

SEMI-ANNUAL REPORT

JANUARY 1 - JUNE 30 2006

Project Title: Atlantic Salmon Monitoring in Washington State

Investigator: Pam Meacham, Washington Department of Fish and Wildlife, Olympia, Washington. meachpmm@DFW.WA.GOV

Funding: Pacific States Marine Fisheries Commission and National Oceanic and Atmospheric Administration

INTRODUCTION

In 1999, the Pacific States Marine Fisheries Commission (PSMFC) established a program with the mission to prevent the negative impacts associated with aquatic nuisance species (ANS). This program includes ANS education and outreach, monitoring programs, research and inter-jurisdictional planning, coordination and grant administration. Funding for the program comes from Wallop Breaux (Sportfish Aid in Restoration), Bonneville Power Administration, NOAA Fisheries, and the U. S. Fish and Wildlife Services. The Program's primary focus is on two ANS Vectors; recreational watercraft and ballast water. In addition to educating recreational boaters and fishermen, the program includes outreach to marinas and other water dependent industries. Species addressed by the program include mitten crab, zebra mussel, green crab, and Atlantic salmon. Other species of concern include the New Zealand mudsnail, sea squirts, Asian carp, and Spartina (cordgrass). To accomplish their goals, PSMFC cooperates and contracts with numerous entities, including the Washington Department of Fish and Wildlife.

In 2003, with NOAA funding, the Pacific States Marine Fisheries Commission began funding WDFW to undertake snorkel surveys for Atlantic salmon juveniles and adults. The program was expanded to include foot and float boat surveys during the winter months. In the initial year 35 rivers and creeks were surveyed, and several hundred juvenile Atlantic salmon were discovered in Scatter Creek below a commercial hatchery outfall. Initial scale and otolith studies of the 109 captured indicated the fish were probably hatchery escapees.

Subsequent contracts and amendments have extended the surveys through December 31, 2006. As of July 11, 2006 the database indicated a grand total of four hundred ninety-two surveys have been completed in one hundred and forty-four streams and rivers. A recent review of the database that eliminated duplicate information and blank entries corrected the number of streams and rivers surveyed as of that date to one hundred thirty-five. The new 2006 contract extends the surveys through December 31, 2007, using a reduced staff.

METHODS

The majority of the snorkel surveys were conducted in the summer, and some of the fall and winters months. On rare occasions backpack electrofishing was used as an alternative to snorkeling for a sampling method. Streams that could not be surveyed by snorkel teams due to

water conditions were surveyed on foot, float boat, foot/hook and line, or float boat/hook and line. Foot, hook and line, and via float boat surveys for returning adults were conducted on streams and rivers during spawning seasons, and when water conditions were not suitable for snorkeling. Surveys under this contract focused primarily on rivers and streams near net pen and hatchery facilities, although efforts were made to survey streams that had not been surveyed under the previous contract.

The survey crew enters survey data into an Access database weekly, and all species observed are listed and identified as adult or juvenile. Length, weight, stomach contents, scale, and otolith samples are taken from any Atlantics captured, and analysis results are entered into the database. Two juvenile Atlantic salmon have been captured during this contract period.

RESULTS

FOOT & FLOAT SURVEYS

Between December 23, 2005 and July 11, 2006 twenty-six surveys were conducted on foot, foot/hook and line, via float boat, or via float boat/hook and line due to poor visibility or flood conditions. No Atlantic salmon or Atlantic salmon carcasses have been observed to date on these surveys. This brings the total number of foot or float surveys conducted to one hundred fifty-five. Between December 23, 2005 and January 16, 2006 no sampling was done due to weather conditions extremely high, turbid, and fast water flows in the rivers and streams. At these times conditions have been such that no type of sampling method is safe.

SNORKEL SURVEYS & RESULTS

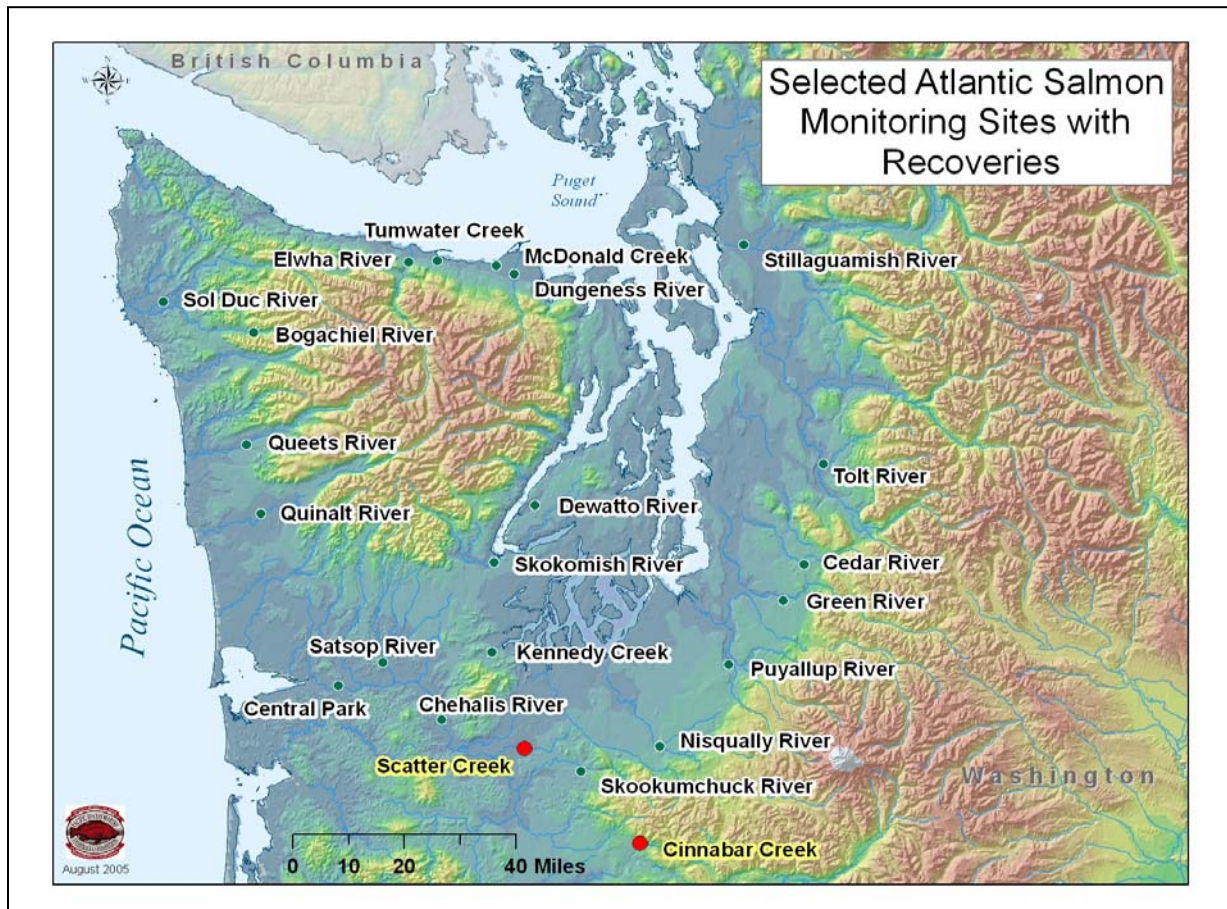
Between December 23, 2005 and July 11, 2006 thirty-two snorkel and one backpack electrofishing survey were conducted in eighteen rivers and streams. During this time period eleven juvenile (fry to parr) Atlantic salmon were observed and two captured (75 mm and 40 mm) from Scatter Creek, where the majority of Atlantic salmon had been found in past years.

To date, surveys have been conducted in the streams and rivers listed below. Those with an asterisk (*) have been surveyed more than once and those with a pound (#) have had foot, backpack electrofishing, hook and line, or float boat surveys conducted. Those in bold were surveyed between December 23, 2005 and July 11, 2006.

Table 1 List of all Rivers and Streams that have been surveyed as of July 11, 2006

Abernathy Creek	Greenwater River #	Rock Creek (King) * #
Beaver Creek	Hamm Creek * #	Rocky Creek
Black River *	Hamma Hamma River	Salmon River * #
Bogachiel River * #	Hill Creek #	Salt Creek
Boulder Creek	Hoko River * #	Samish River

Buck Creek	Hood Canal #	Saratoga Passage * #
Burley Creek	Humptulips River * #	Satsop River * #
Calwah River * #	Independence Creek	Satsop River (East Fork) * #
Canyon Creek	Issaquah Creek #	Satsop River (Middle fork) *
Canyon River	Jackman Creek	Satsop River (West Fork) *
Carbon River	Johns River *	Sauk River *
Cascade River *	Kalama River * #	Scatter Creek * #
Cedar Creek * #	Kapowsin Creek	Seiku River * #
Cedar River *	Kennedy Creek * #	Sherman Creek *
Chambers Creek	Klickitat River *	Skagit River *
Chehalis River * #	Lewis River * #	Skokomish River * #
Chehalis River (East Fork) *	Lewis River (East Fork) *	Skookumchuck River * #
Chehalis River (West Fork)	Lilliwaup River *	Skykomish River * #
Cinebar Creek *	Lincoln Creek #	Snoqualmie River * #
Clark Creek #	Lummi River	Solduc River * #
Clearwater River #	Lyre River *	South Prairie Creek * #
Cloquallum Creek #	Mashell River * #	Spring Creek
Coal Mine Creek	Mccallister Creek *	Spurgeon Creek
Columbia River	McDonald Creek	Stavis Creek
Copalis River	Mill Creek * #	Stillaguamish River (North Fork) * #
Cornell Creek	Mill Creek (Columbia Trib)	Sultan River *
Coulter Creek *	Minter Creek	Sund Creek #
County Line Creek * #	Morse Creek *	Tahuya River * #
Coweeman River *	Nemah River (North Fork)	Taylor Creek #
Cowlitz River * #	Newaukum Creek	Thompson Creek #
Decker Creek * #	Newaukum River * #	Tilton River * #
Delezene Creek * #	Nisqually River * #	Tokul Creek * #
Deschutes River * #	Nooksack River	Tolt River * #
Dewatto River *	Ohop Creek	Toutle River * #
Dry Bed Creek	Olequa Creek	Union River * #
Duckabush River * #	Perry Creek #	Unnamed Creek #
Dungeness River * #	Pilchuck River	Vesta Creek #
Elk Creek *	Porter Creek * #	Voights Creek
Elwha River * #	Prarie Creek	Waddell Creek * #
Fennel Creek #	Puyallup River * #	Wildcat Creek
Finch Creek #	Queets River * #	Willipa River * #
Garrard Creek * #	Quilicene River * #	Wishkah River #
Germany Creek	Quinault River #	Woods Creek #
Goble Creek * #	Racehorse Creek	Workman Creek #
Green River * #	Rock Creek (Thurston)	Wynoochee River * #



REPORTED ATLANTIC SALMON CATCHES

The Washington Department of Fish and Wildlife tracks commercial and recreational fisheries through the use of “Catch Cards” that are distributed with licenses and stamps for various fisheries. The data includes all fish that are taken, including aquaculture production and imported fish as well as those caught by commercial fishermen. It is the obligation of the licensee to turn in their catch cards at the end of the season. Commercial catches have been recorded in several Puget Sound Rivers near net-pen facilities or the processing plant located near the mouth of the Duwamish. Of the thirteen commercial catch cards that were shown to this project last year, ten were caught in Elliott Bay and the Duwamish River, near the processing plant on Harbor Island. Analysis of scales included on catch cards indicated that all of the fish were hatchery grown.

Recreational catch-cards no longer specifically list Atlantic salmon, leaving it up to the individual to write them in if they recognize the species. In addition to Atlantics listed, “Unkown” salmon have been recorded in several rivers that we consider to be primary due to their proximity to net pens or hatcheries, including; Chehalis, Skookumchuck, Wynoochee,

Humptulips, Willapa, Green-Duwamish, Puyallup, Skagit, and Snohomish rivers. They are not included in the chart below. Snorkel and spawning surveys have been conducted in these rivers and have never found Atlantic salmon or carcasses.

Table 2. Catch Card Records for Atlantic Salmon from 1999 through early 2005

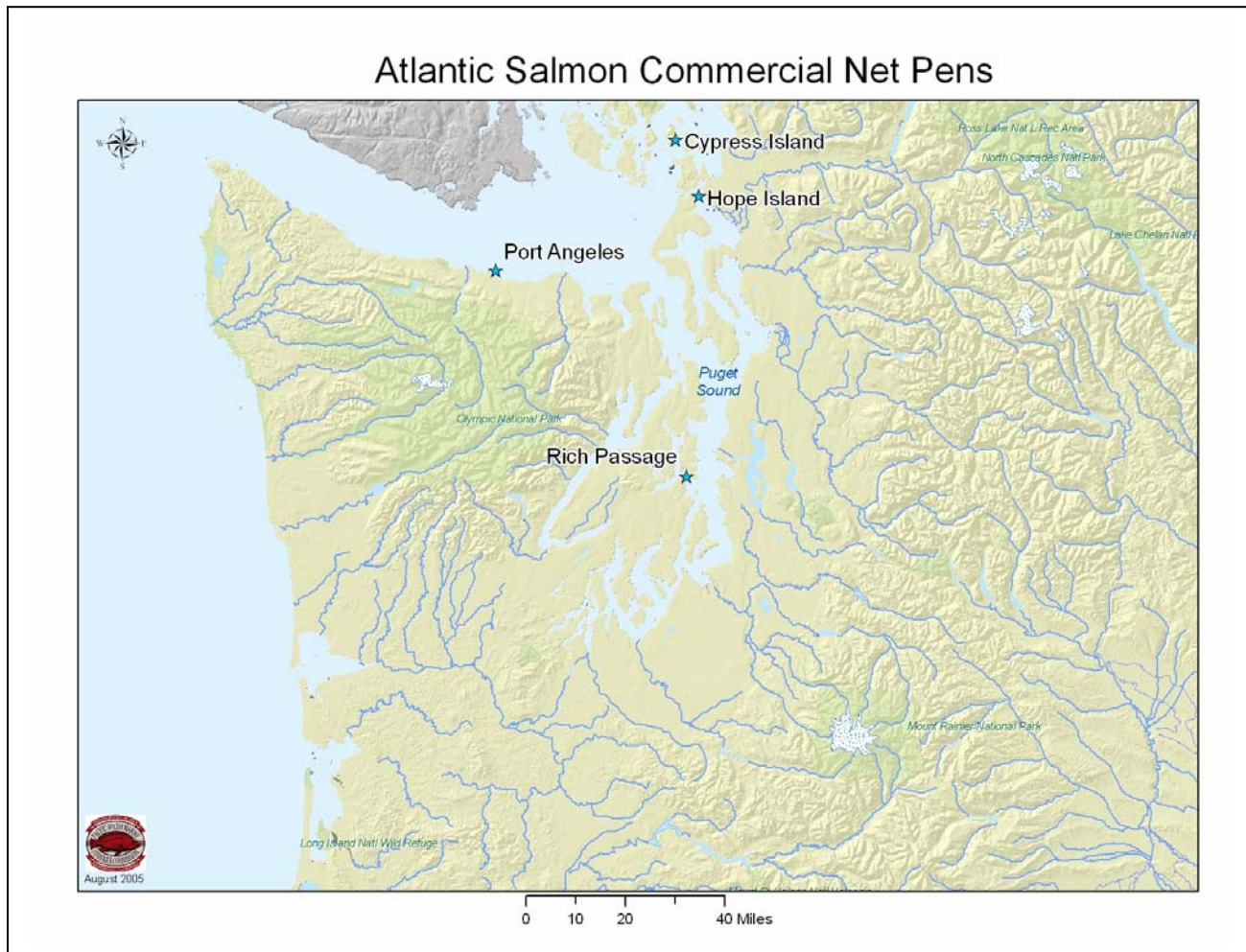
** "Take home" is presumed to be recreational fishery reports.*

Batch/Year	Ticket Data Source Desc	Fish	Pounds
1999	AQUACULTURE	1215592	12152118
1999	COMMERCIAL	4	27
1999	IMPORT	N/A	23417
1999	TAKE HOME	7	63
1999	TEST FISHING	4	33
2000	AQUACULTURE	1296115	13336375
2000	IMPORT	N/A	60715
2001	AQUACULTURE	1507654	16696840
2001	COMMERCIAL	4	28
2001	IMPORT	N/A	222553
2001	TAKE HOME	1	13
2001	TEST FISHING	1	9
2002	AQUACULTURE	1139462	13085441
2002	IMPORT	N/A	103585
2002	TAKE HOME	2	18
2003	AQUACULTURE	2241184	22723739
2003	IMPORT	N/A	124718
2004	AQUACULTURE	335738	3823693
2004	COMMERCIAL	16	82
2004	IMPORT	N/A	45983
2004	TAKE HOME	5	42
2005	IMPORT	N/A	37453

REPORTED ESCAPES

There have been no reported escapes since February 10, 2005, when it was reported that approximately 2500 juvenile Atlantic salmon escaped from the Hope Island net pens. One of the survey teams visited the area on February 15, 2005. They were unable to efficiently survey the

area because the net pen was 200 yards offshore and the surrounding area was all private property.



ANALYSIS

We have re-surveyed Scatter Creek numerous times this season. We did not observe or capture an Atlantic out of Scatter Creek between August 17, 2004 and May 22, 2006. Most likely, the hatchery drained their retention ponds (the source of escapees) or installed the proper gates on the outflow channel that stopped outmigration. On May 23, 2006 we started to observed juvenile Atlantic salmon again in Scatter Creek. The creek has been surveyed seven times between May 23, 2006 and July 6, 2006 resulting in observing eleven and capturing two (75mm and 40 mm) juvenile Atlantic salmon.

APPENDIX - STREAMS SURVEYED BETWEEN JANUARY 1, 2006 AND JULY 11, 2006

Stream Name	County	Date	Sampling method	Start Lat	Start Long	End Lat	End Long
Abernathy Creek	Cowlitz	2/23/2006	Snorkel	123.09.816	46.11.664	123.09.185	46.12.182
Cedar River	King	4/17/2006	Snorkel	122.02.320	47.24.279	122.03.803	47.26.380
Chehalis River	Lewis	2/10/2006	Float	123.18.200	46.34.169	123.16.369	46.37.872
Chehalis River	Lewis	2/16/2006	Float	122.39.065	46.43.174	123.07.057	46.48.444
Chehalis River	Lewis	3/1/2006	Float	123.18.200	46.34.169	123.16.369	46.37.872
Chehalis River	Lewis	4/4/2006	Float hook/line	122.59.065	46.43.174	123.07.057	46.48.444
Chehalis River	Lewis	4/5/2006	Float	123.18.200	46.34.169	123.16.369	46.37.872
Chehalis River	Lewis	4/6/2006	Snorkel	123.18.830	46.56.321		Porter launch
Chehalis River	Lewis	4/25/2006	Snorkel		Mouth of Skookumchuck		Pranther bridge
Chehalis River	Lewis	6/12/2006	Snorkel	123.17.463	46.31.859	123.17.609	46.32.433
Cloquallum Creek	Mason	5/10/2006	Foot	123.22.149	47.05.299	123.22.190	47.03.703
Cowlitz River	Lewis	2/1/2006	Foot hook/line	122.38.133	46.30.958	N/A	N/A
Cowlitz River	Lewis	2/9/2006	Float		Mouth of Blue Cr		Teledo Bridge
Deschutes River	Thurston	3/29/2006	Float		Vail Rd Bridge		Vail Loop Rd Bridge
Dewatto River	Mason	5/3/2006	Snorkel	123.02528	47.46955	123.03455	47.03455
Elwha River	Clallam	4/20/2006	Foot hook/line	N/A	138	N/A	139
Germany Creek	Cowlitz	2/23/2006	Snorkel	123.07.375	46.11.555	123.07.576	46.12.110
Hood Canal	Kitsap	2/21/2006	Float hook/line	122.49.310	47.38.977	N/A	N/A
Humptulips River	Grays Harbor	5/16/2006	Snorkel	123.49.824	47.19.757	123.50.325	47.17.849

Lewis River (East Fork)	Clark	6/28/2006	Snorkel	122.40.110	45.51.637	122.39.984	45.51.456
Lewis River (East Fork)	Clark	3/2/2006	Snorkel	122.35.414	45.48.826	N/A	N/A
Lewis River (East Fork)	Clark	3/2/2006	Snorkel	122.35.414	45.48.826	N/A	N/A
Mill Creek (Columbia Trib)	Wahkiakum/Cowlitz	2/22/2006	Snorkel	123.10.568	46.11.436	123.11.450	46.11.759
Newaukum River	Lewis	3/7/2006	Float	122.50.385	46.35.532	122.54.421	46.36.049
Newaukum River	Lewis	4/13/2006	Snorkel	122.50.984	46.36.540	122.53.806	46.36.332
Nisqually River	Pierce	4/12/2006	Float	122.19.739	46.50.534	122.26.155	46.51.042
Prarie Creek	Thurston	3/8/2006	Electroshock	123.00.085	46.48.058		N/A
Puyallup River	Pierce	3/6/2006	Foot hook/line	122.22.780	47.13.956	122.17.575	47.12.222
Queets River	Clallam	1/19/2006	Foot hook/line	124.12.879	47.33.197	N/A	N/A
Saratoga Passage	Island	1/18/2006	Float hook/line	122.33.864	48.12.126	122.28.167	48.08.164
Saratoga Passage	Island	1/19/2006	Float hook/line	122.23.864	48.12.126	122.28.167	48.08.164
Satsop River	Grays Harbor	3/30/2006	Float	123.27.757	47.05.906	123.31.620	47.02.199
Satsop River	Grays Harbor	4/26/2006	Snorkel	123.28.473	47.05.844	123.28.674	47.05.799
Sauk River	Snohomish	4/18/2006	Snorkel		Mouth of Falls Cr	121.28.360	48.10.353
Scatter Creek	Thurston	3/16/2006	Snorkel		Hatchery		Pool
Scatter Creek	Thurston	4/3/2006	Snorkel		Hatchery		Pool
Scatter Creek	Thurston	4/24/2006	Snorkel		Hatchery		Pool
Scatter Creek	Thurston	5/23/2006	Snorkel		Hatchery		Pool
Scatter Creek	Thurston	5/24/2006	Snorkel		Hatchery		Pool
Scatter Creek	Thurston	5/25/2006	Snorkel		Hatchery		Pool

Scatter Creek	Thurston	5/30/2006	Snorkel			Hatchery		Pool
Scatter Creek	Thurston	6/7/2006	Snorkel			Hatchery		Pool
Scatter Creek	Thurston	6/27/2006	Snorkel			Hatchery		Pool
Scatter Creek	Thurston	7/6/2006	Snorkel			Hatchery		Pool
Seiku River	Clallam	4/19/2006	Snorkel	124.26.527	48.16.736	N/A		N/A
Skokomish River	Mason	5/2/2006	Snorkel	123.14993	47.30652	47.31263		122.17452
Skookumchuck River	Thurston	1/31/2006	Float	122.45.650	46.47.777	122.47.885		46.48.230
Skookumchuck River	Thurston	2/13/2006	Foot	122.45.650	46.47.777	122.47.885		46.48.230
Skookumchuck River	Thurston	2/14/2006	Float	122.45.650	46.47.777	122.47.885		46.48.230
Skookumchuck River	Thurston	2/27/2006	Float	122.45.650	46.47.777	122.47.885		46.48.230
Skookumchuck River	Thurston	5/1/2006	Snorkel	122.43.295	46.47.340	122.44.936		46.47.571
Skykomish River	Snohomish	7/11/2006	Snorkel	122.34.055	47.07.324	122.34.683		47.43.763
Stavis Creek	Kitsap	2/15/2006	Snorkel	122.52.469	47.37.460	122.52.320		47.36.720
Thompson Creek	Thurston	2/6/2006	Foot	122.44.317	46.46.086	122.46.056		46.47.532
Tilton River	Lewis	5/15/2006	Snorkel	122.22.207	46.34.850	122.24.875		46.34.794
Tokul Creek	King	1/17/2006	Foot hook/line	121.84.262	47.55.493	121.84.375		47.55.150
Tokul Creek	King	1/23/2006	Foot hook/line	121.84262	47.55493	121.84375		47.55150
Wynoochee River	Grays Harbor	1/24/2006	Float	123.37.680	47.12.668	123.67.348		47.10.457
Wynoochee River	Grays Harbor	1/25/2006	Float	123.67.348	47.10.457	123.67.348		47.10.457
Wynoochee River	Grays Harbor	1/26/2006	Float	123.37.680	47.12.668	123.67.348		47.10.457
Wynoochee River	Grays Harbor	2/7/2006	Foot hook/line	123.67.348	47.10.457	N/A		N/A
Wynoochee River	Grays Harbor	4/11/2006	Snorkel	123.38.735	47.09.684	123.38.087		47.08.110
Wynoochee River	Grays Harbor	6/1/2006	Snorkel	123.38.901	47.09.597	N/A		N/A