = Brook trout, and RBT = Rainbow trout.

^c ND = No data.

^d Fish caught by hook and line; no length measurements taken.

^e Owl Creek: 21 of 45 bull trout measured.

^f Sulphur Creek: 128 of 202 rainbow trout measured.

^g Wimpey Creek: 162 of 212 rainbow trout measured.

^h Withington Creek: 95 of 147 westslope cutthroat trout measured.

Table 19. Combined mountain whitefish and non-game fish population densities, and species composition for selected streams surveyed in the upper Salmon River basin, 2009.

Stream	Transect ^a	Sample Date	Transect Area (m ²)	No. of Fish Sampled	Fish/100 m ²	Species Composition (%) ^b						
						SCU	LND	SPD	MWF	SUC	RSS	MT
Agency	M	07/14/2009	ND ^c	10	--	100						
Agency	M	07/14/2009	ND	51		100						
Agency	U	06/30/2009	ND	27		100						
Agency	U	06/30/2009	ND	35		100						
Agency	U	07/02/2009	ND	14		100						
Bear Valley	L	07/27/2009	ND	104		100						
Bear Valley	M	08/18/2009	388.0	126	32.5	100						
Beaver	L	07/13/2009	603.4	18	3.0	100						
Beaver	L	07/13/2009	638.0	32	5.0	100						
Beaver	L	07/13/2009	698.9	39	5.6	100						
Beaver	L	07/13/2009	721.6	52	7.2	100						
Beaver	L	07/14/2009	707.7	18	2.5	100						
Beaver	M	07/14/2009	749.0	41	5.5	100						
Beaver	M	07/14/2009	559.8	25	4.5	100						
Beaver	M	07/14/2009	743.0	25	3.4	100						
Beaver	M	07/14/2009	630.0	2	0.3	100						
Beaver	U	07/15/2009	668.0	21	3.1	100						
Big Bear	L	07/09/2009	290.0	7	2.4	100						
Big Bear	L	08/20/2009	ND	--	--	P ^d						
Big Bear	M	07/30/2009	ND	20	--	100						
Big Bear	M	08/20/2009	ND	--	--	P						
Big Timber	L	08/25/2009	ND	--	--	P						
Big Timber	M	09/15/2009	ND	--	--	P				P		
Big Timber	M	09/29/2009	ND	--	--	P						
Canyon	L	06/16/2009	ND	5	--	100						
Canyon	L	06/18/2009	ND	14	--	100						
Canyon	L	09/09/2009	ND	--	--	P						
Cape Horn	L	08/07/2009	510.4	--	--	P						
Castle	L	09/10/2009	484.0	--	--					P		
Clear	M	08/19/2009	302.3	15	5.0	100						
Corral	L	07/16/2009	262.0	--	--	P						

Table 19. Continued.

Stream	Transect ^a	Sample Date	Transect Area (m ²)	No. of Fish Sampled	Fish/100 m ²	Species Composition (%) ^b						
						SCU	LND	SPD	MWF	SUC	RSS	MT
Corral	M	07/16/2009	261.0	--	--	P						
Cruikshank	U	06/18/2009	ND	8	--	100						
Dahlonga	M	09/29/2009	276.0	25	9.1	100						
Dairy	L	08/06/2009	274.0	--	--	P						
East Fork Mayfield	L	08/11/2009	608.6	--	--	P						
East Fork Morgan	L	08/03/2009	566.0	--	--	P						
East Fork												
Pahsimeroi R.	M	08/10/2009	361.0	--	--	P						
East Fork Pierce	L	09/29/2009	104.0	15	14.4	100						
East Pass	L	08/04/2009	452.0	--	--	P						
Hawley	L	08/18/2009	412.0	10	2.4	100						
Hayden	L	08/31/2009	ND	100	--	100						
Hood Gulch	L	08/06/2009	160.0	--	--	P						
Iron	L	07/23/2009	374.0	102	27.3	100						
Iron	L	07/23/2009	529.2	102	19.3	100						
Iron	L	07/23/2009	353.5	11	3.1	100						
Iron	L	07/29/2009	468.3	32	6.8	100						
Iron	L	07/30/2009	400.0	36	9.0	100						
Kenney	L	07/21/2009	ND	--	--	P						
Kenney	L	09/03/2009	ND	--	--	P						
Lemhi River	L	08/10/2009	ND	--	--				P			
Lemhi River	L	08/17/2009	ND	--	--		P	P		P	P	
Lemhi River	M	08/25/2009	ND	--	--		P			P		
Lemhi River	M	08/24/2009	ND	--	--				P			
Lemhi River	M	09/22/2009	ND	--	--				P			
Lemhi River	U	08/19/2009	ND	7	--				100			
Little Springs	M	06/11/2009	ND	3	--	100						
Lyon	L	06/29/2009	138.7	89	64.2	99	1					
Lyon	L	07/28/2009	138.7	29	20.9	100						
Martin	L	07/29/2009	589.0	--	--	P						
Martin	M	08/13/2009	257.0	--	--	P						
McDevitt	M	06/29/2009	ND	5	--	100						
McKay	L	07/22/2009	516.0	--	--	P						

Table 19. Continued.

Stream	Transect ^a	Sample Date	Transect Area (m ²)	No. of Fish Sampled	Fish/100 m ²	Species Composition (%) ^b						
						SCU	LND	SPD	MWF	SUC	RSS	MT
Middle Fork Little Timber	M	10/05/2009	286.0	20	7.0	100						
Morgan	U	07/15/2009	149.0	--	--	P						
Musgrove	L	09/09/2009	466.0	1	0.2				100			
Owl	L	07/22/2009	827.8	156	18.4	82	14	1	3			
Owl	M	07/30/2009	654.0	2	0.3				100			
Owl	M	07/30/2009	614.0	29	4.7	86						14
Pahsimeroi River	U	08/13/2009	1,240.0	9	0.7	100						
Panther	M	09/09/2009	522.0	17	3.3				100			
Patterson	M	06/16/2009	850.9	103	12.1	100						
Patterson	U	06/18/2009	602.0	143	23.8	100						
Patterson	U	06/18/2009	508.0	22	4.3	100						
Patterson	U	07/13/2009	554.0	56	10.1	100						
Patterson	U	07/15/2009	618.5	243	39.3	100						
Payne	L	09/03/2009	123.0	3	2.4	100						
Perreau	L	09/02/2009	296.0	23	7.8	100						
Pole	L	07/27/2009	466.9	102	21.8	100						
Pole	L	07/27/2009	384.1	23	6.0	100						
Pole	L	07/30/2009	455.9	46	10.1	100						
Pole	M	07/22/2009	457.0	20	4.4	100						
Pole	M	07/22/2009	410.3	14	3.4	100						
Ship Island	L	08/02/2009	ND	1	--		100					
Silver	L	07/29/2009	462.0	1	0.2				100			
South Fork Big	L	07/27/2009	425.7	--	--	P						
Squaw	M	07/29/2009	737.0	--	--	P						
Squaw	M	07/29/2009	741.0	--	--	P						
Squaw	U	07/29/2009	651.0	--	--	P						
Stanley Lake	L	07/29/2009	1,186.0	101	11.7	81	19					
Stanley Lake	L	07/29/2009	574.0	142	24.7	58	42					
Stanley Lake	L	07/29/2009	974.0	77	7.9	69	31					
Stanley Lake	L	07/29/2009	1,033.0	100	9.7	54	46					
Stanley Lake	L	07/29/2009	1,074.8	75	7.0	69	31					
Stanley Lake	L	07/29/2009	1,070.0	62	5.8	84	16					
Sulphur	L	07/21/2009	173.0	6	3.5	100						

Table 19. Continued.

Stream	Transect ^a	Sample Date	Transect Area (m ²)	No. of Fish Sampled	Fish/100 m ²	Species Composition (%) ^b						
						SCU	LND	SPD	MWF	SUC	RSS	MT
Sulphur	L	07/08/2009	381.5	76	20.7	100						
Sulphur	L	07/08/2009	441.6	179	40.5	100						
Sulphur	M	07/08/2009	305.1	259	84.9	100						
Swamp	U	10/27/2009	306.0	--	--	P						
Texas	L	07/15/2009	ND	170	--	100						
Trail	L	07/14/2009	207.0	--	--	P						
Trail	L	07/14/2009	231.0	--	--	P						
Trail	L	07/15/2009	189.0	--	--	P						
Unnamed Tributary to Bear	M	08/07/2009	390.0	--	--	P						
Vader	L	10/27/2009	109.0	--	--	P						
Van Horn	M	07/14/2009	274.0	--	--	P						
West Fork Hughes	L	07/14/2009	268.0	--	--	P						
West Fork Morgan	M	07/14/2009	335.0	--	--	P						
West Fork Morgan	M	08/12/2009	292.0	--	--	P						
West Fork North Fork Salmon River	L	08/05/2009	270.0	--	--	P						
West Fork Pahsimeroi River	L	08/10/2009	334.4	--	--	P						
West Pass	L	08/07/2009	667.1	202	30.3	99				1		
West Pass	L	08/06/2009	654.0	49	7.5	100						
West Pass	L	08/06/2009	1,089.7	46	4.2	100						
West Pass	M	08/06/2009	556.0	63	11.3	100						
West Pass	M	08/05/2009	514.0	113	22.0	100						
West Pass	M	08/05/2009	517.0	21	4.1	100						
Wimpey	L	07/13/2009	ND	94	--	100						

^a L = stream transect's lower reach, M = middle reach, and U = upper reach.

^b SCU = Sculpin, LND = Longnose dace, SPD = Speckled dace, MWF = Mountain whitefish, SUC = Sucker, and MT = Madtom.

^c ND = No data.

^d P = Species present during survey but not enumerated.

Table 20. Bull trout redd counts observed in trend survey sections of Alpine Creek, 1998 to 2009.

Year	Survey Dates	No. Redds
1998	08/23, 09/11	0, 1
1999	08/26 ^a	3
2000	08/30, 09/15	6, 9
2001	08/28, 09/11 ^b	11, 15
2002	08/30, 09/12	8, 14
2003	08/27, 09/8	11, 14
2004	08/30, 09/09	6, 9
2005	08/30, 09/12	9, 13
2006	08/29, 09/12	6, 13
2007	08/28, 09/12	17, 18
2008	08/28, 09/11	0, 0 ^c
2009	08/27, 09/09	0, 0 ^c

^a Only one count completed.

^b Counts done independently, not cumulatively.

^c An unknown blockage preventing upstream migration is suspected below the transect site.

Table 21. Bull trout redd counts observed in the trend survey section of Fishhook Creek, 1998 to 2009.

Year	Survey Dates	No. Redds
1998	08/22, 09/10	5, 11
1999	08/22, 08/26	0, 15
2000	08/31, 09/14	12, 18
2001	08/28, 09/11 ^a	15, 11
2002	09/04, 09/11	6, 17
2003	08/27, 09/08	6, 17
2004	08/30, 09/09	10, 11
2005	08/30, 09/12	12, 23
2006	08/29, 09/13	16, 25
2007	08/29, 09/13	21, 21
2008	08/29, 09/11	8, 13
2009	08/27, 09/11	9, 33

^a Counts done independently, not cumulatively.

Table 22. Bull trout redd counts observed in the “new” survey section of Fishhook Creek, 2008 and 2009.

Year	Survey Dates	No. Redds
2008	08/29, 09/12	5, 14
2009	08/27, 09/10	2, 12

Table 23. Bull trout redd count summary in the Hayden Creek drainage, 2006, 2007, 2008, and 2009. Both fluvial and resident bull trout redds were included in survey transect counts.

Stream	No. Bull Trout Redds			
	2006	2007	2008	2009
Hayden Creek trend transect	39	26	21 ^a	22
Upstream of trend transect	<u>74</u>	<u>115</u>	<u>28^b</u>	<u>--^c</u>
Hayden Creek Subtotal	113	141	49	22
East Fork Hayden Creek	49	52	61	54
Downstream of trend transect				<u>11</u>
East Fork Creek Subtotal				65
Bear Valley Creek trend transect	26	25	27	42
Upstream of trend transect	<u>60</u>	<u>115</u>	<u>21</u>	<u>24</u>
Bear Valley Creek Subtotal	86	140	48	66
Wright Creek	10	6	4	-- ^c
Hayden Creek Drainage Total	258	339	162	153

^a Only the upper one-half of transect surveyed twice in 2008.

^b Upstream areas surveyed once in 2008.

^c Not surveyed.

Table 24. Number of resident rainbow trout redds counted in the Lemhi River and Big Springs Creek, 1994 to 2009.

Date	Lemhi River (Beyeler Ranch ^a)	Big Springs Creek (Neibaur Ranch ^b)	Big Springs Creek (Tyler Ranch ^c)	Total
04/26/1994	--	--	--	40 ^d
05/03/1995	--	57	--	57
05/03/1996	7	32	--	39
04/21/1997 and 05/03/1997	8	44	45	97
05/03/1998	18	93	124	235
04/29/1999	29	39	71	139
04/20/2000	23	160	123	306
04/05/2001	2	95	186	283
04/25/2002	3	360	193	556
04/22/2003	56	128	103	287
04/22/2004	15	174	45	234
04/26/2005	3	75	43	121
04/27/2006	9	63	143	215

Table 24. Continued.

Date	Lemhi River (Beyeler Ranch ^a)	Big Springs Creek (Neibaur Ranch ^b)	Big Springs Creek (Tyler Ranch ^c)	Total
04/26/2007	8	163	62	233
05/05/2008	9	82	108	199
05/04/2009	10	100	54	164

^a Habitat improvement project implemented in spring 1995.

^b Habitat improvement project completed in 2003.

^c Habitat improvement project implemented in spring 1998.

^d Incidental count taken during a Lemhi Model Watershed Project habitat survey; includes all of Big Springs Creek.

Table 25. Big Timber Creek electro-fishing survey results, 2007, 2008, and 2009.

Year	No. of Salmonids By Species					Total No. Fish
	Rainbow Trout	Bull Trout	Westslope Cutthroat Trout	Brook Trout	Mountain Whitefish	
2007	269	193	51	0	28	541
2008	418	275	66	3	11	773
2009	166	50	5	0	0	221

Table 26. Fluvial bull trout redd counts observed in trend survey sections of Fourth of July Creek, 2003 to 2009.

Year	Survey Date	No. of Redds
2003	09/17	16
2004	09/09	33
2005	09/02	41
2006	09/06	71
2007	09/05	49
2008	09/01	26
2009	09/10	50

Table 27. Kenney Creek electro-fishing survey results, 2007, 2008, and 2009.

Year	No. of Salmonids By Species					Total No. Fish
	Rainbow Trout	Bull Trout	Westslope Cutthroat Trout	Brook Trout	Mountain Whitefish	
2007	150	27	85	34	0	296
2008	134	18	58	23	0	233
2009	60	7	14	0	0	81

Table 28. Summary of resident trout encountered at the Pahsimeroi Fish Hatchery during spring steelhead trapping, 1991 to 2009.

Year	Trapping Dates	No. Resident Rainbow Trout			No. Bull Trout	Other Salmonids ^a
		Males	Females	Total		
1991	02/13-05/15	--	--	81	0	0
1992	02/07-04/30	--	--	55	0	0
1993	02/19-05/04	7	36	43	0	0
1994	02/15-05/06	10	17	27	0	0
1995	02/20-05/16	11	17	28	0	0
1996	03/01-05/25	5	23	28	0	0
1997	03/01-05/09	1	7	8	0	0
1998	03/01-05/08	8	17	25	0	0
1999	02/19-05/03	7	17	24	0	0
2000	02/25-05/01	10	27	37	0	0
2001	03/01-03/17	27	41	68	0	0
2002	03/01-05/05	19	43	62	0	0
2003	02/28-05/02	9	31	40	0	0
2004	03/05-04/29	11	39	50	1	0
2005	03/02-05/12	4	50	54	1	1 CTxRBT
2006	03/03-04/26	13	29	42	0	1 CT ^b
2007	03/09-05/27	5	23	28	0	1 CT ^b , 1 EBT
2008	02/27-05/21	14	62	76	5	1 RBT sex unknown, 1 EBT
2009	02/20-05/21	16	34	50	0	0

^a CTxRBT = Apparent cutthroat/rainbow hybrid trout, CT = Westslope cutthroat trout, and EBT = Brook trout.

^b Encountered outside range of steelhead trapping dates.

Table 29. Salmonid and non-game species encountered during steelhead and Chinook salmon trapping dates at the East Fork Satellite Facility, 1984 to 2009.

Year	Trapping Dates	Salmonid and Non-game Species ^a						Total
		BU	CT	RBT	EBT	MWF	SUC	
1984	06/20-08/07 ^b	49	3	316	0	1,872	0	2,240
1985	03/15-05/22, 06/11-09/04	ND ^c	ND	ND	ND	ND	ND	--
1986	03/17-04/27, 05/27-09/09	119	0	0	0	49	0	168
1987	03/12-04/30, 05/11-09/03	12	0	0	0	60	0	72
1988	03/15-05/02, 06/01-09/01	0	1	0	0	677	0	678
1989	03/20-05/03, 06/07-09/07	37	0	3	3	200	0	243
1990	03/22-04/30, 06/04-09/14	2	0	0	0	0	0	2
1991	03/01-05/10, 06/03-09/05	89	0	0	0	0	0	89
1992	03/18-05/02, 06/01-09/08	73	0	0	0	0	0	73
1993	03/30-05/12, 06/18-09/06	27	1	0	0	0	0	28
1994	04/05-05/04, 06/06-09/08	61	0	0	0	0	0	61
1995	04/04-05/01, 07/27-08/31	17	0	0	0	0	0	17
1996	03/22-05/10, 06/25-08/30	175	0	1	0	63	0	239
1997	03/28-05/25, 07/08-09/08	13	0	1	0	4	0	18
1998	04/06-05/11 ^d	1	1	1	0	117	0	120
1999	04/02-05/03 ^d	0	0	2	0	29	0	31
2000	03/29-05/03 ^d	0	1	1	1	108	0	111
2001	03/23-05/11 ^d	ND	ND	ND	ND	ND	0	--
2002	03/26-05/21 ^d	0	12	4	0	150	0	166
2003	03/25-05/09 ^d	0	2	4	0	0	0	6
2004	03/29-04/25, 05/11-09/10	175	8	5	0	359	0	547
2005	03/23-05/17, 06/07-08/30	235	11	1	0	194	0	441
2006	03/23-05/18, 06/21-09/26	262	1	2	0	122	0	387
2007	03/15-05/08, 06/04-09/28	228	6 ^e	5	0	91	0	330
2008	03/24-05/14, 06/04-09/24	168	5 ^e	2	0	128	2	305

Table 29. Continued.

Year	Trapping Dates	Salmonid and Non-game Species ^a						Total
		BU	CT	RBT	EBT	MWF	SUC	
2009	03/20-05/12, 06/10-09/21	200	7 ^e	0	0	98	0	305

^a BU = Bull trout, CT = Westslope cutthroat trout; RBT = Rainbow trout, EBT = Brook trout, MWF = Mountain whitefish, and SUC = Sucker.

^b Trap not operated for steelhead.

^c ND = No data.

^d Trap not operated for Chinook salmon.

^e One fish thought to be an apparent cutthroat/rainbow hybrid trout.

Table 30. Salmonid and non-game fish encountered during steelhead and Chinook salmon trapping dates at Sawtooth Fish Hatchery, 1984 to 2009.

Year	Trapping Dates	Salmonid and Non-game Species ^a						Total
		BU	CT	RBT	EBT	MWF	SUC	
1984	07/07-09/06 ^b	1	0	0	0	0	0	1
1985	03/14-05/10, 06/14-09/15	ND ^c	ND	ND	ND	ND	ND	ND
1986	03/13-04/23, 06/20-09/09	3	0	0	0	0	0	3
1987	03/07-05/01, 05/13-09/08	ND	ND	ND	ND	ND	ND	ND
1988	03/03-05/03, 05/23-09/06	ND	ND	ND	ND	ND	ND	ND
1989	03/13-05/03, 06/07-09/11	ND	ND	ND	ND	ND	ND	ND
1990	03/02-05/07, 05/21-09/14	7	0	0	0	1	0	8
1991	02/28-05/14, 06/07-09/15	17	0	0	0	0	0	17
1992	03/02-04/30, 05/28-09/18	24	0	0	0	0	0	24
1993	03/18-05/12, 06/18-09/06	5	0	0	0	0	0	5
1994	03/16-05/09, 05/31-10/26	38	0	0	0	0	0	38
1995	03/15-05/10, 06/12-09/06	6	0	0	0	0	0	6
1996	03/20-05/13, 06/20-09/11	4	1	1	0	9	226	241
1997	03/20-05/12, 06/16-09/04	5	0	6	0	1	116	11
1998	03/23-05/08, 06/10-09/14	4	4	5	0	12	252	277
1999	03/23-05/06, 06/28-09/07,	8	4	10	0	34	97	153
2000	03/20-05/04, 05/30-09/25	27	1	3	0	1	0	32
2001	03/19-05/03, 05/24-09/14	31	0	0	0	0	0	31
2002	03/20-05/02, 05/28-09/09	23	0	3	0	8	26	60
2003	03/28-05/05, 06/12-09/09	29	0	2	0	1	8	40
2004	03/15-04/29, 05/25-09/15	8	0	2	0	5	14	29
2005	03/25-05/05, 06/05-09/19	33	1	2	0	15	5	56

Table 30. Continued.

Year	Trapping Dates	Salmonid and Non-game Species ^a						Total
		BU	CT	RBT	EBT	MWF	SUC	
2006	03/27-05/01, 06/19-09-15	25	3	18	0	35	0	81
2007	03/15-05/01, 05/25-09/11	72	13	27	0	8	189	309
2008	03/19-05/06, 06/11-09/17	18	10	10	0	20	1,089	1,147
2009	03/19-05/07, 06/24-10/16	24	10 ^e	8	0	6	170	218

^a BU = Bull trout, CT = Westslope cutthroat trout; RBT = Rainbow trout, EBT = Brook trout, MWF = Mountain whitefish, and SUC = Sucker.

^b Trap not operated for steelhead.

^c ND = No data.

^d Trap not operated for Chinook salmon.

^e Includes 2 fish thought to be apparent cutthroat/rainbow hybrid trout.

Table 31. Salmonid and non-game fish encountered during sockeye salmon trapping at Redfish Lake Creek temporary weir, 1999 to 2009.

Year	Trapping Dates	Salmonid and Non-game Species ^a						Total
		BU	SOCK	CK	MWF	NPM	SUC	
1999	07/15-10/14	10	6	2	0	1	87	106
2000	07/05-09/23	1	43	1	0	1	21	67
2001	06/26-09/09	1	15	2	0	0	10	28
2002	07/15-10/11	7	10	2	0	1	18	28
2003	07/10-09/25	12	2	4	0	16	65	89
2004	07/13-09/13	6	1	4	0	0	6	17
2005	06/30-09/21	6	2	4	0	4	54	70
2006	07/07-10/03	3	1	2	0	0	4	10
2007	07/03-10/22	29	1	8	2	33	207	280
2008	07/09-10/22	96	432	2	2	76	338	946
2009	07/06-10/20	72	584	1	1	263	250	1,171

^a BU = Bull trout, SOCK = Sockeye salmon; CK = Chinook salmon, MWF = Mountain whitefish, NPM = Northern pikeminnow, and SUC = Sucker.

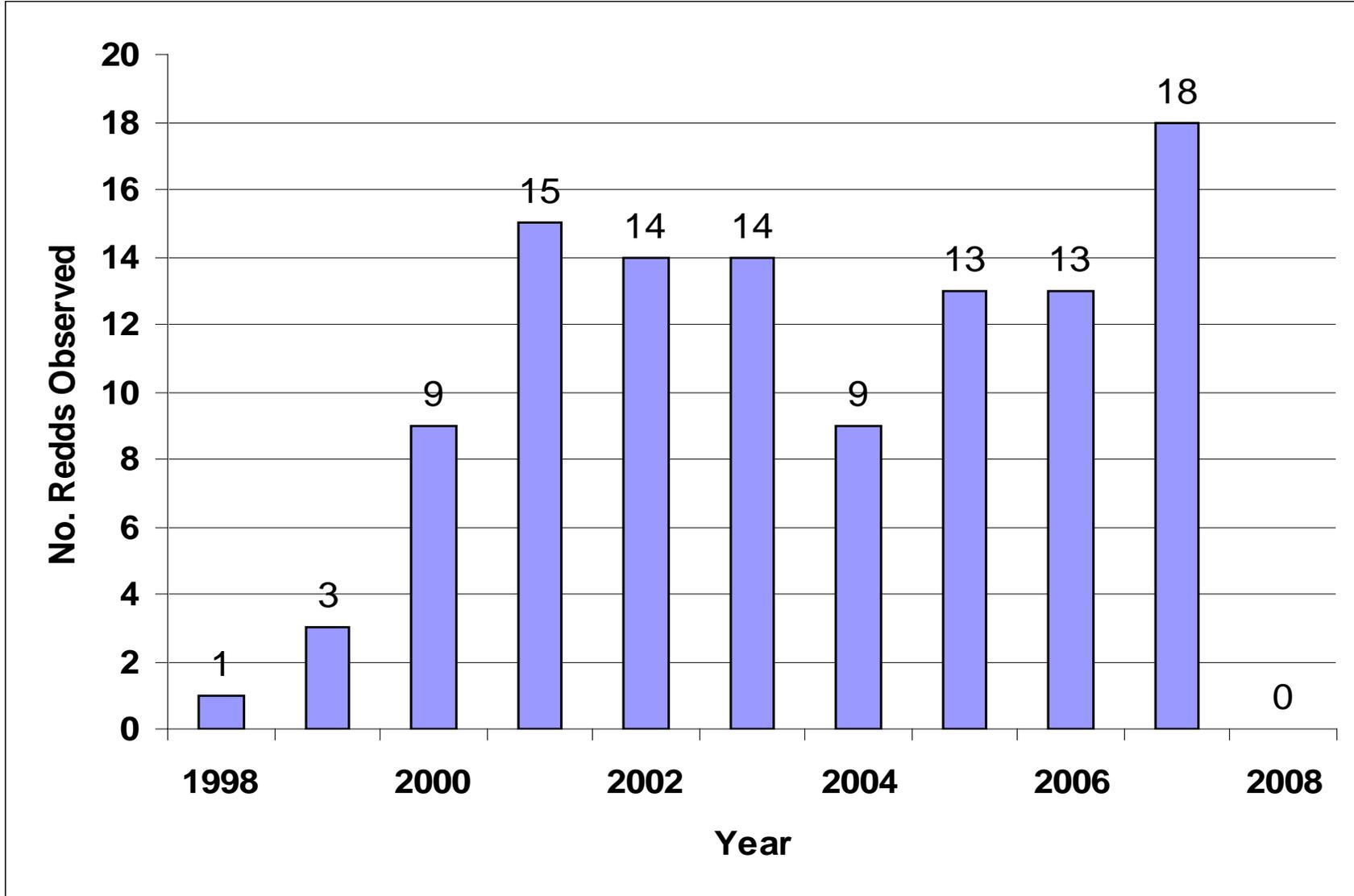


Figure 7. Bull trout redd counts in Alpine Creek, 1998 to 2008.

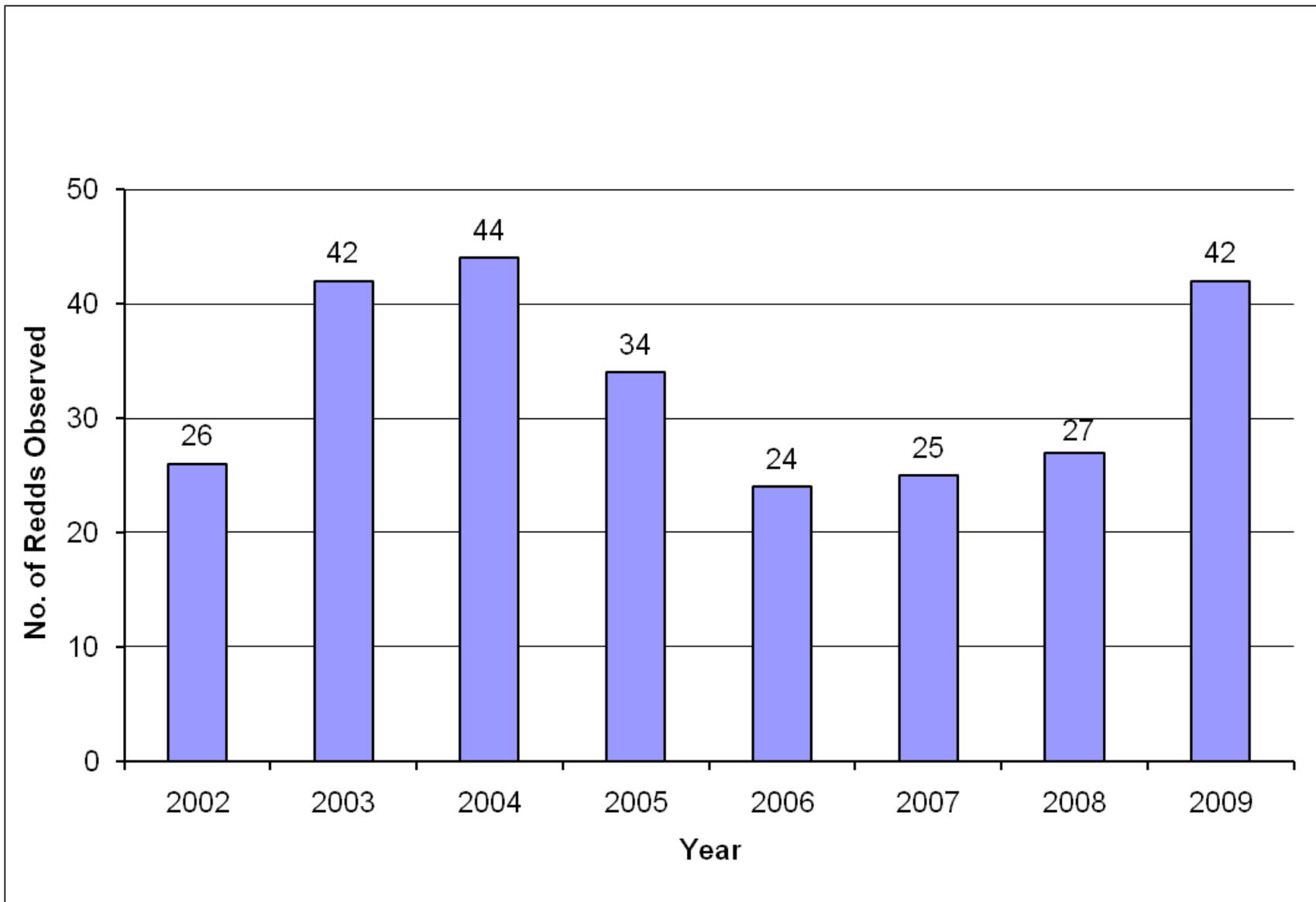


Figure 8. Fluvial bull trout redd counts in the trend transect on Bear Valley Creek, 2002 to 2009.

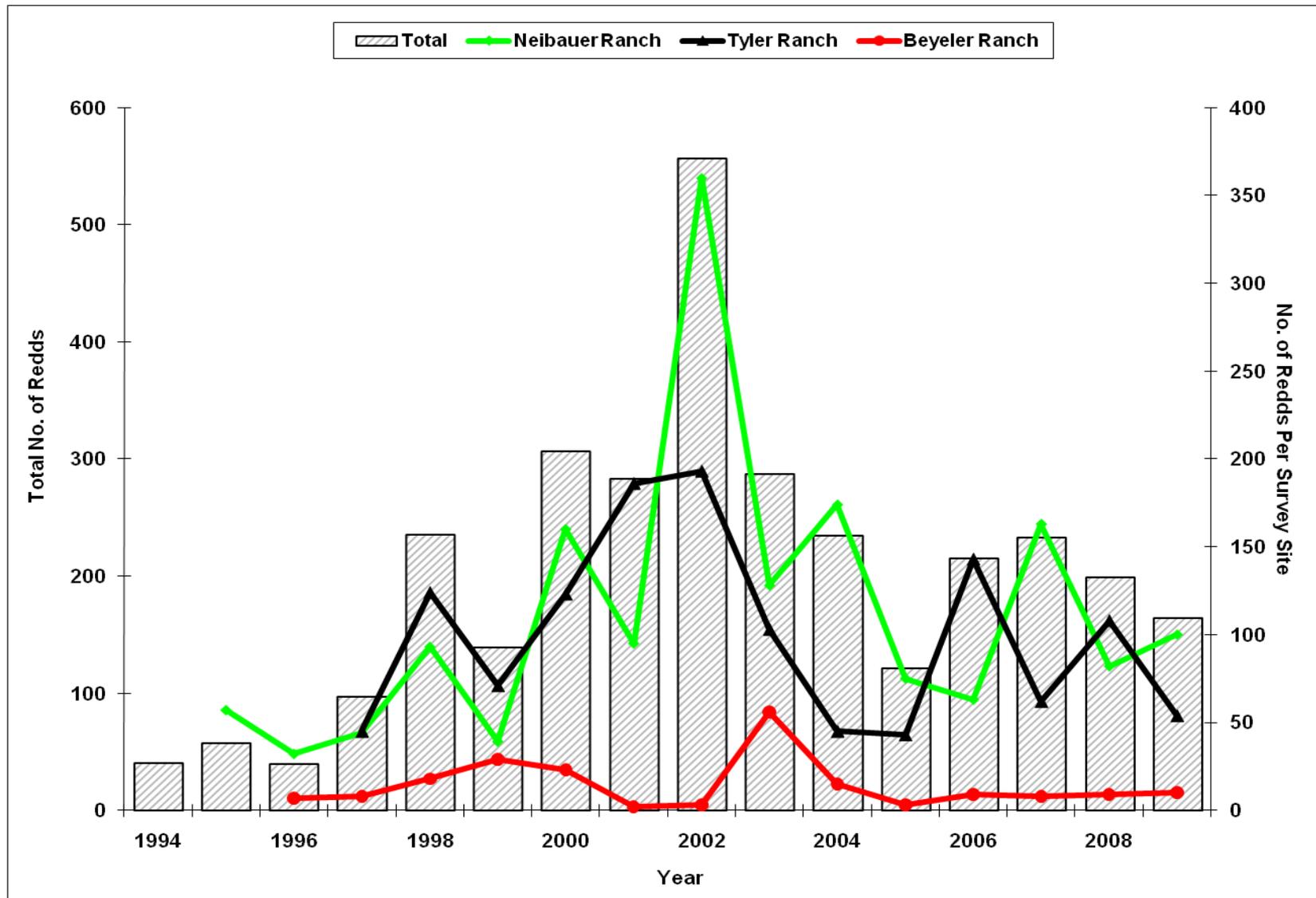


Figure 9. Resident rainbow trout spawning redds counted during ground surveys in the upper Lemhi River (Beyeler Ranch) and Big Springs Creek (Neibaur and Tyler ranches), 1994 to 2009.

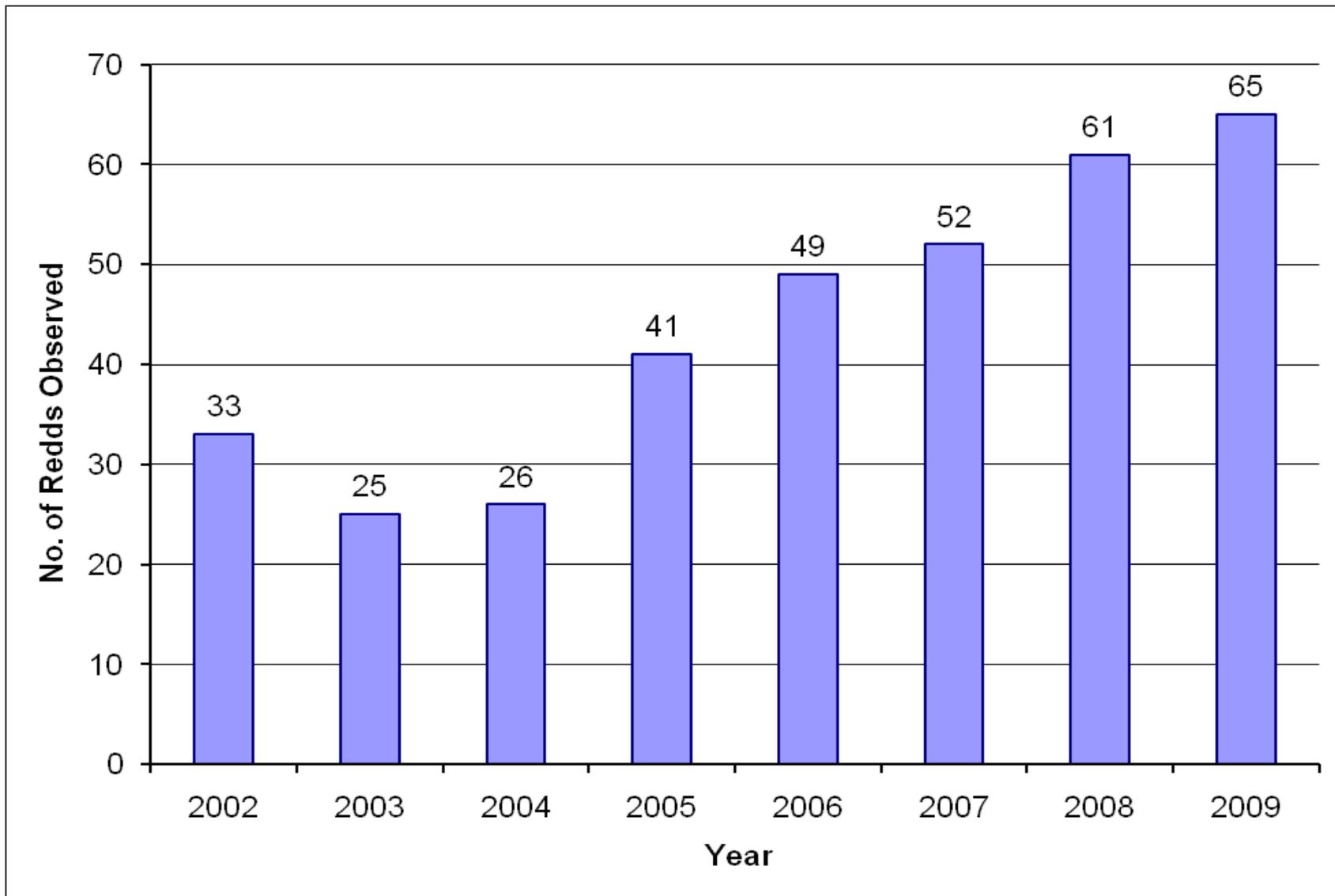


Figure 10. Resident bull trout redd counts in East Fork Hayden Creek, 2002 to 2009.

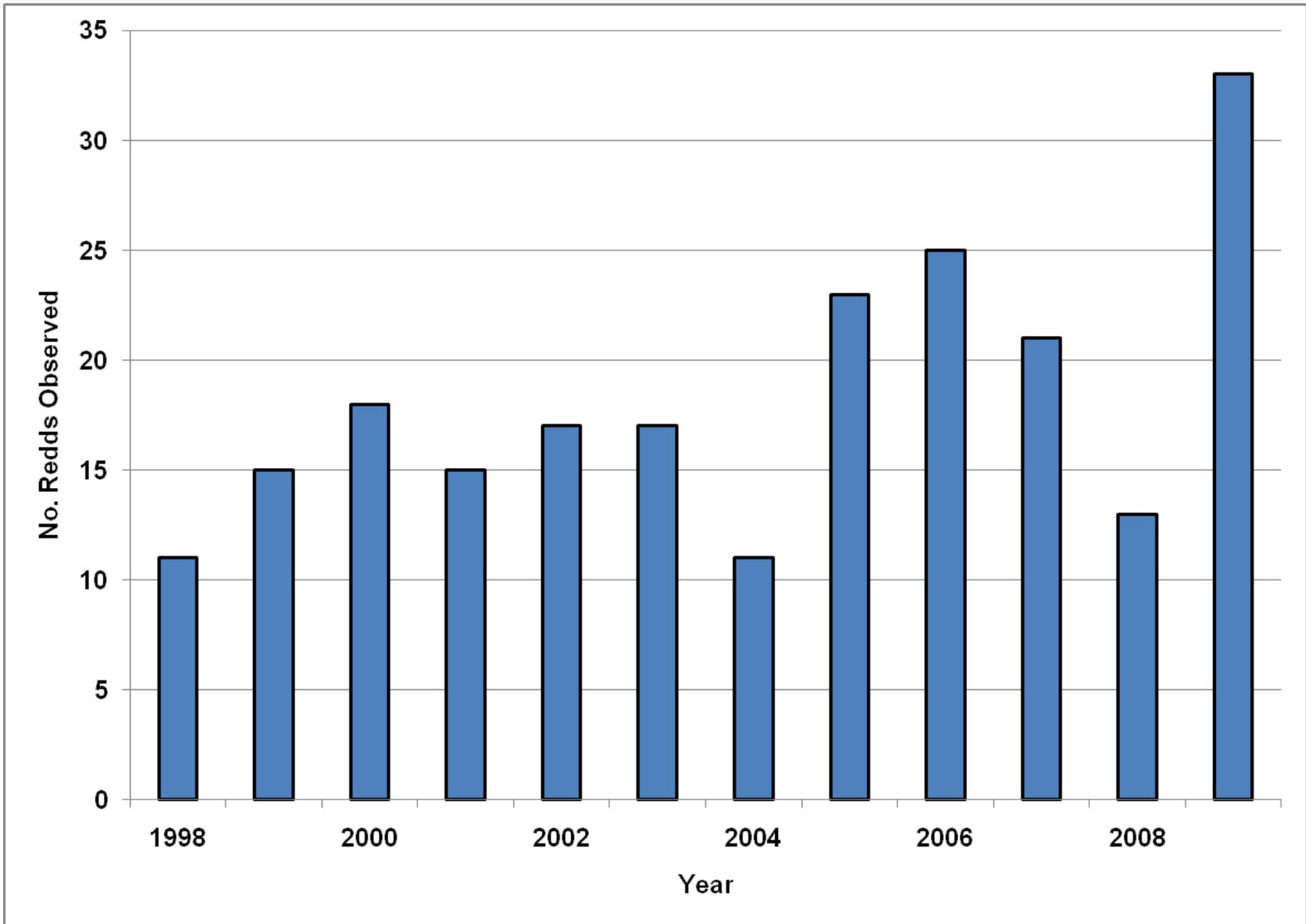


Figure 11. Bull trout redd counts observed in the trend transect of Fishhook Creek. 1998 to 2009.

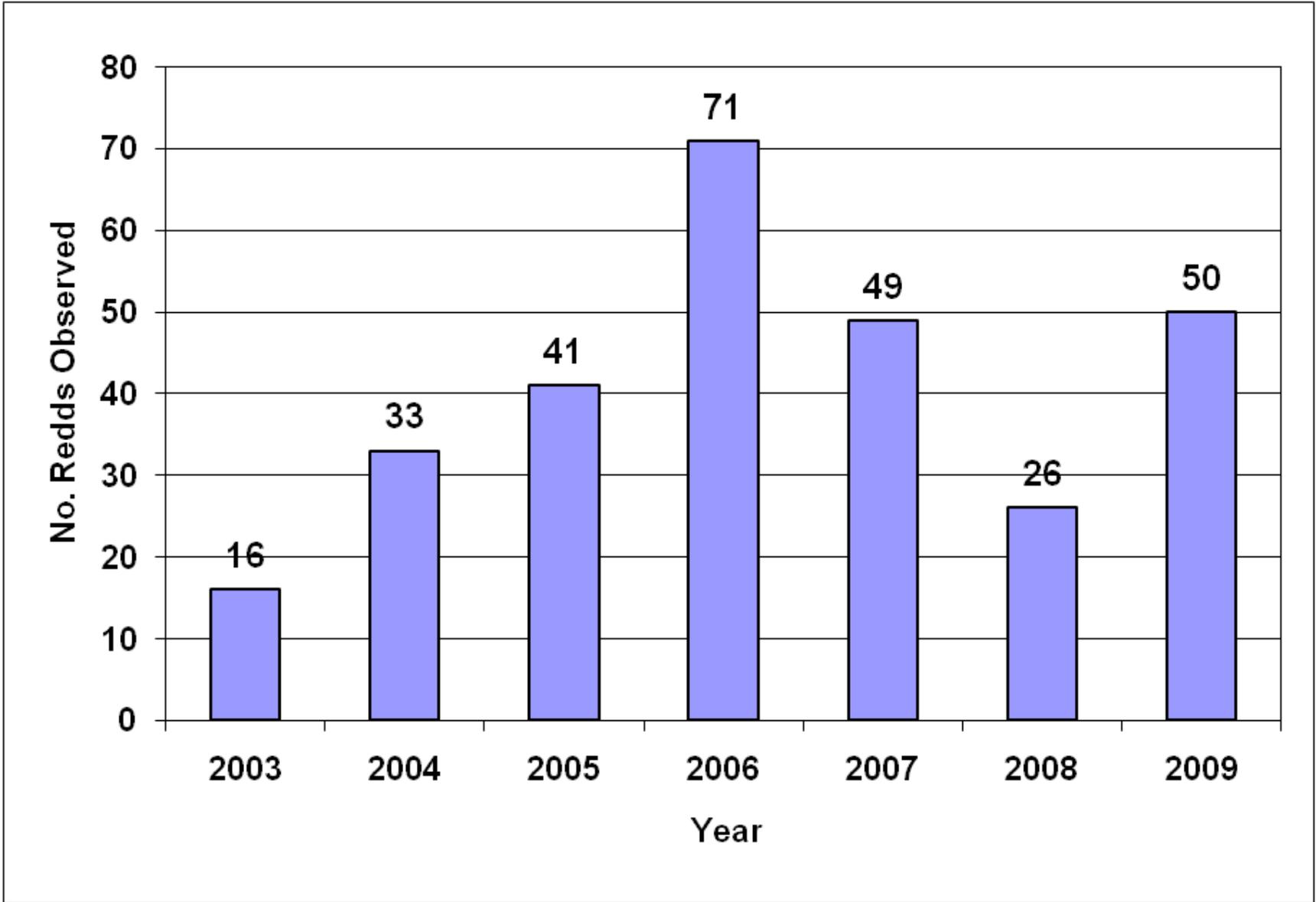


Figure 12. Fluvial bull trout redd counts in Fourth of July Creek (SNRA), 2003 to 2009.

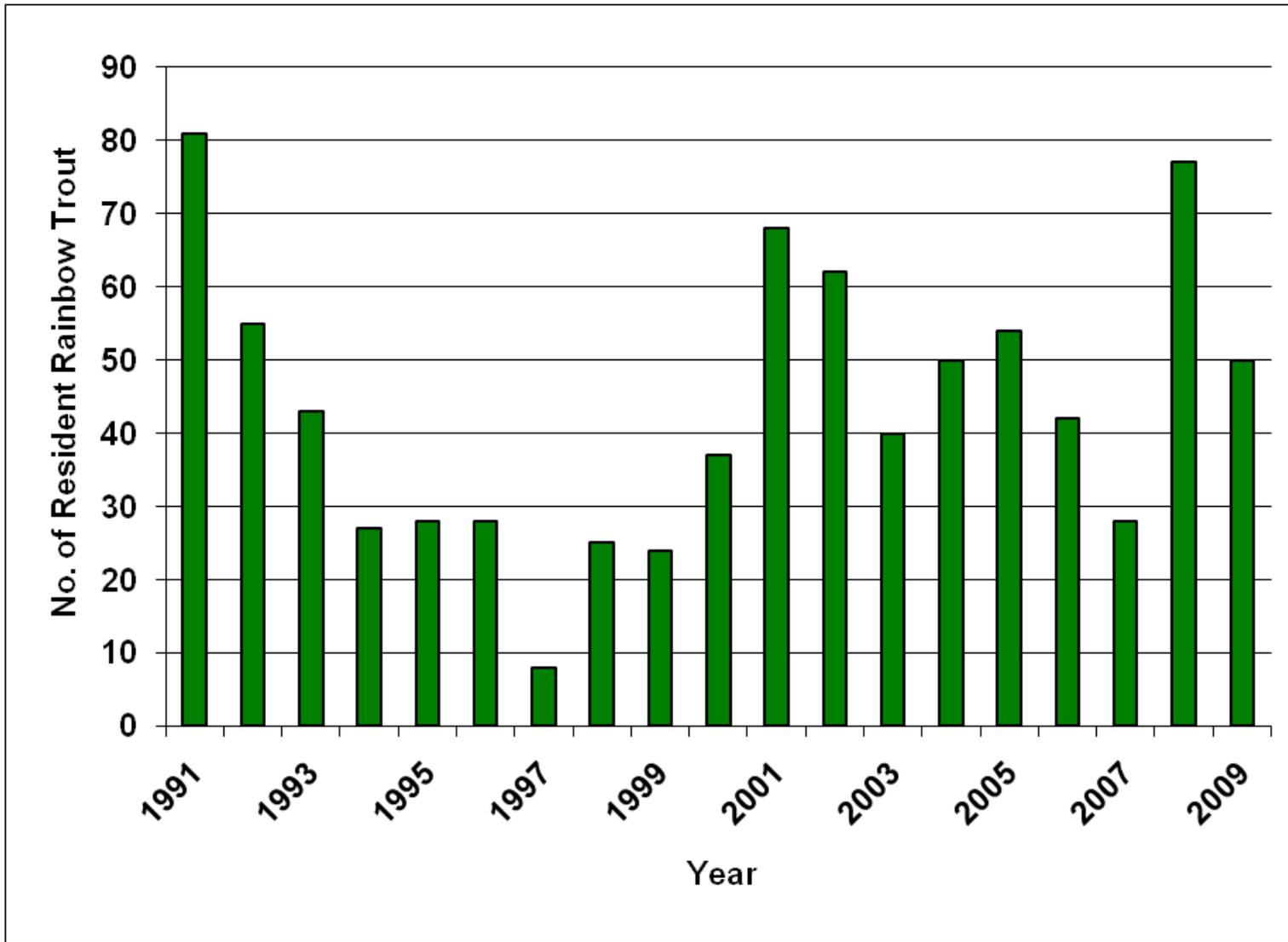


Figure 13. Annual count of resident rainbow trout trapped at the Pahsimeroi Fish Hatchery, 1991 to 2009.

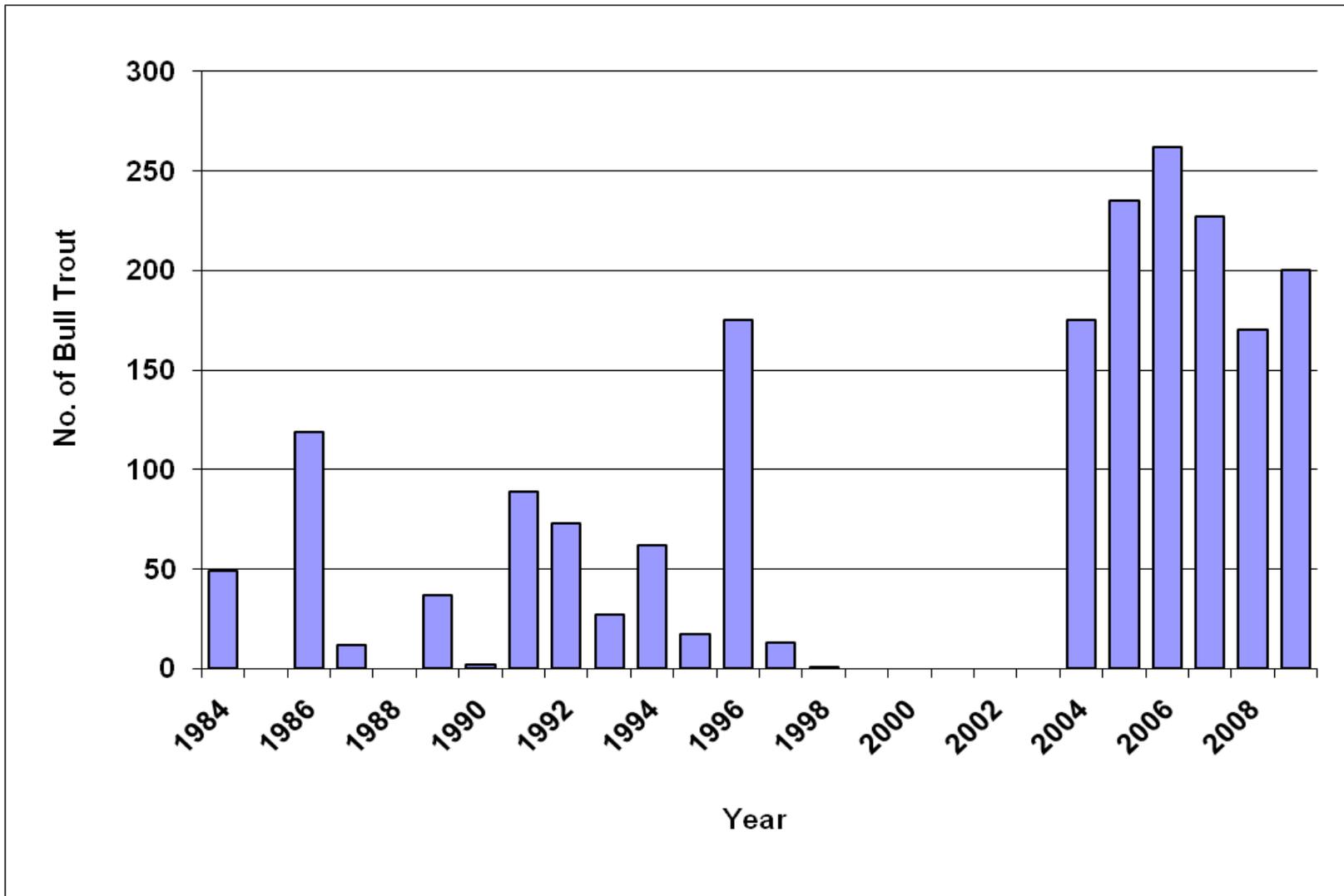


Figure 14. Annual count of bull trout trapped at East Fork Satellite Facility, 1984 to 2009.

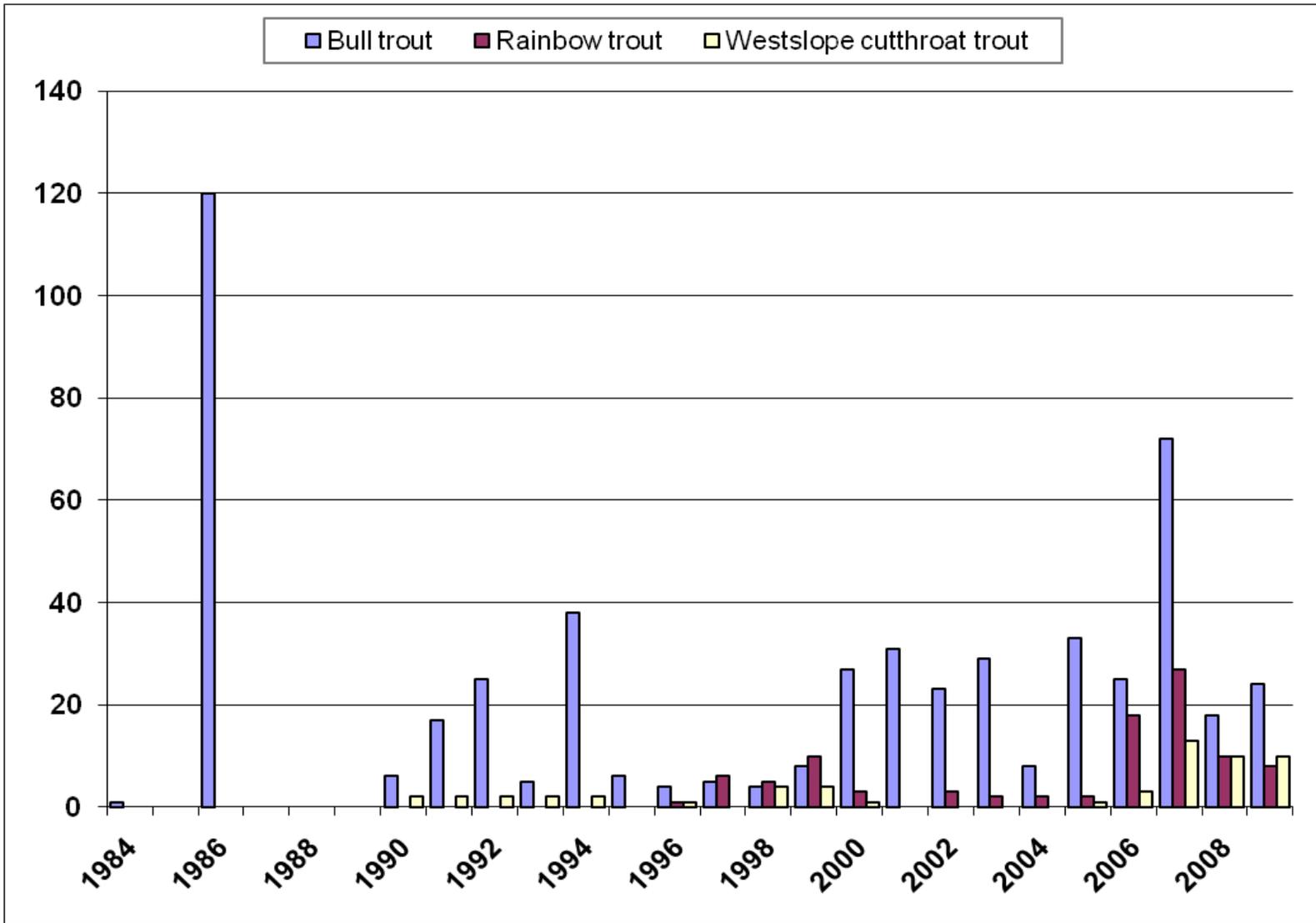


Figure 15. Annual count of selected resident salmonids trapped at Sawtooth Fish Hatchery, 1984 to 2009.

Appendix D. Site characteristics of stream transects surveyed by electro-fishing in the upper Salmon River in 2009.

Stream	Transect ^a	Sample Date	Water Temp. (C ^o)	Transect Length (m)	Transect		Sub-basin	Location in WGS84	
					Mean Width (m)	Transect Area (m ²)		Latitude	Longitude
								Decimal Degrees	
Agency	M	07/14/2009	10.3	160.0	ND ^b	ND	Lemhi River	44.95479	-113.55059
Agency	M	07/14/2009	12.0	160.0	ND	ND	Lemhi River	44.95941	-113.54370
Agency	U	06/30/2009	10.1	160.0	ND	ND	Lemhi River	44.97182	-113.52746
Agency	U	06/30/2009	12.6	160.0	ND	ND	Lemhi River	44.97774	-113.49654
Agency	U	07/02/2009	11.7	160.0	ND	ND	Lemhi River	44.97394	-113.52032
Agency	U	09/10/2009	10.6	160.0	ND	ND	Lemhi River	44.97774	-113.49654
Allan	L	07/14/2009	11.0	150.0	1.02	153.0	North Fork Salmon River	45.52138	-114.03357
Arrastra	L	07/22/2009	10.0	150.0	1.80	270.0	Middle Fork Salmon River	44.87037	-114.42675
Basin	L	09/09/2009	8.0	160.0	ND	ND	Lemhi River	44.60902	-113.40057
Basin	M	08/06/2009	8.5	160.0	ND	ND	Lemhi River	44.84473	-113.81298
Basin	M	08/27/2009	10.0	160.0	ND	ND	Lemhi River	44.84039	-113.78603
Bayhorse	U	10/06/2009	3.2	ND	ND	ND	North Fork to Headwaters	44.40619	-114.36259
Bear Valley	L	07/27/2009	10.6	200.0	ND	ND	Lemhi River	44.78143	-113.75002
Bear Valley	M	08/03/2009	10.0	200.0	ND	ND	Lemhi River	44.78564	-113.76361
Bear Valley	M	08/18/2009	8.5	100.0	3.88	388.0	Lemhi River	44.77949	-113.74758
Beaver	L	07/13/2009	9.0	117.4	5.14	603.4	North Fork to Headwaters	43.90450	-114.82535
Beaver	L	07/13/2009	9.0	100.0	6.38	638.0	North Fork to Headwaters	43.89976	-114.83306
Beaver	L	07/13/2009	9.0	101.0	6.92	698.9	North Fork to Headwaters	43.89624	-114.84178
Beaver	L	07/13/2009	10.0	110.0	6.56	721.6	North Fork to Headwaters	43.89321	-114.84867
Beaver	L	07/14/2009	12.0	105.0	6.74	707.7	North Fork to Headwaters	43.91046	-114.81838
Beaver	L	10/28/2009	2.8	100.0	2.36	236.0	Horse Creek to North Fork	45.28630	-114.28746
Beaver	M	07/14/2009	6.0	107.0	7.00	749.0	North Fork to Headwaters	43.89017	-114.85529
Beaver	M	07/14/2009	7.0	90.0	6.22	559.8	North Fork to Headwaters	43.88886	-114.85915
Beaver	M	07/14/2009	9.0	97.0	7.66	743.0	North Fork to Headwaters	43.88797	-114.85908
Beaver	M	07/14/2009	9.0	105.0	6.00	630.0	North Fork to Headwaters	43.86021	-114.87807
Beaver	U	07/15/2009	5.0	114.0	5.86	668.0	North Fork to Headwaters	43.86021	-114.87807
Beaver	U	07/15/2009	6.0	99.0	1.74	172.3	North Fork to Headwaters	43.84496	-114.89571
Beaver	U	07/15/2009	8.5	98.0	3.24	317.5	North Fork to Headwaters	43.84413	-114.89842
Big Bear	L	07/09/2009	9.1	100	2.9	290.0	Lemhi River	44.67342	-113.15236

Stream	Transect ^a	Sample Date	Water Temp. (C°)	Transect Length (m)	Transect		Sub-basin	Location in WGS84	
					Mean Width (m)	Transect Area (m ²)		Latitude	Longitude
								Decimal Degrees	
Big Bear	L	08/20/2009	11.0	ND	ND	ND	Lemhi River	44.66897	-113.11100
Big Bear	L	08/06/2009	10.0	160.0	ND	ND	Lemhi River	44.67187	-113.15213
Big Bear	M	07/30/2009	8.7	ND	ND	ND	Lemhi River	44.65998	-113.10488
Big Bear	M	08/20/2009	14.0	ND	ND	ND	Lemhi River	44.67439	-113.12991
Big Boulder	L	08/03/2009	10.0	98.0	4.64	454.7	East Fork Salmon River	44.12083	-114.45737
Big Boulder	M	08/03/2009	12.0	105.0	5.14	539.7	East Fork Salmon River	44.12474	-114.48389
Big Boulder	M	08/03/2009	13.0	80.0	5.83	466.4	East Fork Salmon River	44.12518	-114.48784
Big Boulder	U	08/04/2009	12.0	90.0	5.12	460.8	East Fork Salmon River	44.13138	-114.52500
Big Boulder	U	08/04/2009	14.0	87.0	6.92	602.0	East Fork Salmon River	44.11203	-114.57242
Big Boulder	U	08/04/2009	13.0	70.0	6.55	458.5	East Fork Salmon River	44.12997	-114.52976
Big Boulder	U	08/04/2009	9.0	101.0	ND	ND	East Fork Salmon River	44.13266	-114.51022
Big Boulder	U	08/05/2009	14.0	96.0	5.32	510.7	East Fork Salmon River	44.11946	-114.54420
Big Boulder	U	08/05/2009	12.0	100.0	4.88	488.0	East Fork Salmon River	44.10685	-114.57588
Big Boulder	U	08/05/2009	17.0	100.0	3.59	359.0	East Fork Salmon River	44.11168	-114.56298
Big Eightmile	M	08/19/2009	9.3	100.0	4.80	480.0	Lemhi River	44.61717	-113.56841
Big Eightmile	U	09/01/2009	7.1	160.0	ND	ND	Lemhi River	44.57914	-113.57874
Big Eightmile	U	09/10/2009	5.4	160.0	ND	ND	Lemhi River	44.61430	-113.56913
Big Hat	U	09/02/2009	10.5	100.0	2.72	272.0	North Fork to Headwaters	44.82038	-114.11721
Big Jureano	L	10/27/2009	3.3	50.0	1.04	52.0	Horse Creek to North Fork	45.16112	-114.25504
Big Timber	L	08/25/2009	13.0	160.0	ND	ND	Lemhi River	44.66259	-113.37583
Big Timber	M	08/19/2009	8.5	100.0	6.46	646.0	Lemhi River	44.61052	-113.39450
Big Timber	M	09/15/2009	8.4	160.0	ND	ND	Lemhi River	44.56533	-113.39861
Big Timber	M	09/29/2009	8.4	200.0	ND	ND	Lemhi River	44.58952	-113.39767
Big Timber	U	09/14/2009	7.2	200.0	ND	ND	Lemhi River	44.52917	-113.42441
Big Timber	U	09/17/2009	11.3	200.0	ND	ND	Lemhi River	44.54900	-113.40918
Birdseye	L	07/22/2009	11.8	100.0	2.32	232.0	Middle Fork Salmon River	44.92877	-114.38674
Bog	L	07/09/2009	12.3	100.0	0.9	90.0	Lemhi River	44.67064	-113.11045
Boulder	L	09/17/2009	13.6	100.0	2.62	262.0	Horse Creek to North Fork	45.37795	-114.27842
Buck	L	08/05/2009	8.0	160.0	ND	ND	Lemhi River	44.79839	-113.82451
Bull Spring	L	09/08/2009	5.6	100.0	1.18	118.0	Horse Creek to North Fork	44.93740	-114.27500
Camas Canyon	L	07/31/2009	ND	ND	ND	ND	Middle Fork Salmon River	44.89158	-114.72453
	L	06/16/2009	10.3	160.0	ND	ND	Lemhi River	44.69615	-113.33975

Stream	Transect ^a	Sample Date	Water Temp. (C°)	Transect Length (m)	Transect		Sub-basin	Location in WGS84	
					Mean Width (m)	Transect Area (m ²)		Latitude	Longitude
								Decimal Degrees	
Canyon	L	06/18/2009	12.7	160.0	ND	ND	Lemhi River	44.73365	-113.27639
Canyon	L	07/06/2009	10.1	160.0	ND	ND	Lemhi River	44.71580	-113.28188
Canyon	L	09/09/2009	8.7	160.0	ND	ND	Lemhi River	44.71580	-113.28188
Canyon	U	06/15/2009	10.0	160.0	ND	ND	Lemhi River	44.77794	-113.25196
Canyon	U	09/24/2009	ND	50.0	ND	ND	Lemhi River	44.77318	-113.24870
Cape Horn	L	08/07/2009	ND	110.0	4.64	510.4	Middle Fork Salmon River	44.52126	-115.21820
Carmen	U	08/25/2009	8.0	100.0	6.44	644.0	North Fork to Headwaters	45.35555	-113.77955
Castle	L	09/10/2009	12.0	100.0	4.84	484.0	Middle Fork Salmon River	44.80309	-114.47237
Challis	U	07/22/2009	10.3	93.0	4.61	428.7	North Fork to Headwaters	44.50365	-114.46346
Clear	M	08/19/2009	10.0	100.0	3.02	302.3	Lemhi River	44.54698	-113.11961
Clear	M	08/19/2009	ND	88.0	1.27	111.8	Lemhi River	44.55418	-113.10972
Cooper	L	09/23/2009	5.3	100.0	2.54	254.0	Lemhi River	44.72622	-113.72461
Corral	L	07/16/2009	14.4	100.0	2.62	262.0	North Fork to Headwaters	44.79855	-114.22933
Corral	L	07/30/2009	9.0	100.0	2.44	244.0	Horse Creek to North Fork	45.50036	-114.14795
Corral	M	07/16/2009	8.5	100.0	2.61	261.0	North Fork to Headwaters	44.81238	-114.22667
Cougar	M	08/05/2009	8.0	95.0	2.70	256.5	East Fork Salmon River	43.94718	-114.44724
Cruikshank	U	06/18/2009	8.4	160.0	ND	ND	Lemhi River	44.76067	-113.20334
Dahlonga	M	09/29/2009	6.1	100.0	2.76	276.0	North Fork Salmon River	45.55853	-113.89571
Dairy	L	08/06/2009	9.8	100.0	2.74	274.0	Lemhi River	44.63898	-113.55759
Deep	L	08/24/2009	9.6	100.0	2.26	226.0	North Fork Salmon River	45.60157	-113.97694
Deer	L	08/10/2009	11.0	100.0	2.94	294.0	Lemhi River	44.50276	-113.31028
Deer	L	08/20/2009	8.9	100.0	1.34	134.0	Lemhi River	44.79387	-113.77950
Deer	L	09/22/2009	11.7	100.0	0.30	30.0	Lemhi River	44.69200	-113.15000
Deer	U	09/21/2009	4.5	100.0	2.50	250.0	North Fork to Headwaters	44.79387	-113.77950
Ditch	M	07/14/2009	11.7	120.0	4.66	559.0	North Fork Salmon River	45.52271	-113.99666
Ditch	U	07/14/2009	9.1	125.0	4.92	615.0	North Fork Salmon River	45.55816	-114.01460
Divide	L	06/25/2009	ND	160.0	ND	ND	Lemhi River	44.50805	-113.22397
Divide	L	06/25/2009	ND	160.0	ND	ND	Lemhi River	44.48714	-113.19473
Divide	M	06/25/2009	ND	160.0	ND	ND	Lemhi River	44.48602	-113.17828
East Fork Hayden	L	08/03/2009	8.0	160.0	ND	ND	Lemhi River	44.74667	-113.68569
East Fork Indian	L	09/30/2009	ND	ND	ND	ND	Horse Creek to North Fork	45.46023	-114.14346
East Fork Indian	M	09/30/2009	5.6	100.0	1.02	102.0	Horse Creek to North Fork	45.46082	-114.12015

Stream	Transect ^a	Sample Date	Water Temp. (C°)	Transect Length (m)	Transect		Sub-basin	Location in WGS84	
					Mean Width (m)	Transect Area (m ²)		Latitude	Longitude
								Decimal Degrees	
East Fork Indian	M	09/30/2009	5.6	100.0	0.78	78.0	Horse Creek to North Fork	45.45964	-114.10747
East Fork Mayfield	L	08/11/2009	9.4	98.0	6.21	608.6	Middle Fork Salmon River	44.53810	-114.79662
East Fork Morgan	L	08/03/2009	9.5	100.0	5.66	566.0	North Fork to Headwaters	44.67464	-113.88473
East Fork Pahsimeroi River	M	08/10/2009	8.5	100.0	3.61	361.0	Pahsimeroi River	44.12742	-113.69374
East Fork Pierce	L	09/29/2009	5.6	100.0	1.04	104.0	North Fork Salmon River	45.63859	-113.94597
East Fork Spring	L	08/04/2009	11.9	100.0	2.07	207.0	Horse Creek to North Fork	45.42254	-114.27254
East Fork West Pass	U	08/04/2009	8.0	105.0	3.40	357.0	East Fork Salmon River	43.91955	-114.44435
East Fork West Pass	U	08/04/2009	8.0	100.0	3.10	310.0	East Fork Salmon River	43.91779	-114.44643
East Pass	L	08/04/2009	10.8	100.0	4.52	452.0	East Fork Salmon River	44.07410	-114.24669
Flat	M	10/27/2009	1.0	100.0	1.12	112.0	North Fork to Headwaters	44.07404	-114.24693
Ford	L	08/20/2009	13.5	100.0	1.28	128.0	Lemhi River	44.33350	-115.12095
Fourth of July	U	08/25/2009	7.6	100.0	3.60	360.0	North Fork to Headwaters	44.77129	-113.73319
Frank Hall	M	07/15/2009	10.1	100.0	2.10	210.0	Lemhi River	45.42996	-113.83618
Friedorf Gulch	L	08/12/2009	11.4	100.0	ND	ND	North Fork Salmon River	45.55817	-113.96511
Fritzer Gulch	L	10/27/2009	3.3	100.0	0.92	92.0	Horse Creek to North Fork	45.20318	-114.31790
Furnace	L	09/10/2009	8.4	100.0	4.50	450.0	Middle Fork Salmon River	44.76307	-113.19978
Garland	M	08/11/2009	8.0	99.0	2.98	295.0	North Fork to Headwaters	44.17762	-114.74952
Garland	M	08/11/2009	9.0	99.0	2.98	321.4	North Fork to Headwaters	44.17527	-114.76005
Garland	M	08/11/2009	8.0	83.0	2.30	190.9	North Fork to Headwaters	44.17430	-114.76684
Gunsight	L	08/05/2009	10.5	106.8	2.04	217.9	East Fork Salmon River	44.11154	-114.57676
Hammerean	U	08/12/2009	11.3	100.0	2.02	202.0	North Fork Salmon River	45.57018	-113.97704
Hawley	L	07/15/2009	14.0	160.0	ND	ND	Lemhi River	44.66844	-113.31321
Hawley	L	07/15/2009	14.0	160.0	ND	ND	Lemhi River	44.66816	-113.31959
Hawley	M	06/23/2009	12.6	160.0	ND	ND	Lemhi River	44.66112	-113.25171
Hawley	M	06/23/2009	10.1	160.0	ND	ND	Lemhi River	44.67138	-113.27464
Hawley	M	08/18/2009	12.2	100.0	4.12	412.0	Lemhi River	44.66551	-113.19420
Hayden	L	08/31/2009	11.0	280.0	ND	ND	Lemhi River	44.86293	-113.63129
Hayden	L	09/21/2009	8.0	280.0	ND	ND	Lemhi River	44.86293	-113.63129

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								Decimal Degrees	
Hayden	L	09/30/2009	8.0	280.0	ND	ND	Lemhi River	44.86293	-113.63129
Hayden	M	08/04/2009	14.0	230.0	ND	ND	Lemhi River	44.74122	-113.71307
Hayden	M	08/17/2009	11.0	230.0	ND	ND	Lemhi River	44.78882	-113.70371
Hayden	M	08/18/2009	11.0	160.0	ND	ND	Lemhi River	44.77424	-113.70883
Haynes	U	09/28/2009	4.4	160.0	ND	ND	Lemhi River	44.99540	-113.77912
Hood Gulch	L	08/06/2009	13.4	100.0	1.60	160.0	Lemhi River	44.78038	-113.26768
Hot Springs	M	10/27/2009	6.7	30.0	1.09	32.6	Horse Creek to North Fork	45.31027	-114.33569
Hughes	M	07/20/2009	11.3	120.0	4.20	504.0	North Fork Salmon River	45.53812	-114.05897
Hughes	M	08/26/2009	10.3	100.0	4.68	468.0	North Fork Salmon River	45.53493	-114.05677
Hull	L	08/26/2009	10.6	100.0	1.60	160.0	North Fork Salmon River	45.46919	-113.99770
Hull	L	10/01/2009	7.2	100.0	2.13	213.0	North Fork Salmon River	45.47334	-114.01718
Hull	M	09/30/2009	4.4	100.0	1.04	104.0	North Fork Salmon River	45.48469	-114.07713
Hull	M	10/01/2009	ND	ND	ND	ND	North Fork Salmon River	45.47685	-114.03624
Hull	M	10/01/2009	ND	ND	ND	ND	North Fork Salmon River	45.47714	-114.03640
Hull	U	09/30/2009	4.4	50.0	1.08	54.0	North Fork Salmon River	45.48342	-114.05001
Indian	M	07/30/2009	8.9	100.0	4.24	424.0	Horse Creek to North Fork	45.50059	-114.14912
Indian	M	07/30/2009	6.0	100.0	3.52	352.0	Horse Creek to North Fork	45.46318	-114.14794
Indian	M	09/30/2009	10.4	100.0	5.24	524.0	Horse Creek to North Fork	45.48168	-114.14318
Iron	L	07/20/2009	7.0	ND	4.18	ND	North Fork to Headwaters	44.20665	-114.98538
Iron	L	07/23/2009	11.0	110.0	3.4	374.0	North Fork to Headwaters	44.22248	-114.96038
Iron	L	07/23/2009	11.0	131.0	4.04	529.2	North Fork to Headwaters	44.22263	-114.95936
Iron	L	07/23/2009	14.0	70.0	5.05	353.5	North Fork to Headwaters	44.21397	-114.98062
Iron	L	07/29/2009	13.0	105.0	4.46	468.3	North Fork to Headwaters	44.20066	-114.99979
Iron	L	07/30/2009	11.5	101.0	3.96	400.0	North Fork to Headwaters	44.21853	-114.96975
Iron	M	09/01/2009	8.8	100.0	5.14	514.0	North Fork to Headwaters	44.91726	-114.05651
Iron	U	07/20/2009	10.5	90.0	3.16	284.4	North Fork to Headwaters	44.19130	-115.04872
Iron	U	07/20/2009	10.5	98.0	4.06	397.9	North Fork to Headwaters	44.19116	-115.04029
Jim	L	08/04/2009	8.0	121.0	5.88	711.5	East Fork Salmon River	44.13369	-114.52820
Johnson Gulch	M	08/12/2009	10.8	100.0	1.04	104.0	North Fork Salmon River	45.56640	-113.97399
Kadletz	L	08/20/2009	10.1	100.0	2.68	268.0	Lemhi River	44.77343	-113.74581
Kenney	L	07/21/2009	9.9	160.0	ND	ND	Lemhi River	45.04033	-113.62141
Kenney	L	09/03/2009	10.0	160.0	ND	ND	Lemhi River	45.04033	-113.62141

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								Decimal Degrees	
Kenney	M	07/22/2009	9.3	160.0	ND	ND	Lemhi River	44.06110	-113.58574
Kinnikinic	L	07/22/2009	12.0	100.0	2.68	268.0	North Fork to Headwaters	44.27414	-114.40804
Kinnikinic	L	07/22/2009	8.0	110.0	2.82	310.2	North Fork to Headwaters	44.28522	-114.41166
Lake	L	08/31/2009	10.8	20.0	1.70	34.0	North Fork to Headwaters	45.00518	-114.02295
Lake	M	09/15/2009	11.6	100.0	3.28	328.0	North Fork to Headwaters	45.01441	-114.00926
Lake	U	09/16/2009	8.9	100.0	2.02	202.0	North Fork to Headwaters	44.99782	-114.04959
Lake	U	09/21/2009	6.7	100.0	1.82	182.0	North Fork to Headwaters	45.00348	-114.03768
Lemhi River	L	08/10/2009	14.0	300.0	ND	ND	Lemhi River	45.15746	-113.82167
Lemhi River	L	08/17/2009	12.0	250.0	ND	ND	Lemhi River	45.13919	-113.80565
Lemhi River	M	08/25/2009	13.0	160.0	ND	ND	Lemhi River	44.94229	-113.64123
Lemhi River	M	08/24/2009	11.0	320.0	ND	ND	Lemhi River	44.86750	-113.62432
Lemhi River	M	09/22/2009	9.0	320.0	ND	ND	Lemhi River	44.86750	-113.62432
Lemhi River	M	09/28/2009	8.0	320.0	ND	ND	Lemhi River	44.86750	-113.62432
Lemhi River	U	08/19/2009	17.0	250.0	ND	ND	Lemhi River	44.81748	-113.58459
Lemhi River	U	08/19/2009	10.0	320.0	ND	ND	Lemhi River	44.75003	-113.47661
Lick	L	09/14/2009	10.0	100.0	0.87	87.0	North Fork Salmon River	45.53051	-113.90143
Lick	M	07/15/2009	9.3	100.0	2.08	208.0	North Fork Salmon River	44.74075	-114.30020
Lick	M	08/12/2009	ND	100.0	1.78	178.0	North Fork Salmon River	44.74904	-114.31563
Little Bear	L	09/22/2009	8.3	100.0	0.71	71.0	Lemhi River	44.66811	-113.14697
Little Hat	U	07/07/2009	14.8	100.0	1.00	100.0	North Fork to Headwaters	44.75306	-114.16377
Little Jureano	L	10/27/2009	4.4	20.0	0.76	15.2	Horse Creek to North Fork	45.16390	-114.26445
Little Springs	L	06/11/2009	13.9	160.0	ND	ND	Lemhi River	44.77008	-113.52193
Little Springs	M	06/11/2009	13.9	160.0	ND	ND	Lemhi River	44.76475	-113.51542
Little Springs	U	06/11/2009	16.9	160.0	ND	ND	Lemhi River	44.75644	-113.49705
Little Timber	M	08/01/2009	ND	ND	ND	ND	Lemhi River	44.62448	-113.42678
Loon	L	07/31/2009	ND	ND	ND	ND	Middle Fork Salmon River	44.80827	-114.81229
Lyon	L	06/29/2009	13.0	73.0	1.90	138.7	North Fork to Headwaters	44.32339	-114.29216
Lyon	L	07/28/2009	12.0	73.0	1.90	138.7	North Fork to Headwaters	44.32339	-114.29216
Lyon	M	06/30/2009	13.0	110.0	3.56	391.6	North Fork to Headwaters	44.32925	-114.30913
Lyon	M	07/02/2009	7.0	100.0	2.42	242.0	North Fork to Headwaters	44.33049	-114.31956
Lyon	U	07/28/2009	6.0	120.0	2.82	338.4	North Fork to Headwaters	44.32810	-114.31767
Lyon	U	07/07/2009	6.0	120.0	1.36	137.4	North Fork to Headwaters	44.33519	-114.34027

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Marble	L	07/30/2009	ND	ND	ND	ND	Middle Fork Salmon River	44.74409	-115.01703
Martin	L	07/29/2009	9.6	100.0	5.89	589.0	North Fork to Headwaters	44.38937	-114.49722
Martin	M	08/13/2009	7.9	100.0	2.57	257.0	North Fork to Headwaters	44.39890	-114.51496
McDevitt	M	06/29/2009	12.8	160.0	ND	ND	Lemhi River	44.93716	-113.77706
McDevitt	U	06/29/2009	12.9	160.0	ND	ND	Lemhi River	44.92581	-113.74112
McKay	L	07/22/2009	13.0	117.0	4.41	516.0	Yankee Fork Salmon River	44.48563	-114.54430
McKim	L	08/03/2009	10.8	100.0	3.65	365.0	North Fork to Headwaters	44.81115	-113.97045
Middle Fork Little Timber	M	10/05/2009	3.3	100.0	2.86	286.0	Lemhi River	44.58650	-113.46578
Mill	M	08/20/2009	7.5	100.0	3.62	362.0	Lemhi River	44.70662	-113.59409
Mink	L	07/21/2009	6.6	100.0	2.02	202.0	Horse Creek to North Fork	44.86700	-114.29910
Moose	L	08/24/2009	10.0	100.0	2.02	202.0	Horse Creek to North Fork	45.65425	-113.97085
Moose	U	08/05/2009	9.0	100.0	2.36	236.0	Horse Creek to North Fork	45.67457	-113.95469
Moose	U	08/05/2009	9.2	100.0	2.48	248.0	Horse Creek to North Fork	45.67457	-113.95469
Morgan	U	07/15/2009	13.1	100.0	1.49	149.0	North Fork to Headwaters	44.81624	-114.25862
Moyer	M	09/08/2009	5.6	100.0	6.48	648.0	Horse Creek to North Fork	44.96071	-114.29445
Moyer	M	09/28/2009	7.1	100.0	5.90	590.0	Horse Creek to North Fork	44.96071	-114.29445
Musgrove	L	09/09/2009	12.4	100.0	4.66	466.0	Horse Creek to North Fork	45.02210	-114.31446
Napias	U	09/15/2009	8.4	100.0	3.10	310.0	Horse Creek to North Fork	45.22446	-114.11353
North Fork Iron	L	09/01/2009	8.8	100.0	3.52	352.0	North Fork to Headwaters	44.92645	-114.11439
North Fork Lawson	L	10/28/2009	11.3	100.0	0.98	98.0	Pahsimeroi River	44.57730	-114.01932
North Fork Little Timber	M	10/26/2009	4.4	100.0	5.24	524.0	Lemhi River	44.59939	-113.45997
North Fork Morgan	M	08/03/2009	10.4	95.0	2.81	267.0	North Fork to Headwaters	44.68547	-113.90083
North Fork Salmon River	U	08/05/2009	11.0	100.0	2.98	298.0	North Fork Salmon River	45.66286	-113.97887
North Fork Williams	L	07/27/2009	13.4	100.0	2.10	210.0	North Fork to Headwaters	45.08439	-114.04640
North Fork Williams	M	07/27/2009	11.2	100.0	2.54	254.0	North Fork to Headwaters	45.09431	-114.05161
Opal	L	07/16/2009	9.0	100.0	2.50	250.0	Horse Creek to North Fork	44.89873	-114.31504
Otter	L	07/15/2009	9.1	100.0	3.06	306.0	Horse Creek to North Fork	44.86089	-114.28962

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Owl	L	07/22/2009	15.0	104.0	8.00	827.8	Horse Creek to North Fork	45.31841	-114.44870
Owl	L	07/29/2009	12.0	101.0	2.58	260.6	Horse Creek to North Fork	45.33970	-114.46290
Owl	M	07/30/2009	ND	ND	ND	654.0	Horse Creek to North Fork	45.32940	-114.45960
Owl	M	07/30/2009	ND	ND	ND	614.0	Horse Creek to North Fork	45.34439	114.46278
Owl	U	08/20/2009	11.0	82.0	ND	ND	Horse Creek to North Fork	45.43734	-114.40530
Owl	U	08/20/2009	12.0	59.0	4.50	265.7	Horse Creek to North Fork	45.44356	-114.39643
Pahsimeroi River	U	08/13/2009	8.0	200.0	6.20	1,240.0	Pahsimeroi River	44.27632	-113.65554
Pahsimeroi River	U	08/13/2009	11.0	200.0	5.70	1,140.0	Pahsimeroi River	44.31917	-113.65390
Panther	M	09/09/2009	13.2	100.0	5.22	522.0	Horse Creek to North Fork	45.02182	-114.31559
Panther	U	07/21/2009	9.9	100.0	3.08	308.0	Horse Creek to North Fork	44.86022	-114.29053
Panther	U	09/09/2009	7.8	100.0	4.98	498.0	Horse Creek to North Fork	44.89699	-114.31618
Patterson	M	06/17/2009	12.0	124.0	6.46	801.0	Pahsimeroi River	44.56766	113.90685
Patterson	M	06/16/2009	14.0	127.0	6.70	850.9	Pahsimeroi River	44.56766	113.90685
Patterson	U	06/18/2009	13.0	100.0	6.02	602.0	Pahsimeroi River	44.55371	-113.87134
Patterson	U	06/18/2009	9.0	100.0	5.04	504.0	Pahsimeroi River	44.54831	113.86321
Patterson	U	07/13/2009	11.0	100.0	5.54	554.0	Pahsimeroi River	44.56406	-113.89760
Patterson	U	07/15/2009	9.0	100.4	6.16	618.5	Pahsimeroi River	44.55767	-113.88265
Payne	L	09/03/2009	12.6	100.0	1.23	123.0	Lemhi River	44.77269	-113.71610
Perreau	L	09/02/2009	9.9	100.0	2.96	296.0	North Fork to Headwaters	45.10096	-113.97328
Pierce	L	07/02/2009	10.0	100.0	1.96	196.0	North Fork Salmon River	45.62309	-113.96401
Pigtail	L	08/10/2009	9.0	102.0	2.94	299.9	North Fork to Headwaters	44.13080	-114.72945
Pigtail	L	08/10/2009	8.0	92.0	1.66	152.7	North Fork to Headwaters	44.12982	-114.72958
Pigtail	L	08/12/2009	ND	88.0	1.8	158.4	North Fork to Headwaters	44.12312	-114.74661
Pigtail	M	08/12/2009	10.0	106.0	1.42	150.5	North Fork to Headwaters	44.11520	-114.76771
Pigtail	M	08/12/2009	11.0	94.0	1.56	146.6	North Fork to Headwaters	44.11682	-114.76296
Pigtail	U	08/12/2009	8.0	101.0	1.65	166.7	North Fork to Headwaters	44.11212	-114.77280
Pine	L	08/27/2009	12.0	115.0	3.46	397.0	Horse Creek to North Fork	45.36337	-114.30009
Pine	L	08/27/2009	12.0	100.0	3.32	332.0	Horse Creek to North Fork	45.36004	-114.29077
Pine	U	08/04/2009	11.8	100.0	3.76	376.0	Horse Creek to North Fork	45.32927	-114.24478
Pistol	L	07/29/2009	ND	ND	ND	ND	Middle Fork Salmon River	44.72176	-115.15398
Pole	L	07/27/2009	12.0	115.0	4.06	466.9	North Fork to Headwaters	43.91696	-114.77635
Pole	L	07/27/2009	12.5	99.0	3.88	384.1	North Fork to Headwaters	43.91329	-114.76931

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Pole	L	07/30/2009	8.0	97.0	4.70	455.9	North Fork to Headwaters	43.92742	-114.80649
Pole	M	07/22/2009	5.5	119.0	3.84	457.0	North Fork to Headwaters	43.91193	-114.75566
Pole	M	07/22/2009	8.0	96.5	3.64	351.3	North Fork to Headwaters	43.92918	-114.71389
Pole	M	07/22/2009	6.0	92.0	4.46	410.3	North Fork to Headwaters	43.91256	-114.73478
Pole	U	07/22/2009	9.0	82.0	3.12	255.8	North Fork to Headwaters	43.93675	-114.69293
Pole	U	07/27/2009	4.5	96.0	1.96	188.2	North Fork to Headwaters	43.94653	-114.68522
Pole	U	07/27/2009	5.0	90.0	2.36	212.4	North Fork to Headwaters	43.94898	-114.68523
Purcell	M	08/17/2009	15.2	100.0	4.86	486.0	Lemhi River	44.55906	-113.34492
Quaking Asp	L	09/03/2009	10.0	100.0	1.02	102.0	Lemhi River	44.69674	-113.15005
Quaking Asp	L	09/22/2009	5.5	100.0	0.84	84.2	Lemhi River	44.69331	-113.14889
Quartz	U	08/12/2009	ND	ND	ND	ND	North Fork Salmon River	45.58379	-113.99015
Rapid River	L	07/29/2009	ND	ND	ND	ND	Middle Fork Salmon River	44.68002	115.15254
Rattlesnake	U	08/31/2009	8.5	100.0	1.70	170.0	North Fork to Headwaters	44.96514	-114.03258
Reservoir	L	07/09/2009	7.0	100.0	2.60	260.0	Lemhi River	44.68075	113.15608
Roaring	M	08/06/2009	9.0	90.0	2.04	183.6	East Fork Salmon River	43.97877	-114.47451
Rough Canyon	L	07/15/2009	9.9	100.0	2.58	258.0	Lemhi River	44.76273	-113.19978
Sage	M	07/06/2009	8.0	90.9	0.87	79.1	Horse Creek to North Fork	45.41346	-114.09293
Sage	M	07/06/2009	11.0	90.0	1.88	169.2	Horse Creek to North Fork	45.41990	-114.08800
Sheep	M	09/14/2009	8.7	100.0	5.90	590.0	North Fork Salmon River	45.50323	-113.90284
Ship Island	L	08/02/2009	ND	ND	ND	ND	Middle Fork Salmon River	45.17586	114.71096
Short	L	08/20/2009	8.9	100.0	1.06	106.0	Lemhi River	44.78883	-113.77074
Silver	L	07/29/2009	16.2	100.0	4.62	462.0	Middle Fork Salmon River	44.83520	-114.47979
Silver	M	07/22/2009	12.3	110.0	2.92	321.2	Middle Fork Salmon River	44.88720	-114.40046
Silver	M	10/19/2009	6.7	100.0	2.62	262.0	Middle Fork Salmon River	44.88720	-114.40046
Silver	M	10/19/2009	5.1	100.0	1.65	165.0	Middle Fork Salmon River	44.93511	-114.37511
Silver	U	07/29/2009	13.0	100.0	2.34	234.0	Middle Fork Salmon River	44.90344	-114.35656
South Fork Big	L	07/27/2009	11.4	110.0	3.87	425.7	Pahsimeroi River	44.44134	-113.60102
South Fork Hull	L	10/01/2009	ND	ND	ND	ND	North Fork Salmon River	45.47045	-114.01772
South Fork Iron	M	09/01/2009	12.7	100.0	2.32	232.0	North Fork to Headwaters	44.91015	-114.11784
South Fork Moyer	L	09/08/2009	5.6	100.0	2.26	226.0	Horse Creek to North Fork	44.92373	-114.28168
South Fork Pigtail	L	08/10/2009	5.0	98.0	2.48	243.0	North Fork to Headwaters	44.11588	-114.73825

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South Fork Pigtail	L	08/10/2009	5.5	121.0	2.34	283.1	North Fork to Headwaters	44.11765	-114.73603
South Fork Pigtail	L	08/10/2009	5.5	107.0	1.46	156.2	North Fork to Headwaters	44.10258	-114.74783
South Fork Pigtail	L	08/10/2009	6.5	97.0	1.34	130.0	North Fork to Headwaters	44.09102	-114.76265
South Fork Williams	M	07/27/2009	12.2	100.0	3.16	316.0	North Fork to Headwaters	45.06422	-114.03515
South Fork Williams	M	10/22/2009	3.8	100.0	1.54	154.0	North Fork to Headwaters	45.05524	-114.04767
South Fork Williams	U	10/22/2009	3.3	146.0	1.45	212.0	North Fork to Headwaters	45.05879	-114.06473
Spring	L	08/04/2009	13.3	100.0	3.92	392.0	Horse Creek to North Fork	45.39722	-114.25879
Spring	M	09/17/2009	10.5	100.0	1.94	194.0	Horse Creek to North Fork	45.42265	-114.29688
Squaw	L	09/23/2009	8.2	100.0	0.72	72.0	Lemhi River	44.72947	-113.72741
Squaw	M	07/29/2009	15.1	100.0	7.37	737.0	North Fork to Headwaters	44.33906	-114.47622
Squaw	M	07/29/2009	12.8	100.0	7.41	741.0	North Fork to Headwaters	44.36531	-114.48993
Squaw	M	08/27/2009	10.0	100.0	2.44	244.0	Horse Creek to North Fork	45.43446	-114.21280
Squaw	U	07/29/2009	10.4	100.0	6.51	651.0	North Fork to Headwaters	44.38696	-114.49523
Stanley Lake	L	07/29/2009	14.0	100.0	11.86	1,186.0	North Fork to Headwaters	44.25518	-115.00937
Stanley Lake	L	07/29/2009	16.0	100.0	5.74	574.0	North Fork to Headwaters	44.25542	-115.00967
Stanley Lake	L	07/29/2009	19.0	100.0	9.74	974.0	North Fork to Headwaters	44.26075	-115.02595
Stanley Lake	L	07/29/2009	21.0	96.0	10.76	1,033.0	North Fork to Headwaters	44.26056	-115.02493
Stanley Lake	L	07/29/2009	20.0	97.0	11.08	1,074.8	North Fork to Headwaters	44.25151	-115.04131
Stanley Lake	L	07/29/2009	20.0	100.0	10.70	1,070.0	North Fork to Headwaters	44.25112	-115.04206
Stroud	M	08/06/2009	9.5	100.0	3.00	300.0	Lemhi River	44.65660	-113.57063
Sulphur	L	07/21/2009	17.0	100.0	1.73	173.0	Middle Fork Salmon River	44.54746	-113.91600
Sulphur	L	07/28/2009	ND	ND	ND	ND	Middle Fork Salmon River	44.55314	-115.30100
Sulphur	L	07/08/2009	ND	109.0	3.50	381.5	Pahsimeroi River	44.54746	-113.91600
Sulphur	L	07/08/2009	14.0	115.0	3.84	441.6	Pahsimeroi River	44.54746	-113.91600
Sulphur	M	07/08/2009	15.0	113.0	2.70	305.1	Pahsimeroi River	44.52238	-113.82800
Sulphur	U	07/10/2009	8.0	105.0	1.64	172.2	Pahsimeroi River	44.51003	-113.93710
Sulphur	U	07/10/2009	9.0	100.0	1.20	120.0	Pahsimeroi River	44.51030	-113.93710

Stream	Transect ^a	Sample Date	Water Temp. (C°)	Transect Length (m)	Transect		Sub-basin	Location in WGS84	
					Mean Width (m)	Transect Area (m ²)		Latitude	Longitude
								Decimal Degrees	
Swamp	U	10/27/2009	1.1	100.0	3.06	306.0	Pahsimeroi River	44.34371	-115.15419
Tater	M	11/03/2009	6.7	100.0	ND	ND	Lemhi River	44.62579	-113.86391
Texas	L	07/15/2009	15.8	160.0	ND	ND	Lemhi River	44.53449	-113.30212
Texas	L	07/15/2009	16.0	160.0	ND	ND	Lemhi River	44.65598	-113.32140
Texas	L	07/16/2009	12.7	160.0	ND	ND	Lemhi River	44.52393	-113.28923
Tobias	L	09/23/2009	7.6	100.0	1.72	172.0	Lemhi River	44.73652	-113.68690
Trail	L	07/14/2009	16.0	100.0	2.07	207.0	North Fork to Headwaters	44.73873	-114.26882
Trail	L	07/14/2009	12.9	100.0	2.31	231.0	North Fork to Headwaters	44.74663	-114.28200
Trail	L	07/15/2009	12.5	100.0	1.89	189.0	North Fork to Headwaters	44.75227	-114.28894
Trail	L	10/28/2009	3.3	100.0	2.08	208.0	Horse Creek to North Fork	45.25472	-114.29792
Twelvemile	L	08/03/2009	11.0	115.0	4.02	462.3	North Fork to Headwaters	45.01417	-113.90934
Twin	L	07/21/2009	4.0	96.5	2.08	200.7	North Fork to Headwaters	43.93104	-114.72187
Twin	L	07/21/2009	4.5	98.0	0.86	84.1	North Fork to Headwaters	43.93939	-114.72085
Twin	L	08/24/2009	9.5	100.0	4.64	464.0	North Fork Salmon River	45.61272	-113.98364
Unnamed Tributary to Bear	M	08/07/2009	ND	104.0	3.9	405.6	Middle Fork Salmon River	44.46268	-115.10383
Vader	L	10/27/2009	3.6	100.0	1.09	109.0	Middle Fork Salmon River	44.34267	-115.13087
Van Horn	M	07/14/2009	9.4	100.0	2.74	274.0	North Fork to Headwaters	44.77810	-114.28434
Vine	L	08/05/2009	12.4	100.0	1.56	156.0	North Fork Salmon River	45.61666	-113.97304
Wagonhammer	M	10/29/2009	4.4	100.0	1.66	166.0	North Fork to Headwaters	45.40880	-113.93370
Warm Springs	U	08/10/2009	12.0	105.0	7.28	764.4	North Fork to Headwaters	44.14399	-114.72260
Warm Springs	U	08/11/2009	10.5	92.0	4.08	375.4	North Fork to Headwaters	44.07893	-114.64045
Warm Springs	U	08/11/2009	9.0	108.0	3.86	416.9	North Fork to Headwaters	44.08877	-114.65049
Warm Springs	U	08/11/2009	10.0	101.0	2.94	296.9	North Fork to Headwaters	44.07028	-114.63795
Warm Springs	U	08/11/2009	9.5	84.0	3.80	319.2	North Fork to Headwaters	44.08456	-114.64269
Warm Springs	U	08/12/2009	7.5	96.0	5.38	516.5	North Fork to Headwaters	44.10973	-114.68380
Warm Springs	U	08/12/2009	5.5	98.0	5.64	552.7	North Fork to Headwaters	44.09565	-114.65951
Warm Springs	U	08/12/2009	5.5	116.0	5.18	600.9	North Fork to Headwaters	44.10010	-114.66683
Warm Springs	U	08/12/2009	7.5	86.0	5.56	478.2	North Fork to Headwaters	44.10973	-114.68380
Weasel	L	07/21/2009	8.9	150.0	1.4	210.0	Horse Creek to North Fork	44.88690	-114.30547
West Fork Camas	L	07/28/2009	13.1	100.0	6.22	622.0	Middle Fork Salmon River	44.82203	-114.52672
West Fork	L	07/14/2009	10.1	200.0	1.34	268.0	North Fork Salmon River	45.51895	-114.04166

Stream	Transect ^a	Sample Date	Water Temp. (C°)	Transect Length (m)	Transect		Sub-basin	Location in WGS84	
					Mean Width (m)	Transect Area (m ²)		Latitude	Longitude
Hughes									
West Fork Hull	L	10/01/2009	ND	ND	ND	ND	North Fork Salmon River	45.47710	-114.03640
West Fork Iron	L	09/01/2009	9.7	100.0	3.28	328.0	North Fork to Headwaters	44.92142	-114.11602
West Fork Morgan	M	07/14/2009	19.3	100.0	3.35	335.0	North Fork to Headwaters	44.69116	-114.29477
West Fork Morgan	M	08/12/2009	ND	100.0	2.92	292.0	North Fork to Headwaters	44.71000	-114.33359
West Fork North Fork Salmon River	L	08/05/2009	12.3	100.0	2.70	270.0	North Fork Salmon River	45.65465	-113.97302
West Fork Pahsimeroi River	L	08/10/2009	8.9	80.0	4.18	334.4	Pahsimeroi River	44.14452	-113.72118
West Pass	L	08/07/2009	9.0	102.0	6.54	667.1	East Fork Salmon River	43.98748	-114.49069
West Pass	L	08/06/2009	9.0	100.0	6.54	654.0	East Fork Salmon River	43.98222	-114.48464
West Pass	L	08/06/2009	9.0	103.0	10.58	1,089.7	East Fork Salmon River	43.97580	-114.46822
West Pass	M	08/06/2009	11.0	100.0	5.56	556.0	East Fork Salmon River	43.96683	-114.45390
West Pass	M	08/05/2009	12.0	100.0	5.14	514.0	East Fork Salmon River	43.95395	-114.44841
West Pass	M	08/05/2009	7.0	110.0	4.70	517.0	East Fork Salmon River	43.94104	-114.44771
West Pass	U	08/04/2009	9.0	106.0	6.06	642.4	East Fork Salmon River	43.92663	-114.44752
Wildcat	L	07/03/2009	ND	ND	ND	ND	Lemhi River	44.75284	-113.21763
Wildcat	L	09/24/2009	4.9	100.0	0.83	83.0	Lemhi River	44.75426	-113.21612
Williams	M	08/03/2009	12.8	100.0	3.66	366.0	North Fork to Headwaters	45.08365	-113.98621
Wimpey	L	07/13/2009	10.1	160.0	ND	ND	Lemhi River	45.10928	-113.69381
Wimpey	L	09/08/2009	9.7	160.0	ND	ND	Lemhi River	45.10928	-113.69381
Withington	M	07/13/2009	10.1	160.0	ND	ND	Lemhi River	45.05564	113.75404
Withington	U	07/06/2009	13.9	160.0	ND	ND	Lemhi River	45.04647	-113.82532
Withington	U	07/09/2009	10.1	160.0	ND	ND	Lemhi River	45.04485	-113.81712
Woodtick	L	09/28/2009	6.6	100.0	2.05	205.0	Horse Creek to North Fork	45.04877	-114.28465
Wright	L	10/26/2009	1.7	100.0	3.50	350.0	Lemhi River	44.78021	-113.76064
Wright	M	07/28/2009	7.7	160.0	ND	ND	Lemhi River	44.76830	-113.76968
Wright	M	08/05/2009	8.3	160.0	ND	ND	Lemhi River	44.75647	-113.80045

^a L = transect's lower reach, M = middle reach, and U = upper reach.

^b ND = No data.

SALMON REGION FISHERY MANAGEMENT 2009 ANNUAL REPORT

Middle Fork Salmon River Snorkeling Transects and Project Angling

ABSTRACT

During July 2009, IDFG personnel snorkeled 28 of 29 main stem MFSR transects to sample for fish presence and density. For the 28 main stem MFSR traditional transects surveyed in 2009, westslope cutthroat trout had an overall mean density of 1.1 fish/100 m², rainbow trout /steelhead were 0.4 fish/100 m², and juvenile Chinook salmon were 0.7 fish/100 m². By comparison to 2007, the closest year for which snorkel data is comparable, westslope cutthroat trout had a mean density of 0.9 fish/100 m², rainbow trout /steelhead was 0.4 fish/100 m², and juvenile Chinook salmon was 0.1 fish/100 m².

INTRODUCTION

The MFSR, part of the Wild and Scenic Rivers System, flows through the Frank Church River of No Return Wilderness, a remote area in east central Idaho. The MFSR originates at the confluence of Bear Valley and Marsh creeks near Cape Horn Mountain. It flows 171 km to its confluence with the Salmon River, 92 km downstream from Salmon, Idaho (Figure 16).

Primitive roads access Dagger Falls and Boundary Creek, the traditional boating ingress to the MFSR, and the headwaters of some MFSR tributaries. Access to the lower 156 km of the river is limited to aircraft, float boats, or horse/foot trails.

The MFSR is a major recreational river offering a wide variety of outdoor and back-country experiences. The number of people floating the river during the permit season has increased substantially in the past 47 years, from 625 in 1962 to 9,001 floaters in 2009. The U.S. Forest Service estimated total use days to be 54,510 days in 2009, down from 57,248 use days calculated for 2008 (D. Leuzinger, U.S. Forest Service, personal communication).

The earliest MFSR fishery study, conducted in 1959 and 1960, evaluated the life history and seasonal movements of westslope cutthroat trout (Mallet 1960, 1961). In 1971 the IDFG initiated studies to monitor MFSR westslope cutthroat trout abundance and to evaluate catch-and-release regulations established by the IDFG Commission in 1972. The Commission adopted similar regulations for major MFSR tributaries in the early and mid-1980s.

The 1971 study established snorkeling transects to be surveyed periodically (Corley 1972; Jeppson and Ball 1977, 1979). In this report, these 1971-established transects are described as main-stem historical (Corley) transects (N=6). Since then, IDFG began additional studies within the MFSR drainage. In 1981, traditional main stem steelhead transects were established and IDFG began evaluating wild steelhead trout populations on the MFSR (Thurw 1982, 1983, 1985). In 1985, the Department added additional snorkel sites to enumerate cutthroat trout and Chinook salmon and began calculating steelhead, juvenile Chinook salmon, and westslope cutthroat trout densities in the MFSR and its tributaries (Reingold and Davis 1987a, 1987b, 1988; Lukens and Davis 1989; Davis et al. 1992; Schrader and Lukens 1992; Liler and Lukens 1992). The snorkel sites established since 1981 are known in this report as main-stem (N=29) or tributary (N=10) traditional transects.

This report, a continuation of the 1985 study, presents data collected in July 2009 on fish densities in the MFSR drainage.

OBJECTIVES

Monitor rainbow trout/steelhead, juvenile Chinook salmon, and westslope cutthroat trout densities within the MFSR and its tributaries to evaluate long-term trends in population status.

Monitor the effects of catch-and-release regulations on resident fish populations in the MFSR drainage, particularly westslope cutthroat trout.

METHODS

Mainstem and Tributary Snorkeling Transects

From July 27 to August 3, 2009, IDFG personnel snorkeled 28 of 29 traditional main stem MFSR transects using snorkeling techniques described by Thurow (1982). Historical transects on the MFSR were established prior to 1985 while traditional transects were established since 1985. Five of six MFSR historical (Corley) transects and all 10 traditional tributary transects were snorkeled in 2009. Additional physical information on main stem and tributary snorkel sites surveyed in 2009 is located in Appendices E, F, and G, which details snorkeling transects, locations, and 3-dimensional measurements.

Project Angling

Project anglers used conventional fly-fishing and spin cast gear to collect fish species data on the MFSR from Boundary Creek, located 0.9 km downstream of Dagger Falls, to the mouth of the Middle Fork, 153.4 km downstream of Dagger Falls (Figure 16). Fish were identified by species, measured to the nearest 10 mm total length, and released.

RESULTS AND DISCUSSION

Mainstem and Tributary Snorkeling Transects

In the MFSR traditional snorkeling transects, IDFG personnel counted 297 westslope cutthroat trout, 120 rainbow trout/steelhead, 203 juvenile Chinook salmon, 1 bull trout, and 202 mountain whitefish (Table 32). In 2007, the closest year for which data is comparable, snorkelers counted 175 westslope cutthroat trout, 36 rainbow trout/steelhead, 22 juvenile Chinook salmon, 6 bull trout, and 135 mountain whitefish in these same transects (Curet et al. 2009). Additionally, reddsideshiner, northern pikeminnow, and sucker were observed but not counted this year. One smallmouth bass *Micropterus dolomieu* was also seen in 2009. In 2007, 26 of 29 transects were snorkeled while 28 of 29 were surveyed in 2009. This year's data is reported in Tables 32-41 and Figures 17-25.

Mean densities for cutthroat, rainbow, and Chinook salmon in MFSR transects appeared to show improvement this year when compared to 2007, the closest year for which snorkel data is comparable (Table 33). The mean cutthroat trout density of 1.1 fish/100 m² in 2009 increased slightly from the 0.9 fish/100 m² finding in 2007. The rainbow trout density doubled from 0.2 fish/100 m² in 2007 to 0.4 fish/100 m². The Chinook salmon number showed the greatest gain of the three species with a density of 0.7 fish/100 m² in 2009 compared to 0.1 fish/100 m² in 2007.

Five of the six historical (Corley) sites on the MFSR were snorkeled in 2009 (Table 34). Westslope cutthroat trout density in these transects ranged from 0.1 to 10.3 fish/100 m² and had a mean density of 2.6 fish/100 m² in 2009. Rainbow trout density in these transects ranged from 0.0 to 1.0 fish/100 m² in 2009 and had a mean density of 0.2 fish/100 m² (Table 35). No juvenile Chinook salmon were observed in the historical transects during this year's snorkeling surveys. Bernard Airstrip Hole was not surveyed in 2009 due to site misidentification.

All ten tributary transects in the MFSR were snorkeled in 2009. IDFG personnel counted 65 westslope cutthroat trout, 36 rainbow trout/steelhead, and 52 juvenile Chinook salmon (Table 36). Mean densities of westslope cutthroat trout, rainbow trout/steelhead, and Chinook salmon in MFSR tributaries were 1.5, 0.8, and 1.0 respectively (Table 37). This compares with 2007 mean densities of 0.7, 0.7, and 0.7 for westslope cutthroat trout, rainbow trout/steelhead, and juvenile Chinook salmon, respectively (Curet et al. 2009a).

Project Angling

IDFG anglers caught 601 fish from the main-stem MFSR during the 2009 survey (Figure 22). Of the salmonids caught and released, westslope cutthroat trout comprised 56.6% (N=340) and rainbow trout/steelhead accounted for another 38.3% (N=230). Apparent cutthroat/rainbow hybrid trout added 1.3% (N=8,) to the catch, mountain whitefish another 0.7% (N=4), bull trout 0.3% (N=2), and 0.2% brook trout (N=1) accounted for the balance of salmonids caught (Figure 22). Additional non-game fish caught in 2009 included northern pikeminnow (2.3%, N=14) and redbelt shiner (0.3%, N=2). The 2009 mean total length for westslope cutthroat trout and rainbow trout/steelhead were 248.8 mm and 183.5 mm, respectively (Figure 22).

Catch-and-release regulations have been in effect since 1972. Before this date, approximately 20% of the westslope cutthroat trout caught by project anglers were over 300 mm total length. Since the regulation change, this proportion has fluctuated yearly, ranging from 18% to 53%, and currently averages 35.9% (Figure 18). The proportion of westslope cutthroat trout larger than 300 mm caught by project anglers in 2009 was 26% (N =89).

MANAGEMENT RECOMMENDATIONS

Continue monitoring densities of westslope cutthroat trout, rainbow trout/steelhead, and juvenile Chinook salmon in all 29 main-stem sites, 10 tributary sites, and six historical MFSR sites by snorkeling between the second week of July and the third week of August annually. This information demonstrates population trends over time. The main stem westslope cutthroat trout snorkel counts on the Middle Fork Salmon, St. Joe, Coeur d'Alene, and Selway rivers, along with the General Parr Monitoring snorkel counts for westslope cutthroat trout, likely comprise the best trend dataset for a salmonid subspecies in America (D. Schill, IDFG, personal communication).

Table 32. Numbers of fish counted in traditional snorkel transects, Middle Fork Salmon River, 2009.

Transect Name	Westslope Cutthroat Trout					Rainbow Trout/Steelhead					Chinook Salmon			Other Species ^a					Total Fish
	Total Length (mm)					Total Length (mm)					Age	Age	Total	BU	MWF	NPM	SUC	RSS	
	75-150	150-230	230-300	>300	Total	75-150	150-230	230-300	>300	Total	0	1							
Boundary	4	9	2	6	21	6	0	0	0	6	1	67	68	1	20	0	0	0	116
Gardells Hole	0	0	1	8	9	11	12	3	1	27	15	18	33	0	6	0	0	0	77
Velvet	0	12	8	8	28	4	7	0	0	11	19	8	27	0	0	0	0	0	66
Elkhorn	0	1	2	5	8	12	13	1	2	28	0	10	10	0	22	0	0	0	68
Sheepeater	0	7	3	1	11	1	0	1	0	2	0	2	2	0	10	0	0	0	25
Greyhound	0	22	0	14	36	0	3	0	0	3	0	0	0	0	0	0	P ^b	0	39
Rapid River	5	13	0	8	26	0	16	0	0	16	0	24	24	0	48	0	0	0	114
Indian Pool	0	24	0	11	35	0	11	0	0	11	0	0	0	0	17	P	P	0	63
Pungo	0	4	4	6	14	2	4	0	0	6	30	0	30	0	8	0	3	0	61
Marble Pool	0	1	4	5	10	1	0	1	0	2	0	0	0	0	8	P	P	0	21
Skijump	0	2	1	4	7	0	0	0	0	0	0	0	0	0	4	0	0	0	11
Lower Jackass	0	0	0	4	4	3	0	0	0	3	0	0	0	0	18	P	P	0	25
Cougar	0	0	0	2	2	0	0	0	0	0	2	0	2	0	9	0	P	0	13
Whitie Cox	0	4	6	10	20	0	1	0	0	1	0	0	0	0	0	0	0	0	21
Rock Island	0	1	1	0	2	0	0	0	0	0	6	0	6	0	4	0	0	0	12
Hospital Pool	0	8	2	1	11	0	0	0	0	0	0	0	0	0	4	P	P	0	15
Hospital Run	0	0	1	0	1	0	1	0	0	1	0	0	0	0	2	0	P	0	4
Tappan Pool	0	0	1	2	3	0	0	0	0	0	0	0	0	0	1	0	P	0	3
Tappan Run ^c	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Flying B	0	4	3	3	10	0	0	0	0	0	0	0	0	0	1	0	P	0	11
Airstrip	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Survey	0	2	0	8	10	0	0	0	0	0	1	0	1	0	0	P	P	0	11
Big Creek Bridge	0	2	1	2	5	0	0	0	0	0	0	0	0	0	5	P	0	P	10
Love Bar	0	5	0	8	13	0	2	0	0	2	0	0	0	0	1	P	P	0	16
Ship Island	0	0	0	6	6	0	0	0	0	0	0	0	0	0	9	P	P	0	15
Little Ouzel	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0	0	P	0	3
Otter Bar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	P	0	0
Goat Creek Pool	0	0	1	0	1	0	0	0	0	0	0	0	0	0	3	P	P	0	4
Goat Creek Run	0	1	0	0	1	1	0	0	0	1	0	0	0	0	2	P	P	0	4
Total	9	122	41	125	297	41	70	6	3	120	74	129	203	1	202	P	P	P	828

^a BU=Bull trout, MWF=Mountain whitefish, NPM=Northern pikeminnow, SUC=all Sucker species, RSS=Redside shiner.

^b P = Species present but not enumerated.

^c Site no longer exists due to river blow-out/changing river morphology or dynamics.

^d One smallmouth bass observed; not included in total.

Table 33. Densities of westslope cutthroat trout, rainbow trout/steelhead, and juvenile Chinook salmon in traditional snorkel transects, Middle Fork Salmon River, 2009.

Transect Name	River km ^a	Transect Area (m ²)	Densities (Fish/100 m ²)			
			Westslope Cutthroat Trout	Rainbow Trout/Steelhead	Chinook Salmon	Other Fish ^b
Boundary	0.3	690.0	3.0	0.9	9.9	3.0
Gardells Hole	4.3	756.0	1.2	3.6	4.4	0.8
Velvet	8.8	199.8	14.0	5.5	13.5	0.0
Elkhorn	13.6	530.4	1.5	5.3	1.9	4.1
Sheepeater	21.3	632.4	1.7	0.3	0.3	1.6
Greyhound	24.5	554.4	6.5	0.5	0.0	0.0
Rapid River	29.6	518.0	5.0	3.1	4.6	9.3
Indian Pool	40.0	1,479.6	2.4	0.7	0.0	1.1
Pungo	44.3	462.0	3.0	1.3	6.5	2.4
Marble Pool	51.0	937.2	1.1	0.2	0.0	0.9
Skijump	52.3	1,023.0	0.7	0.0	0.0	0.4
Lower Jackass	60.6	1,420.8	0.3	0.2	0.0	1.3
Cougar	64.6	320.0	0.6	0.0	0.6	2.8
Whitie Cox	73.9	591.6	3.4	0.2	0.0	0.0
Rock Island	74.1	707.6	0.3	0.0	0.8	0.6
Hospital Pool	82.9	896.0	1.2	0.0	0.0	0.4
Hospital Run	84.3	739.2	0.1	0.1	0.0	0.3
Tappan Pool	92.6	1,644.0	0.2	0.0	0.0	0.1
Tappan Run	-- ^c	--	--	--	--	--
Flying B	106.6	900.0	1.1	0.0	0.0	0.1
Airstrip	108.6	1,320.0	0.0	0.0	0.0	0.0
Survey	119.7	810.0	1.2	0.0	0.1	-- ^d
Big Creek Bridge	124.6	1,850.0	0.3	0.0	0.0	0.3
Love Bar	127.8	1,160.0	1.1	0.2	0.0	0.1
Ship Island	135.8	1,159.2	0.5	0.0	0.0	0.8
Little Ouzel	144.0	1,183.2	0.3	0.0	0.0	0.0
Otter Bar	144.6	1,830.4	0.0	0.0	0.0	0.0
Goat Creek Pool	151.5	1,500.8	0.1	0.0	0.0	0.2
Goat Creek Run	151.8	1,366.4	0.1	0.1	0.0	0.1
Total		28,181.6	50.9	22.2	42.6	30.7
Mean			1.1	0.4	0.7	0.7

^a River km readings begin at Dagger Falls at 0.0 km.

^b Includes bull trout, mountain whitefish, northern pikeminnow, sucker (var. species), dace (var. sp.), and redbside shiner.

^c Transect no longer exists due to river blow-out.

^d Fish not enumerated; no density calculation made.

Table 34. Number of westslope cutthroat trout and rainbow trout/steelhead by length group (mm), Chinook salmon by age group, and other fish species counted in the main-stem historical (Corley) transects, Middle Fork Salmon River, 2009.

Transect Name	Westslope Cutthroat Trout Total Length (mm)					Rainbow Trout/Steelhead Total Length (mm)					Chinook Salmon Age Age			Other Species ^a						Total Fish
	75-150	150-230	230-300	>300	Total	75-150	150-230	230-300	>300	Total	0	1	Total	BU	MWF	NPM	SUC	RSS	Total	
Little Creek Guard Station	0	6	8	28	42	1	3	0	0	4	0	0	0	0	13	P ^c	P	0	13	59
Mahoney Camp	0	0	0	7	7	0	0	0	0	0	0	0	0	0	2	0	P	0	2	9
White Creek Pack Bridge	0	2	1	1	4	0	1	0	0	1	0	0	0	0	2	0	0	0	2	7
Bernard Airstrip ^d	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Cliffside Rapids Hole	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	P	P	0	0	2
Hancock Rapids Hole	0	0	0	2	2	0	0	0	0	0	0	0	0	0	2	P	P	P	2	4
Total	0	8	9	40	57	1	4	0	0	5	0	0	0	0	19	0	0	0	19	81

^a BU=Bull trout, MWF=Mountain whitefish, NPM=Northern pikeminnow, SUC=various Sucker species, and RSS=Redside shiner.

^b Density expressed as the number of fish/100 m².

^c P = Species present but not enumerated.

^d Transect not surveyed in 2009.

Table 35. Densities of westslope cutthroat trout, rainbow trout/steelhead, Chinook salmon, and other fish species observed in the six historical (Corley) snorkel transects, Middle Fork Salmon River, 2009.

Transect Name	Densities (Fish/100 m ²)			
	Westslope Cutthroat Trout	Rainbow Trout/ Steelhead	Chinook Salmon	Other Species ^a
Little Creek Guard Station	10.3	1.0	0.0	3.2
Mahoney Camp	2.2	0.0	0.0	0.6
White Creek Pack Bridge	0.1	0.03	0.0	0.1
Bernard Airstrip ^b	--	--	--	--
Cliffside Rapids Hole	0.1	0.0	0.0	-- ^c
Hancock Rapids Hole	0.1	0.0	0.0	0.1
Total	12.8	1.03	0.0	4.0
Mean	2.6	0.2	--	1.0

^a Includes bull trout, mountain whitefish, northern pikeminnow, sucker species, and redbside shiner.

^b Transect not surveyed in 2009.

^c Fish not enumerated; no density calculation made.

Table 36. Numbers of westslope cutthroat trout and rainbow trout/steelhead by length group (mm), juvenile Chinook salmon by age group, and other fish species counted in ten tributary snorkel transects, Middle Fork Salmon River, 2009.

Transect Name	Westslope Cutthroat Trout					Rainbow Trout/Steelhead					Chinook Salmon			Other Species ^a						Total Fish
	75-150	150-230	230-300	>300	Total	75-150	150-230	230-300	>300	Total	Age 0	Age 1	Total	BU	MWF	NPM	SUC	RSS	Total	
Pistol Creek Lower	3	3	1	0	7	0	0	0	0	0	3	0	3	0	4	0	0	0	4	14
Pistol Creek Upper	0	4	1	0	5	3	0	0	0	3	0	0	0	0	4	0	0	0	4	12
Indian Creek Lower	0	0	0	2	2	3	0	1	1	5	5	1	6	0	1	0	0	0	1	14
Indian Creek Upper	0	0	0	0	0	7	2	0	0	9	29	0	29	0	6	0	0	0	6	44
Marble Creek	1	0	1	0	2	1	1	0	0	2	0	0	0	0	1	0	0	0	1	5
Loon Creek Lower	0	3	3	5	11	0	0	0	0	0	0	0	0	0	7	0	P ^b	0	7	18
Loon Creek Upper	0	3	3	3	9	0	4	0	0	4	0	0	0	0	5	0	P	0	5	18
Camas Creek Lower	1	14	0	7	22	2	4	0	0	6	2	0	2	0	19	0	P	0	19	49
Camas Creek Upper	0	0	0	2	2	1	3	0	0	4	0	0	0	0	2	0	0	0	2	8
Big Creek	0	2	1	2	5	2	1	0	0	3	12	0	12	0	1	0	0	0	1	21
Total Mean	5	29	10	21	65	19	15	1	1	36	51	1	52	0	50	0	P	0	50	203

^a BU=Bull trout, MWF=Mountain whitefish, NPM=Northern pikeminnow, SUC=various sucker species, and RSS=Redside shiner.

^b P = Species present but not enumerated.

Table 37. Densities of westslope cutthroat trout, rainbow trout/steelhead, Chinook salmon, and other fish species observed in tributary snorkel transects, Middle Fork Salmon River, 2009.

Transect Name	Densities (Fish/100 m ²)			
	Westslope Cutthroat Trout	Rainbow Trout/ Steelhead	Chinook Salmon	Other Species ^a
Pistol Creek Lower	1.7	0.0	0.7	1.0
Pistol Creek Upper	0.9	0.5	0.0	0.7
Indian Creek Lower	0.3	0.7	0.8	0.1
Indian Creek Upper	0.0	1.9	6.0	1.3
Marble Creek	0.4	0.4	0.0	0.2
Loon Creek Lower	2.9	0.0	0.0	1.9
Loon Creek Upper	3.5	1.5	0.0	1.9
Camas Creek Lower	4.2	1.1	0.4	3.6
Camas Creek Upper	0.7	1.1	0.0	0.7
Big Creek	0.7	0.4	1.7	0.1
Total	15.3	7.6	9.6	11.5
Mean	1.5	0.8	1.0	1.2

^a Includes bull trout, mountain whitefish, northern pikeminnow, sucker species, and redbside shiner.

Table 38. Summary of westslope cutthroat trout, rainbow trout/steelhead, and Chinook salmon and their mean densities in main stem traditional snorkel transects, Middle Fork Salmon River, 1996, 1999, 2003 to 2005, and 2007 to 2009.

Year	Westslope Cutthroat Trout		Rainbow Trout/Steelhead		Chinook Salmon		Total Transect Area (m ²)
	No. of Fish	Mean Density ^a	No. of Fish	Mean Density	No. of Fish	Mean Density	
1996	296	0.6	83	0.2	2	0.0	46,781.0
1999	304	1.4	141	0.6	470	2.2	21,846.0
2003	302	1.0	87	0.3	1,659	5.6	29,874.8
2004 ^b	150	1.6	88	0.9	2,095	22.1	9,498.8
2005	344	1.1	132	0.4	127	0.4	31,954.8
2007	175	0.9	36	0.2	22	0.1	19,544.0
2008 ^c	73	1.7	40	1.0	90	2.1	4,203.2
2009	297	1.1	120	0.4	203	0.7	28,182.0

^a Expressed as the number of fish observed per 100m².

^b Only upper 10 of 29 total transects surveyed.

^c Only upper 6 of 29 total transects surveyed.

Table 39. Summary of westslope cutthroat trout, rainbow trout/steelhead, and Chinook salmon and their mean densities in historical (Corley) snorkel transects, Middle Fork Salmon River, 1996, 1999, 2003 to 2005, and 2007 to 2009.

Year	Westslope Cutthroat Trout		Rainbow Trout/Steelhead		Chinook Salmon		Total Transect Area (m ²)
	No. of Fish	Mean Density ^a	No. of Fish	Mean Density	No. of Fish	Mean Density	
1996 ^b	--	--	--	--	--	--	--
1999 ^b	--	--	--	--	--	--	--
2003	92	0.9	22	0.2	141	1.4	10,069.2
2004 ^b	--	--	--	--	--	--	--
2005	112	4.6	0	--	0	--	5,308.0
2007	40	1.1	12	0.3	0	--	4,376.0
2008 ^b	--	--	--	--	--	--	--
2009	57	0.6	5	0.1	0	0.0	9,824.0

^a Expressed as the number of fish observed per 100m².

^b Not surveyed.

Table 40. Summary of westslope cutthroat trout, rainbow trout/steelhead, and Chinook salmon and their mean densities in Middle Fork Salmon River tributary snorkel transects, 1996, 1999, 2003 to 2005, and 2007 to 2009.

Year	Westslope Cutthroat Trout		Rainbow Trout/Steelhead		Chinook Salmon		Total Transect Area (m ²)
	No. of Fish	Mean Density ^a	No. of Fish	Mean Density	No. of Fish	Mean Density	
1996	95	0.9	113	1.0	1	0.0	10,985.0
1999	44	1.1	140	0.2	141	3.4	4,349.6
2003	85	1.8	102	2.2	412	8.8	4,704.0
2004 ^b	68	2.2	69	1.9	673	23.1	3,742.9
2005	42	1.1	91	2.2	49	1.2	4,447.2
2007	27	0.1	28	0.1	29	0.1	4,073.2
2008 ^c	--	--	--	--	--	--	--
2009	65	1.3	36	0.7	52	1.1	4,901.2

^a Expressed as the number of fish per 100 m².

^b Only upper 10 of 29 total transects surveyed.

^c Not surveyed.

Table 41. Summary of fish caught and released during project angling in the Middle Fork Salmon River, 1996, 1999, 2003 to 2005, and 2007 to 2009.

Year	Total No. Fish	Species ^a									Total Hours Fished
		CT	RBT	BU	RBTxCT	CK	MWF	EBT	RSS	NPM	
1996	400	280	116	0	0	0	2	0	0	2	UNK ^b
1999	322	182	12		8	0	0	0	0		UNK
2003	260	167	91	0	0	1	0	0	1	0	UNK
2004	430	243	184	1	0	1	0	0	0	1	133.8
2005	401	226	157	7	0	0	2	0	0	5	69.3
2007	542	264	253	2	1	0	6	0	0	16	121.7
2008	155	64	90	0	1	0	0	0	0	0	26.9
2009	601	340	230	2	8	0	4	1	2	14	166.0

^a CT = Westslope cutthroat trout, RBT = Rainbow trout/steelhead, BU = Bull trout, RBTxCT = Rainbow/cutthroat trout hybrid, CK = Chinook salmon, MWF = Mountain whitefish, EBT = Brook trout, RSS = Redside shiner, and NPM = Northern pikeminnow.

^b UNK = Unknown.

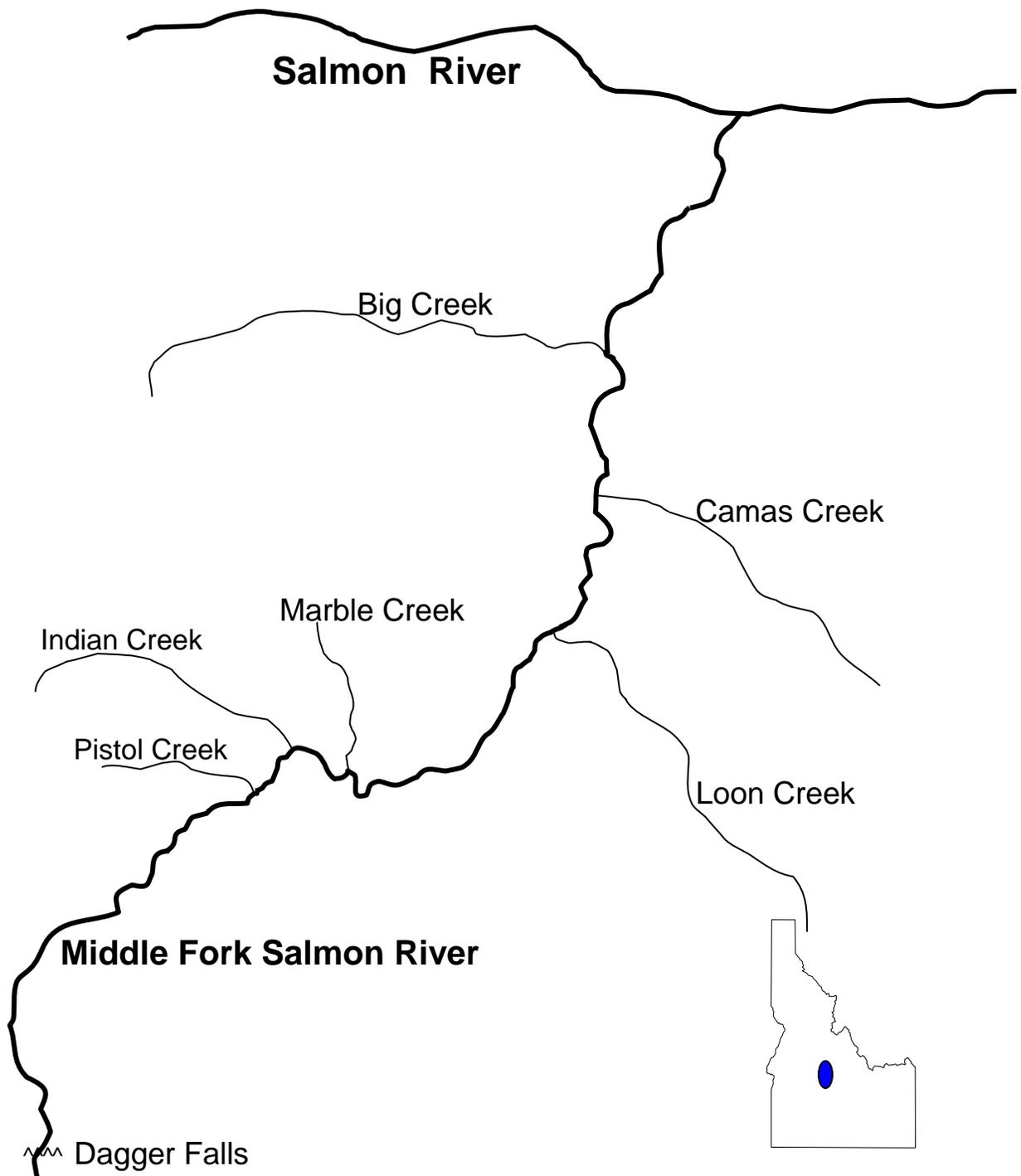


Figure 16. Map of the Middle Fork Salmon River and major tributaries, Idaho.

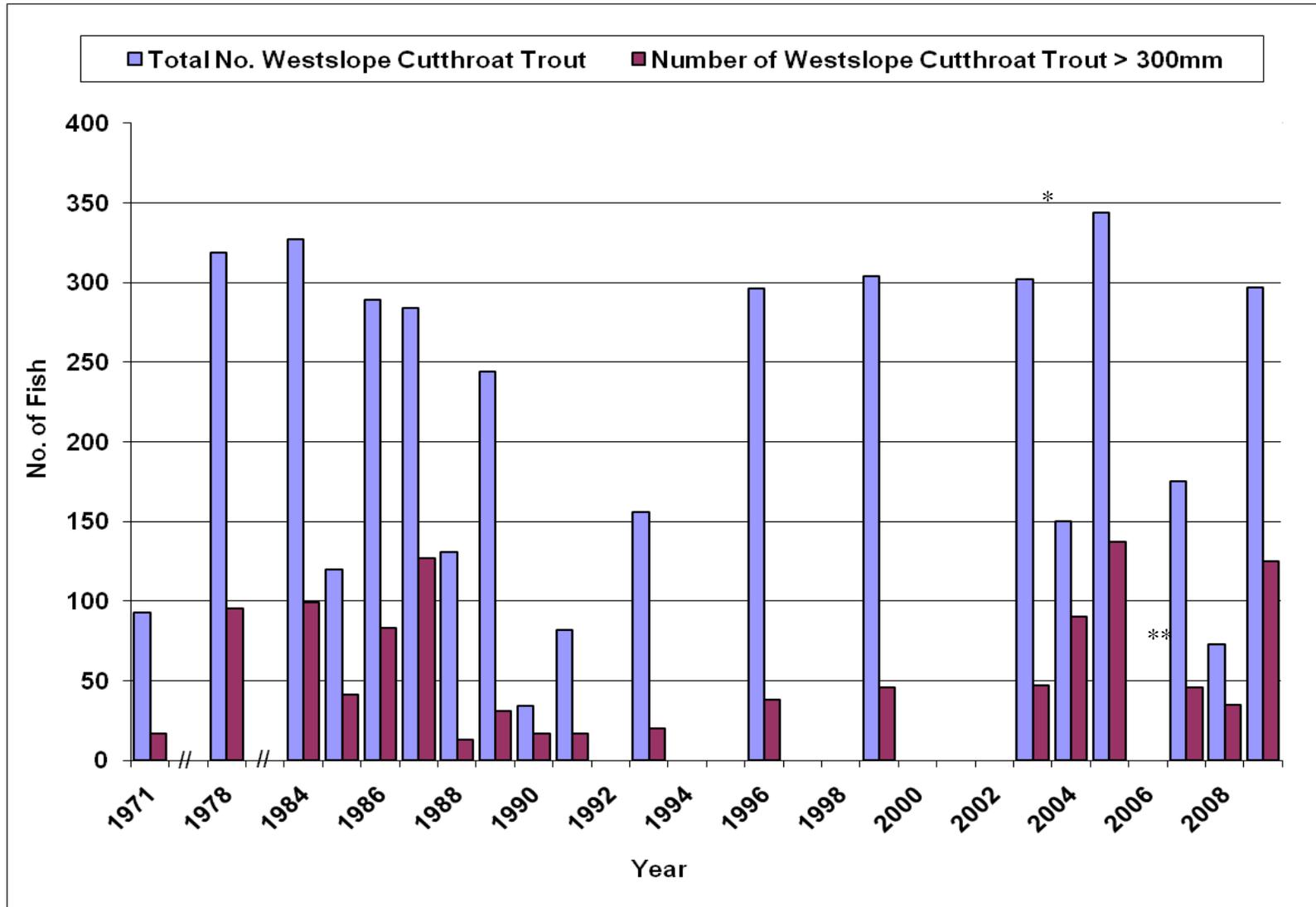


Figure 17. Number of westslope cutthroat trout counted in main stem Middle Fork Salmon River snorkeling transects, 1971, 1978, 1984 to 1991, 1993, 1996, 1999, 2003 to 2005, and 2007 to 2009. The 2004 data, marked with *, includes only survey sites upriver of Loon Creek. The 2008 data, marked with **, includes only survey sites upriver of Marble Creek.

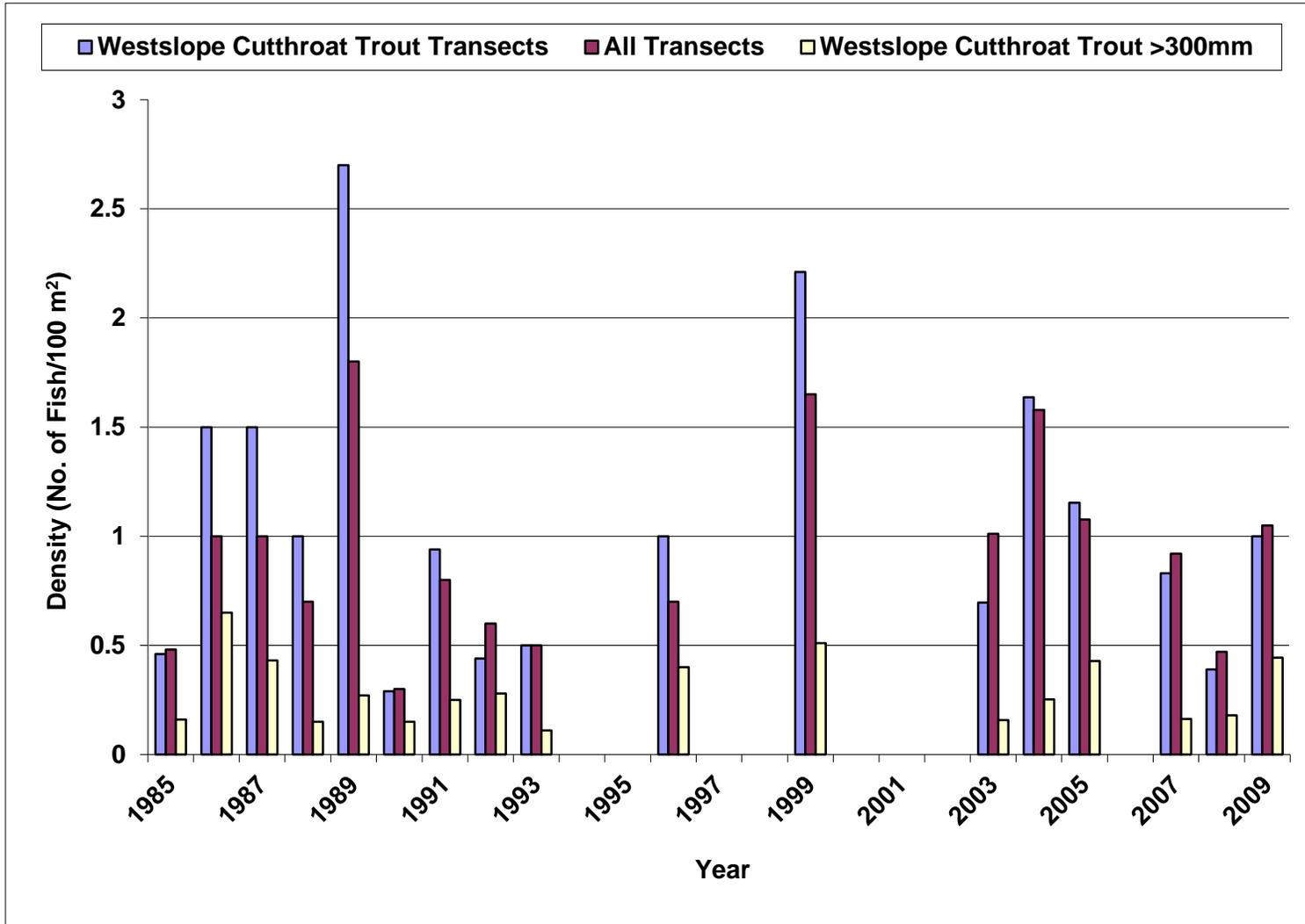


Figure 18. Densities of westslope cutthroat trout counted in westslope cutthroat trout-only transects (see Appendix C), in all transects, and densities of westslope cutthroat trout greater than 300 mm counted in all transects during Middle Fork Salmon River snorkeling surveys, 1985 to 1993, 1996, 1999, 2003 to 2005, and 2007 to 2009. Not all transects were sampled in all years.

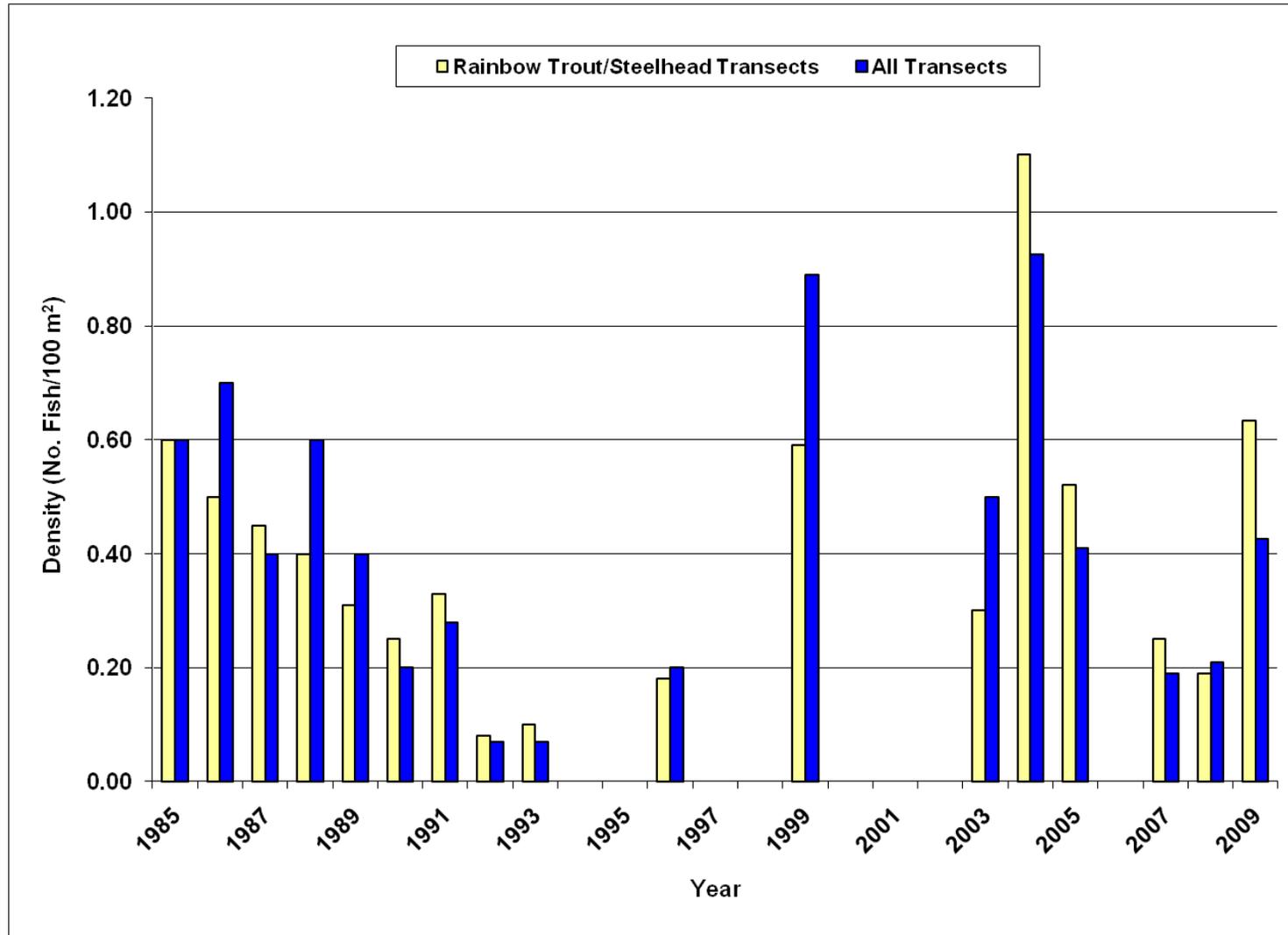


Figure 19. Densities of rainbow trout/steelhead counted in rainbow trout/steelhead-only transects (see Appendix C) and in all transects during Middle Fork Salmon River snorkeling surveys in 1985 to 1993, 1996, 1999, 2003 to 2005, and 2007 to 2009. Not all transects were sampled in all years.

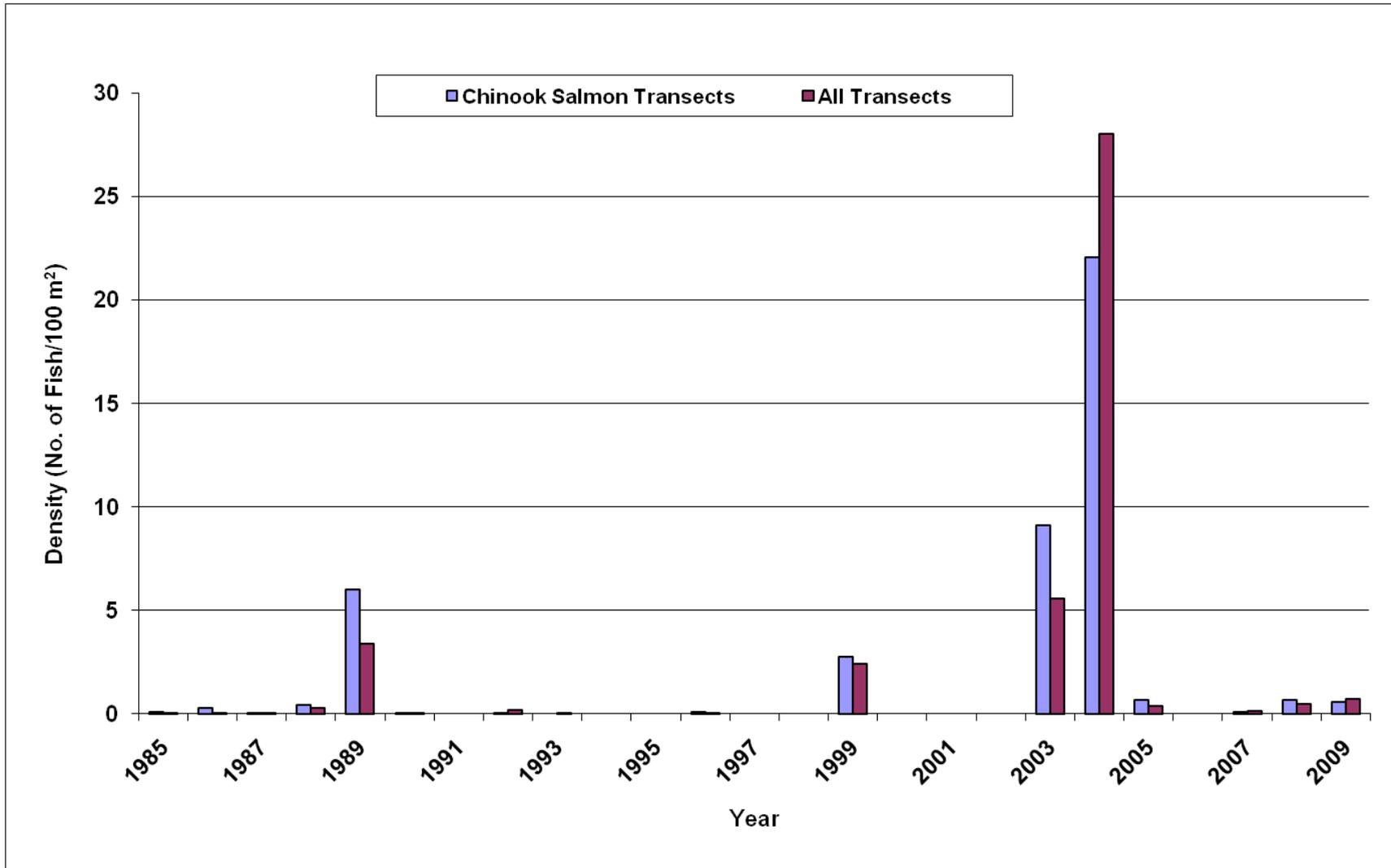


Figure 20. Densities of Chinook salmon in Chinook salmon-only transects (see Appendix C) and in all transects during Middle Fork Salmon River snorkeling surveys, 1985 to 1993, 1996, 1999, 2003 to 2005, and 2007 to 2009. Not all transects were sampled in all years.

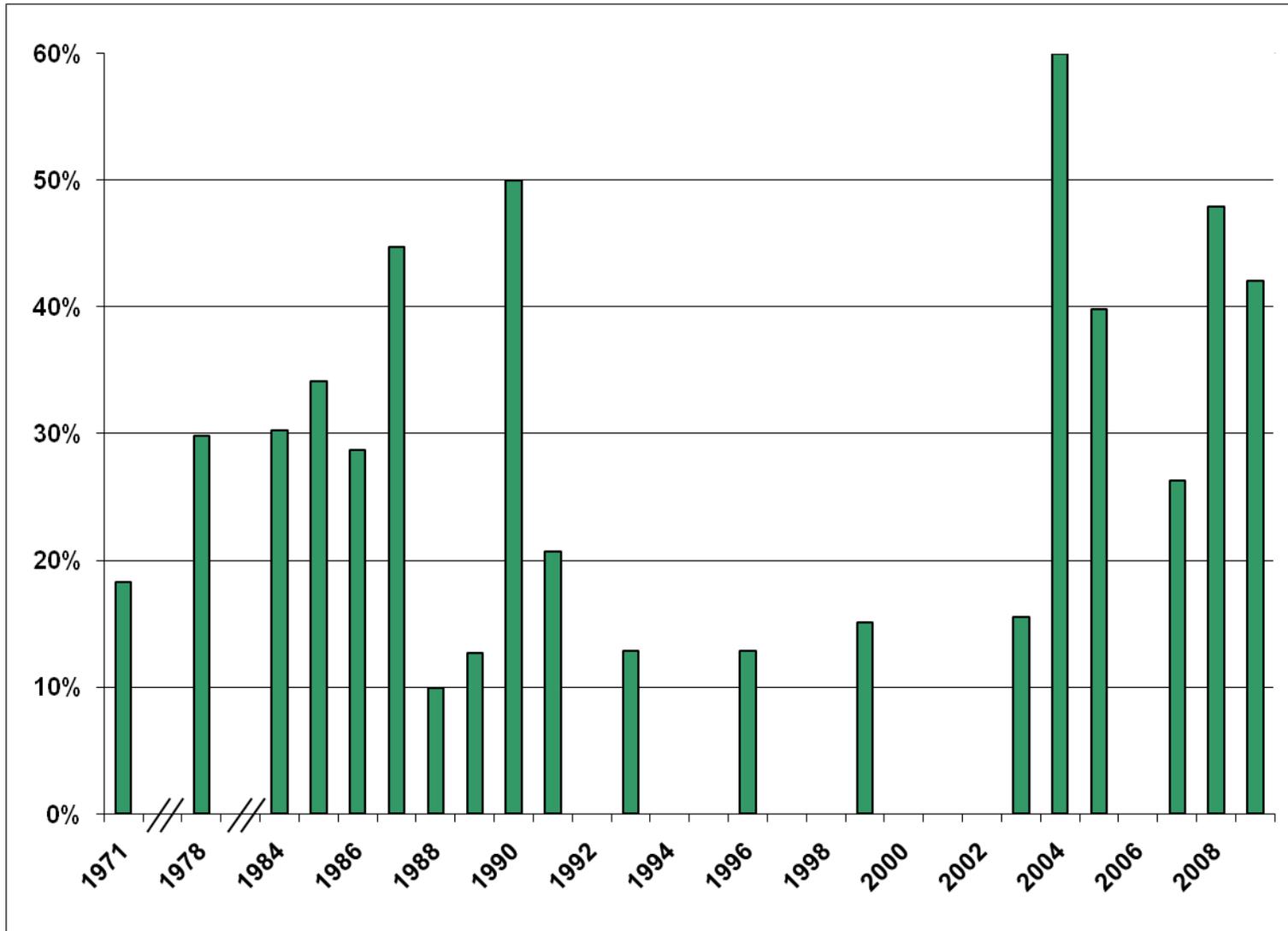


Figure 21. Percentage of westslope cutthroat trout larger than 300 mm total length sampled by snorkeling the Middle Fork Salmon River in 1971, 1978, 1984 to 1993, 1996, 1999, 2003 to 2005, and 2007 to 2009. Not all transects were sampled in all years.

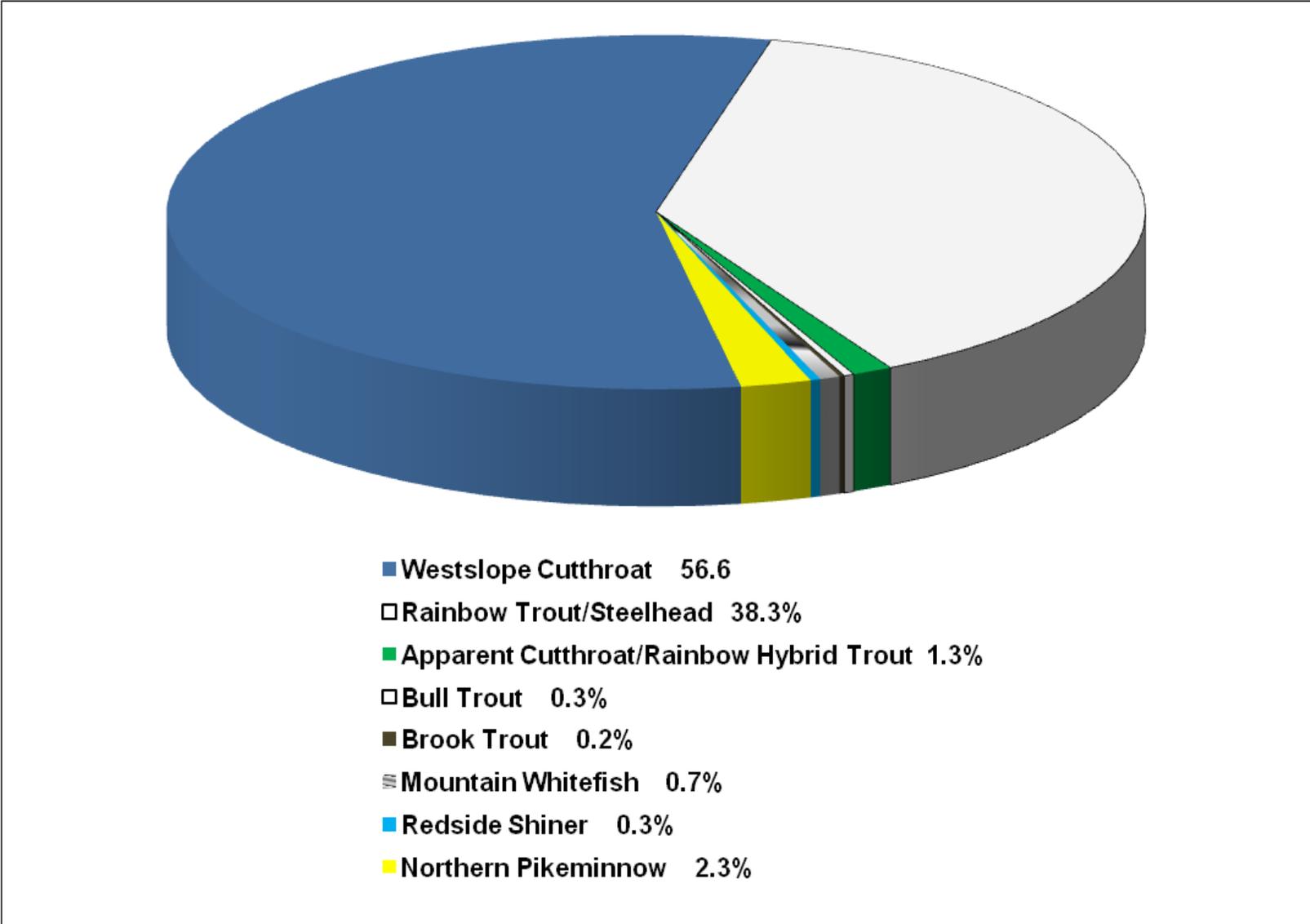


Figure 22. Species composition of fish (N = 601) caught by IDFG project anglers in the main-stem Middle Fork Salmon River, 2009.

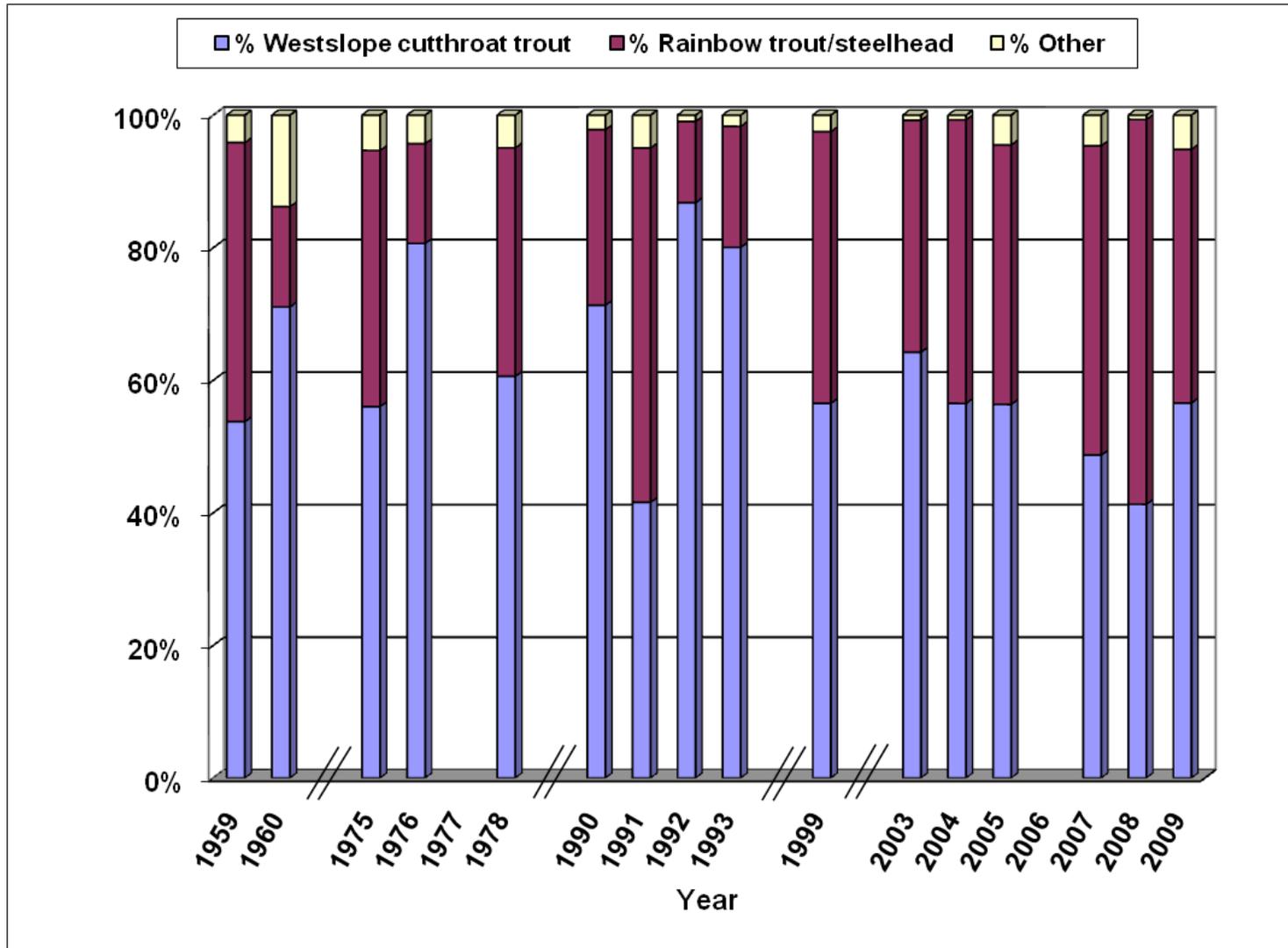


Figure 23. Proportions of species caught by project anglers in the Middle Fork Salmon River, 1959, 1960, 1975, 1976, 1978, 1990 to 1993, 1999, 2003 to 2005, and 2007 to 2009. "Other" includes all fish species except westslope cutthroat trout and rainbow trout/steelhead.

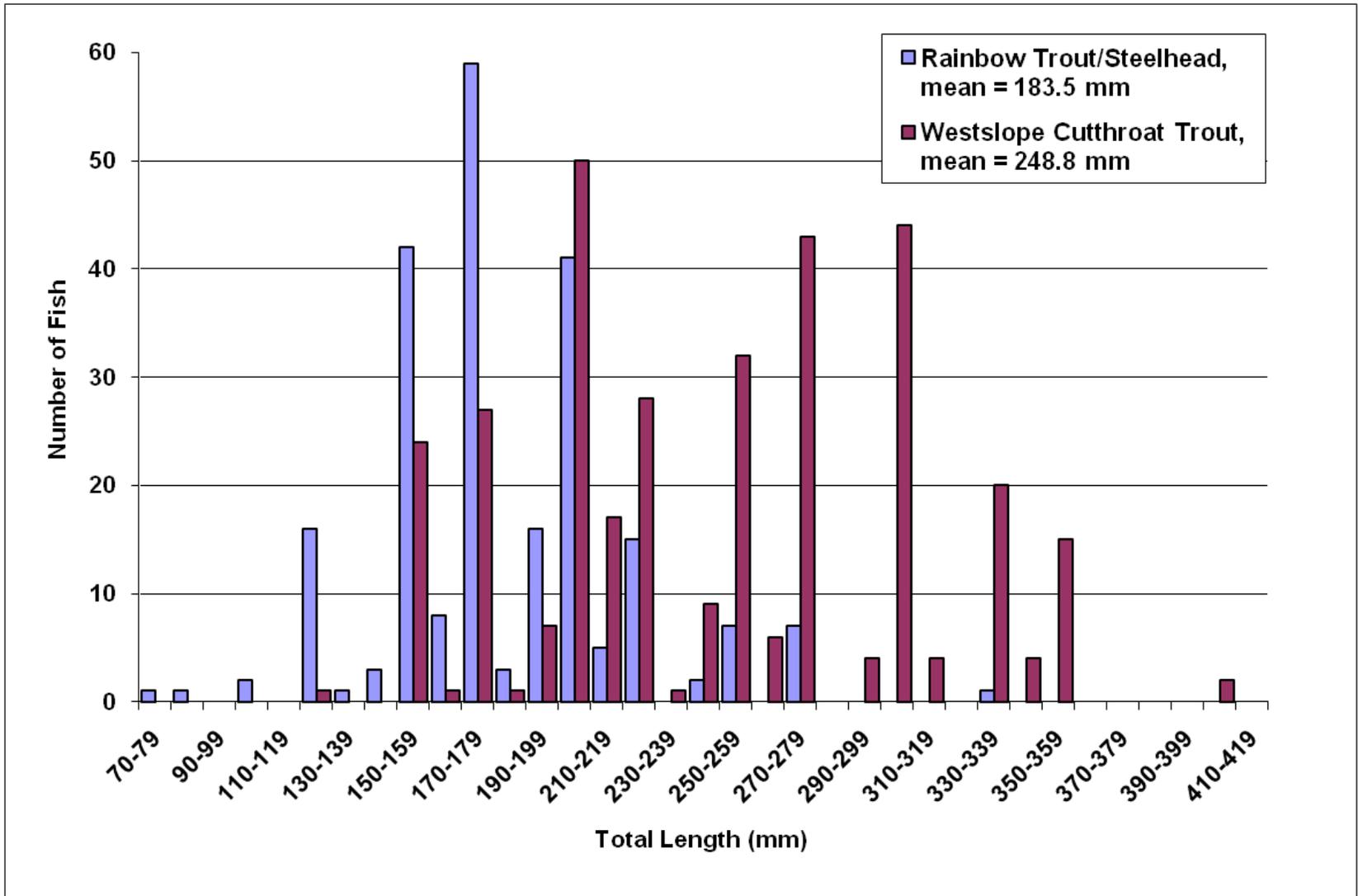


Figure 24. Length frequency of westslope cutthroat trout (N = 340) and rainbow trout/steelhead (N = 230) caught by project anglers in the Middle Fork Salmon River, 2009.

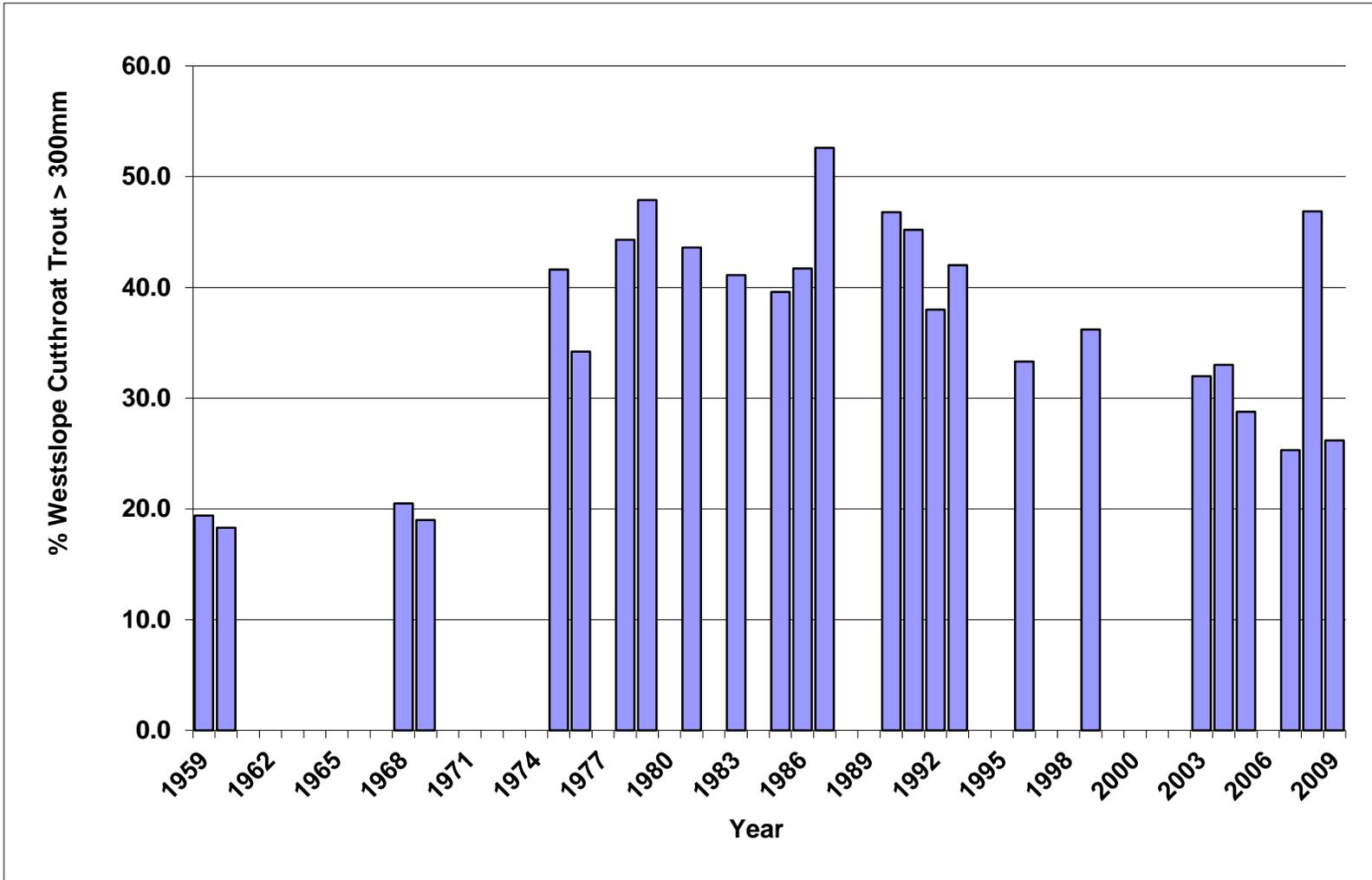


Figure 25. Percentage of westslope cutthroat trout larger than 300 mm total length sampled by project angling in the Middle Fork Salmon River in 1959, 1960, 1968, 1969, 1975, 1976, 1978, 1979, 1981, 1983, 1985 to 1987, 1990 to 1993, 1996, 1999, 2003 to 2005, and 2007 to 2009.

Appendix E. Locations and dimensions of traditional transects, Middle Fork Salmon River, surveyed in 2009.

Transect Name	River km ^a	Transect Length (m)	Visibility (m)	Visibility Corridor (m)	Transect Area (m ²)	Traditional Species ^b
Boundary	0.9	69	2.5	10.0	690.0	SB
Gardells Hole	4.6	126	3.0	12.0	756.0	C2, CK
Velvet	8.8	37	2.7	10.8	199.8	C2, CK
Elkhorn	14.1	68	3.9	15.6	530.4	SB
Sheepeater	21.3	102	3.1	12.4	632.4	SB
Greyhound	25.8	99	2.8	11.2	554.4	C2, CK
Rapid River	29.6	74	3.5	14.0	518.0	SB
Indian	40.8	137	2.7	10.8	1,479.6	SB
Pungo	45.1	77	3.0	12.0	462.0	C2, CK
Marble Pool	51.7	142	3.3	13.2	937.2	C2, CK
Skijump	52.3	155	3.3	13.2	1,023.0	SB
Lower Jackass	60.9	111	3.2	12.8	1,420.8	C2, CK
Cougar	65.9	50	3.2	12.8	320.0	SB
Whitie Cox	74.9	102	2.9	11.6	591.6	C2, CK
Rock Island	75.2	122	2.9	11.6	707.6	SB
Hospital Pool	82.9	80	2.8	11.2	896.0	C2, CK
Hospital Run	84.3	66	2.8	11.2	739.2	SB
Tappan Pool	94.9	137	3.0	12.0	1,644.0	C2, CK
Tappan Run	95.1	-- ^c	--	--	--	SB
Flying B	106.6	75	3.0	12.0	1,900.0	C2, CK
Airstrip	108.6	110	3.0	12.0	1,320.0	SB
Survey	119.0	75	2.7	10.8	810.0	SB
Big Creek Bridge	124.6	185	2.5	10.0	1,850.0	C2, CK
Love Bar	127.0	100	2.9	11.6	1,160.0	SB
Ship Island	134.6	126	2.3	9.2	1,159.2	C2, CK
Little Ouzel	143.2	87	3.4	13.6	1,183.2	SB
Otter Bar	144.0	143	3.2	12.8	1,830.4	C2, CK
Goat Creek Pool	151.5	134	2.8	11.2	1,500.8	C2, CK
Goat Creek Run	151.8	122	2.8	11.2	1,366.4	SB

^a River km readings start at Dagger Falls.

^b Traditional steelhead transects established in 1981: SB = Steelhead B-run. Traditional cutthroat trout and Chinook transects established in 1985: C2 = westslope cutthroat trout and CK = Chinook salmon.

^c Survey site no longer exists due to river blow-out.

Appendix F. Locations and dimensions of main-stem Middle Fork Salmon River historical (Corley) transects surveyed in 2009.

Transect Name	River Location ^a (km)	Transect Length (m)	Visibility (m)	Visibility Corridor (m)	Transect Area (m ²)	Traditional Species ^a
Little Creek Guard Station	57.6	85	2.7	10.8	408.0	C2, CK
Mahoney Camp	67.4	50	1.5	6.0	320.0	SB,C2, CK
White Creek Pack Bridge	78.1	300	2.9	11.6	3,480.0	SB,C2, CK
Bernard Airstrip ^c	109.4	100	--	--	--	SB,C2
Cliffside Rapids Hole	141.3	300	3.4	13.6	4,080.0	SB,C2
Hancock Rapids Hole	147.0	120	3.2	12.8	1,536.0	C2

^a River km reading begins at Dagger Falls.

^b SB = Steelhead B-run, C2 = Westslope cutthroat trout, and CK = Chinook salmon.

^c Transect not surveyed in 2009.

Appendix G. Locations and dimensions of Middle Fork Salmon River tributary transects surveyed in 2009.

Transect Name	Tributary Location ^a	Transect Length (m)	Visibility (m)	Visibility Corridor (m)	Transect Area (m ²)	Traditional Species ^b
Pistol Creek Lower	125 m above pack bridge	28	3.6	14.4	403.2	SB,C2, CK
Pistol Creek Upper	100 m above lower site	40	3.6	14.4	576.0	SB,C2, CK
Indian Creek Lower	75 m above mouth	76	2.4	9.6	729.6	SB,C2, CK
Indian Creek Upper	300 m above mouth	50	2.4	9.6	480.0	SB,C2, CK
Marble Creek	Above pack bridge	64	2.2	8.8	563.2	SB,C2, CK
Loon Creek Lower	Below pack bridge	52	1.8	7.2	374.4	SB,C2, CK
Loon Creek Upper	360 m above pack bridge	36	1.8	7.2	259.2	SB,C2, CK
Camas Creek Lower	Below pack bridge	75	1.9	7.6	524.4	SB,C2
Camas Creek Upper	Above pack bridge	37	1.9	7.6	281.2	SB,C2, CK
Big Creek	360 m above mouth	71	2.5	10.0	710.0	SB,C2

^a Location description applies to individual tributary.

^b SB = Steelhead B-run, C2 = Westslope cutthroat trout, and CK = Chinook salmon.

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2009 MANAGEMENT REPORT

Technical Guidance and Public Outreach

Technical guidance was provided to federal, state, county, municipal, and private agencies/entities upon request. Technical guidance was also provided to sportsmen's groups, conservation organizations, and private citizens in the form of fish pond development, stocking and management advice, funding requests and project feasibility opinions, and various conservation and educational programs.

Salmon Region fishery management staff provided technical assistance and guidance to the following government agencies and private groups during 2009:

- U.S. Army Corps of Engineers
- Idaho Department of Water Resources
- U.S.D.A. Forest Service
- Idaho Division of Environmental Quality
- U.S. Fish and Wildlife Service
- Governor's Office of Species Conservation
- N.O.A.A. Fisheries
- U.S. Bureau of Reclamation
- Private consultants
- Idaho Outfitters and Guides Licensing Board
- Mining Companies
- Idaho Department of Transportation
- State of Idaho Attorney General's Office
- Custer County
- U.S.D.I. Bureau of Land Management
- General Public
- Upper Salmon Basin Model Watershed Project
- Private Landowners
- Environmental Protection Agency
- Upper Salmon Basin Habitat Conservation Plan
- Blackbird/Panther Creek Reclamation Project
- Challis School District
- Leadore School District
- Salmon School District
- Salmon 4-H Group
- Headstart Program

During this reporting period, project staff provided technical assistance as time allowed, to private landowners, irrigation districts, and all requesting state, federal and tribal agencies. We submitted comments to agencies and private entities concerning outfitter/guide special use permits, inquiries regarding stream habitat conditions on private lands, private pond permits, grazing allotments, applications for installation of in-stream structures, bank stabilization, stabilization and treatment of mine tailings, fish screening, applications for irrigation diversions, permits for discharging materials into streams, consultations concerning Endangered Species Act (ESA) issues, bridge

construction, applications for stream restoration projects and water right applications. Department staff also spent considerable time assisting with the development of the Lemhi Habitat Conservation Plan, and the update of a region wide tributary prioritization plan.

Regional personnel were an integral part of the collaboration effort with the Upper Salmon Basin Watershed Project to implement on the ground habitat improvement measures, potential stream reconnects and fish migration flows. We also conducted on-site inspections of proposed, on-going and completed projects.

Of the estimated 45,000 anglers that fish in the Salmon Region, approximately 90% live outside the area. Because these anglers are not familiar with regional waters, we respond to over 500 requests for basic information on fishing opportunities, techniques, regulations, and area specifics.

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