

Smith River Adult Trout and Salmon Surveys in Summer 2004

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The Smith River Alliance coordinated surveys of adult fish in the Smith River during the summer of 2004 under contract with the California Department of Fish and Game and the Steelhead Catch Report-Restoration Card Funds. The Smith River Alliance began this type of work in 2000 for the purpose of utilizing past data collected by the Smith River National Recreation Area (USFS) and the California Department of Fish and Game (CDFG) to investigate summer fish abundance and distribution. This report provides a brief summary of the surveys and results from 2004. A more detailed and substantive report will be provided following the 2005 work as per the scope of the CDFG contract.

The summer surveys use snorkelers to locate, identify and count fish in the three main forks of the Smith River, comprising over 60 miles of adult salmon and trout holding habitat. Volunteer snorkelers are recruited from agencies and the community and trained in protocols developed by USFS staff in 1994, and improved in recent years with input from CDFG. A Volunteer Weekend at Rock Creek Ranch provides numerous volunteers and the ability to accomplish more than 15 miles of survey in a single day. The Volunteer Weekend has also become an important educational event, providing the opportunity for community involvement in a fisheries monitoring program.

Survey Methods

Teams of two or more snorkelers count adult fish while moving from the upstream to the downstream end-points of designated survey segments. Survey segments range in length from 1.0 to 4.5 miles. All segments of each Fork of the river are surveyed in the shortest period of days possible.

Each team is assigned a captain with adequate experience for confirming fish identification and providing leadership in the application of optimal techniques. Team captains tally observed fish on dive slates before and after surveying each large pool.

The following optimal techniques are employed to increase the probability of observing each fish and reduce the probability of over-counting:

- Snorkelers all receive training in the Smith River prior to collecting data.
- Each team includes a snorkeler who dives to examine holding sites under cover of boulders, logs or ledges. The diver is “spotted” by adjacent snorkeler to avoid unseen displacement of fish.
- Teams maintain positions and assigned lanes while moving downstream.
- Snorkelers communicate each fish observation by pointing and vocalizing.
- Teams keep all heads in the water until completely through each pool or run.
- Riffles, pocket-water and turbulent areas are surveyed to the degree possible without compromising safety.
- Rapid entry into pools from upstream riffles is preceded by the stealthy entry of one or more snorkelers from the bank.
- Snorkelers calibrate their size estimates underwater by using props of known length.
- Fish counting activity is conducted between the hours of 9:30 and 4:30 pm to provide optimal light conditions.

Fish are counted according to the types listed in Table 1. The list includes all types of adult salmonid fish present in the Smith River during summer, as well as suckers.

Results

Surveys from July 23-August 14, 2004 covered a total of 30 miles of river, including all target reaches of the Middle Fork (17.6 Miles), and the 13.8 miles of the South Fork most frequently surveyed in past years. Due to limited available assistance, surveys did not cover either the South Fork above Hurdygurdy Creek, or any of the North Fork.

The completed surveys utilized a total of 36 volunteers, 31 of whom participated only for the Volunteer Weekend August 14. Volunteers included 18 people with prior experience with these surveys. All volunteers were trained or retrained according to the methods described above. The total count of fish by category for both the Middle Fork and South Fork is shown in Table 1.

Table 1: Categories of adult fish, size range, and total counts for surveyed segments of the South Fork (13.8 Miles) and Middle Fork (17.6 Miles) Smith River, Summer 2004.

Fish Category	Species	Size Range (inches)	South Fork	Middle Fork
Cutthroat, large	<i>O. clarki clarki</i>	12 – 20"	126	196
Cutthroat, medium	<i>O. clarki clarki</i>	10 – 12"	169	171
Cutthroat, small	<i>O. clarki clarki</i>	7 – 10"	211	164
Resident Rainbow	<i>O. mykiss</i>	10 – 14"	39	86
Steelhead	<i>O. mykiss</i>	16 – 28"	8	6
Half-pounder	<i>O. mykiss</i>	12-16"	0 ¹	0 ¹
Chinook	<i>O. tshawytscha</i>	18 – 42"	12	2
Sucker	<i>C. rimiculus</i>	8 – 20"	21	68

1. Surveyors were not necessarily trained to classify Half-pounders

A total of 125 resident rainbow trout, 14 summer steelhead, and 14 spring Chinook were found in 2004. Resident rainbow trout were more abundant in the Middle Fork, while more steelhead and Chinook were found in the South Fork. An average of 37 adult

cutthroat trout per mile were found in the South Fork, compared to 30 adult cutthroat trout per mile in the Middle Fork. However, the relative proportion of adult trout by size classes was skewed to the small (<10") in the South Fork and to the large (>12") in the Middle Fork.

Due to confusion in previous years, surveyors were not instructed to distinguish the "half-pounder" form of steelhead. These small steelhead enter the Smith River after a few months of rearing in the ocean, but they are rare. Personal observation and interviews of team leaders indicates either no half-pounders in 2004 or that the few that were observed were classified as resident rainbow trout.

The 30 miles surveyed in 2004 were comprised of 14 individual segments. Fish counts for each segment, distance of segment, dates, names of surveyors and auxiliary notes are contained in a database used to generate the Fish by Reach table in the Appendix. The database may be useful for examining variation in observed abundance among crews and locations, but such analysis is beyond the scope of this report. An analysis of abundance data from current and past surveys will be included in a 2005 report.

Juvenile fish were not specifically targeted in these surveys. However, many of the snorkelers are trained to identify juvenile coho salmon and were instructed to make note of any such observations. No juvenile coho salmon were observed. Juvenile coho salmon have not been observed in the main forks of the Smith River during any previous summer adult fish surveys according to available data. Juvenile Chinook salmon were observed in all segments surveyed in 2004.

Suckers were observed in most reaches of the Middle Fork and South Fork but were most abundant in the lower reaches of both. Suckers were not observed in the Middle Fork above Patrick Creek and were not observed in the South Fork above Rattlesnake Slide, but these observations do not necessarily describe upstream limits to their distribution.

The three size classes of cutthroat trout are the consequence of how previous surveys were conducted. Early surveys most often classified adult cutthroat as those larger than 12" and those less than 12". Some surveys in the 1991-1995 defined the smaller category as those cutthroat less than 12" but greater than 10". Volunteers surveying the South Fork in 2000-2003 were instructed to not count adult cutthroat less than 10" in size. This simplification came out of concern that the challenge of surveying the more dispersed and well-hidden small adult cutthroat would overwhelm their function and compromise counts of the other fish categories. In 2004, all surveyors were given the challenge of collecting data by the three size classes. This challenge was successfully met due to emphasis on the practice and calibration of under-water size estimation.

Water clarity in the South Fork enables the identification of fish at distances of up to 15 feet depending on sunlight and other factors. Visibility is markedly better in the Middle Fork and allowed the identification of fish at distances up to 45 feet. Water clarity conspicuously deteriorated in the first two weeks of August due to increases in suspended biological material.

Hand-held thermometers were used on the upper and lower reaches of each fork. Maximum water temperatures in the Middle Fork ranged from 62-72 degrees, increasing downstream, during the survey dates. Maximum water temperature in the South Fork ranged from 62-66 degrees F on August 15, increasing in the downstream direction. Adult cutthroat trout were often observed using thermal refuge provided by springs and groundwater seeps.

The methods used in 2004 attempted to produce the most precise fish counts while preserving the ability to monitor trends in fish abundance using data that was first collected in 1982. The particular techniques employed by the former surveys are not known in detail, but likely generated more bias than counts in 2004 due to the recent development of optimal techniques. Assessment of trends in fish abundance is beyond the scope of this report. However, a review of available data for the years 1982, 1991-1995, and 2000-2003 indicate that the observed abundance of fish in 2003 is within the range observed in previous years.

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APPENDIX Table 1: Fish Counted by Reach in the South Fork and Middle Fork Smith River, Summer 2004

Date	South Fork Segment	CTT<10"	CTT10-12"	CTT>12"	Chinook	Steelhead	Resident	Sucker	Leader
8/15/2004	Hurdygurdy to Rattlesnake Cr.	19	7	12	0	2	2	0	David Katz
8/15/2004	Rattlesnake to Boulder Cr.	15	21	16	4	0	2	0	Darell Warnock
8/15/2004	Boulder to Rock Cr Ranch	63	42	12	3	4	25	1	Thomas Dunklin
8/15/2004	Rock Cr. R. to Sandy Camp	32	24	19	0	1	1	0	Joe Gillespie
8/15/2004	Sandy Camp to Carter Falls	41	32	25	1	0	0	1	Gary Reedy
8/15/2004	Carter Falls to above Surprise	31	23	37	4	1	9	18	Zack Larson
8/15/2004	Above Surprise to Scaling Stat.	10	20	5	0	0	0	1	Grant Wershckull
	Middle Fork Segment								
8/3/2004	Siskiyou Fk to Patrick Cr	26	23	37	0	2	12	0	Reedy
8/15/2004	Patrick Cr to Madrone Camp	18	29	25	0	0	32	0	Jerry Barnes and Craig
8/15/2004	Madrone Camp to Eightmile	16	20	48	0	1	23	4	Morgan Strachan
8/15/2004	Eightmile Cr to NF	5	14	29	0	2	6	yes	Nick Simpson
7/24/2004	NF to Peacock Bridge	64	50	29	0	0	12	60	Morgan Strachan
7/23/2004	Peacock to MP9	35	35	28	2	1	1	4	Reedy

APPENDIX Table 2: Summary of Previous Summer Adult Fish Surveys in the Main Forks of the Smith River with Data from the South Fork (SF).

Year	SF Date	Start	End	Miles	CKS	CTT>12"	SHT	Resident	Other Forks	Surveyors
1982	7/26-8/27	Eightmile	Middle Fork	25	11	91	5	NA	MF, NF	USFS?
1989	8/28	GO Road	Craigs Cr	13.2	2	125	5	NA		USFS?
1990	9/11	GO Road	Craigs Cr	13.2	0	138	7	NA		USFS?
1991	9/9-12	GO Road	Craigs Cr	13.2	1	51	8	NA	MF	Wood/Rogers
1992	9/3-5	Rattlesnake	Scaling Stat.	11	1	120	8	NA	MF, NF	USFS/Reedy
1993	9/7-9	Hurdygurdy	Middle Fork	15.2	17	111	4	NA	MF, NF	USFS/Reedy
1994	8/10 - 9/5	Harrington	Scaling Stat.	27	8	190	7	13	MF, NF	USFS/Reedy
1995	8/2-3	Hurdygurdy	Middle Fork	15.2	21	161	4	19	MF, NF	USFS/Reedy
2000	8/19	Hurdygurdy	Lower Concrete Br	8	1	101	2	2		SRA/Reedy
2001	8/18	Hurdygurdy	Scaling Stat.	13.2	2	235	1	6		SRA/Reedy
2002	8/24	Indian Bar	Gorge	15	14	283	4	17		SRA/Reedy
2003	8/6-14	Eightmile	Middle Fork	25	17	290	2	29	MF	SRA/Reedy
2004	8/15	Hurdygurdy	Scaling Stat.	13.2	12	126	8	39	MF	SRA/Reedy

Note: Six Rivers National Forest provided the data from 1982, 1989, and 1990 without description of data collection methods or personnel. The above table lists all known surveys; The Middle Fork and North Fork were not surveyed in any year when the South Fork was not surveyed.